STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

CENTENNIAL OFFICE BUILDING · ST. PAUL, MINNESOTA · 55155

May 17, 1977

DNR INFORMATION
(612) 296-6157

TO: ALL INDIVIDUALS INTERESTED IN THE MANAGEMENT OF FRONTENAC STATE PARK

FROM: DENNIS THOMPSON, PARK PLANNER Dennis Thompson
DAN COLLINS, ASSISTANT PARK PLANNER Dan Collins

A draft management plan for Frontenac State Park has been completed by the Department of Natural Resources and is available for review at the Red Wing Public Library in Red Wing; Frontenac State Park Office; at the Regional Headquarters Office in Rochester from Robert Johnson, Regional Park Supervisor; and from the Park Planning Office in the Centennial Office Building, St. Paul, Minnesota 55155. These copies may be reviewed at your convenience and any comments you have should be placed in writing and directed to:

John C. Winter
Park Specialist
Division of Parks and Recreation
Room B-95
Centennial Office Building
St. Paul, MN 55155

The Outdoor Recreation Act of 1975 provides for a 30-day review period in which comments may be made and received by the Division of Parks and Recreation. After this 30-day review period, a public meeting will be held in Red Wing and additional comments on the management of Frontenac State Park will be received at that time.

This meeting will be held on June 20, 1977, at 7:30 p.m., in the Auditorium of Twin Bluff Junior High School which is located at 2120 Twin Bluff Road in Red Wing.

We wish to thank each and every one of you for your personal interest and involvement in assisting us and commenting at past meetings on the planning process and the management of Frontenac State Park.

DT:DC:gd

INTRODUCTION TO 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 accommodate 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 Minnesota can take great pride.

MANAGEMENT PLAN SUMMARY (Draft)

INTRODUCTION

Through the foresight of past legislators, the State of Minnesota has been able to preserve many resource-rich areas for the recreational enjoyment of its citizens. Approximately 214,000 acres of recreational land are included within the statutory boundaries of our 65 state parks. Some of our State's most valuable natural resources lie within our state parks. If our state park system is to remain a source of pride and spiritual renewal for the people of Minnesota, it is vitally important that each unit be carefully planned and developed to maximize recreational opportunities while protecting the natural resources within the unit. Recognizing the need to protect the multi-million dollar investment, the Legislature enacted the Outdoor Recreation Act of 1975 (ORA '75).

ORA '75 has required theDepartment of Natural Resources to prepare detailed resource management plans for all its major recreational units and to classify them in relation to the established classifications in the Act. The Division of Parks and Recreation received funding to prepare management plans for twenty major recreational units during the current biennium. In order to do this extensive planning job, the park planning staff was established and with the assistance of other department specialists, has now completed the draft plan for Sibley State Park.

INTRODUCTION TO REGION

Frontenac is located within the "Mississippi River Valley" which runs from St. Anthony Falls to the Iowa border. It was cut by the merging waters of three sources-glacial river ancestors of the St. Croix, the Minnesota, and the Upper Mississippi. However, the upper Mississippi was by far the smallest of the three sources, as evidenced by the narrow canyon from St. Anthony's Falls to the river's former junction with Glacial River Warren at Fort Snelling.

The original vegetation in the park was a mixture of "big woods," "native prairie," and "oak openings and barrens." The big woods vegetation was a thin strip of the north edge of the park cloaking the steep slope facing Lake Pepin. Oak openings and barrens covered the majority of the park with two small areas of prairie on the northern bluff, and a strip extending east from Frontenac Station to Lake Pepin.

INTRODUCTION TO FRONTENAC

Frontenac had its origins back in the 1930's when the National Park Service first urged its establishment. Considerable interest was shown and for a while it appeared that the park would become a reality. However, this original concern finally waned and the proposal eventually sat on the shelf for a number of years.

It wasn't until the 1950's interest re-emerged. Largely as a result of the efforts of the Frontenac Park Association, the park was authorized by the 1957 Legislature. Since that time, the park has undergone three boundary expansions in 1961, 1965, and 1971. Presently, the authorized acreage stands at 2.689.

RESOURCE INVENTORY AND MANAGEMENT SUMMARY

FUTURE USE

The Minnesota State Comprehensive Outdoor Recreation Plan (SCORP) has identified southeast Minnesota as an area of great recreation potential. Often referred to as "Hiawatha Land," the area provides a number of recreation opportunities. Fishing, including fine trout fishing, hunting, including areas for deer, ruffed grouse and pheasant populations, boating, including excellent sailing on 43,000 acre Lake Pepin, hiking, and camping are all available within a relatively small area crossed by several principal highways. Also available are pioneer settlements, river town history and architecture. Lastly, the eastern two-thirds of the region provides the most rugged landscape in Minnesota, formed by spectacularly eroded outcrops of bedrock, largely forested by oaks and other hardwoods.

Increased future use of the area is probably inevitable. Its close proximity to the Twin Cities as well as the dramatic vistas afforded by the relief are a sure combination for future recreational demand.

Use of State parks within Hiawathaland appears to be on the increase. Overall the 10 State parks found there registered a 33.79% increase in attendance during the first nine months of 1975 over 1974. It should be pointed out though, much of this increase is a result of a flood free year in Whitewater. Over the years Frontenac has experienced slight but steady increase of demand on its resources.

SOILS

The soils of the Frontenac area were formed by a variety of different actions. There are several types of glacial till soils, limestone and sandstone residual soils, loess soils, glacial outwash soils, recent alluvial soils, and organic soils.

The most stable soils are found along the bluff top (limula) and "middle ground" adjacent to old Frontenac. (Burkhardt and Waukegan). The least stable soils are found on the steep slopes of the bluff (Frontenac) and immediately below Villa Maria (Marsh).

UNDERGROUND HYDROLOGY

The bluffs found in the park were once islands as Glacial River Warren roared through all of the bottomlands in the area. This action severed the Prairie du Chien-Jordan aquifer which runs higher than the bottomlands. Consequently, the well log for the picnic ground shows that it had to go past this typically water-rich formation and continue on to the Ironton-Galesville aquifer which yields only moderate amounts of water.

SURFICIAL HYDROLOGY

The largest and most striking water body within, or bounded by Frontenac State Park is Lake Pepin. The park also enclosed Pleasant Valley Lakelet and portions of Wells and Pleasant Valley Creeks (see Surficial Hydrology Map, page).

The water quality of Lake Pepin is significantly effected by inadequate secondary sewage treatment and occasional raw sewage discharges into the Mississippi River by Red Wing and the Twin Cities. Although steps are underway to raise the efficiency of existing facilities, little significant improvement is likely until considerable new construction is completed.

Improvements in the Red Wing and Twin Cities sewage treatment facilities are scheduled for completion in 1980 and 1981. But improvements in the sewage collection facilities will take longer. Both partially have combined sewage collection systems. Meaning that storm and gutter runoff is combined with sewage in one pipe. In order to avoid heavy rainfall overflow of this system the sewage will have to be separated into two separate pipes. Red Wing's work is scheduled for completion in 1983 while the Twin Cities in 1987.

Sauger, White bass, Walleye, crappie, bluegill, channel catfish, and Northern pike (amongst others) are all taken by fishermen in Lake Pepin. However, within recent years there has been increasing evidence of Poly-Chloro Bysphnols (PCB's) found in fatty tissues of fish taken from the lake, The Minnesota Health Department has warned that consumption of Lake Pepin fish should be limited to once a week. It appears that PCB contamination are cumulative and linger on for many years. And, thus, although river pollution has been curtailed it may be years before the effects have been completely erased.

VEGETATION AND WILDLIFE

Except for the steep wooded slopes, and the floodprone bottom-lands, the majority (55%) of the park is classified as either old field or agricultural consistent with the parks proposed natural state park designation. Vegetation management will be aimed primarily at restoring these land's presettlement vegetation (i.e. prairie and oak savannas(i.e. occasional groupings of bur oak, blackoak, white oak, shagbark hickory etc.))

Utilizing seeding, transplanting and prescribed (i.e. controlled) burns it is hoped that the dynamic balance between prairie and encroaching forest lost in the last century can be reestablished.

The other major thrust of the vegetation management plan calls for screening out U.S. 61 off of Pleasant Valley Lakelet, and the old town of Frontenac from the park.

CULTURAL RESOURCES

In addition to serving as a focal point for pre-historic aboriginal cultures, Frontenac (platted in 1857) was a very prominent and active town in the fur tradding, logging and steamboat areas.

FUTURE DIRECTION OF THE PARK

Before specific management techniques can be proposed or facility developments suggested, it was necessary to analyze all pertinent information available on the park. The general directio of development will be established by its classification. This will be formalized by zoning sub-units within the park for different purposes based upon resource characteristics and capabilities.

CLASSIFICATION

Because Frontenac fulfilled all three qualifications stipulated by the Outdoor Recreation Act of 1975, namely; 1. typifying the landscape region, 2. being able to attract users from throughout the state and 3. being able to carry the use associated with the classifications, it is recommend that the park be classified as a Natural State Park.

This means that management shall seek to maintain a balance among the plant and animal life of the park and re-establish desirable plants and animals formerly found in the area.

Programs and facilities will be provided to interpret, utilize, and appreciate the natural surroundings of the park. But in order to protect this park for future generations, no activities will be permitted which significantly degrade the natural resources. Physical development will be limited to those facilities necessary to complement the natural features and values being preserved.

In addition, it is recommended that portions of Pointaw Sable be designated as a Historic Site, and that Pleasant Valley Lakelet be designated as the eastern terminus of the proposed Wacouta Ponds Scientific and Natural Area.

ZONING

Ecological Protection Zone - Includes areas which are sensitive to certain uses, require special management or protection, and/or have significant value for research. Development will be restricted to interpretive facilities and trails, and management will be directed toward perpetuation of natural values.

Areas Included

Three different areas have been identified as ecological protection areas: Wacouta Pond within the park, steep slopes along the bluffs, and most of the marshy area off of Pointau Sable.

Wacouta Pond and the string of marshes below it are in an ancient perched valley through which the Mississippi River, or part of it, once flowed. The floor of this valley, which has long been abandoned by the river, is now more than 200 feet above the level of adjacent Lake Pepin. Aside from natural history values, this vallye is of considerable interest as a physiographic feature. This entire area has been recommended as a Scnietific and Natural Area. That part which extends into Frontenac State Park is included within this potential zone.

The slopes along the bluffs are very steep in places (+25%) and consequently susceptible to erosion. Therefore, use upon them must be controlled and vegetative management techniques utilized to encourage stability.

The marshy area near Point au Sable is sensitive to development. The standing water and constant flooding make development very expensive. The relative inaccessibility of Bottomland Hardwoods oriented next to a sand beach creates a diversity ideal for large numbers of wildlife species.

Outstanding Natural Feature Zone - Includes areas which are geologically or biologically significant on a statewide basis. These features are often the park's principal attraction. Major development may be necessary to preserve the integrity of the natural feature while providing for high use. Resource management will be restricted to restoring and perpetuating the resource's natural characteristics.

Although the entire bluff top on which the picnic area and campground reside could with some justification be included within this zone, one focal point exists. The bluff off of the picnic area provides a scenic vista of the old town of Frontenac and picturesque Lake Pepin and is one of user highlights of the park.

Access to Point au Sable is now limited and use is low. If a parking lot is developed in the area, this point will become a user highlight. The Point is an excellent bird watching location and contains a beautiful sand beach. In the future, this area will become an important natural feature within the park.

General Environment Zone - This zone includes those areas which typically lack any outstanding natural, historical and cultural features but provide the bulk of the "setting" for the unit. "Low key" development will be allowed here: primitive campsites, riding trails, interpretive facilities, roads and facilities necessary for health and safety of users. Resource management will be directed at improving the natural aesthetic quality of the vegetation and wildlife habitat.

Historical and Cultural Zone - This zone includes those sites which help illustrate the historic and prehistoric heritage of the area that should be preserved or restored. Activities, development and management will all emphasize these interpretive values.

Areas Included

Sand Point is rich in pre-history. To date the following sites have been located: the Akeson Site (21-GD-100), Three Mounds (21-GD-118), the Burfeind Site (21-GD-90), Frontenac State Park Mounds (21-GD-121), Mouth Wells Creek Site, "Rice Pond" Habitation Site, South Ridge Site, Havanna Ridge Site. In addition, a Flour Mill, a clammer's site, and numerous historic celler depressions have been located.

A zone which incorporates most of these sites has been delineated.

Development Zone - This zone includes lands and waters where major park development and intensive use will be concentrated. The placement of this zone depends on its ability to withstand intensive use while facilitating access to the remainder of the park. Management will be directed toward improving the recreation capabilities and characteristics of the environment.

Only those locations needed for specific development were retained from potential development areas. One area not identified as "potential" was also included. In order to provide limited access to Point au Sable prehistorical, historical, recreational and natural features a parking lot will be required. Because the area is wet much of the year, considerable fill will be necessary.

DEVELOPMENT PLAN

ROADS

1. Develop a park entrance off of U.S. 61 near Pleasant Valley Lakelet.
2. Develop a park road and parking facility near Point au Sable.

CAMPGROUNDS

1. Retain (at least for the next ten years) the present Family Campground.
2. Develop a new campground overlooking Pleasant Valley Lakelet.
3. Retain Pioneer Group Camp

PICNIC AREAS

Retain present Picnic Area.

TRAILS

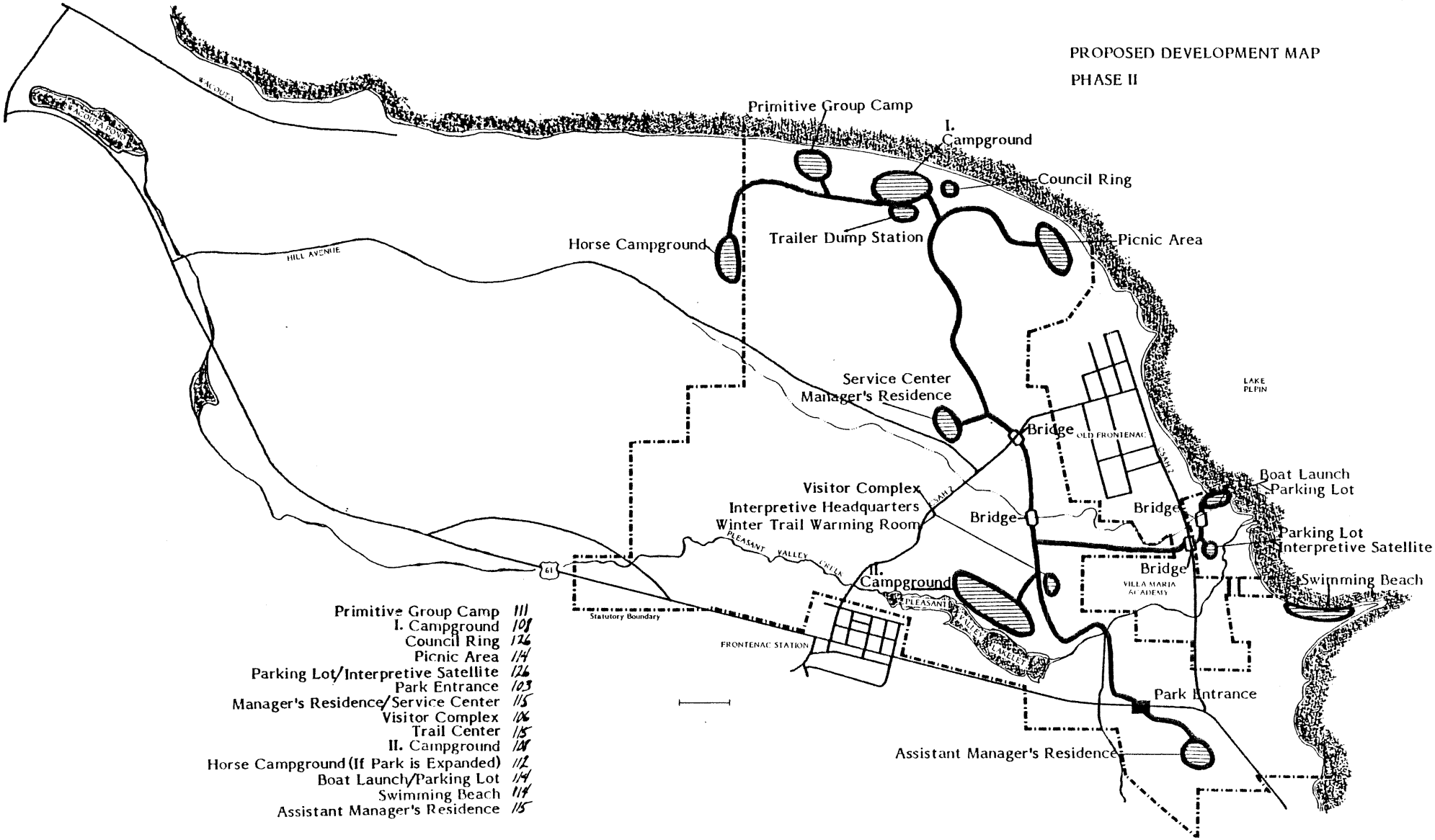
1. Extensive rehabilitation of bluff hiking trails
2. "Zoning" the river bluffs for snowmobiles and Point au Sable for cross-country skiers.

INTERPRETIVE

1. Develop self quided trail of Point au Sable.
2. Develop Council Ring adjacent to present Family Campground.
3. Develop as a part of the proposed Visitor Complex, an Interpretive Headquarters.

ADMINISTRATIVE FACILITIES

1. Construct a Visitor Complex with the following functions: contact station, park office, interpretive headquarters, and winter warming room.


PROPOSED DEVELOPMENT MAP
PHASE II
Primitive Group Camp
I. Campground
Council Ring
Trailer Dump Station
Picnic Area
Horse Campground
HILL AVENUE
Service Center
Manager's Residence
Bridge
OLD FRONTENAC
LAKE PEPIN
Boat Launch
Parking Lot
Visitor Complex
Interpretive Headquarters
Winter Trail Warming Room
Bridge
Bridge
Parking Lot
Interpretive Satellite
PLEASANT VALLEY CREEK
II. Campground
Bridge
VILLA MARIA ACADEMY
Swimming Beach
Statutory Boundary
FRONTENAC STATION
Park Entrance
Assistant Manager's Residence
Primitive Group Camp 111
I. Campground 109
Council Ring 126
Picnic Area 114
Parking Lot/Interpretive Satellite 126
Park Entrance 103
Manager's Residence/Service Center 115
Visitor Complex 106
Trail Center 115
II. Campground 108
Horse Campground (If Park is Expanded) 112
Boat Launch/Parking Lot 114
Swimming Beach 114
Assistant Manager's Residence 115

2. Relocate Manager's Residence and Service Center.

BOUNDARY MODIFICATIONS

Although the boundary of Frontenac State Park resembles a "square" on a map when the topographic relief is overlayed, it becomes apparent that the unit is quite disjointed. The boundary presently intersects two bluffs as well as part of the valley. They jointly form some agricultural land in addition to the property near Sand Point which is predominantly wet.

1. In order to link the bottomlands of Point au Sable and the currently developed bluff with an internal road system, it will be necessary to add a 7 acre (approx.) piece of land in the western corner of the intersection of Winona Avenue and CSAH 2 (just north of Villa Maria).

2. There is a small parcel of land (approx. 7 acres) which should be added to the park boundary because:
   (1) It will provide additional buffer between the town and the park.
   (2) The park now includes over 100 acres of the owner of this property. Including it within the park will allow the property to remain unsevered.
   (3) The owner appears to be a willing seller.
   Adjacent to this property a .9 acre piece should be deleted from the park and allowed to remain with the owner's property

3. In the vicinity of the manager's residence there are two 8 acre (approx.) parcels of land-one inside and one outside the park's boundary. Because the 8 acre (approx.) parcel west of the tracks should be deleted from the park while the 8 acre (appsox.) parcel east of the tracks should be added.

4. However, parks should be surrounded by a buffer to keep 20th century development from intruding into the outdoors environment. When park boundaries are not formed by recognizable features or when boundaries are intersected by public roads, it jeopardizes the ability of the manager to supervise and create the protected environment that parks should be.

   Therefore, a major deletion is planned (approx. 760 acres) on the bluff closest to Frontenac Station. It is proposed that CSAH 2 form much of this boundary. However, in order to protect the states investment to date, it will be essential that Goodhue County enact strong zoning ordinances and designate only compatible uses adjoining the park. DNR Forestry would be a welcome neighbor to the park.

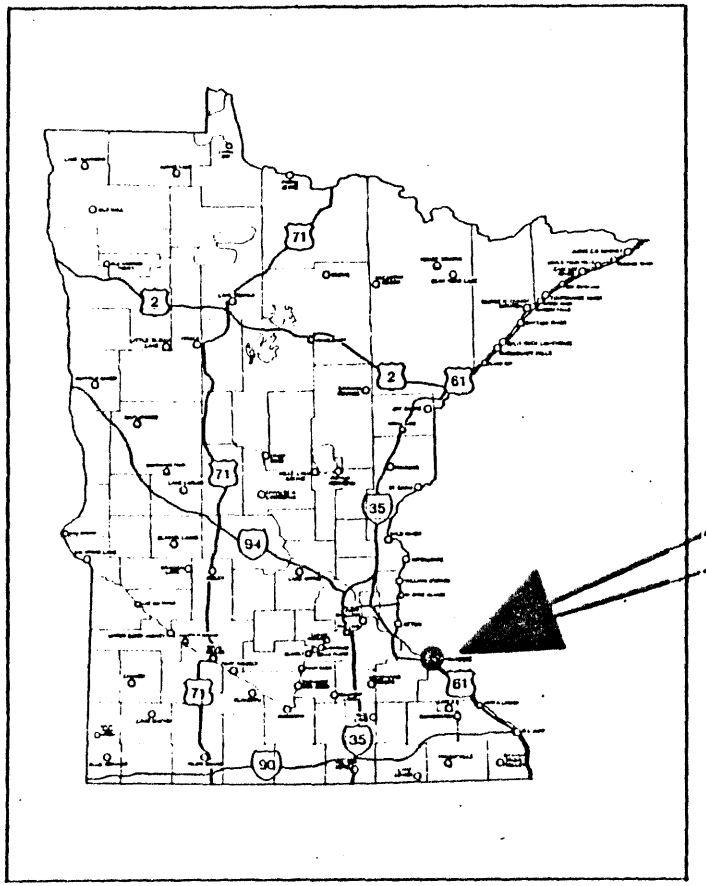
5. The bluffs above Frontenac were actually islands as Glacial River Warren roared through this area. At this time the DNR has parts of two bluffs. A boundary modification should be authorized which incorporates a single entire bluff (an addition of approximately 900 acres). The boundary would extend from Lake Pepin to Hill Top Road except where considerable private development has taken place. These residences would be excluded from the park.

   This addition would provide badly needed trail facilities for park users. Linear trails could be developed which take advantage of the breath taking views of Lake Pepin. The scale and climatic considerations makes this area best suited for horses (winds make it bugfree) and snowmobiles (too steep and cold for cross-country skiers).

6. Villa Maria makes an ideal neighbor to this state park. Their desire for seclusion in order to heighten spiritual awareness is compatible with outdoor recreation within a natural state park.

   For years Villa Maria served as a girls academy. However, a fire destroyed the classrooms and the school has had to be closed. Since that time Villa Maria has been serving as an inter-faith spiritual retreat house. The Ursaline Sisters there also go into neighboring communities doing catechetical work. In addition, a summer girls group camp has been constructed to the rear of the main building. The Ursalines have no immediate intention to leave Frontenac.

   Due to the strategic location of their property (practically surrounded by park) it is essential that the state purchase the land <u>if and when</u> it ever becomes available. It is, therefore, recommended that the Villa be included within the state park at the first appearance of financial difficulty for this institution (approx. 140 acres). Otherwise, it is recommended that the park support the Villa in any way possible.



FRONTENAC STATE PARK

GEOGRAPHICAL PERSPECTIVE

The park is located in southeastern Minnesota (Goodhue County), and is reached by following U.S. 61 eight miles east of the city of Red Wing. The authorized land area is approximately 2,835 acres in size. Approximately 50% of this area is currently under administration jurisdiction of the Division of Parks and Recreation.

Description:

Township 106 North
Range 5 West
Section 22,26,27,33,34,35,36

Township 105 North
Range 5 West
Section 1,2,3,4

REGIONAL PERSPECTIVE

Frontenac is located within the "Mississippi River Valley" which runs from St. Anthony Falls to the Iowa border. It was cut by the merging waters of three sources - glacial river ancestors of the St. Croix, the Minnesota, and the Upper Mississippi. However, the Upper Mississippi was by far the smallest of the three sources, as evidenced by the narrow canyon from St. Anthony's Falls to the river's former junction with Glacial River Warren at Fort Snelling

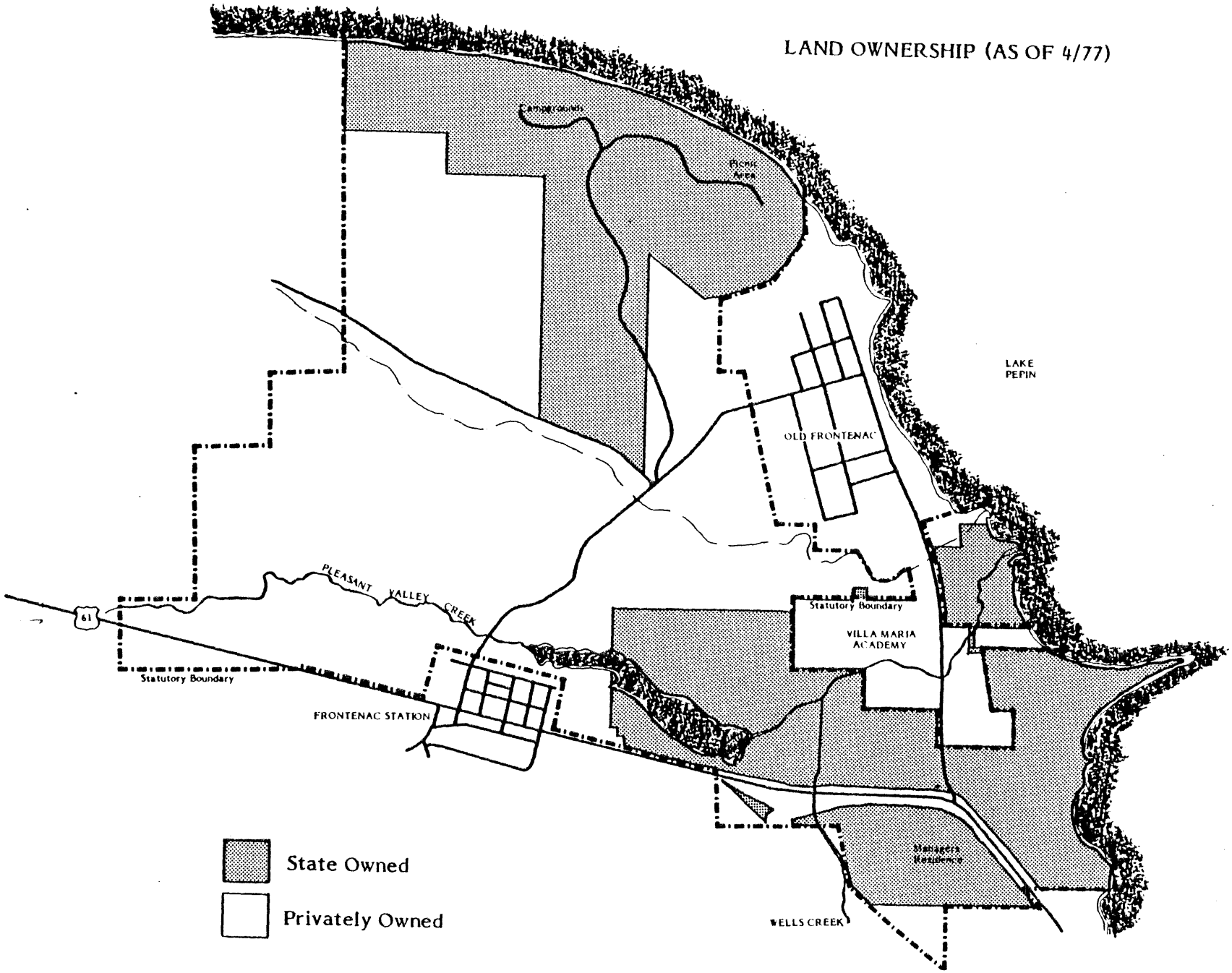
The predominant use of land in this area is for agricultural purposes. In 1975, 62.4% of the land in Goodhue and Wabasha counties was cultivated. Of the remainder, 16.8% was forested and 15.1% was pasture and open.

The State Planning Agency has estimated that the population in Goodhue and Wabasha totaled 55,100 in 1974. This is a slight increase over 1970 census data, when these counties had a population of 51,987.

The Minnesota State Comprehensive Outdoor Recreation Plan (SCORP) has identified southeast Minnesota as an area of great recreation potential. Often referred to as "Hiawatha Land," the area provides a number of recreation opportunites. Fishing, including fine trout fishing; hunting, including deer, ruffed grouse and pheasant; boating, including excellent sailing on 43,000 acre Lake Pepin; hiking; and camping area all available within a relatively small area crossed by several principal highways. Also available are pioneer settlements, river town history, and architecture. Lastly, the eastern two-thirds of the region provides the most rugged landscape in Minnesota, formed by spectacularly eroded limestone and sandstone outcrops, largely forested by oaks and other hardwoods.

According to data generated by the Department of Economic Development, Goodhue and adjoining Winona Counties derived $13,627,000 from tourism - travel expenditures in 1974. This is approximately 2.4% of the total gross sales within the counties.

Increased future use of the area is probably inevitable. Its close proximity to the Twin Cities as well as the dramatic vistas afforded by the topography are a sure combination for expansion of future recreational use. Realization of this potential may occur though, only after other vacation areas become glutted with use, or after the area is actively marketed as a vacation destination parkage.


LAND OWNERSHIP (AS OF 4/77)
Picnic Area
LAKE PEPIN
OLD FRONTENAC
PLEASANT VALLEY CREEK
61
Statutory Boundary
Statutory Boundary
VILLA MARIA ACADEMY
FRONTENAC STATION
Managers Residence
WELLS CREEK
State Owned
Privately Owned

Sources of Information:

Department of Economic Development, The Economic Distribution of Tourist-Travel Expenditures in Minnesota by Regionas and Counties, St. Paul, Minnesota; Research Division, October 1975.

Minnesota Department of Natural Resources and Minnesota State Planning Agency, Minnesota Resource Potentials in State Outdoor Recreation. (Project 80) St. Paul Bureau of Planning (DNR) and Minnesota; Section, (SPA), July 1971.

Minnesota State Planning Agency, Minnesota Pocket Data Book, 1975, St. Paul, Minnesota; Department Planning Division, August 1975.

Minnesota State Planning Agency, Minnesota Pocket Data Book, 1973, St. Paul, Minnesota; Development Planning Division, December 1973.

Minnesota Department of Natural Resources, Minnesota State Comprehensive Outdoor Recreation Plan, St. Paul, Minnesota; Bureau of Environmental Planning and Protection, 1974.

CLIMATE

Minnesota has a continental-type climate. The State is subject to frequent outbreaks of continental polar air throughout the year, with occasional artic 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. Pacific Ocean air masses that move across western United States produce comparatively mild and dry weather at all seasons.

Due to its southern location in the State,the Frontenac area experiences winter temperatures which are 10^{o}F warmer than the northern third of Minnesota. Although Frontenac experiences periods of bitter cold during the winter, it is far less likely to maintain a snowcover useable for recreation purposes throughout the season when compared to other portions of the sate. Strangely enough, summer temperatures do not vary as much. Except for the "North Shore," only 3^{o} or 4^{o}F separate temperatures throughout Minnesota.

Weather Data

	Mean Minimum	Mean Maximum
January	4^{o}F	24^{o}F
July	60^{o}F	84^{o}F

Precipitation:

Snowfall[3]	45"
Total precipitation	30"

Those areas of the park which are upon the Mississippi River bluffs are subjected to nearly constant winds. It minimizes mosquito nuisance and provides a cooling effect on hot summer nights, but it does create somewhat of a noise problem for tenters as the canvas ripples through the night. This same windswept area in the winter is extra cold which limits its utility as a location for cross-country skiing, snowshoeing, etc.

The bluff shields some of the lowland area from wind with dense bottomland vegetation, providing an additional buffer. In short, the absence of wind allows a partial respite from Minnesota's typically severe winter but results in an area which is hot and full of mosquitos in the summer.

Sources of Information:

U. S. Department of Commerce, Climates of the State, (Climatography of the United States No. 60-21) by Earl. L. Kuehnast, Silver Spring, MD; National Oceanic and Atmospheric Administration Environmental Data Service, Rev. June 1972.

Seasonal Snowfall, an unpublished 1976 report by Earl L. Kuehnast, State Climatologist, Department of Natural Resources.

GEOLOGIC HISTORY

Much of the existing topographical relief found within the park was caused by the waters of the Glacial River Warren. While Glacial Lake Agassiz drained south, a tremendous volume of water was conducted down what is now the Minnesota and Mississippi River Valleys. The erosive force of this glacial river cut deeply into the sedementary rock layers, while leaving some islands usch as the two bluffs on the north side of the park.

As the glaciers retreated and allowed Lake Agassiz to drain north, the flow of water through Frontenac decreased in volume, increased its rate of alluvial deposition, and abandoned some of its former channels.

All of the bottomland portions of the park were at one time under water. The amount of alluvial deposits has been very deep in some areas, for instance, the well dug at the managers residence is 74 feet deep, and is still in this material.

0-25'	Coarse gravel & clay
25-40'	Medium sand
40-48'	Medium-coase sand
48-52'	Coarse gravel
52-56'	Water bearing sand
56-65'	Fine sand
65-74'	Medium fine sand

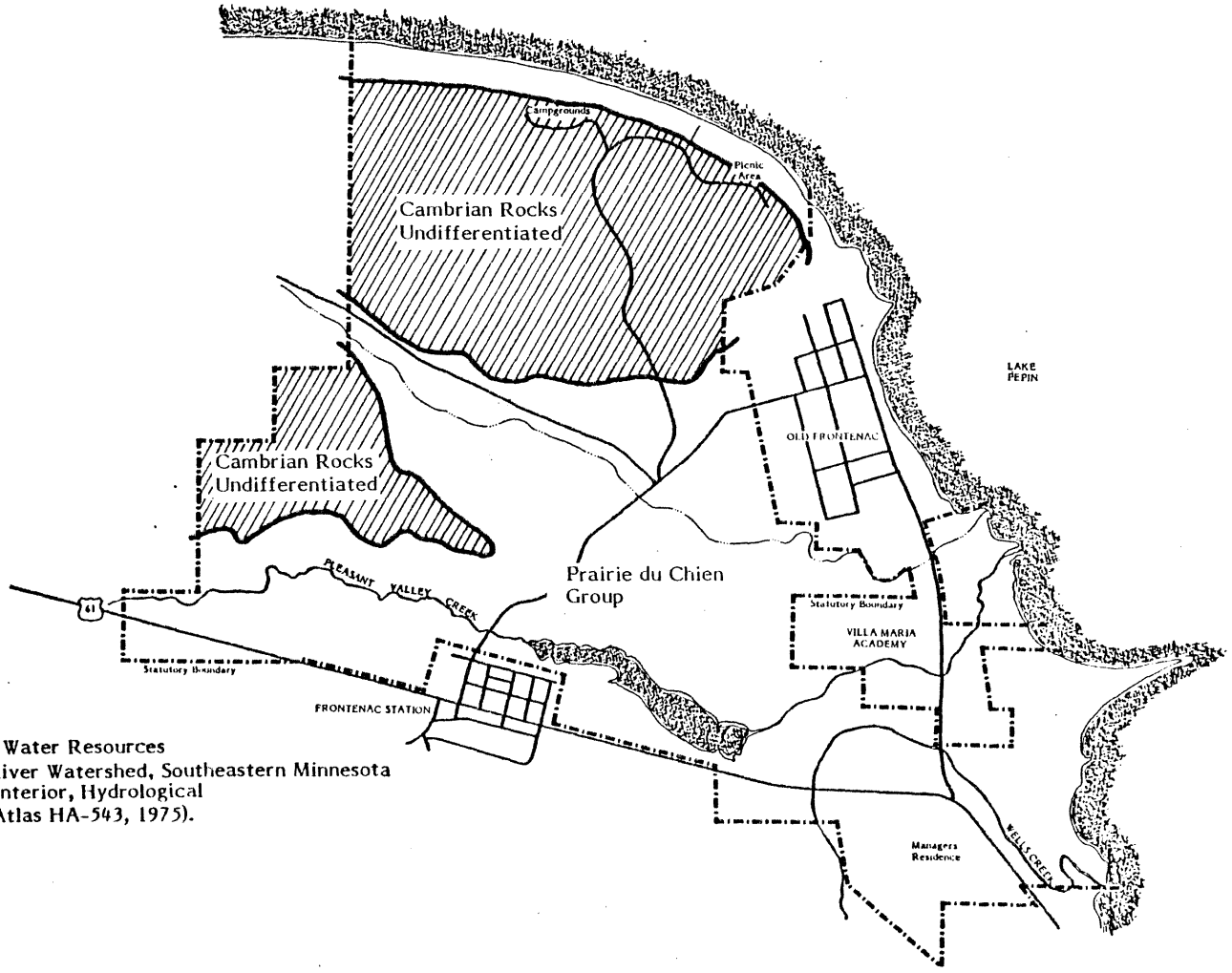
According to interpretation by the Minnesota Geological Society (Dave Milas, 6/76) the bluff areas are composed of a variety of sedminetary rock strata occasionally covered with loess. The well drilled near the picni area passed through the following layers.

0-40'	Sand
40'-60'	Undifferentiated
60'-205'	Prairie du Chien
205'-340'	Jordan Sandstone
340'-390'	St. Lawrence
390'-410'	Undifferentiated
420'-545'	Franconia
545'-600'	Ironton Sandstone
600'-616'	Galesville Sandstone

Prairie du Chien Group

Comprised of the Shakopee Dolomite, New Richmond Sandstone and Oneota Dolomite. The Shakopee is mainly dolomite commonly containing chert and a few sandstone beds. The New Richmond is a fine to medium grained quartzose sandstone. The Oneota underlies the New Richmond and is mainly dolomite, containing chert locally toward the base. Large amounts of water are available, primarily from fractures and solution cavities. The Prairie du Chien and Jordan Sandstone are hydraulically connected.

DISTRIBUTION OF BEDROCK FORMATIONS
IN FRONTENAC AREA



(Adapted from: Water Resources of the Zumbro River Watershed, Southeastern Minnesota Department of Interior, Hydrological Investigations, Atlas HA-543, 1975).

Jordan SAndstone

Yellow or white, medium to coarse-grained quartz sandstone, commonly crossbedded; locally silty fine-grained. Large amounts of water available.

St. Lawrence and Franconia Formations

The St. Lawrence is silty sandy dolomite and shale. Generally does not yield water and retards vertical water movement. The Franconia is typically green very fine grained glauconitic shaly quartzose sandstone that does not yield much water.

Ironton and Galesville Sandstones

The Ironton Sandstone is a medium to coarse grained quartz sandstone. The underlying Galesville Sandstone is similar, but less silty. Yield moderate amounts of water.

A fault line with a displacement of nearly 150 feet is readily visible on Barn Bluff near Red wing. On the basis of data compiled from various well logs, this fault apparently extends down the abandoned river channel along the Highway 61 alignment.

Sources of Information:

Well Logs, FRontenac State Park, Minnesota Department of Natural Resources, Bureau of Engineering, 7-30-65. Interpretation by Dave Milas, Minnesota Geologic Society.

U.S. Department of Interior, Water Resources of the Jumbro River Watershed, Southeastern Minnesota (Hydrologic Inventigations, Atlas HA-5437), by H. W. Anderson et al., Reston, VA; U. S. Geological Survey, 1975.

HISTORY

As described in an article by June Holmquist, the first European exployers known to have visited the area of the park were Father Louis Hennepin and his two companions, Antoine Augelle and Michel Accault. They had been sent by LaSalle to explore the upper Mississippi in 1680. In 1686, Nicolas Perrot, who had been commissioned commandant of the west by the governor-general of Canada, built Fort St. Antoine near the foot of Lake Pepin, on the east (Wisconsin) side. There, in 1689, he issued a protocol proclaiming the French king's sovereignty over the region of the upper Mississippi, which included all of present Minnesota.

In 1723, the French government authorized establishment of a post in the land of the Dakotas, (Sioux), where exploration teams could be sent out toward the Pacific Ocean. On September 17, 1727, Rene Boucher, and Sieur de la Perriere, with a party of soldiers, constructed what was later known as Fort Beauharnois. When spring floods came, the soldiers were forced to abandon their shelter and eventually rebuild the fort on higher ground. The exact locations of both facilities are unknown.

Throughout the years of the fur trade, until settlement began in the 1860's, the region of Lake Pepin was the scene of great activity. Great quantities of furs were sent down river from numerous posts on the shores of Lake Pepin.

Within the park boundaries, are a number of sites which point to heavy use of the land by Native Americans. The Wells Creek Mounds, reported by T.H. Louis in the 19th Century is located about 60 feet above Wells Creek in a northwestern direction from the manager's residence. A series of mine burial mounds are located north of the manager's residence along U.S. 61. Finally, there are three more mounds on a wooded point overlooking Wells Creek and Lake Pepin, adjacent to the southwest corner of the park.

The early explorers, traders, and Native Americans were eventually replaced by numerous lumberjacks, who assembled logs from the St. Croix and Mississippi Rivers into huge rafts, and floated them down the lake to the sawmills.

Steamboats also provided a colorful chapter to the area's history. The opening of navigation on the river was very important to Minnesota; its residents were virtually isolated from the rest of the world during the winter months. Lake Pepin has always remained frozen after the river melts. In those days, when it did finally free up, there was great rejoicing. The steamers would race to St. Paul from Lake Pepin with the winner getting a handsome purse.

The town itself was originally named Westervelt, after the proprieter of one of the early fur posts. It was Westervelt and Israel Garrard who platted the early village in 1857. These two sold out their interest in the town to two of Israel's brothers, who in turn named the town Frontenac in honor of the former Governor-general of CAnada.

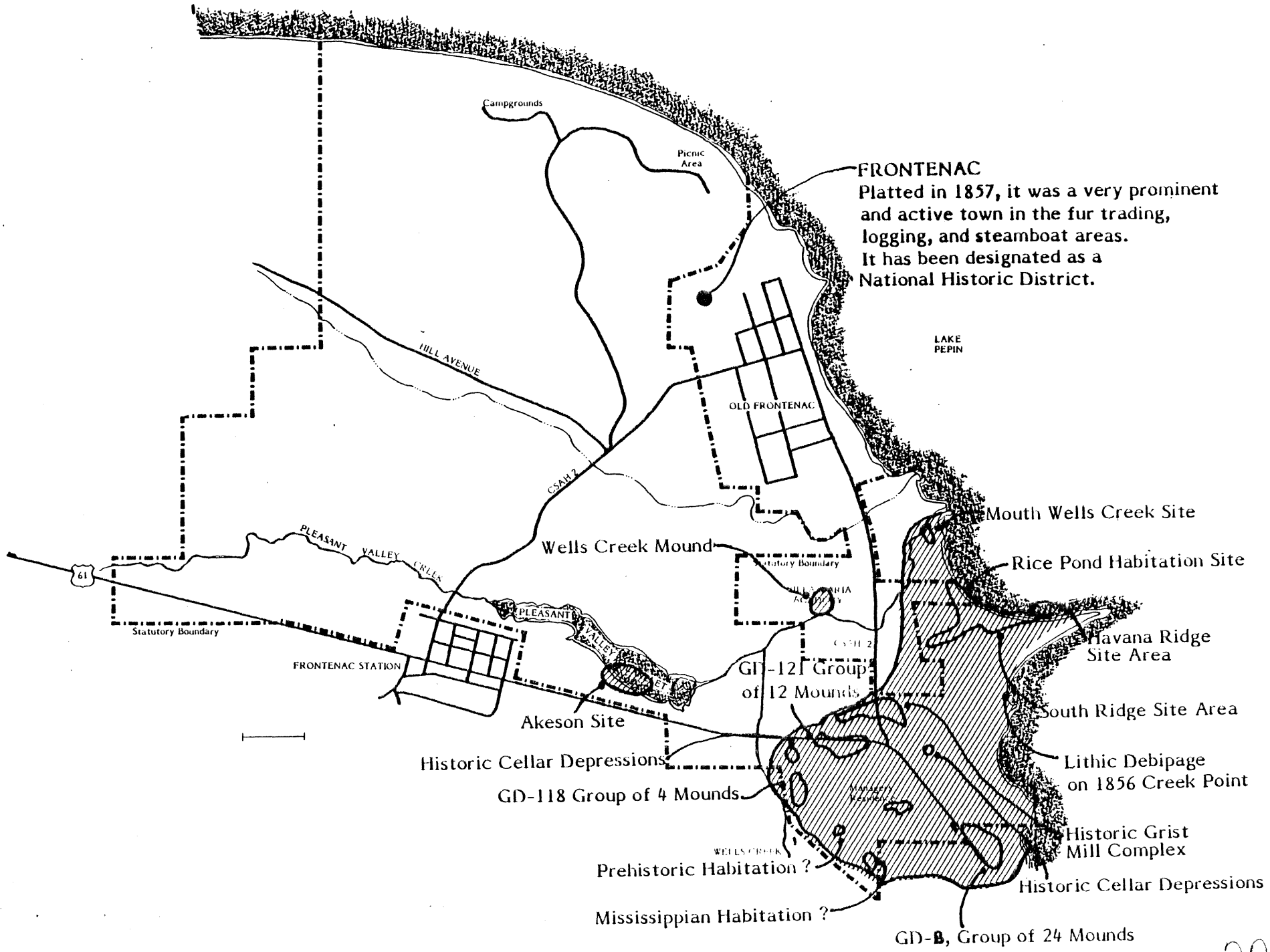
A hotel was eventually constructed, and the town became a vacation mecca for southerners. The American Travellers' Journal for August, 1881, described Frontenac as the "Newport of the Northwest."

Sources of Information:

Article titled "Outline History of Lake Pepin and Frontenac Area" by June D. Holmquist, Publications Department Minn. Historical Society.

Prehistoric Archeological Sites in Minnesota Statre Parks, Archeological Labortatory, Dept. of Anthropology, U of M, Minneapolis, Minnesota.

HISTORIC FEATURES



PARK HISTORY

As discussed by Al Marshall in an article on the park's early establishment history, Frontenac had its origins back in the 1930's when the National Park Service first urged its establshment. Considerable interest was shown and for a while it appeared that the park would become a reality. However, this original concern finally waned and the proposal sat on the shelf for a number of years.

As a result of an editorial appearing in Red Wing's Daily Republican Eagle, interest reemerged in the early 50's. By 1955, the Legislature had before it a proposal for the park's establishment. Although opposition was slight, the measure failed. As often happens, too many requests were submitted for funding and the project was lost in the shuffle.

Oddly enough, it was the months that followed defeat that insured final ratification. A key landowner, Mrs. Lulu Monro, was anxious to see her 160 acre tract near Point au Sable become part of a state park, but could not afford to hang on to the land indefinitely. After park authorization failed she offered her property for sale.

The Frontenac Park Association raised $25,000 to obtain a five year option to purchase the land. Spurred on by this dedication of local money, the Legislature established the park in 1957. However, instead of the original 412 acres requested in 1955 they authroized 950 acres.

Since that time, the park has undergone three boundary expansions in 1961, 1965, and 1971. Presently, the authorized acreage stands at 2,689.

Source of Information:

[1] Albert M. Marshall, "Frontenac State Park,"
Minnesota Naturalist, March, 1956, Pgs. 1-3.

OFF SITE IMPACTS

Adjacent Land

The statutory boundary of the park is quite irregular. Except for the old town of Frontenac, Lake Pepin forms the park's northern and eastern boundaries. Also excluded from the park is Villa Maria Academy which extends out from the southern boundary of the town. Both the town and the academy then, are completely "land locked" by park land.

The southern boundary roughly follows U.S. 61 wrapping around three sides of Frontenac Station. It looks out onto small areas of cropland, wooded hillsides, and a private marina. The western boundary lacks a geographic feature to delineate it; it is framed in by rolling cropland and wooded terrain.

Because Lake Pepin is practically inacessible from the developed portion of the park, it would have to be termed an off-site impact. For years the lake has been known for its fishing potential and is known to be one of the finest boating areas in the state. It undoubtedly draws visitors from around the state, and contributes to the use of the park. If the Mississippi is ever cleaned up to the point of providing swimming, etc., the region would receive considerably more use.

Old Frontenac is a sleepy little residential area devoid of any industries or businesses. It served as a fur-trading post as early as the 18th century and later on as a steamboat resort for the people of New Orleans. Lack of formal historical interpretation on the town's part has kept sighseer traffic to a minimum. However in the future this could change. It is conceivable that the town could serve as a tremendous attracting force for park users.

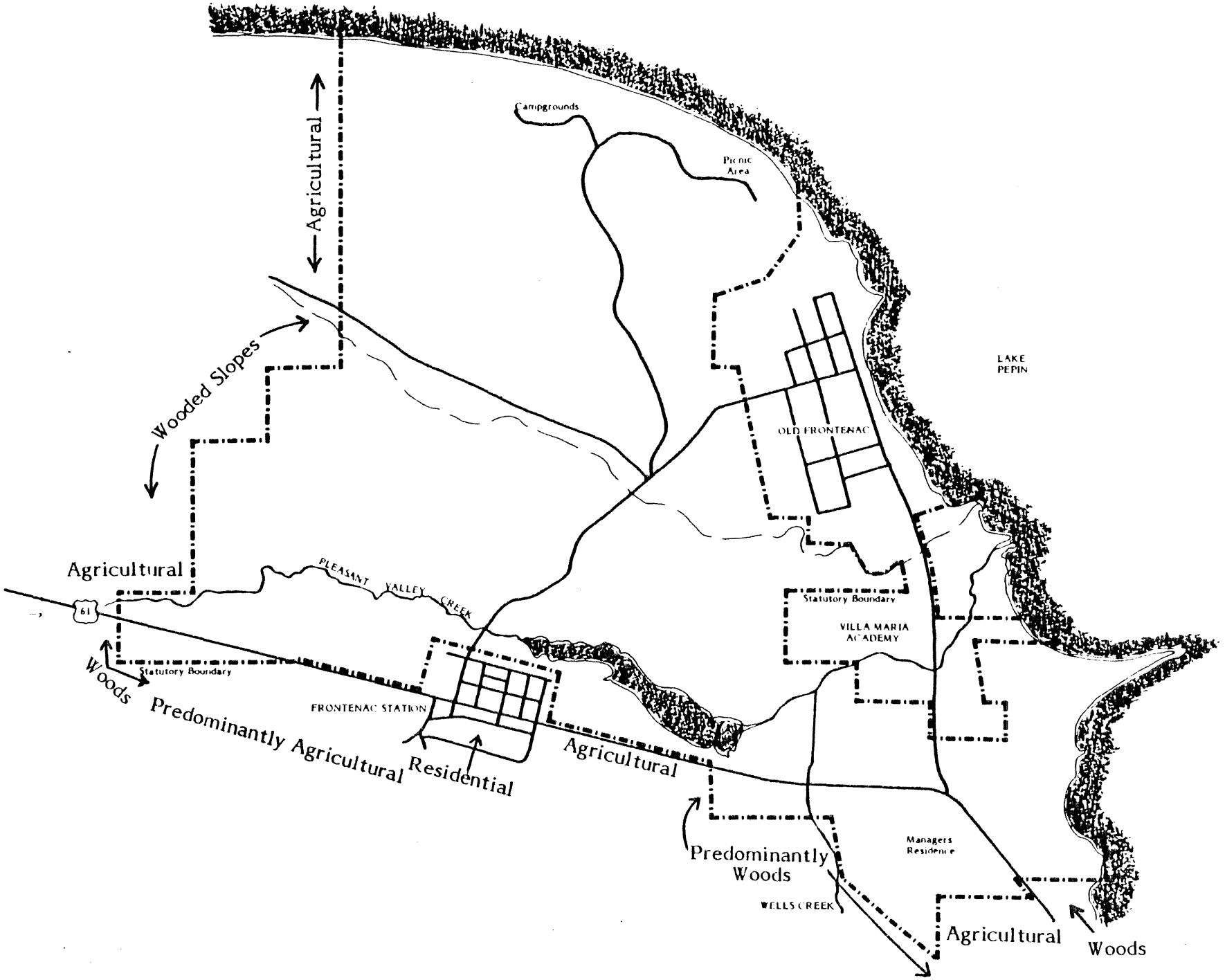
Prior to a fire in the classrooms of Villa Maria (1968), the academy had a larger impact upon the park. Because Villa Maria is virtually surrounded by park, users must pass through the statutory boundary. Remaining development there does not detract appreciably from the unit, in fact, its presence may have a net positive effect. The academy's grounds are thickly wooded and blend in nicely with the park.

Access Corridor

Frontenac STation is a small village somewhat newer than Frontenac which borders U.S. 61 on one side and park on the other three sides. Most users pass through the town when entering the park, and as such, it introduces them to the immediate area. It can be characterized as "neat and well kept" and while not enhancing the park's quality, neither is it a major detraction.

The road between the town and the formal entrance of the park winds through a marshy area with a view of Pleasant Valley Lakelet. It is quite pretty and allows a transition from the hustle of U.S. 61.

OFF-SITE IMPACTS



Through Site Development

A number of transportation corridors bisect and/or border the park. U.S. 61 runs along the southern end of the park and impacts the unit in a number of ways. Most importantly, it is the main traffic link with the rest of the state. Beyond that, it has a negative visual and auditory impact on would-be users of Pleasant Valley Lakelet and separates two parcels of land in the southeast and southwest corners of the park. (Some interest has been shown by the Minnesota Department of Transportation to reroute this road further south outside of the park's boundary (See Realignment of U.S. 61, page 84).)

CSAH 2 originates in Frontenac Station, then proceeds northeast through the park to old Frontenac and then heads south and reunites with U.S. 61. It is used and needed by "landlocked" old Frontenac but does prove to be an administrative hassle for the manager and poses a potential danger to park users. Both the visual and auditory senses are effected by its existance.

Chicago, Milwaukee, St. Paul and Pacific Railroad (Milwaukee Road) borders the southeastern corner of the park. It is far out of the way of the users and does little to damage the users experience.

A small gravel township road bisects the western half of the park and meets up with CSAH 2. Hobby farm development within the park statutary boundary has been facilitated by this road. It provides an additional access point and resulting enforcement difficulties.

SCENIC QUALITY

The two bluffs which are partially within the statutory boundary are distinctive landform features. These two bluffs, with their steeply sloping sides, rise abruptly out of the flat alluvial plain.

The old quarry located on south and east faces of the northern-most bluff has left a distinctive vertical rock outcropping. This area has had many of its man-made features softened by time so that it provides a distinctive landscape.

The vegetation, while being somewhat diverse, is fairly common. The majority of the area is visually nondiscript agricultural and old field areas. But the "big woods" and "open woods" on the steep slopes provide a sharp contrast to the nearby barren "upland brush" ridges.

Lake Pepin, because of it's large size and it's steeply sloped rugged shoreline is very distinctive visually. The panoramic view of the lake from the surrounding bluffs emphasizes its size and beauty. The small lakelet located between gently sloping hills has a fairly common visual character, but is quite pastoral.

SPATIAL QUALITY

The panoramic view from the top of the bluff overlooking Lake Pepin and the town of old Frontenac is one of the main features of this park. The feeling generated by this view is somewhat dependent on the weather and time of day. For example, you might receive a lazy feeling on a hot summer day as you watch the barges creep up the river, but on a early morning when everything is shrouded with fog and mist you might receive lonely and isolated feelings.

Much of the hardwood vegetation on the sidehills create a canopied space but also provide filtered views down and out due to their steep slopes. The big woods area near the manager's residecne also provides a canopied space, with the brushy understory creating visual baffles allowing some long views, but also stopping visibility to the immediate area. The "bottomland hardwoods," while having a plain overhead, is so dense that visibility is also limited to only the immediate area.

There are many pleasant detail landscapes within the park. Several areas in the old rock quarry are beautiful with the rugged rocks towering overhead and the small delicate wildflowers flourishing the crevices. Pleasant Valley Creek also creates a beautiful scene as it gurgles through the cattails.

CLASSIFICATION

Introduction

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

A. Which of the eleven classifications from ORA '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 ORA '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.

Classification Objective

The objective of classification of state parks is to determine the most suitable management direction for a given unit based on its natural resources and recreational potential. Of primary concern in setting management direction is the protection and perpetuation of those natural resources which set a particular park apart from all other parks. Also of concern is the need for a statewide recreation system which will meet the legitimate recreational needs of our society without unduly harming the resources of the unit.

The intent of state park classification is to relate the above two concerns to an overall management program which will protect and perpetuate our natural resources and provide for the recreational enjoyment of those resources without significantly impairing their quality.

It should be noted that the Natural State Park classification does not necessarily exclude recreational activities from a unit. This classification places management and development emphasis on the preservation and interpretation of the natural resources within the unit. 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. The following paragraphs outline the factors involved in the classification of this unit.

CLASSIFICATION

Alternatives Considered:

Recreational State Park, Natural State Park, Regional Park, Scientific and Natural Area, and Historic Site.

Staff Recommendation:

Natural State Park with a Scientific and Natural Area, and HIstoric Site within.

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:

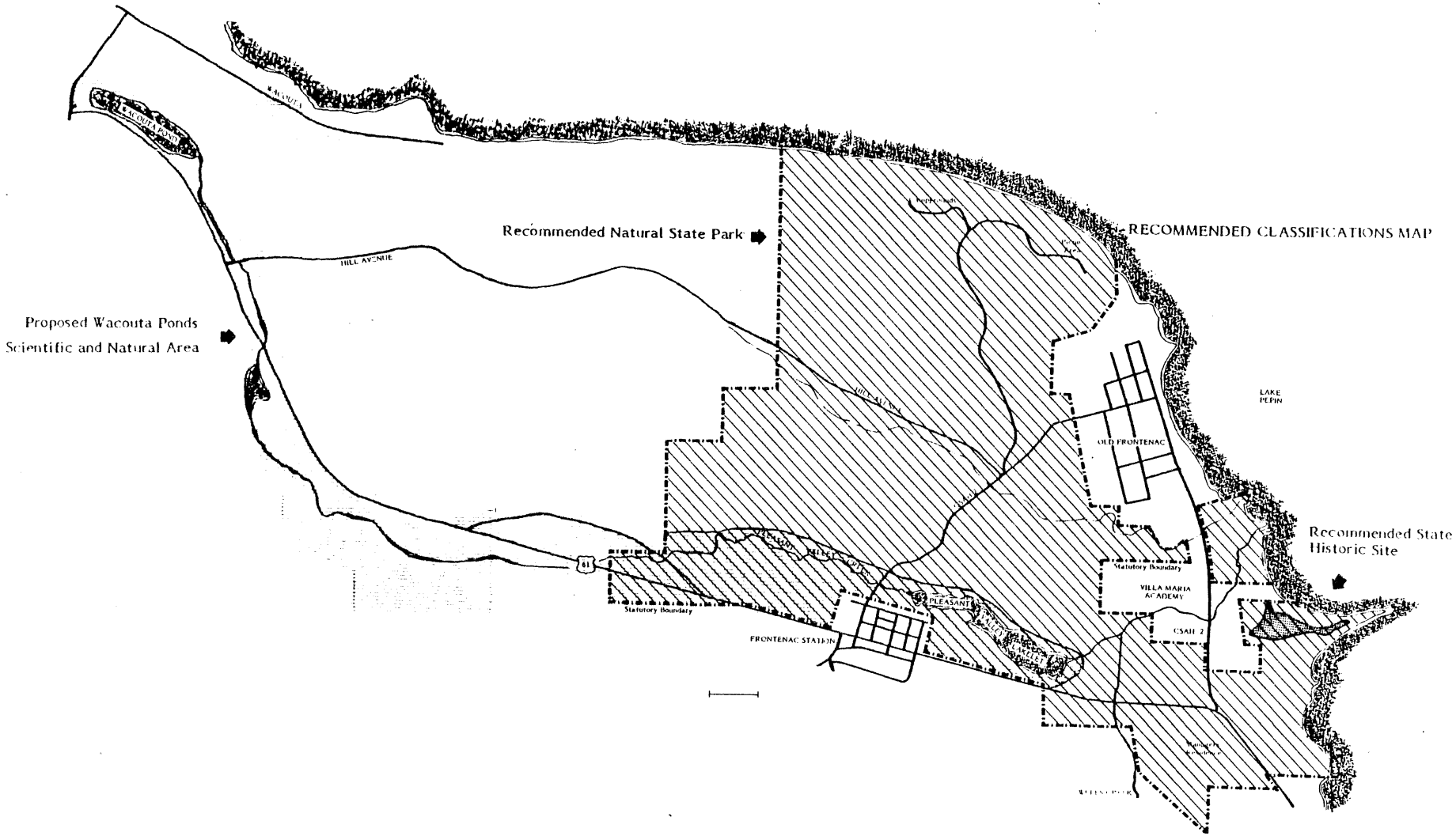
> "Exemplifies the natural characteristics of the major landscape regions of the state, as shown by accepted classifications. In an essentially unspoiled or restored condition or in a condition that will permit restoration in the foreseeable future or contains essentially unspoiled natural resources 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."

Rationale:

Frontenac is located within the Mississippi River Valley which was formed by the water action of glacial River Warren. The two bluffs within the park were actually islands when torrents of glacial water passed through the area. There is one portion of the bluff which lies below the picnic area that served as a stone quarry. However, it has been inactive for 40-50 years and has become partially revegetated. Today, rather than being a visual blight, the old quarry has fine potential for either historical or natural resources interpretation.

The presettlement vegetation of this area was a combination of "oak openings and barrens" and "big woods." Today the park is primarily big woods along the river bluffs, old field and pioneer hardwoods in the rolling upland area, bottomland hardwoods on the flood plain, and agricultural along old Frontenac. The park's vegetation will be quite similar to presettlement vegetation after consistent management for many years.

The park has two primary water resources: the Mississippi River and a small lakelet off of T. H. 61. Although there is no access for swimming, boating, etc., to the Mississippi, the river does provide a dramatic setting for the park. Perhaps in the future, greater utilization of this resource will be possible.


RECOMMENDED CLASSIFICATIONS MAP
Recommended Natural State Park
Proposed Wacouta Ponds
Scientific and Natural Area
Recommended State
Historic Site
HILL AVENUE
LAKE
PEPIN
OLD FRONTENAC
Statutory Boundary
VILLA MARIA
ACADEMY
FRONTENAC STATION
61

The lakelet is small (less than 70 acres) and not very deep (less than 4 feet) and it is partially spring fed, and it is apparently capable of supporting limited recreation use in the future. Its source of water is the Wacouta ponds which parallel U.S. 61 for several miles. They are the only ponds of this type south of the Twin Cities and within 50-100 miles of the river. These ponds attract a wide variety of birds not seen in other places. (See Birds Assocaited With Wacouta Ponds, page). For this reason the area is recommended for Scientific and Natural Area designation.

In addition to the already mentioned natural resources, the park contains an important Middle Woodland site (400 B.C. - 300 A.D.). It is most likely a northern peripheral Hopewellian cultural expression and as such is one of the few known Havan Tradition sites within the Mississippi Valley north of Wabasha. This area is recommended as a Historic Site.

The total authorized land within the park is 2,835 acres. With appropriate development, the park should be able to support use associated with Natural State Park classification. However, care will have to be exercised to avoid the loamy steeply sloped areas which are subject to erosion as well as the relatively sensitive areas of prairie found in parts of the rolling uplands.

Although the park is located near the Twin Cities, lack of quality water access detracts from its potential to serve as a Recreational State Park. Besides, the unit satisfies each of the criteria established for Natural State Park classification. To summarize, the unit is representative of the regional landscape, contains a number of scenic vistas and recreational opportunities sufficient to draw people from throughout the state, and is large enough to accommodate use related to Natural State Park classification.

RESOURCE MANAGEMENT

Introduction

Optimal management of Minnesota's State Park System requires a multi-disciplinary approach to each park's unique resource content. All determinations in this plan are based upon:

1. an initial inventory of the park's soils, waters, vegetation, wildlife, fisheries and historical/cultural sites and values;

2. a careful examination of the interdependence of these systems as well as their relationships to larger systems, within or outside park boundaries;

3. a critical, site-specific zoning of all park areas according to natural and cultural resource values; and,

4. an assessment of the park's recreational potential consistent with its classification and zoning.

While this planning process has shed new light on both resources and potentials, it has often outlined and underscored the need for specific researches in areas where pertinent data is now deficient.

ZONING

Introduction

Before the specific management of an area within a park can be considered, a zoning concept must be established to evaluate the various management alternatives within the park. General management strategies can then be determined and expressed by zoning the park for its prime management objectives.

The purpose of park zoning is to formally recognize the various features of our parks and their legitimate non-destructive uses. It must be recognized that some resources are vulnerable to destruction through overuse. Park zoning identifies those areas suitable for specific uses and establishes 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 was adopted which will permit effective, economical management of the park's resources, centralize legitimate 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 have been defined with a description of their prime management objectives. All six management zones may not necessarily be found in each and every park.

The final zoning map is a composite concept of all potential zones to show 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.

1. Ecological Protection Zone - The ecological protection zone includes areas having ecological communities which are either 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 distrub these values. All forms of access may be prohibited when necessary. In certain instances, small structures may be necessary to orient use and protect habitat.

   Potential Areas within the Park

   Three different areas have been identified as potential ecological protection areas: Wacouta Pond within the park, steep slopes along the bluffs, and the marshy area off of Sand Point.

   Wacouta Pond and the string of marshes below it are in an ancient perched valley through which the Mississippi River, or part of it, once flowed. The floor of this valley, which has long been abandoned by the river, is now more than 200 feet above the level of adjacent Lake Pepin. Aside from natural history values, this valley is of considerable interest as a physiographic feature. This entire area has been recommended as a Scientific and Natural Area. That part which extends into Frontenac state Park is included within this potential zone.

   The slopes along the bluffs are very steep in places (+25%) and consequently susceptible to erosion. Therefore, use upon them must be controlled and vegetative management techniques utilized to encourage stability.

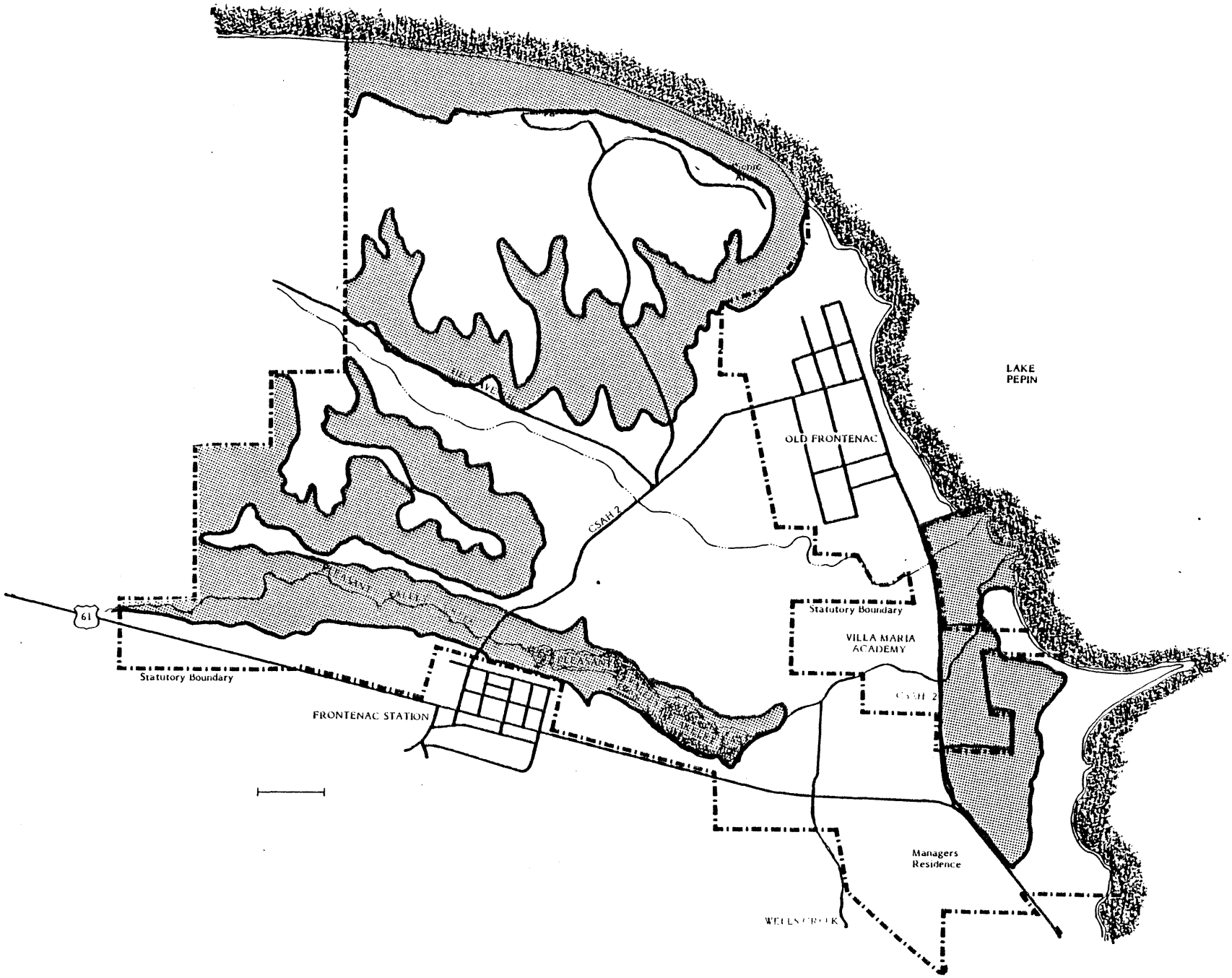
   The marshy area near Sand Point is sensitive to development. The standing water and constant flooding make development proposals very expensive. However, the relative inaccessibility of Bottomland Hardwoods oriented next to a sand beach creates a diversity ideal for large numbers of wildlife species.

2. Outstanding Natural Feature Zone - The outstanidng 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 recreation facilities may be necessary to allow for enjoyment and interpretation. All development must be compatible to the features of the site to protect its natural character. Resource management will be restricted to restoring the resources and perpetuating their natural characteristics.

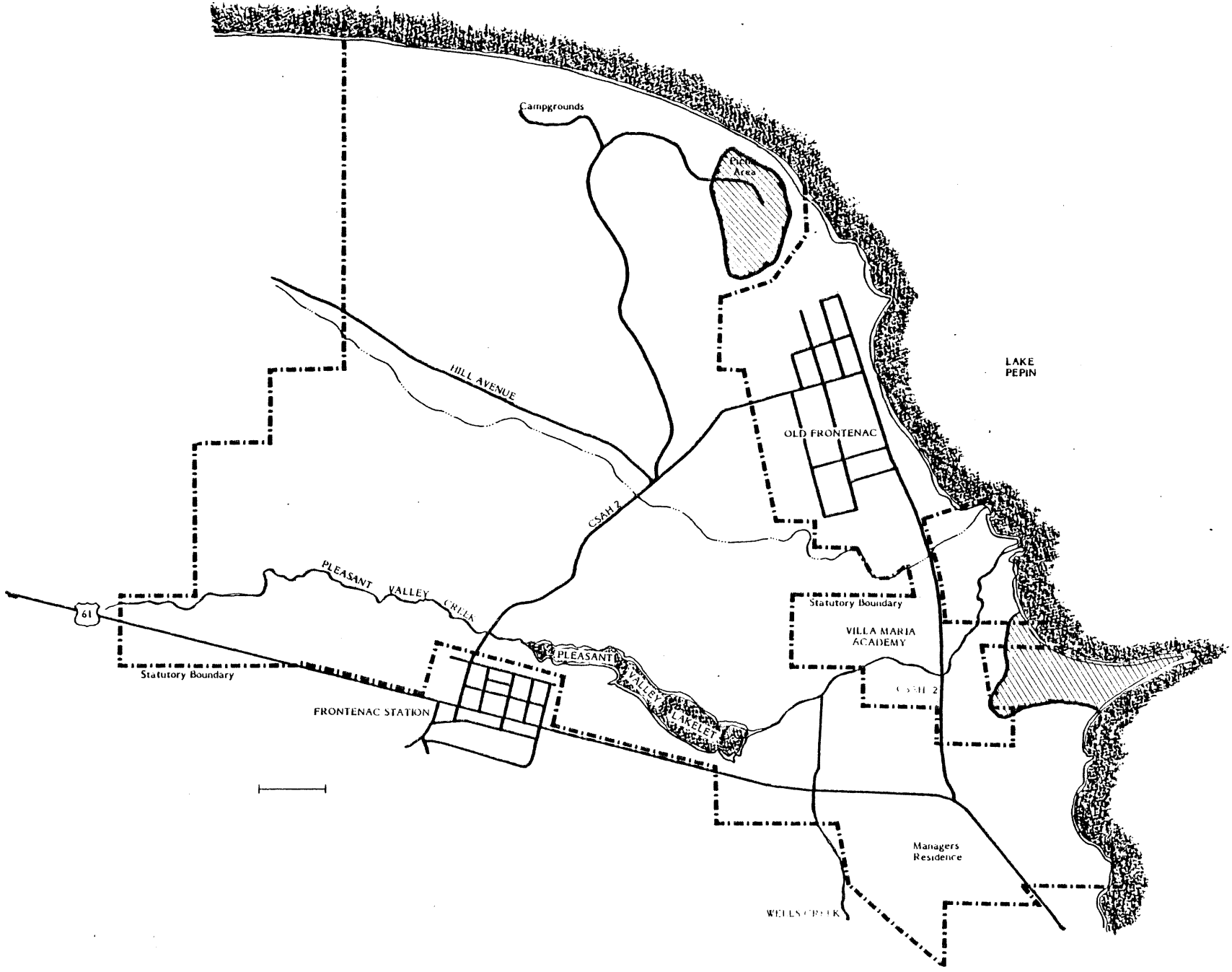
   Potential Areas within the Park

   The entire bluff top on which the picnic area and campground reside could, with some justification, be included within this potential zone; one focal point exists. The bluff off of the picnic area provides a scenic vista of the old town of Frontenac and picturesque Lake Pepin and is one of the user highlights of the park.

POTENTIAL ECOLOGICAL PROTECTION ZONES



POTENTIAL OUTSTANDING NATURAL FEATURE ZONES



Access to Point au Sable is now limited and use is low. If a parking lot is developed in the area, this point will become a user highlight. The Point is an excellent bird watching location and contains a beautiful sand beach. In the future, this area will become an important natural feature within the park.

3. Primitive Zone - The primitive zone includes extensive areas of land and water remote from high density use areas and major development within the park 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 the natural environment and the aesthetic character of that environment. - No Areas exist within this park.

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 expereince by improving the natural aesthetic quality of the vegetation and the wildlife habitat for visual enjoyment. Lakes may be managed to improve recreational fishing. Minor improvements to the resources may be made which prevent damage to the soils and vegetation.

Potential Areas within the Park

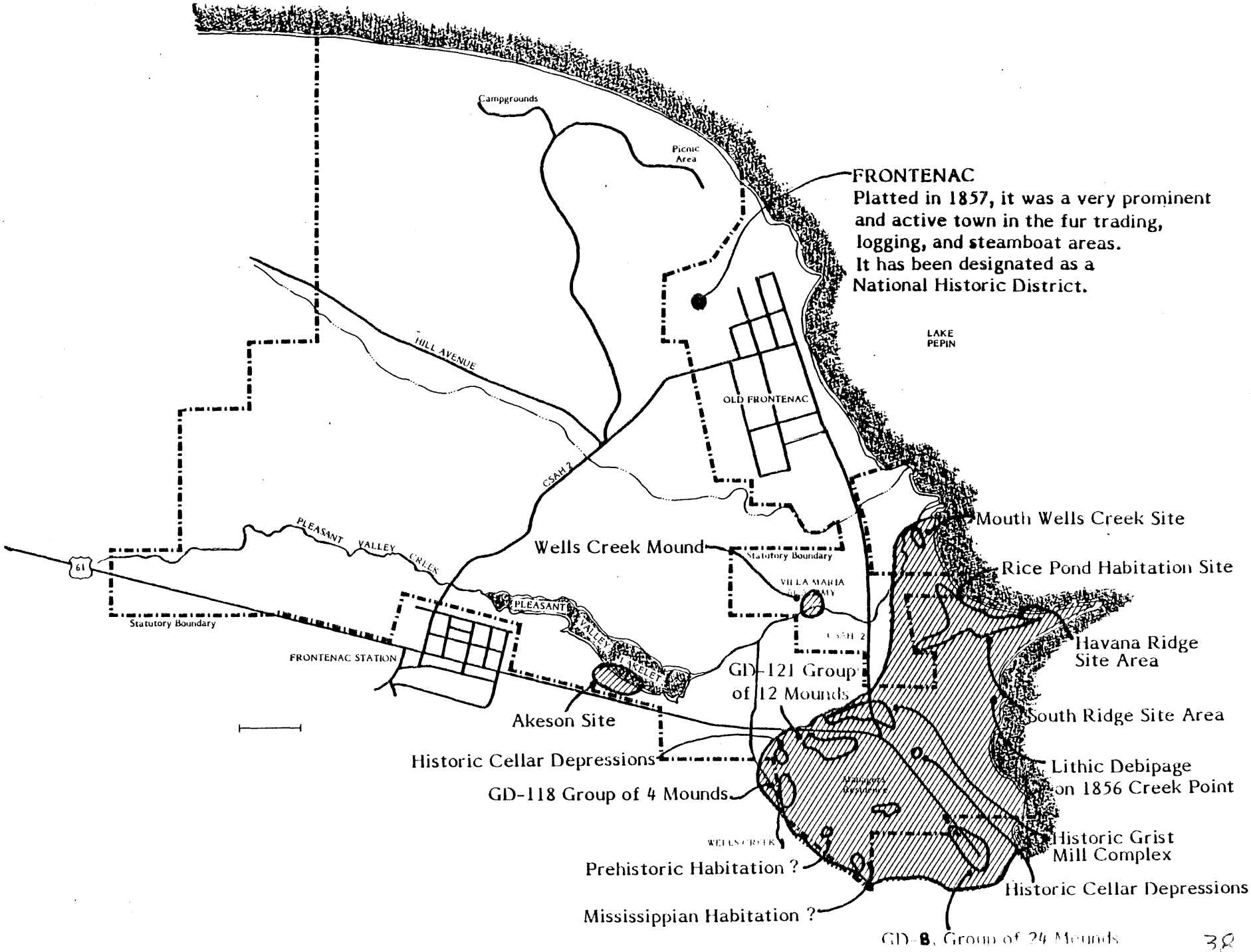
The areas within the park which have potential for development, but will not be developed, will be designated as a General Environment Zone.

5. Historical and Cultural Zone - The historical and cultural zone includes those sites which help to illustrate the historical and archeological heritage of the area that should be presented or restored. Activities should emphasize the interpretive values of the site. Recreation development will be restricted to activities 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 teh 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 activites. 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 Areas within the Park

Point au Sable is rich in pre-history. To date the following sites have been located: the Akeson Site (21-GD-100), Three Mounds (21-GD-118), the Burfeind Site (21-GD-90), Frontenac State Park Mounds (21-GD-121), Mouth Wells Creek Site, "Rice Pond" Habitation Site, South Ridge Site, Havana Ridge Site. In addition, a Flour Mill, a clammer's site, and numerous historic celler depressions have been located.

POTENTIAL CULTURAL/HISTORICAL



At this time, the Havana Ridge Site has been recommended as a state Historic Site (see page 31) and has been nominated to the National Registry of Historic Places. This Middle Woodland Site (400 B.C.-300 A.D.) is most likely a northern peripheral Hopewellian cultural expression. As such, it is one of the few known Havana Tradition sites within the Mississippi Valley north of Wabasha.

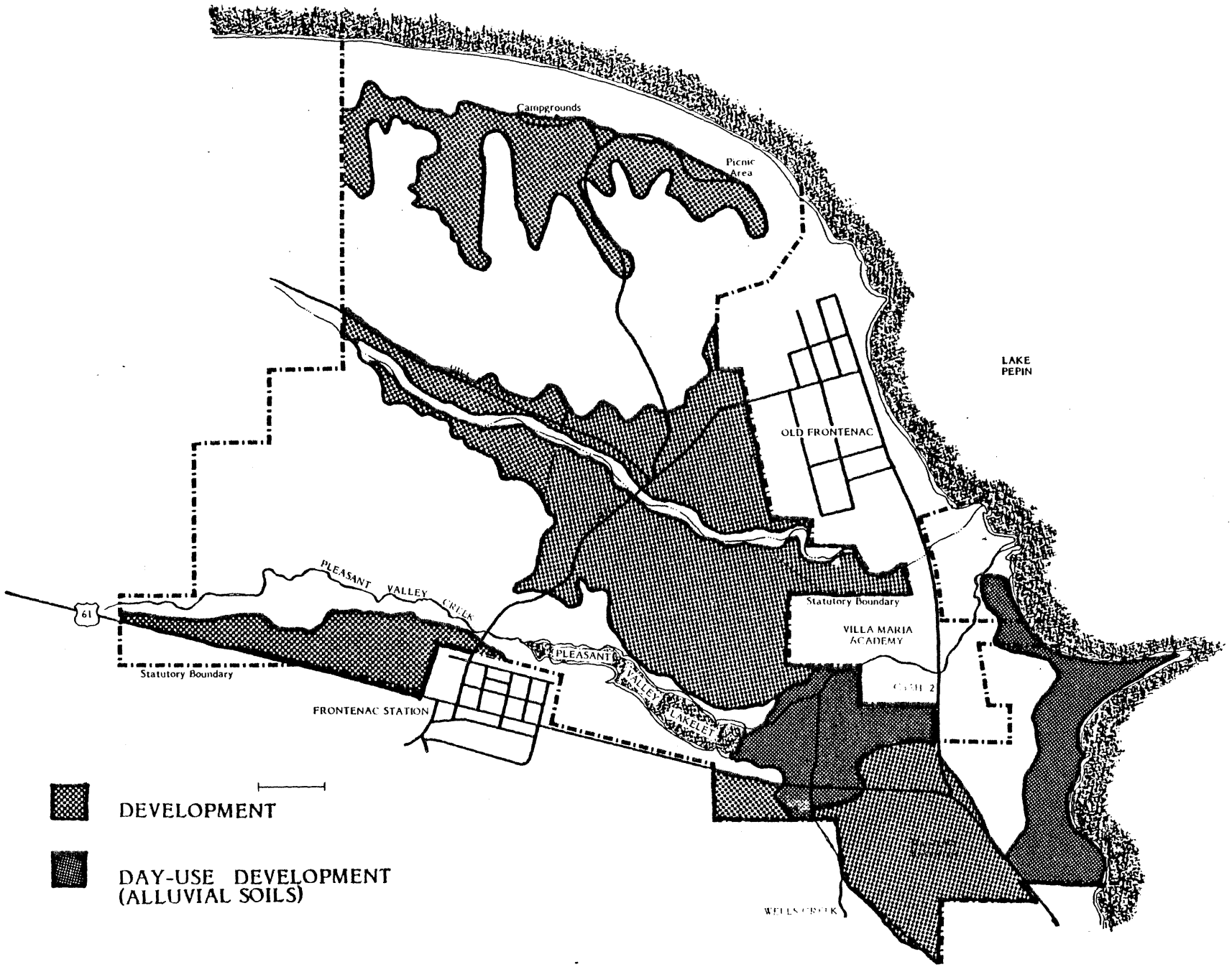
A zone which incorporates most of these sites has been delineated.

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 maintian 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 historic zones through which they pass. Resource management will be directed toward improving the recreation capabilities and characteristics of the environment. However, native vegetation should not be extensively replaced solely for aesthetic reasons.

Potential Areas within the Park

The potential development zone areas depicted here reflect the suitability of the soils and topography for development. These areas are further divided into those lands subject to periodic flooding and those not. The areas which are periodically flooded may be utilized for day use facilities such as picnicking, but should not be used for overnight facilities.

POTENTIAL DEVELOPMENT ZONES



Final Zoning

1. Primitive Zone - None designated.

2. Ecological Protection - All of the steep slopes and water bodies of the Wacouta Ponds have been retained within this zone. However, the part of Point au Sable that has been nominated to the National Register of Historic Places has been deleted. In addition, another small area near CSAH 2 has been deleted and designated with the Development Zone so as to provide a parking lot which will provide user access to the areas prehistoric, historic and natural features.

3. Outstanding Natural Feature - Due to its prehistoric cultural significance, much of Point au Sable has been included within the Historic and Cultural Zone. However, the beach area has been retained within the Outstanding Natural Feature Zone due to its potential to serve as a natural highlight of the park.

   The area near the picnic area on the bluff top overlooking Lake Pepin has also been included.

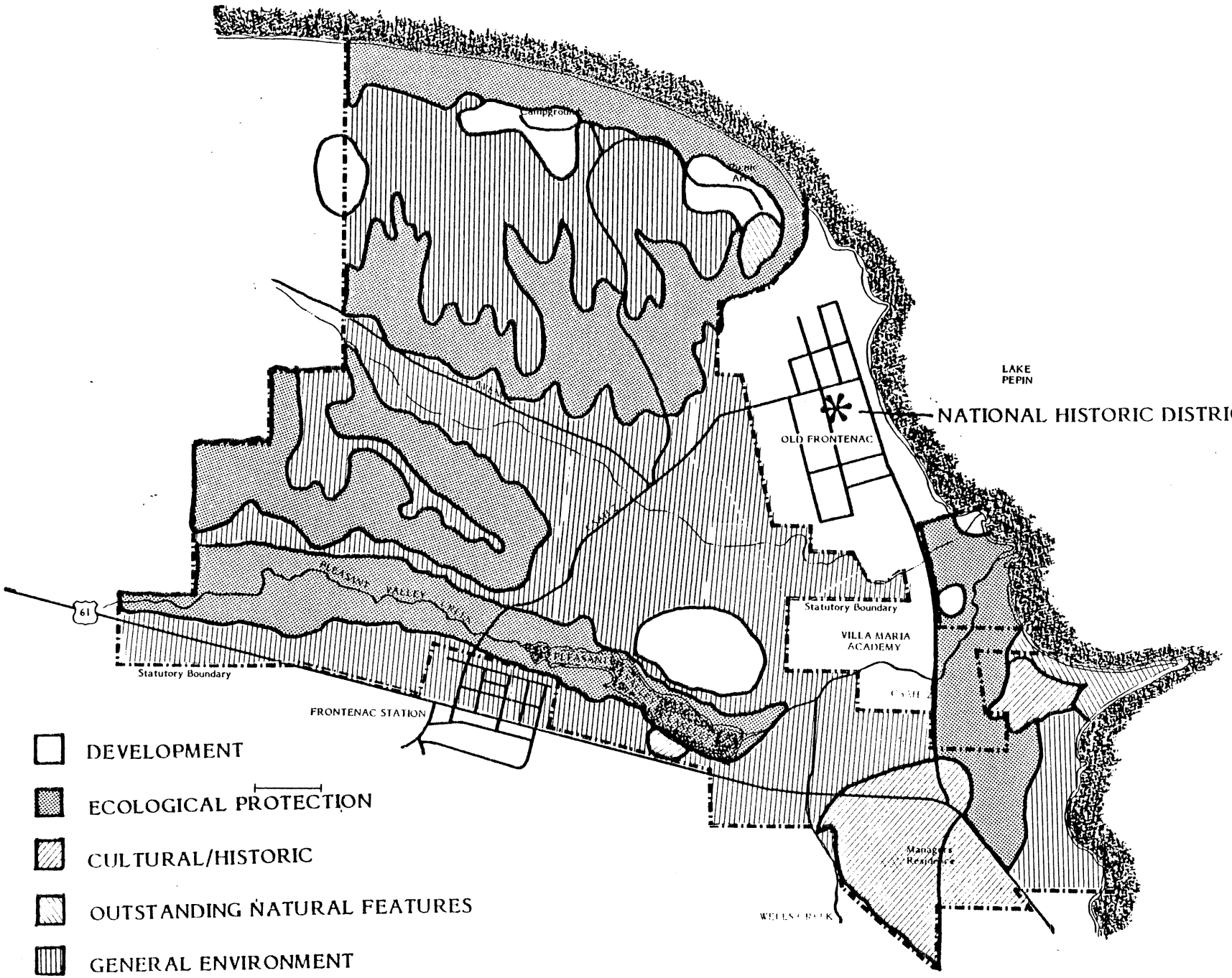
4. General Environment Zone - All areas not included in other zones were incorporated into this zone.

5. Historic and Cultural Zone - The potential Historic Zone was split in two. The portion near Sand Point corresponds with the site currently under consideration for inclusion within the National Register of Historic Places. The other portion encompasses all of the known sites near the manager's residence. In addition, the Akeson Site (21-GD-100) overlooking Pleasant Valley Lakelet has also been included.

   An intensive survey to locate prehistoric and historic sites is still needed in much of the park, but especially on the bluffs overlooking Lake Pepin. This zone will perhaps include more area once these bluffs have been surveyed.

6. Development Zone - Only a small portion of the potential development zone has been included within the final zone because only those locations needed for specific development were retained. One area not identified as "potential" was also included. In order to provide limited access to Point au Sable's prehistorical, historical, recreational and natural features, a parking lot will be required. Special construction techniques will have to be used to develop in this area because of annual flooding.

FINAL ZONING



WATER RESOURCES MANAGEMENT

Introduction

Few elements, if any, play a more important role in the total environment and its component life support systems than water. Besides nourishing vegetation and wildlife, water provides aesthetic experiences for park users. Lakes and streams, for instance, provide the majority of recreational opportunities in many units.

Water resources are managed in two aspects -- underground and surficial. In general, underground water resources are managed to maintain a high quality groundwater supply. The following park policies will work toward that goal:

1. To purchase all lands within a park's statutory boundary, to insure control over uses which might contaminate groundwater.

2. To prevent groundwater contamination by insuring that recreational uses and development meet or exceed current health and pollution regulations.

Surficial water resources are managed more easily than underground systems. Surface water management programs should include total watersheds, not just a particular lake or stream. Unfortunately, few parks encompass total watersheds, particularly those of streams, thus controls are 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 one or more 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.

As with underground water resource management, the principle goal of surficial water resource management is to retain or re-establish high water quality. In order to do this, only those park activities that will not adversely affect the water quality will be allowed along a shoreline and within a watershed. All new park developments will conform to local shoreline zoning regulations.

The following policies will be strived for in lakes and streams that presently aren't in total state ownership.

1. To acquire the private parcels within the statutory boundary of the park.
2. To support local surface use regulations or the development of such.
3. To oppose any development or use of a water body or watershed that will pollute or otherwise degrade the water quality.

The following policies will be strived for on lakes and streams and/or watersheds that are controlled by the Division of Parks and Recreation:

1. To monitor and restrict surface use, if necessary, to prevent pollution of the water.
2. To consider water level control structures only after a thorough study to determine their effects on the total watershed has been completed.
3. To coordinate and monitor fisheries, aquatic vegetation, and aquatic wildlife management so that such management does not have a permanent adverse affect on the water quality.

UNDERGROUND

As noted in the Geologic History Section (page) the bluffs found in the park were once islands as Glacial River Warren cut through the area. This action severed the Prairie du Chien-Jordan aquifer which runs higher than the bottomlands. Consequently, the well log for the picnic ground shows that it had to go past this typically water-rich formation and continue on to the Ironton-Galesville aquifer which yields only moderate amounts of water.

The well near the manager's residence was drilled through various layers of alluvium (ie., sand, gravel, and clay deposited by flowing water) and near a suspected fault line which runs from Red Wing through the bottomlands to the Mississippi River. This suspected fault line with its overburden of sand and gravel would indicate an area of high aquifer recharge. But, because most of the aquifers flow toward the Mississippi River, few wells can utilize water from this recharge area. Nevertheless, caution will be necessary in developing the area. The other sensitive areas included within the Suitability Maps for sewage lagoons (page 55) and the drain fields (page 53).

SURFICIAL

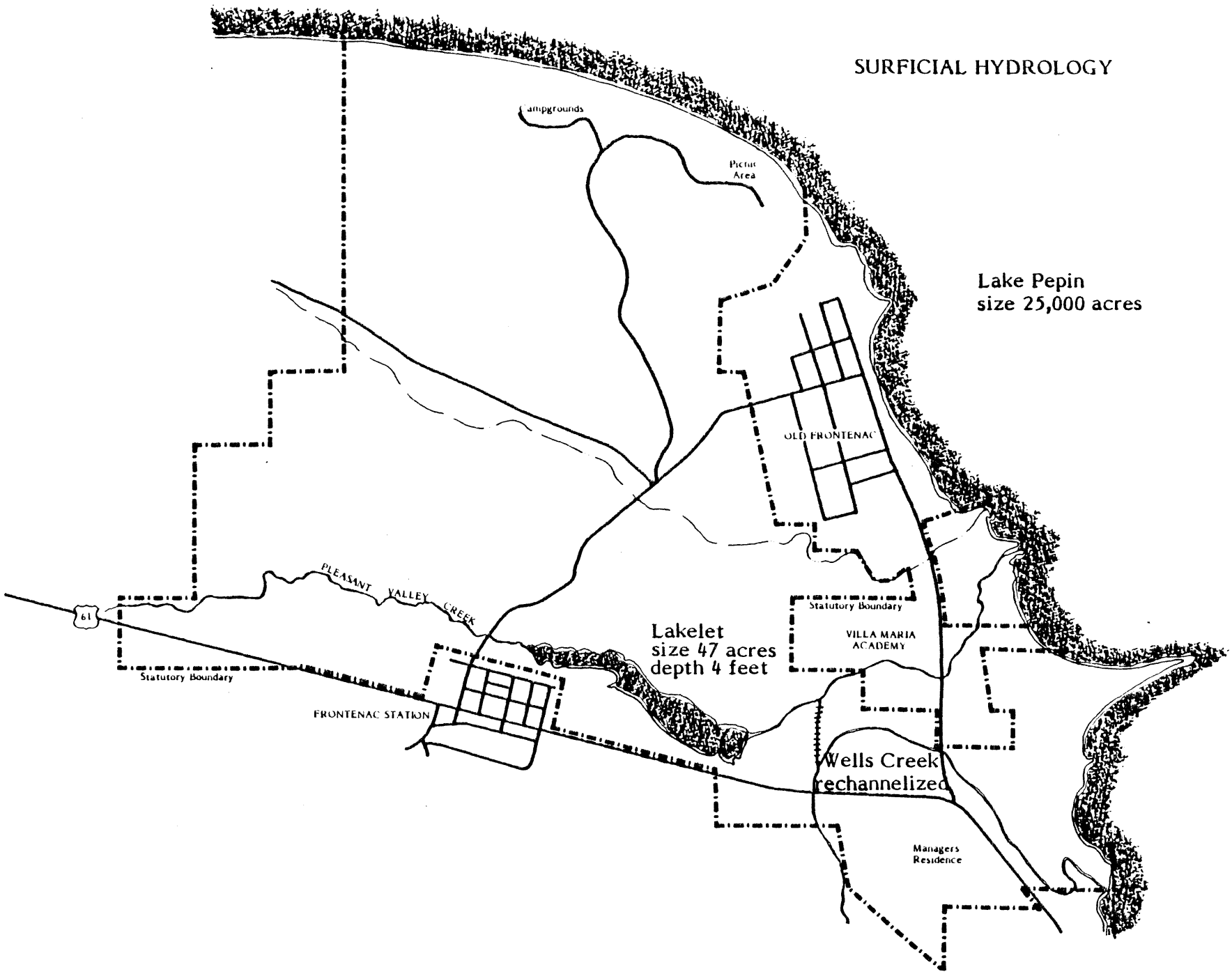
The largest and most striking water body within, or bounded by Frontenac State Park is Lake Pepin. The park also encloses Pleasant Valley Lakelet and portions of Wells and Pleasant Valley Creeks (see Surficial Hydrology Map, page 45).

Over the years, sediment carried by the Chippewa River dropped out of suspension as it slowed to meet the Mississippi River. The resulting delta constricted the larger river and forced the inundation of what was originally floodplain. This process has created Lake Pepin. The lake at present is about 25 miles long and 2 to 3 miles wide, and covers about 25,000 acres. Lake Pepin is heavily used for recreation, such as boating, sailing, waterskiing, etc.

The water quality of Lake Pepin is significantly effected by inadequate secondary sewage treatment and occasional raw sewage discharges into the Mississippi River by Red Wing and the Twin Cities. Although steps are underway to raise the efficiency of existing facilities, little significant improvement is likely until considerable new construction is completed. Improvmenets in the Red Wing and Twin Cities sewage treatment facilities are scheduled for completion in 1980 and 1981. But improvements in the sewage collection facilities will take longer. Both partially have combined sewage collection systems.....meaning that storm and gutter runoff is combined with sewage in one pipe. In order to avoid heavy rainfall overflow of this sytem the sewage will have to be separated into two separate pipes. Red Wing's work is scheduled for completion in 1983 while the Twin Cities in 1987.

Pleasant Valley Creek is a very small creek that winds through the low marshy Wacouta Ponds. The marshes along this creek are the only ones of this type in a band 50-100 miles wide along the Mississippi and south of the Twin Cities. These few marshes then, because of their strategic location in a migratory pathway, attract an unusual number of birds not commonly occurring in Minnesota (see Birds Associated with Wacouta Ponds, page). Roughly paralleling U.S. 61, the creek eventually deposits into Pleasant Valley Lakelet. It then converges with Wells Creek and they combined empty into Lake Pepin.

Formed somewhat by beaver activity, the lakelet is small (less than 70 acres) and shallow (less than 4 feet). Besides the creek, a number of springs as well as runoff, supply the water for it. It reportedly has a sand bottom which has been covered over by 4 feet of silt and muck.


SURFICIAL HYDROLOGY
Campgrounds
Picnic Area
Lake Pepin
size 25,000 acres
OLD FRONTENAC
PLEASANT VALLEY CREEK
61
Statutory Boundary
Lakelet
size 47 acres
depth 4 feet
Statutory Boundary
VILLA MARIA ACADEMY
FRONTENAC STATION
Wells Creek
rechannelized
Managers Residence

FISHERIES

Introduction

Fishing is one of the most popular recreation activities in Minnesota, year round. Each year more than one and one-half million Minnesotans, and hundreds of thousands of tourists, fish the state's lakes and streams. With this tremendous pressure upon fish populations, every effort should be made to maintain or improve fisheries.

Although there is currently no developed access to Lake Pepin from the park, one is planned (page 114). Until that time there is a small township boat launch in old Frontenac and a major public boat launch facility near Lake City. There are numerous species of fish in good abundance within Lake Pepin. The species most sought include:

Sauger	Bluegill
White bass	Channel catfish
Walleye	Northern pike
Crappie	

Other fish that are caught in Lake Pepin are:

Yellow perch	Flathead catfish
Carp	Bowfin
Drum	Green sunfish
Mooneye	Smallmouth bass
Rock bass	Bullheads
Largemouth bass	Suckers
Sunfish	

Other species present in the lake include:

Lake sturgeon	Gar species
American eel	Warmouth
Shovelnose sturgeon	Gizzard shad
Yellow bass	Orange spotted sunfish

Within recent years there has been increasing evidence of Poly-Chlorinated Biphenyls (PCB's) found in fatty tissues of fish (most notably carp), taken from Lake Pepin. The Minnesota Health Department has warned that consumption of Lake Pepin fish should be limited to once a week. It appears that PCB contamination is cumulative and lingers for many years. Although PCB pollution may be curtailed in the neary future, it will be many years before the effects have been completely erased.

The other body of water in the park is the Pleasant Valley Lakelet. Other than rough fish, this small pond has very little recreational fishing potential. Reports have been received of some trout being taken further upstream in Pleasant Valley Creek.

SOILS MANAGEMENT

Introduction

Soils and their underlying geological foundations are the major components of a park's topography, greatly influencing vegetative cover. This section is concerned with soil problems and capabilities. Several areas within the Minnesota State Parks System have become seriously compacted and/or eroded as a result of not considering soil limitations in management and development.

Primarily, soils are managed to protect them from nature's erosive forces and/or human uses which may result in compaction, erosion or pollution. There are three major policies and goals related to soils management:

1. That adequate ground cover is maintained.

2. That management problems, such as erosion, compaction, pollution, be corrected as soon as possible.

3. That, to the greatest possible extent, all future uses and developments will be restricted to suitable soil situations.

SOILS

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

The soils of the Frontenac area were formed by a variety of different actions. There are several types of glacial till soils, limestone and sandstone residual soils, loess soils, glacial outwash soils, recent alluvial soils, and organic soils.

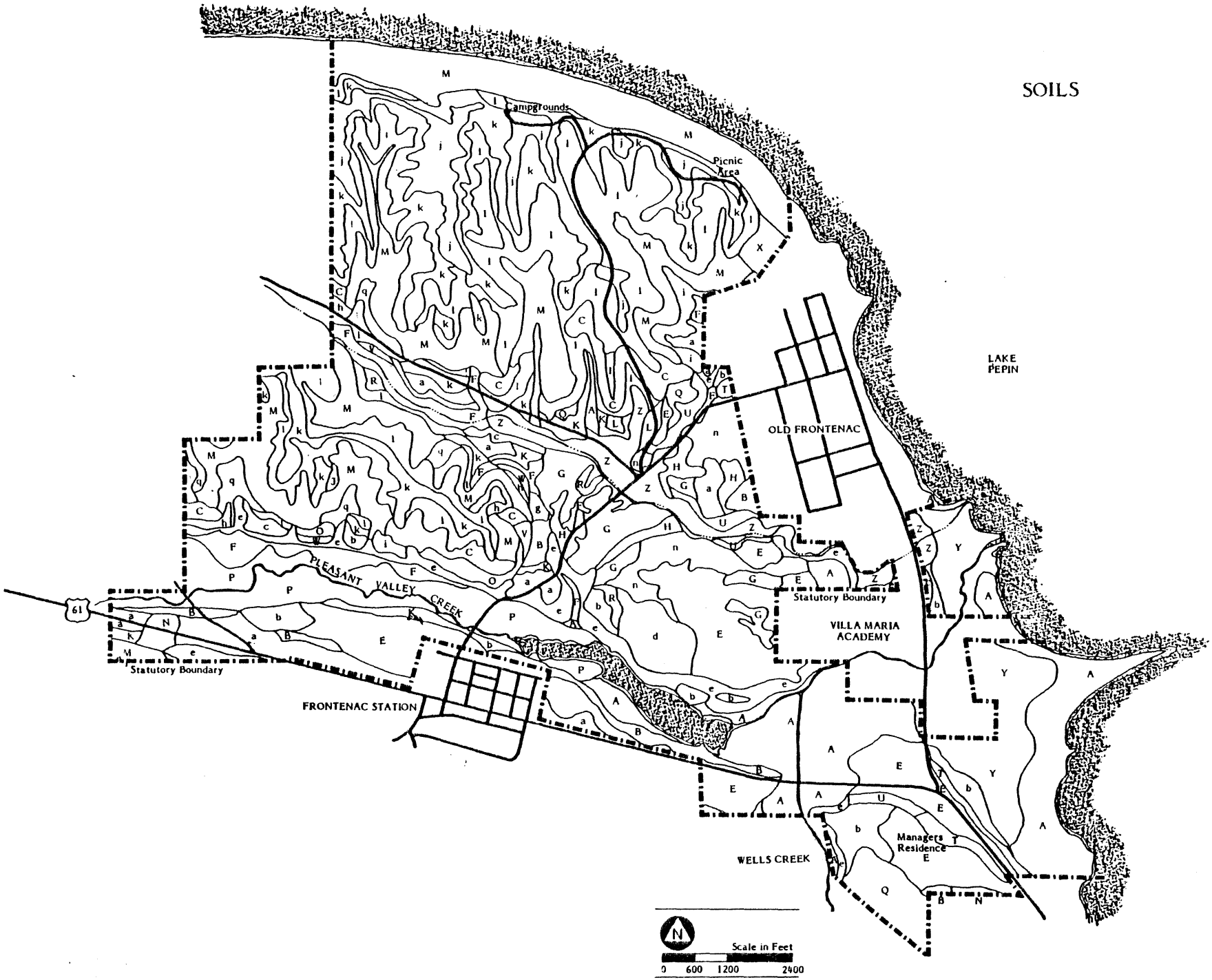
The soils identified by the Soil Conservation Service are shown on the Soil Characteristics Suitabilities Chart (page 51). This chart was derived from the single sheet Soil Survey Interpretations, and describes some of the engineering characteristics of each series and rates each as to its suitability for different uses. This chart can be keyed to the Soils Map (page 49) and the Soils Suitability Maps (pages 53-59).

In selecting a site for a particular use the soil limitation rating is not the only criteria to consider. In some circumstances soil limitations can be modified or removed so that the soil can be used safely for the intended use. For this reason some kinds of soil rated as "sever" can be used. This is especially important where good sites are scarce. A good example of this would be the placement of a parking lot upon the marshy soils near Sand Point. In order to utilize this area's cultural, natural, and recreational potentials an access has to be provided. The site chosen as well as the internal road system leading up to it utilizes the least amount of low soils (see Roads, page 103).

The trails on the bluff side near the picnic ground are generally in poor condition (see Trails, page 117). They are steep, dangerous, and in need of continual maintenance. One of the major recommendations of this plan is that considerable amounts of money be spent on the rehabilitation and partial realignment of these trails, to redevelop and realign these trails for greater user safety and to reduce erosion.

Northeast of the existing park entrance road is an intermittent stream that carries runoff from the bluff top to Lake Pepin. Where this runoff water reaches the alluvial sand it has cut a ravine with 30 feet plus crumbly sand walls. Only a portion of this ravine is within the statutory boundary but it is a hazardous area and the continued erosion should be controlled. Since most of the bluff top has been taken out of low crops, the speed of the erosion has been greatly decreased. But an erosion control assessment by the Bureau of Engineering will be desirable to develop appropriate erosion control techniques.

SOILS


Campgrounds
Picnic Area
LAKE PEPIN
OLD FRONTENAC
Statutory Boundary
VILLA MARIA ACADEMY
PLEASANT VALLEY CREEK
61
Statutory Boundary
FRONTENAC STATION
WELLS CREEK
Managers Residence
N
Scale in Feet
0 600 1200 2400

SOIL SUITABILITY CHART KEY

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	(A)* Permeability	Erosion Hazard	Potential Frost Action	Intensive		Paths and Trails	(B)* Recreation Buildings	Sewage Lagoons	Septic Tank Filter Fields
						Picnic Areas	Camp Areas				
Alluvial land	A	12-50%	6-20	Severe[1,2]	Slight	Severe[1]	Severe[1]	Moderate[2]	Severe[1]	Severe[1,6]	Severe[1,6]
Alvin	B	0-3%	2-20	Slight	Moderate	Slight	Slight	Slight	Slight	Severe[1]	Slight
Bellechester	C	25-45%	6-20	Severe	Low	Severe[1,2]	Severe[1,2]	Severe[1,2]	Severe[1,2]	Severe[1,6]	Severe[1]
Brodale	D	25-80%	.6-2.0	Severe[1,9]	Low	Severe[1]	Severe[1]	Severe[1]	Severe[1,3]	Severe[1,3]	Severe[1,3]
Burkhardt	E	0=3%	2-20	Slight	Low	Slight	Slight	Slight	Slight	Severe[6]	Moderate[5]
Chaseburg	F	0-3%	.6-2.0	Slight	Moderate	Moderate[4]	Severe	Moderate	Severe[4]	Severe[4]	Severe[4]
Dakota	G	0-3%	2-20	Slight	Low	Slight	Slight	Slight	Slight	Severe[6]	Slight
Dickinson	H	6-12%	2-20	Slight-Mod	Low	Moderate	Moderate	Slight	Moderate	Severe[6]	Moderate
Dubuque	I	12-18%	.6-2	Moderate	Low	Slight	Slight	Slight	Slight	Severe[3,5]	Severe[3,5]
	J	18-35%	.6-2	Severe[1]	Low	Severe[1]	Severe[1]	Severe[1]	Severe[1]	Severe[1]	Severe[1]
Estherville	K	6-18%	2-20	Slight-Mod	Low	Mod-Sev[1]	Mod-Sev[1]	Moderate	Mod-Sev[1]	Severe[1,6]	Mod-Sev[1,5]
Fairhaven	L	0-3%	1-6.3	Slight	Low	Slight	Slight	Slight	Slight	Severe[3,6]	Slight
Frontenac	M	35-80%	.6-2	Severe[1]	Slight	Severe[1]	Severe[1]	Severe[1]	Severe[1,3]	Severe[1,3]	Severe[1,3]
	q	25-40%	.6-2	Severe[1]	Slight	Severe[1]	Severe[1]	Severe[1]	Severe[1,3]	Severe[1,3]	Severe[1,3]
Gotham	N	2-12%	6-20	Slight	Low	Moderate[9]	Moderate[9]	Moderate[9]	Slight-Mod[9]	Severe[6]	Moderate[3]
	O	12-35%	6-20	Mod-Sev[1]	Low	Severe[1,9]	Severe[1,9]	Severe[1,9]	Severe[1,9]	Severe[1,6]	Severe[1,3]
Houghton	P	0-1%	.6-2	Slight	High	Severe[7,9]	Severe[7,9]	Severe[7,9]	Severe[7,9]	Severe[7,9]	Severe[7,9]
Kegonsa	Q	0-3%	.6-20	Slight	Slight	Slight	Moderate	Modrate	Slight	Severe[6]	Moderate
	R	6-18%	.6-20	Slight	Slight	Moderate	Moderate	Moderate	Moderate	Severe[1,6]	Moderate

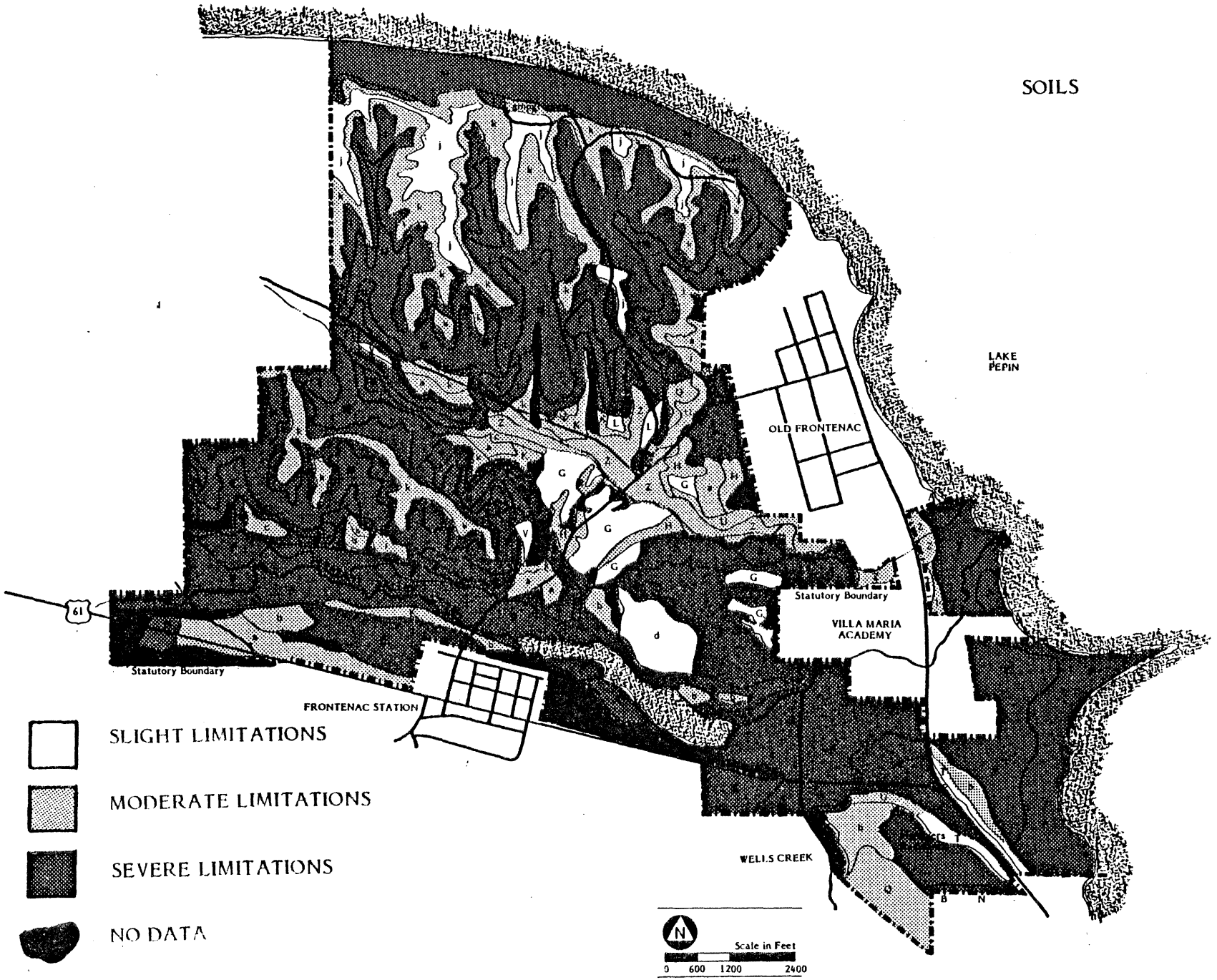
Lawson	S	0-2%	.6-2	Slight	High	Moderate[4]	Severe[4]	Moderate[4]	Moderate[4]	Very Sev[4]	Very Sev[4]
	T	0-6%	6-20	Slight	Low	Moderate	Moderate	Moderate	Slight	Severe[5,6]	Slight
	U	6-35%	6-20	Severe[1]	Low	Mod-Sev[1,9]	Mod-Sev[1,9]	Mod-Sev[1,2,9]	Mod-Sev[9,1,9]	Severe[1,5,6]	Mod-Sev[1,6]
Lindstrom	V	2-6%	.6-2	Slight	Moderate	Moderate	Moderate	Slight	Moderate	Moderate[1]	Slight
	W	12-25%	.6-2	Moderate	Moderate	Severe	Severe	Slight	Severe	Severe[1]	Severe[1]
Marlean	X	40-80%	.6-20	Severe	Low	Severe[1]	Severe[1]	Severe[1]	Severe[1]	Severe[1]	Severe[1]
Marsh	Y	0-1%		Slight	High	Severe[7]	Severe[7]	Severe[7]	Severe[7]	Severe[7]	Severe[7]
McPaul	Z	0-2%	.6-2.0	Slight	High	Slight	Slight	Slight	Mod-Sev[4,8,10]	Moderate[6]	Moderate[6,7]
Mt. Carroll	a	0-3%	.6-2.0	Slight	Low	Slight	Slight	Slight	Moderate	Moderate[6]	Moderate[6]
Plainfield	b	0-6%	6.-20	Slight	Low	Severe[2,9]	Severe[2,9]	Severe[2,9]	Slight	Severe[3,6]	Moderate[3,6]
	c	6-25%	6.-20	Slight	Low	Severe[1,2,9]	Severe[1,2,9]	Severe[1,2,9]	Mod-Sev[1]	Severe[1,5,6]	Moderate[1,5,]
Port Byron	d	0-3%	.6-2.		Moderate	Slight	Slight	Slight	Slight	Moderate[6]	Slight
Salida	e	1-12%	6.-20.	Slight-Mod	Low	Slight-Mod[1]	Slight-Mod[1]	Slight-Mod[1]	Slight-Mod[1]	Severe[6,10]	Severe[5]
	f	12-45%	6.-20	Slight-Mod	Low	Severe[1]	Severe[1]	Severe[1]	Severe[1]	Severe[1,6]	Severe[1,5]
Seaton	g	6-12%	.6-2.0	Slight	Moderate	Moderate[1]	Moderate[1]	Slight	Moderate[1]	Slight[1]	Severe[1]
Seaton, Timula and Pold	h	Steep	.6-2	Severe	High	Severe[1]	Severe[1]	Severe[1]	Severe[1]	Severe[1]	Severe[1]
Terrill	i	12-18%	.6-2.0	Moderate	Moderate	Moderate[1]	Moderate[1]	Moderate[1]	Mod-Sev[1]	Severe[1,6]	Moderate[6]
Timula	j	2-6%	.63-2.0	Slight	Low	Slight	Slight	Slight	Slight	Slight	Slight
	k	6-12%	.63-2.0	Slight	Low	Modrate[1]	Moderate[1]	Moderate[1]	Moderate[1]	Moderate[1]	Moderate[1]
	l	12-25%	.63-2.0	Moderate	Low	Severe[1]	Severe[1]	Moderate[1]	Severe[1]	Severe[1]	Severe[1]
Vasa	m	0-3%	.6-2.0	Slight	High	Moderate[9]	Moderate[6,9]	Moderate[6,9]	Moderate[8]	Moderate	Moderate
Waukegan	n	0-3%	.6-2.	Slight-Mod	Low	Slight	Slight	Slight	Slight	Severe[5,6]	Slight

*A Permeability measured in inches per hour

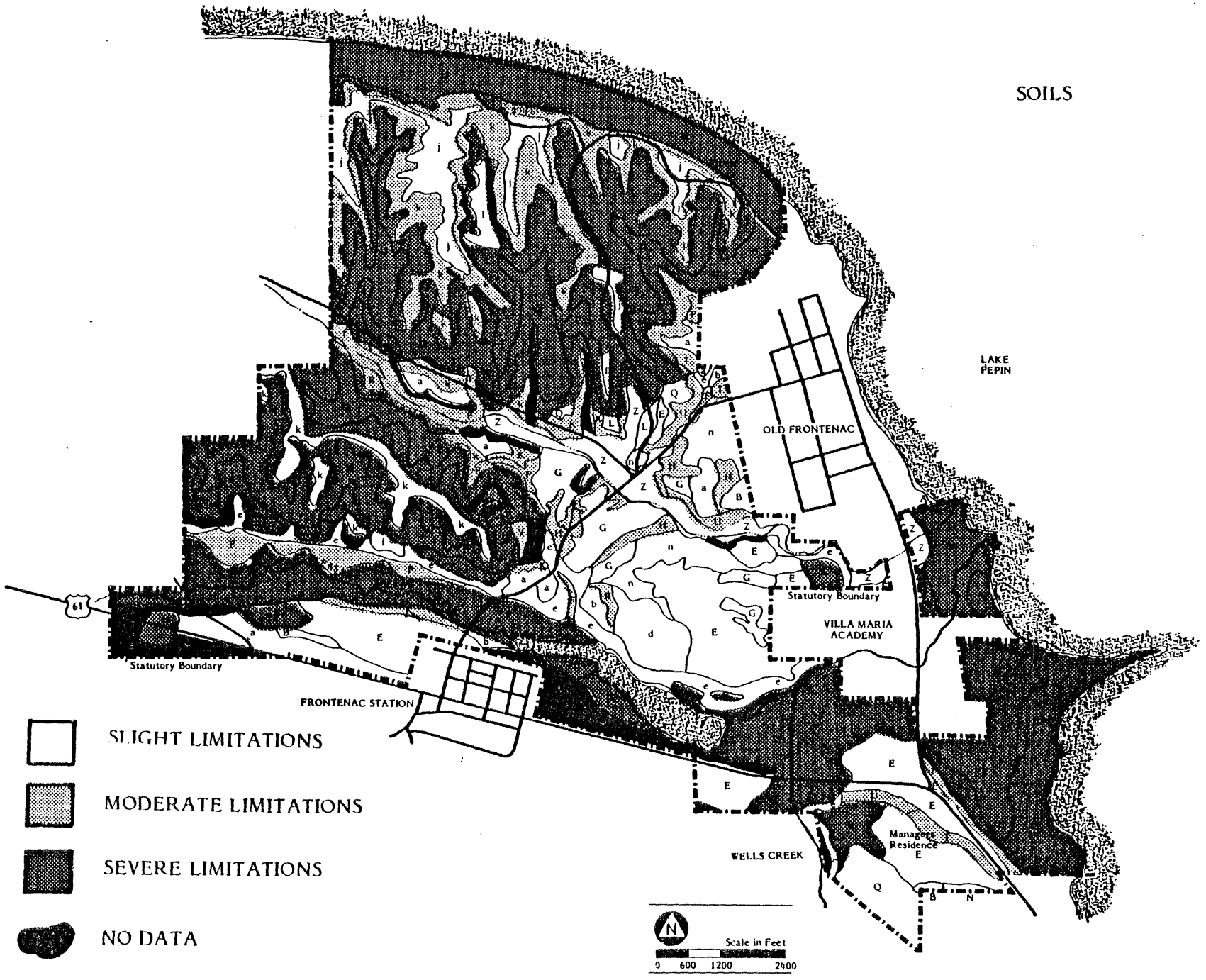
*B Based on buildings without basements

SOIL SUITABILITY/

SEPTIC TANK FILTER FIELDS

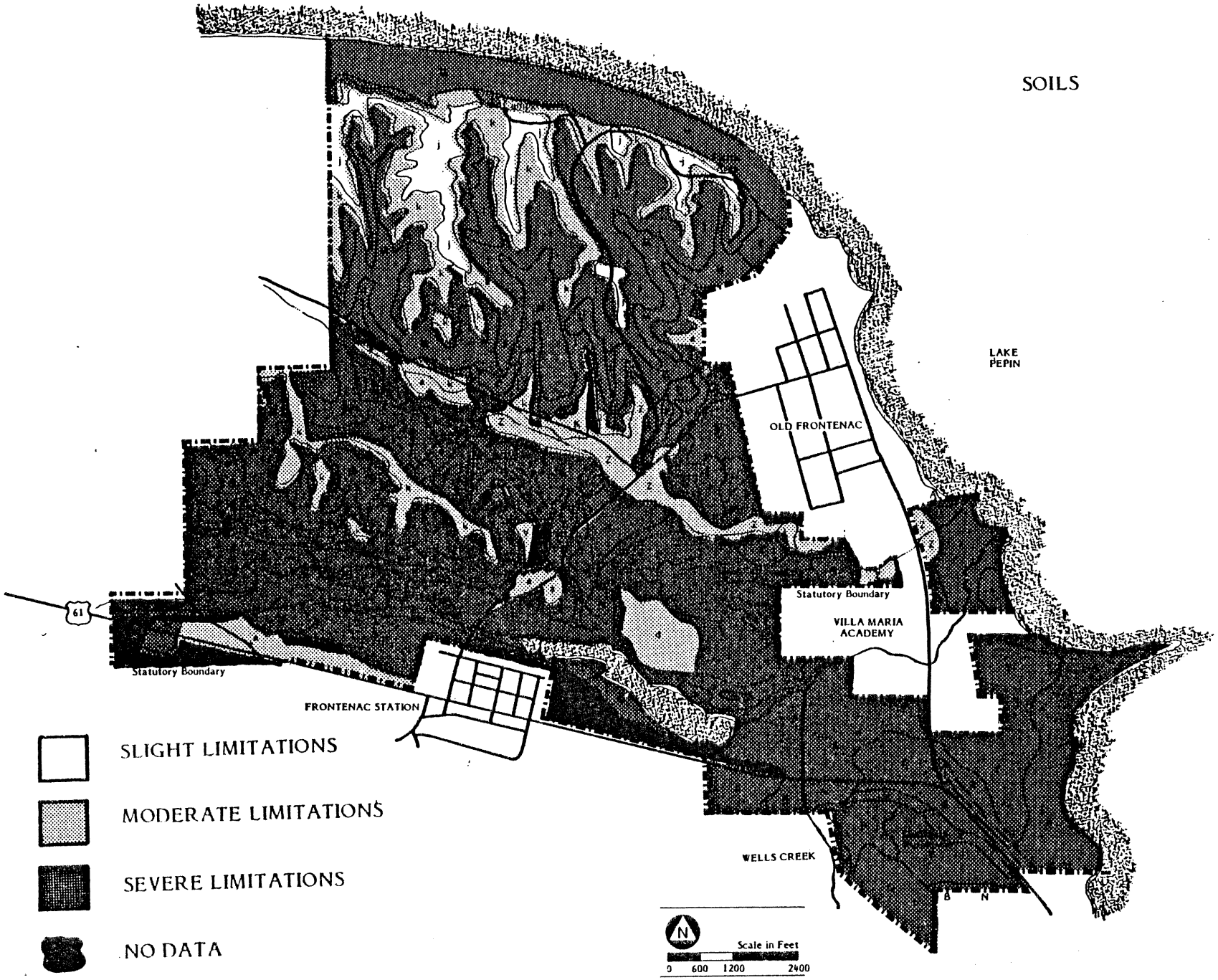


SOIL SUITABILITY/
PICNICKING AND CAMPING



SOIL SUITABILITY/

SEWAGE LAGOONS



VEGETATION MANAGEMENT

Introduction

Each and every park in our system has features which distinguish it as unique within the state, and often these features are vegetative. In order to perpetuate these unique qualities, it is important that a vegetation management plan be tailored to each park. Several factors were considered in developing a system of vegetation management options, including the following:

1. Vegetation prior to white settlement.
2. Proposed types and intensities of parcel use.
3. Unusual or rare plant communities.
4. Wildlife and fisheries management needs.
5. Special diversity and character.

Since vegetation management practices must vary from park to park according to existing vegetation, predominant soils and park classification, such a plan may call for restoration of presettlement communities, or it may prescribe management of communities which will sustain intensive recreational activities. Vegetation management is also directed toward the establishment or perpetuation of a certain character associated with a given park; e.g., the towering pines of Itasca State Park.

Vegetation management also affects animal populations and their distribution within a park. Where possible, efforts will be made to reestablish select plant and animal populations now absent in the park area, but which were formerly present. Although timber harvest may be used as a management tool in the rehabilitation or restoration of certain plant and animal species, production of wood fiber will not, in itself, be a major consideration.

Original Vegetation

Presettlement vegetation within the park was a mixture of "big woods", prairie, and "oak openings and barrens". The big woods vegetation was on a thin strip of the north edge of the park cloaking the steep slope facing Lake Peopin. Oak openings and barrens covered the majority of the park with two small areas of prairie on the northern bluff, and a strip extending east from Frontenac Station to Lake Pepin.

Existing Ecological Communities

Almost all the land, other than steep slopes and very wet areas, has been cleared of the original oak openings and barrens, and native prairie. Much of this land is currently utilized for agricultural row crops. The ecological communities currently existing are:

Code	Community	Acres	%
AG	Agricultural Land	842	30.9
BiW	Big Woods	419	15.4
BoT	Bottomland Hardwood Forest	280	10.2
BR	Open Brush	72	2.6
MH	Marsh & Ponds	187	6.8
OF	Old Field	608	22.2
OpW	Open Woods	179	6.6
PG	Pine Groves	5	.2
SV	Oak Savanna	33	1.2
WdP	Wooded Pasture	61	2.3
WM	Wet Meadow	44	1.6

Agricultural Land (AG)

These lands are seasonally tilled for purposes of raising cereal grains or row crops.

Big Woods (BiW)

Predominant tree species include: sugar maple, basswood, American elm, red oak, bur oak, hickory, black walnut, and butternut. Bog woods vegetation still does exist in the area noted as originally having that vegetation. Although some of this area has been used through the years as a woodlot, it still retains a mature big woods character. Other areas of this vegetation type occur within the park, although they are much younger stands.

Bottomland Hardwoods (BoT)

This type occurs on nearly all major floodplains and valley bottoms. The species present include: American elm, green ash, cottonwood, silver maple, and willow. Bottomland hardwoods are found along Lake Pepin and along portions of Wells and Pleasent Valley Creeks.

Open Brush (BR)

The areas of this type are predominantly vegetated by: hazel, dogwood, wolfberry, cherries, sumac, juneberries, and roses. Some scattered small clumps of young quaking aspen, oaks, and other species are also present. This type can be found on the northern bluff on a bald ridge near the entrance road.

Marsh and Ponds (MH)

Marsh and ponds are normally flooded by 6"-4' of water throughout the growing season. Plant species prevalent in this area include: cattails, bulrush, bur-reed, duckweed, etc. The majority of this type is found along Pleasent Valley Creek with some areas along the edge of Lake Pepin.

Old Field (OF)

These areas were formerly cultivated fields or other disturbed areas which are now characterized by bluegrass, weeds, bromegrass, etc. Much of this area is now being invaded by: young boxelder, Chinese elm, sumac, aspen and oak.

Open Woods (OpW)

This community is typified by mature tree cover over 30-50% of the area found either as randomly scattered individuals or in scattered clumps. Common species include: burr oak, maple, basswood, elm, and ash. The south and east slopes of the northern bluff are cloaked in this vegetational type.

Pine Groves (PG)

Two small plantations of mixed spruce and pine are located on the southeast crest of the northern bluff. These trees are 3-5" diameter and are rather densly planted.

Oak Savanna (SV)

This type is characterized by scattered open growing oaks with grass and scattered brush understory. Some areas of this type occur along the periphery of the lakelet and scattered areas within the open brush area.

Wooded Pasture (WdP)

The north and east facing slopes of the southern bluff have scattered wooded pasture areas. These areas have a variable species composition but are characterized by closely cropped ground cover with scattered clumps of brush.

Wet Meadow (WM)

The area near ~~Highway~~ US 61, just west of the highway wayside, is considered a wet meadow community. It is characterized by reed, canary grass, sedges, cut-grass, etc.

Sensitivity to Intensive Use

The majority of park vegetation is insensitive to intensive use because it is old field or agricultural at present. The most sensitive areas are the steep slopes with their inherent erosion problems.

Vegetation Map Coes

The Vegetation Map (page 61) delineates the ecological communities found within the park. Each symbol on the map describes many things about the vegetation there. It tells the ecological community type, its size and density, as well as the shrub and ground cover density and the communities ' fire susceptibility.

Shrub Density; Woody plant material usually greater than 4' tall.

0. None; Brush layer absent, may have been removed by artificial means.

1. Light; High visibility within stand even when leaves are out; no difficulty encountered in walking through stand.

2. Moderate; Some visual obstruction by small to large brush pockets. Walking may be hindered to some degree by brush.

3. Heavy; Visual obstruction severe, visibility limited to less than 100', walking is extremely difficult.

Ground Cover Density; Herbaceous plant material usually less than 6' tall.

0. None; Litter layer absent, native ground cover absent or heavily disturbed by use.

1. Light; Litter layer readily visible, low growing plants widely scattered or in small clusters.

2. Moderate; Litter layer somewhat obscured by low growing plants; occasional extensive areas without plants may occur.

3. Heavy; Litter layer obscured by low growing plants.

Fire Susceptibility; Ease with which the plant community can carry a fire during the normal seasonal fire period.

0. None; fuel is sparse or absent.

1. Low; adequate fuel to carry a fire is present in scttered patches.

2. Moderate; fuel is present in sufficient amounts to carry a fire for some distance.

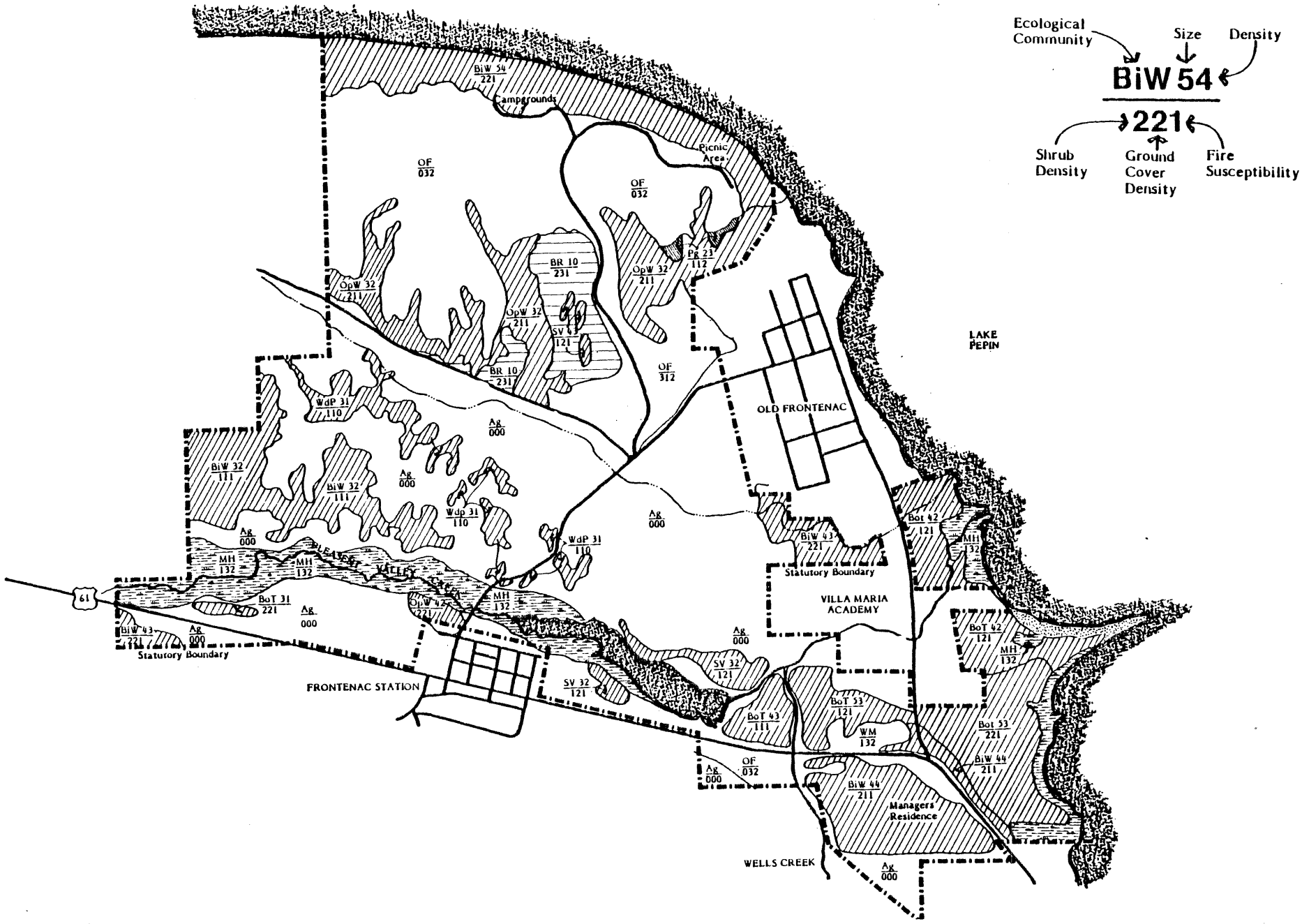
3. High; large accumulations of fuel. Potential for extensive, damaging fire is great.

Cover Size and Density Code for Ecological Communities

Cover Density Code	1=0-1" Seedlings Trees/AC	2=1-3" 3=3-5" Saplings Trees/Ac	4=5-9" Poles Trees/Ac	5=9-15" Small Saw Timber Trees/Ac	6=15+" Large Saw Timber Trees/Ac
0	*	*	0-30	0-10	0-5
1	0-500	0-250	31-90	11-40	6-20
2	500-1,000	251-500	91-150	41-60	21-30
3	1,001-2,000	501-1,000	151-210	61-80	31-45
4	2,001-5,000	1,001-2,500	211-270	81-100	46-60
5	5,001-10,000	2,501-5,000	271-330	101-130	61-75
6	10,001-20,000	5,001-10,000	331-390	131-150	76-90
7	20,001-30,000	10,001-15,000	391-450	151-180	91-105
8	*	*	451-510	181-200	*
9	*	*	511+	201+	*

*Not a valid density code for these size classes.

VEGETATION MAP (see page for vegetation types, and page for code explanation).


Ecological Community
Size
Density
BiW 54
221
Shrub Density
Ground Cover Density
Fire Susceptibility
Campgrounds
Picnic Area
LAKE PEPIN
OLD FRONTENAC
Statutory Boundary
VILLA MARIA ACADEMY
FRONTENAC STATION
Statutory Boundary
Managers Residence
WELLS CREEK
61

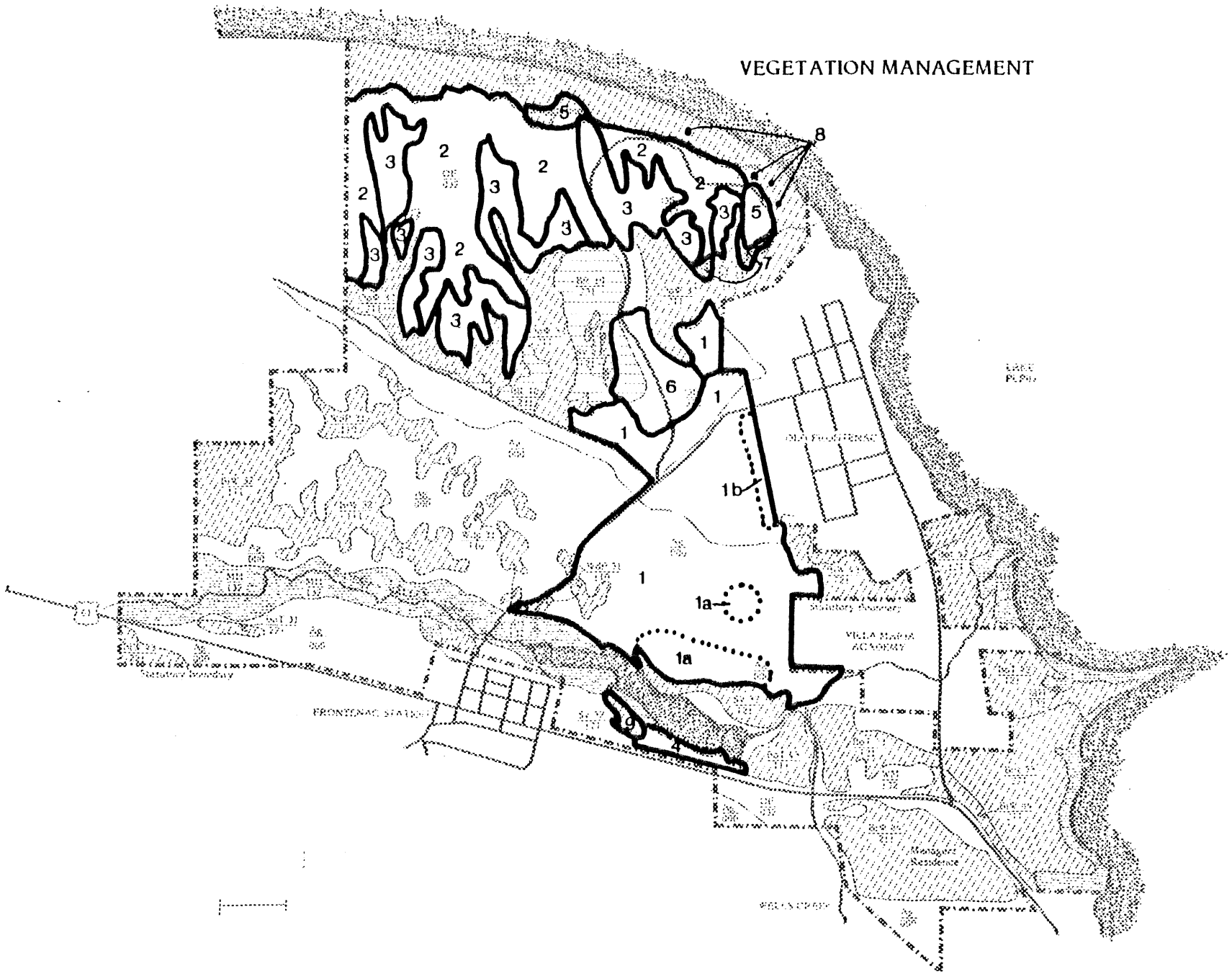
PLANT SPECIES OF FRONTENAC

Pasque flower
Violet-purple
Birds foot violet
Blood root
Dutchman's britches
Wild plum
Rue anemone
Jack in the pulpet
Scilla
Woodland phlos
Creeping charley
Wild leek
Marsh marigold
Apple
Butter and eggs
Goats beard
Wood anemone
Buttercup
Day lily
Yarrow
Wild stawberry
Yellow wood sorrel
Pussy toes
Columbine
Male pussy willow
Rose lady slipper
Toad flax
Bed straw
Lily of the valley
Black cherry
Wild sweet william
Jacobs ladder
Horse nettle
Foam flower

Cattail
Plaintain lily
Purple alfalfa
Water lily
Bur cucumber
Princess feather
Elderberry
Creeping bluebell
Bristle thistle
Soloman seal
Virginia blue bell
Purple fringed orchid
Mullen
Flat top goldenrod
Wild geranium
Cinquifoil
Pink week
Campion custard
Cull thistle
Red clover
White clover
Morning glory
Water cress
Hairy vetch
Beach pea
Cow parsnip
Sweet clover
Dog wood
Harebell
Sow thistle
Cowbane
Wild carrot
Alsike
Germander

4 o'clock
New England aster
Creeping bell flower
Black medic
Canadian anemone
Daisy
Touch-me-not
Sulpher cinquifoil
Creeping jenny
Yellow alfalfa
Button daisy
Plume goldenrod
Lobela
Cup daisy
Joe pie weed
Asters
Gentian
Surprise lily
White sage
Poison ivy
Sunflower
Hop clover
Lead plant
Vervail
Canadian thistle
Catnip
Loosestrife
Thimble flower
Swamp milkweed
Primrose
Mildweed
Tic trifoil
Berganot

(Source: Park Manager)


VEGETATION MANAGEMENT
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VEGETATION MANAGEMENT

1. Existing Vegetation: Agricultural

Proposed Management: Reestablish and Maintain Oak Savanna

The gently sloping bottomland between Frontenac Station and Old Frontenac was vegetated with oak savanna, composed of scatteredclumps of mature board crowned trees interspersed and underlain with prairie, when this area was first settled. The majority of the trees were bur oaks, although some black oak, white oak, shagbark hickory, pin oak, black cherry, etc., were also present. Reestablishment of the vegetational type is desirable because: (1) Returning land within natural state parks to their presettlement vegetation is consistent with state park philosophy. (2) It will provide shade without blocking the views of the bluffs. (3) It will provide a valuable food supply for some wildlife species. (4) This plant community is not very common.

Due to the fact that this vegetational type has little timber production value, there has been little research done on how to manage it. It would be preferred to develop a research project to first establish peoper techniques and to monitor the results to determine if the proper communities are being restored.

If this is not possible, management must still proceed and should be implemented by DNR staff utilizing information at hand and supplemented by whatever details continued on site inspection might reveal. The following management schedule is the general practices that should be followed unless future site inspection or other savanna management studies indicate new management direction.

Oak savannas are difficult to establish because of the exceedingly fast root growth of bur oak seedlings. Therefore, several steps will have to be taken to reach the final oak savanna stage. As these lands are purchased, the existing fields will be seeded one year to soybeans. The next year prairie seed will be drilled in. The prairie grasses will be allowed to grow and establish themselves until there is enough thatch to carry a fire. After the first fire they should be burned approximately every 3-4 years. Once the prairie grasses have become established (3-6 years), bur oak seedlings will be planted in scattered clumps where they will provide shade, screen undesired views and frame the views of the distant bluffs. Only approximately 50% of the area should be shaded by the mature trees. Once oak seedlings have been planted, these areas should be protected from fire for 12-15 years to allow the young saplings to become established. Once these saplings have reached the age where they are no longer greatly affected by grass fires, burning on a 3-4 year schedule should be continued.

1a. Reestablishing the oak savanna with the technique just described will take a long time, but it will accurately reestablish this vegetational type. Portions of this area will be needed for active use areas prior to the time that the oak savanna will reach maturity. In these area then we can perhaps introduce some slightly out of character plant materials that can be transplanted at a larger size then bur oak. Although bur oaks were the most prevalent tree species, black oak, white oak, shagbark hickory, pin oak, black cherry, etc. were present in Wisconsin oak openings, which are comparable to what existed here. By transplanting some of these alternative species, especially shagbark hickory, pin oak and black cherry, into the areas we can greatly excellerate the time necessary to create the shaded protected atmosphere desired for the contact station and campground areas. By interplanting these clumps of saplings with clumps of seedling bur oaks, the tree species composition will eventually reach a more natural balance.

1b. This area, while again in the proposed oak savanna, is adjacent to a newly developed section of Old Frontenac. These houses should be visually screened, or at least softened by vegetation along this edge. This vegetative screen should be composed of prairie edge plants. These would include bur oaks, hawthorn, sumac, red cedar, and shagbark hickory. These species should be planted in clumps or groupings.

2. Existing Vegetation: Old Field

Proposed Management: Reestablish and Maintain Prairie

These areas located on the bluff top were cloaked with a carpet of prairie plants and scattered oak trees when this area was first settled. Through the years the trees were cut down and the prairie plowed to make way for agricultural crops. As these areas were purchased by the state, most of them were allowed to return to an old field condition. The flat bluff tops will be managed to reestablish the prairie vegetation, while the slopes will be managed for hardwood vegetation (see Management Area 3). Most of the area should be burned in the early spring (April 15 - May 15). The prairie seed must be drilled in shortly after the fire. If enough thatch is available the following spring, the area should again be burned. A 3-4 year burning schedule should be implemented thereafter. When extra labor is available, non-seeded prairie forbes and grass should be transplanted from the prairie remnants into this reestablishment area in order to speed up their advance. If scattered clumps of bur oak seedlings appear they should be protected from fire for 10-15 years, at which time they should be able to withstand the heat of a grass fire and create clumps of shade scattered over the flat plain of the prairie.

3. Existing Vegetation: Old Field

Proposed Management: Northern Hardwoods

The valleys in the upland plateau have slightly different microclimatic conditions than the plateau itself. The north and east slopes are cooler and moister, while the exposed (those not protected by a nearby north or east slope) south and west slopes are warmer and drier. The north and east slopes and the unexposed south and west slopes should be allowed to succeed to pioneer hardwoods and then in time to a northern hardwoods type. Some scattered plantings of red oak, white oak, green ash, shagbark hickory, etc. can be implemented to speed up this succession process.

4. Existing Vegetation: Old Field

Proposed Management: Northern Hardwoods

As use increases north of Pleasant Valley Lakelet, it will be desirable to screen out the sound from, and view of, U.S. 61. The most important screening will be that closest to the highway. A dense planting of northern hardwoods, including green ash, basswood, red oak, red cedar, hawthorn, gray dogwood, sumac, etc., should be implemented.

5. Existing Vegetation: Old Field

Proposed Management: Establish Northern Hardwoods

This area includes the existing campground and picnic grounds. Many young trees have been planted with the campsites and around. These are beginning to provide some shade, although several more years of growth will be required before they can be of much benefit. Native fruit bearing shrubs (e.g., alpine currant, etc.) should be planted in these high use areas to provide some inter-site screening, wind deflection, and to increase the opportunity for seeing wildlife.

6. Existing Vegetation: Dry Prairie and Upland Brush

   Proposed Management: Maintain Dry Prairie

   These two dry ridges are presently vegetated with a variety of prairie grasses and forbes. By burning these areas every 3-4 years we can expect to maintain and increase the native population, which will provide a source of plants for transplanting into the restoration areas (Management Areas 1 and 2).

7. Existing Vegetation: Conifer Plantation

   Proposed Management: Remove and Replant With Native Species

   These two small clumps of mixed conifers are composed of species alien to this part of the state. Because this will be a natural state park, the integrity of the vegetational communities must be sought. The coniferous vegetation does add a desirable vegetational diversity for trail users. Therefore, portions of the existing trees will be cut and native white pine replanted. This will be done in three phases, spaced 15 years apart so that when the last one-third of the existing trees are cut down, the first phase will be thirty years old. By this method, the tree species will be changed with little visual disruption.

8. Existing Vegetation: Big Woods

Proposed Management: Maintain Openings

Four openings are currently provided which allow park visitors panoramic vistas of Lake Pepin and its surrounding bluffs. These openings should be maintained by removing the underbrush and any necessary tree limbs every two years, or as necessary.

9. Existing Vegetation: Oak Savanna

Proposed Management: Maintain Oak Savanna

This area should be burned with a "cool" ground fire every 3-4 years, or as necessary. This will maintain the prairie vegetation while discouraging non-oak tree species.

10. Existing Vegetation: Variable

Proposed Management: Passive

Minimal management except for wild fire suppression and the removal of potentially hazardous dead or dying trees along trails and other use areas.

VEGETATION MANAGEMENT

PROJECT	BIENNIUM					
Project	'78-'79	'80-'81	'82-'83	'84-'85	'86-'87	TOTAL
1. Reestablish and Maintain Oak Savanna	$ 2,000	$ 4,000	$ 3,000	$2,000	$2,000	$ 13,000
a. Transplanting	6,000	20,000	5,000			31,000
b. Transplanting	2,000	8,000				10,000
2. Reestablish and Maintain Prairie		4,000	3,000	2,000	2,000	11,000
3. Establish Northern Hardwoods		8,000				8,000
4. Plant Northern Hardwoods		10,000				10,000
4. Plant Northern Hardwoods		4,000	2,000			6,000
6. Maintain Dry Prairie		2,000	1,500	1,500	1,500	6,500
7. Remove and Replant With Native Species						
8. Maintain Openings		500	500	500	500	2,000
9. Maintain Oak Savanna		1,000	1,000	1,000	1,000	4,000
10. Passive	Minimal cost, do as part of ongoing maintenance					
TOTAL	$10,000	$61,500	$16,000	$7,000	$7,000	$101,500

WILDLIFE MANAGEMENT

Introduction

Encounters with wildlife in state parks provide many highlights for park visitors each year. Certain management techniques can be implemented which provide greater opportunities for such experiences. It may also be necessary to use special wildlife management techniques in areas where public use and wildlife activities conflict. For example, these may include areas where raccoons are upsetting garbage cans in and around picnic grounds; where there is over-browsing in a deer yard; or, where beaver are obstructing culverts, flooding roads or causing other property damage. Wildlife management must address such concerns. It is the intent of this section to deal with specific problems which might arise in the course of overall park management.

Wildlife management in state parks will be directed toward providing opportunities for visitors to observe wildlife and to learn more about their habits and habitat. Wildlife populations will not be managed for sustained maximum productivity, but rather for sustained maximum species diversity. Management will proceed in a manner which is compatible with existing and planned vegetation types in and around a given park.

Harvest of animal populatins will be viewed as a management tool rather than as a sport, and will be utilized only when wildlife populations adversely affect the resources of a park or threaten the health and safety of park visitors. Wherever feasible, management will attempt to reintroduce species which are not presently found in the vicinity of a park, but which inhabited the area prior to white settlement.

Any decision regarding reintroduction of a species must also consider such factors as park size and available habitat. Potential conflicts between park users and area residents must also be considered. Initially, the wildlife management plan addresses itself to the correction of those circumstances which require immediate attention. Other recommendations, more general in nature, regard such factors as changes in plant community ages and species diversity over longer periods of time.

Frontenac with its vegetational and surficial hydrology variation provides good habitat for a variety of birds, mammals, reptiles and amphibians.

Frontenac is visited by many "birders," who come primarily to search out and view the bird species that are seasonal residents as well as those who migrate along the Mississippi. Park visitors who come for other reasons are often rewarded by sitings of a variety of species from the graceful soaring flight of bald eagles to the flitting flight of warblers. Although many species of reptiles and anphibians are found within the park, of most interest to the average visitor is the rattlesnake. Rattlesnakes are found within the park; they are not, however, very numerous.

Certain wildlife species occurring within a park are especially noteworthy because special precautions are required in their management or protection or because they have the potential for creating damage to vegetation, and property or harming park visitors. These wildlife species and the potential problems are discussed in the following paragraphs.

Endangered, Threatened or Rare Species

Species within this group include those presently in danger of extinction in Minnesota within the immediate future, those which could become endangered in the foreseeable future in Minnesota but not necessarily throughout their entire range, or those that once resided in Minnesota but have been entirpated (driven out), or nearly so, because of changes in land and water use patterns.

Birds

Seasonal Residents	Migrants
None indicated	None indicated

Mammals

None indicated

Reptiles and Amphibian

None indicated

Species of Special Interest

Species within this group are uncommon or locallky 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
Double-crested cormorant	None indicated
Bald Eagle	
Great Egret	
Osprey	

Mammals

None indicated

Reptiles and Amphibians

Red-backed salamander
Snapping turtle
Blanding's turtle
False map turtle
Wood turtle
Rattlesnakes

Troublesome Species

Troublesome species include wildlife which as individuals or populations might become nuisances to either the natural resources of a park, park property or park visitors.

Birds

Species	Potential Problems
None indicated	

Mammals

Species	Potential Problems
White Tailed Deer	Overbrowsing vegetation
Beaver	Overutilization of vegetation and trout stream damming
Raccoon	Raiding garbage cans

Reptiles and Amphibians

Species	Potential Problems
Timber rattle snake	Hazard to park visitors

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

Sensitivity to Humans

Species are those which are unusually sensitive to disturbance by human activity. Disturbance during one season or another may result in nest or den abandonment, change 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 effects over a much larger area.

Birds

None indicated

Mammals

Red fox
Gray fox

Reptiles and Amphibians

None indicated

Source of Information:

Minnesota Department of Natural Resources, The Uncommon Ones, (10-75-10M), St. Paul; Bureau of Information and Education, 1975.

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 trained observer.

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

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

Winter Visitant - Normally found in the park area only during the winter months.

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							SEASONAL OCCURRENCE				
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	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								SEASONAL OCCURRENCE				
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	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								SEASONAL OCCURRENCE				
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	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							SEASONAL OCCURRENCE				
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	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							SEASONAL OCCURRENCE				
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	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-brested 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							SEASONAL OCCURRENCE				
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN
●	Indigo Bunting								o	o			
●	Dickcissel									o			
	Evening Grosbeak												
	Purple Finch												
	Pine Grosbeak												
	Hoary Redpoll												
●	Common Redpoll										o		
	Pine Siskin												
●	American Goldfinch								o	o			
	Red Crossbill												
	White-winged Crossbill												
●	Rufous-sided Towhee									o			
	Lark Bunting												
●	Savannah Sparrow								o	o			
●	Grasshopper Sparrow								o	o			
	Henslow's Sparrow								o	o			
	Le Conte's Sparrow												
	Sharp-tailed Sparrow												
●	Vesper Sparrow								o	o			
	Lark Sparrow												
	Dark-eyed Junco												
	Tree Sparrow												
●	Chipping Sparrow								o	o			
●	Clay-colored Sparrow								o	o			
●	Field Sparrow									o			
●	Harris' Sparrow												
●	White-crowned Sparrow									o			
●	White-throated Sparrow									o			
●	Fox Sparrow									o			
●	Lincoln's Sparrow									o			
●	Swamp Sparrow								o	o			
●	Song Sparrow								o	o			
	Lapland Longspur												
	Smith's Longspur												
	Chestnut-collared Longspur												
	Snow Bunting												
●	Little Blue Heron												

FOUND IN PARK	SPECIES	RELATIVE ABUNDANCE								SEASONAL OCCURRENCE				
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN	
●	Opossum			●										
●	Eastern Mole			●										
●	Star-nose Mole			●										
●	Cinerous 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		●											
●	Southern 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						SEASONAL OCCURRENCE					
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	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							SEASONAL OCCURRENCE					
		ABUNDANT	COMMON	UNCOMMON	RARE	ENDANGERED	UNKNOWN	PERMANENT RESIDENT	SUMMER RESIDENT	MIGRANT	WINTER VISITANT	SEASONALLY INACTIVE	UNCERTAIN	
●	Common Snapping Turtle		o											
●	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			o										
●	Northern Water Snake		o											
●	Eastern Plains Garter Snake		o											
●	Eastern Garter Snake		o											
	Red Sided Garter Snake													
	Plains Hognose Snake													
●	Eastern Hognose Snake			o										
●	Blue Racer			o										
	Eastern Smooth Green Snake													
	Western Smooth Green Snake													
●	Bullsnake		o											
●	Western Fox Snake			o										
	Black Rat Snake													
●	Eastern Milk Snake			o										
	Eastern Massasauga													
●	Timber Rattlesnake				o									
●	Mudpuppy			o										
●	Central Newt			o										
	Jefferson Salamander													
●	Eastern Tiger Salamander			o										
	Gray Tiger Salamander													
	Red-backed Salamander													
	Dakota Toad													
●	American Toad		o											
	Great Plains Toad													
●	Northern Spring Peeper		o											
●	Eastern Gray Treefrog			o										
	Blanchard's Cricket Frog													
	Boreal Chorus Frog													
	Western Chorus Frog													
	Pickerel Frog													
	Mink Frog													
●	Northern Leopard Frog		o											
	Green Frog													
●	Wood Frog			o										
	Smooth Softshell Turtle													
	Red bellied Snake													
	Blue Spotted Salamander													

Development has been sensitive to wildlife considerations within the park. For instance, the development on Point au Sable has been deliberately low key in order to disturb the wildlife habitat as little as possible while providing access to the resources of the area for park users. The trail itself will have an interpretive component which will focus on the wildlife of the area.

The alignment of the entrance road off U.S. 61 along the Wells Creek dredge spoils has been proposed in order to take maximum advantage of a previously disturbed area (see page 103). Prior to its development a detailed feasibility study will be completed by the DNR's Bureau of Engineering. Input from a wildlife biologist has been specifically requested.

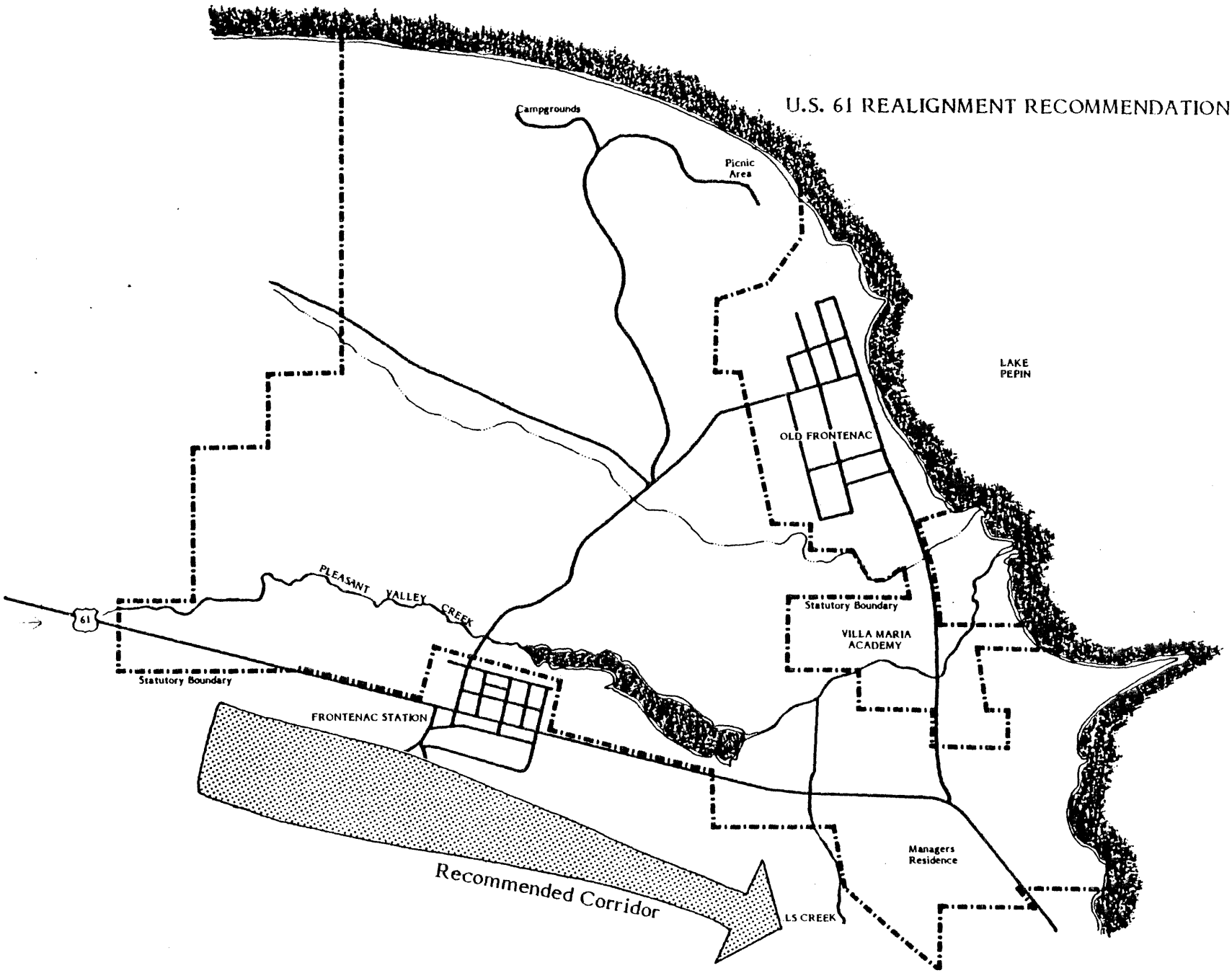
Planting of fruit bearing shrubs has been called for to partially increase user contact with wildlife populations.

The Proposed Campground #2 will enjoy good views of Pleasant Valley Lakelet. Loafing logs should be strategically placed so as to provide viewing spots for the lakes turtles.

In general, wildlife habitats within the park will be enhanced by bringing the prairie areas back to their pre-settlement condition and thereby maintaining and expanding the amount of prairie forest edge conditions. This edge is a desirable habitat for a variety of wildlife species. Creation, maintenance, and expansion of the oak savannas will increase production of acorns, a prime food for deer, squirrels and others.

REALIGNMENT OF U.S. 61

If U.S. 61 is upgraded in future years to a four lane highway, it is recommended that the road be reconstructed to the south and west of the railroad tracks it now parallels. This (see U.S. 61 Realignment Recommendation, page 84) will minimize the visual and auditory disturbance to the park, eliminate the risk of destruction of historic and prehistoric artifacts known to exist in the Point au Sable area, minimize the risk of personal injury to park users, and permit greater utilization and appreciation of Pleasant Valley Lakelet and the area around the existing manager's residence.


U.S. 61 REALIGNMENT RECOMMENDATION
Campgrounds
Picnic Area
LAKE PEPIN
OLD FRONTENAC
PLEASANT VALLEY CREEK
61
Statutory Boundary
VILLA MARIA ACADEMY
Statutory Boundary
FRONTENAC STATION
Managers Residence
Recommended Corridor
LS CREEK

RECREATION MANAGEMENT

Introduction

Careful consideration must be given to future needs of the park user public. 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 discernable, but estimations of the time period over which this demand develops and magnitude are 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. However, this data is not (nor can it be) sensitive to any unpredicted technological discoveries or political events. For instance, no one could predict the oil embargo which created an "energy crisis" overnight. This development and its varifications, have had a direct impact upon travel patterns.

There are two basic aspects of recreation demand. The first involves the measurement of the amount and kind of recreation opportunities/facilities which the public desires (e.g., the size of the park or the number of campsites). The second aspect involves the estimation of latent demand for recreation opportunities/facilities which people would participate, given ample opportunity and adequate conditions (e.g., the number of handicapped accessible campsites if the architectural barriers to their use within a given park were removed).

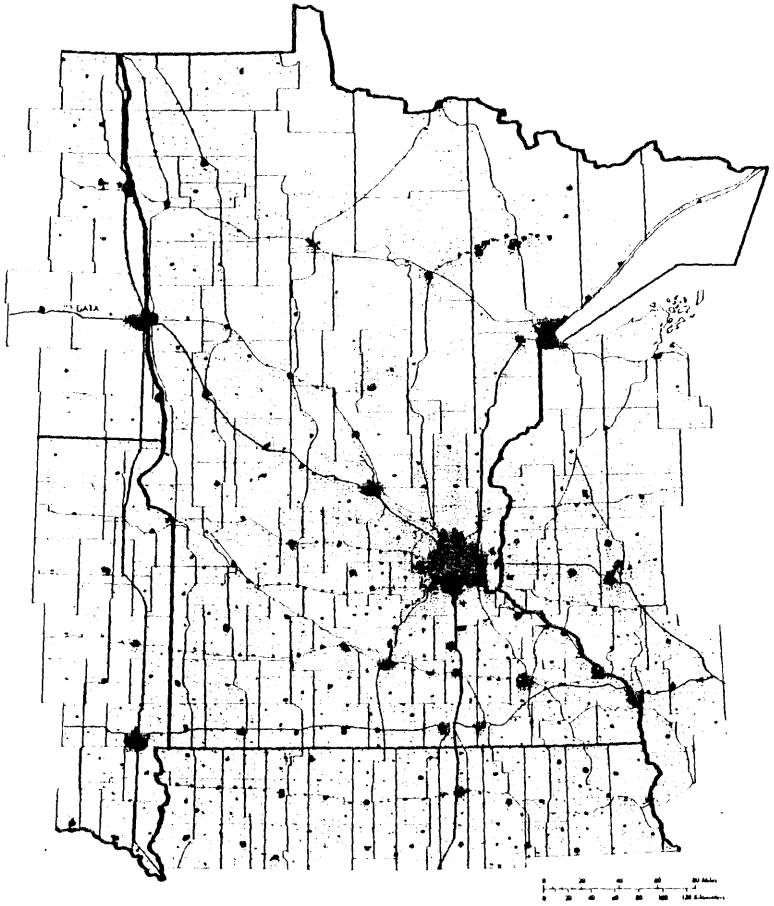
Statewide Analysis

Minnesota's population in 1970 was 3,805,000. The Population Distribution Map (page 81) indicates distribution of residents throughout the State in that year. Of course, the heaviest concentration occurred in the Twin Cities, and surrounding area. Other important urban centers included Duluth-Superior, Fargo-Moorhead, Rochester, St. Cloud and Austin-Albert Lea.

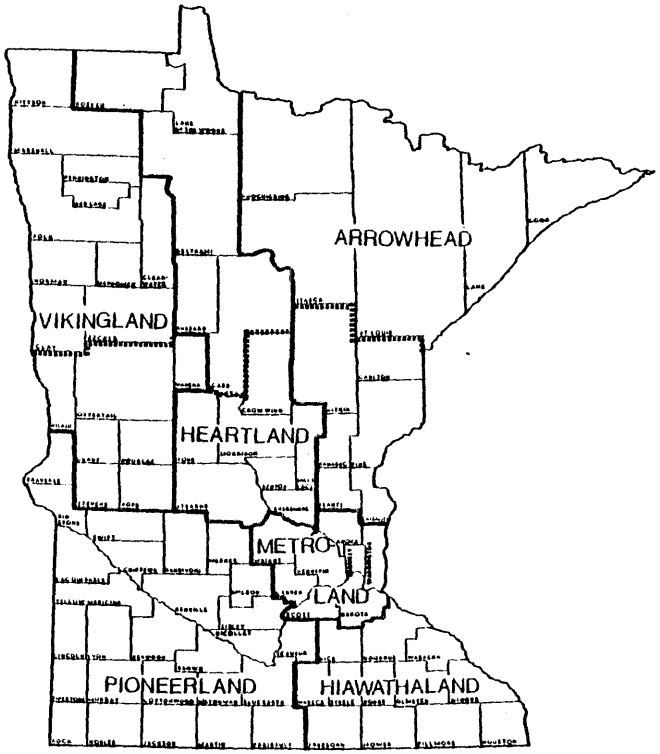
Minnesota covers approximately 84,000 square miles, of which nearly 4,000 square miles is water. More than 12,000 lakes of ten acres or more in size are scattered across the landscape; thousands of miles of rivers and streams wind through the State; approximately 19 million acres of land are forested. These waters and forests, coupled with a varied climate and abundant wildlife, form a unique resource base providing outstanding recreational opportunities.

Not all of Minnesota is appreciated the same way. For instance, one person might prefer a forest experience over one of the prairie or vice versa. One thing is clear: when a significant portion of the population identifies an area as a vacation destination, it is probably a result of a complex process of positive reinforcement between lodging facilities, natural resources, and other supporting business. It would appear that those areas offering the greatest diversity of opportunities receive the greatest demand.

The Department of Economic Development (DED) has divided the State into six tourism regions: Arrowhead, Heartland, Metroland, Hiawathaland, Pioneerland, and Vikingland (See Tourism Regions Map, page 81). The number of lodges and motels within a given area are an important indicator of its attractiveness. The rank order of the regions based upon total overnite lodging capacity is as follows: Heartland (46,993), Metroland (39,768), Arrowhead (36,054), Vikingland (25,959), Hiawathaland (13,680), and Pioneerland (12,216). When this capacity is compared on a per capita basis, their rank order changes dramatically; Heartland (15.5%), Arrowhead (9.2%), Vikingland (9.0%), Hiawathaland (3.4%), Pioneerland (2.3%), and finally Metroland (2.0%), (Minnesota's Lodging Summary, page). One must remember that sub-regions within any one of these may score high in attractiveness but that this is diluted when the entire region is considered.



POPULATION DISTRIBUTION MAP



TOURISIM REGIONS

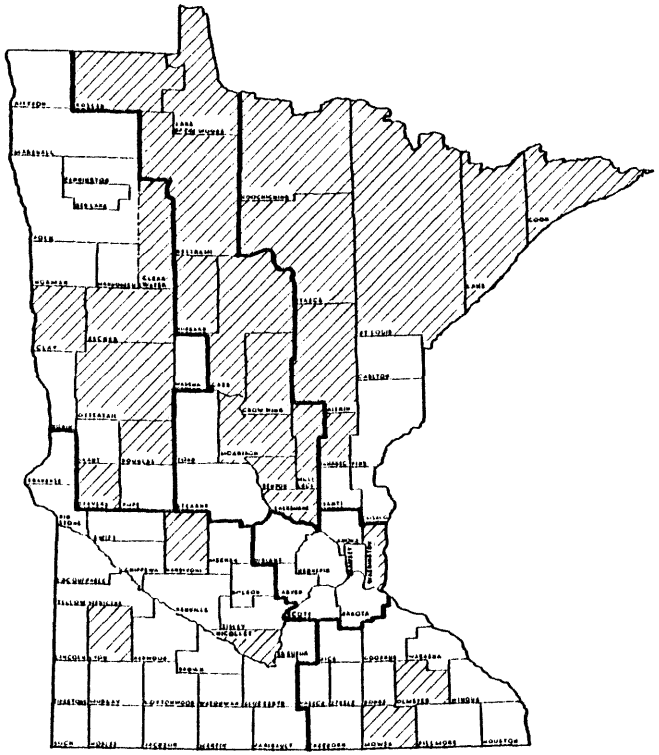
Another measure of regional attractiveness is tourist travel expenditures. Using sales and use as data, the Department of Economic Development has estimated that $996,000,000 was spent within Minnesota in tourism related activities in 1974. Although there are some exceptions (notably Olmsted and Mower Counties), counties having in excess of $10,000,000 of tourist-travel expenditures occurred in the northern two-thirds of the State. Tourism-Travel Maps (see page 89) point out these counties with expenditures as a percent of county gross sales above the State average. Both measurements, lodging units per capita and tourist-travel expenditures, indicate heavy recreational use in the northern portion of the state.

Many of the facts and figures, such as those cited above, were "brought down to reality" in a 1974 opinion survey of residents within the 10 county Twin City area conducted by the Minneapolis Star and Tribune. Results showed that for the Twin City residents[1] the northern half of the Arrowhead region, which includes the counties of St. Louis, Itasca, Koochiching, Lake and Cook, is the most popular vacation area. Thirty-eight per cent of those planning a week or more of vacation in Minnesota and 39% of those planning a vacation of less than a week in the State said they planned to vacation in that area. Second in popularity for planned vacations in 1974 was the southern Heartland region (Crow Wing, Mille Lacs, Sherburne, Benton, Stearns, Morrison and Todd Counties). Twenty-five percent of both those planning "long" or "short" vacations said they would vacation in southern Heartland.

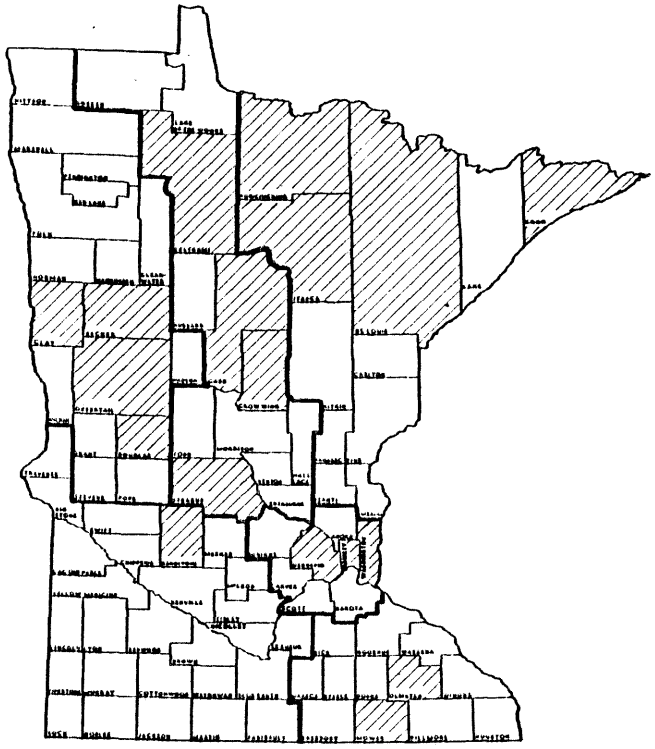
Planned Destination	Percent of Those Planning a Vacation of or longer	Percent of Those Planning a Vacation of One Week
North Arrowhead	38%	39%
South Arrowhead	6%	7%
North Heartland	11%	9%
South Heartland	25%	25%
North Vikingland	6%	4%
South Vikingland	7%	9%
Pioneerland	4%	8%
Hiawathaland	3%	8%
Metroland	2%	3%
Don't know/undecided	6%	12%
	108%*	125%*

*Does not total 100% because some respondents named more than one area.

[1]Because this survey was conducted within the Twin Cities, travel perference data for Metroland as a destination is, of course, distorted.



Minnesota Counties with Tourist-Travel Expenditures as Percent of County Gross Sales above State Average.



Minnesota Counties with Estimated Tourist-Travel Expenditures of $10,000,000 and Over in 1974

MINNESOTA'S LODGING INDUSTRY[1]

	Population 1970	Estimated Lodging Capacity	Lodging Capacity Population (approximate %)
Arrowhead			
Aitkin	11,403	3,140	18.8
Carlton	28,072	702	2.5
Chisago	17,492	607	3.5
Cook	3,423	3,773	110.2
Isanti	16,560	291	1.8
Itasca	35,530	7,250	20.4
Kanabec	9,775	360	3.7
Koochiching	17,131	1,716	1.2
Lake	13,351	3,330	83.5
Pine	16,821	520	3.1
St. Louis	220,693	14,365	65.0
Arrowhead Sub-Total	390,251	36,054	9.2
Heartland			
Beltrami	26,373	5,458	20.7
Benton	20,841	399	1.9
Cass	17,323	13,964	80.6
Crow Wing	34,826	11,903	34.2
Hubbard	10,583	6,405	60.5
Lake of the Woods	3,987	1,604	12.0
Mille Lacs	15,703	2,052	13.1
Morrison	26,949	848	3.3
Roseau	11,569	255	2.2
Sherburne	18,344	492	2.7
Stearns	95,400	2,009	2.1
Todd	22,114	1,604	7.3
Heartland Sub-Total	304,012	46,993	15.5

Hiawathaland			
Dodge	13,037	106	.8
Fillmore	21,916	334	1.5
Freeborn	38,064	535	1.4
Goodhue	34,763	541	1.6
Houston	17,556	276	1.6
Mower	43,783	1,071	2.4
Olmsted	84,104	8,018	9.5
Rice	41,582	876	2.1
Steele	26,931	311	1.2
Wabasha	17,224	417	2.4
Waseca	16,663	139	.8
Winona	44,409	1,056	2.4
Hiawatha Sub-Total	400,032	13,680	3.4
Metro			
Anoka	154,556	618	.4
Carver	28,310	193	.7
Dakota	139,808	1,243	.9
Hennepin	960,080	27,592	2.9
Ramsey	476,255	7,681	1.6
Scott	32,423	144	.4
Washington	82,948	1,418	1.7
Wright	38,933	879	2.3
Metro Sub-Total	1,913,313	39,768	2.0

Pioneerland			
Big Stone	7,941	474	6.0
Blue Earth	52,322	739	1.4
Brown	28,887	453	1.6
Chippewa	15,109	584	3.9
Cottonwood	14,887	253	1.7
Faribault	20,896	297	1.4
Jackson	14,352	252	1.8
Kandiyohi	30,548	1,685	5.5
Lincoln	8,143	480	5.9
Lyon	24,273	481	2.0
Lac Qui Parle	11,164	135	1.2
Martin	24,316	543	2.2
Meeker	18,810	526	2.8
McLeod	27,662	434	1.6
Murray	12,508	115	.9
Nicollet	24,518	576	2.3
Nobles	23,208	1,231	5.3
Le Sueur	21,332	823	3.9
Pipestone	12,791	235	1.8
Redwood	20,024	301	5.6
Renville	21,139	291	1.4
Rock	11,346	99	.9
Sibley	15.845	221	1.4
Swift	13,177	292	2.2
Traverse	6,254	165	2.6
Yellow Medicine	14,418	291	2.0
Watonwan	13,298	240	1.8
Pioneerland Sub-Total	509,168	12,216	2.3

Vikingland			
Becker	24,372	5,515	22.6
Clay	46,585	1,140	2.4
Clearwater	8,013	263	3.3
Douglas	22,892	6,060	26.5
Grant	7,462	215	2.9
Kittson	6,853	212	25.0
Ottertail	46,097	8,845	18.4
Pope	11,107	855	7.7
Polk	34,435	807	2.3
Mahnomen	5,638	359	6.4
Marshall	13,060	103	.8
Norman	10,008	271	2.7
Red Lake	5,388	20	.1
Stevens	11,218	321	2.9
Pennington	13,266	390	3.0
Wadena	12,412	331	2.7
Wilkin	9,389	252	2.7
Vikingland Sub-Total	288,195	25,959	9.0
Grand Total	3,804,971	174,670	4.6

[1] Included motels, hotels, and lodges.

(Based upon and derived from Lodging Industry Data for Minnesota Counties, University of Minnesota, February 1976.)

REGIONAL DEMAND

As can be seen from the Statewide Recreation Demand Inventory, Frontenac is not currently in a prime tourism region. However, there are some reasons to believe that this unit will receive additional pressure in the future. For instance, the "energy crisis" has underscored the importance of locating recreation facilities where they are accessible to large numbers of people. The park is within ten miles of Red Wing and 50 miles of the Twin Cities. Lake Pepin is becoming more recreationally attractive: by 1987, completed improvements to the sewage systems of Red Wing and the Twin Cities should result in a significant improvement in the lake's water quality.

The Statewide Comprehensive Outdoor Recreation Plan (SCORP) of 1974 has identified considerable deficiencies in outdoor recreation opportunities within the region that the park resides. Opportunities for camping, picnicking, swimming, hiking and snowmobiling are judged deficient currently and estimated to increase in the future for Region 10, which includes Dodge, Fillmore, Freeborn, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha and Winona Counties. Although it is not the intent of the state to provide for the total recreation needs for Minnesota, the DNR is committed to assist where possible the private sector and local units of government in fulfilling these needs.

Frontenac is located in the stream-dissected area of the State which contains elements of native prairie vegetation, hardwood forests, trout streams, as well as bluffs and valleys. Furthermore, because it was one of the first settled areas within Minnesota and because latter developments within the State occurred primarily in the fertile farm lands to the west and industrial areas to the north, some pioneer developments still remain relatively unnoticed to this day. This combination of accessibility and attractiveness puts the region and the park in an enviable tourism potential position.

Already there are signs of development. For instance, both Mower and Olmsted counties are among the top ten counties within the State for total tourist-travel expenditures in 1974, and high investment on the part of the private sector for lodging facilities has also been documented. Although the draw of the Mayo Clinic has a considerable effect upon this data, still it points towards further appreciation of the area. Frontenac resides within Goodhue County; in 1974 it was estimated by the Department of Economic Development that $4,804,827 was spent on tourism travel there.

Use of State parks within Hiawathaland appears to be on the increase. Overall the 11 state parks found there registered 33.7% increase in attendance during the first nine months of 1976 over 1975. It should be pointed out though, much of this increase is a result of a flood free year in Whitewater. Over the years Frontenac has experienced slight but steady increase of demand on its resources.

Assuming that the stream dissected area acts as a total recreation package with many of the parks having similar potentials, the parks found there must act together in such a way to eliminate duplication and maximize the range of experiences available to the user.

REGIONAL PARK ATTENDANCE SUMMARY

NINE MONTH TOTALS

JANUARY-SEPTEMBER

STATE PARK	1974	1975	1976
Beaver Creek	15,186	15,512	15,504
Carley	6,214	12,400	11,860
Forestville	38,530	41,902	46,764
Frontenac	60,121	46,980	62,036
Helmer Myre	92,080	107,411	104,847
John Latsch	3,488	2,768	2,593
Lake Louis	17,022	23,017	28,584
Nerstrand Woods	52,293	64,532	49,020
Rice Lake	24,061	38,387	51,562
Sakatah	36,963	41,841	39,911
Whitewater	108,737*	103,642*	253,668*
REGION TOTALS	454,695	498,392	666,349
PERCENT CHANGE		+9.6	+33.7

*Flood curtailed some use.

One component of this diversity is the "needs" which each will hopefully fulfill. Needs may be considered motivational forces. When a person "needs" food, he will search for it; if a person "needs" shelter, his behavior will be directed toward obtaining it. When dealing with personal needs such as solitude, or achievement there is no "right" or "wrong". Everyone has a slightly different way of looking at their surrounding environment.

Following the example of the U.S. Forest Service a Need Fulfillment Matrix (page) has been developed for parks within the region as well as the Whitewater Management Area. Although it is recognized that other recreation facilities should eventually be added to this system (e.g., Richard Dorer Memorial Hardwood Forest, DNR Corridor Trail System, U.S. Fish and Wildlife lands, etc.) the scope of this study would not permit it at this time. This system is somewhat rough but as a broad statement of park development direction it does have utility. The needs considered include: solitude or the need to be apart from others; achievement or the need to accomplish or master difficult tasks; autonomy or the need to be independent and free; aesthetics or the need for beauty; security or the need for a sense of well being; orientation or the need for a consistant and stable way of perceiving and comprehending one's surroundings; and affiliation or the need to belong.

The Regional Need Fulfillment Matrix shows parks within the stream dissected area, what needs they are presently fulfilling and what needs they may fulfill in the future. Frontenac at present, is rated low in solitude, autonomy, and affiliation; medium in aesthetics, security and orientation; and high in achievement. Future managemetn will be directed at increasing the solitude and autonomy and aesthetics within the park by increasing the user opportunities to observe the natural features and wildlife within the park and by vegetatively screening out much of T.H. 61 and Frontenac. By expanding the trail system into new areas, the user will have a greater opportunity to experience and satisfy his (her) particular desires.

The Regional Activities Summary (page) describes the present potential and future development tentatively planned for the park. As can be seen, few units provide access to water. Therefore, every effort will be made to maximize potential water contact for park users. Of the state parks along the Mississippi River in this region (John Latsch, O.L. Kipp and Frontenac) only Frontenac has good terrain for cross-country use. Both O.L. Kipp and John Latsch have such extreme topographic relief that cross-country skiing would be difficult as well as dangerous.

LEGISLATIVE DEVELOPMENT RESTRICTIONS

When Frontenac was established as a state park in 1957 development restrictions were written into its enabling legislation:

> These lands as acquired shall be dedicated as a state park to be known as "Frontenac State Park" under the supervision and control of the commissioner of conservation as provided for other state parks and shall be for the perpetual use of the people of the state and to be administered in the same manner as provided for other state parks except that the future development of following described portions of the park shall be limited to the preservation of the present natural feature of the area as a wild life and bird sanctuary. Any development shall not exceed the laying out and cleaning of footpaths. No commercial venture, concession stands or permanent structures shall be permitted in the area.

In addition a corridor was delineated in which the entrance road was to be located.

NEED FULFILLMENT MATRIX

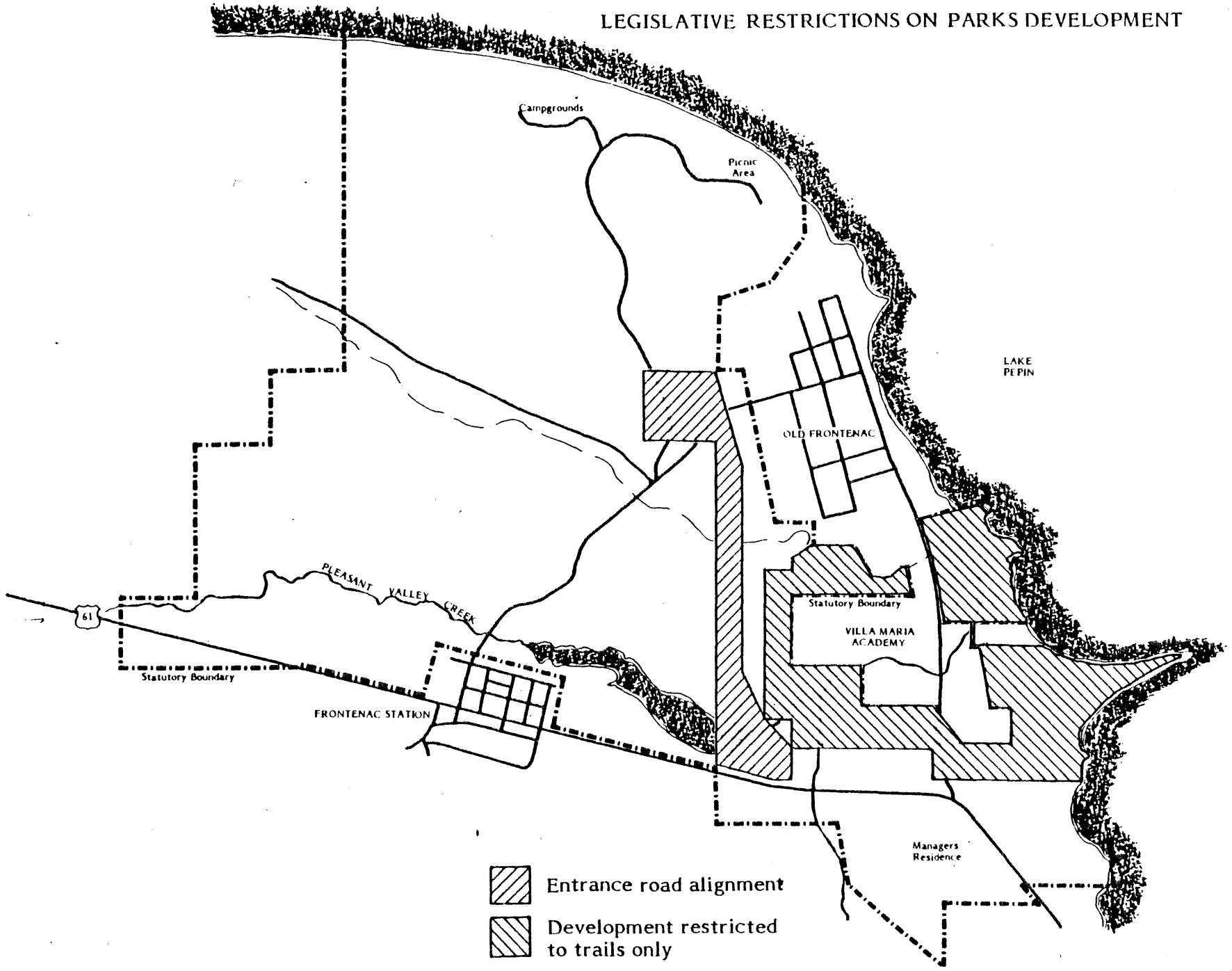
Needs Fulfilled	O.L. Kipp	John Latsch	Whitewater State Park	Whitewater Wildlife Management Area	Forestville	Carley	Frontenac	Beaver Creek
Solitude								
Present Potential	High	High	Low	High	Medium	Medium	Low	Medium
Future Development Direction	Medium	High	Low	High	Medium	Medium	Medium	Medium
Achievement								
Present Potential	High	High	Medium	High	Medium	Low	High	Medium
Future Development Direction	Medium	High	Medium	High	High	Medium	High	Low
Autonomy								
Present Potential	Low	High	Low	High	Medium	Medium	Low	Medium
Future Development Direction	Medium	High	Low	High	High	Medium	Medium	Medium
Aesthetics								
Present Potential	High	High	High	High	High	Medium	Medium	High
Future Development Direction	High	High	High	High	High	Medium	High	High
Security								
Present Potential	Low	Low	Medium	Low	High	High	Medium	High
Future Development Direction	Medium	Low	Medium	Low	Medium	High	Medium	Medium
Orientation								
Present Potential	Low	Low	Medium	Low	Medium	High	Medium	High
Future Development Direction	Medium	Low	Medium	Low	Medium	High	Medium	Medium
Affiliation								
Present Potential	Low	Low	High	Low	Medium	Low	Low	Medium
Future Development Direction	Medium	Low	High	Low	Medium	Low	Low	Medium

9 to A

REGIONAL ACTIVITIES SUMMARY

	Camping					Water				Trails								
	River	Backpack	Rustic	Semi-Mod	Group	Swimming	Fishing	Boating	Canoe	Hiking	Equestrian	Bicycle	Snowmobile	Cross-Country	Auto - Sight Seeing	Handicap Access	Picnicking	Interp. Centers
O. L. Kipp																		
Present Potential	L	H	H	M	M	L	L	L	L	H	L	L	M	L	L	M	L	L
Future Development				X						X			X			X		X
John Latsch																		
Present Potential	M	H	M	L	L	L	M	M	L	H	M	L	M	M	L	L	H	L
Future Development	X	X					X	X		X							X	
Whitewater State Park																		
Present Potential	L	M	M	H	H	M	H	L	L	H	L	M	M	M	L	M	H	L
Future Development		X		X	X	X	X			X		X		X		X	X	X
Forestville																		
Present Potential	L	M	H	H	M	L	H	L	L	H	H	M	H	H	L	H	L	L
Future Development				X	X		X			X	X		X	X		X		X
Carley																		
Present Potential	L	M	H	L	L	L	H	L	L	M	L	M	L	L	L	M	L	L
Future Development			X				X			X		X				X		X
Frontenac																		
Present Potential	M	L	M	H	H	L	M	M	L	H	H	M	H	L	L	M	H	L
Future Development				X	X	X	X	X		X	X	X	X	X		X	X	X
Beaver Creek																		
Present Potential	L	L	H	M	L	L	H	L	L	M	L	L	L	L	L	M	M	L
Future Development			X				X			X						X	X	

9 to P


LEGISLATIVE RESTRICTIONS ON PARKS DEVELOPMENT
Campgrounds
Picnic Area
LAKE PEPIN
OLD FRONTENAC
Statutory Boundary
VILLA MARIA ACADEMY
PLEASANT VALLEY CREEK
61
Statutory Boundary
FRONTENAC STATION
Managers Residence
Entrance road alignment
Development restricted to trails only

From all accounts, these restrictions were aimed at a proposal of the time to develop a marina on Point au Sable. This development was seen as incompatible with the natural character of land, especially in such close proximity to the Villa Maria Girls' Academy (you will notice that the "restricted zone" surrounded this institution.)

Since that time, as a result of lightning, one of the Villa Maria buildings was destroyed and the Academy closed permanently. In addition Pleasant Valley Lakelet has increased in size so that the entrance road corridor now goes through this water body.

Restrictions of this kind may have some utility in the short run of the park, but as conditions change the inflexibility can do a dis-service to the park. Because of its prehistoric, historic, geologic, and wildlife resources, Point au Sable has considerable potential for interpretation. In addition the sand beach on the point provides a quality swimming potential on Lake Pepin.

The Outdoor Recreation Act of 1975 was passed so that each park unit might have a comprehensive long range management plan. In order to develop the park into a first class unit, one which ties the three levels of the park together, it is necessary to have these restrictions lifted. This park qualifies as a state park only if the seperate portions can be bound together. It is recommended that no development occur until these restrictions are legislatively removed.

DEVELOPMENT

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 insuring the least damage to park values. To the higest 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 raods 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.

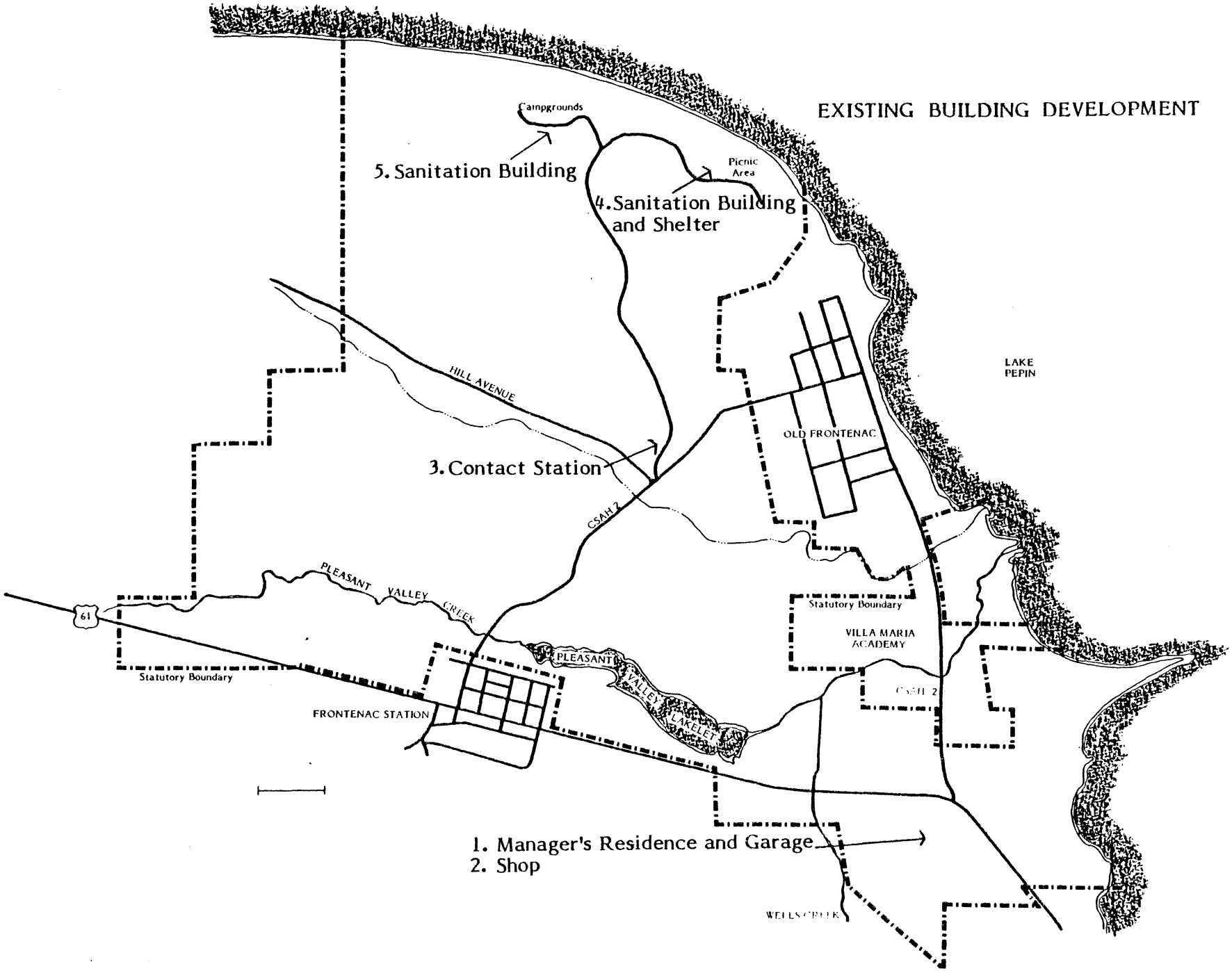
Such appropriate facilities, if wisely located, designed and constructed, can serve to protect park values by focusing and directing the uses of the park. For example, a road, a trail, or a formal campground can serve to channel use within specifically designated locations, thus preventing indiscriminate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

It is DNR policy to provide recreational opportunities for all people within the state. However, extreme topographic relief in some units precludes extensive use by the handicapped. For instance, to provide trails in such terrain which are accessible to the handicapped, it may require such an extensive system of "switch-backs" and hard surfacing that the natural "atmostphere" for which the unit was established is destroyed. Therefore, the DNR will concentrate its efforts upon providing accessibility in those parks which have the most potential for utilization by the handicapped. Keeping in mind the ideal of providing recreational opportunities for all individuals, a systematic approach will be followed in selected units to remove barriers to use and enjoyment by handicapped park visitors.

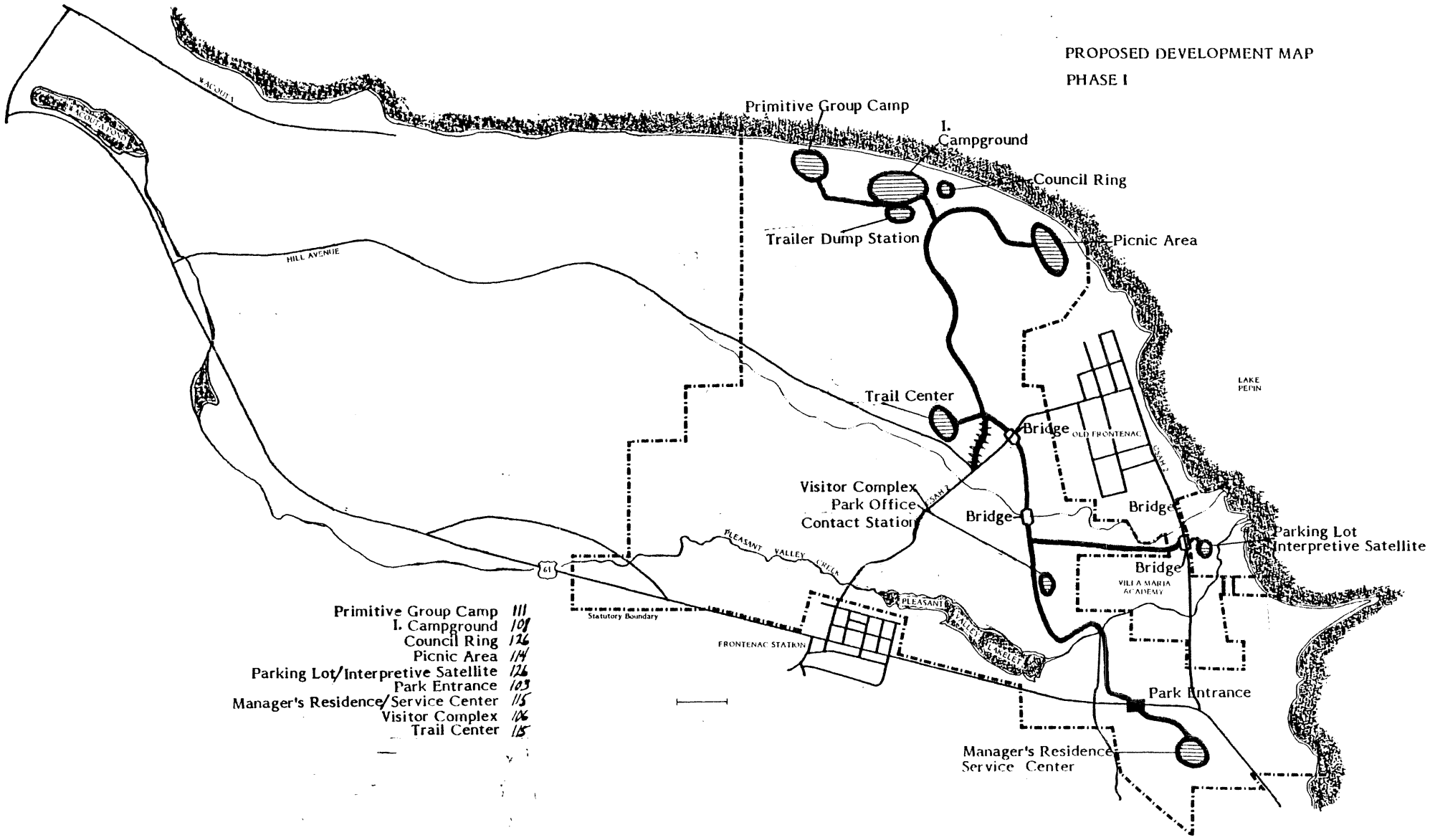
SUMMARY OF BUILDINGS WITHIN FRONTENAC STATE PARK

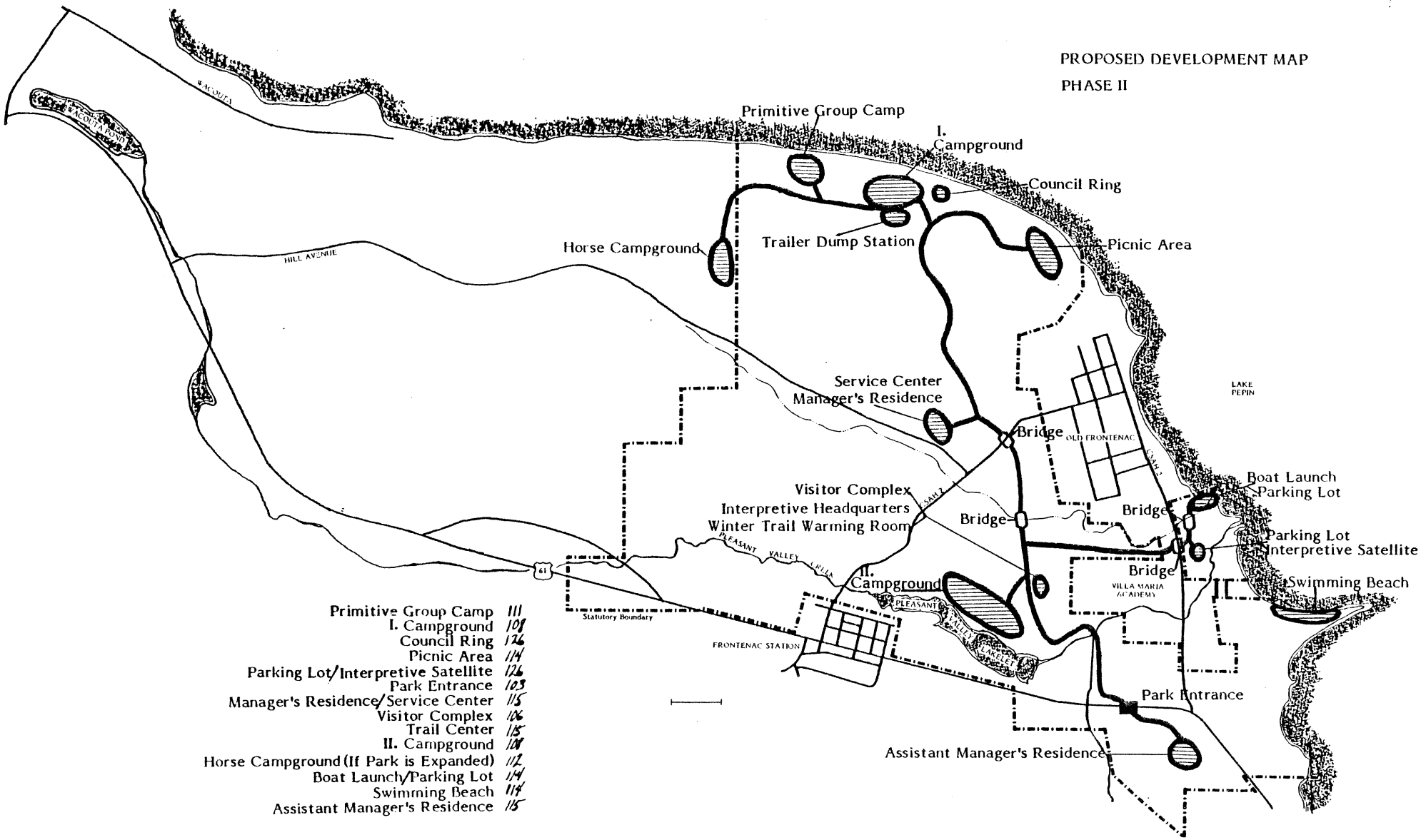
Map Key	Building Description	Outside Dimension	Construction	Date Built	Condition of Building*
1	Residence and Garage	24' x 30' 28' x 64'	Stone and Wood	1910	Fair
2	Shop	30' x 40'	Metal	1964	Good
3	Contact Station	10' x 14'	Wood	1974	Good
4	Sanitation Building & Shelter (Picnic Area)	22' x 50'	Wood	1965	Good
5	Sanitation Building (Campground)	28' x 38'	Wood	1965	Good

*As rated by Orville Stensgard, Building Maintenance Supervisor, DNR, as of 9/74.


EXISTING BUILDING DEVELOPMENT
Campgrounds
5. Sanitation Building
Picnic Area
4. Sanitation Building and Shelter
HILL AVENUE
3. Contact Station
CSAH 2
LAKE PEPIN
OLD FRONTENAC
PLEASANT VALLEY CREEK
61
Statutory Boundary
VILLA MARIA ACADEMY
PLEASANT VALLEY LAKELET
FRONTENAC STATION
1. Manager's Residence and Garage
2. Shop
WELLS CREEK

100


PROPOSED DEVELOPMENT MAP
PHASE I
Primitive Group Camp
I. Campground
Council Ring
Trailer Dump Station
Picnic Area
HILL AVENUE
Trail Center
Bridge
OLD FRONTENAC
LAKE PEPIN
Visitor Complex
Park Office
Contact Station
Bridge
Bridge
Parking Lot
Interpretive Satellite
Bridge
VILLA MARIA ACADEMY
PLEASANT VALLEY CREEK
Statutory Boundary
FRONTENAC STATION
Park Entrance
Manager's Residence
Service Center
Primitive Group Camp 111
I. Campground 109
Council Ring 126
Picnic Area 114
Parking Lot/Interpretive Satellite 126
Park Entrance 103
Manager's Residence/Service Center 115
Visitor Complex 106
Trail Center 115


PROPOSED DEVELOPMENT MAP
PHASE II
Primitive Group Camp
I. Campground
Council Ring
Trailer Dump Station
Horse Campground
Picnic Area
HILL AVENUE
Service Center
Manager's Residence
Bridge
OLD FRONTENAC
LAKE PEPIN
Boat Launch
Parking Lot
Visitor Complex
Interpretive Headquarters
Winter Trail Warming Room
Bridge
Bridge
Parking Lot
Interpretive Satellite
PLEASANT VALLEY CREEK
II. Campground
Bridge
VILLA MARIA ACADEMY
Swimming Beach
Statutory Boundary
FRONTENAC STATION
Park Entrance
Assistant Manager's Residence
Primitive Group Camp 111
I. Campground 108
Council Ring 126
Picnic Area 114
Parking Lot/Interpretive Satellite 126
Park Entrance 103
Manager's Residence/Service Center 115
Visitor Complex 106
Trail Center 115
II. Campground 108
Horse Campground (If Park is Expanded) 112
Boat Launch/Parking Lot 114
Swimming Beach 114
Assistant Manager's Residence 115

102

ROADS (PROPOSED) - Implementation within 5 years

In addition to simply "moving" the park visitor to a particular highlight, the park access and entrance roads set the tone for the entire unit. Within Frontenac deciding on a specific alignment was perhaps the most complex and difficult issue to resolve. (See Road Alignment Alternatives, page 104)

It was decided that users will enter the park directly from U.S. 61 on a road constructed from dredge spoils deposited by the channelization of Wells Creek (Alternative 1). A bridge will be necessary to span the confluence of Wells Creek and Pleasant Valley Creek. Additional fill for this crossing will be provided by the cutting necessary to reach the relatively flat land above these bottomlands. The road will then proceed to the contact station where the user will decide on either of three destinations: the bluffs, Point au Sable, or the nearby campground.

Two other alignments were considered. Alternative 2 would have routed all park traffic onto Hill Avenue. Because this is presently a gravel township road with a 21 foot wide road surface and no shoulders, considerable work would be necessary to bring this road up to park road standards. Users would continue on Hill Avenue until after its junction with CSAH 2. At that point, users would enter the park's internal raod system.

Alternative 3 would have required the construction of a by-pass around Frontenac Station and the utilization of CSAH 2 up to the entrance into the park's internal road system.

Although the benefits of two separate entrances into a town are obvious (e.g., emergencies), it is recommended that continuing study be given to closing one of the routes into Old Frontenac. This would enhance the quality of the outdoor environment, create a safer outdoor experience for park visitors, maximize administrative control of the area, and save the cost of one highway overpass.

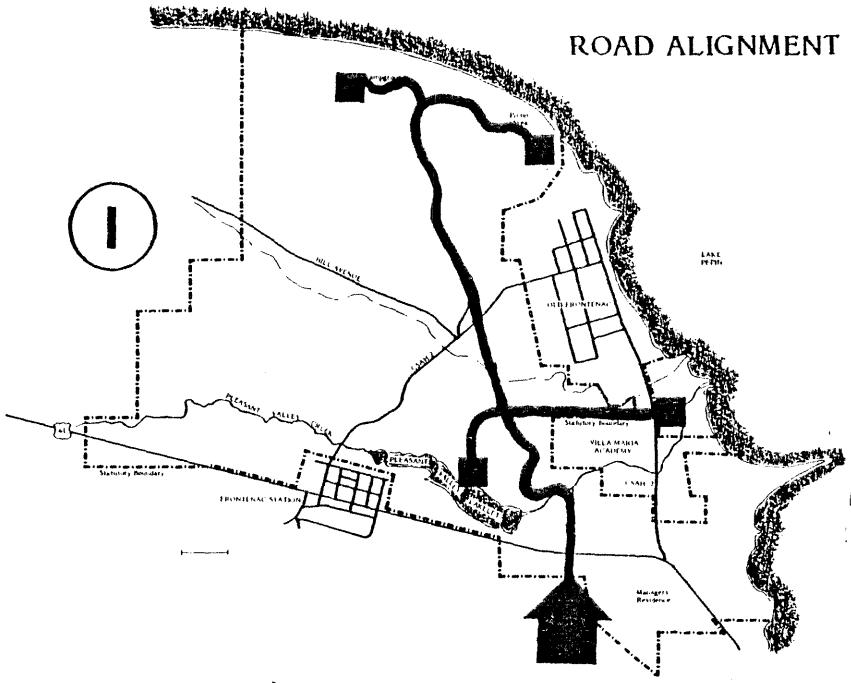
These factors were considered when weighing the various park entrance alternatives:

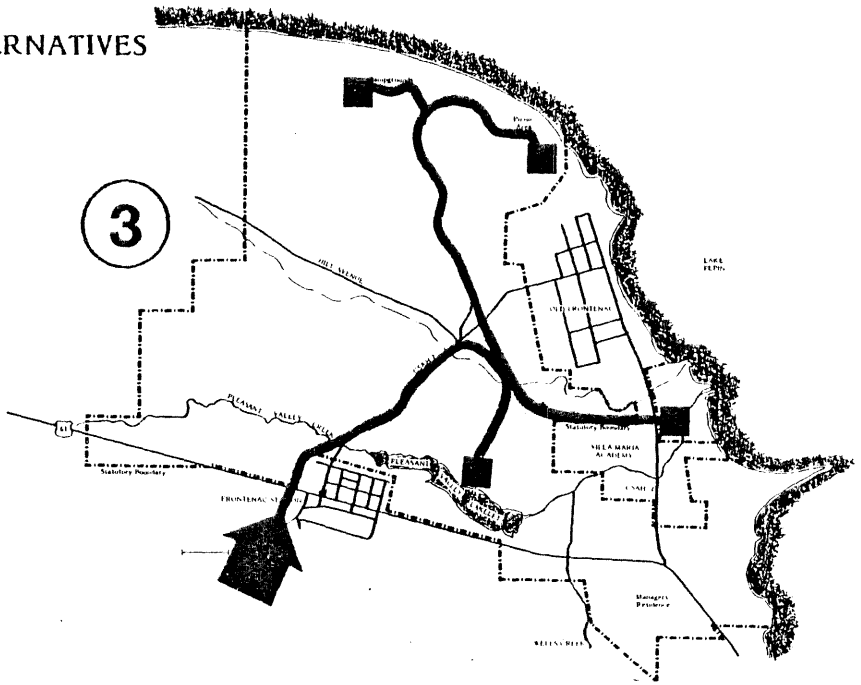
1. potential environmental damage.
2. appropriateness.
3. cost.
4. potential adverse impact on Frontenac, Frontenac Station, and Villa Maria.
5. aesthetics.
6. total miles of road.

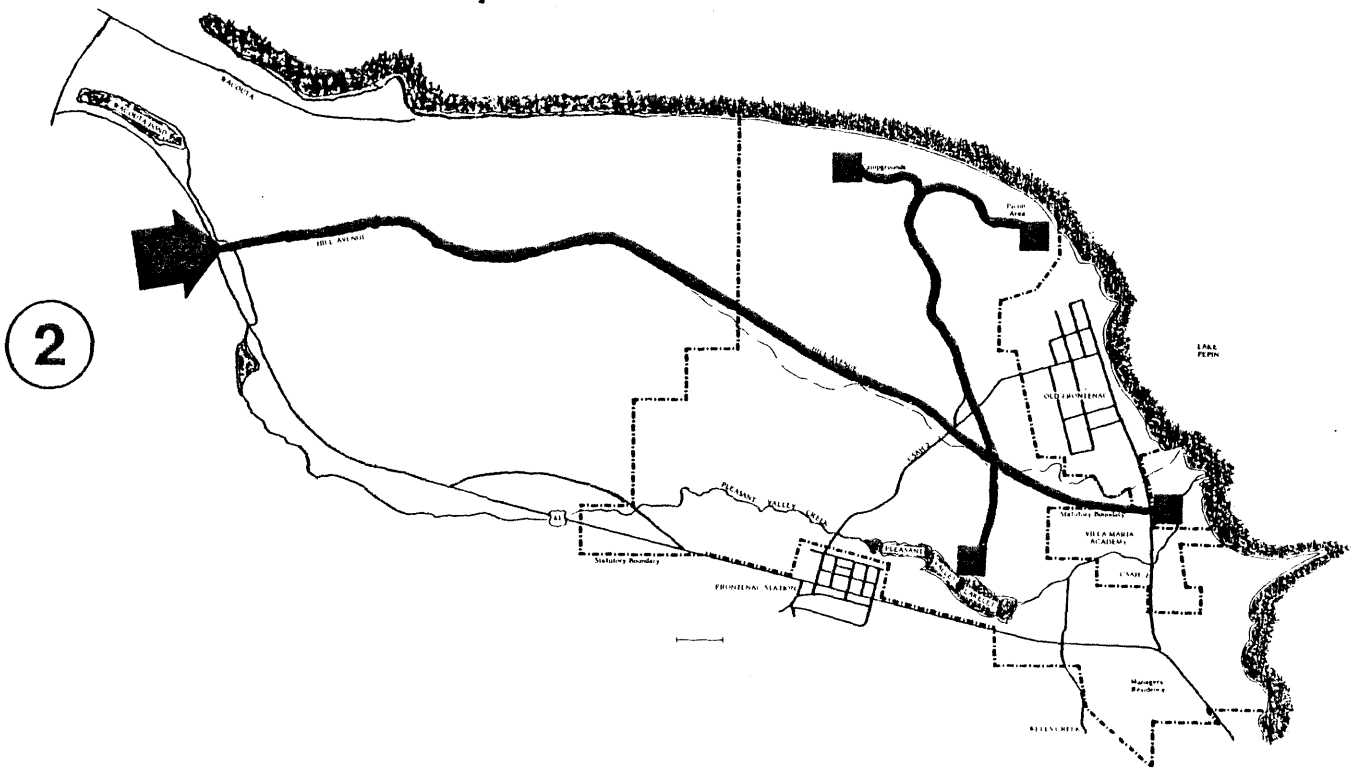
Potential Environmental Damage

Utilizing the dredge spoils created by the channelization of Wells Creek will minimize destruction of previously undisturbed land although major grading will be necessary to bring the road up onto the bluff overlooking the bottomlands. This alternative will cause some disruption of the relatively undisturbed existing wildlife communities. Bringing Hill Avenue up to park standards (alternative 2) would have required extensive cutting and regrading along several portions of the existing alignment. Rerouting a road around Frontenac Station (alternative 3) would require some cutting, filling, and bridge work in order to get around the east side of Frontenac Station (i.e. the Pleasant Valley Creek Side), thus negatively impacting the proposed Wacouta Ponds scientific and natural area.

ROAD ALIGNMENT ALTERNATIVES







Entering the park via alternative 1 will provide the user a glimpse of the three major landscapes within the park: the bottomlands, the relatively flat middle ground, and the bluff tops. Utilizing Hill Avenue as an entrance would not expose the user to the bottomlands. And although rerouting traffic around Frontenac Station near Pleasant Valley Creek would have some contact with each landscape there would be no introduction to the bottomland hardwood forest near Point au Sable.

Cost

Although construction of the entrance off U.S. 61 will cost an estimated $, this compares with $ for bringing Hill Avenue up to County State Aid Highway Standards, and $ to construct a by-pass around Frontenac Station.

Potential Adverse Impact On Frontenac, and Frontenac Station

Entering the park directly from U.S. 61 will minimize park user contact with both Frontenac and Frontenac Station. Utilizing the Hill Avenue alignment would be an improvement over the existing alignment which brings all park visitors through Frontenac Station. Constructing a by-pass around Frontenac Station would also be an improvement over the existing situation, but it would invite its re-creation as future construction might flank the new road.

Aesthetics

Bringing the user directly off U.S. 61 through a densely canopied bottomland forest and then up and out onto an expansive oak savanna will be scenic introduction to the park. The Hill Avenue entrance would have been equally beautiful as it winds its way through wooded valley between the two bluffs. Although it is admittedly a subjective judgement, rerouting CSAH2 around Frontenac Station would not compare in beauty to either of these two alternatives.

Miles of Road

Bringing the users directly of U.S. 61 will require .7 miles of internal roads to the Visitor Complex with no improvement of access roads to the park. Utilizing Hill Avenue would have required .3 miles of internal roads in addition to 3.8 miles of upgrading of Hill Avenue to CSAH standards. Rerouting traffic around Frontenac Station would require .3 miles of internal roads as well as the construction necessary to get around the town.

VISITOR COMPLEX (Proposed)

First Phase Implementation (Contact Station and Park Office) - within 5 years
Second Phase Implementation (Interpretive Headquarters) - after 5 years

Existing Development

The existing contact station is located near the intersection of the campground and picnic area entrance road and CSAH 2. This location allows for supervision of the access to the existing high use area, but leaves much of the park unsupervised. A new location for this facility is proposed.

Proposed Location Site Advantages

1. Stable soils
2. In the strategic middle of the park
3. Suitable site for contact station, interpretive center, and winter trail center functions.

Site Disadvantages

Offers limited supervision of CSAH 2 between Frontenac Station and Frontenac (which bisects the park).

Discussion

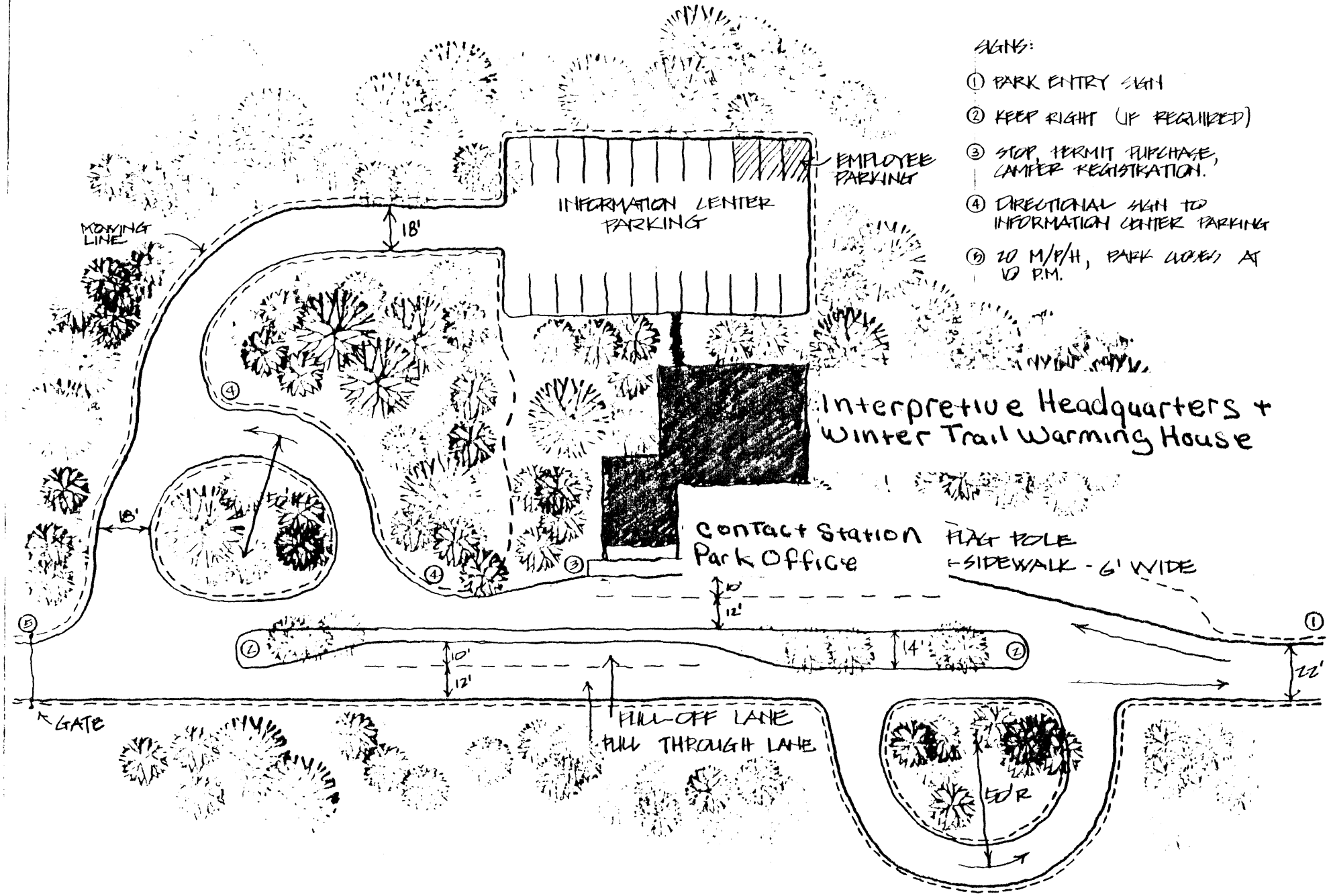
In order to orient all park users to Frontenac's diverse resources a visitor complex will be developed in the area of the intersection of the entrance road and the road to Point au Sable. This complex will eventually accommodate the following function: initial park user contact, registration, orientation/interpretation, warming house and park administration.

It will be built in two phases and constructed in such a way that separate entrances can be provided for the contact/administrative portion and the interpretive/warming house portion. This will avoid congestion in the administrative portion of the structure.

The contact station and park office portion of this structure will be large enough to proivde the park manager and his (her) assistant office space in addition to space for a receptionist and park orientation displays. This will be built first.

An addition to this structure and a 50-car parking lot will be constructed when Campground #2 goes into operation. This structure will serve as an Interpretive Headquarters for summer users and a Trail Center for winter users. For interpretive purposes the building should be large enough for a limited number of permanent displays, a naturalist's office, and have a media display room. For winter trail users the media display room would be used for a warming room. The parking lot would be shared by both groups. Any additional parking spaces needed for winter users will be plowed on land adjacent to this structure. In no case should a massive parking lot be provided.

VISITOR COMPLEX



CAMPGROUND #1 (Existing)

Existing Development

The campground is located on top of the bluff as sown on the following map. It is laid out in four loops which have a total of 59 camping spurs radiating out from them. A modern sanitation building with flush toilets and showering services are proivded for 39 of the campsites. The remaining twenty campsites are serviced by four pit toilets. Two small visitor parking lots and one trailer dump station are also located within this campground complex.

Site Advantages

1. Stable soils (Timula).
2. Scenic vistas possible.
3. Good access to upland prairies.
4. Winds refreshing during hot summer months.

Site Disadvantages

1. Winds cold (20 mph prevailing wind) in spring and fall.
2. Poor access to bottomlands and Lake Pepin.
3. Encourages use of erosion sensitive bluff side steep slopes.

Discussion:

Future expansion of this area is not planned.

Relatively speaking this is not a popular tourist campground. Although the prevailing winds keep this area bugfree and tend to "cool" the user, the intensity of these winds make it difficult to successfully complete some routine camping chores (e.g. setting up the tent, cooking over an open flame or gas stove, etc.).

If use decreases significantly as a result of the proposed campground #2 (see page 102), this facility should be phased out or converted to a Horseman's campground and Day Use Area (see page 103).

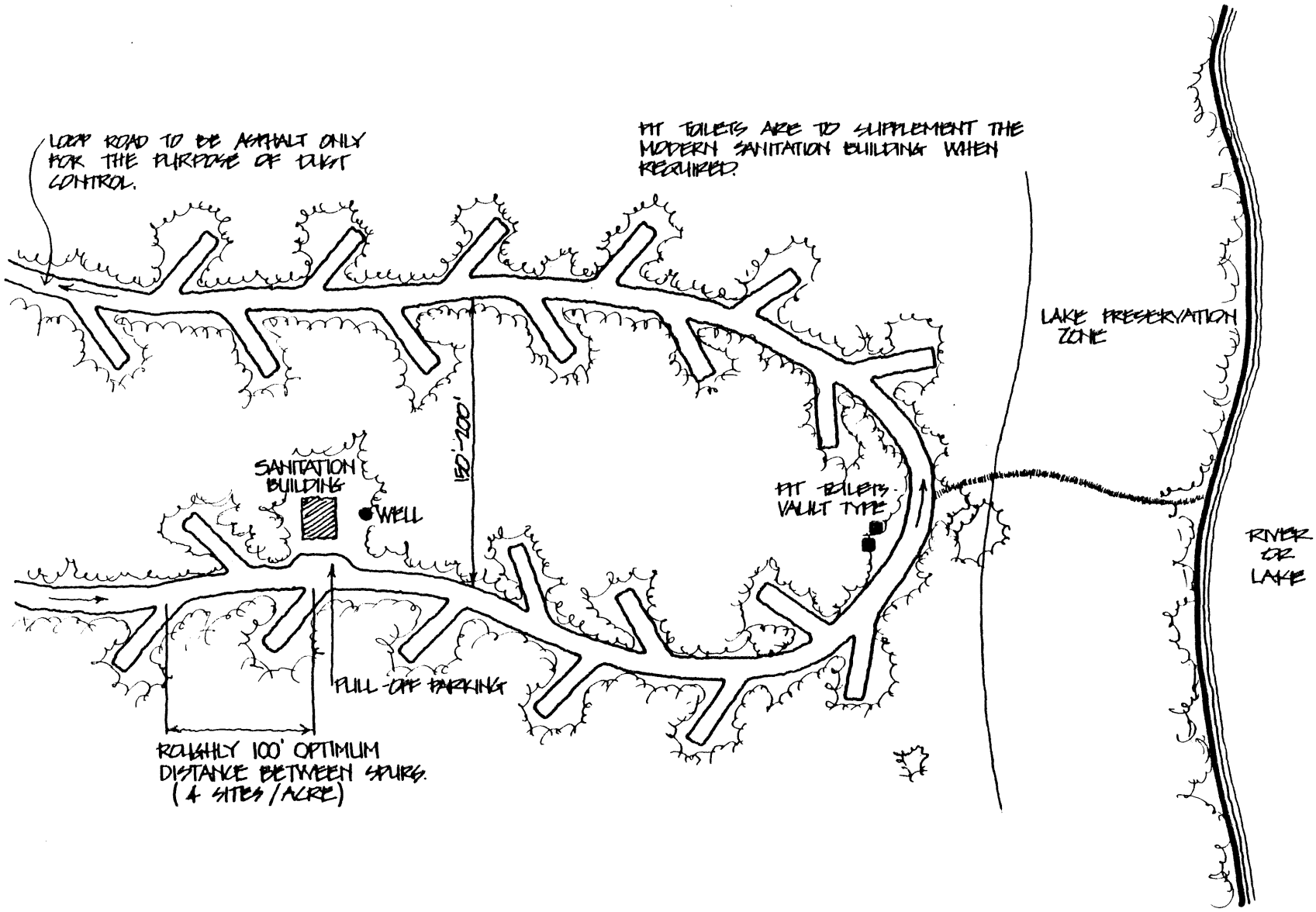
CAMPGROUND #2 (Proposed) - Implementation after 5 years

Site Advantages

1. Stable soils (Burkhardt, Port Byron and Waukegan).
2. Wind protected
3. Good access to Point au Sable as well as the bluff.
4. Although partially wooded, also takes advantage of previously disturbed land (agricultural).
5. Because site is close to the proposed Visitor Complex (see page 105), no additional building needed for Interpretive facilities.
6. Scenic views out over Pleasant Valley Lakelet and of the distant bluffs.

CLASS IV - MODERN CAMP SITE

PLAN - 1"=100'

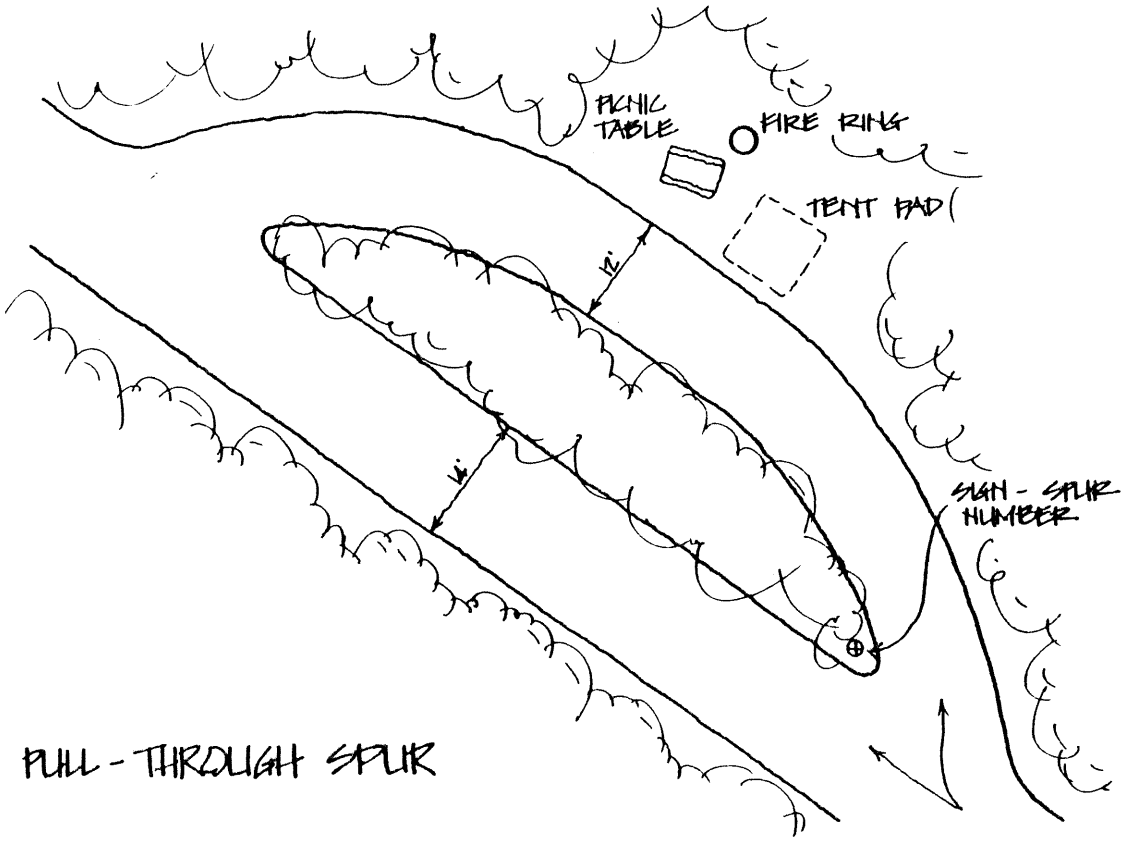


CAMPGROUND SPUR TYPICALS

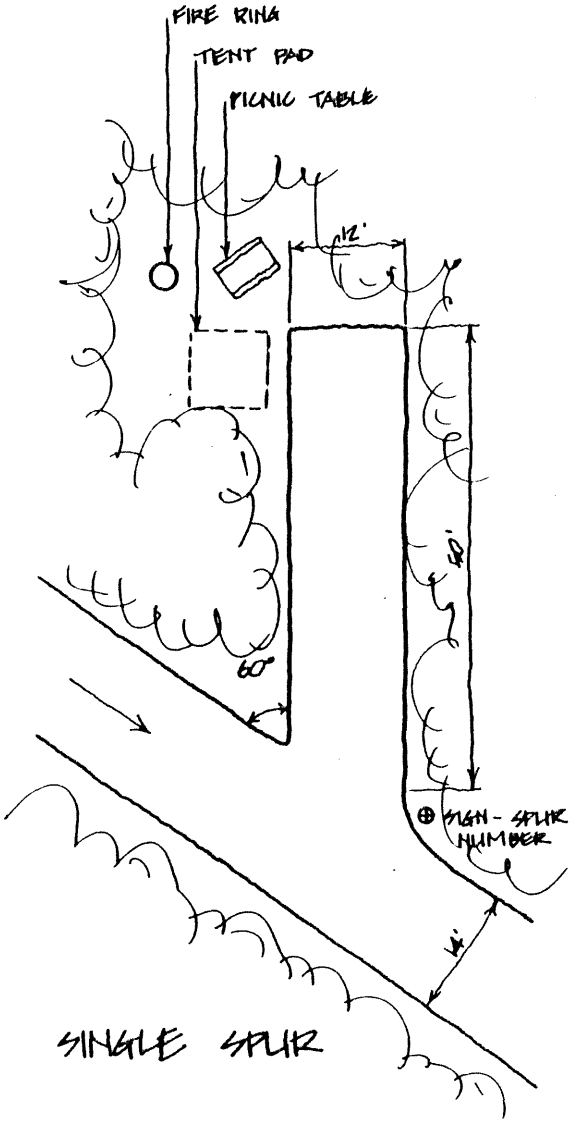
SCALE: 1"=20'

NOTE: SPUR LOCATIONS SELECTED WITH RESPECT TO TOPOGRAPHY AND VEGETATION.

MOWING TO OCCUR ONLY IN THE IMMEDIATE AREA OF THE SITE.



PULL - THROUGH SPUR



SINGLE SPUR

Site Disadvantages

None noted.

Discussion

This campground will be constructed once the agricultural fields have been replanted to oak savanna and will consist of 50-60 campsites.

The camping spurs and access road will be surfaced, but not paved until frequency of use can be determined and the additional outlay of funds justified. Inter-site screening and separation should allow for some interaction between campsites while providing visual privacy, and direct campsite interaction with the natural surroundings. Consequently, sites should be spaced at least 65' apart.

Each campsite will contain a camping spur, fire ring, picnic table and tent pad. A centrally located water source, and flush toilet facility will be necessary. According to the Soil Conservation Service (see Soils, page 53) this area is well suited for drain fields.

PRIMITIVE GROUP CAMP (Existing)

Existing Development

Directly west of Campground #1 is the Primitive Group Camp which has a 24 tent capacity. A small open sided roofed shelter, two pit toilets, and a 12 car parking lot are also provided for the users' convenience.

Site Advantages

1. Stable soils (Timula).
2. Winds cool in summer.
3. Detached from most other park users.

Site Disadvantages

1. Winds cold in spring and fall.
2. Little vegetative shielding from sun and wind, although young trees are planted.

Discussion

No expansion of this area is planned.

HORSE CAMPGROUND and DAY USE FACILITY (Proposed) - To be implemented only after the park boundary is expanded and land purchased.

Site Advantages

1. At beginning of trail system.
2. Detached from most other users.
3. Prevailing winds will keep horses bug free.

Site Disadvantages

None noted.

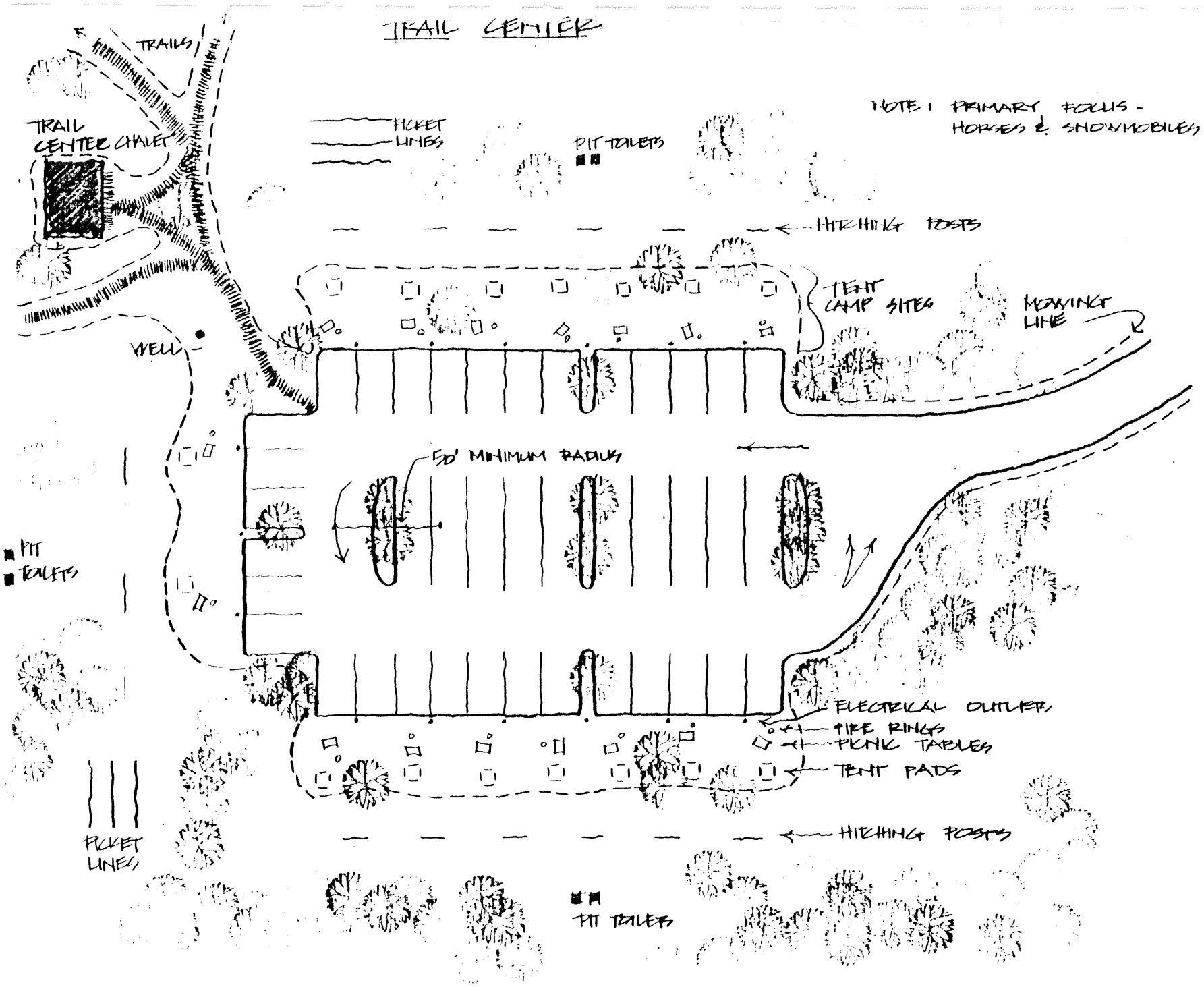
Within southeastern Minnesota there appears to be considerable demand for horse trails (e.g. Forestville State Park runs at capacity all summer long). However, the region's terrain creates side hill erosion hazard in many places.

If the park is expanded as recommended (page 124), practically the entire bluff can be used by horsemen. Admittedly care will be necessary in the exact alignment and construction, but at least here you do not have already established use patterns. In parks where use has been unbridled, it is often difficult to change user attitudes and keep them away from badly eroded trails.

Approximately fifteen to twenty camping sites should be provided in this area. These sites will have picnic tables, fire rings, horse tie areas, spurs for trailers and campers, an area for a tent, unloading ramp, central pit toilets, central water supply, and a horse manure deposition area. In the general vicinity, but separated from the campground, a day-use facility will also be provided. This day-use area will include an unloading ramp, parking for twenty cars and trailers, picnicking facilities, tie areas and pit toilets.

Because few standards exist for this type of facility, the Bureau of Engineering will check with local user groups for design recommendations.

* As was discussed (see page 108), Campground #1 may be phased out. If this should happen, the area should be studied for conversion into this Horseman Campground and Day Use Area.


TRAIL CENTER
NOTE: PRIMARY ROLLS - HORSES & SNOWMOBILES
TRAILS
TRAIL CENTER CHALET
PICKET LINES
PIT TOILETS
HITCHING POSTS
TENT CAMP SITES
MOWING LINE
WELL
50' MINIMUM RADIUS
PIT TOILETS
ELECTRICAL OUTLETS
FIRE RINGS
PICNIC TABLES
TENT PADS
HITCHING POSTS
PICKET LINES
PIT TOILETS

PICNIC AREA (Existing)

Existing Development

The picnic area is located on the northeastern edge of the bluff. At present, 35 picnic tables, an open shelter, and a modern sanitation building are provided. Two parking lots are located in this area: parking lot "A" provides 150 parking spaces, and parking lot "B" provides 70 parking spaces.

Site Advantages

1. Stable soils (Timula).
2. Good vistas of Lake Pepin.
3. Winds cool in summer.

Site Disadvantages

1. Winds cold in spring and fall.
2. Little shade at present.

Discussion

Except for the number of picnic tables, no further expansion of this area is planned. Ample parking spaces exist for future use. Revegetation with shrubs and trees is planned for this area to mitigate partially the adverse effects of the wind (see page).

Point au Sable Beach

Consistent with the recommended Natural State Park classification a low key swimming facility for Point au Sable is planned. Although Lake Pepin is not now a suitable swimming lake, plans are underway to reduce pollution of the Mississippi River (see Water Resources, page 43).

Development will be limited to a flood proof sanitation building, trash recepticles, and a lifeguard stand. The sanitation facility will probably also receive use by the many boaters who anchor near the point. Hopefully the trash recepticles will reduce the current littering problem experienced with this user group.

BOAT ACCESS (Proposed) - Implementation after 5 years

At the present time, there are relatively few public places to launch a boat onto Lake Pepin (only Lake City and Hanson's Harbor in the immediate area) and they generally receive heavy use. When users see Frontenac State Park on the map they often assume that there will be some water access and bring their boats. Therefore, a boat access to Lake Pepin is planned for the park. In order to minimize disruption to Villa Maria and the town of Frontenac, and retain strong administrative control, this facility will be accessed only from within the park.

In addition, a public access not connected with park roads would result in a complicated access for park users.

This area will have a surfaced boat ramp, a boat dock, a 50 car and trailer parking lot, and an anchored vault toilet.

MANAGER'S RESIDENCE AND SERVICE CENTER (Existing and Proposed)

- Implementation of temporary residence as land is purchased
- Implementation of permanent rest center within 10 years

Existing Development

This behind-the-scenes area is located in the Southeast corner of the park off U.S. 61. The manager's residence, shop, maintenance garage and storage area are located here.

Site Advantages

1. Permits some privacy for the manager and family.
2. Utilizes a historic building (Lt. Garrard's House, 1907).

Site Disadvantages

1. Minimal supervisory control over users of bluff area.
2. Complicated access to manager for park users.

Discussion:

As attendance in this park increases, there will be a greater need for an assistant manager. When this person comes on board an additional residence will be needed. It appears that Mr. Walter Sewert's farmstead, if he is willing to sell, is in a fair location for this park facility, as a temporary solution.

However, in order to protect the park from unsupervised and unauthorized activities, it will be necessary to strategically place the Manager's Residence and Service Center at the "vulnerable" corner of Hill Avenue and CSAH 2. The park is at its narrowest here and is fronted by two public roads. At that time the Asst. Manager will move into the manager's former residence.
Because this development will displace the existing Trail Center (page), it will be necessary to coordinate its construction with phase 2 of the Visitor Complex (i.e., the addition of an Interpretive Center and a Winter Trail Center).

SNOWMOBILE TRAIL CENTER

Existing Development

At present the trail center is only accessible off Hill Avenue, but is expected to be accessible off the campground and picnic area entrance road after a small parcel of land is purchased. The trail center area provides a 200 car capacity parking lot and a loading ramp.

Site Advantages

1. Eliminates necessity to snowplow bluff road.
2. Good access from existing Contact Station.

Site Disadvantage

1. Too far from primary cross-country ski trail.

Discussion

This facility will be phased out when the proposed Visitor Complex (see page 105) is built and the new manager's residence and service center is constructed here (see page 115).

STRUCTURED GROUP CAMP - (IMPLEMENTATION ONLY IF VILLA MARIA IS PURCHASED BY THE STATE)

Existing Development

A group camp consisting of two barracks (one heated, the other unheated) and staff residence has recently been constructed on the grounds of Villa Maria Retreat House.

Site Advantages

1. Stable soils
2. Easy access to future internal road system
3. Excellent access to Sand Point
4. Not subject to flooding

Site Disadvantages

None identified

Discussion:

Although there are no plans at this time to close this institution, the DNR should be ready to act in the event that something should happen to such an important adjoining landowner. Consequently, it is recommended that much of the Villa Maria property be included within the statutory boundary at such time that this institution's future viability is threatened (see Villa Maria, Proposed Boundary Modification Section, page 140).

This group camp would require little or no modification to immediately serve park purposes.

TRAILS

Park users will follow the course of least resistance and maximized fulfillment. Defining pedestrian paths is necessary in areas where any significant amount of traffic is desired or expected. Whenever many people pass through an area the environment will be altered, but the impact on the total area is decreased if these visitors are channeled onto a carefully planned path rather than left to wander indiscriminately.

A well designed path leads a person along rather than forces him to stay on the trail with artificial barriers. A meandering path is pleasant to walk but only if these curves are located in logical places. An unnecessary curve will be short circuited.

Those areas along a path at which a person will stop to investigate, view, or discuss some natural phenomenon will require an area which is wider than the general path surface. Slippery surfaces should be avoided whenever possible. Traffic over algae covered rocks, wet logs, and wet clay or peat presents excessive distraction. Remove obstacles from trailways and check for overhanging branches and limbs along trails.

EXISTING FOOT TRAILS

Frontenac State Park is a park of extremes. From the floodplain of the Mississippi River and Wells Creek, the topography rises several hundred feet to the campgrounds and picnic areas. Because of the rapid changes in topography, the foot trails, which were laid out many years ago, have followed these contours. With the combination of the fragile soil types and topography, many existing trails have deteriorated to a point where complete rehabilitation or realignment is going to be needed.

There are three alternatives to attacking the problem of trail deterioration:

1. Rehabilitation
2. Realignment
3. Closing

The first alternative, rehabilitation, appears to be the best alternative. Due to the age of the trails, they are well established and the public is reluctant to change their ways. The cost of rehabilitation in this park will be expansive. This is due to the high labor costs and because of the relief of the park, motorized equipment cannot be used to move the needed materials to the desired locations. The only method applicable is to physically carry the materials down the hills.

The second alternative, realignment, is also a viable alternative to the trail problem at Frontenac. Many of the trails were established "after the fact"; that is, they were marked as a trail because that is where the people went. In many cases the trail alignments go up extremely steep slopes and should be realigned. Some of the trails angle up the hillsides. Due to natural fordes, these trails are narrow, treacherous paths at times less than a foot wide. If a trail is realigned, care should be taken in construction, using proper techniques in lay-out, clearing, and control and/or prevention of erosion on the trail.

The last alternative, closing a trail, is not a viable alternative. Because the trails lead to landmarks or lookouts, closing a trail without providing an alternate route is not feasible.

Following is a discussion of the problem areas on the trails at Frontenac and alternatives to resolving the problems.

TRAILS NO. 1, 2, and 3

These three trails are the worst trails in the park; they descend over 400 feet from the campground and picnic areas to the shore of Lake Pepin. Last year these trails were upgraded by widening and stabilizing the downhill side of the trail. To put these trails in better condition, limestone or pressure treated lumber should be used to form steps, waterbars, and low trail edge retaining walls. Where the slope is extremely steep, stairs constructed of limestone or pressure treated lumber and railings should be installed. Another problem common to these trails are the "short cuts". These "short cuts" run between the switchbacks, which are very close together, and create erosion problems. These switchbacks should be lengthened and the distance between trails increased. Short cuts and abandoned trails that remain will be filled with slash and pegged down.

TRAILS 4 and 5

These two trails have erosion problems. Limestone or pressure treated lumber should be installed to form both steps and waterbars to stabilize the trails.

REMAINING TRAILS

Although all trails need some remedial work, the remaining trails generally are in good condition. To make maintenance easier (i.e. mowing and winter grooming), the trails should be disced (or something similar) to smooth out the old gopher mounds and uneven ground.

Point au Sable Trail

A pedestrian trail will be developed which will lead users to the proposed Point au Sable Beach (see page 114). In addition to providing an access, it will have an interpretive component. Kiosks will alert trail users of the natural and cultural features of the area in addition to interpretive markers placed along the trail.

Winter Use

In the recent past, snowmobilers have had trails throughout the park. In order to satisfy the increasing demand for ski trails and to minimize user conflicts, snowmobiles will be restricted to the northern portion of the park (i.e., upon the bluffs) while cross-country skiers will be served in the southern portion near Point au Sable in the vicinity of Villa Maria.

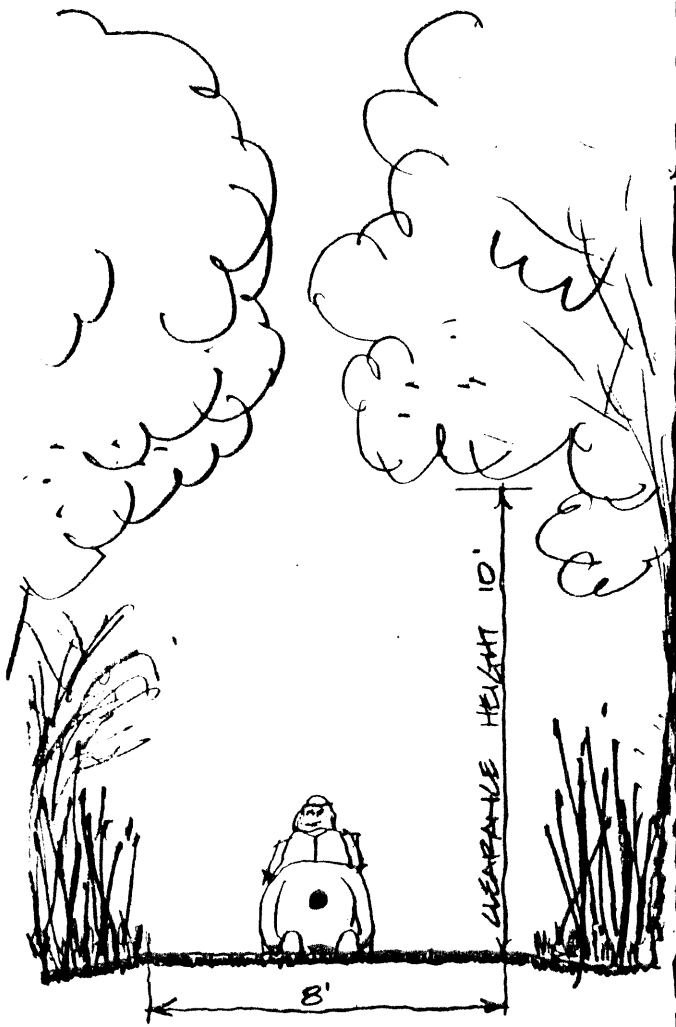
This "zoning" scheme was chosen because:

1. The extreme terrain in the bluff area is well suited for a snowmobile while only being suited for the advanced skier,

2. The climatic conditions (wind and cold) of the bluff are better suited to the snowmobiler. While the "windless" Sand Point is well suited for the cross-country skiers.

3. The snowmobile noise might be disruptive to the tranquility of Villa Maria headquarters while being unnoticeable up on the bluffs.

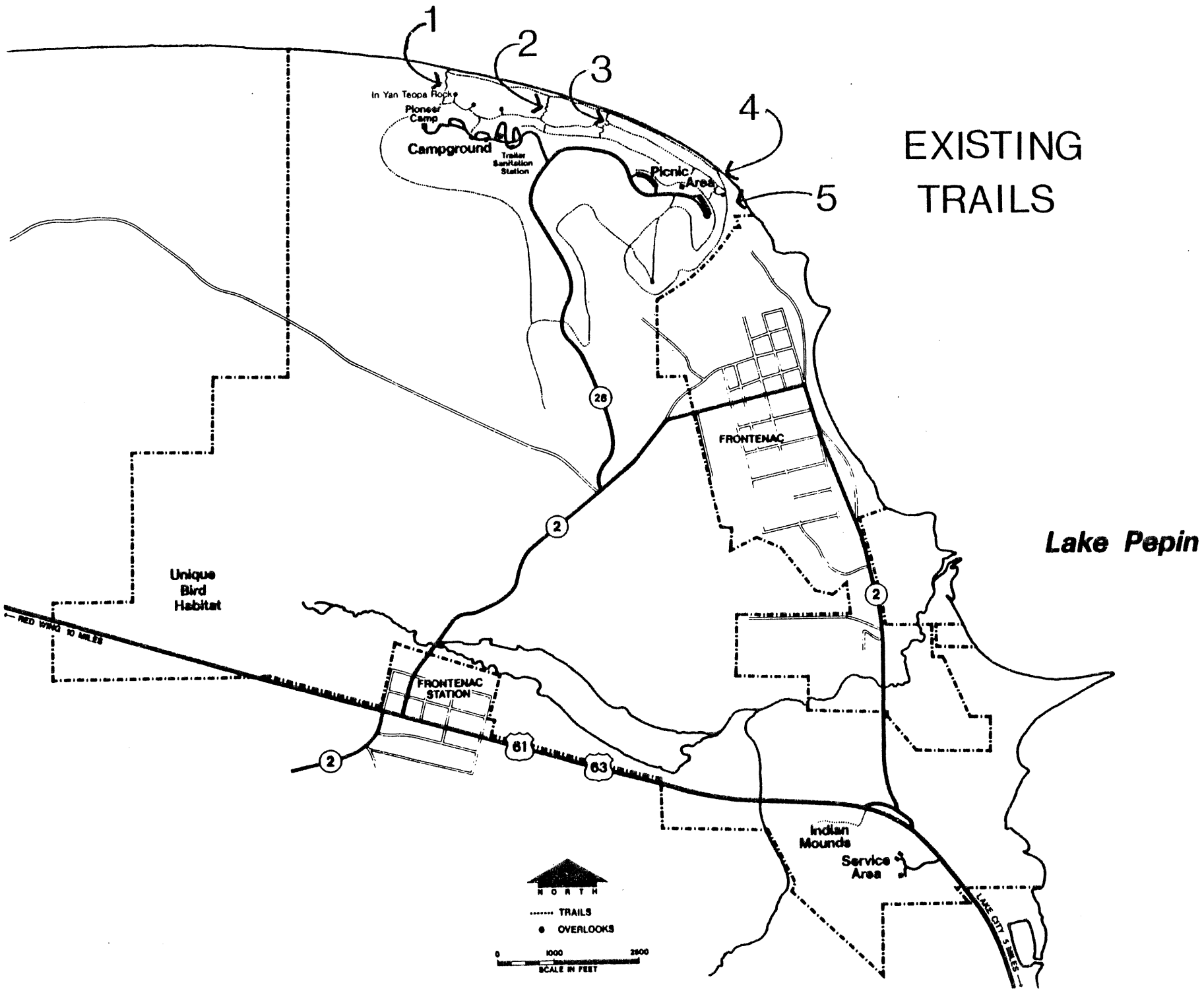
TRAILS
SCALE: 1/4" = 1'-0"

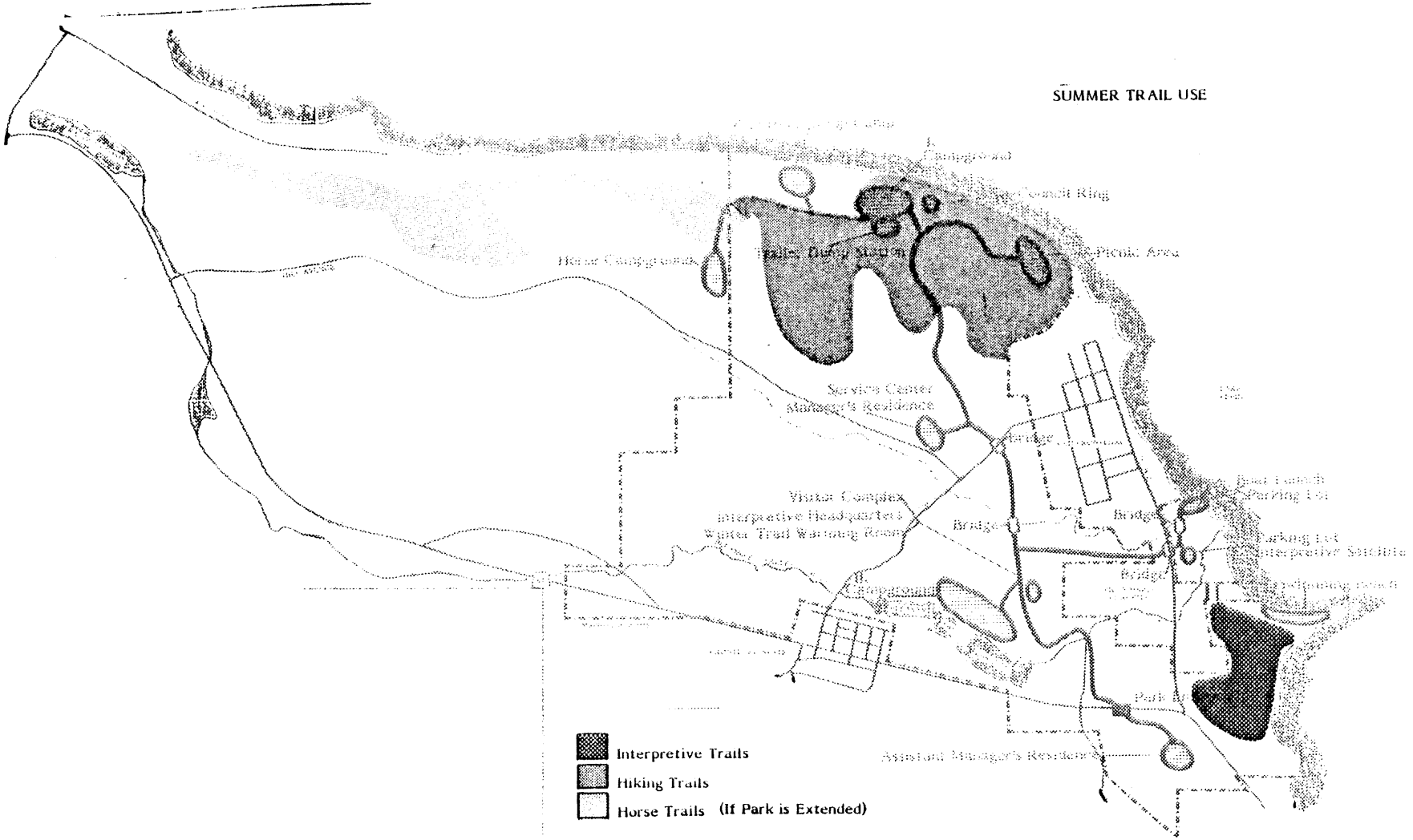


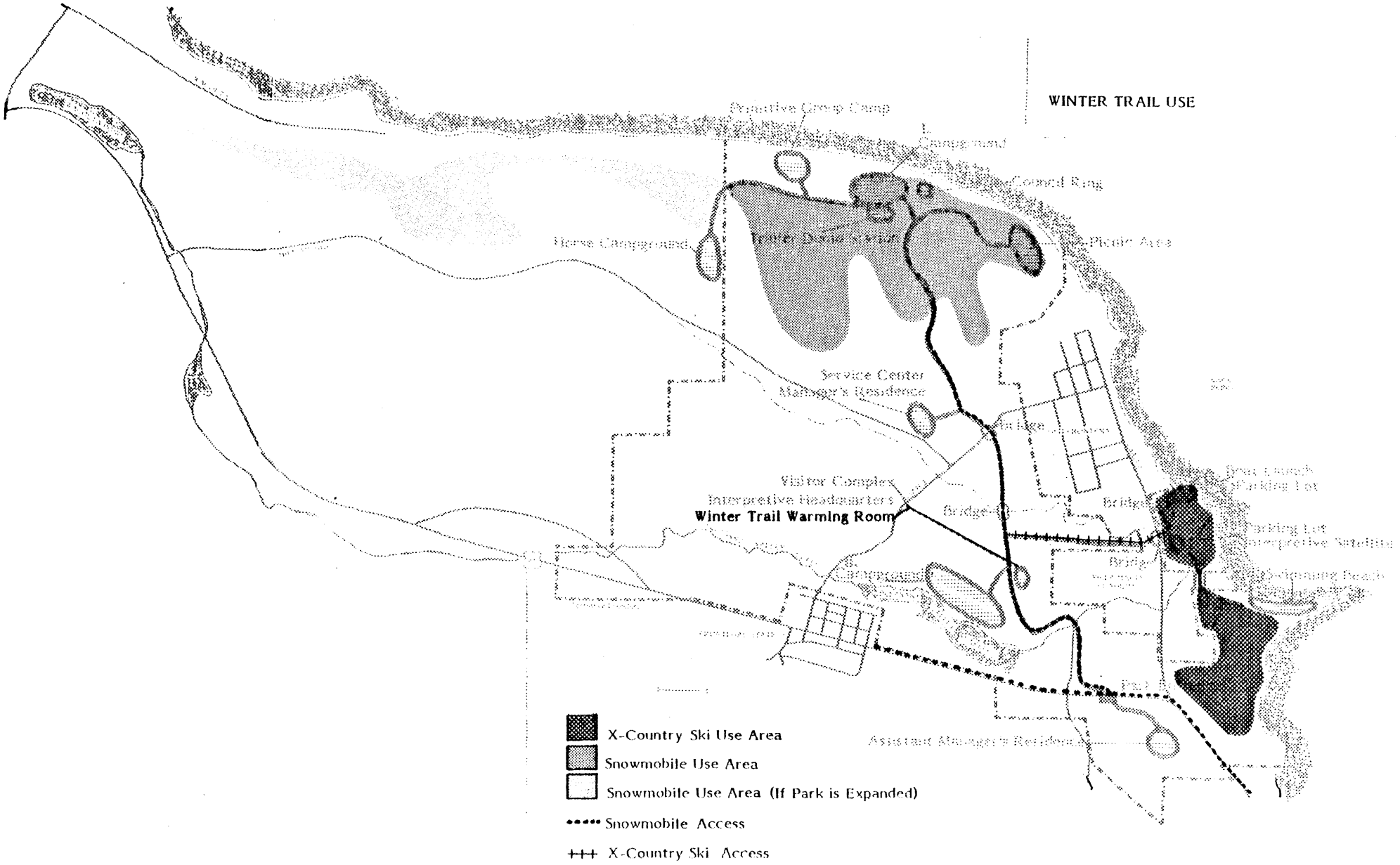
- MULTIPLE USE TRAIL –
  - SNOWMOBILES – HORSEBACK RIDING
  - COMPACTED SURFACE 1/4" TO 1' SLOPE

- FOOT TRAIL
  - HIKING – CROSS COUNTRY SKI
  - COMPACTED SURFACE 1/4" TO 1' SLOPE
  - CLEARANCE HEIGHT TO BE 7' ABOVE NORMAL SNOW DEPTH
  - ACTUAL PATH SURFACE WIDTH NEED NOT BE 4' BUT WIDTH CLEARANCE SHOULD BE 4'.

- BICYCLE AND HANDICAPPED TRAIL
  - BITUMINUS OR CRUSHED LIMESTONE AND CLAY SURFACE (3:1) 1/4" TO 1' SLOPE
  - HEIGHT – 7' MINIMUM, 10' DESIREABLE
  - WIDTH – 4' MINIMUM – ONE WAY. TWO WAY – 6' MINIMUM, 8' DESIREABLE


1
2
3
4
5
EXISTING
TRAILS
In Yan Teopa Rocks
Pioneer Camp
Campground
Trailer Sanitation Station
Picnic Area
28
FRONTENAC
2
Lake Pepin
Unique Bird Habitat
RED WING 10 MILES
FRONTENAC STATION
61
63
2
Indian Mounds
Service Area
LAKE CITY 5 MILES
NORTH
TRAILS
OVERLOOKS
0
1000
2000
SCALE IN FEET


SUMMER TRAIL USE
Interpretive Trails
Hiking Trails
Horse Trails (If Park is Extended)


WINTER TRAIL USE
Primitive Group Camp
Council Ring
Horse Campground
Picnic Area
Service Center
Manager's Residence
Visitor Complex
Interpretive Headquarters
Winter Trail Warming Room
Bridge
Assistant Manager's Residence
X-Country Ski Use Area
Snowmobile Use Area
Snowmobile Use Area (If Park is Expanded)
Snowmobile Access
X-Country Ski Access

A snowmobile access from Frontenac Station to Lake City is desirable by local residents. When the Department of Transportation replaces the Wells Creek bridge over U.S. 61 (within 2 years) the bridge will have a snowmobile lane on it. Untill that time that it will be necessary to bring snowmobilers along the dredge spoils of Wells Creek to the cross-country bridge over Pleasant Valley Creek. This trail will continue out of the valley over the farmland (if an arrangement can be worked out) to the trail center (see Snowmobile Trail Center, page 115). A spur will be necessary that leads to Frontenac Station.

When the new entrance road is completed over the dredge spoils the (see page 103) snowmobilers will use this as a snowmobile trail to the Visitor Complex (see page 105), and as an access to the snowmobile trails upon the bluff.

Horse Trails

If the park boundary is expanded and the land purchased (see Boundary Modifications, page 127), adequate room exists for a number of horse trails traversing practically the entire length of the bluff. Used in conjunction with a Horseman's Campground and Day Use facility it should be an equestrian highlight of southeastern Minnesota (see Horseman's Campground and Day Use Area for further discussion, page 112).

INTERPRETIVE MANAGEMENT PLAN

Introduction

> "An educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience and by illustrative media, rather than simply to communicate factual information."

Interpretive services provide the link between users, the resource and the agency operating it.

Specific objectives include:

1. Demonstrating the kinship of park visitors and the park environment, and by association, broader human interactions with ecosystems.

2. Illustrating the historic and ongoing impact of natural forces on the park and on the relationsihp of people who help comprise them.

3. Assisting park visitors in the discovery of meaningful and satisfying ways to enjoy their stay without intruding on the experiences of other parks visitors or the quality of the park environment.

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

Interpretive Services will be developed in recognition of the following:

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

2. People are a natural and necessary part of park environments, free to enjoy them in constructive ways.

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

The hoped for benefit of experiencing the park and related interpretive services will be; an increase in the quality of life, and a gradual strengthening of environmental awareness in, the people who recreate and learn in the park. 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 our state's cultural heritage.

I. INTERPRETIVE THEMES

A. Geology

Frontenac is located within the Mississippi River Valley which was formed by the water action of glacial River Warren. The two bluffs within the park were actually islands when torrents of glacial meltwater passed through the area. There is one portion of the bluff which lies below the picnic area that served as a stone quarry. It has laid dormant for 40 to 50 years; however, vegetation has moved back into the area. Today, rather than being a visual blight, it has a fine potential for interpretation from historical, geological, and ecological points of view.

The aluvial fan created by the confluence of the Chippewa River with the Mississippi River near Reeds Landing, Minnesota creates a natural dam for the waters of the Mississippi, slowing them and partially damming them to form Lake Pepin upstream. This body of water is a great recreation and scenic source that can be viewed from the bluffs of Frontenac State Park.

B. History

As a result of extensive testing in 1976, the Minnesota Historical Society has identified a number of prehistoric habitation sites within the park.

Because of the proximity of the Mississippi River and Lake Pepin to the park, an excellent opportunity exists to interpret this waterway's rich history of explorers, furtraders, and commerce.

The events of the steamboat era and the resort town of Old Frontenac provides another interpretive theme rich in the cultural aspects of the late 19th and early 20th century American life style. Many important and distinguished people of the period came to this community for vacation. The quiet and relaxed atmostphere still exists here today.

C. Vegetation

Some dispute exists over the original vegetation types that existed in and around Frontenac. It was probably forested primarily with northern hardwoods along the river bluffs with Oak-Savanna prairie on the rolling upland. Some natural prairie vegetation still exists in the park, but it has a number of disturbance species associated with it. The restoration of prairie to the upland areas will require an active management role on the part of the State Park. This will allow interpretation of the prairie and of restoration values.

D. Wildlife

One of the important features for interpretive programming in Frontenac State Park is the fact that it lies in a major route for migratory birds. Bald and Golden Eagles winter in this area. Recently, attempts have been made to reintroduce the rare and endangered Peregrine Falcon in the vicinity by the Federal Fish and Wildlife Service.

A variety of reptiles inhabit the park. These include bull snakes, fox snakes, northern water snakes, blue racers, eastern milksnakes, and timber rattlesnakes. Turtle species in the area include blandings, wood, map, false map, snapping, western painted, and western spiny softshell.

Among the mammals that offer interpretive themes for the park are oppossum and beaver. Beaver played a primary role in attracting early fur trade.

PROGRAMS

Existing

Frontenac State Park provides wide opportunities for interpretation of history, pollution, ecology, wild foods, and crafts. Few audio-visual programs are possible due to lack of equipment. Due to reliance on outside funding for a naturalist staff, the interpretive programming is limited.

For future programs, an increase in utilization of the Park's unique resources is planned. Increased programs for school and special groups are needed. With proper equipment, facilities, and staff, interpretive programs are planned to encompass all of Frontenac's diverse resources.

INTERPRETIVE DEVELOPMENT

Discussion

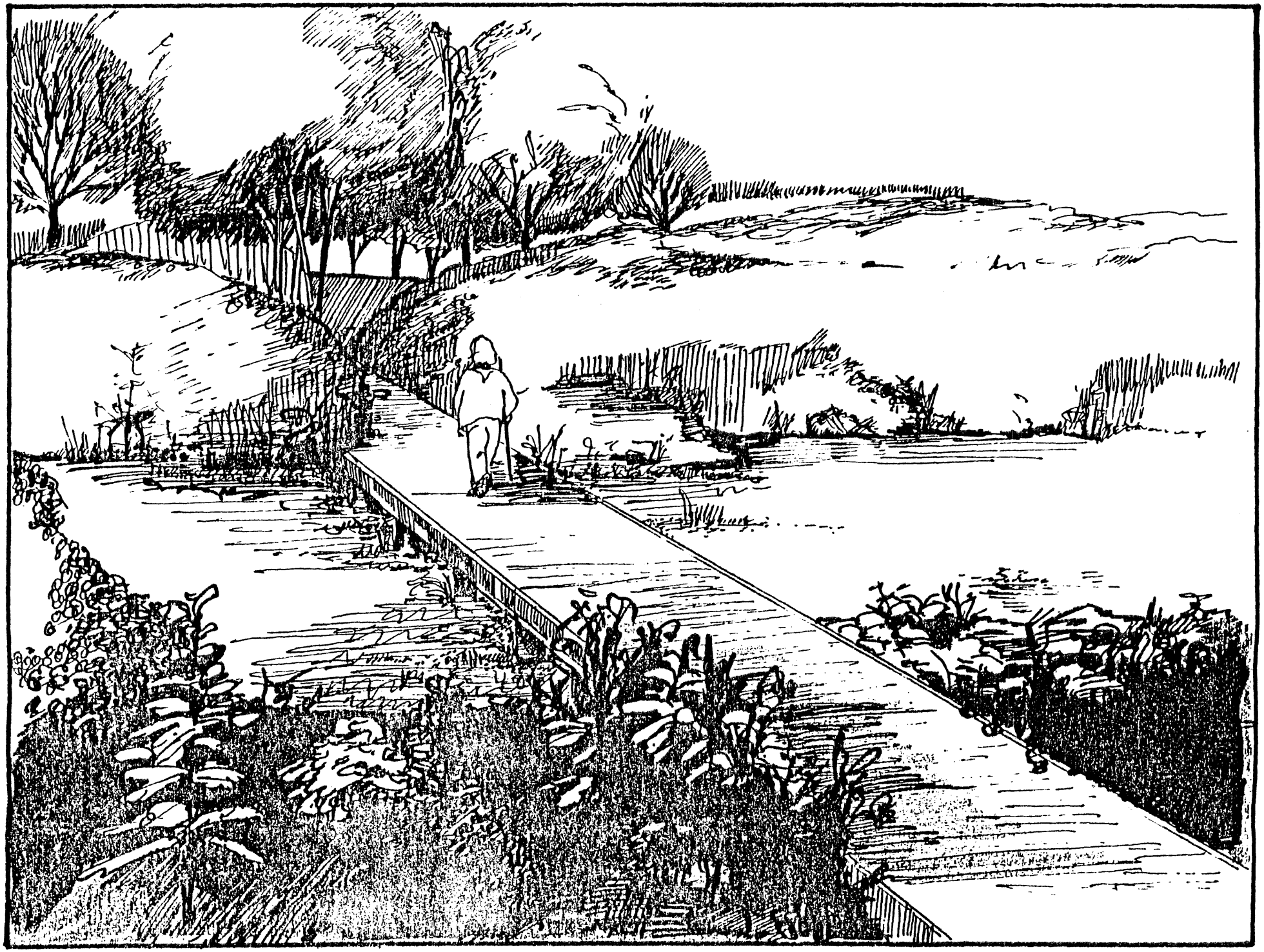
Due to the diverse resources (geologic, prehistoric, historic, aesthetic, wildlife), topographic differences (the bluffs, "normal", and floodplain) and climatic fluctuations (strong prevailing winds on the bluffs, windless floodplain), development is distributed throughout the park.

A hub and satellite interpretive center development is planned. Satellite interpretive facilities are planned for the Sand Point and bluff areas with a central office being located in the Visitor Complex (see page 105).

The Point au Sable facility will consist of a number of interpretive kiosks within or near the parking lot that describes in some detail the natural and cultural resources of the area. In addition, this satellite will be the dispersal point for information to be used on a self guided interpretive trail that leads out to the Point au Sable beach.

The Upper Bluff facility will consist of a council ring for movie/slide presentations. It will have seats for approximately 30 people with provisions for greater numbers if users bring their own lawn chairs. In addition to the limited seating, a permanent viewing stand and bulletin board will be necessary. Electricity will be needed for the movie projector.

The Interpretive Headquarters within the Visitor Complex (see page 105) will have room for permanent displays, accommodations for slide shows and other media presentations and a naturalists office.



BOUNDARY ADJUSTMENTS AND ACQUISITION

Introduction

Boundary adjustments 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. There are two goals or policies that should be strived for in every park:

> To expand present or establish future parks with sufficient acreage to preserve and perpetuate their natural resources and still provide the necessary recreation facilities to interpret and enjoy these resources, yet not include acreage that would be unreasonable to purchase or unnecessary. In cases where buffer land is needed but purchase is not reasonable or possible, an attempt should be made to zone the area to protect it or obtain easements (partial interest), other forms of agreement with the present landowner. The agreement would state that for a consideration the landowner would agree not to develop any non-conforming use or facility.
>
> To control all land within the statutory boundary by fee title (direct ownership).

Because it would be fiscally and physically impossible to achieve these goals overnight, this plan will establish priorities that will work toward them. The following framework will be used in developing adjustment and acquisition priorities:

1. Land needed for preservation or perpetuation 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 compatible with existing or potential park purposes.

Although the boundary of Frontenac State Park resembles a "square" on a map when the topographic relief is overlayed, it becomes apparent that the unit is quite disjointed. The boundary presently intersects two bluffs as well as part of the valley. They jointly form some agricultural land in addition to the property near Sand Point which is predominantly wet.

1. In order to link the bottomlands of Point Au Sable and the currently developed bluff with an internal road system, it will be necessary to add a 7 acre (approx.) piece of land in the western corner of the intersection of Winona Avenue and CSAH 2 (just north of Villa Maria).

   Unless this alignment is utilized the state may have to pay an additional $20,000 to engineer a road through the flood prone land near Wells Creek south of the Villa Maria property (see Roads, page 103).

   This is a first priority acquisition.

2. There is a small parcel of land (approx. 7 acres) which should be added to the park boundary because:
   (1) It will provide additional buffer between the town and the park.
   (2) The park now includes over 100 acres of the owner of this property. Including it within the park will allow the property to remain unsevered.
   (3) The owner appears to be a willing seller.

MAP

Adjacent to this property a .9 acre piece should be deleted from the park and allowed to remain with the owner's property.

3. In the vicinity of the manager's residence there are two 8 acre (approx.) parcels of land. The railroad tracks in the south-east corner of the park provides an excellent boundary. Therefore, the 8 acre (approx.) parcel that is west of the tracks should be deleted from the park while the 8 acre (approx.) parcel to the east should be added.

4. However, parks should be surrounded by a buffer to keep 20th century development from intruding into the outdoors environment. When park boundaries are not formed by recognizable features or when boundaries are intersected by public roads, it jeopardizes the ability of the manager to supervise and create the protected environment that parks should be.

   Therefore, a major deletion is planned (approx. 760 acres) on the bluff closest to Frontenac Station. It is proposed that CSAH 2 form much of this boundary. However, in order to protect the state's investment to date, it will be essential that Goodhue County enact strong zoning ordinances and designate only compatible uses adjoining the park. DNR Forestry would be a welcome neighbor to the park.

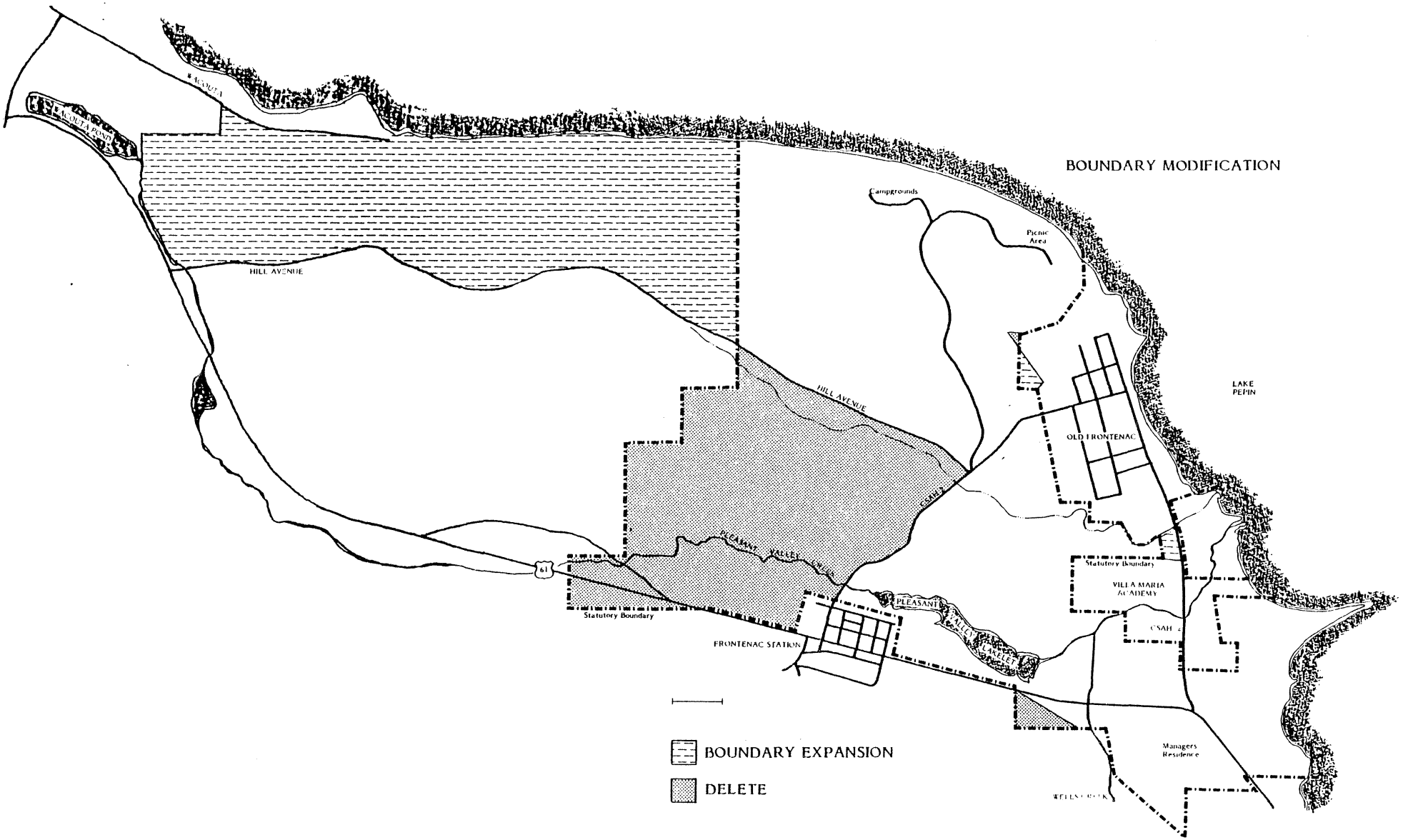
5. The bluffs above Frontenac were actually islands as Glacial River Warren roared through this area. At this time the DNR has parts of two bluffs. A boundary modification should be authorized which incorporates a single entire bluff (an addition of approximately 900 acres). The boundary would extend from Lake Pepin to Hill Top Road except where considerable private development has taken place. These residences would be excluded from the park.

   This addition would provide badly needed trail facilties for park users (see Trails and Horseman Campground and Day Use Facility, page 112). Linear trails could be developed which take advantage of the breath taking views of Lake Pepin. The scale and climatic considerations makes this area best suited for horses (winds make it bugfree) and snowmobiles (too steep and cold for cross country skiers).

6. Villa Maria makes an ideal neighbor to this state park. Their desire for seclusion in order to heighten spiritual awareness is compatible with outdoor recreation within a natural state park. Although environmental education is not currently being stressed there, there may be a day when this becomes a reality.

   For years Villa Maria served as a girls academy. However, a fire in destroyed the and the school has had to be closed. Since that time Villa Maria has been serving as an inter-faith spiritual retreat house. The Ursaline Sisters there also go into neighboring communities doing catechetical work. In addition, a summer girls' group camp has been constructed to the rear of the main building. The Ursalines have no immediate intention to leave Frontenac.

   However, due to the strategic location of their property (practically surrounded by park) it is essential that the state purchase the land if and when it ever becomes available. It is therefore recommended that the Villa be included within the state park at the first appearance of financial difficulty for this institution (approx. 140 acres). Otherwise, it is recommended that the park support the Villa in any way possible.


BOUNDARY MODIFICATION
Campgrounds
Picnic Area
HILL AVENUE
HILL AVENUE
LAKE PEPIN
OLD FRONTENAC
61
Statutory Boundary
VILLA MARIA ACADEMY
Statutory Boundary
FRONTENAC STATION
Managers Residence
BOUNDARY EXPANSION
DELETE

IMPLEMENTATION OF THE MANAGEMENT PLAN

Once the management plan has been completed, it is important that it be implemented correctly and that the cooperation between the Parks staff, Regional staff, local officials and the public continues so that the plan is kept current, remains on schedule, and becomes a reality.

The implementation is contingent on funding provided for maintenance, operation, development and acquisition. The Parks staff will continue to monitor the recommended management within the plan, gather new data and make changes to the plan when necessary to improve the management of the unit. In order to continue this cooperation and planning effort, the following responsibilities have been established and must be followed in order to best implement this plan.

REGIONAL OFFICE

The Regional Administrator and staff will be diretly responsible for supervising the physical implementation of this plan.

Specific Requirements

1. The Regional Administrator will be responsible for assigning qualified staff to help implement appropriate sections of this management plan. Expertise is important. For example, the District Forester, and Wildlife Managers, should be involved in the implementation of the vegetation management and wildlife portions of this plan, and other specialists consulted on appropriate aspects of implementation.

2. The Regional Park Supervisor will be directly responsible to supervise and direct the Park Manager to assure that the management plan is implemented correctly.

3. The Regional Park Supervisor will continuously field inspect all management improvements of the park and report his findings to the Director of Parks and Recreation and to the Regional Administrator.

4. The Regional Park Supervisor will submit a written report to the Director of Parks and Recreation and to the Regional Administrator on the success and problems confronted in implementing this management plan each year.

5. The Regional Park Supervisor must present any recommended change (additions, deletions, modifications) to the Director for approval before such change can be implemented.

PARK MANAGER

General

It will be the responsibility of the Park Manager, under the direct supervision of the Regional Park Supervisor, to coordinate the physical implementation of the management plan. He will continue to inform the Regional Supervisor and Parks staff of the progress of the implementation of the management plan through project proposals and annual written progress reports, or more often as necessary.

Specific Requirements

1. He will seek the assistance of the Regional Supervisor and Parks staff in the resolution of any major problems he may find during the course of plan implementation.

2. If the manager is uncertain or concerned with the recommended management of a specific item within the plan, he will inform the Regional Park Supervisor and Director.

3. The Park Manager will assist and give direction to assigned field personnel responsible for implementing the appropriate sections of this management plan.

4. The Park Manager will maintain records on the accomplishment of specific items of this plan to assure future continuity and to provide reference for up-dating and revisions of the plan.

5. The Park Manager will initiate project proposals as necessary to assure implementation of the plan.

PARK PLANNING STAFF

General

The Director will be directly responsible to monitor the implementation, and continue the up-dating and revisions of the plan.

Specific Requirements

1. The Parks staff will monitor the physical implementation of this plan. They will review all detailed Engineering drawins which will be signed by the Director prior to their implementation and considered as part of the total plan.

2. The Parks staff will field inspect all new improvements within the park and report their findings to the Director.

3. The Parks staff will work directly with the Regional Office, (the Regional Administrator, and the Regional Park Supervisor, etc.) in the physical implementation of the plan.

4. The Parks staff will continue the necessary coordination with the public and local officials in improving the plan.

5. Changes and/or modifications to the approved plan will be processed through the Director following the procedures used in developing the original plan.

PROJECT PROPOSALS

Project proposals will be submitted for review, approval and monitoring as follows, to assure implementation of and compliance with the management plan:

1. Projects specifically detailed within the plan are considered approved and project proposals will be submitted to the Region and Parks staff for reviewing, compliance with the plans and for monitoring the implementation progress.

2. Development projects (force account) specifically funded will have project proposals submitted to the Region for approval and funding, and to the Parks staff for review and monitoring.

3. Projects not specifically detailed within the plan, or specifically funded, will have project proposals submitted to the Region and Parks staff for approval, review and monitoring.

FRONTENAC DEVELOPMENT

	BIENNIUM					
VEHICULAR CIRCULATION	1978-79	1980-81	1982-83	1984-85	1986-87	TOTAL
Road-Entrance to Visitors Comples (.7 mile)[1]- Asphalt						
Bridge (over Wells Creek)		125,000				125,000
Grading and Surfacing		175,000				175,000
Visitor Complex to Existing Contact Station (.7 mile)-Asphalt						
Bridge (over intermittent stream)		60,000				60,000
Overpass (over CSAH #2)		100,000				100,000
Grading and Surfacing		75,000				75,000
Campground #1 to Horsemen's Campground (.7 mile)[2]-Asphalt					60,000	60,000
Visitor Complex to Point au Sable (.6 mile)[1]- Asphalt						
Overpass (over CSAH #2)			100,000			100,000
Grading and Surfacing			65,000			65,000
Point au Sable to Boat Launch (.3 mile)[1]- Gravel						
Bridge (over intermittent stream)				60,000		60,000
Grading and Surfacing				20,000		20,000
Parking Lots - Point au Sable (Cap. 50)[1]- Gravel			15,000			15,000
Visitor Complex (Cap. 50) - Asphalt				10,000		10,000
ADMINISTRATIVE STRUCTURES						
Phase 1 - Park Office and Contact Station		50,000				50,000
Phase 2 - Interpretive Headquarters and Winter Trail Warming Room				30,000		30,000
Manager's Residence (Proposed)					60,000	60,000
Manager's Residence (Existing)	3,000					3,000
Service Center						
30' x 50' Service Building					50,000	50,000
Grading and Miscellaneous					20,000	20,000
30' x 50' Cold Storage					30,000	30,000
Gas/Oil Storage					5,000	5,000
Well					10,000	10,000

	BIENNIUM					
	1978-79	1980-81	1982-83	1984-85	1986-87	TOTAL
USE AREAS						
Campgrounds (semi-modern) Campground #1 (existing)						
Handicap Use Rehabilitation of Sanitation Building	3,000					3,000
Semi-Modern Campground #2 (Cap. 45)				135,000		135,000
Horseman Campground and Day Use Area					65,000	65,000
Pioneer Group Camp						-----
Picnic Area (25 additional tables)				2,000	1,750	3,750
Handicap Use Rehabilitation of Sanitation Building	3,000					3,000
Trails	74,000	16,000	20,000	20,000	20,000	150,000
INTERPRETIVE DEVELOPMENT						
Council Ring		3,000				3,000
Point au Sable Parking Lot Displays [1]			10,000			10,000
Point au Sable Self Guided Trail Displays [1]				3,000		3,000
Miscellaneous Equipment	1,000	1,000	1,000	1,000	1,000	5,000
Historical and Cultural Study	3,000					3,000
Birdwatching Blinds [1]			5,000	5,000		10,000
TOTALS	87,000	605,000	216,000	286,000	322,750	1,516,750

[1] If Legislative Development Restrictions are Removed.

[2] If park boundary is expanded and land purchased.