Cross River State Wayside & Temperance River State Park

Management Plan

Draft

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Produced by the staff of the Office of Planning, Minnesota Department of Natural Resources, September 30, 1982. Funded by the Legislative Commission on Minnesota Resources. Dennis Thompson and Grant Scholen, Park Planners.

LIST OF MAPS

SUMMARY

This plan recommends that Cross River State Wayside and Temperance River State Park be consolidated into one state park unit (retaining the name Temperance River State Park). A recreational state park classification is proposed for Temperance River State Park. This classification directs the park's development and resource management toward providing a potentially large number of people with a broad selection of outdoor recreation opportunities in a natural setting.

Vegetation and wildlife management reflects the limited existing land base and cooperative management with the U.S. Forest Service. Resource actions include revegetating the northern gravel pit, negotiating a powerline right-of-way agreement, and maintaining a maximum abundance of snags (dead standing and downed trees).

The great majority of proposed recreational development is contingent on land exchanges with the U.S. Forest Service. The major exception to this is the relocation of the service court to the northwest side of TH 61. Following land exchanges, the following development is proposed: reconstruction and design of the upper campground, a boat launch on Lake Superior, a primitive group camp, a new contact station /park office, and relocation of the manager's residence.

Trail development will include construction of two bridges on the Temperance River and one bridge on the Cross River. Snowmobile access will be provided through the park along the powerline right-of-way. The main trail along the Temperance River will be upgraded and interpretive signage will be provided. A day use trail will be constructed north of the new boat launch. A cooperative agreement pertaining to all trails in the vicinity will be formalized with the U.S. Forest Service.

Two long range development alternatives are outlined that will guide development on a long term basis. One alternative provides for a TH 61 three lane bridge over the Temperance River and the other calls for an underpass on TH 61. Both alternatives provide one park entrance and more efficient operation of the park.

INTRODUCTION

AN OVERVIEW OF CROSS RIVER STATE WAYSIDE AND TEMPERANCE RIVER STATE PARK

Cross River State Wayside and Temperance River State Park are situated along Trunk Highway 61 in southern Cook County about 81 miles northeast of Duluth. Cross River State Wayside is located adjacent to the village of Schroeder and Temperance River State Park lies about 1.5 miles north of Schroeder. Both units are about 228 miles from the Twin Cities.

Cross River State Wayside was established in 1961 and the statutory boundary encompasses 2,520 acres. The U.S. Forest Service owns 1,920 acres, with the remaining 600 acres in state trust fund ownership. Recreational development in the wayside is limited to trails. The skiing/hiking trail system is connected to the trails within Temperance River State Park. A spur of the North Shore State Trail, which provides for snowmobiling and hiking, also passes through the wayside.

Temperance River State Park was established in 1957 and its statutory boundary encompasses 133 acres. All of the acreage within the park is under the custodial control of the DNR, Division of Parks and Recreation, and the great majority of the land adjacent to the park is owned by the U.S. Forest Service as part of the Superior National Forest. Park development includes 31 semi-modern campsites, 20 primitive campsites, a sanitation building with showers, and 6 to 8 miles of cross country skiing and hiking trails (mileage figures include Cross River Wayside and trails between). The park also provides a picnic area on the shore of Lake Superior. Natural amenities which make Temperance River State Park a very popular recreational site include camping adjacent to Lake Superior and the spectacular geologic formations along the Temperance River gorge.

Cross River Wayside

Temperance

To U.S.F.S. Ski Trails

Cross

Falls

Falls

Falls

Shelter

River

North Shore Trail

Parking

Schroeder

Temperance River State Park

Lake Superior

25

26

30

29

35

36

31

32

6

R5W

R4W

T59N

T58N

BM

BM 701

61

Legend

- Highway
- Gravel Road
- Logging Road
- Statutory Boundary
- Ski Touring & Hiking
- Hiking
- Snowmobile

N

4

Existing Trails

Cross River State Wayside & Temperance River State Park

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

Kilometers: 0, 500m, 1km

REGIONAL ANALYSIS

INTRODUCTION

In order to determine a park's potential role in perpetuating natural resources and fulfilling recreational needs, a regional analysis process has been initiated. The analysis is designed to look at a park's interrelationship with factors such as: accessibility, population, economy, transportation, and other recreational facilities nearby.

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

THE SURROUNDING AREA

Accessibility

It is important to evaluate how accessible Cross River Wayside and Temperance River State Park are to the users when planning for future use. Alternative methods of transportation also need to be considered in light of increased energy costs.

Temperance River State Park is located in Cook County 1.5 miles (2.4 km) northeast of the village of Schroeder and 1.5 miles (2.4 km) southwest of Tofte on Trunk Highway 61 (TH 61). The park is 81 miles (130 km) northeast of Duluth, and 228 miles (365 km) from the Twin Cities. Cross River State Wayside is situated adjacent to the village of Schroeder.

TH 61 is a busy thoroughfare carrying extensive tourist and commercial traffic. Thousands of tourists visit the North Shore area each year. This geographical area is both a destination and a travel route. It is, therefore, very important to analyze how Temperance River State Park fits into the whole recreation system along the North Shore. This recreational system includes federal, state, county, municipal, and private recreational facilities which are linked into a corridor by TH 61. Recreational use along the North Shore is most intense close to the shore of Lake Superior and decreases inland. Use is also highest at those facilities close to Duluth and decreases further north toward the Canadian border. Temperance River State Park is about as far up the shore as a park visitor from the Twin Cities would be willing to drive in one day.

The dramatic increases in gasoline prices in the last few years have affected recreational travel patterns. The recreational use along the North Shore has continued to increase, indicating its attractiveness for vactioners.

Another potential result of higher gasoline prices is the increased use of alternative types of transportation. TH 61 north of Duluth receives considerable use by bicyclists, ~~although the shoulders in some areas are not suitable for bicycle use. If TH 61 is upgraded and paved shoulders developed, a major increase in bicycle use could be expected.~~ MnDoT has recently paved the TH 61 shoulders which a not previously paved. This greatly improves the suitability of TH 61 for bicyclists. There is also a commercial bus route along TH 61. The bus would stop at the park entrance to pick up or discharge passengers.

Population

The area around Temperance River State Park has a very small population base. The 1981 census shows 5,835 people living within 25 miles (40 km) of the park. Local residents make up a fairly small percentage of the total park use. Input from public mettings suggested that the local residents use the park primarily for trout fishing.

Economy and Land Use

The majority of land in Cook County is publicly owned. The following is the approximate land ownership percentages.

	Percent
National Forest	40.6
Boundary Waters Canoe Area	26.1
Misc. Federal	4.6
DNR Parks	.6
DNR Forestry	12.3
Other State Lands	.6
County Tax Forfeit	.5
Private	14.7

As the ownership pattern suggests, both logging and tourism are important to the county's economy.

Supply and Demand of Recreational Facilities

The recreational system along the North Shore includes federal, state, county, municipal, and private recreation facilities which are linked into a corridor by TH 61.

The State Comprehensive Outdoor Recreation Plan of 1979 (SCORP '79) is a 4 year study which identifies recreation patterns and activity preferences on state and regional levels. SCORP '79 surveys were done on the basis of economic development regions. Temperance River State Park is located in Economic Development Region #3. (See map p 9.) This region includes the counties of Lake, Cook, St. Louis, Aitkin, Carlton, and Koochiching. SCORP '79 has ranked the following recreational activities according to Minnesotans' desire for more opportunities to do them.

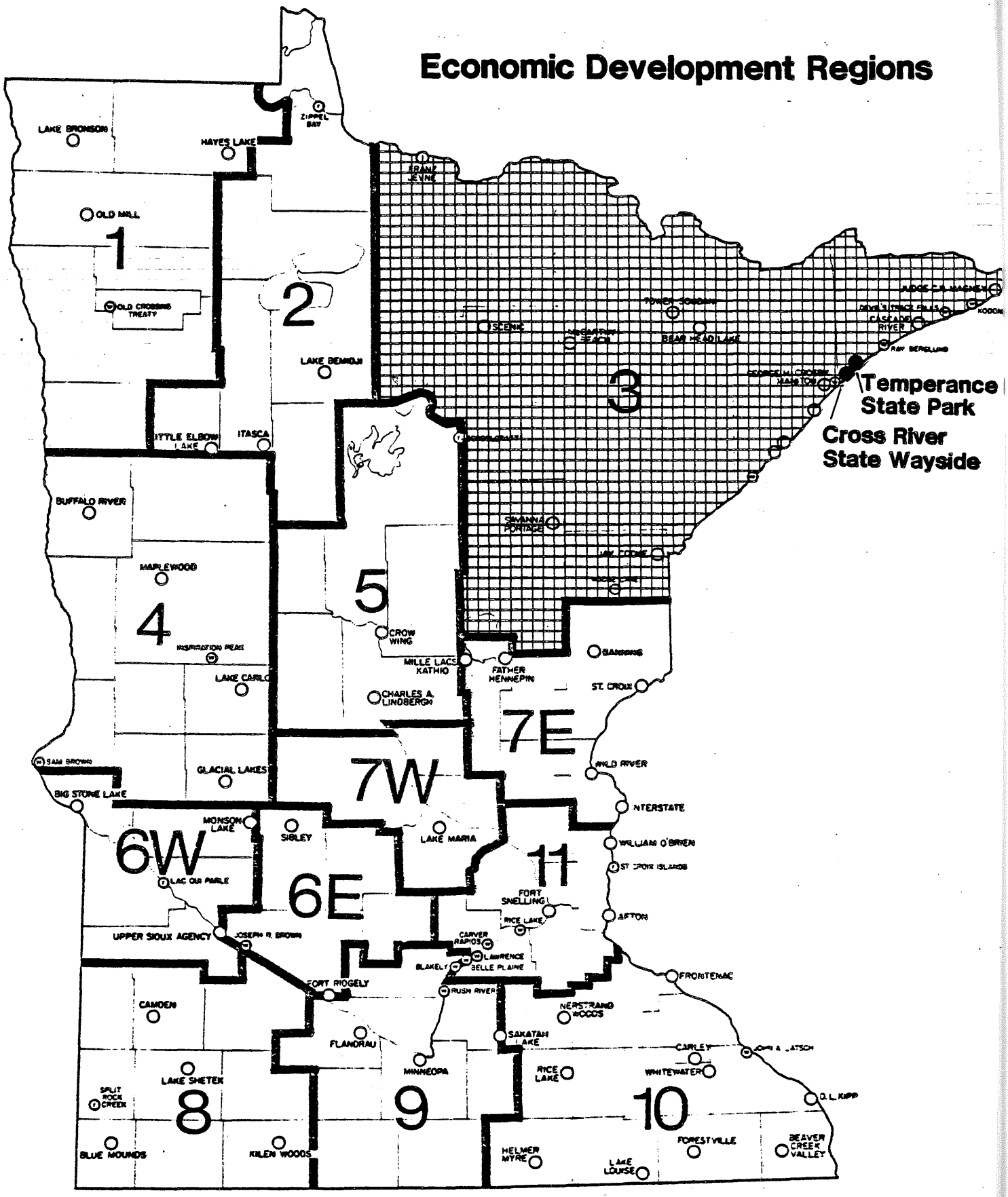
Summer Activities

All Minnesotans	Region 3 Residents
1. Bicycling	1. Camping
2. Camping	2. Fishing
3. Fishing	3. Bicycling
4. Tennis	4. Tennis
5. Swimming	5. Swimming
6. Hiking	6. Boating
7. Picnicking	7. Picnicking
8. Boating	8. Hiking
9. Golfing	9. Golfing
10. Park facilities	10. Canoeing
11. Canoeing	11. Baseball/softball
12. Horseback riding	12. Horseback riding

Winter Activities

All Minnesotans	Region 3 Residents
1. Hunting	1. Hunting
2. Ski touring	2. Ski touring
3. Snowmobiling	3. Snowmobiling

Economic Development Regions



Picnicking

There are several picnic areas within a 25 mile (40 km) radius of the park. The following chart summarizes these facilities and includes the picnic ground in Temperance River State Park.

Administration	Number of Areas	Number of Picnic Sites
MN/DOT	4	5
U.S. Forest Service	6	16
DNR Forestry	1	10
DNR Parks	4	15
Private	4	32
	19	78

A small picnic area is provided near the lake, but most day users do not know it is available. Most of the picnicking in the park takes place on the rocks along the river or adjacent to the highway wayside parking lot. Most local residents use U.S. Forest Service picnic grounds which are free and fulfill their needs adequately, but travelers on Highway 61 would probably not want to use those more remote sites.

Camping

The following table illustrates the camping facilities located within a 25 mile (40 km) radius of the park and includes the two campgrounds in Temperance River State Park.

Administration	Number of Campgrounds	Number of Sites
U.S. Forest Service	12	142
DNR Forestry	2	59
DNR Parks	4	111
Private	5	91

Lake Superior is the main attraction in the area and many campers prefer to camp near it. Of the campgrounds within 25 miles (40 km) of the park, only the following are near Lake Superior.

Administration	Number of Campgrounds	Number of Sites
DNR Parks	3	91
Private	3	82

Trails

Trails are an important part of a person's recreational use of the out-of-doors. Several different agencies provide recreational trails within 25 miles (40 km) of Temperance River State Park.

Land Administrator	Trail Type (in miles)			
	Hiking	Ski Touring	Snowmobile	Horseback
Municipal	-	-	-	-
U.S. Forest Service	120	86	103	-
DNR Trails & Waterways	62*	-	62*	62*
DNR Forestry	25	-	25	-
DNR Parks	27	19	-	-
County	-	18	30	-
Private	24	20	7	-

* These mileage figures include the North Shore Trail which is not totally completed, but is scheduled to be open in 1982.

Temperance River State Park is too small to provide many miles of trails. But, the park's trails are connected to trails in the adjacent Superior National Forest.

Swimming

There are no designated public swimming beaches within 25 miles (40 km) of Temperance River State Park. There are 6 private swimming beaches and one swimming pool, all are associated with resort or motel facilities. The season for outdoor swimming in this area is very short due to the coolness of summer air and water temperatures.


THE
PARK
USER

PARK VISITATION

The following chart shows the use Temperance River State Park has received during the past 10 years. The number of day users is an estimate, while the number of camping occasions is an accurate count.

Year	Day Use Estimate	Camping Occasions	Total Visitation Estimate
1971	57,728	12,339	70,067
1972	76,300	10,735	87,035
1973	92,196	10,674	102,870
1974	99,903	11,843	111,746
1975	108,630	14,109	122,739
1976	98,868	12,892	111,760
1977	124,660	14,588	139,248
1978	148,795	15,806	164,601
1979	108,823	16,274	125,097
1980	97,640	17,114	114,754

A general increase is shown in the camping occasions during most of the last ten years. Some of the camping increase in 1979 and 1980 may have occurred because the campground at Gooseberry Falls State Park was closed for repairs. Day use has decreased from a high of nearly 150,000 in 1978 to less than 100,000 in 1980.

Day use accounts for 85-90 percent of this park's total use. Most of the day users are tourists who stop for a short period of time to hike along the river, or down to Lake Superior.

Temperance River State Park is intensively used from June 15 to August 15. In 1980 an average of 50 campsites out of 51 were occupied each night, or an occupation rate of 98 percent of capacity. This is one of the highest occupation rates of any of the state parks. This intensive use is focused on a very limited land area which necessitates continued management and maintenance to avoid facility and resource degradation.

Cross River Wayside gets very light use during the summer. The Minnesota Department of Transportation (MnDOT) rest stop adjacent to HWY 61 and the Cross River in Schroeder gets very heavy use. However, there is no land connection between MnDOT rest stop and Cross River Wayside.

Cross River Wayside receives most of its use during the winter by cross-country skiers and snowmobilers.

CAMPER PROFILE

Camper registration cards are completed for each campsite which is used by a group of campers. This card records camper name and address, number in party, length of stay and dates the campsite was used. A sample of these cards for the three year period 1977-1979 was taken. The following information on campers at Temperance River State Park was drawn from this sample. This information does not necessarily provide data on individual campers. Information gathered is on each group of campers who register for a campsite.

Eighty-three percent of the campers in Temperance River State Park come from Minnesota. Of these, the majority (58 percent) of campers live in the Twin City metropolitan area. The next highest is Duluth, where about 3 percent of the campers live. The rest of the campers who live in Minnesota (39 percent) are distributed throughout the state. Approximately 17 percent of the campers live in other states, with most coming from Wisconsin, Michigan, Iowa, and Illinois. This is slightly less out-of-state visitors than other state parks. The mean out-of-state use for all the state parks is 28 percent. About 2 percent of the campers in Temperance are senior citizens.

The following chart shows the size of camping groups in 1977-79. This use pattern is typical of the party sizes other parks receive.

Number in Party	Percent of Total Camping Parties
1	4
2	46
3	13
4	19
5	10
greater than 5	18

CLASSIFICATION

THE STATE RECREATION SYSTEM

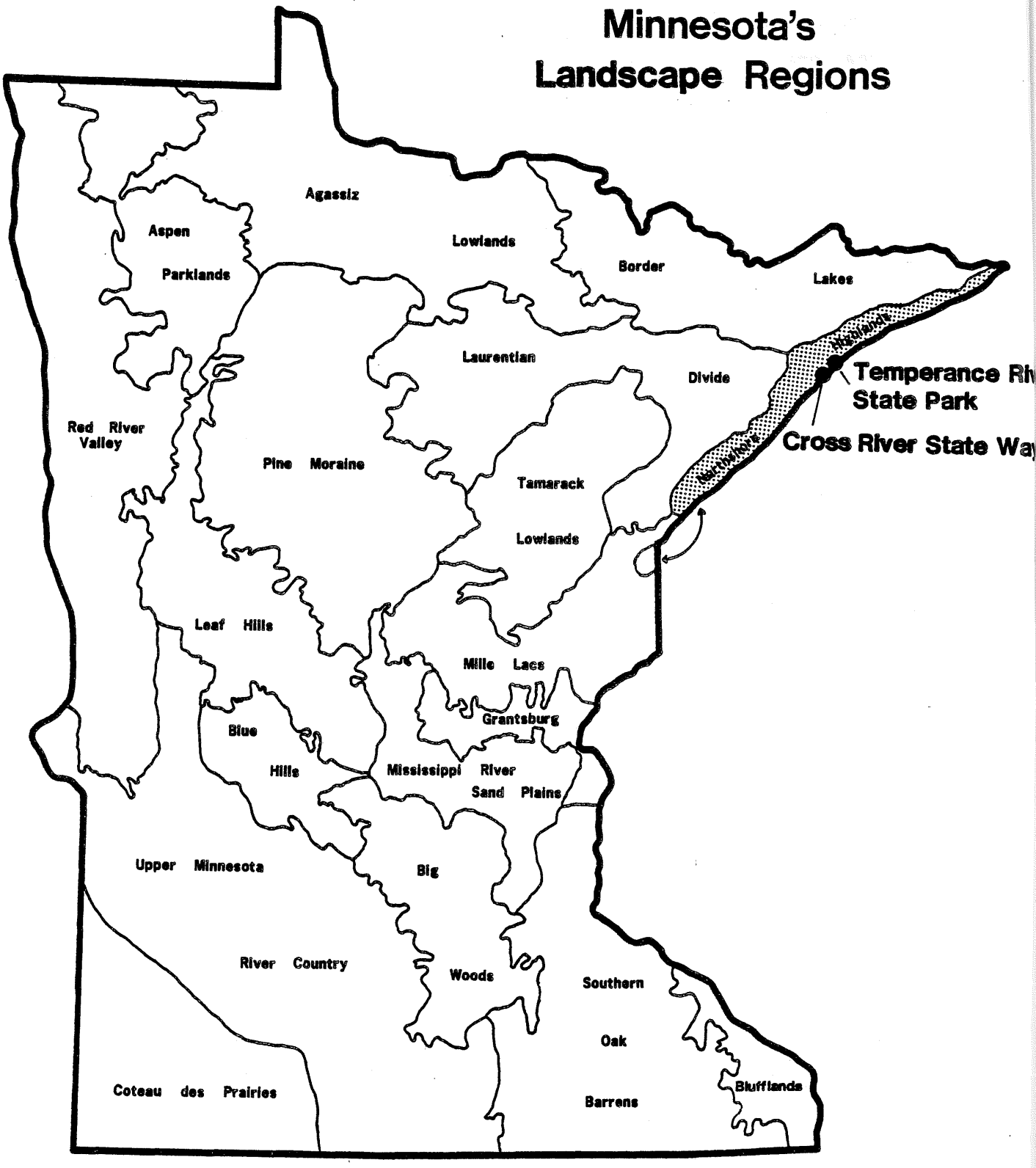
Minnesotans are fortunate to live in a state with such a wide variety of natural, scenic, and historic resources. To ensure public access and to prevent inappropriate development, the state has set aside lands which exemplify these outstanding resources. It is the management goal for all state recreational lands, including state parks, to protect and perpetuate these resources for use by the citizens of Minnesota.

There is a delicate balance which must be maintained when recreational facilities are provided for large numbers of people in areas of outstanding and often sensitive resources. Inappropriate development can result in irreparable damage to the resource. To help ensure this recreation/resource balance, the Minnesota State Legislature established, through the Outdoor Recreation Act of 1975, a classification process whereby each unit in the state recreation system can be identified as one (or more) component in the system. These components are: natural state park; recreational state park; state trail; state scientific and natural area; state wilderness area; state forest and state forest sub-area; state wildlife management area; state water access site; state wild, scenic, and recreational rivers; state historic site; and state rest area. Included in this legislation are general criteria for classifying, planning, and managing each of these components.

Through this classification system the role for each recreational unit in the system is identified. The two primary classifications for state parks are natural and recreational. These two, along with other classifications, are considered during the planning process. The most appropriate is recommended for the park. If a state park does not meet the established classification criteria, the DNR will consider the possibility of eliminating the park from the state recreational system.

LANDSCAPE REGION SYSTEM

The landscape region system divides the state into 18 regions. These regions are differentiated according to the characteristic plant and animal life, landforms, and cultural patterns which existed before, during, and after European settlement. The landscape region system is a framework which


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

provides valuable information useful in the planning of Minnesota's state parks. Temperance River is located in the North Shore Highlands Landscape Region. This region is famous for its bare rock cliffs along the Lake Superior shoreline and for its rushing streams with many waterfalls. This region is a band 6 to 13 miles (10 to 20 km) wide, extending along the North Shore of Lake Superior from the Canadian border to Duluth. The area is bounded on the west by the drainage divide between streams emptying directly into Lake Superior and the headwater streams of the St. Louis and Pigeon Rivers.

Prior to European settlement, this region was covered with four vegetation types. Aspen-birch with scattered conifers and white and Norway pine vegetation types were common. Mixed hardwood pine and conifer bog swamp were less extensive, yet still common. Due to lumbering activities, slash fires and later fire suppression, the dominant forest cover today is aspen-birch regrowth.

Temperance River is an excellent example of the geological character representative of the North Shore Highlands Landscape Region. The vegetation patterns, where undisturbed, are also representative of this region.

CLASSIFICATION RECOMMENDATION

Each state park is managed and developed according to its natural resources and their ability to withstand visitor use. Temperance River State Park is recommended for classification as a recreational state park because it best fulfills the criteria for this designation. This plan recommends that Cross River State Wayside and Temperance River State Park be consolidated into one State Park (see Boundary Modification, p 71).

The Outdoor Recreation Act of 1975 (Minnesota Statute 86A.01 to 86A.11) establishes an outdoor recreational system which will (1) preserve an accurate representation of Minnesota's natural and historical heritage for public understanding and enjoyment, and (2) provide an adequate supply of scenic, accessible, and usable lands and waters to accommodate the outdoor recreational needs of Minnesota's citizens. Recreational state parks are established as one component of this outdoor recreation system.

In keeping with the legislative mandate of the Outdoor Recreation Act of 1975, the Department of Natural Resources has established a goal, objectives, and policies for recreational state parks. It is the goal of the Department of Natural Resources in recreational state parks to:

Provide Lands which offer a Broad selection of outdoor recreational opportunities in a natural setting and which may be used by large numbers of people.

To facilitate meeting this goal, objectives and policies have been described. It is the objective of the Department of Natural Resources to ensure that proposed recreational state parks meet, or have the potential to meet, the following critiera:

A. Possess natural resources, or artificial resources in a natural setting, with outstanding outdoor recreation potential.

   The Temperance River gorge and the shoreline of Lake Superior provide an outstanding recreation setting. This potential is further justified in the location of the campground, which is situated on the shore of Lake Superior.

B. Provide outstanding outdoor recreational opportunities that will attract visitors from beyond the local area.

   The natural resources of this park outlined in criteria A above provide the setting for outstanding recreational opportunties. Besides the campground on Lake Superior, the inland trail system provides spectacular views of the topography of the north shore as well as Lake Superior. The people who camp and hike in this park come from throughout the state (see ~~Park Visitor~~ Camper Profile Section, p 14).

C. Contain resources which permit intensive recreational use by large numbers of people and be of a size sufficient to provide for effective management and protection of the natural and/or artificial outdoor recreational resources, so that they will be available for both present and future generations.

The geologic features which are one of the parks prime attractions can be used by large numbers of people without serious degradation. With careful development and management, the area can be preserved for the use of future generations. The current size of the park is limited, so proposed developments will be contingent on land exchanges which enlarge the park's land base.

D. Be located in areas where they effectively accommodate the outdoor recreational needs of the state population, provided that they complement but are not in place of recreational service normally offered by local units of government and the private sector.

SCORP '79 identifies Economic Development Region #3 as having a greater need for recreational camping, picnicking and trail facilities than any other region in the state. The North Shore corridor provides a spectrum of recreational opportunities administered by the private sector and public agencies (local, state, and federal).

PARK RESOURCES

CLIMATE

Although the Temperance River State Park area is subject to the strong continental weather patterns influencing all of Minnesota, the local climate is moderated by Lake Superior. The water temperature of the lake remains relatively constant throughout the year. The park receives warming breezes off Lake Superior in the winter and cooling breezes in the summer. Generally, temperatures in the Temperance River area are 10 degrees warmer in the winter and cooler in the summer than inland areas of northeastern Minnesota. The following temperatures are from information collected at Two Harbors, Minnesota and should reflect the temperature variations to be expected near Lake Superior in the park. The inland portion of the park is somewhat cooler and is more accurately reflected in temperatures documented at the Duluth Airport.

Temperature Variations

	Two Harbors	Duluth Airport
Mean January Maximum	22°F (-6°C)	18°F (-78°C)
Mean January Minimum	2°F (-17°C)	-1°F (-18°C)
Mean July Maximum	76°F (24°C)	76°C)
Mean July Minimum	53°F (12°C)	53°F (12°C)

Mean Average Extremes/Frequency

Less than 0°F (-18°C) 55 days/year
More than 90°F (32°C) 0 days/year

Precipitation

Annual Total 28 in. (71 cm)
Annual Snow 65-70 in. (165-179 cm)

Prevailing Winds

Northeast - exceeding 30 mph (48 kmph) an average of 30 days during the period from May through September.

The climate of Temperance River area is ideal for recreation throughout the year. The cool summers along Lake Superior make the area ideal for picnicking, hiking, and camping. The moderating effect of Lake Superior tends to extend the normal summer recreation season well into the fall.

Winter recreation conditions are ideal. The season is long, mild, and has abundant snowfall. The area usually has a suitable snowcover for winter sports from the beginning of December until the middle of April. Snowcover in the metro area is usually not suitable until near the end of December and is gone by mid-March.

Source: Kuehnast, Earl L., 1959. Climate of Minnesota. United States Department of Commerce.

GEOLOGY

Temperance River State Park is underlain by basalt bedrock. The basalt is exposed in many places in the park, but particularly along the Temperance River. Basalt is dark in color, black to brown, some dark red-brown. It was formed from lava about 1.1 billion years ago. At that time this part of North America was subject to great tensional forces from beneath, which pulled the earth's surface apart along a zone of fractures which extended from the Lake Superior area southwestward into Kansas and Oklahoma. The lava which formed basalt flowed up out of these fractures to the surface and cooled rapidly. Because of this rapid cooling, basalt is fine grained with closely spaced joints and fractures. Also gas bubbles formed which tended to float to the top leaving small pores (vesiculs) in the upper levels, much like the upper surface of an ice cube. These lava flows were then buried under several thousand feet of later flows. Over time, water slowly seeped down through the upper flows, picking up minerals and depositing these minerals in the pores of the early lava flows. The rocks formed in these

pores are of many different types, but two types of particular interest to collectors are agates and thomsonite. Through time the upper layers of rock were removed by glaciers, weathering, and stream erosion; exposing the areas where agates and thomsonite were formed.

The last glacier started to recede 13,000 years ago. As it receded east into the Lake Superior basin, lakes developed around its margin from melted ice and rain. About 10,500 years ago, Glacial Lake Duluth was formed. This large lake was about 500 feet higher than Lake Superior. While Glacial Lake Duluth existed, it deposited clay sediment on the lake bottom, deltas of sand and gravel were formed at the mouths of rivers and the waves removed loose materials from its shoreline. As the glacier retreated to the northeast, lower outlets were uncovered and the water level began dropping. Beaches and deltas were formed at many different levels as the water level dropped. In what is now Temperance River State Park, the Amasa soil type (map code 512 BC) was formed by a delta in Glacial Lake Duluth.

Park visitors find that one of the most interesting geologic features in the park is the narrow Temperance River gorge with its many waterfalls. The rapidly falling river cut deep potholes in the soft lava of the river bed. Potholes are formed by swirling water carrying sand and gravel which wears away the soft lava. Over thousands of years these potholes were dug deeper and wider, eventually connecting and creating the deep narrow gorge seen today. Some dry potholes can be seen adjacent to the river. These were formed under the river and then left dry when the river moved to a different course, or became smaller.

The general mineral potential of lands in the Cross-Temperance area has been determined by the DNR, Division of Minerals. The area exhibits a fair mineral potential with good geologic reliability. Major metals which may occur in this area are copper, silver, nickel, titanium, iron, and platinum group elements.

SOILS

In general, the soils along the North Shore are poor for development. Most are shallow and often there are springs and seepages. When compared to other soils along the North Shore, the soils in Temperance are quite good, but they still pose some limitations for development.

The following soils map and soil type descriptions were adapted from "Soil Survey of North Shore of Lake Superior Costal Zone Management Area, 1977." This document was written by the USDA Conservation Service in cooperation with Minnesota Agricultural Experiment Station.

Map Code #504 BC Duluth Very Fine Sandy Loam

This deep, well to moderately-well drained soil is formed of loam to clay loam till. Slopes are convex shaped, short and irregular. Duluth soils are about 60 in. (152 cm) deep composed of a surface and subsurface layer 13 in. (33 cm) thick. Natural fertility is medium and the organic content is high due to the microclimate effect of Lake Superior. The main tree species growing on this soil are aspen, red pine, eastern white pine, white spruce, maple, paper birch, and basswood. Construction of structures on this soil is limited by slope and the high potential of this soil to shrink and swell and frost heave. Use of this soil for intensive recreation is limited by erosion and compaction problems.

Map Code #512 BC Amasa Gravelly Fine Sandy Loam

Amasa soil consists of deep, gently sloping to sloping soils with 12 to 24 in. (31 to 61 cm) of loam over 5 to 10 ft (1.5 to 3.1 m) sand and gravel. These soils are found on beaches, terraces and deltas. The main tree species supported by this soil type are quaking aspen, paper birch, Norway pine, jack pine, eastern white pine, and balsam fir. These soils are suitable for the construction of most developments including roads, buildings, and major recreational facilities.

Map Code #890 BD Barto-Mesaba Complex Gravelly Silt Loams

This mapping unit consists of Barto soil 8 to 20 in. (20 to 51 cm) to bedrock. Mesaba soil 20 to 40 in. (51 to 102 cm) to bedrock and Quetico soil 4 to 18 in. (10 to 46 cm) to bedrock in such a complex pattern that it

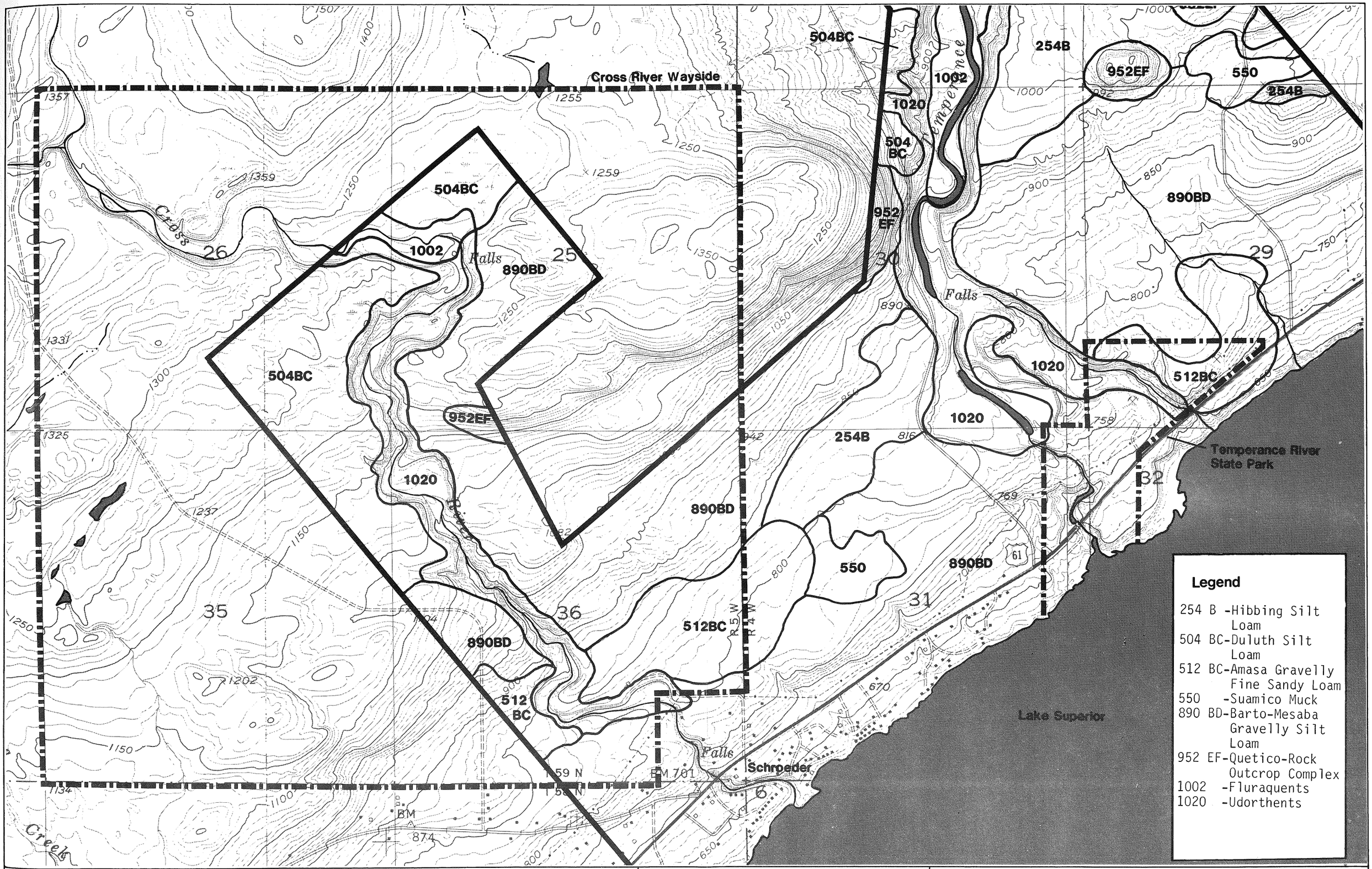
is not practical to separate them in mapping. They are gently sloping to rolling areas and very well drained, although seepage over solid bedrock is common. The main tree species growing on these soils are aspen, Norway pine, eastern white pine, jack pine, balsam fir, and paper birch. Depth to bedrock and slope are often major problems for construction of many structures. This soil complex is so variable in depth to bedrock that test holes may discover isolated areas which are suitable for most structures. These soils have only moderate limitations for campground or picnic area development, and are good for trail construction. Large openings in the crown cover should be avoided, because tree root growth is restricted by bedrock and large rock fragments which allow more chance of windthrow.

Map Code #952 EF Quetico-Rock Outcrop

This mapping unit consists of very shallow Quetico soils and rock outcrops in such a complex pattern that it is impractical to separate them in mapping. The Quetico soils mainly occupy the concave more gentle segments of slopes. They make up about one-third of the area. Rock outcrops occupy the convex and steeper segments of the slopes. Quetico soil is a gravelly silt loam 8 to 24 in. (20 to 61 cm) thick. Surface runoff is rapid and seepage over bedrock is common. North facing slopes support upland timber and south facing slopes are bare to brushy. Main species are aspen, Norway pine, jack pine, eastern white pine, and paper birch. Construction of structures on this soil type is very difficult. Recreational uses, such as hiking trails and dispersed campsites are possible if the site is selected carefully. Erosion is a major problem on steep slopes and should be a major consideration in all facility designs.

Map Code #1020 Udorthents (18-45 percent slopes)

These steep soils are formed in clayey sediment. They are found in long, narrow, V-shaped valleys. In places where the river is undercutting the valley wall, there are landslides and slumping with little soil material or vegetation. Only those stream valleys with an average top width is 300 ft (91 m) or more are mapped. This soil has severe limitations for most uses because of the steep slopes. Recreational uses such as trails are possible. Erosion control is a major consideration when selecting trail alignments.



Soils

Cross River State Wayside & Temperance River State Park

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

Map Code #1002 Fluvaquents

These nearly level soils are adjacent to streams and rivers. They are wet and frequently flooded during spring thaw and following heavy rains. In most places, they consist of stratified layers of loam, sand, and gravel. Organic matter occurs also in variable layers. Included in mapping are small areas that are better drained and not frequently flooded. Also included are some organic soils.

HISTORY/ARCHAEOLOGY

Prehistory

Prehistoric settlement along the North Shore is not well documented because the rocky country and thin soils have not preserved many archaeological remains. Very few remains were discovered during the construction of TH 61. Evidence of prehistoric settlement along the southern shore of Lake Superior (Wisconsin) suggests that humans inhabited this area prior to 5,000 B.C. Very little is known of these cultures except that they worked native copper into spear points and other various objects.

History

Pierre Esprit Radisson and Medard Chouart, Sieur des Groselliers were probably the first white visitors to the North Shore when they travelled up the shore of Lake Superior during 1660. Along with the Ojibwa Indian tribe, the French controlled the North Shore area until 1763. From 1763 to 1803, the British were in control of the North Shore. The first white residents to Lake and Cook County were probably clerks at American Fur Company posts located along the shore in the 1830's.

The Ojibwa called the Cross River the "Tchibaiatigo zibi" or "Wood of the Soul (or Spirit) River." In 1843, Father Baraga, a missionary priest, crossed Lake Superior from the Wisconsin shore and landed safely at the mouth of the river despite a storm. In gratitude, Father Baraga erected a cross at the river. The stream was later named the Cross River because of this incident. The Ojibwa name for the Temperance River was "Kawimbash" or "Deep Hollow River." In an 1864 report, Thomas Clark called the stream the Temperance River because unlike other North Shore streams, this river had no

bar at its mouth. In Clark's words, ".... this stream, never having a 'bar' at its entrance, to incommode (inconvenience or distress) and baffle the weary voyageur in securing a safe landing, is called no bar or Temperance River."

Commercial fishing along the shore produced millions of pounds of whitefish and lake trout between 1880 and the 1920's. After this time, the fishing industry turned to the Superior herring (or cisco), which is still the mainstay of the industry.

The most extensive early settlement and organization of the North Shore territory took place as a result of the logging industry (see Vegetation History, p 33 for additional discussion). Most of the logging took place between 1890 and 1910 when railroads were constructed all along the North Shore between Duluth and the Cross River. The increased accessiblity afforded by the railroads resulted in extremely heavy logging at the turn of the century.

John Schroeder established the Schroeder Lumber Company at the mouth of the Cross River in 1896. The population of this logging camp reached 1,000 between 1904 and 1906, and the logging crews worked mainly on the Cross, Temperance, and Two Island River watersheds. Timber was rafted from the mouth of the Cross River across Lake Superior to the Schroeder Lumber Mill in Ashland, Wisconsin. In the early 1900's a logging dam was located just above the present day TH 61 bridge over the Cross River.

With the decline of the fishing and logging industry, the economy of the North Shore corridor turned to tourism. In 1925, TH 61 was completed and the automobile began to replace the trains, steamboats, and dog teams which were previously the main forms of transportation to this isolated area. Along with taconite and forest products, tourism is still a leading factor in the economy of the North Shore.

WATER RESOURCES

Surface Water

Temperance River State Park is bisected by the Temperance River and bounded on the south by Lake Superior. The rushing river and variable moods of Lake Superior are the natural features which attract visitors to this park.

The Temperance River is 98 miles (157 km) long and drains a 164 sq mile (425 sq km) area. Of all the rivers along the North Shore, only the Brule River drains a larger area. It is interesting to note that both the Brule and Temperance rivers have Brule Lake as their source. Brule Lake is approximately 1,850 ft (564 m) above sea level and Lake Superior is about 600 ft (183 m) above sea level. About half of Temperance River's total 1,250 ft (381 m) drop occurs in the last 4 miles (64 km) of the river. The river drops about 140 ft (43 m) within Temperance River State Park (which is a distance of about 1 mile).

The volume of water coming down the Temperance River varies significantly from a minimum flow of approximately 6 cubic feet per second to a maximum of 2,500 cubic feet per second. The average flow is approximately 150 cubic feet per second.

The narrow gorge through the park is formed by the erosion and eventual connection of many deep potholes. Potholes are formed when the rushing water swirls sand and pebbles which carve holes in the bed of the stream. The stream has changed its alignment in the past as evidenced by the many potholes which are now separated and well above the existing river.

The Cross River drains a total area of approximately 91 sq miles (236 sq km). The river drops an average of 60 ft per mile (11.4 m per km) in its 55 mile (88 km) length. Stream flow data as well as other general information on the Cross River is limited.

Lake Superior has a major influence on the park. It provides a very scenic and dynamic setting, and has a major impact on the weather in the park. Lake Superior covers 31,700 square miles and contains 2,985 cubic miles of water. This makes Lake Superior the second largest lake in the world. The only larger lake is the Caspian Sea.

Ground Water

Ground water in the Lake Superior watershed is highly variable, ranging from good to saline in the bedrock acquifers. The many irregularities and breaks in the bedrock and the different rates at which the various types of bedrock allow water movement, create a large number of independent artesian flow systems. In places, water moves through the aquifers so slowly that large amounts of dissolved materials get concentrated in the water. This is the situation in the vicinity of Temperance River State Park. Wells drilled in the park provide water that becomes more and more salty the longer the well is used.

The park wells are therefore being abandoned and water will be pumped from Lake Superior. The water will then be filtered and treated for park use. Construction of this new system was begun in 1981.

Water Resource Management

The salinity of the park water is currently the major water related problem in the park. The poor water quality in the sanitation building causes maintenance problems and is extremely uncomfortable for campers. No further specific management recommendations are recommended once this problem is corrected.

FISHERIES

Temperance River

Temperance River is a designated trout stream open to angling during the trout season. In the upper portions of the river (north of the park), brook trout were stocked as early as 1910 and brown trout in 1926. Brown and brook trout have established populations in these areas, and stocking of these species was discontinued in 1979 and 1980 (respectively).

Rainbow trout were stocked in the Temperance River between 1928 and 1975. Angler reports during the past few decades have indicated poor to fair rainbow trout fishing. Starting in 1980, large numbers of steelhead fry have been introduced annually into the Temperance River just north of the park. Steelheads are a migratory form of rainbow trout which were imported

from the Pacific Coast. These interbreed with other strains of rainbow so completely that differentiation is now rarely made in inland waters. These fish will swim down to Lake Superior and hopefully return to the mouth of the Temperance River as adults. The first barrier for fish attempting to migrate upstream is located below the TH 61 bridge. The feasibility of creating a fish ladder at this point was studied and rejected in 1981. Reproductive habitat is limited below the barrier, so the stocking of steelheads will have to continue for the Temperance River to remain a steelhead fishery (it will not be a reproducing population).

Chinook salmon were also introduced into the Temperance River during 1980 and 1981. These salmon were introduced in the same vicinity as the rainbow trout, and it is hoped that they too will return to the mouth of the Temperance in the next few years.

Cross River

Cross River is also a designated trout stream open to angling during the trout season. The mouth of the river and the first barrier falls are located outside of the wayside boundary and the majority of the fishing takes place in the first river sector (between Lake Superior and the first barrier). Steelhead and coho salmon are the most popular fish in this portion of the river, with fishing pressure heavy during the prime fishing periods. The upper Cross River, including the segment in the wayside, supports a small population of brook trout and northern pike. Fishing pressure is light in the wayside area. The trout and pike population increases slightly as you travel upriver from the wayside. The Cross River has not been intensively managed or stocked in recent years.

Upper portions of a number of north shore streams including the Cross and Temperance Rivers contain northern pike. This is due to the presence of a number of connecting lakes in the watersheds. The DNR, Section of Fisheries does not promote or manage these northern pike stream populations.

Lake Superior

Lake Superior provides excellent cold water sport fishing. Some of the more popular species include lake trout, steelheads, coho salmon, and chinook salmon. Unfortunately, public access to the lake is limited by a ~~lack~~ lack of an adequate number of boat launches (see Proposed Development, Action #1, p .)

Management

Objectives:

To maintain or improve the present level of fishing opportunities

The DNR, Division of Fish and Wildlife is responsible for fisheries management in the Temperance and Cross rivers. This plan recommends a continuation of the management programs which are currently being implemented by the Fisheries Section.

VEGETATION

Vegetation History

Since the retreat of the last glacier, the vegetation of northeastern Minnesota has been slowly changing. Tundra occurred during the most recent glacial period, followed by a period dominated by spruce forests. Between 10,000 and 11,000 years ago, a general warming trend resulted in a decline in spruce and an increase in Norway pine, jack pine, and birch. During the peak of the warming trend (about 7,000 years ago), the white pine began to appear in Minnesota. Since migration into the area, pine species have remained a part of the regional vegetation. Pine stands were generated by recurrent fires until extensive cutting, slash fires, and fire suppression occurred between 1880 and 1930 (Wright, 1971).

A description of the vegetation prior to European settlement is available in the General Land Office survey records. These records are the field notes of the original surveyors from the late 1800's. As the surveyors walked along the section lines of each township, they recorded tree species and size at one mile and one-half mile intervals. The size, species, location, and frequency of occurrence indicates that the present forest composition is similar to what existed prior to settlement. The following table is a representation of the species mentioned by the original surveyors. Tree size was recorded as the diameter of the tree at breast height (DBH).

Original Surveyer's Notes

Frequently mentioned species	DBH	Occasionally mentioned species	
birch (white?)	(8-14")	sugar maple	(No DBH given)
yellow birch	(13-18")	white pine	" "
spruce (white?)	(5-16")		
fir	(6-11")		
cedar	(6-16")		

Understory shrub species were typically alder, hazel, mountain ash, and "spotted" maple (presumed mountain maple). Cedar and fir were often mentioned as regenerating understory species.

Marschner (1930) used the General Land Survey notes to develop a map of the "original" vegetation of Minnesota. Marschner mapped the entire park area as "aspen-birch," a vegetation type dominated by trembling and big tooth aspen and paper birch. Conifer elements existed either as co-dominants (Norway and white pine and white spruce) or in the understory (balsam fir, white and black spruce, and/or white cedar). In an interpretation of Marschner's map, Heinselman (1975) suggested that the natural successional direction of the aspen-birch type was toward a forest dominated by conifers. This natural successional direction was greatly influenced by natural fires.

The two most influential disturbance factors of the vegetation of northeastern Minnesota have been fires and logging. While logging is exclusively a result of human activity, fires were both human-related and naturally occurring. In recent years, fire suppression has altered the natural fire cycle that existed in presettlement times.

Before logging and settlement, natural fires were the major environmental factor controlling the composition, age, structure, and general appearance of northern Minnesota vegetation. Prior to human inhabitation, fires occurred by natural causes (lightning, extreme heat, and sunlight). Later fires were set by Indians, explorers, settlers, prospectors, and logging crews. Fires on the North Shore occurred in 1850, 1878, 1906, and a very destructive fire occurred in 1910. Annual fires occurred between 1913 and

1918. Very destructive fires occurred in the Cross River area in 1920, 1922, and 1925. A very large fire which encompassed approximately 40,000 acres and burned most of the major river watersheds along the North Shore occurred in 1926 (Kellner, 1963). This was the last fire known to occur in the Cross-Temperance River area, and as a result many charred stumps are still visible in this vicinity.

The first logging operation began near Duluth about 1840, and by 1856 sawmills had been built along the shore as far as Two Harbors and Beaver Bay. Logging began in the Cross-Temperance area in the late 1890's, with the most intense cutting period being between 1900 and 1910. Large quantities of white pine, cedar, tamarack, spruce, black ash, and trembling aspen were cut all along the North Shore highlands. Logging was usually followed by repeated large scale slash fires to clear logging debris. Slash fires are different than natural fires in that generally no mature trees remain to provide a new seed source. As a result, aspen and birch were increased after the logging era, but the presettlement forests also contained a strong aspen-birch element.

Existing Vegetation

Although significant disturbance factors (such as fires and logging) have occurred in the Cross-Temperance River area, surveys indicate that the existing vegetation is similar to the presettlement survey records. Much of the park is considered a northern mesic forest. According to Curtis (1949), this type of forest exhibits a high degree of compositional stability. In addition, much of the logging that has occurred appears to have been select cutting rather than clear cutting. The cover types in the Cross-Temperance study area represent a wide range of topographic sites, from wet lowland areas to dry upland sites. The soils vary from rock outcrop areas to moderately deep loams and clays. This variety of conditions can be directly correlated to the variety of vegetation types that occur in the area. While the wetter areas are characterized by lowland conifer species such as cedar and black spruce, the dryer areas contain more of the aspen and birch components. Sugar maples are more often found in the moderately moist (mesic) areas. There are eight vegetation types shown on the Cross-Temperance Vegetation Map. The map covers three areas: the Cross River Wayside area, the Temperance River State Park area (including the potential shoreline acquisition), and the U.S. Forest Service land which is

situated between the two state units. The entire study area described above includes over 3,000 acres (1,538 hectares). The majority of the land in this study area is owned by the U.S. Forest Service. Because of potential land exchanges with the U.S. Forest Service (see Boundary Modification Section, p 75), the entire 3,000 acre (1,538 hectares) area will be briefly described in the vegetation analysis.

Field surveys by a variety of DNR personnel were conducted in Temperance River State Park during the spring, summer, and fall of 1981. The remaining areas were not field checked, however the U.S. Forest Service provided commercial timber type maps and descriptions for the preparation of this plan. Aerial photos from May of 1978 were also used to delineate cover types. The inventory provided by the Forest Service is based on commercial timber management and provides information as to the size and density of the dominant commercial timber type in a particular area. The entire Temperance River State Park as well as the majority of the remaining study area has been typed by the Forest Service as predominantly white (or paper) birch. The birch cover type will be described in detail, especially as it relates to Temperance River State Park. Because of the limited information available on the other cover types, their descriptions will be relatively short. In determining the following vegetation types, the Forest Service types the area according to which species has 50 percent or more of the total coverage. Hence, if 50 percent or more of the trees sampled in a particular area are birch, the area would be typed Birch (B).

Through the Vegetation Section, refer to the following table in relation to the Forest Service vegetation descriptions.

Size	Hard woods -DBH	Softwoods -DBH
Saplings	0- 5"	0-5"
Pole size	5-11"	5-9"
Saw timber	11" and over	9" and over

Stocking	"Ft^2" basal area*
Poorly stocked	10-39% stocking
Medium stocked	40-69%
Well stocked	70% and over

*Basal area: A measure of dominance in forests expressed as the area of the trunk of a tree at a height 4 1/2 feet above the ground or as the total of such areas for all trees in a given space.

Vegetation Types

Birch (B)

The U.S. Forest Service typed the entire Temperance River State Park area as "well stocked, pole size birch. The majority of the Cross River Wayside and U.S. Forest Service land between the Temperance and Cross River units is typed as medium to well stocked pole and saw timber birch. Roughly 60 percent of the entire 3,800 acre (1,538 hectare) vegetation study area is typed as predominantly paper birch. The following detailed description of the birch community within Temperance River State Park is expected to be similar to the birch areas outside of the park, however the areas outside of the park are located further inland and therefore may contain slightly different vegetation components.

The dominant canopy species in this community is paper birch (8" to 14" DBH), with a constant interspersion of white spruce (6" to 18" DBH). Trembling aspen (6-12" DBH) is commonly associated with the birches and white cedar (10-20" DBH) is present in both lowland areas and on the rock outcrop areas along the river gorge. Another way to visualize the canopy coverage in this area would be:

paper birch	(a)		
white spruce	(c)	(a)	abundant
trembling aspen	(c)	(c)	common
white cedar	(c)	(o)	occasional
balsam fir	(o)		

Although paper birch is the most abundant tree species, there are areas that are dominated by large aspen or spruce trees (12-14" DBH). Small areas (1 to 5 acres) with almost 100 percent canopy coverage of aspen and spruce can be found along the trail loops north of the river (Section 29, SW 1/4 of the SW 1/4).

The most common shrub species in this community are speckled alder, elderberry, thimbleberry, and mountain ash. Mountain maple is also very prolific in the shrub layer. Speckled alder is especially dense along the sunny river edges. Mountain ash is unusually large (4-8" DBH and about 10 to 20' high) along TH 61 and near the Lake Superior shoreline.

Ground cover throughout the park is dominated by large-leaved aster and sarsaparilla. Other common species include fireweed, high bush honeysuckle, bear's tongue, and bunchberry. Shadier areas contain many mosses and lichens, as well as some occasional coral root. Sunnier areas often are vegetated with goldenrods, asters, harebell, strawberry, meadowrue, and interrupted fern.

An interesting variation of this community exists along the ravine in the northern portion of the park. In this area, mountain maple (2-4" DBH) becomes quite dense along the ravine side slopes and also along the rivers. Common ground species along the waterways includes jewelweed, marsh marigold, and bedstraw. Along the slopes, bear's tongue, ground pine, and various mosses are common.

Aspen (A)

The majority of the aspen (trembling and big tooth) communities within the vegetation study area have been described by the Forest Service as well stocked, saw timber stands.

Maple (M)

The majority of the maple (sugar maple) communities have been described as medium to well stocked pole and saw timber stands. These maple stands are situated along the higher north shore ridge, which rises approximately one to two miles inland of Lake Superior in the Cross-Temperance area. Sugar maple has the ability to grow in extremely shady conditions, and it is frequently the leading dominant in many stands along the inland North Shore area.

Lowland Conifer (LC)

Two lowland conifer areas encompassing approximately 80 acres (32 hectares) are located within Cross River Wayside. These stands were typed by the Forest Service as "mixed swamp conifers", comprised of well stocked saw timber. This wet, boggy community is usually dominated by black spruce and white cedar.

Cedar (C)

The one cedar community within the study area is adjacent to a lowland conifer area. This cedar area was described as well stocked saw timber by the Forest Service.

White Spruce (WS)

One small (about 15 acres/16 hectares) area within Cross River Wayside has been typed as well stocked, saw timber white spruce.

Red Pine (R)

About a 40 acre (16 hectare) area within Cross River Wayside has been typed as a medium stocked sapling area of Norway pine. These pines were planted by the Forest Service.

Opening (O)

The three larger (30^{+} acres/12 hectares) forest openings within Cross River Wayside were cut as wildlife openings by the Forest Service. These openings provide more forest edge and forest habitat variety which benefit many wildlife species. In the future, however, the Forest Service plans to plant white spruce in these areas to provide cover for the white-tailed deer population. This will also bring these areas back into timber production.

The four smaller (2 to 7 acre/.8 to 3 hectare) openings located just north of Temperance River State Park were also cut as wildlife openings. These areas were cut about 8 years ago and are now covered with a dense stand of trembling aspen (1 to 4" DBH). In addition to providing edge and habitat variety, the aspen in these areas provide browse for the deer herd.

The Forest Service plans to continue to provide forest openings well into the future. This ongoing program is maintained by firewood permit sales to the public, and the cuts usually are planned within paper birch areas.

Gravel Pits (GP)

There are two gravel pits in Temperance River State Park, hereby refered to as the northern pit and the southern pit. The entire park was at one time owned by the Minnesota Department of Transportation (MN/DOT). With the

Cross River Wayside

Vegetation Study Area

Temperance River State Park

Lake Superior

Falls

Falls

Falls

Creek

Temperance

Cross

Schroeder

T 59 N

T 58 N

R 5 W

R 4 W

BM 701

BM 874

26

25

30

29

36

31

32

35

6

Legend

B	Birch
M	Maple
A	Aspen
O	Opening
LC	Lowland Conifer
R	Red Pine
WS	White Spruce
C	Cedar
G.P.	Gravel Pit

N

40

Vegetation

Cross River State Wayside & Temperance River State Park

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

Kilometers 0 500m 1km

establishment of the park in 1957, the DNR, Division of Parks and Recreation, granted MN/DOT leases to use the pits. After twenty years of mining gravel from these areas (mostly from the northern pit), the lease was terminated in early 1977. In the fall of 1977, however, a major flood along the North Shore washed out many roads, and the northern pit was opened again on an emergency basis. (MN/DOT emergency #88 declared 9/4/77.) In 1978, the pit was leveled and planted with clover and Norway pine. Trembling aspen is beginning to grow in parts of this area. Between 1957 and 1977 the northern gravel pit was used extensively, and it doubled in size from approximately 3 to 6 acres (1.2 to 2.4 hectares). The southern gravel pit has not been mined for several years and it is currently being used as an auxillary shop and storage area.

The U.S. Forest Service maintains a gravel pit just north of the park on the Carlton Peak Road. The Forest Service uses this 2 acre pit and also issues permits to the general public.

Vegetation Management

Temperance River State Park is one of the smallest parks in the state park system. Because of the limited land base, vegetation management projects are limited. The 133 acre (54 hectare) area is currently being used to its maximum recreational development potential (two campgrounds, waysides, and a trail system that covers the remaining area). If a land trade with the Forest Service becomes a reality, the newly acquired state park lands should be evaluated for their vegetation management potential along with their development potential.

Objectives:

To return disturbed areas to natural conditions

To maintain visitor safety within the park

Action #1. Revegetate the northern gravel pit.

Many wildlife species use forest openings habitat. Abandoned gravel pits serve as forest openings and are beneficial to many wildlife species

including ruffed grouse, woodcock, deer, and timber wolves. The wildlife value of the pit should be enhanced by application of a fertilizer. The Forest Service commonly uses a 12/12/12 mixture applied at 400 lbs/acre followed by wildlife-preferred seed mixture planting. In some cases lime is applied at a rate of about 5 lbs per acre.

Traditionally gravel pits have been reclaimed by seeding with a brome grass mixture to cover the area and control erosion. This method does not allow the area to return to its natural condition because the cover grasses maintain themselves and impede natural succession. An interim cover that does not impede succession (such as clover, vetch, and fescue species) should be planted.

The Coastal Zone Management Program, conducted a study on the Environmental Geology of the North Shore in 1977. This study identifies potential sand and gravel sources in the Cross-Temperance area. The MN/DOT should explore alternate sources of gravel in this area. THE MPD will contain a ~~mroe~~ more complete reference to the 1977 Geology study.

The DNR, Division of Wildlife many cost share this project.

	1	2	3	4	5	TOTAL
COST	3,000					3,000

Action #2. Maintain a clearing of vegetation in front of safety signs.

Because of the many potentially dangerous points along the river gorge trail system, a special effort must be made to ensure that all safety signs are visible and readable throughout the year. During the summer season, the vegetation should be cleared well away from the signs to make them visible to the public.

No development cost.

Action #3. Negotiate a permit with the United Power Association (UPA) for the powerline right-of-way (ROW) that currently passes through the Cross-Temperance units.

Several powerline companies have worked in this area in the past, but the existing line is maintained by the UPA. The line was built in 1965, and a permit application was made to the Commissioner of Conservation in February of 1966. No records of the approved permit can be found.

The Division of Parks should negotiate a permit with UPA that is similar to the permit negotiated with Minnesota Power Company between Silver Bay and Taconite Harbor. The permit should allow for shrubs and low growing trees planted in natural appearing clumps near the tree line edge and power poles. The permit should also address the use of herbicides within the ROW. In addition, the ROW through Temperance River State Park should be narrowed if possible. If a permit can't be negotiated, consideration should be given to moving the alignment around the park (in this case the ROW should be revegetated except for a narrow treadway for the existing snowmobile trail).

The permit should take into consideration the proposed development outlined in this plan (see p55&65). Some of the proposed development may be located within the ROW.

As of fall, 1982, the permit negotiation is already in progress.

No Development Cost.

Latin names of common plants mentioned in Vegetation Section text.

Trees

Common name	Latin name
Sugar maple	Acer saccharum
Yellow birch	Betula lutea
Trembling aspen	Populus tremuloides
White birch (paper birch)	Betula papyrifera
White cedar	Thuja occidentalis
White pine	Pinus strobus
White spruce	Picea glauca
Balsam fir	Abies balsamea
Big tooth aspen	Populus grandidentata
Black spruce	Picea mariana
Red pine	Pinus resinosa

Shrubs

Speckled alder	Alnus rugosa
Speckled hazel	Corylus spp.
Mountain maple	Acer spicatum
Mountain ash	Sorbus Americanna
Elderberry	Sambucus spp.
Thimbleberry	Rubus parviflorus

Herbs

Large-leaved aster	Aster macrophyllus
Sarsaparilla	Aralia nudicaulis
Fireweed	Epilobium angustifolium
High bush honeysuckle	Diervilla lonicera
Bear's tongue	Clintonia borealis
Bunchberry	Cornus canadensis
Coral root	Corallorhiza spp.
Goldenrod	Solidego spp.
Aster	Aster spp.
Harebell	Campanula rotundifolia
Strawberry	Fragaria spp.
Meadow rue	Thalictrum spp.
Interrupted fern	Osmunda claytoniana
Jewelweed	Impatiens spp.
Marsh marigold	Caltha palustris
Bedstraw	Galium spp.
Clover	Trifolium spp.

WILDLIFE

The variety of plant communities in the park vegetation study area provides habitat for a diversity of wildlife species. Lowland conifer areas provide a direct contrast to the mixed hardwood/conifer communities. No formal records of wildlife abundance or occurrence have been kept for the park. The DNR Non-game Program, the DNR Forest Wildlife Research program, and inventories conducted by the nearby Superior National Forest personnel were used in compiling wildlife information for the Cross and Temperance River areas. The management plan details (MPD) will contain comprehensive 1981 wildlife species lists that were compiled for the Superior National Forest (includes birds, mammals, amphibians, and reptiles).

Game Species

An overview of some of the larger, more common mammalian game species found along the North Shore is outlined below. In addition to an estimation of the population dynamics for each species, special management consideration are discussed. Much of the following information has been provided by the DNR, Forest Wildlife Populations and Research Group.

Beaver. Beaver census routes on the North Shore streams indicate an average population of one beaver colony per two miles of stream. These populations fluctuate between .4 and 1.5 colonies/mile of stream from year to year. In general, beaver populations have been at a relatively high level in recent years.

Moose. Moose populations immediately adjacent to the shore are generally low, considering the quality of available habitat. The average density for this area is 0.3 moose per sq. mile. However, the area just over the North Shore ridge (inland) is relatively good moose habitat and has moose densities of 1-2 moose per sq. mile. The DNR, Section of Wildlife is currently developing a moose management policy and moose management zones along the North Shore.

White-tailed deer. The North Shore of Lake Superior has been a traditional yarding (wintering) area for white-tailed deer since about the turn of the century. Deer were not endemic in northern Minnesota; they migrated north when the area began to be logged. Population densities during peak white-tailed populations through this area in the 1940's and 50's exceeded 300 deer per sq. mile. As the vegetation in the area has matured its suitability as deer habitat has decreased. Current wintering densities of whitetails may reach 100 deer per sq. mile in some specific areas along the North Shore. Summer densities of whitetails through this area range from 10-20 deer per sq. mile.

One of the problems with deer population along the shore is highway roadkills along TH 61. Several previous North Shore park plans (Tettegouche and Cascade State Parks) have called for actions relating to this problem. If these actions are successful, they should also be implemented at Cross-Temperance.

Black bear. Bear density in the vicinity of the park ranges from .5 to 1 bear per sq. mile. Seasonal concentrations can be higher around desirable areas such as blueberry patches, dumps, and camp sites. These seasonal concentrations will also vary according to the amount and availability of foods over a wide area. It is not unusual for bears to move from 50-75 miles (80-125 km) to find food during years when it is in short supply.

In the Superior National Forest, bear problems occur most frequently in years when wild fruit and nut crops fail due to drought or frost. Despite frequent nuisance problems (such as bears marauding around campsites or scattering garbage) in years of scarce food, injuries to humans have been rare. Nuisance bears are best managed on an individual basis.

Keeping park areas free of garbage, informing campers that black bear are present and not to be taken lightly, and educating campers as to the food habits of the black bear should help to reduce nuisance bear problems in the future.

Non-Game Mammals

The DNR, Non-game Program has developed a preliminary guide to the non-game mammals of northeastern Minnesota. This guide covers DNR Region 2, which includes Carlton, Aitkin, St. Louis, Lake, Cook, Itasca, and Koochiching counties. The following list is adopted from the guide, however it includes species from Lake and Cook counties only. Both counties were included because of the park's close proximity to the Lake-Cook county line.

Species List of Non-Game Mammals from Lake and Cook counties

Insectivores
- Masked shrew
- Arctic shrew
- Northern water shrew
- Pygmy shrew
- Short-tailed shrew
- Star-nosed mole

Bats
- Little brown bat
- Keen's little brown bat*
- Silver-haired bat
- Big brown bat*
- Red bat
- Hoary bat

Other Rodents
- Deer mouse
- Southern bog lemming
- Gapper's red-backed vole
- Heather vole**
- Meadow vole
- Rock vole**
- Meadow jumping mouse
- Woodland jumping mouse
- Porcupine
- Norway rat - E
- House mouse - E

Carnivores
- Marten*
- Short-tailed weasel
- Least weasel*
- Long-tailed weasel*
- Spotted skunk*
- Striped skunk
- Wolverine (?)*
- Cougar (?)*
- Gray wolf*
- Coyote

Squirrels
- Woodchuck
- Thirteen-lined ground squirrel
- Franklin's ground squirrel
- Eastern chipmunk
- Least chipmunk
- Red Squirrel
- Northern flying squirrel*

Ungulates
- Caribou (P)*

Key
- * - Priority species-reports needed
- ** - Priority species-known only in Region #2
- E - Exotic species (not native)
- ? - Hypothetical species (reports not confirmed)
- P - Peripheral (edge of range - one siting during winter of 81-82)

Reports of the rock vole and heather vole in Minnesota are limited to the St. Louis-Lake-Cook county area. The spotted skunk is catagorized as rare by the DNR, Natural Heritage Program (MNHP). Any sighting of these or any of the other species listed as "priority species" should be reported to the DNR, Non-game Program.

The timber or gray wolf is officially listed by the U.S. Fish and Wildlife Service as threatened. Since the early 1940's, Minnesota has had the largest population of timber wolves in the contiguous United States. The Cross - Temperance River area is in the primary Minnesota range of the timber wolf, which includes the Arrowhead Region northeast of a line from Lake of the Woods to Two Harbors. A 1979 survey estimated the total population of timber wolves in Minnesota at about 1200. The DNR, Section of Wildlife developed a management plan for the timber wolf (1980). In the plan, estimates of timber wolves in the Superior Management Unit (includes Cook, Lake, and northern St. Louis counties) were approximately 1 wolf per 17 sq. miles. The Superior Management unit contains some of the best timber wolf habitat in the state. Wolves in Minnesota prey primarily on white-tailed deer, with secondary prey species including moose and beaver.

Reptiles and Amphibians. The following list is adapted from a preliminary guide to the reptiles and amphibians of Region 2 by the DNR, Non-game Program.

Species List of Reptiles and Amphibians from Lake and Cook Counties

Turtles
- Common snapping turtle
- Western painted turtle

Lizards
- None

Snakes
- Red-bellied snake
- Eastern garter snake)
- Northern ringneck snake

Salamanders
- Central (common) newt *
- Blue-spotted salamander
- Eastern tiger salamander
- Red-backed salamander *
- Mudpuppy (?)

Toads
- American toad

Frogs
- Northern spring peeper
- Common (gray) treefrog
- Boreal chorus frog
- Mink frog
- Northern leopard frog
- Green frog
- Wood frog

Key

(?) - hypothetical species (reports needed)

* - special interest species (reports needed)

Any sightings of the species listed as "special interest species" should be reported to the DNR, Non-game Program. All special interest species noted above are catagorized as "rare" by the DNR, Natural Heritage Program.

Birds. The diversity of habitat that was described in the Vegetation Section provides for a great variety of bird species. Each of the communities that were discussed will contain an avian population composed of birds that have adapted to that particular community type. An excellent guide to the birds of the area and their respective habitat types is available from the Forest Service. The booklet is titled the "Birds of the Superior National Forest" by Janet C. Green, Gerald J. Niemi, and Karl P. Siderits (U.S. Government Printing Office: 1978-753.965). This comprehensive guide covers many habitat types including mature deciduous, black spruce-tamarack, and mixed deciduous-coniferous communities.

Breeding bird surveys conducted by the U.S. Fish and Wildlife Service between 1975 and 1979 suggested that 33 Minnesota species reach their highest relative abundance in Region 2E (which is comprised of Lake and Cook counties). These 33 bird species are listed below:

Common loon
Herring gull
Downy woodpecker
*Gray jay
Red-breasted nuthatch
Hermit thrush
*Golden-crowned kinglet
Solitary vireo
Philadelphia vireo
Nashville warbler
*Magnolia warbler
Yellow-rumped warbler
Chestnut-sided warbler
Connecticut warbler
Canada warbler
*Pine siskin
White-throated sparrow
*Red-breasted merganser
Yellow-bellied sapsucker
Yellow-bellied flycatcher
Common raven
Winter wren
Swainson's thrush
Ruby-crowned kinglet
Red-eyed vireo
Black-and-white warbler
Northern parula
*Black-throated blue warbler
Black-throated green warbler
Northern waterthrush
Mourning warbler
American redstart
*Dark-eyed junco

* Considered uncommon and/or of limited distribution in Minnesota (DNR, Non-game Program).

The DNR, Natural Heritage Program recognizes several bird species within Region #2E as "Elements". An Element is a natural feature of particular interest because it is exemplary, unique, threatened, or endangered on a statewide or national basis. These bird elements are listed below.

Common Name	Status
Peregrine falcon (migrant)	endangered
Bald eagle	threatened
Goshawk	rare
Cooper's hawk	rare
Merlin	rare
Great gray owl	rare
Black-throated blue warbler	rare
Common loon	special concern
Osprey	special concern

The North Shore of Minnesota is a corridor route of one of the largest raptor (birds of prey) migrations in North America. During September of each year, hundreds of people gather at Duluth's Hawk Ridge to observe thousands of migrating broad-winged and sharp-shinned hawks. Almost every raptor species known to inhabit or visit Minnesota can be seen during this fall migration. Many of these raptor species pass though the park, however, the most common residents in the Cross-Temperance area are probably broad-winged hawks, barred owls, and great-horned owls.

Wildlife Management

The land base within the present study area that is currently under the administrative control of the Division of Parks and Recreation is limited to the 133 acre (54 hectare) Temperance River State Park. Because this acreage is currently being used intensively for recreation, wildlife management projects will be limited. The Division of Parks and Recreation is fortunate, however to have the Superior National Forest surrounding this state park. The Forest Service is active in wildlife management projects, primarily in providing forest openings within northern hardwood stands. Several openings have been made within Cross River Wayside and also just north of Temperance River State Park (see Vegetation Section, p 39). Should a land exchange with the Superior National Forest become a reality, the Division of Parks and Recreation should continue their wildlife management efforts. The DNR, Section of Wildlife has maintained a good working relationship with the Cross and Temperance River units in the past and will continue this effort in the future.

Objective:

To enrich the existing habitat and increase wildlife observation

Action #1. Maintain a maximum abundance of snags in Temperance River State Park.

In recent years, value of dead trees (snags) to wildlife has been receiving increased recognition. Dead standing and downed trees provide nest sites and dens for many cavity-nesting birds and mammals. Raptors and woodpeckers use snags for perching, feeding, and roosting. As many as 30 mammal species and 13 reptile and amphibian species have been identified as known users of either standing or fallen snags in northern Minnesota (Niemi, 1979). Many of these species are known to inhabit the Cross-Temperance River area. Hazardous limbs in recreational use areas (campground, trails and along river should be trimmed for visitor safety. Leaving an abundance of snags unless they pose visitor safety or physical obstruction problems (roads, trails) will increase wildlife observation for park visitors.

No development cost.

PHYSICAL DEVELOPMENT AND RECREATION MANAGEMENT

RECREATION MANAGEMENT OBJECTIVES

These recreation management objectives are intended to guide the development of recreational facilities in all recreational state parks.

To coordinate park development with private and other public facilities and resources in the vicinity

To limit park development to that which is necessary for efficient management and for the public to experience, study, and enjoy the natural resources

To locate park development where it will have the least impact on sensitive natural, archaeological or historic resources, will not detract from the enjoyment of other users, and will allow easy access to areas of high scenic or study value

To ensure physical accessibility and program usability of new developments by special populations (i.e. persons with physical disabilities, the elderly, and the very young)

To recognize and make efforts to comply with appropriate state, county, and muncipal regulations as they apply to park development and management

EXISTING DEVELOPMENT

Upper Campground

31 semi-modern campsites

1 sanitation building with shower

Lower Campground

20 primitive campsites

Picnic Area

10 tables

Administrative Facilities

contact station

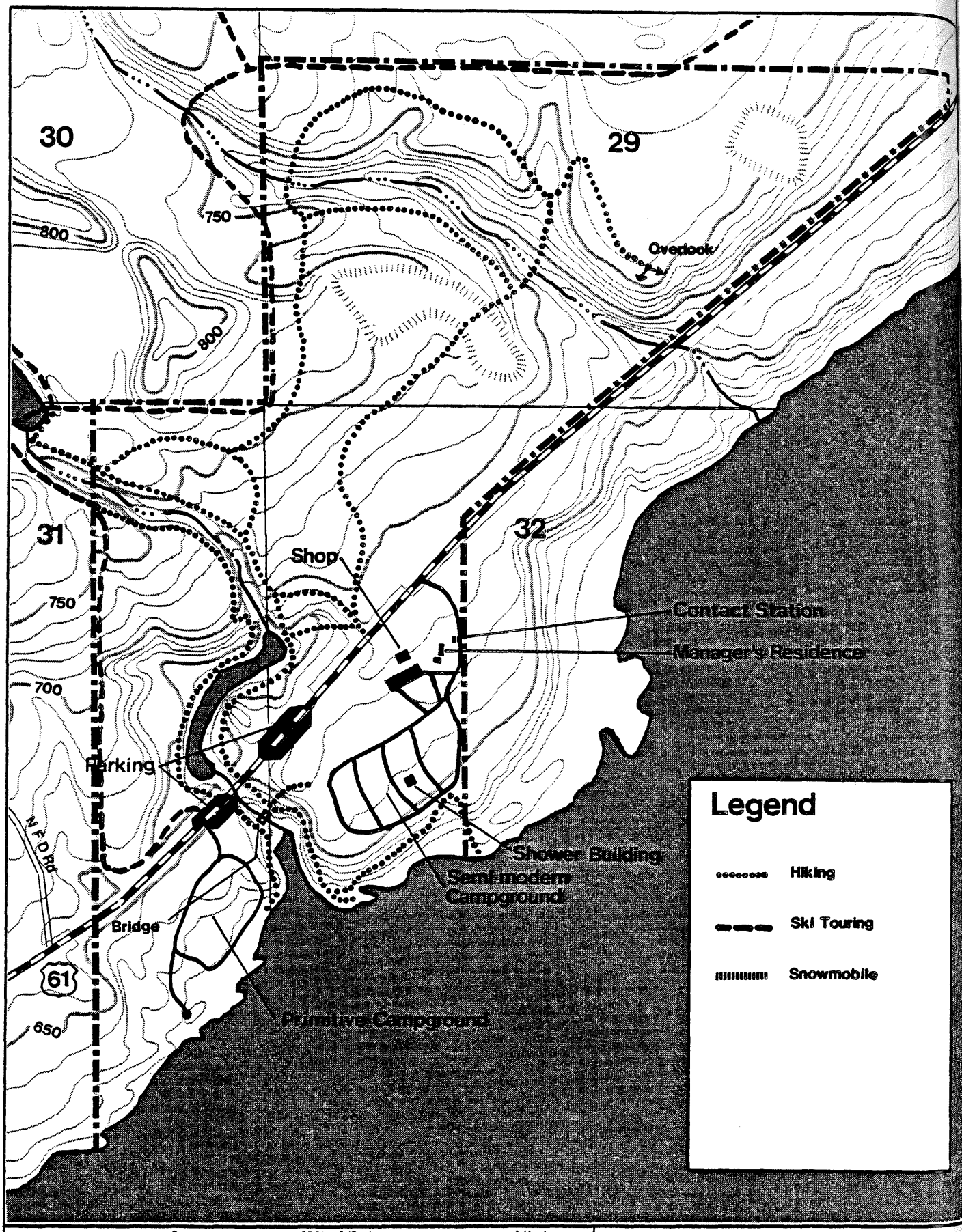
manager's residence

shop/warehouse building

wood shed

oil and fuel shed

house trailer (not in use)



Temperance River State Park

N

Existing Development

Trails (includes Cross River Wayside and trails between)
6 miles of hiking trails
8 miles of cross-country ski trails

Wayside Parking
Approximately 40 single vehicle stalls
plus room for three vehicles with trailers

PROPOSED DEVELOPMENT

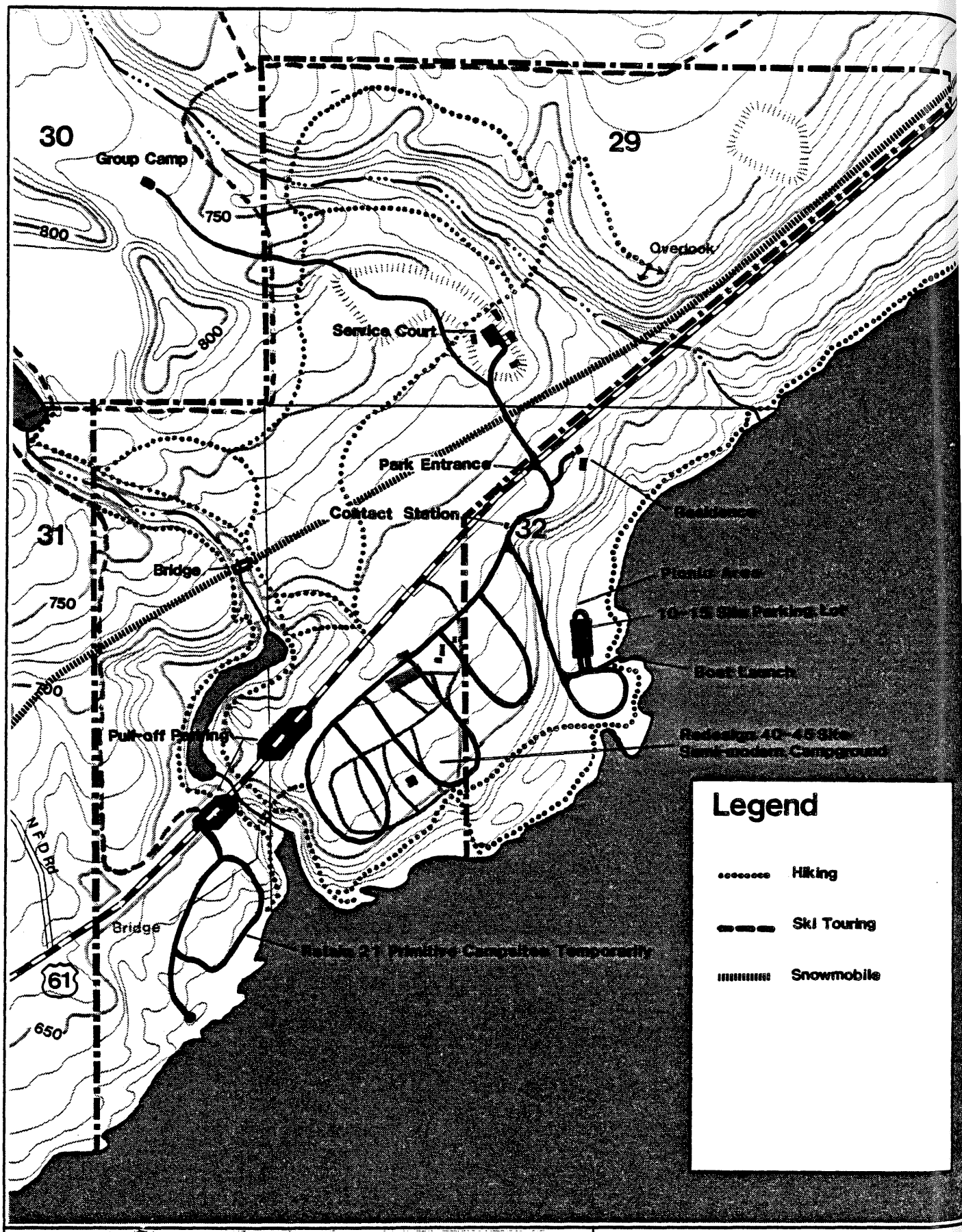
It is important to note that the great majority of the proposed development is contingent on land exchanges with the U.S. Forest Service (see Boundary Modification p 7/).

Temperance River State Park is divided into four different use areas by TH 61 and the Temperance River. The two highest use areas are the two campgrounds between TH 61 and Lake Superior separated by the Temperance River Gorge. The other two areas are the hiking trails on either side of the Temperance River on the inland side of TH 61.

It is not feasible to develop the park to provide vehicular access to all four of these areas from one controlled entrance point. But it is desirable to maintain only one vehicular park entrance and to minimize the amount of pedestrians going back and forth across TH 61.

Two long range development alternatives were selected as having the most potential. Most of the development is the same for both alternatives. They differ only in developments which would probably not be implemented for many years. The following proposed development section includes all the developments which would be implemented in the near future. The long range development section includes the two long range development alternatives.

PROPOSED DEVELOPMENT
Action #1. Develop a boat launch on Lake Superior.



Temperance River State Park

55A

Proposed Development

Public boat access all along the north shore is limited. Although Lake Superior provides excellent coldwater fishing opportunities (several species of trout and salmon), people who wish to fish have difficulty finding a place to launch their boats.

A boat launch should be constructed on Lake Superior northeast of the existing park.

The proposed boat launch area is currently on U.S. Forest Service land which is part of a proposed land exchange (see Boundary Modification, p71). The boat launch should be constructed after the land exchange is completed; however because of the length of time frequently required to complete such exchanges, the DNR, Division of Trails and Waterways should pursue a permit to build the access while the exchange is in process. The DNR, Division of Parks, should work closely with the Division of Trails and Waterways so that the boat launch and access road can work into the overall proposed development outlined in this plan.

The proposed boat launch area is located on a rocky point which has two gravel bottomed cuts in the rock. One cut faces east and the other south. Both these cuts appear to be ready made for use as a boat ramp, although some blasting would be needed in the south facing cut.

The east facing cut appears to offer the best protection from waves and storms. The ramp would be the easiest to construct and would not be visually obtrusive from the lake. Development of a ramp in the south facing cut should not be implemented initially. If in the future it is determined that there are a significant number of days each season when the south facing cut would be a safer launching area then the east one, then the south ramp could be developed. A 10-15 site gravel parking lot will be developed near the boat ramp. The parking lot should be screened from the lake. The site chosen for the parking lot should allow for expansion in the future if demand warrants. A small, day-use picnic area should be provided just north of the parking lot. The access road to the boat launch site from TH 61 will pass the park contact station, providing some protection for boater's vehicles and equipment, and some control over the types of use the area receives. The construction of this boat launch may require a permit from the DNR, Division of Waters.

The access road will have up to a 10 percent grade which may make it difficult to pull very large boats back up to TH 61. The U.S. Army Corps of Engineers has a long range plan to develop a harbor of refuge and upgraded boat launch at Schroeder in the future. When this launch is built, it will accommodate larger boats than the Temperance River launch.

	1	2	3	4	5	TOTAL
COST			10,000			10,000

Action #2. Establish the service court in the gravel pit on the north side of TH 61.

The existing service court area occupies valuable public recreation space and is visually obtrusive for park visitors. The proposed location is out of the high public use area, but easily accessible for the park staff. The area is already disturbed, so native vegetation will not have to be destroyed.

The existing shop should be moved to the new service court location if feasible. Running water for cleaning tools and equipment and an employees toilet should be provided in the shop. A new gas and oil storage building will be built. The parking lot and outdoor storage area can be surfaced with on-site gravel.

	1	2	3	4	5	TOTAL
COST	25,000					25,000

Action #3. Reconstruct a 40-45 site semi-modern campground.

The existing 31 site semi-modern campground should be redesigned to meet current campsite spacing and traffic flow standards. This action can be implemented only if the land exchange with the Forest Service is implemented (see Boundary Modification Section, p 71) and the service court (see Action # 2 p 57) and manager's residence (see Action # 6 p 59) are moved.

The new campground will provide 9-14 more campsites. This will allow reducing sites or eliminating the primitive campground (see Long Range Development discussion p 65) while retaining about the same total number of campsites in the park. The new campsites will be further separated from one another creating more privacy for each site. The campground will be organized into loops rather then lanes, which reduces the amount of traffic past each site. The modern toilet building will no longer be centrally located in the campground so a set of vault toilets should be provided near the northeast side. Because no naturalist program currently exists at the park, organized group use is low. There is good potential for an interpretive program at this park, and the campground design should include a site for the construction of an amphitheater in the future. The area south of the campground between the southernmost camping lane and the lake seems most suitable. The amphitheater location should be situated in such a way that it is not visually obtrusive from the lake.

	1	2	3	4	5	TOTAL
COST		70,000				70,000

Action #4. Develop a primitive group camp.

This park does not currently provide facilities for groups to camp together. This is one of the facilities that is provided in most state parks. It is expected that a primitive group camp in a pleasant setting in Temperance River State Park will receive significant use.

The site selected for this facility (see Proposed Development Map, p 55A) is separated from the rest of the high use portions of the park. Easy access to the trail system can be provided. The vehicular access to the group camp would be provided adjacent to the proposed service court area. This access would provide good control over unauthorized use of the group camp. The amount of traffic to and from most group camps is low enough so it should not pose an inconvenience to park staff in the service court area.

Only a primitive group camp should be developed. The access road should be low grade minimal development, with a 5 car parking lot. Pit toilets, a fire ring, and cleared areas for 5-6 tents will be provided. If future use warrents more development it should be readdressed at that time.

Because this group camp site is currently on U.S. Forest Service land, an area adjacent to the northern gravel pit will be used on an interim basis until land exchanges are completed which acquire the proposed group camp site.

	1	2	3	4	5	TOTAL
COST	500				4,000	4,500

Action #5. Construct a contact station/park office near the proposed park entrance.

The location of the contact station will change when the new campground is developed. The existing contact station is too small to be suitable as a contact station/park office even if moved to the new location.

The contact station/park office will include space for an exterior ticket window, a small inside lobby and ticket counter, space for two desks and toilet facilities. A firewood storage area will be accessible from the outside. Display space for maps, rules and general information should be provided near the building entrance. A typical turnaround and small employee parking lot will also be constructed.

	1	2	3	4	5	TOTAL
COST		80,000				80,000

Action #6. Provide a manager's residence and garage.

The existing manager's residence is in poor to fair condition and located in an area that could be better used as part of the campground. The site selected for the new manager's residence will allow good control of the park entrance and service court even during off hours. The site is a small plateau adjacent to TH 61. The small size and proximity to TH 61 makes this area unsuitable for park visitor use, but desirable for a manager's residence. Consideration should be given to moving the existing residence to the new location or constructing a new one. The new location of the Manager's residence should have a view of the park entrance road and not be visually obtrusive from Lake Superior. The new location should also have a view of the new boat launch area.

The Division of Parks and Recreation is in the process of establishing a policy to deal with managers' residences in state parks. This proposed action should be reassessed when the policy is determined.

Cost: Dependent on option selected

Action #7. Provide temporary toilet facilities adjacent to the wayside, and replace the stone walls.

There is an expressed need for public toilet facilities easily accessible to motorists in the vicinity of Temperance River State Park. MNDOT intends to eventually develop a wayside rest in the area, but it will probably not be developed for several years. As an interim measure vault toilets will be provided at the Temperance River Wayside where the park staff can maintain them.

The low stone walls around the parking lots are in poor condition. To repair the walls would require dismantling and reconstruction which is very expensive. Therefore, the walls will be removed and replaced with large individual stones, or wood timbers to control vehicular circulation. Walkways around the parking lots and across the bridge will also be improved.

	1	2	3	4	5	TOTAL
COST	25,000	(may be cost shared with MN/DOT)				25,000

Trails. The U.S. Forest Service and DNR, Division of Parks and Recreation have been developing an extensive integrated system of hiking and cross country ski trails in the vicinity of Temperance River State Park and Cross River Wayside. Temperance River State Park will act as the main trailhead to access both the park and Forest Service trails.

Action #1. Construct a snowmobile/ski bridge across the Cross River.

A bridge across the Cross River is needed to allow year-round access from the Cross River parking lot to the North Shore Trail. This bridge would also allow access from Temperance State Park to a ski trail if developed on the west side of the Cross River. The best location for this bridge has not been determined, but it should be in the vicinity of the existing North Shore Trail ford crossing.

Cost: To be constructed by the Trails & Waterways Unit.

Action #2. Construct two bridges across the Temperance River.

The hiking use along the Temperance River upstream from TH 61 is focused on the east side of the river. A bridge would encourage use of both sides of the river and reduce the impact. At present, visitors hiking along the river must return on the same side which is not as enjoyable as hiking a loop trail and seeing the river gorge from both sides. One bridge should be constructed near the area where the powerline crosses the river. This allows for about a 1/2 mile hike which is about the length of trail most day users would prefer. Hikers, snowmobilers, and skiers will be able to use this bridge. The second bridge will be constructed below the falls in Section 30 and will be primarily for hikers and skiers. Both bridge locations should be selected where they will not obstruct the most scenic parts of the gorge and where they can be reached by a gently sloping trail. Construction of these bridges may require a permit from the DNR, Division of waters.

	1	2	3	4	5	TOTAL
COST			$40,000			40,000

Cross River Wayside

Temperance

Falls

To U.S.F.S. Ski Trails

Cross

Falls

Temperance River State Park

River

Shelter

North Shore Trail

Parking

Falls

Schroeder

Creek

Lake Superior

25

26

30

29

35

36

31

32

6

R5W

R4W

59 N

58 N

BM 701

BM 874

61

Legend

- Highway
- Gravel Road
- Logging Road
- Statutory Boundary
- Ski Touring & Hiking
- Hiking
- Snowmobile

N

61

Existing Trails

Cross River State Wayside & Temperance River State Park

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

Kilometers: 0, 500m, 1km

Cross River Wayside
Overlook
Overlook
Overlook
See Trails, Action 4
Falls
Temperance
Falls
Bridge
To Tofte
To U.S. 61
Bridge
Temperance River State Park
See Trails, Action 5
Shelter
Overlook
North Shore Trail
Bridge
Falls
Schroeder
Lake Superior
Creek
BM 874
BM 701
T. 59 N
T. 58 N
R. 5 W
R. 4 W
25
26
30
29
35
36
31
32
6
1357
1359
1331
1325
1237
1202
1104
1259
1255
1082
992
907
942
816
789
759
742
670
650
1400
1300
1250
1150
1100
1000
900
850
800
1050
890
61

Legend

Existing

- Ski Touring & Hiking
- Hiking
- Snowmobile

Proposed

- Ski Touring & Hiking
- Snowmobile
- Overlook

N

62

Proposed Trails

Cross River State Wayside & Temperance River State Park

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

Kilometers 0 500m 1km

Action #3. Provide trails suitable for heavy pedestrian use along the Temperance River.

The area along the Temperance River receives very high use by both hikers and fishermen (downstream from TH 61). The existing trails are too unstable and narrow to accommodate the levels of use they receive and should be upgraded.

A surfaced trail should be provided from the Lake Superior shoreline to the proposed bridge near the powerline right-of-way. This trail should have a minimum width of 4 feet (1.2 m) and be wider in areas where people would be apt to stop for a special view. As much of this trail as is feasible should be handicapped accessible. Railings will be provided where the trail runs adjacent to a high cliff.

Ideally, trail work such as low retaining walls, railings and steps would be constructed out of native stone for low maintainence costs and to blend with the existing trail improvements. If stone is not feasible, treated wood will suffice.

The main trail alignment should avoid the very steep slopes and provide the easiest grade possible. Spur trails shall provide access to the overlook areas. Obviously many visitors will take the most direct path, for instance up the rock cliff near Hidden Falls. But the less direct easier route should be readily identified and accessible so that visitors are not led to try climbing areas beyond their abilities.

	1	2	3	4	5	TOTAL
COST	30,000	10,000		20,000		$60,000

Action #4. Negotiate ~~an~~ a cooperative agreement with the U.S. Forest Service on all trails in the Cross-Temperance area that are situated on U.S. Forest Service land.

A cooperative agreement should be reached between the DNR, Division of Parks and Recreation and the U.S. Forest Service in relation to all trails in and between Cross River State Wayside and Temperance River State Park. The Forest Service does not groom their ski trails, but will allow the DNR to

groom those that receive high use. Some of these trails will become part of the state park if the proposed land exchanges are implemented (see Boundary Modification, p 71).

About 4 miles of trail is proposed in and adjacent to Section 25 in the Cross River Wayside (see Proposed Trail map, p 62). This trail system is on U.S Forest Service land that will eventually be incorporated into the new Temperance River State Park consolidation (see Boundary Modification map, p). This area is in the lowest aquisition priority, and a land trade to aquire this property may be well into the future. The development of these trails should be developed in cooperation with the U.S. Forest Service in a fashion similar to the way in which existing trails are managed.

Cost: No development cost for cooperative agreement; trail development and maintenance by DNR and U.S. Forest Service by agreement.

Action #5. Construct a day-use trail north from the new boat launch.

This trail alignment will follow the Lake Superior shoreline. The trail should be designed so that it has the potential to accommodate 5-6 walkin campsites in the future (see Long Range Development, Alternative A, p 66).

	1	2	3	4	5	TOTAL
COST			4,000			$4,000

Action #6. Provide snomobile access through the park.

This trail will begin at the current end of the North Shore trail at the DNR parking lot in Cross River Wayside. It will pass through Temperance River State Park and cross the Temperance River on the proposed bridge (see action #2), and end in Tofte. This trail will follow the existing power line right-of-way. Some grading will probably be needed in short segments.

	1	2	3	4	5	TOTAL
COST				3,000		3,000

Action #7. Provide interpretive signs along the Temperance River.

Two or three interpretive signs should be constructed in key day-use locations along the Temperance River gorge. The signs should describe the geologic history of the area and should be oriented so that the visitor can read the sign and view representative parts of the river at the same time. Posts from and old interpretive trail that are still along the river should be removed as soon as possible.

	1	2	3	4	5	TOTAL
COST				3,000		3,000

LONG RANGE DEVELOPMENT

The following long range development alternatives both fulfill two major planning objectives for this park. They allow the establishment of a park with only one entrance, and allow the removal of the pull-off parking areas adjacent to TH 61.

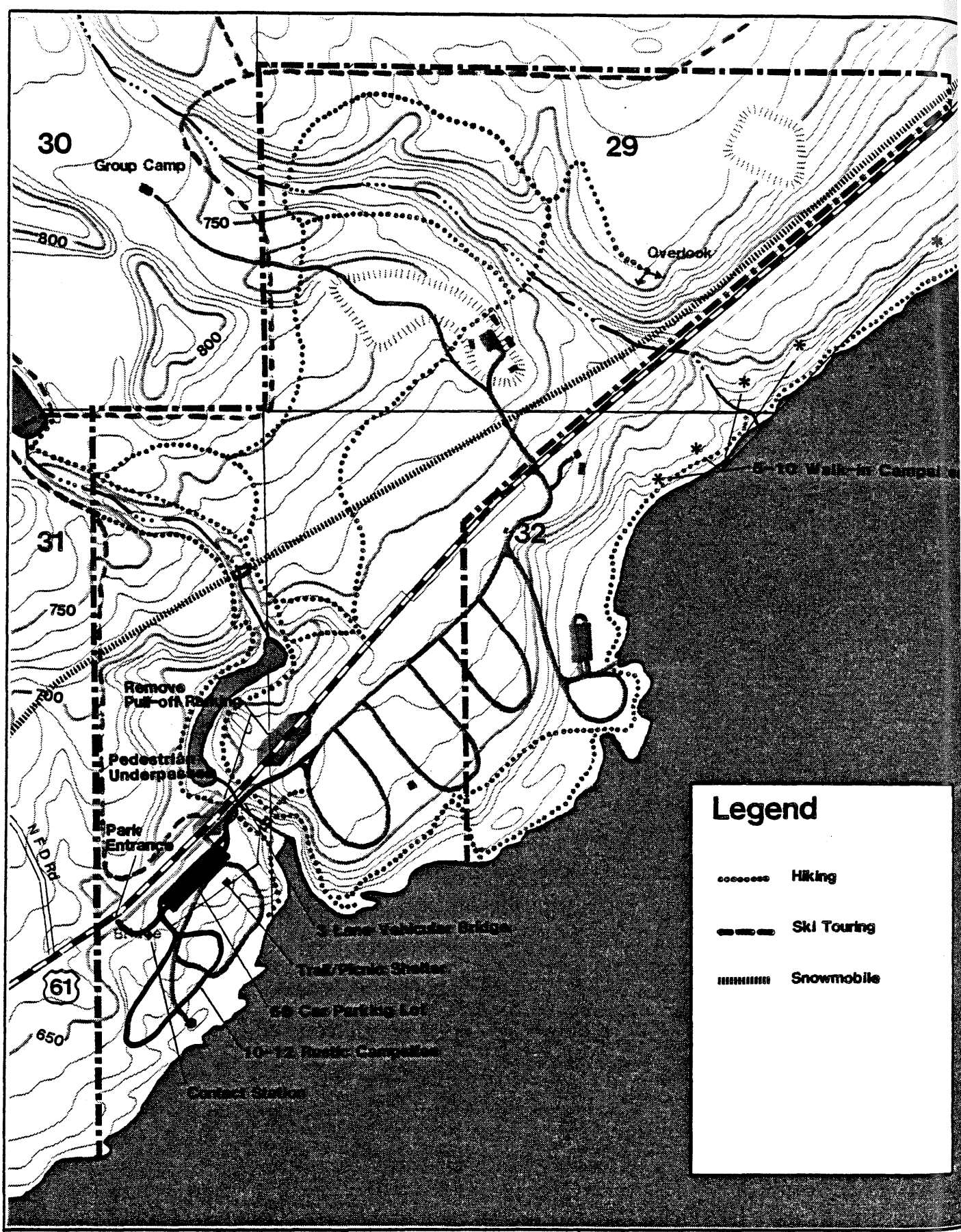
One park entrance ensures that all park visitors have good information on park facilities, rules and regulations. It minimizes vandalism and other disruptive behavior. It also allows more efficient use of park staff.

The pull-off parking areas along TH 61 create a high use area on and adjacent to TH 61. The large number of people going back and forth across the highway and viewing the river gorge from the highway bridge is not desirable. This high pedestrian use slows traffic, poses potential hazards for tourists, and does not provide a quality recreational experience. By providing a parking area removed from TH 61 and pedestrian underpasses, a safer more enjoyable visit to the Temperance River area can be provided.

Alternative A - Connect the two campgrounds together with a vehicular bridge (see Long Range Development Map - Alternative A, p 66).

The following actions would be implemented if this alternative were selected.

- Construct a 3 lane TH 61 bridge over the Temperance River.
- Move the contact station to the new park entrance.



Temperance River State Park

Long Range Alternative A

- Reduce the number of campsites in the lower campground area from 21 sites to 10-12 sites.
- Construct a 60 car parking lot for day use visitors.
- Remove pull-off parking areas adjacent to TH 61.
- Construct a small trail/picnic shelter near the day use parking lot.
- Develop 5-10 walk-in campsites near Lake Superior north of the boat launch site.

This alternative would be considered only if the TH 61 bridge across the Temperance River had to be replaced by MN/DOT. This bridge is not scheduled for replacement, and probably would not be replaced for many years unless a major flood would weaken the structure. It is desirable to connect both campgrounds with a vehicular bridge but it is not desirable to have two adjacent bridges across the scenic Temperance River valley. But if the TH 61 bridge is replaced, a 3 lane bridge could be constructed with only slightly more impact on the river valley than a new 2 lane bridge. The lane closest to Lake Superior would be physically separated from TH 61 traffic and would be used for park traffic only.

The park entrance will be located in the area now used for the lower campground. Visitors will enter, stop at the contact station, drive past the day use parking area and cross the Temperance River on a one way bridge to the main campground. Visitors leaving the campground would have to exit near the manager's residence.

The number of campsites in the lower campground would be reduced from 21 sites to 10-12 sites to make room for the contact station and day use parking.

Five to ten walk-in campsites will be constructed north of the boat launch site. Campers desiring the walk-in campsites will park at the boat launch parking lot and carry their gear to the campsites. The trail will be adjacent to Lake Superior and the campsites should be inland and not visible from the trail.

A 60 car parking lot for day use visitors will be constructed. Once it is in place the pull-off parking along TH 61 can be removed and pedestrian underpasses constructed under TH 61. Having the contact station and day-use parking on the south side of the river will provide excellent park information to both day users and camping visitors. The location of the day use parking lot in this alternative affords good public access to the Temperance River mouth area, however pedestrian underpasses beneath TH 61 would be needed to direct pedestrians to the inland river pothole and gorge area.

A small trail/picnic shelter will be built near the day use parking lot. Its major function will be as a warming shelter for skiers using the park and Forest Service trails in the vicinity. It will also be used as a small shelter for picnickers during the summer. Vault toilets for both winter and summer use should be provided in the vicinity.

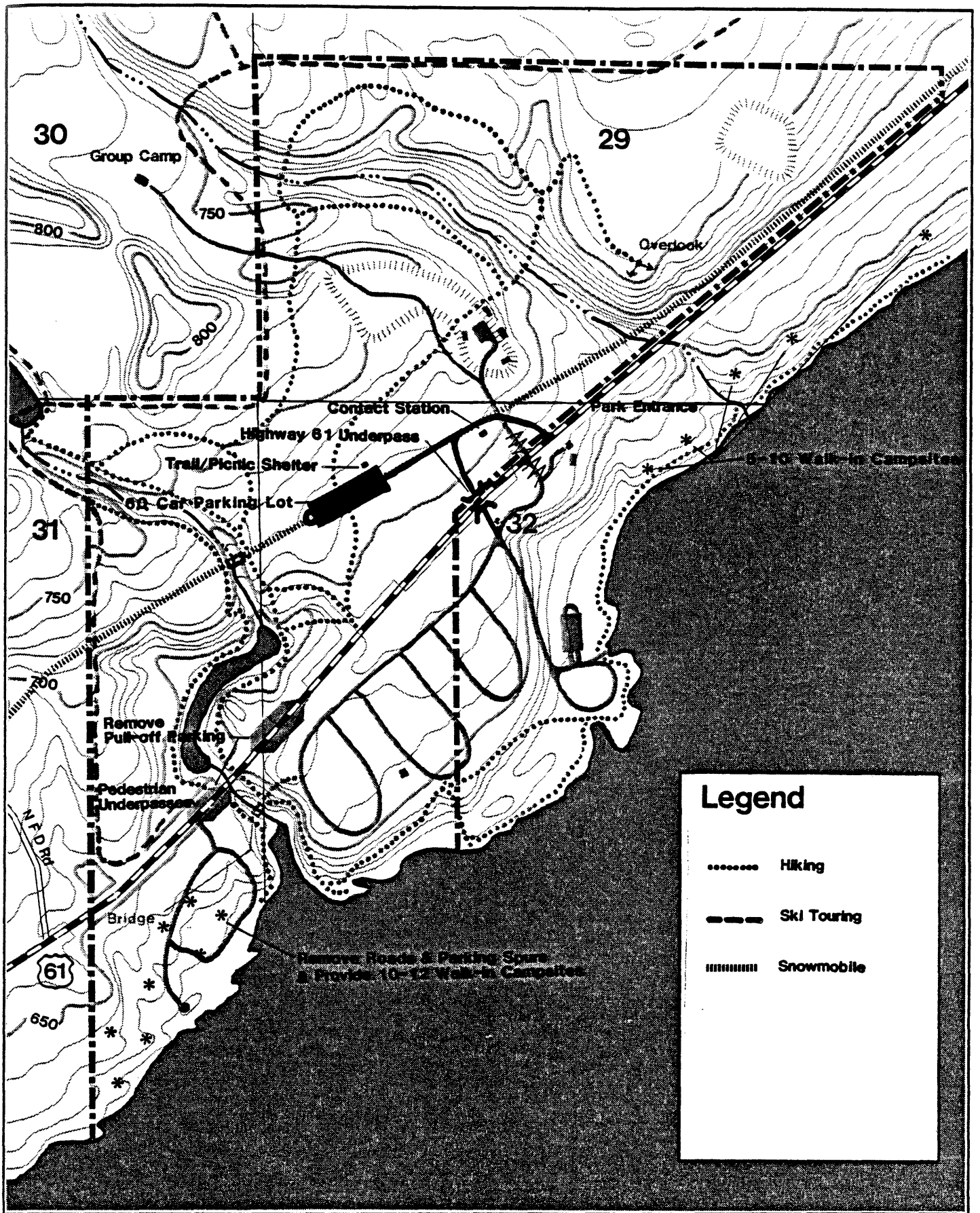
Cost to DNR would exceed $750,000

Alternative B - Construct a vehicular underpass to connect the land on both sides of TH 61 (see Long Range Development Map - Alternative B, p 69).

The following actions would be implemented if this alternative were selected.

- Construct a vehicular highway underpass under TH 61.
- Construct a park entrance road on the northwest side of TH 61.
- Move the contact station to the new park entrance.
- Construct a 60 car parking lot on the northwest side of TH 61.
- Remove pull-off parking areas adjacent to TH 61.
- Remove roads and spurs in the lower campground and redesign for walk-in camping.
- Construct a small trail/picnic shelter near the day use parking lot.
- Develop 5-10 walk-in campsites near Lake Superior north of the boat launch site.

Construction of a vehicular underpass would connect the upper campground area with the land on the northwest side of TH 61. The contact station would provide visitor information and control and the day use parking would be provided for on the northwest side of TH 61, while a controlled, safe



Temperance River State Park

Long Range Alternative B

connection is provided to the southeast side for camping and a boat launch. A camper would enter the park, stop at the contact station, drive past the day use parking lot, under TH 61 and enter the campground.

The contact station would be moved to across TH 61 where it would provide information and control for the day use parking area.

The day use parking lot is situated close to the Temperance River gorge and pothole area. This gorge is one of the most spectacular on the North Shore and one of the main attractions in the park. Once this parking lot is developed, the pull-off parking areas along TH 61 will be removed. The main drawback to this parking lot location is that visitors who wish to fish must carry their fishing equipment approximately 1/2 mile to the river mouth area. Pedestrian underpasses will allow easy access to the mouth area without walking across TH 61.

The lower campground will be redesigned as a walk-in campground. This will allow closing the vehicular entrance to the lower campground, reducing visitor access to the park to one entrance. The existing roads and spurs will be removed and 10 walk-in sites will be developed. Revegetation of the former road and spur areas will be necessary. The number of sites lost in the lower campground will be replaced in the sem-modern campground. The total number of campsites in the park will remain about the same.

Five to ten walk-in campsites will be constructed north of the boat launch site. Campers desiring the walk-in campsites will park at the boat launch parking lot and carry their gear to the campsites. The trail will be adjacent to Lake Superior and the campsites should be inland and not visible from the trail.

A small trail/picnic shelter will be constructed near the day use parking area. Its major function will be as a warming shelter for skiers using the park and Forest Service trails in the vicinity. It will also be used as a small picnic shelter during the summer. Vault toilets for both winter and summer use should be provided in the vicinity. Also display boards for interpretive information should be in or near the shelter.

Cost to DNR would exceed $1,000,000.

BOUNDARY MODIFICATION

Cross River Wayside

Temperance

Falls

Cross

Falls

Temperance River State Park

Lake Superior

Falls

Schroeder

Creek

26

25

30

29

35

36

31

32

6

T 58 N

BM 701

BM 874

1507 1400 1357 1359 1255 1250 1259 1350 1331 1300 1325 1237 1150 1202 1164 1134 1100 942 816 1000 992 907 900 850 890 800 750 769 650 670 61

Legend

- State Park
- State Trust Fund
- Private
- U.S. Forest Service (all areas not toned)

N

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

Kilometers 0 500m 1km

Ownership

Cross River State Wayside & Temperance River State Park

BOUNDARY MODIFICATION

Although Temperance River State Park is one of the smallest parks in the system, it is also one of the most intensively used. The 133 acres (54 hectares) within the park's statutory boundary are all under the custodial control of the Division of Parks and Recreation. The amount of existing development within this park is at or exceeds the maximum development the limited land base can withstand without impairing the resource. The majority of the proposed development is contingent on land exchanges with the Forest Service that would increase the acreage of the park (see Proposed Development, p 55).

There are 2,520 acres (1,020 hectares) within the statutory boundaries of Cross River State Wayside. Three sections (1,920 acres/1,777 hectares) are owned by the U.S. Forest Service. Slightly less than one section (600 acres/243 hectares) is state trust fund land under the custodial control of the Division of Parks and Recreation. Development within the entire wayside is limited to a trail system, 2 three-sided trail shelters, and a rustic grass parking area on the section of trust fund land. ~~(see Trails Section, p____)~~

Management

Objectives:

To include lands into the park which have potential for future trails and park facilities

To consolidate state lands into more efficient units

Action #1. Introduce legislation to consolidate the Cross River and Temperance River units into one state park.

Temperance River State Park and Cross River State Wayside are separated by a distance of approximately one mile. The Temperance and Cross River units would function more efficiently if they were consolidated into one park. The boundary adjustment would also allow implementation of the proposed development at Temperance River (see Proposed Development, p 55). The proposed park boundary would delete approximately two sections of Forest Service land

(most of sections 26 and 35, T59N; R5W) and add Forest Service land in sections 30, 31, and 32 (T59N, R4W). (See Boundary ~~Adjustment~~ Modification Map, p75.) Through the consolidation, there would be a net decrease of about 275 acres within state park unit statutory boundaries. There are no private land parcels within the proposed boundary.

The Forest Service has expressed an interest in a land exchanges with the DNR, Division of Parks. The management plan for Cascade River State Park identifies a land parcel in excess of 500 acres that the Forest Service may have an interest in aquiring. Because Forest Service aquisition priorities have changed since the Cascade River plan was written, other suitable land parcels may have to be identified to complete the exchanges. Forest Service land within the Cross-Temperance proposed boundary has been prioritized in the order in which the lands should be acquired. These prioritized Forest Service lands are outlined in the Map Code below.

Map Code, p___.

1st Priority Land - This parcel of land is about 75 acres (30 hectares) in size, contains about 3/4 mile of TH 61 frontage and ~~just over 1/2 mile of~~ Lake Superior shoreline. This land is the key to the proposed development outlined in this plan (see Proposed Development, p55).

2nd Priority Land - The 2nd priority lands are bounded by a National Forest Development (NFD) road and the existing western boundary of Temperance River State Park. There is a small amount of Lake Superior shoreline and about 1/2 mile of the upper Temperance River within this 140 acre (57 hectare) parcel. The area situated between the NFD road and the Temperance River has good potential as an additional campground site in the distant future.

3rd Priority Land - This 240 acre (97 hectare) parcel contains about one mile of the upper Temperance River. The western side of the parcel is bounded by the NFD road and the area has good trail potential. All of the 1st, 2nd, and 3rd priority lands are riparian lands, and could only be exchanged for other riparian lands in the same general vicinity that offer

National Forest Development Road

Cross River Wayside

Proposed Park Boundary

STATE PARK

Temperance River State Park

STATE TRUST FUND

Lake Superior

Schroeder

Falls

Creek

River

T 59 N

T 58 N

R 5 W

R 4 W

BM 701

BM 874

25

26

29

30

31

32

35

36

1

6

Legend

Exchange Priorities

First

Second

Third

Fourth

N

75 **Boundary Modification**

Temperance River State Park

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

Kilometers 0 500m 1km

at least the same amount of public access to water. The land at Cascade River State Park and the 1st, 2nd, and 3rd priority lands identified here may be a workable trade under the present exchange criteria.

4th Priority Land - This parcel of about 1,190 acres (476 hectares) contains a large hill that has excellent trail potential. The Cross River passes through the western portion of this parcel. A statutory boundary which includes this land will insure the preservation of the Cross River corridor for public use.

Cost: No development cost

OPERATIONS AND STAFFING

OPERATIONS

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

The task of providing services to the public and security for park facilities and resources 24 hours a day, 12 months of the year is monumental. During the busy season, park operations and supervision of park facilities is necessary 98 hours per week (8:00 to 10:00 p.m., seven days a week). During the other seasons the park maintains the same hours, but significantly decreases in visitation, which allows operation of the park by a reduced staff. However, even during the off season, maintenance, repairs and park security are ongoing responsibilities which account for many work hours.

There are four basic aspects to maintenance and operations:

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

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

STAFFING

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

In light of the current federal budget, we cannot predict the availability of CETA personnel in the future. The YACC Program will be drastically reduced in the coming year (60 percent reduction in personnel in 1982). Beyond 1982, the availability of YACC personnel is also questionable.

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

Existing Staff (1980)	Staff Months
Management	
1 full time park manager	12
Maintenance and Operations	
3 seasonal park workers	15 1/2
1 park laborer	5 1/2

The existing staff should be adequate to maintain present park facilities as well as any additional proposals in this management plan.

COST AND PHASING SUMMARY

The following cost estimates were generated in March, 1982. These cost estimates are based on current prices and available information. As new information is made available and as new or modified programs are initiated, revised cost estimates will be prepared to more realistically represent costs at that time. This plan is intended to be implemented in ten years. The phases noted suggest the level of funding to be requested each biennium. But there is no guarantee that this amount of funding would be received from the legislature. Therefore, some change to these phases can be expected. Estimated costs are for individual projects. Costs for some projects may be reduced if they are done in conjunction with other projects.

Action	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
Vegetation Management						
1 Revegetate the northern gravel pit.	$ 3,000					$ 3,000
2 Maintain a clearing of vegetation in front of signs.	No Development Cost					
3 Negotiate a powerline ROW permit with the UPA.	No Development Cost					
Wildlife Management						
1 Maintain a maximum abundance of snags.	No Development Cost					
Proposed Development						
1 Develop a boat launch on Lake Superior			10,000			10,000
2 Establish the service court in the gravel pit on the north side of TH 61.	25,000					25,000
3 Reconstruct a 40-45 site semi-modern campground.		70,000				70,000
4 Construct a primitive group camp.	500				$ 4,000	4,500
5 Construct a contact station/park office near the proposed park entrance.		80,000				80,000

Action	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Total
6 Provide a manager's residence and garage.	Cost contingent on option selected					
7 Provide temporary toilet facilities and replace stone walls at the Temperance River Wayside.	$25,000 (May be cost shared with MN/DOT)					$ 25,000
Trails						
1 Construct a snowmobile/ski bridge across the Cross River.	To be constructed by Trails & Waterways Unit					
2 Construct two bridges across the Temperance River.			$40,000			$ 40,000
3 Construct trails suitable for heavy pedestrian use along the Temperance River.	$30,000	$10,000		$20,000		60,000
4 Negotiate a cooperative agreement with the U.S. U.S. Forest Service on all trails in the Cross-Temperance area that are situated on U.S. Forest Service land.	No Development Cost					
5 Construct a day-use trail north from the new boat launch.			4,000			4,000
6 Provide snowmobile access through the park.				3,000		3,000
7 Provide Interpretive signs along the Temperance River.				3,000		3,000
Phase I Totals	83,500	160,000	54,000	26,000	4,000	327,500
Long Range Development						
Alternative A. Connect the two campgrounds together with a vehicular bridge.			Cost to DNR would exceed $750,000			
Alternative B. Construct a vehicular underpass to connect the land on both sides of TH 61.			Cost to DNR would exceed $1,000,000			