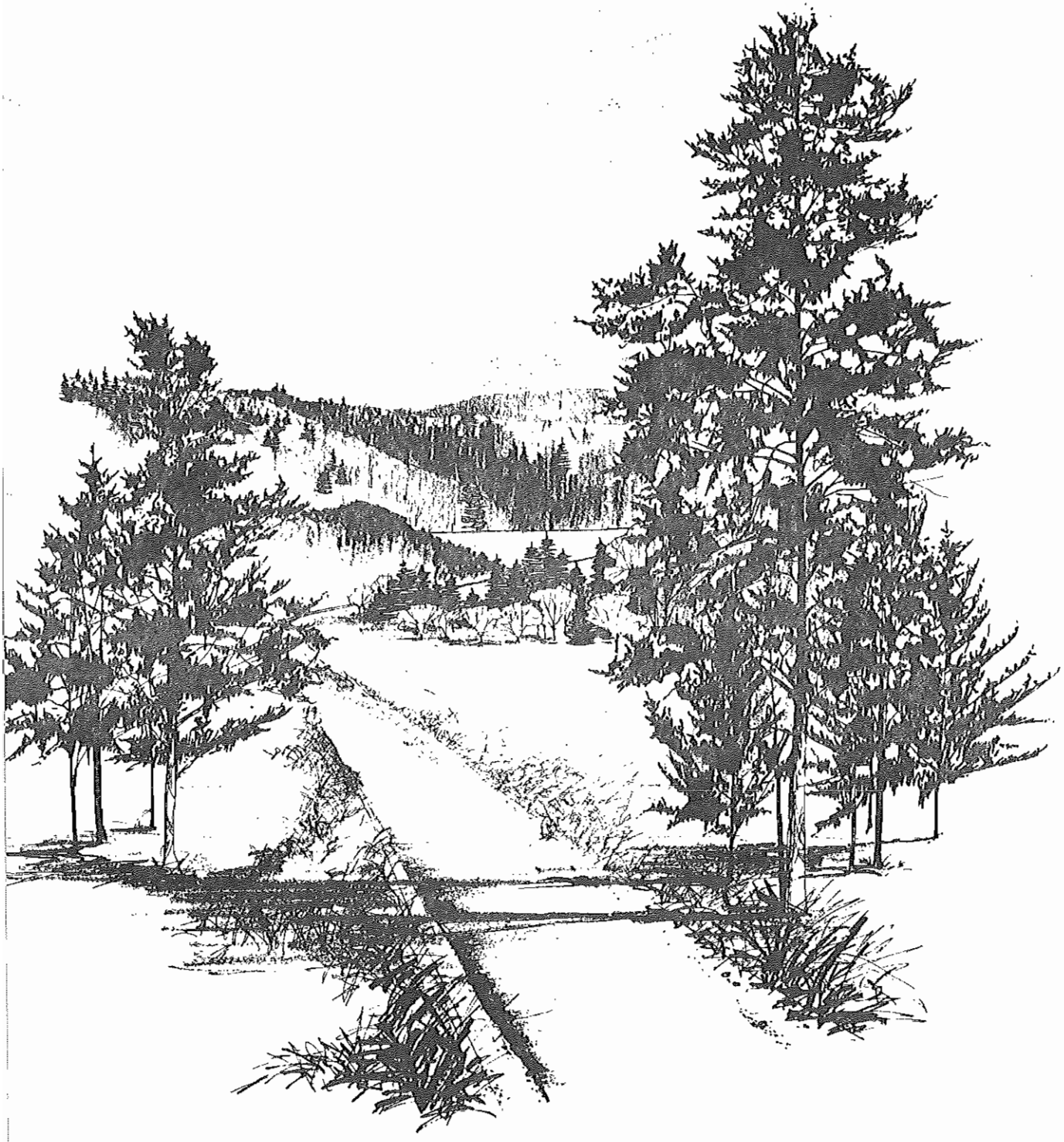
minnesota department of natural resources



master plan for the

heartland trail

Printed - October 1979

Trail Planning Section
Trails & Waterways

master plan for the heartland trail

minnesota department of natural resources

Contents

Due to the specialized nature of some resource data, technical appendices have been compiled. They are available upon request from the:

Minnesota Department of Natural Resources
Trails Planning Section
Space Center - 444 Lafayette Road
Saint Paul, Minnesota 55101

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"Conservation . . . can be defined as the wise use of our natural environment: it is, in the final analysis, the highest form of national thrift -- the prevention of waste and despoilment while preserving, improving and renewing the quality and usefulness of all our resources."

- President John F. Kennedy
Conservation Message to Congress (1962)

The Department of Natural Resources wishes to express its gratitude to those citizens and public servants who have combined their efforts to create this master plan for the Heartland Trail. However, the list is long - far too long to identify individual contributions. The DNR hopes the cooperative spirit that has been evidenced in the plan's finalization will continue into the future, guaranteeing a first rate recreational experience for all users.

The "Heartland Trail Plan" will be filed with and be available from the Documents Section, 140 Centennial Building, St. Paul, Minnesota 55155.

SUMMARY OF RESULTS

PURPOSE

To document the direction of the Heartland Trail's future management as planned by members of the Department of Natural Resources.

SCOPE

This plan concerns itself with general management considerations within the next ten years for the Heartland Trail.

GOAL

To preserve a linear representation of the Pine Moraine Landscape Region for use as a long distance multiple use corridor which complements regional facilities and contribute to statewide recreational goals.

MAJOR ACTIONS

Park Rapids to Walker

- Rehabilitate trail surface.
- Complete trail waysides in Nevis, Dorset, and Akeley.
- Remodel former railroad bridge in Park Rapids for trail use.
- Develop three small rest areas.
- Remodel DNR-owned building in Nevis to be used for trail headquarters.
- Acquire and develop land for a small primitive camping area.
- Acquire and develop marsh observation deck east of Akeley.
- Connect the two trail segments through Walker for bicyclists and through Chippewa for snowmobiles.
- Rehabilitate badly eroded trail side slopes.
- Develop and implement boulevard planting on the right of way in Dorset, Nevis, and Akeley.

Walker to Cass Lake

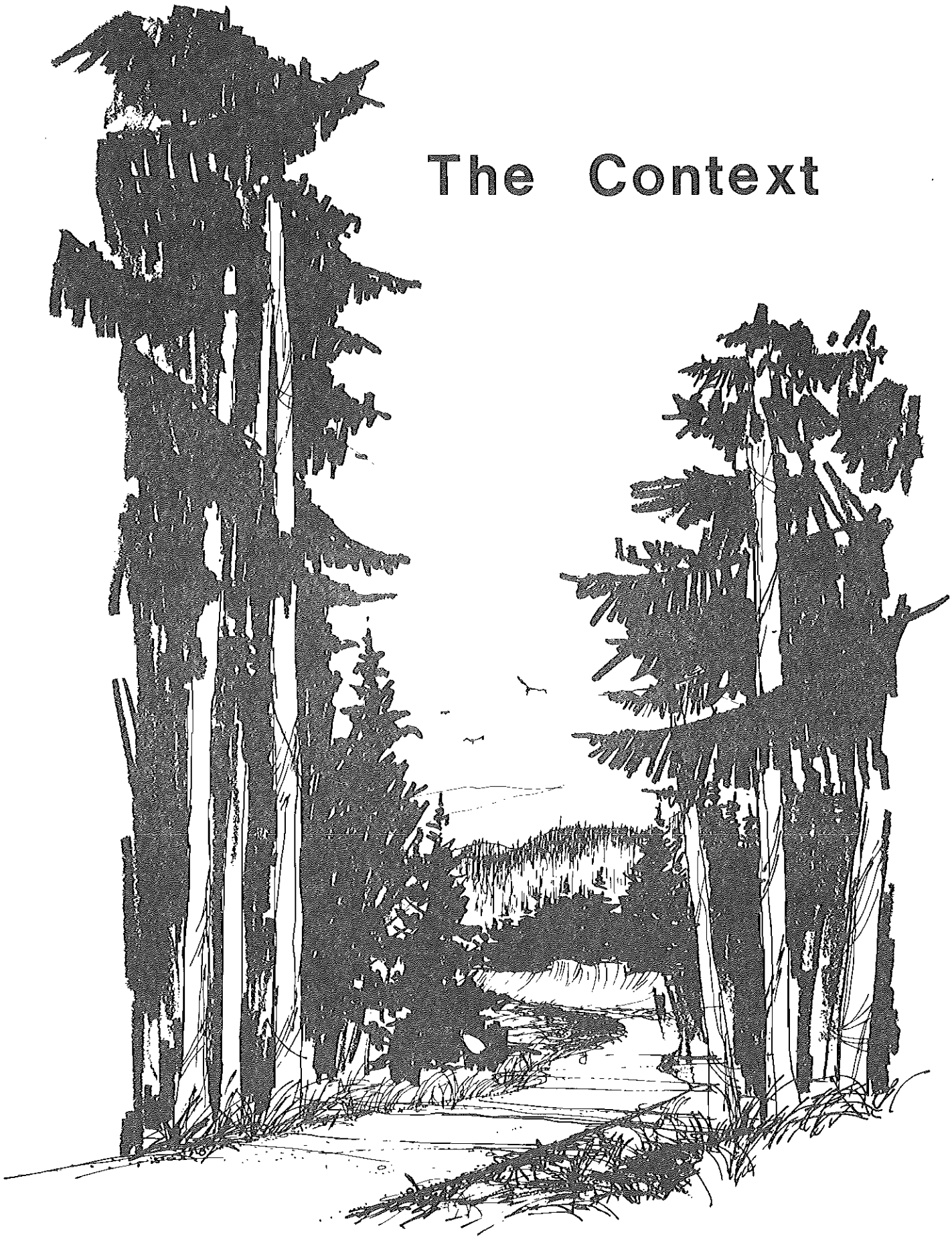
- Resolve present litigation affecting portions of this segment.

- Complete trail for use by bicyclists and snowmobilers.
- Develop a non-vehicular access trail wayside adjacent to Kabekona Bay Bridge and vehicular access waysides in Wilkinson and Cass Lake.
- Develop two small rest areas.
- If necessary, pursue alignment alternatives for this section or segments of it.

Throughout the Entire Trail

- Reestablish examples of presettlement vegetation.
- Provide maximum screening from highways.
- Implement interpretive plan.
- Eliminate non-authorized trail uses.
- Establish permanent manager for trail.

The Context



THE CONTEXT

MINNESOTA

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

Minnesota's population in the 1970 census totaled 3,804,971, ranking it nineteenth among the states and the District of Columbia. This 1970 total represented a 12 percent increase over the 1960 population, but was not due to excessive migration into the state. Rather, it represented a natural population increase of 417,000 over the years. The heaviest concentrations of people occurred in the Twin Cities, the Duluth-Superior area, the Fargo-Moorhead area, Rochester, and St. Cloud.

DNR'S STATEWIDE TRAIL SYSTEM

The history of trails in the United States is deeply embedded in the heritage of this country. First there were Indian trails and then the trails of the white man. Combined, these trails carried the explorer, adventurer, and pioneer across the continent, facilitating the country's westward expansion and aiding in the extension of the country's domain from the Atlantic to the Pacific.

Until recently, these trails had basically a utilitarian value. As Americans experienced more leisure time, increased mobility, and continuing growth in environmental awareness, there came the need for recreational facilities. It was then that the recreational potential of trails was recognized.

Although there have been recreational trails in Minnesota since the establishment of Minnesota's first state park, Camp Release in 1889, the formal beginnings of a statewide trail system did not occur until the late 1960's. At that time rapid growth in the popularity of the snowmobile created a need to provide trails and, in some cases, regulate use.

In 1967, the Division of Parks and Recreation was charged with the responsibility of promoting and developing facilities for snowmobilers (M.S. 1967, Section 84.83, Subdivision 2). Until authorization of the first state trail in 1969, these trails were developed in state parks on state-owned lands. In 1969, the legislature authorized the Department of Natural Resources (DNR) to "establish, develop, maintain and operate recreational areas" (M.L. 1969, Section 85.015, Subdivision 1.)

Four trails were authorized in 1971 and six more have been authorized since that time (table 1, page 6). These legislatively authorized state trails now form the backbone of the state recreational trail system (Figure 1, page 7).

During the 1973 session, the legislature passed trail legislation, appropriated funds for trail development and maintenance, and authorized a temporary DNR trail staff to provide a statewide recreational trail system. The DNR Trails Section, Division of Parks and Recreation, was assigned the task of developing state trails and other recreational trails to meet the demands of the recreating public. In 1977, the responsibility for trail planning was removed from the Division of Parks and Recreation and placed within a newly created section of the Office of Planning and Research. The goal of the DNR's recreational trail program is to conserve, protect and use Minnesota's resources in trail development so as to provide a broad spectrum of recreational trail opportunities for existing and future generations.

Included in the recreational trail system are state park and state forest trails, grant-in-aid trails, and state corridor trails. State park and state forest trails are usually short loop trails designated for a single use during a particular season.

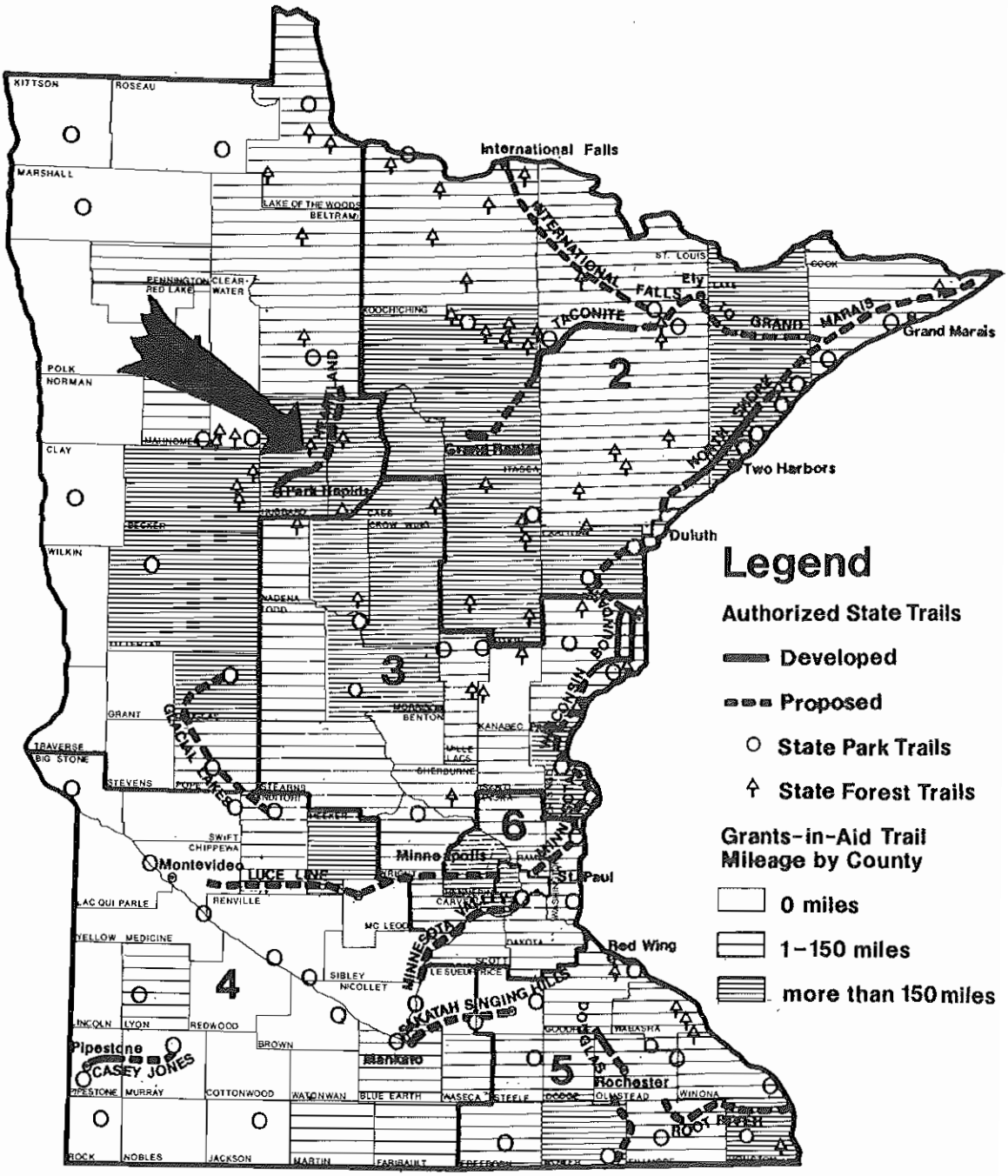
Grant-in-aid trails are developed through the cooperative efforts of trail user groups, landowners, local units of government, and the DNR. The DNR offers trail assistance grants for the development of snowmobile, ski touring, and equestrian trails. These trails, which usually provide access to state trails, are under the jurisdiction of local units of government.

State trails are long distance corridors designed to provide recreational opportunities in accordance with the Outdoor Recreation Act of 1975 (Appendix). Where possible, these trails link cities, recreational areas and other trail systems. These trails are planned, developed and maintained by the DNR and are located on lands under the jurisdiction of the state.

TABLE 1

State Trails

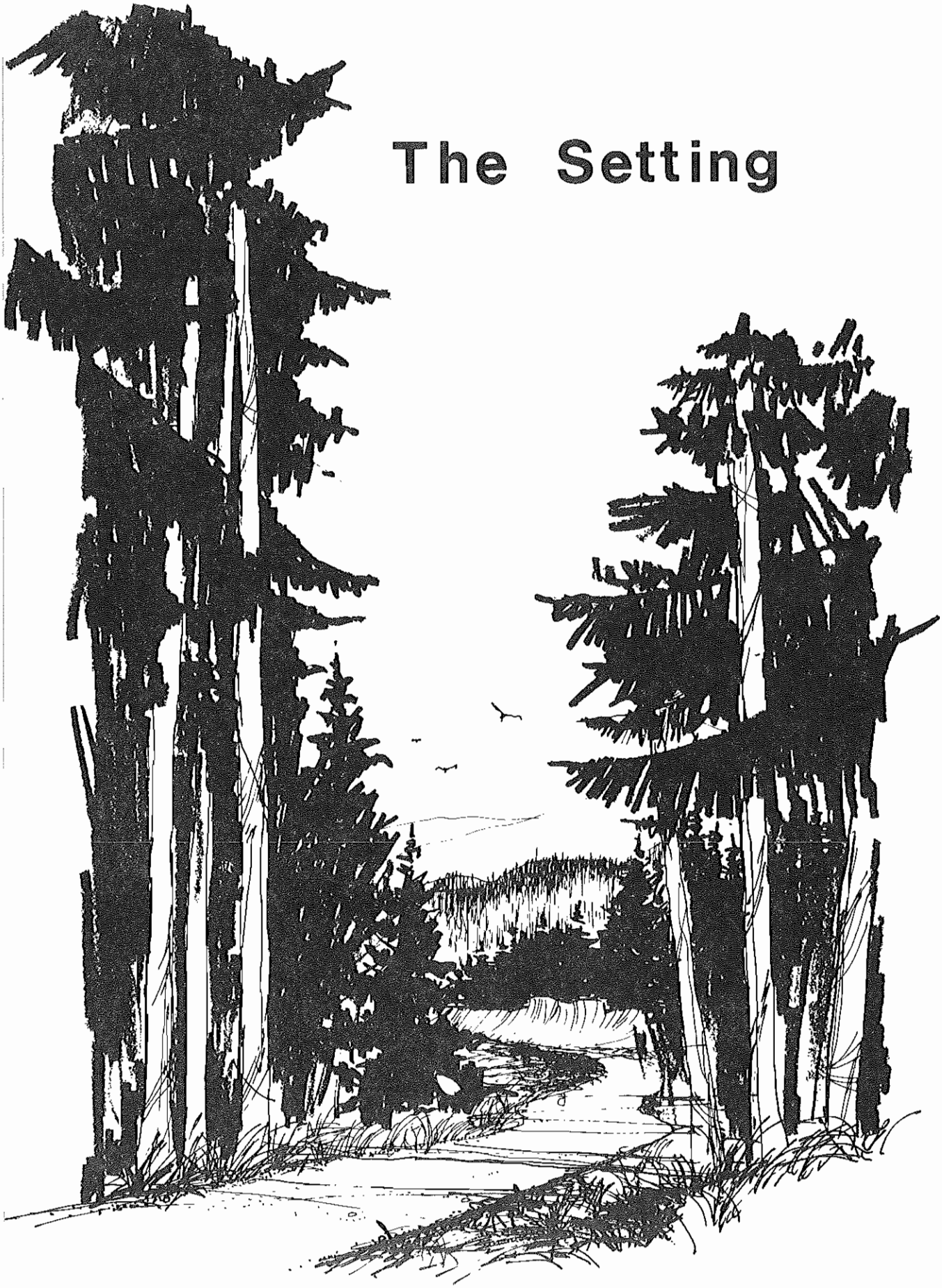
Trail	Date of Authorization	Authorized Mileage
Casey Jones	1971	37
Countryview	1971	22
Douglas	1971	12
Glacial Lakes	1971	100
Grand Marais to International Falls	1975	220
Heartland	1974	48
Luce Line	1973	104
Minnesota Valley	1969	72
Minnesota-Wisconsin Boundary	1973	210
North Shore	1975	192
Root River	1971	50
Sakatah Singing Hills	1971	42
Stewartville to LeRoy	1978	26
Taconite	1975	165
TOTAL		1,300



MINNESOTA RECREATIONAL LAND TRAILS

Figure 1

The Setting



REGIONAL OVERVIEW

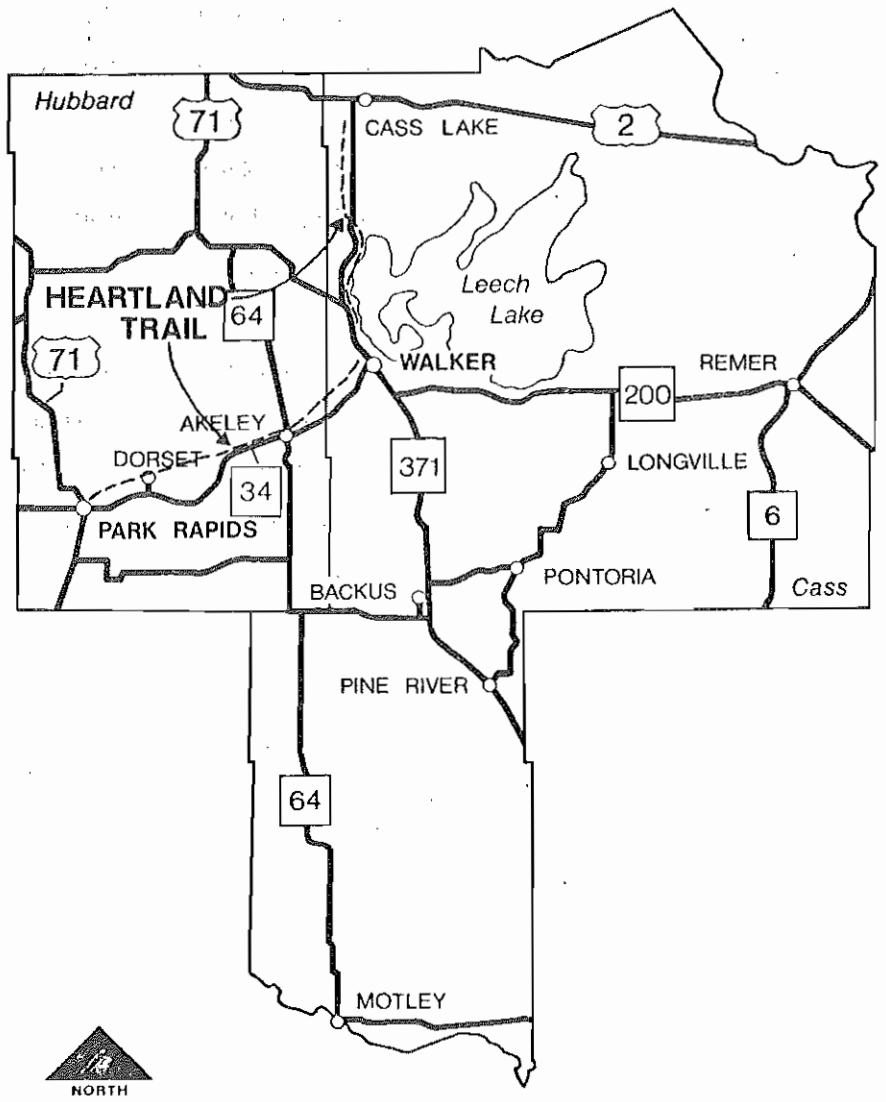
The Heartland Trail lies within the "big moraine" complex; an area of rough terrain shaped like a reversed question mark, which extends from Albert Lea through the Twin Cities to Detroit Lakes, Park Rapids, and into the Arrowhead region of Minnesota. This moraine was formed by deposition of glacial materials at the leading edge of repeated glacial advances. Moraines are composed of materials ranging in size from fine clay materials to boulders. Near the trail, the landscape is composed of hill ranges consisting mainly of course bouldary material. The area is packed with countless lakes, ponds, and bogs.

Currently, 67 percent of Hubbard and Cass Counties are forested; 13 percent is water; 9 percent is open or pasture; only 7 percent cultivated; and 4 percent in other miscellaneous categories. The State Planning Agency estimated that 31,600 people resided there in 1974. Park Rapids, Cass Lake, and Walker are the three principal cities within the counties.

Although Cass and Hubbard Counties contribute less than 1 percent of the state's population and only 3 percent to the state's gross product, they contribute almost 5 percent to the state's total tourist-travel expenditures. These expenditures account for 42.5 percent of the area's total economy. The statewide county average is only 3.3 percent.

The above data demonstrates how dependent Cass and Hubbard Counties are upon tourism. Tourism must be a major consideration in efforts toward economic development in these counties. Extension of the tourism-recreation season through the winter by increasing snowmobiling and skiing opportunities and stimulating other recreational activities for year-around use would enhance the economy of the area and stabilize employment.

COUNTY LOCATION MAP



SCALE: One Inch Equals 12.0 Miles

Figure 2

HISTORICAL OVERVIEW

Former Use

Early explorers to the Heartland Trail area included such famous men as William Morrison, Henry Schoolcraft, Zebulon Pike, Joseph Nicollet and Joseph Cass. Most of these men came in the late seventeenth century in search of the source of the Mississippi River. They found Dakota (Sioux) Indians occupying the land. Later, as Ojibway (Chippewa) Indians were forced westward from the Lake Superior region, the Dakota were driven from their hunting grounds. By the mid-eighteenth century, the Ojibway were the major occupants of the trail area.

During the late 1700's and early 1800's trading posts were established throughout the region. Fur traders were active as early as the late 1700's. In fact, the Northwest Company had established two fur trading posts on Cass Lake as early as 1784.

Lumbermen and farmers arrived in the late 1800's. In the vicinity of the Heartland Trail, the lumbermen found a large resource of red and white pine. For many years, pine logging was the leading industry of the region and still has considerable importance.

Lumbermen acquired large tracts of land and set up logging operations. One operation in Akeley was built by the Red River Logging Company in 1890. During peak operations, this mill employed between 4,000 and 5,000 men with a monthly payroll of about $60,000.

Agricultural development dates from the late 1800's when the Shell Prairies and other settlements were founded. Farmers found rich prairies in this area. Wheat and oats were the principal crops grown. Today, these crops have minor importance; feed grains and forage are now the chief crops grown in the area.

As agricultural and timber production increased, the need for an economical means of transporting products to markets in the South and West increased. As a result, logging and transportation railroads were founded. The Sauk Centre and Northern Railway Company started a line in 1882 that eventually connected Park Rapids and Cass Lake. The Wadena and Park Rapids Railway Company as well as the Park Rapids and Leach Lake Railway Company were also involved in development of this line. The abandoned railroad (now the Heartland Trail right of way) was built by the Park Rapids and Leech Lake Railway Company and is now owned by the state. There are no sites of archaeological or historical significance listed by the Minnesota Historical Society as occurring within the trail right of way (ROW). However, close to the trail, many Indian mounds, burial grounds, and prehistoric sites have been identified.

Presettlement Vegetation

The discussion of presettlement vegetation found along the Heartland Trail is based on Francis J. Marshner's map entitled, "The Original Vegetation of Minnesota." This map was based on land survey notes taken by surveyors just prior to settlement.

Marshner's map shows that the vegetation along the Heartland Trail prior to settlement was quite diverse (Figure 3, page 12). On the sandy-outwash plain from Park Rapids to just each of Akeley, original vegetation cover was jack pine scattered with open areas. This cover type was dependent on fire which created open areas and produced the heat necessary for jack pine regeneration. Common shrubs and ground cover in this area included hazel, blueberry, sweet fern, wintergreen bracken, reindeer moss, and bearberry. Red oak, burr oak, aspen, and birch were also present but not dominant.

Aspen-birch forests were interspersed throughout the jack pine openings and barrens. These forests were dominated by quaking aspen, bigtooth aspen and paper birch. Conifers that were

ORIGINAL VEGETATION

after F. J. Marschner (1930)
with interpretation from P. Rundell (1978)

MHP MIXED HARDWOOD AND PINE
Red Sugar Maple, White Pine, Basswood, Oaks, Ironwood, Ash, Elm, American, Red, Aspen, Birch

WNP WHITE AND NORWAY PINE GROVE
Nearly pure stands of pine, Green Ash, Red Maple.

AsB ASPEN-BIRCH
Will eventually become Conifer. Includes White and Norway Pine, Balsam, Green Ash, Northern Pine, Oak, Balsam Fir, Birch, White Spruce, as associated species.

CBS CONIFER BOGS AND SWAMPS
Black Spruce, Tamarack, White Cedar, Arborvitae Balsam and Mountain Ash.

WPM WET PRAIRIES, MARSHES AND SLOUGHS
Marsh-grasses, Flags, Reeds, Rushes, Wild Rice, with Willow and Alder-brush in places.

BrP BRUSH PRAIRIE
Grass and Brush of Aspen, Balm of Gilead and little Oak and Hazel.

JPB JACK PINE BARRENS AND OPENINGS
Jack Pine with Oak, Aspen, Hazel-brush and occasionally Norway Pine.

In addition - caragena in disturbed areas and Choke Cherry and sumac throughout.

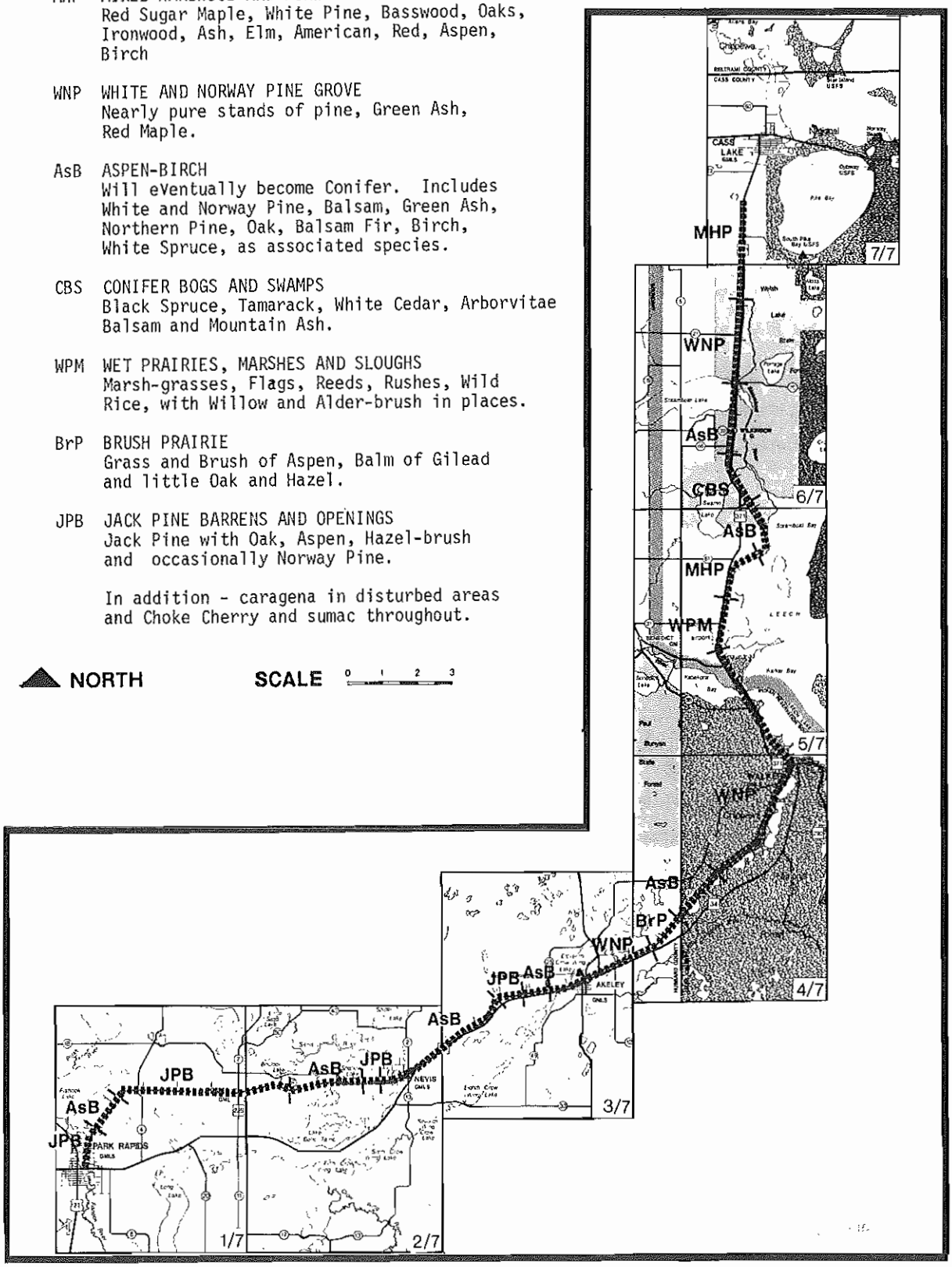


Figure 3

present included white and red pine, balsam fir, white spruce and northern white cedar. This type of cover also existed south of Walker.

The vegetative cover from east of Akeley to Leech Lake was pine groves. This forest type consisted of mature white and red pine interspersed with black spruce, white cedar, balsam fir, and white spruce. A history of repeated surface fires contributed to the existence of this pine forest.

Transitional hardwood forests once dominant near Steamboat Bay and south of Cass lake consisted of white pine stands mixed with red oak, burr oak, elm, black ash, paper birch, yellow birch, red maple, sugar maple and aspen. This vegetative cover was the result of wind and fire disturbances.

Small areas of wet prairie, conifer bogs and swamps were found along the trail. Marshes and sloughs of the wet prairies occurred on poorly drained peatlands near Kabekona Bay. Vegetative types characteristic of wet prairies were cattail, sedge, wild rice, reed, bluejoint grass, iris, willow, speckled alder and bog birch.

Conifer bogs and swamps were found north of Steamboat Bay. In these areas, cedar, balsam, tamarack and spruce were the dominant vegetative types. Other plants that were common include heath, bog birch, paper birch, sedge and sphagnum mosses.

THE HEARTLAND TRAIL TODAY

Authority

The Heartland Trail was authorized as a state recreational trail by an act of the Minnesota State Legislature (M.S. 1974, Section 85.015, Subdivision 12). The trail was officially designated by the Commissioner of the Department of Natural Resources on January 19, 1976.

By law: Minnesota Statutes 1974, Section 85.015, STATE TRAILS, Subdivision 1.

The commissioner of natural resources shall establish, develop, maintain and operate the trails designated in this section. Each trail shall have the purpose assigned to it in this section. The commissioner of natural resources, may acquire lands by gift or purchase, in fee or easement, for the trail and facilities related to the trail.

Subd. 12. (a) The trail shall originate at milepost 90.92 at Park Rapids in Hubbard County and shall extend in an easterly direction along the Burlington Northern railroad right-of-way to the south line of Oak Avenue in Walker in Cass County. The trail shall then continue from the section line between Section 9 and 16, Township 142 North, Range 31 West, in a northerly direction along the Burlington Northern Railroad right of way to milepost 137.78, approximately two miles south of Cass Lake in Cass County, and there terminate.
(b) The trail shall be developed primarily for riding and hiking.
(c) In addition to the authority granted in subdivision 1, lands and interests in lands for the Heartland Trail may be acquired by eminent domain. Before acquiring any land or interest in land by eminent domain the commissioner of administration shall obtain the approval of the governor. The governor shall consult with the legislative advisory committee before granting his approval. Recommendations of the legislative advisory committee shall be advisory only. Failure or refusal of the committee to make a recommendation shall be deemed a negative recommendation.

Description

The Heartland Trail, an abandoned Burlington Northern railroad right of way, extends about 48 miles across north-central Minnesota. It is a unique lineal corridor which, when completed, will allow recreational travel across a variety of terrain. The trail crosses farmland and woods interspersed with lakes and ponds, and the terrain varies from level to gently rolling.

The trail originates in Park Rapids and terminates about two miles south of Cass Lake passing through the communities of Dorset, Nevis and Akeley in Hubbard County, and Walker and Wilkinson in Cass County along the way. The trail is severed by a two mile section of railroad right of way that was not abandoned which lies between Cass County Road 12 in Walker and the section line between sections 9 and 16 of Shingobee Township (T142N, R31W).

Although the average width of the trail corridor is 100 feet, in some towns it extends to 400 feet. When acquisition for a continuous trail corridor is complete, the trail will cover about 675 acres.

When complete, the trail, or portions of the trail, may be used for bicycling, horseback riding, and snowmobiling. Ski-touring and hiking are permitted on the trail but are not considered primary uses due to the relatively flat nature of the former railroad grade and the existence of quality use areas in the immediate vicinity (e.g. Shingobee Ski Trail System and the trans-continental North Country Trail now under development). To accommodate multi-use during the same season, two parallel treadways were developed within the right of way between Park Rapids and Walker. The first, the abandoned railroad grade, has a six-foot-wide asphalt surface for bicycling and snowmobiling. The second treadway has been cleared for horseback riding in an area parallel to the first. Motorized vehicles other than snowmobiles are not allowed on any portion of the Heartland Trail.

Classification

The Outdoor Recreation Act of 1975 (M.S. 1976 Ch. 86A) established the following criteria for areas to be classified as a State Trail:

(1) Permits travel in an appropriate manner along a route which provides at least one of the following recreational opportunities:

(i) travel along a route which connects areas or points of natural, scientific, cultural, and historic interest;

(ii) travel through an area which possesses outstanding scenic beauty;

(iii) travel over a route designed to enhance and utilize the unique qualities of a particular manner of travel in harmony with the natural environment;

(iv) travel along a route which is historically significant as a route of migration, commerce, or communication;

(v) travel between units of the state outdoor recreation system or the national trail system; and

(2) Utilizes, to the greatest extent possible consistent with the purposes of this subdivision, public lands, rights of way, and the like; and

(3) Provides maximum potential for the appreciation, conservation, and enjoyment of significant scenic, historic, natural, or cultural qualities of the areas through which the trail may pass; and

(4) Takes into consideration predicted public demand and future use.

Recreational Opportunities - The trail satisfies points i and ii of the first condition by linking a number of towns possessing features attractive to tourists (page 31-35) with elements of the North Country Trail and the Chippewa National Forest (e.g. Pike Bay Campground). This is done while bringing the user through the often beautiful and varied landscapes of the Pine Moraine Landscape Region. Furthermore, with the cooperation from the Minnesota Department of Transportation (Mn/DOT) this trail may become part of a large bicycle loop in the future connecting both Lake Itasca State Park and Lake Bemidji State Park (page 41).

Inter-governmental Coordination - The trail satisfies the second condition by designing its facilities so as to complement what is being offered by other units of government. For example, a major picnic shelter is not required in Akeley (as originally planned) because a major public park exists in town on Eleventh Crow Wing Lake (page 59). Also, a bypass in the trail around Walker will take maximum advantage of Federal Chippewa National Forest land found there (page 63).

Interpretation - The trail satisfies the third condition by establishing an interpretive framework that explores natural, scientific, cultural, and historical points of interest (page 39).

Demand - Finally, the Department of Natural Resources (DNR) considers public demand and future use by taking a "wait and see" approach. Although potential demand is addressed (page 35), one should recognize that predicting the future level of use on a trail is nearly impossible.

Perhaps just as important as the actual physical development of a trail is the way it is later promoted. Consequently, major expenditures of money for resurfacing, etc., will have to await actual use counts once the trail has been completed and been in operation for some time.

Land Ownership

The major portion of land acquired for development of the Heartland Trail is an abandoned Burlington Northern railroad grade. The rights to this roadbed were sold to the State of Minnesota in April, 1974, for $85,000. The purchase included all lands and structures within the right of way. Since Burlington Northern retained trackage in Walker, the acquired right of way is not continuous.

a) One 27-mile portion extends from Park Rapids to Walker, Minnesota. This section has been developed and is open for use.

b) The second portion of the railroad right of way, 21 miles, extends from Kabekona Bay to two miles south of Cass Lake, Minnesota (see page 63). This section has not yet been developed.

State ownership of portions of the stretch between Kabekona Bay and Cass Lake is being disputed in court by the Department of Interior in behalf of the Leech Lake Indian Tribe. In their suit, the Leech Lake Band of Chippewa Indians claim that the Burlington Northern Railroad had no right to convey the land to the State of Minnesota as the land in question was covered under an Act of Congress that merely granted a right of way to the railroad through the Leech Lake Reservation for as long as the railroad operated. Once the railroad ceased to operate, they claim that the right of way reverted to the Reservation.

At this time, it is impossible to tell when the case might be settled. Consequently, no development on the disputed stretch will occur until a settlement is reached.

In addition to these railroad lands, nine acres of land were purchased from a private landowner for $65,000 in February, 1976. This parcel is located just north of Kabekona Bay Bridge and includes lakeshore frontage on Leech Lake and access to Highway 371.

Existing Development

Development of the Heartland Trail has been limited to the 27-mile segment between Park Rapids and Walker. To provide for incompatible uses, two treadways have been constructed within the right of way. The first is a six foot, one and one half inch

Figure 4

Nevis
Wayside

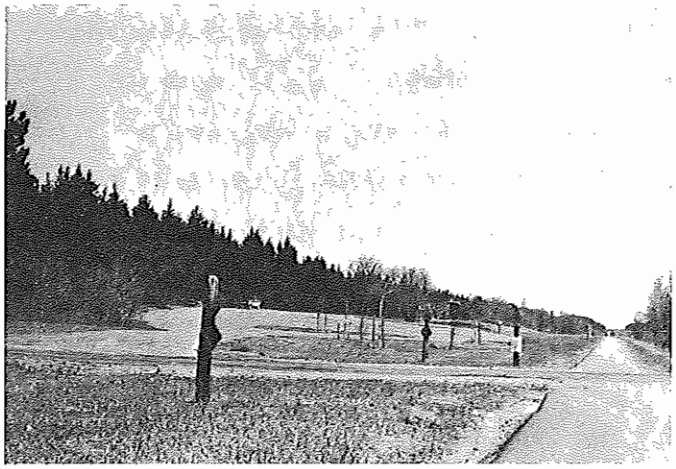


Figure 5

Akeley
Wayside

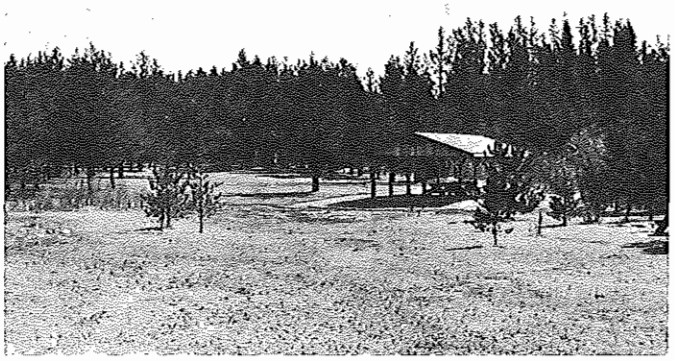


Figure 6

Dorset
Wayside

thick asphalt surface with one foot gravel shoulders which was laid down on the old railroad grade to allow for bicycling. In winter, this treadway is open to snowmobiling. The second treadway was developed parallel to the first for horseback riding. Hiking and ski-touring is allowed on both treadways. However, due to the flat nature of this former railroad grade, little of this type of use is expected. These two treadways merge at and cross two old railroad bridges which have been decked and railed for trail use.

A trail wayside has been constructed in Dorset (Figure 6, page 19). It now consists of a parking lot, snowmobile and horse unloading ramp, picnic tables, pit toilets, and a shelter building. Waysides were also started in Nevis and Akeley but as yet are incomplete. Although the materials for the shelters have been purchased, landscaping and shelter construction must still be completed in both locations.

Existing Use

For the last three years, primary use of the Heartland Trail has been by snowmobilers. In order to identify the winder user of the trail, a survey was conducted in the winter of 1975.* This informal survey was conducted on four weekends with 19 sampling periods. Forty-one snowmobilers and 25 businessmen who had facilities adjacent or close to the trail were interviewed. The following are results of that survey.

One-third of the trail users interviewed were local people, one-third were from the metro area and one third were from rural Minnesota and surrounding states. Users came from Iowa, North Dakota and all parts of Minnesota, except the northeast. Non-resident users were staying mainly in private homes and cabins rather than in motels or resorts.

*The full results of this survey are contained in the Appendix.

Seventy percent of the out-of-town users indicated that their primary reason for traveling to the area was snowmobiling. All others said that visiting relatives or friends was their primary reason for being in the area.

Two-thirds of the users had been snowmobiling five or more years. One-third of the snowmobilers were on the Heartland Trail for the first time and one-third had used the trail ten or more times.

Because the snowmobile trails in the Heartland Trail Area are well established, the makeup of the trail-user group is expected to remain constant. It does not seem plausible to assume that there will be a great increase in the number of snowmobilers who travel specifically to use the Heartland Trail.

TRAIL RESOURCES

Natural Resource Perspective

Climate

Minnesota's climate is characterized by warm, humid summers and cold, snowy winters. Average daily high temperatures in the trail area vary between 82°F. in July and 16°F. in January.

Average annual precipitation in the trail area is 26 inches. Warm, moist air masses from the Gulf of Mexico bring most of the precipitation during June, July, and August. About 15 percent of the annual precipitation occurs as snowfall. Brought in by strong polar winds from the northwest, the average annual snowfall is 47 inches. The average number of days with snow cover of one inch or more is 130.

Table 2 provides a summary of climate in the trail area.

Topography/Geology

Topography of the Heartland Trail area varies from nearly level to heavily rolling. The morainic topography of this area owes its origin to an older group of moraines, the St. Croix Moraine system, and also to a younger group of moraines, the Bemis-Altamount-Gary Moraine system. Several extensive terminal moraines cause variance in elevation from 1,300 to 1,700 feet above sea level. These moraines alternate with wide level areas of till and outwash plains.

The area near Park Rapids is an outwash plain of sand and gavel deposited over glacial till. East of there, the area is more characteristic of morainic landforms. Some of the moderately raised areas are glacial till deposited by ice masses while other raised areas are stratified materials deposited by glacial meltwaters.

TABLE 2

Climate Summary

	Station		
	Bemidji	Pine River	Park Rapids
Years of Record	54	71	68
TEMPERATURE			
Mean Annual Temp. (^{o}F)	38.1	39.9	38.9
Maximum Temp. (^{o}F)	107	104	107
Minimum Temp. (^{o}F)	-50	-53	-51
PRECIPITATION			
Mean Annual Precipitation (inches)	21.95	26.54	26.57
Maximum Pptn. (inches)	39.76	45.86	39.01
Year	1901	1902	1906
Minimum Pptn. (inches)	12.47	14.81	14.35
Year	1917	1936	1910
April-Sept. Mean Pptn. (inches)	16.55	19.90	19.17
Oct.-March Mean Pptn. (inches)	5.40	6.64	7.40
Maximum 24-hr. Pptn.	4.15	7.10	6.75
Date	7-22-14	6-3-98	8-1-06
Annual Snowfall (depth in inches)	45.7	50.0	46.3

Bedrock of the area is comprised of Pre-Cambrian crystalline and metamorphic rocks. Cretaceous sedimentary beds are deposited over the bedrock. However, most of these beds have been removed by preglacial or glacial erosion.

In the Heartland Trail area, terrain has only a minor effect on the trail user. With the exception of a few swampy or rocky areas, most of the railroad grade is suitable for all trail activities.

Soils

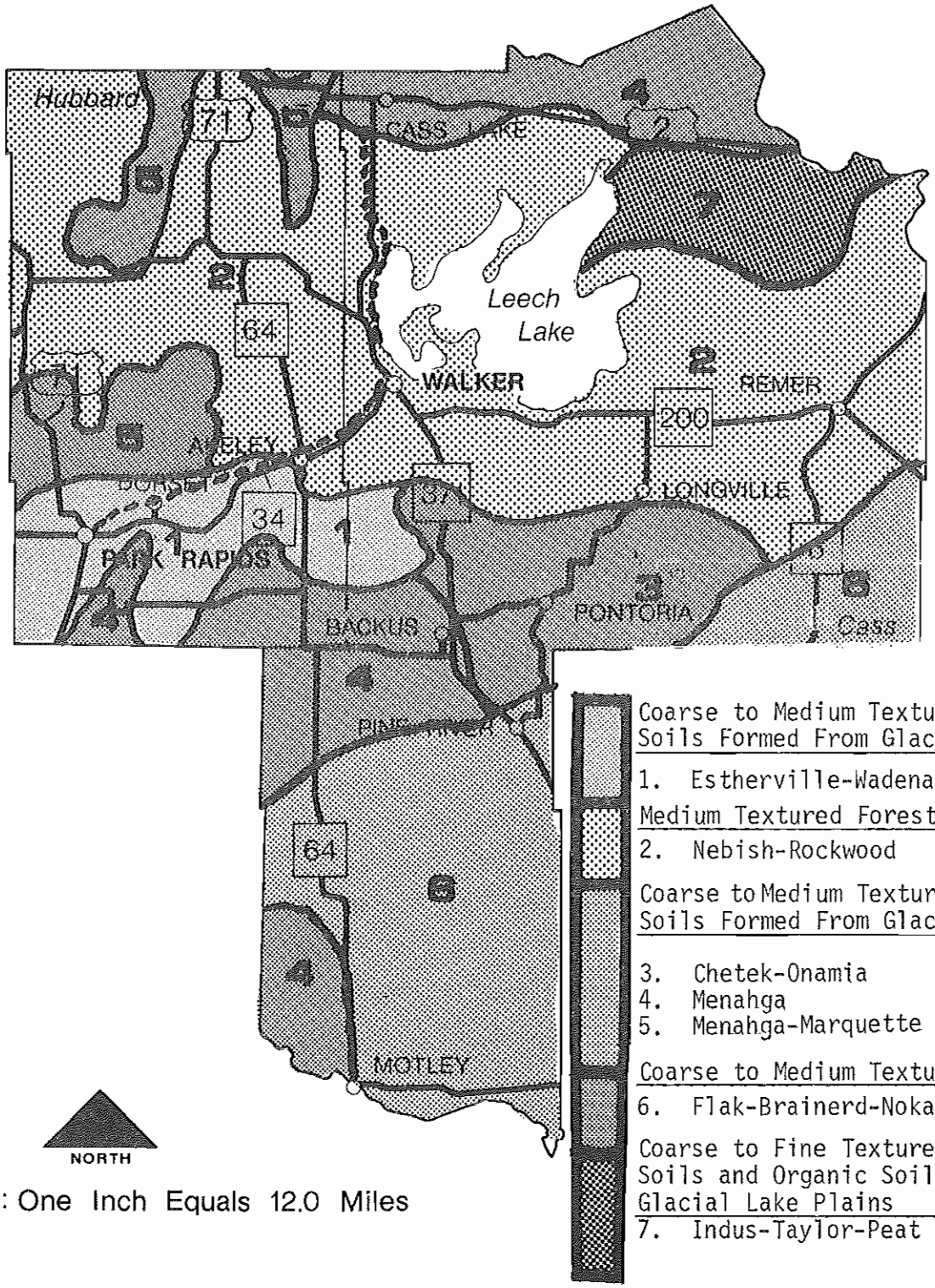
Note: Only general soil association information is presently available for this area.

The Menahga-Marquette soil association, found near the western portion of the trail (Figure 7, page 25) consists of droughty, light-colored forest soils. Menahga soils consist of fine to medium textured noncalcareous outwash sands. Marquette soils consist of a medium textured material overlying calcareous gravel. This soil association is usually less than 18 inches deep.

The Estherville-Wadena-Hubbard soil association, found along the western portion of the trail, consists of well to excessively drained, dark-colored prairie soils. Estherville and Wadena soils consist of moderately coarse to medium textured material overlying calcareous outwash gravel. Hubbard soils consist of leached, coarse and medium sand outwash. Droughtness and wind erosion are major management problems of these soils.

The Nebish-Rockwood soil association, found along the eastern portion of the trail, consists of light-colored, well-drained soils. The Nebish soils developed from loam and the Rockwood from sandy-loam, buff-colored calcareous glacial till. Poorly drained mineral soils occupy many depressed areas. Erosion

Soils



----- **Heartland Trail**

Park Rapids to Cass Lake

(Derived from: SOILS OF MINNESOTA, H.F. Arneman)

Figure 7

control and maintenance of organic matter are major management problems of these soils.

Surficial Waters/Fisheries

The Heartland Trail travels within two watersheds -- (Figure 8, page 28).

a) the Crow Wing River watershed for the trail section from Park Rapids to just beyond Akeley.

b) the Mississippi River watershed for the trail section from just beyond Akeley to Cass Lake.

Actually, the Crow Wing River begins in Eleventh Crow Wing Lake just to the north of Akeley (and the trail). From there it flows through the rest of the Crow Wing Lakes (Tenth through the First) and continues on to eventually join the Mississippi River. This series of lakes was formed by the melting of rows of ice blocks after glaciation.

On the trail between Nevis and Dorset, Shallow Lake feeds Lake Belle Taine which in turn feeds Fifth Crow Wing Lake. This last connection is not accomplished by surface flowage; apparently, an underground tie exists through porous soils found in the area.

In addition to most of the other lakes in the area, the Crow Wing Lakes are all noted for their good fishing. According to Thomas Waters, in his book The Streams and Rivers of Minnesota," ... the upper lakes (Eleventh through Seventh) are best for largemouth bass and panfish, and the lower lakes (Sixth through First) are deeper and classed as northern pike-walleye lakes."

Heartland Trail users can gain access to the Eleventh by utilizing the municipal park within Akeley, and to the Tenth and Eighth Lakes by utilizing public accesses developed on those lakes. Some fishing has been noticed from the trail bridge over the connection between Shallow Lake and Lake Belle Taine.

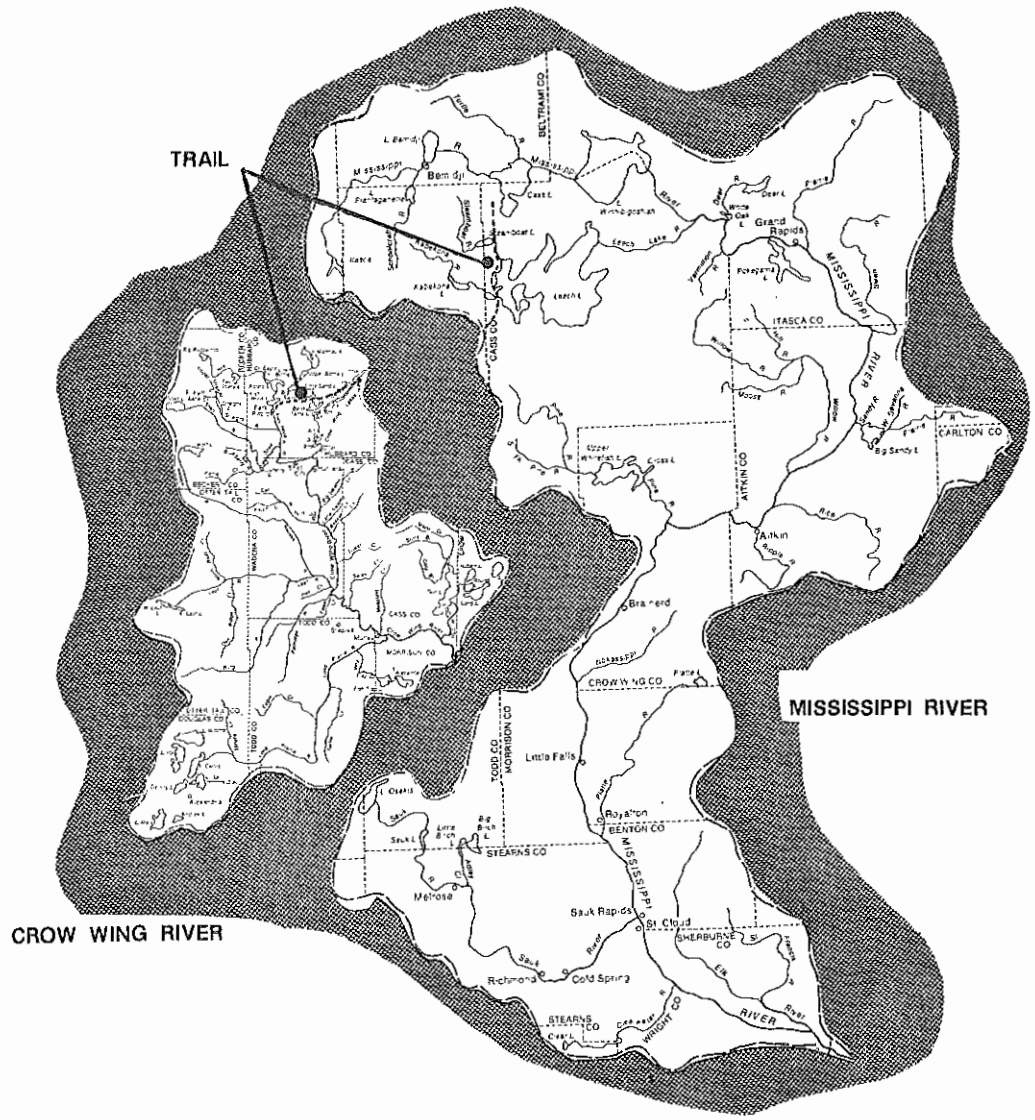
As stated earlier, the trail enters the Mississippi River Watershed above Akeley and continues throughout the rest of the trail alignment to Cass Lake. As such, its connection with Walker provides trail users excellent access to Leech Lake, Kabekona Bay Bridge, and nine acres of adjoining land providing user access to yet another fisherman's paradise. Again, according to Thomas Waters, the Kabekona River which empties into Kabekona Bay is probably the best known and most productive brook trout stream in Minnesota. Finally, near the trail's end, access to Pike Bay will be provided by a bicycle and hiking trail within the Chippewa National Forest. This trail is being planned by the U.S. Forest Service.

Ground Water

The thick deposits of glacial drift in the Crow Wing River watershed contain numerous layers of sand and gravel which furnish abundant quantities of good quality ground water. In the upper part of the watershed, where the Heartland Trail lies, the water-bearing formations occur at a relatively shallow depth in the plain.

Ground water in the Mississippi River Watershed is most abundant in the glacial drift and in the enriched ore deposits of iron formations of the Mesabi and Cuyana iron ore ranges. In some areas, the decomposition zone (developed on granitic bedrock) contains significant quantities of water.

The quantity of water in the glacial drift varies depending on the source and distribution of the drift, and thickness of enclosed sand and gravel deposits or lenses. Drift deposited by glaciers from the northeast contains a higher percentage of sand and gravel than the drift deposited by glaciers from the northwest. Accordingly, ground water in the eastern half of the watershed is more abundant.



AREA WATERSHEDS

NORTH

SCALE 3/8" = 10 MILES

TRAIL ·····

Derived From - The Streams and Rivers of Minnesota, by Thomas F. Waters

Figure 8

TABLE 3

Water Sources and Capacities

	Park Rapids	Akeley	Cass Lake	Walker
Water Source	Glacial Drift	Eleventh Crow Wing Lake	Glacial Drift	Glacial Drift
Number of Wells	2	-	2	2
Capacity (Millions of Gallons per Day)	1.9	0.144	0.54	1.20
Water Treatment*	+	+	-	-
Sewage Treatment*	+	-	-	+

* + signifies that such treatment is present; - signifies no treatment.

Water levels range from ground level in artesian areas to several hundred feet below the surface. Due to recharge during spring ice breakup, natural groundwater levels rise to a maximum during April and early May and reach their low in January or February.

Most municipal water supplies in this area are taken from groundwater. The glacial drift furnishes abundant water of good quality. Water sources and capacities for cities along the trail are shown in Table 3.

Vegetation

Present vegetation along th Heartland Trai contains only remnants of the original plant communities. Logging, land clearing, cultivation, fires and other natural or man-related disturbances have greatly altered the vegetation found along the Heartland Trail. Almost all the natural white and red pine have been cut for timber. Jack pine and aspen areas have been cleared for cultivation and the wood used for pulp. Most of the other vegetative cover types have also been altered by man.

Along the western portion of the trail scattered clumps of jack pine, red oak, burr oak, red pine, white pine and spruce are mixed with cultivated and grazed lands. The predominance of big bluestem within the right of way is a result of low nutrient soil and man's disturbances.

Along the eastern portion of the trail, remnants of jack pine barrens and hardwood-conifer forests can be found. Jack pine and aspen are the dominant species. There are many marshes, sloughs, swamps and conifer bogs along this part of the trail.

Wildlife

Corresponding to the vegetative diversity found along and adjacent to the trail, the Heartland Trail area provides suitable habitat for a wide variety of wildlife. Common mammals along the

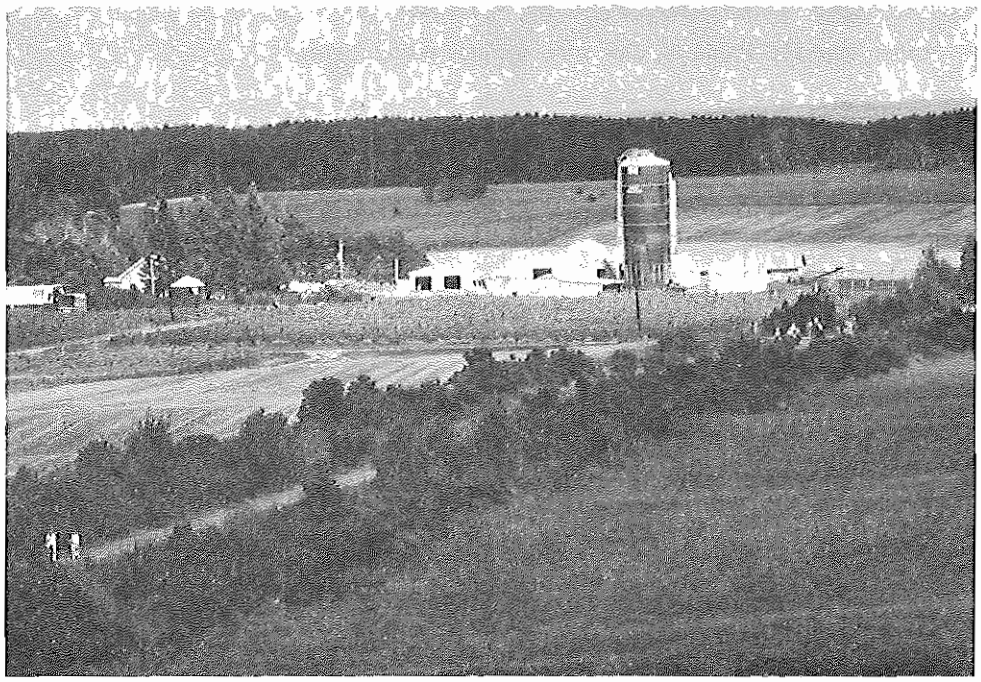


Figure 9 - Trail Corridor Weaver Farm

Figure 10 - Bicyclists Near Forestry Tower

trail include white tailed deer, raccoon, red fox, porcupine, and muskrat. Occasionally one can observe weasel, skunk, mink and beaver. Other mammals found in the area include mice; bats; gophers; chipmunks; ground, red and gray squirrels; brush wolves; bobcats; and black bear.

A variety of songbirds, waterfowl, shorebirds, and raptors can be observed from the trail. Near the trail, common songbirds are flickers, orioles, bluejays, hawks, and sparrows. Along with these, mallards, woodducks, loons and blue-winged teal are common during the summer. Other species of waterfowl such as Canadian geese and lesser scaup ducks are seen during spring and fall migrations. Ruffed grouse and woodcock are the most common upland game birds in the area. The Chippewa National Forest provides suitable habitat for the bald eagle and osprey. Trail users may occasionally see these birds.

Common reptiles and amphibians that can be seen along the trail or near adjacent ponds and lakes include the following: leopard frog, American toad, garter snake, salamander, and painted and snapping turtles.

Cultural Resource Perspective

Park Rapids (Source: '78 Tour Guide to Minnesota Heartland)

Vacationers will find some 180 resort, motel, campground, and trailer park hosts in the area. A restored logging camp offers lumberjack meals in a setting which includes an historic operating sawmill. Pioneer relics can be seen at its Little Log Museum, and old farm equipment is on display at Old Smokey Ranch.

Small-fry love its old-west-styled deer park, and native live fish can be seen in the AquaPark Aquarium's huge freshwater tank. Fishermen revere its hundreds of lakes, horsemen enjoy its three riding stables, and golfers admire the new 18-hole Headwaters Country Club in the pines.

Park Rapids has something new and special to offer in 1978 with the opening of the North Country Museum of Arts, the only museum in the state outside of Minneapolis, with as extensive a collection of Old Masters paintings. At home in the old Hubbard County courthouse, this permanent display evokes a sense of wonder at the superb talent and artistic mastery that has been preserved for us for hundreds of years. The Museum also will feature traveling exhibitions from other institutions.

In conjunction with this attraction, the Hubbard County Historical Society is designing displays in the courthouse it shares with the museum of Arts, and the Headwaters Area Arts Council offers a year-round calendar of lively arts activities.

Nevis (Source: '78 Tour Guide to Minnesota Heartland)

Nevis is remarkably fortunate to be situated between the 12 lakes on the Mantrap Chain and the 11 lakes on the Crow Wing Chain. The Crow Wing lakes are part of the historic canoe route of early Minnesota, and the same lakes and rivers still provide a scenic trail for the modern day canoeist.

Nevis is the gateway to the 80,000 acre Paul Bunyan State Forest with 300 miles of trails and roads through the forestland for hiking, horseback riding or a leisurely drive through the country-side. In the winter, the main trails are kept well groomed by the Nevis snowmobile club and the D.N.R. for cross country skiing, snowshoeing and snowmobiling.

The home of the "World's Largest Muskie," Nevis honors this elusive fish with Muskie Days. Celebrated on the second Tuesday and Wednesday in July. The events include a fishing contest, parades, selection of a candidate to the Miss

Minnesota contest, street dance for the entire family, carnival and many events and games for the children. On the second Sunday in February, the Nevis snowmobile club sponsors a full weekend of fun climaxing with a Barbeque on Lake Belle Taine.

Akeley (Source: '78 Tour Guide to Minnesota Heartland)

Akeley, Paul Bunyan's "birthplace", where Paul's cradle can still be seen, is at the junction of Minnesota Highways 34 and 64.

It is located on the south shore of beautiful, spring fed Eleventh Crow Wing Lake, the source of the Crow Wing River and its chain of lakes. From within the village limits, snowmobile trails lead to Paul Bunyan, Badoura, and Chippewa National Forests. Akeley celebrates Paul Bunyan Days in June and the Winter Fantasy in January. Resorts, a motel, and caping facilities are available for year-'round pleasure.

Walker (Source: '78 Tour Guide to Minnesota Heartland)

Walker, the county seat of Cass County, is in the Chippewa National Forest - 640,000 acres of wilderness purchased from the Chippewa and dedicated by President Theodore Roosevelt - and in the Leech Lake Indian Reservation.

A museum of natural history, exhibits of Indian arts and crafts, and a restored pioneer school are at Walker. History buffs will enjoy visiting Indian burial grounds at Onigum and Sugar Point, site of the last skirmish between U.S. Army troops and American Indians in 1898. Fur trading posts were built in the area as early as 1791, but remains of a prehistoric mound-builders civilization date back to 500 B.C.

Golfers enjoy its 18-hole Tianna Country Club with watered fairways, and fishermen find prize-winning catches during the Walleye Contest in June and Muskie Derby in August.

Fishing is what it's all about in Cass County which hosts the second largest number of out-of-state fishermen annually. Sixty resorts cater to fishing, hunting, and nature enthusiasts all around the seasons. The Leech Lake Area Chamber of Commerce sponsors sled dog races, held around the first of the year. The annual Leech Lake Regatta attracts hundreds of sailboats in several classes for both cruising and racing events.

Leech Lake Indian Reservation (Source: Environmental Review of the Headwaters of the Mississippi Reservoir Projects Center for Environmental Studies, Bemidji State 1973)

The Leech Lake Indian Reservation was established in 1855 by a treaty between the United Stats and the "Chippewa of the Mississippi." The reservation encompasses parts of Beltrami, Cass, and Itasca Counties and includes land on two of the Mississippi Headwaters Reservoirs, Leech Lake and Lake Winnibigoshish.

The Leech Lake reservation and five other reservations are organized as the Minnesota Chippewa Tribe with a Tribal Executive Committee providing coordinated governance. Each reservation has its own reservation business committee (RBC) which governs local affairs and operates independently in most areas of management, such as housing and business projects.

The Bureau of Indian Affairs (BIA), Department of the Interior, is responsible for the administration of Indian lands and has complete, jurisdictional control of all reservations. The Minnesota Agency, headquartered in Bemidji, serves the Minnesota Chippewa reservations. The Red Lake Reservation is not affiliated with the others and has a separate agency.

Cass Lake (Source: Bemidji, Minnesota, Official 1978 Vacation Guide)

The Cass Lake Lions' Club sponsors their annual Water Carnival in the city during the last part of July and visitors will enjoy this street event.

The Minnesota Highway Department recently completed a rest area on the shore of Cass Lake, and an expansive new marina was constructed just east of the village on Highway 2. This marina offers 50 boat stalls, excellent harbor facilities and outstanding docking for the weary fisherman at the end of his day.

Another possibility for an exciting, fun-filled day is a ride on the mail route boat through the entire Mississippi River Chain. This scenic tour runs daily through some of the most beautiful wilderness and resort areas in northern Minnesota and is available for relatively little cost.

Visitors will also want to tour the logging museum in Cass Lake and should contact the Information Center of the Civic and Commerce Club before completing their plans.

Cass Lake is also headquarters for the Chippewa National Forest, and a visit to the historic three-story log headquarters building is interesting and informative.

DEMAND

Regional Attractiveness

Heartland

Clearly, the Heartland Trail is located in a prime vacation area. Throughout its area, the Heartland Tourism Region features an outstanding array of lakes and northern forests (Figure 11, page 37). All of Minnesota's five largest inland lakes are

within or bordering this region. Farms are interspersed throughout the Heartland. In the southern portion of the region, these farms coalesce into the excellent agricultural area of Stearns County. At the northern extreme, characteristics of the Red River Valley and a unique bluegrass agriculture emerge. With the exception of St. Cloud, the Heartland's cities are small; the metropolitan Minneapolis-St. Paul area exerts a substantial impact upon its southern area. Based upon Heartland's natural endowments of water and woods, tourism assumes a prominent role compared to the region's other economic opportunities.

Uel Blank et al, in a 1975 study on Minnesota's Lodging industry observes that the Heartland's 1,200 resorts, with a combined capacity of over 40,000, have capitalized upon the region's natural recreational resources. Heartland accounts for almost one-half of the total Minnesota resort capacity.

Recent construction of new buildings in the Heartland is not high compared to Vikingland. However, resorts in Heartland show the largest extent of recent upgrading and modernization of the three northern resort-oriented regions. Thus, this region is likely to retain its supremacy in Minnesota's resort facilities.

Almost 175 miles of water frontage and over 38,000 acres of land are controlled by the region's lodging operations. These figures rank Heartland first in the state in this respect.

The Heartland Tourism Region has more than 40 percent of Minnesota's trailer camping areas operated in association with motels and resorts. These 272 areas, combined with other private campgrounds plus those operated by governmental agencies, make a number of camping services available.

Two measures emphasize the impact of travel-tourism-recreation upon Heartland. Table 4 indicates that lodging capacity is equal to approximately 15 percent of Heartland's 1970 population. This

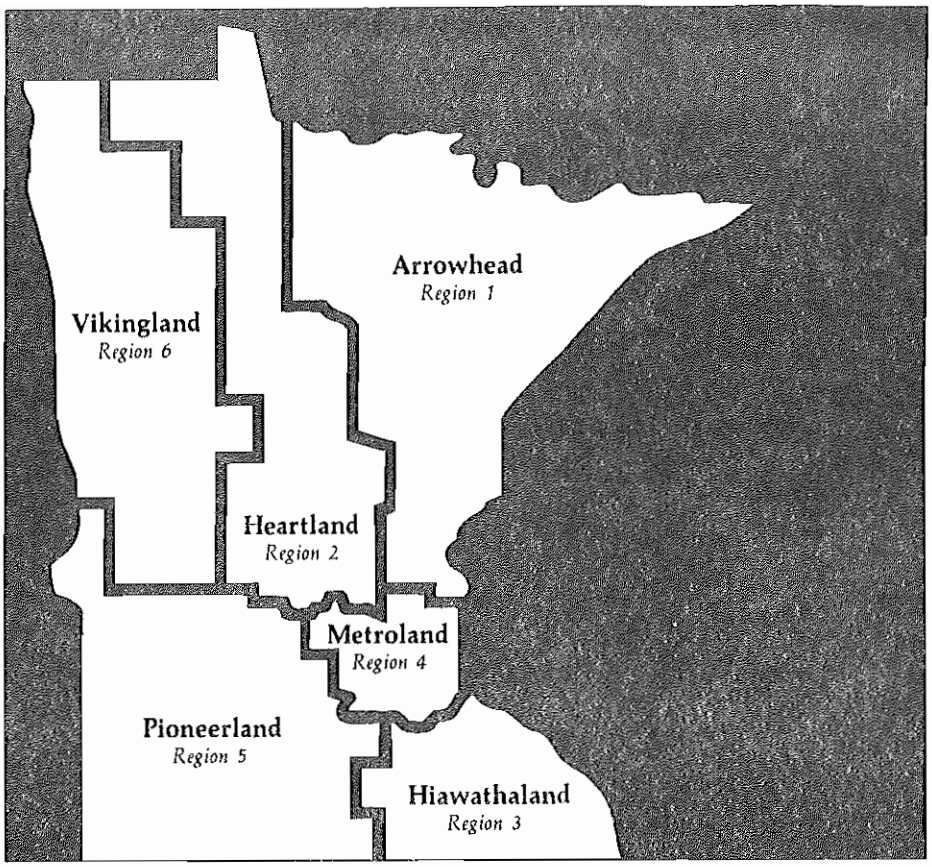


Figure 11 - Tourism Regions

TABLE 4

Lodging Capacity as a Percentage of Resident Population for Minnesota Tourism Regions, 1970.

Tourism Region	1970 Lodging Capacity ÷ 1970 Region Resident Population
Vikingland	8.6%
Pioneerland	2.5%
Hiawathaland	3.4%
Metroland	2.1%
Heartland	15.2%
Arrowhead	9.2%
AVERAGE FOR STATE	4.6%

TABLE 5

Capacity Ratios: Resort Capacity vs. Combined Hotel and Motel Capacities for Minnesota Trouism Regions, 1970.

Tourism Region	1970 Resort Capacity ÷ Hotel and Motel Capacity
Vikingland	2.55
Pioneerland	0.29
Hiawathaland	0.06
Metroland	0.03
Heartland	5.05
Arrowhead	1.49
AVERAGE FOR STATE	0.94

figure is noticeably higher than for any other region in the state. The second factor is the relative importance of resorts as suppliers of the region's total lodging capacity. The ratio of resort capacity to the combined hotel and motel capacity, shown in Table 5, is better than 5:1 in Heartland and almost two times that of the next closest region.

Accessibility

Availability of high quality access routes, in conjunction with population center distribution, shows that the Heartland Trail is within a four-hour drive of most Minnesotans; over three million. Population centers within one hundred miles of the Heartland Trail include Alexandria, Bemidji, Grand Rapids, Hibbing, Brainerd, Fargo-Moorhead, and Detroit Lakes. Cities within 200 miles of the trail include Duluth, St. Cloud, Minneapolis, St. Paul and the metro area.

The Heartland Trail area is served by five major highways. State Highways 371 and 64 and U.S. Highway 71 run north and south. State Highway 34 and U.S. Highway 2 run east and west. The trail parallels State Highway 34 along the entire 27 miles between Park Rapids and Walker. The trail then parallels State Highway 371 along the remaining 21 miles between Kabekona Bay and Cass Lake. Forty public roads intersect the trail providing access to it.

Relationship to Other Recreation Areas

There are many fine recreational facilities within the area which draw recreationists from all over the state and nation.

It is helpful to look at these facilities to show their relationship to the trail. This relationship will not only help in determining location, number, and types of facilities needed for the trail, but will also point out other recreational opportunities available to the user.

TABLE 6

State and Federal Recreational Facilities within Hubbard and Cass Counties

Recreational Facility	Hubbard County	Cass County
State Parks:	Itasca	Crow Wing Schoolcraft
Sites on National Register of Historic Places:	Itasca Bison Site	Chippewa Agency Gull Lake Mounds Hole-in-the-Day Cabin Site Rice Lake Hut Rings
Canoe and Boating Routes:	Crow Wing River	
State Forests:	Badoura Paul Bunyan	Foot Hills Pillsbury Battleground Remer Welsh Lake Bowstring Land O'Lakes
National Forests:		Chippewa
Wildlife Management Areas:		Mud Goose

Handicapped Use Suitability

Clearly, this is a desirable area to all, but to the disabled it may have special importance. Few outdoor recreation areas within this region, or for that matter, the state, can better serve some of their recreational needs. Due to the nature of the asphalted former railroad bed with its 3 percent maximum slope, the trail is easily negotiable by many paraplegics (those paralyzed in the lower half of the body). The trail might be equally accessible to some quadraplegics (those having total body paralysis) if accompanied by an able-bodied person.

Proposed Impacting Development

North Country Trail

- a federally sponsored 3,246 mile trail being developed which traverses New York, Pennsylvania, Ohio, Michigan, Wisconsin, Minnesota, and terminating at the proposed Lewis and Clark Trail in North Dakota. It will provide opportunities for hiking and in segments opportunities for horseback riding, bicycling, and snowmobiling across the nation.

Traveling from East to West in the Heartland Trail region, the North Country Trail will enter the Chippewa National Forest-Leech Lake Indian Reservation complex (Figure 12, page 42) a few miles west of the Hill River State Forest. This complex contains dense boreal forests intermixed with many swamps and lakes.

At its intersection with the Heartland Trail, near the eastern boundary of the Paul Bunyan State Forest, the North Country Trail will be routed obliquely to the northwest through the Paul Bunyan State Forest. The trail will then pass through terrain that consists of forested, rolling hills to Itasca State Park, where Lake Itasca is acclaimed as the origin of the Mississippi River.

From Itasca State Park, the North Country Trail will be routed southwestward, passing through the White Earth Indian Reservation and White Earth State Forest.

It appears that the North Country Trail will not be open to snowmobiles where it intersects the Heartland Trail.

Pike Bay Bicycle Route

- a 20 mile hard-surfaced U.S. Forest Service trail being planned in and around the Pike Bay area (near Cass Lake). It will provide Heartland bicyclists (and others) with access to approximately 190 campsites, as well as a variety of picnicking and day use areas, including opportunities for swimming and fishing.

Circle Bicycle Route traveling from Bemidji through Itasca State Park to Park Rapids to Walker and Cass Lake.

In conjunction with the Minnesota Department of Transportation (MN/DOT) efforts, there is potential for development of a 120-mile bicycle route. At this time, it appears that it may be completed as early as 1985.

Heartland County Park

An expansion to Riverside City Park and the Heartland Trail in Park Rapids (Figure 13, page 43) is proposed. It would provide day use facilities and parking access to the trail in this area. However, a funding source for this development has not been located to date. The DNR recommends that the state fund it through the Land and Water Conservation Fund (LAWCON).

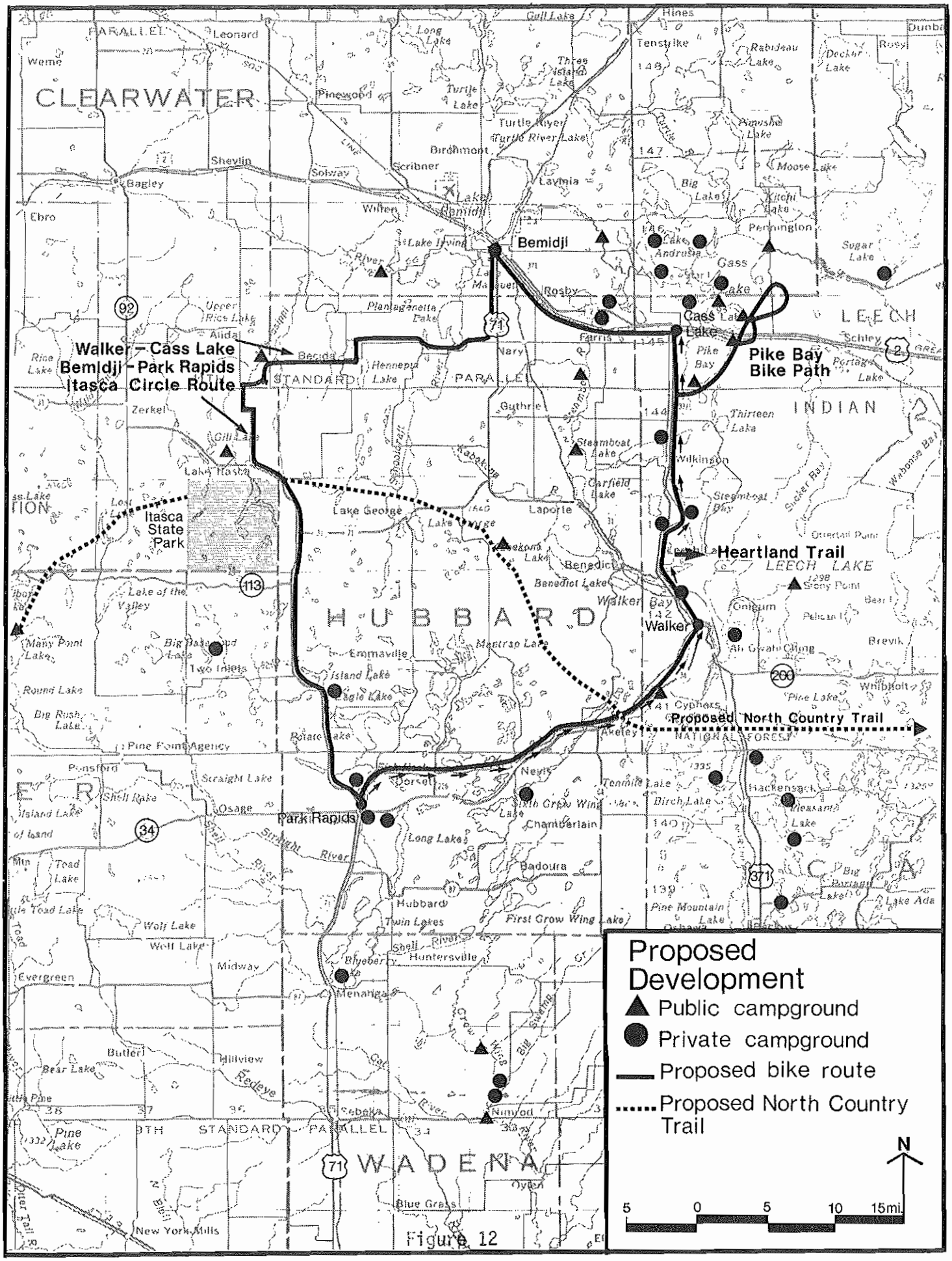

Walker - Cass Lake
Bemidji - Park Rapids
Itasca Circle Route
Pike Bay
Bike Path
Heartland Trail
Proposed North Country Trail
Itasca
State
Park
Bemidji
Cass Lake
Walker
Park Rapids
CLEARWATER
HUBBARD
LEECH LAKE
INDIAN
WADENA
Proposed
Development
Public campground
Private campground
Proposed bike route
Proposed North Country
Trail
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Figure 12

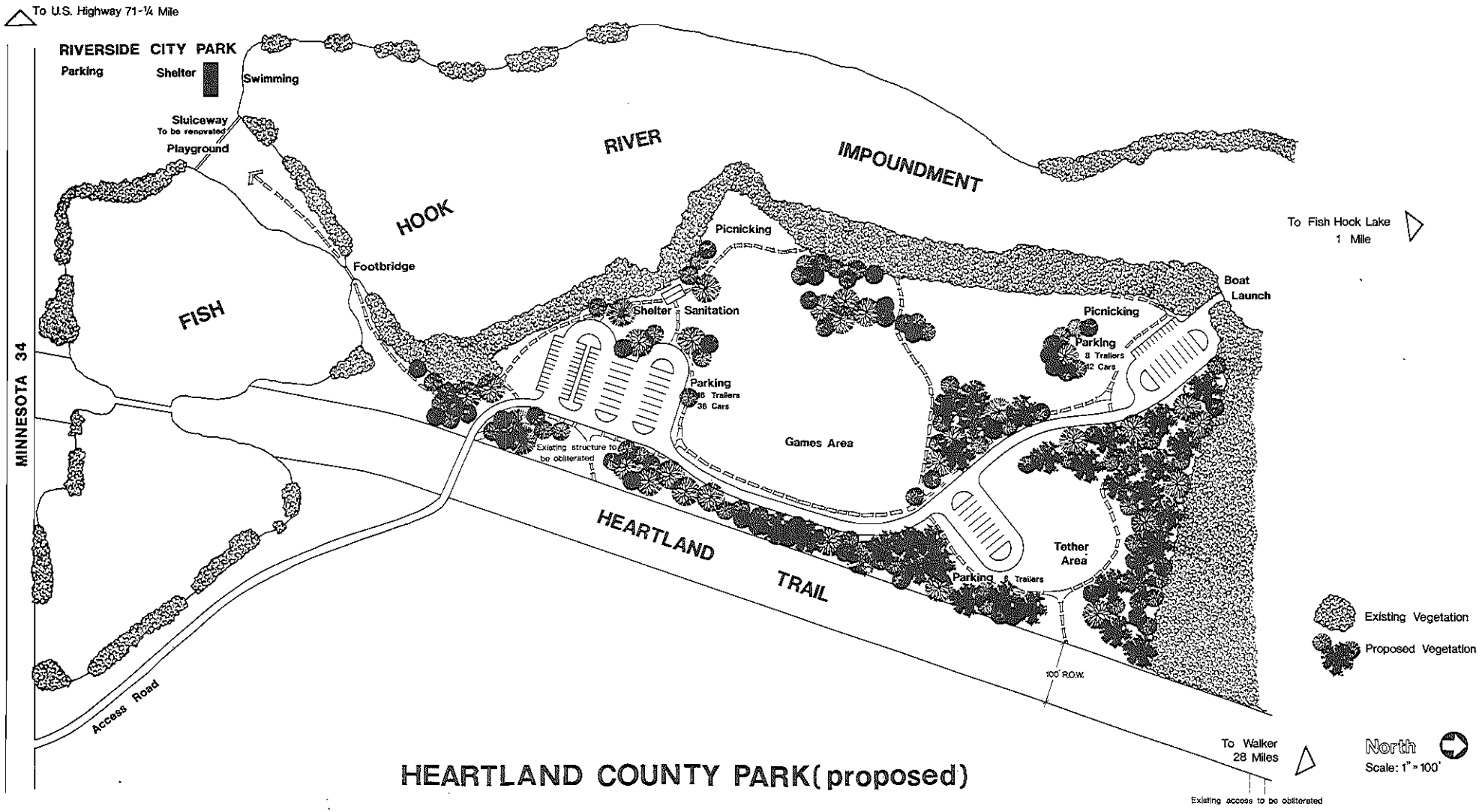
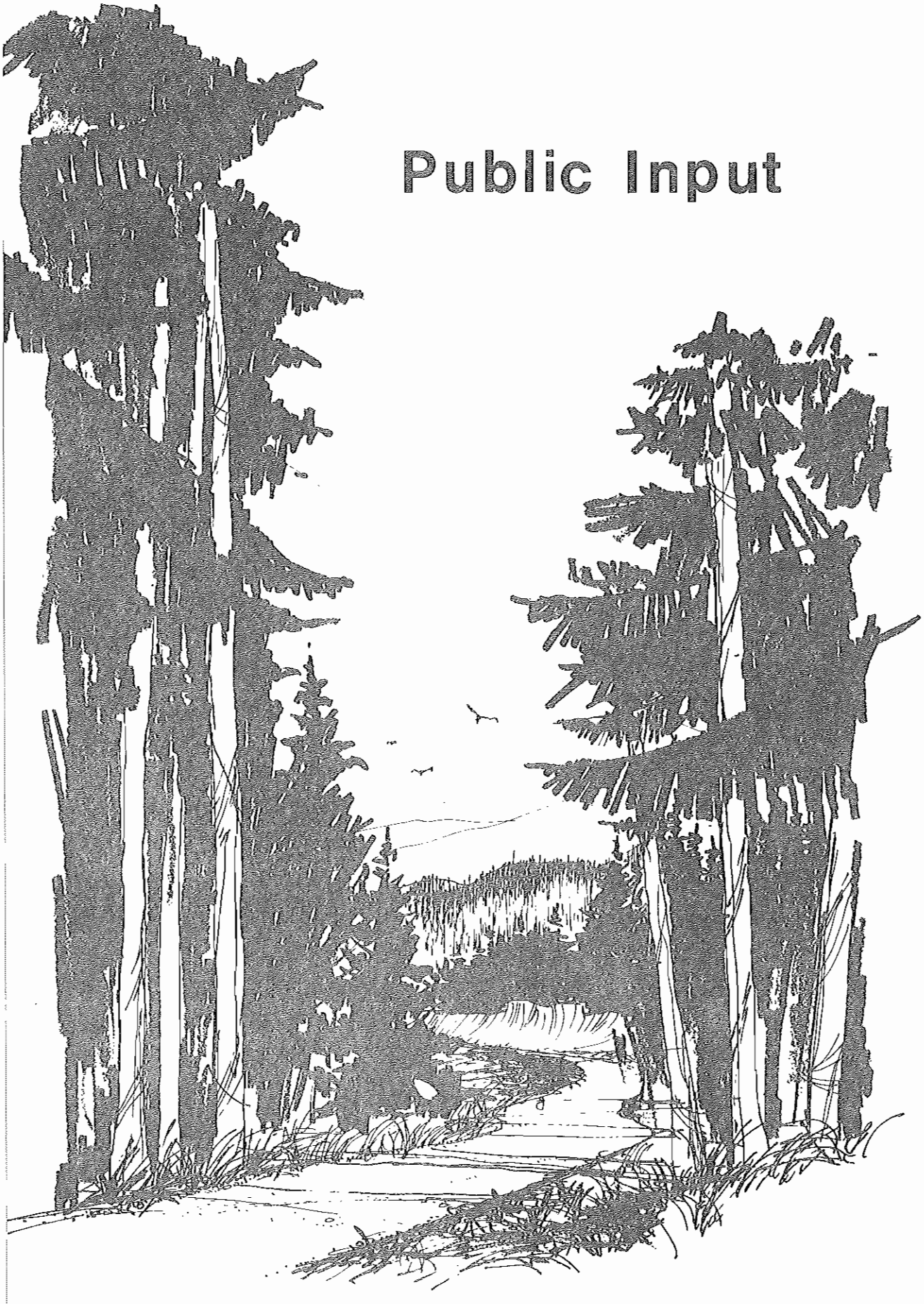

To U.S. Highway 71-¼ Mile
RIVERSIDE CITY PARK
Parking
Shelter
Swimming
Sluiceway
To be renovated
Playground
RIVER
IMPOUNDMENT
HOOK
FISH
Footbridge
Picnicking
Shelter
Sanitation
Parking
36 Trailers
36 Cars
Games Area
Existing structure to be obliterated
Picnicking
Boat Launch
Parking
8 Trailers
12 Cars
To Fish Hook Lake
1 Mile
MINNESOTA 34
HEARTLAND TRAIL
Tether Area
Parking 8 Trailers
100' R.O.W.
Access Road
Existing Vegetation
Proposed Vegetation
To Walker
28 Miles
North
Scale: 1" = 100'
Existing access to be obliterated
HEARTLAND COUNTY PARK(proposed)

Figure 13

Public Input



USE SURVEYS

In 1975 two surveys* were conducted--one to measure the impact that winter users (snowmobilers in particular) were having on businesses (Department of Economic Development) and the other, to measure user satisfaction (Benson, 1975). Across the board, businesses were supportive of the Heartland Trail, even those not directly benefitting. Included are some of the observations, conclusions, etc. of those surveys.

It is difficult to say how much increase in business in the motels and resorts is directly due to the trail. The Park Rapids motels depend on it the most because their guests can ride from the motel down the trail to other areas. However, several of these motels report a drop in business which they attribute to the increased number of winterized resorts which are "luring" their guests away. Much of their business now is "off-the-road" business-guests who just drop in instead of making reservations or planning ahead. Many of the Highway 71 motels in Park Rapids report that their business is now about one-half skiers.

*Both surveys are reproduced in the appendix.

Weekend users generally do not travel very far on the trail. Two thirds of the parties interviewed traveled less than one-half of the trail length and only one party traveled the whole distance. Sixty percent of the weekend users interviewed said they expected to be on their machines for four or more hours on this particular run. Users entered and exited the trail in many different locations.

Nevis and Akeley are benefiting the most from the trail. Being in the middle, they attract use from both sides, and their club grant-in-aid trails are favorite destinations for trail users. Resorts and motels south of the trail use the Heartland Trail

heavily for sending their guests to the club trails and from there to the Paul Bunyan Forest. The Lake Belle Taine resorters are sent from there east through Nevis to the club trail. This type of use is typical for this area of the trail.

The respondents interviewed were satisfied with the trail in general. When the users were asked to rate their satisfaction with the trail as a whole, the mean response of all users was 4.1 on a scale from 1 to 5. (1 - very dissatisfied, 3 - indifferent and 5 - very satisfied) Although the most commonly chosen response they made was (5), there were a sufficient number of respondents dissatisfied with, or indifferent to the trail to pull the average down.

The users were very satisfied with the use of a railroad grade for a trail, but were not satisfied with its grooming. Respondents were generally satisfied with trail width and trail safety although a few comments were made concerning excessive speed. One party made a request to mark with reflective tape all guy wires, culverts and other hazards in the ditches between the road and the trail to warn night riders. From observation it can be seen that a great many snowmobilers circle around between the ditch and the trail, and an accident adjacent to the trail would be of as much concern as an accident on the trail. This situation is especially dangerous because the part of the trail which parallels the road from Akeley to Nevis has some of the heaviest night use, increasing the hazard of an accident.

Six respondents indicated they would like to see directional signs and maps. Such a system would include the Heartland Trail, State Forest trails and club trails. Although people usually knew when they were on the Heartland, users were often confused as to where they had been or where they were going. They requested a signing system telling them where to turn off the trail to reach other destinations. Suggestions included a color code system -"You are here" maps - or a number system for

trails. Resort owners also indicated interest in such a system so that they could send their guests out without a guide. The 1974 Snowmobiler Survey done for the DNR by Gogebic College points up the importance of signs and maps to trail users. Seventy-seven percent of the snowmobilers thought that marking and mapping trails was an important use of state snowmobile funds. They rate this almost as high as establishing new trails (79 percent indicated that was an important use). Due to their vested interests in the trail, the snowmobile clubs would probably assist with the labor if a good comprehensive signing scheme were developed.

It was difficult to measure satisfaction with trail facilities since none existed at the time of the survey. Some people were satisfied with the present state of non-development; they felt the towns could take care of the trail users' needs. However, more users requested additional facilities. Seven respondents asked for restrooms. Some of them did not like to go into restaurants to use the facilities because they did not like to feel obligated to buy. Two users wanted access parking lots. On this survey, only two of the forty-one parties had hauled their machines to the trail. Most of that type of day use is being served by the Paul Bunyan parking lots. If there were lots, they might be used, but the demand would likely be low in the winter. Shelters or picnic tables were requested by four users.

Users expressed concern about poor access to Walker and Park Rapids. The Walker Town Council has approved marked snowmobile routes into town which should take care of that problem. Otherwise the trail provides readily available food, beverage, gas, and machine repair services.

DRAFT PLAN REVIEW

Public meetings were held on February 7-8, 1978 in Walker to discuss the draft of this plan. The question most asked at both hearings was what the DNR planned to do about enforcement of

The Plan

GOAL AND OBJECTIVES

GOAL

The goal of the Heartland Trail Management Plan is to preserve a linear representation of the Pine Moraine Landscape Region for use as a long distance multiple use recreational corridor which complements regional facilities and contributes to statewide recreational goals.

OBJECTIVES

The objectives of the DNR are:

To complete the trail from its present terminus in Walker to the town of Cass Lake.

To retain and/or reestablish examples of pre-settlement vegetation within the corridor.

To promote a greater understanding of the region through which the trail passes.

To provide access to a variety of other trails and recreation areas within the area.

To provide a high quality biking, horseback riding, and snowmobiling experiences and, to a lesser extent, provide opportunities for hiking and ski touring and handicapped use.

To utilize existing facilities wherever possible.

To enhance the region's current position as a quality tourist attraction.

DEVELOPMENT

Most of the trail between Park Rapids and Walker is complete and open, while the trail between Walker and Cass Lake remains to be developed. Consequently, most of the DNR's effort in the future will be concentrated on the second portion of the trail. However, development will have to wait until and an agreement is reached between the DNR, Leech Lake Indian Tribe, and Department of Interior or until an interim alternative alignment can be secured in cooperation with the MN/DOT and/or others. Any significant change will necessitate an amendment to the plan with an additional public meeting. In the interim it may be necessary to protect the State's interest in these lands by seeking legal ways to preclude development within the contested right of way (ROW).

Trunk Highway (TH) 34 roughly parallels the trail between Park Rapids and Walker, and between Walker and Cass Lake the trail is roughly paralleled by TH 371.

In fact, these state highways and trail rights of way are adjacent to each other for a high percentage of the total distance. Therefore, it is imperative that all future DNR actions for the Heartland Trail be coordinated with future transportation improvements proposed by the Mn/DOT or the respective counties.

The Mn/DOT has asked that the DNR work closely with them to ensure that any future trail alighment does not force a "4F" or "6F" involvement (required by Federal highway law where a highway improvement negatively impacts a recreation facility) if adjacent highways are to be upgraded. The DNR has agreed to work closely with the Mn/DOT to prevent such an involvement if possible. Any trail development within existing or proposed highway right of way will be undertaken jointly to ensure that future conflicts do not occur.

In addition, interdepartmental coordination may be necessary to alleviate undesirable aspects associated with the highway's close proximity. For example, parking along roadsides for the purpose of gaining access to the trail may become a problem requiring a joint effort. The DNR will work with the Mn/DOT to develop a signing system to guide motorists to the developed trail waysides and access points. Trail brochures will also help to indicate the location of these facilities. In certain problem areas, vegetation management efforts may be helpful in screening the trail from view by passing motorists. If on-road parking is still a problem, "no parking" signs may have to be erected in select locations.

PARK RAPIDS TO WALKER SURFACE

When the trail was originally surfaced, a six foot wide strip of 1 1/2-inch thick site-mixed asphalt was applied over the existing sandy base. Little base preparation was done and no defoilant was applied prior to the surfacing.

Two problems are now apparent with the surface.

1) Segments of the trail are "washboarding" because the base was inadequately compacted when the surface was applied. (Washboarding is the wrinkling and crumbling of a paved surface.)
2) Vegetation is pushing up through the surface in some areas.

Although most of the three year-old treadway is still in good condition and no overall repairing is anticipated, major repair is needed on 5-10 percent of the treadway. These sections will require repair or replacement in the near future. When specific trail segments need repair, the Bureau of Engineering will be asked to determine whether to remove and replace the surface or to place an additional overlay over the existing surface.

Figure 14

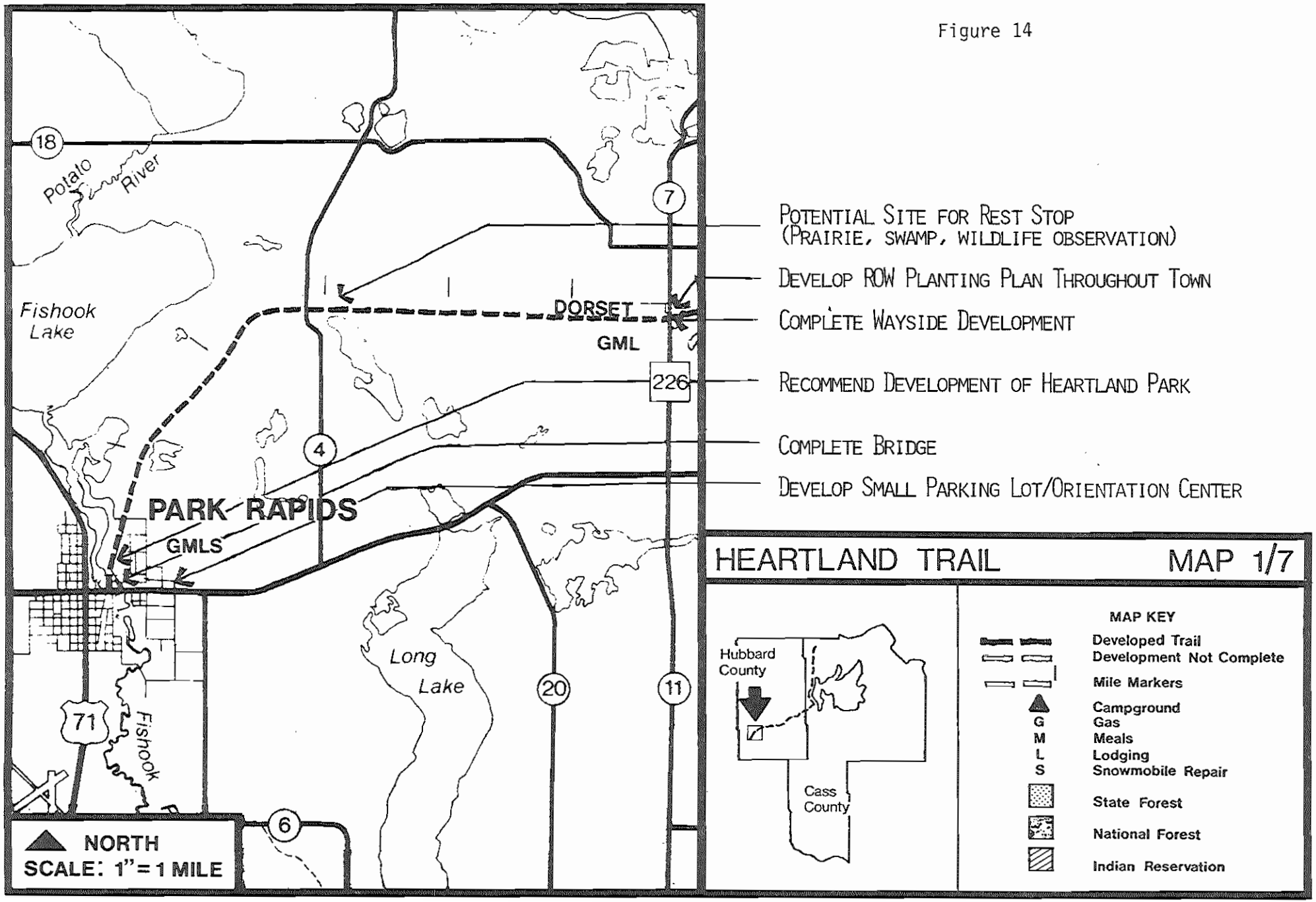

18
Potato River
7
Fishook Lake
DORSET
GML
226
4
PARK RAPIDS
GMLS
Long Lake
20
11
71
Fishook
6
NORTH
SCALE: 1"=1 MILE
POTENTIAL SITE FOR REST STOP (PRAIRIE, SWAMP, WILDLIFE OBSERVATION)
DEVELOP ROW PLANTING PLAN THROUGHOUT TOWN
COMPLETE WAYSIDE DEVELOPMENT
RECOMMEND DEVELOPMENT OF HEARTLAND PARK
COMPLETE BRIDGE
DEVELOP SMALL PARKING LOT/ORIENTATION CENTER
HEARTLAND TRAIL
MAP 1/7
Hubbard County
Cass County
MAP KEY
Developed Trail
Development Not Complete
Mile Markers
Campground
G Gas
M Meals
L Lodging
S Snowmobile Repair
State Forest
National Forest
Indian Reservation

Figure 15

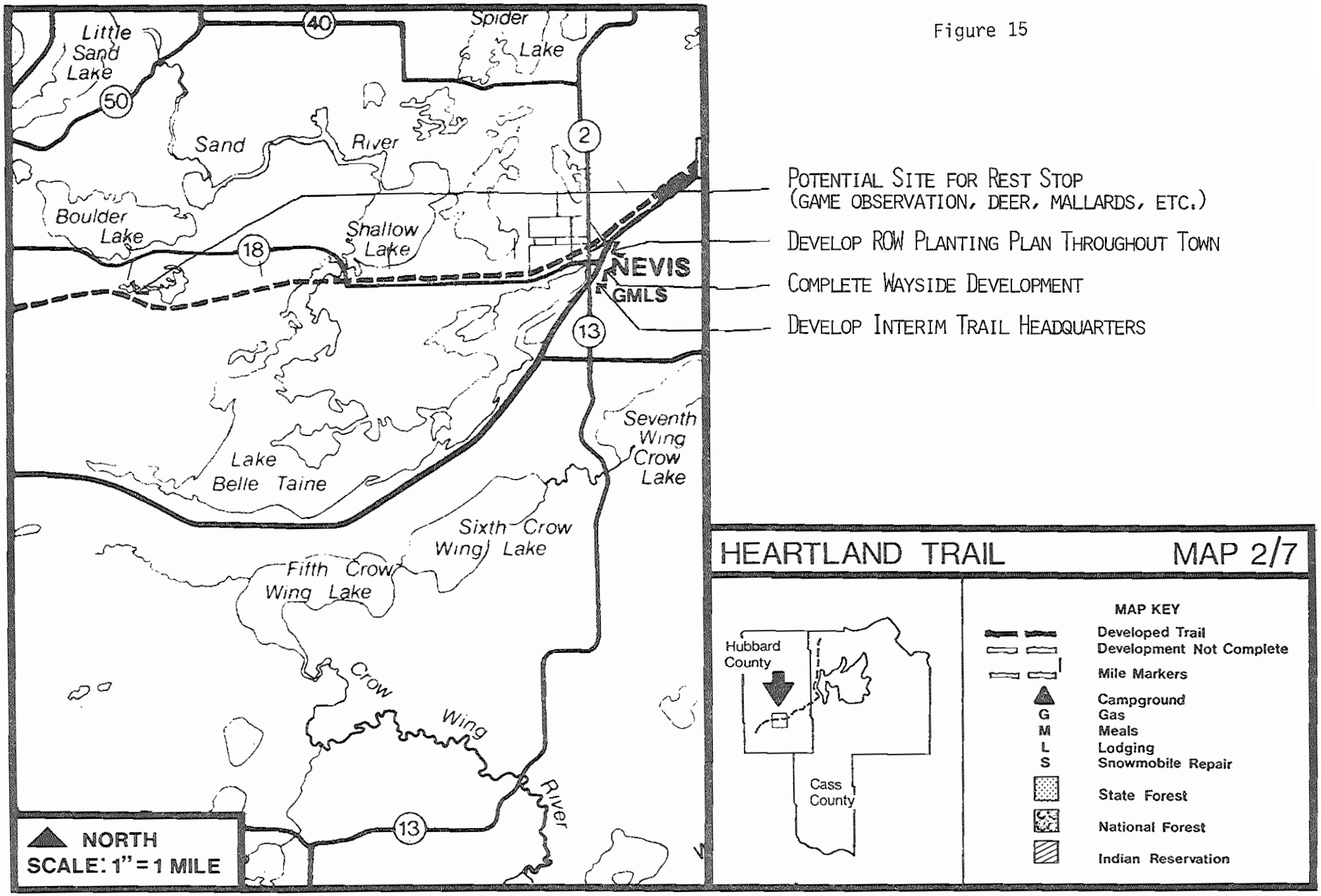

Little Sand Lake
40
Spider Lake
50
Sand River
2
Boulder Lake
Shallow Lake
18
NEVIS
GMLS
13
Seventh Wing Crow Lake
Lake Belle Taine
Sixth Crow Wing Lake
Fifth Crow Wing Lake
Crow Wing River
13
NORTH
SCALE: 1" = 1 MILE
POTENTIAL SITE FOR REST STOP (GAME OBSERVATION, DEER, MALLARDS, ETC.)
DEVELOP ROW PLANTING PLAN THROUGHOUT TOWN
COMPLETE WAYSIDE DEVELOPMENT
DEVELOP INTERIM TRAIL HEADQUARTERS
HEARTLAND TRAIL
MAP 2/7
Hubbard County
Cass County
MAP KEY
Developed Trail
Development Not Complete
Mile Markers
Campground
G Gas
M Meals
L Lodging
S Snowmobile Repair
State Forest
National Forest
Indian Reservation

Figure 16

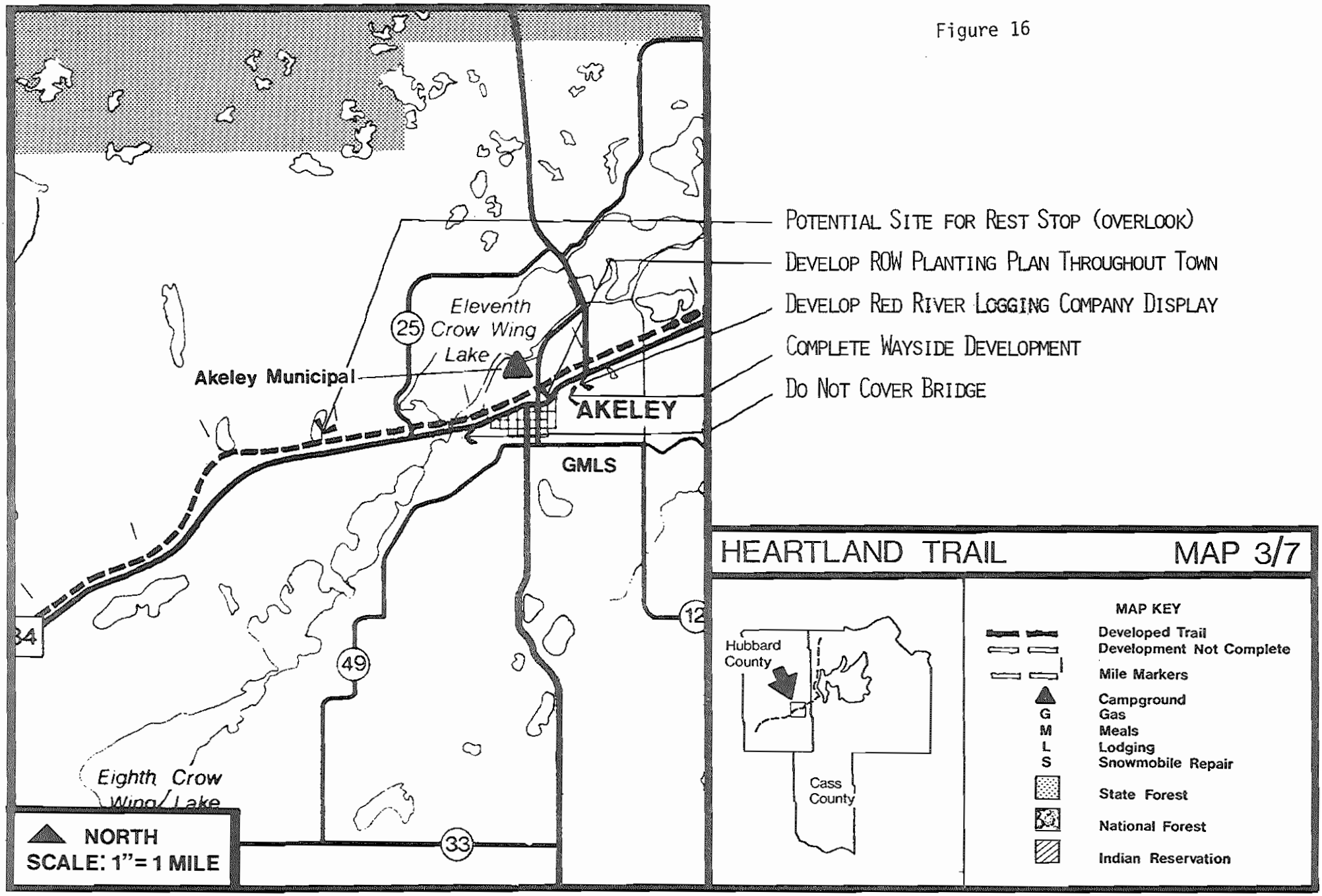
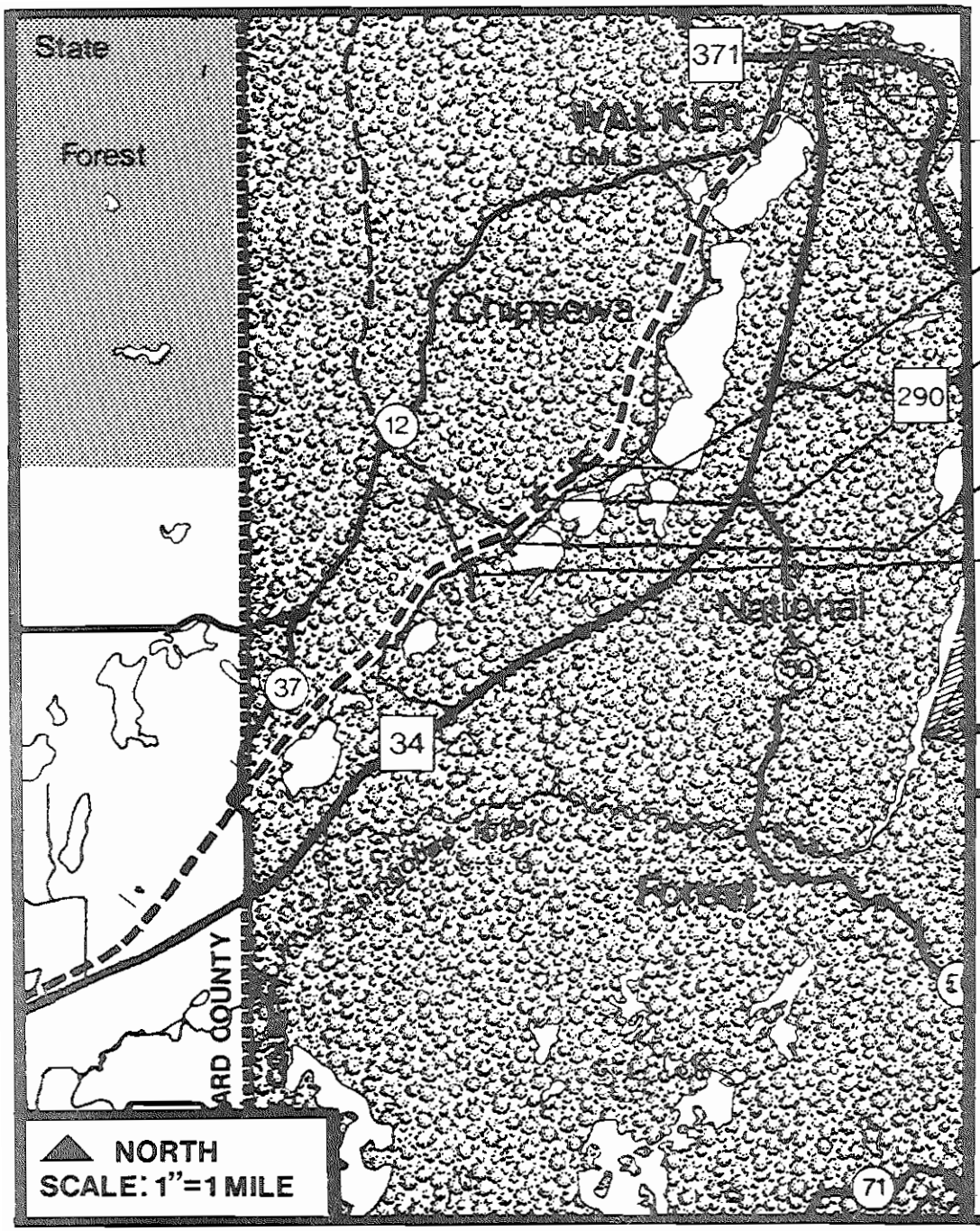

POTENTIAL SITE FOR REST STOP (OVERLOOK)
DEVELOP ROW PLANTING PLAN THROUGHOUT TOWN
DEVELOP RED RIVER LOGGING COMPANY DISPLAY
COMPLETE WAYSIDE DEVELOPMENT
DO NOT COVER BRIDGE
Eleventh Crow Wing Lake
Akeley Municipal
AKELEY
GMLS
25
49
33
12
34
Eighth Crow Wing Lake
NORTH
SCALE: 1"= 1 MILE
HEARTLAND TRAIL
MAP 3/7
Hubbard County
Cass County
MAP KEY
Developed Trail
Development Not Complete
Mile Markers
Campground
G Gas
M Meals
L Lodging
S Snowmobile Repair
State Forest
National Forest
Indian Reservation

Figure 17



ESTABLISH ROUTE THROUGH WALKER LINKING CITY PARK, MUSEUMS, AND BUSINESS DISTRICT

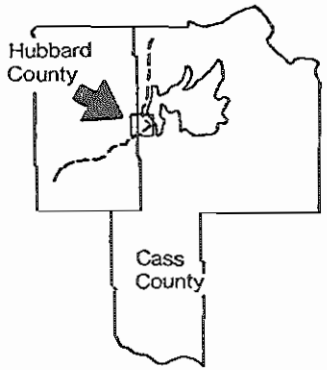
ACQUIRE AND DEVELOP MARSH OBSERVATION PLATFORM

ACQUIRE AND DEVELOP SMALL PRIMITIVE CAMPING AREA

ESTABLISH INTERPRETIVE INTERFACE WITH NORTH COUNTRY TRAIL

ALTERNATIVE SNOWMOBILE ALIGNMENT AROUND WALKER

HEARTLAND TRAIL — MAP 4/7



MAP KEY

- Developed Trail
- Development Not Complete
- Mile Markers
- Campground
- G Gas
- M Meals
- L Lodging
- S Snowmobile Repair
- State Forest
- National Forest
- Indian Reservation

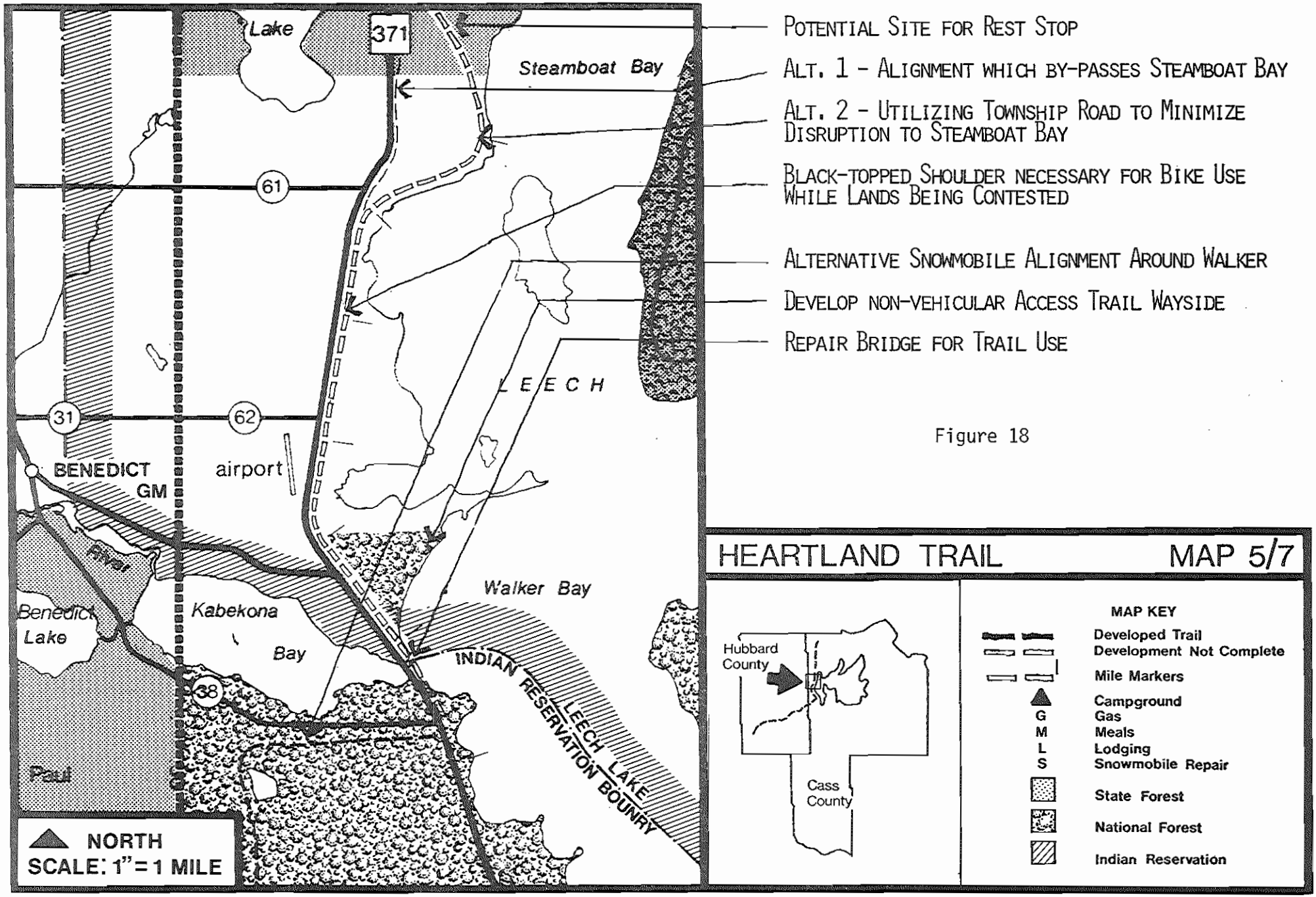
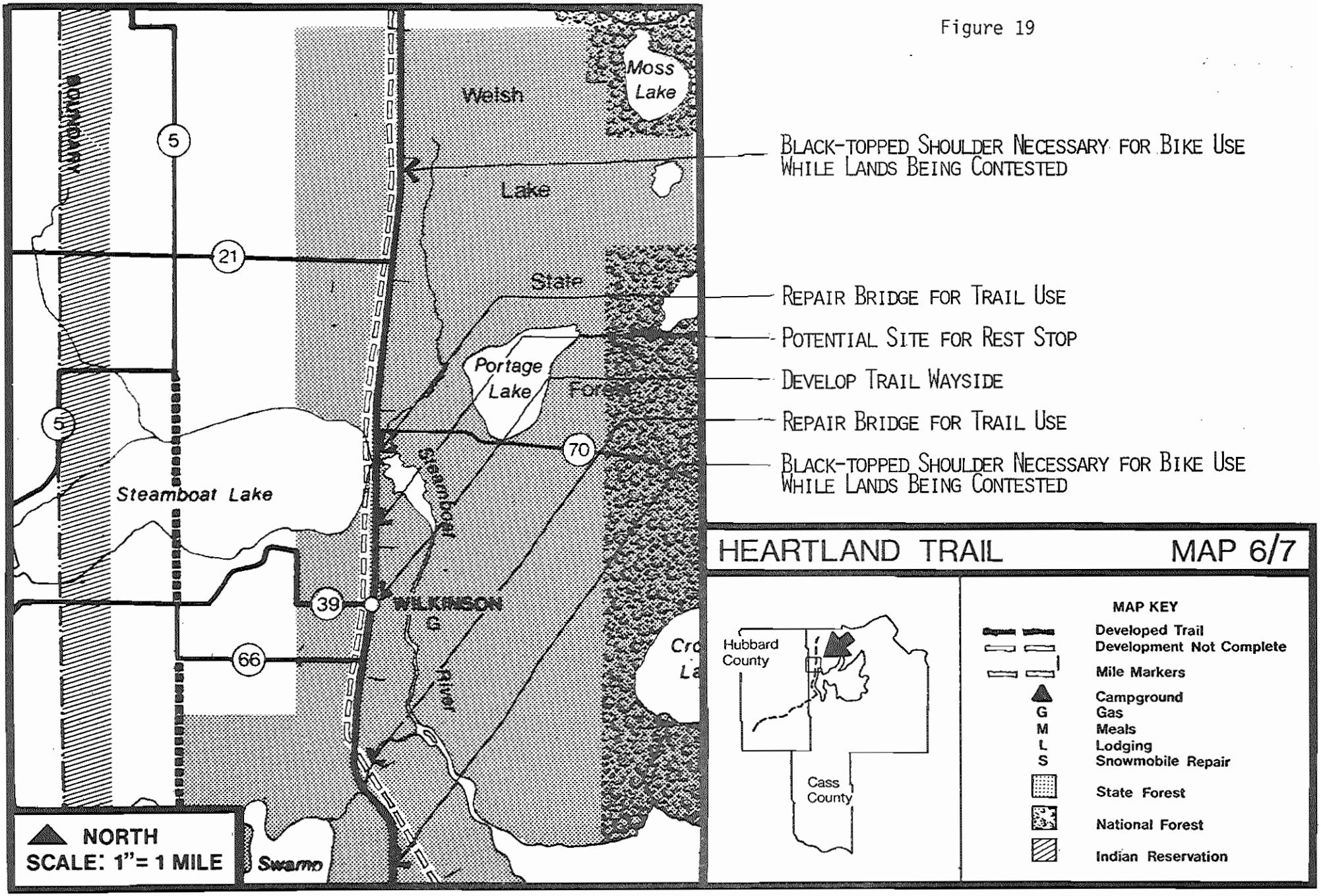

Lake
371
Steamboat Bay
61
31
62
BENEDICT
GM
airport
LEECH
Walker Bay
Benedict
Lake
Kabekona
Bay
38
INDIAN RESERVATION BOUNRY
LEECH LAKE
Paul
NORTH
SCALE: 1" = 1 MILE
POTENTIAL SITE FOR REST STOP
ALT. 1 - ALIGNMENT WHICH BY-PASSES STEAMBOAT BAY
ALT. 2 - UTILIZING TOWNSHIP ROAD TO MINIMIZE DISRUPTION TO STEAMBOAT BAY
BLACK-TOPPED SHOULDER NECESSARY FOR BIKE USE WHILE LANDS BEING CONTESTED
ALTERNATIVE SNOWMOBILE ALIGNMENT AROUND WALKER
DEVELOP NON-VEHICULAR ACCESS TRAIL WAYSIDE
REPAIR BRIDGE FOR TRAIL USE
HEARTLAND TRAIL
MAP 5/7
Hubbard County
Cass County
MAP KEY
Developed Trail
Development Not Complete
Mile Markers
Campground
G Gas
M Meals
L Lodging
S Snowmobile Repair
State Forest
National Forest
Indian Reservation

Figure 18

Figure 19


Moss Lake
Welsh
Lake
5
21
State
Portage Lake
5
70
Steamboat Lake
Steamboat
39
WILKINSON
66
River
Swamp
NORTH
SCALE: 1"= 1 MILE
BLACK-TOPPED SHOULDER NECESSARY FOR BIKE USE WHILE LANDS BEING CONTESTED
REPAIR BRIDGE FOR TRAIL USE
POTENTIAL SITE FOR REST STOP
DEVELOP TRAIL WAYSIDE
REPAIR BRIDGE FOR TRAIL USE
BLACK-TOPPED SHOULDER NECESSARY FOR BIKE USE WHILE LANDS BEING CONTESTED
HEARTLAND TRAIL
MAP 6/7
Hubbard County
Cass County
MAP KEY
Developed Trail
Development Not Complete
Mile Markers
Campground
G Gas
M Meals
L Lodging
S Snowmobile Repair
State Forest
National Forest
Indian Reservation

Most trail design manuals call for an eight foot width for two-way grade, separated bikeways. The Heartland Trail was paved at only six feet because of high cost and uncertainty about the amount of bicycle use it would receive. As trail segments need repaving, consideration will be given to widening the treadway to eight feet. The decision to repair the trail at an eight foot width will be based on:

1) the current and anticipated level of public use, and
2) the total length of the section to be repaired.

Trail Waysides

Except for providing water and an orientation/interpretation display, the Dorset wayside is complete. The display will be a standard design, rustic, three-panel roofed kiosk with interchangable interpretive visuals and printed text. Two of the three panels, facing opposite trail segments, provide information on what lies ahead. These panels should be rotated seasonally by maintenance crews. The third panel, facing away from the trail toward the rest area, should feature a trail logo and statement of goal, function and benefits; off-trail conveniences, recreational facilities and points of interest; and emergency information.

Unlimited use of the Dorset area for camping might promote non-trail user use. Also, this area will be used on an experimental, permit-only basis by handicapped groups for camping. The present sanitation facilities are handicapped accessible, and the adjoining parking lot might be used to bring additional equipment required by the handicapped. If a demand for such use emerges, permanent accommodations for this special population is recommended.

The trail waysides in Nevis and Akeley will require more work before completion. Original plans for these two towns had called for construction of trail shelters similar to the one in Dorset.

However, a suitable site for that size shelter does not exist in Nevis--it would have aesthetically dominated the site. Instead, a smaller shelter will be constructed incorporating an orientation/interpretation display. Provision of water, completion of the parking lot, and some additional plantings will complete this wayside.

A major public park exists in Akeley on Eleventh Crow Wing Lake which offers picnicking, camping, swimming, fishing, shelter, also has a highway rest area adjacent to the ROW. On account of these existing facilities, it would not be proper to invest in a major picnic shelter there. Instead, an orientation/interpretation display will be designed and located there to also serve as an inclement weather refuge. In addition, a permanent display commemorating the Red River Logging Company camp may be developed. These developments will complement existing facilities in the area. Provision of water, completion of the parking lot, and some additional plantings will complete this wayside.

No such development is planned for Park Rapids as the county has proposed a park adjacent to the trail which will serve as the user rest stop. The expanded trail right of way adjacent to TH 34 should be equipped with a small parking lot and an orientation/interpretation display. This highly visible location could serve as a "lure" to would-be users travelling the highway and remove any ambiguity as to access to the trail.

Bridge Repairs

Akeley Bridge - As a result of input received of the February 7 & 8, 1978 public meetings, the Akeley bridge will not be covered. This development would have introduced a quaint character reminiscent of New England which would have been out of character for this region. The money saved could better be used for other trail improvements. Minor modifications are needed to permanently retain the bridge's present character.

Park Rapids Bridge - Although materials have been purchased, this bridge remains to be renovated for trail purposes. Even though other options exist to gain access to the trail from the proposed Heartland County Park, completion of this bridge would establish a use for the land adjacent to TH 34, and would thus minimize future conflicts with adjacent landowners in the event the trail is extended (depending on future rail abandonment of course). In addition, it would provide an essential ingredient in the setting which "would be" trail users (i.e., those in the automobile) could view.

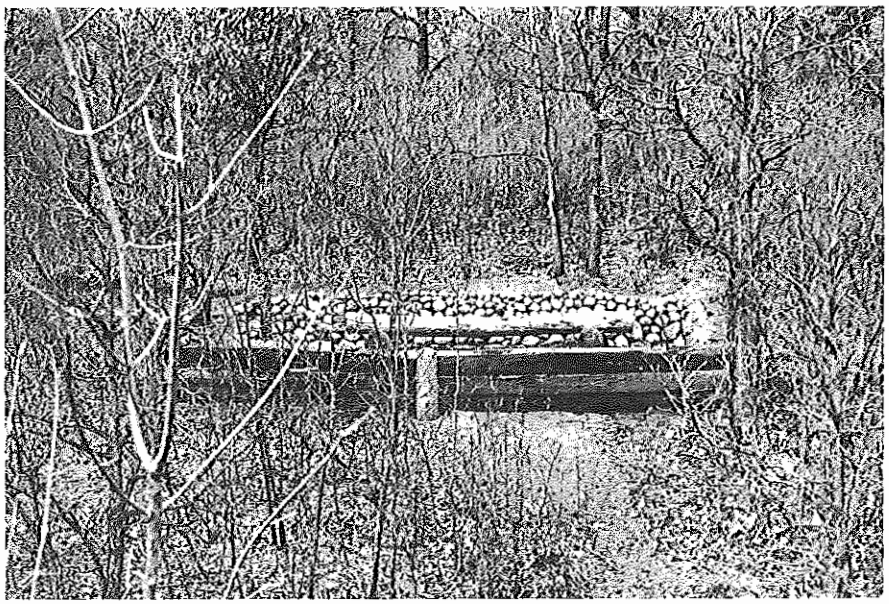
This bridge should be closed to snowmobiles as long as the bridge through Riverside Park remains open. The Riverside Park bridge eliminates a dead end situation since there are no side streets which cross TH 34, and because the railroads do not permit snowmobile operation adjacent to trackage which is still in operation. The Riverside bridge would deposit users onto a side street which will maximize their legal access options throughout Park Rapids.

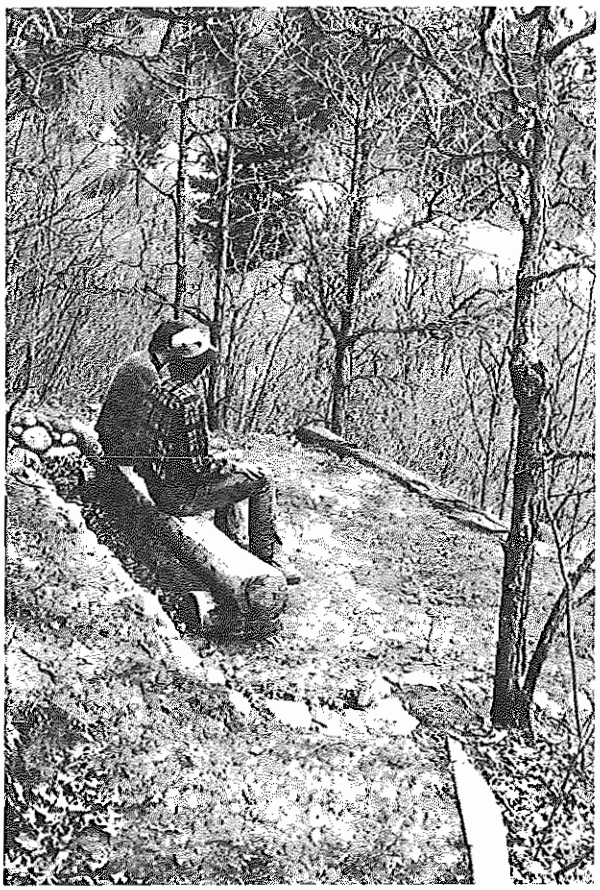
Rest Areas

A small, native stone bench has been constructed near Akeley. Due to the important role it serves for rest, its ability to blend into the environment, and its immunity to most vandalism, three of these structures will be constructed approximately six miles apart. Due to the hand work involved, Youth Conservation Corps (YCC) or Young Adult Conservation Corps (YACC) crews should be employed.

Trail Headquarters

To date, the trail has existed without an administrative hub. Equipment is stored in a warehouse near Park Rapids, and paperwork is processed either through the DNR Regional Headquarters in Bemidji or sometimes in the home of the trail maintenance crew chief. As trail use increases, this will become an increasingly cumbersome arrangement.





Figures 21 & 22

Rest Area Near

Akeley

A focal point for the trail is needed for administration, complaints, interpretation and equipment storage. However, because trail headquarters have not as yet been used in Minnesota, their optimum "form" is not known. Consequently, what is proposed may only be an interim solution.

The DNR owns a 24' x 24' building along the trail in Nevis. With slight modification, it could be converted into the trail headquarters. The Region should evaluate its usefulness two years after it is opened and recommend any changes on this arrangement.

Camping Area

Camping is a primary element for many bicycle-tourers. However, they may desire different experiences. While some desire full facilities (e.g. flush toilets, showers, etc.), others desire an opportunity to camp in a primative setting. Therefore, a small camping area (approx. ten sites) is proposed between Akeley and Walker just inside the Chippewa National Forest.

Development of this camping area will be restricted to irregularly shaped clearings for tent sites equipped with fire rings, a well screened primitive sanitation facility, and a centrally located water supply. The site was selected because of its central location along the entire trail, potential for seclusion, scenic quality, and proximity to the crossing of the North Country Trail which is currently being developed.

Since the land for this proposed campsite is now under Federal ownership, a cooperative agreement, special use permit, land exchange, lease, or some other agreement must be arranged prior to construction. It is possible that the U. S. Forest Service will construct such a facility for North Country Trail users. Hopefully, Heartland users would be welcome in the facility and this development would be unnecessary.

Due to the low cost of development, consideration should be given to discontinuing the campsite if management problems arise. Admittedly, it is impossible to forecast its reception, but the DNR feels that the potential use benefits justify the attempt.

Marsh Observation Deck

A small observation deck overlooking a marsh is planned, east of Akeley. Such a facility will provide an interpretive highlight for the user. As in the case of the proposed camping area, the land needed is not part of the land transferred from the railroad. This would seem to be an excellent project for the YCC and/or YACC.

Walker Access

As a result of the input received at the public meeting reviewing the draft of this trail plan (2/7/78) and a Walker City Council resolution (3/23/78), connection of the southern and northern segment of the trail is proposed <u>through</u> the City of Walker. By doing this, the bicyclist will have access to Walker's park, beach, restaurants, museums, etc. The exact alignment has yet to be chosen. It is expected that local officials will work with impacted resident to minimize conflicts should they arise.

<u>Walker to Cass Lake</u>

Minnesota Department of Transportation (Mn/DOT) is presently evaluating potential shoulder surfacing on TH 371. This project would provide ten foot shoulders and will be considered for use as a bikeway. In addition to a railroad viaduct just outside of Walker, Mn/DOT is also proposing two bridge replacements. One is over the Steamboat River and the other is over Kabekona Bay. Both of these bridges are tentatively scheduled for replacement around 1982. If the DNR is prepared for trail development at that time, joint contracts for bridge work could be considered.

As mentioned earlier (page 49), coordination is necessary to avoid duplication of efforts and avoid developments which would adversely affect each department's intended development.

Potential Users

Because this portion of the right of way is constructed through filled in wet lands, its useable width is limited at several points. Consequently, only one treadway will be developed at this time.

The trail will be developed for bicycles (as opposed to horses) since it will provide a link in a proposed 120-mile bicycle route (page 41). A hazardous situation could arise for the handicapped as well as horsemen in the Walker portion of the trail since that section will travel, to some extent, on the streets of Walker. In the future, should a trail surface be developed near Walker, it should be useable by horses since an alternative route may be identified for bicyclists (possibly the shoulder of TH 371). The DNR does not want to preclude use by horses for this section of the trail.

The primary winter trail use consideration is snowmobiling. For this use, the type of surface applied does not matter since the trail is covered with snow.

Steamboat Bay Route Alternatives

With regard to landowner objections to the trail in the Steamboat Bay area, two alternative alignments have surfaced (Figure 18, page 55). The first alignment would roughly parallel TH 371 going through hilly terrain. The second alignment would utilize the Township Road right of way and tie into the old railroad grade near property now owned by Larry Corrick and Wilson Pepworth.

Although the first alternative is distant enough from lakeshore residents desiring privacy, the trail may not be suitable for bicycles. The trail would have slopes too steep, thereby, limiting many bicyclists. A detailed layout will have to be prepared prior to evaluation of this alignment. It is not anticipated that either horses or snowmobiles would experience difficulty in use of this trail. The second alternative, while

running close to the residences, maintains a better grade for use by bicycles. Another desirable feature of this alignment is that it would utilize an existing transportation route and is further away from the lakeshore residences than the old railroad grade. For these reasons, the prime consideration in alignment choice is its suitability for bicycling.

Although the state is authorized to use the railroad grade, it will not exercise that right if a suitable alternative can be found. Input and cooperation from the local citizenry is encouraged.

Bridge Repairs

All three railroad bridges need to be upgraded prior to use. They will need decking and railings.

Trail Surfacing Method

A number of potential trail surfaces were considered. Some were dismissed readily because of potential user hazard (airborne asbestos fibers from crushed taconite tailings), and failure to identify a local source of construction material (crushed limestone) leaving only asphalt, asphalt emulsion, soil cement, and a clay and sand mixture as final alternatives.

Not only would the asphalt method and asphalt emulsion be expensive, but future use by horses would be precluded. Furthermore, the high heat absorbtion of a black surface degrades its ability to hold snow making snowmobiling difficult during marginal snow years.

Some consideration was given to utilizing soil cement. Here, trail surface development consists of roto-tilling cement into the soil (in this case sand), wetting it down, and after it has set up firmly, seal coating it with a water based asphalt emulsion and pea gravel. The cost would be relatively

inexpensive, but the technology of this method as yet has not proven itself in northern Minnesota. Water is often captured within the surface which causes widespread cracking when frozen.

The surface for the Walker to Cass Lake section is similar to one used on clay tennis courts for many years. It consists of approximately 1¼ to 2 inches of clay harrowed into the ground that is then packed with pneumatic rubber roller and finally treated with a calcium chloride solution. Although there will be yearly maintenance required - (Calcium chloride must be applied every year) - the cost is minimal as compared to other surfaces considered. It is expected that clay can be acquired for $1/cubic yard - enough to surface 27 feet of a six foot wide surface. Approximately $2.50 is needed for each foot of bituminous trail of the same width (based upon a three inch thickness).

This surface could be utilized by horses in the future. By simply ceasing applications of the calcium chloride, the surface would become a soft clay sand mixture ideal for horse hooves. Also, this type of surface would provide an excellent base for asphalt should the DNR decide to use that method in the future.

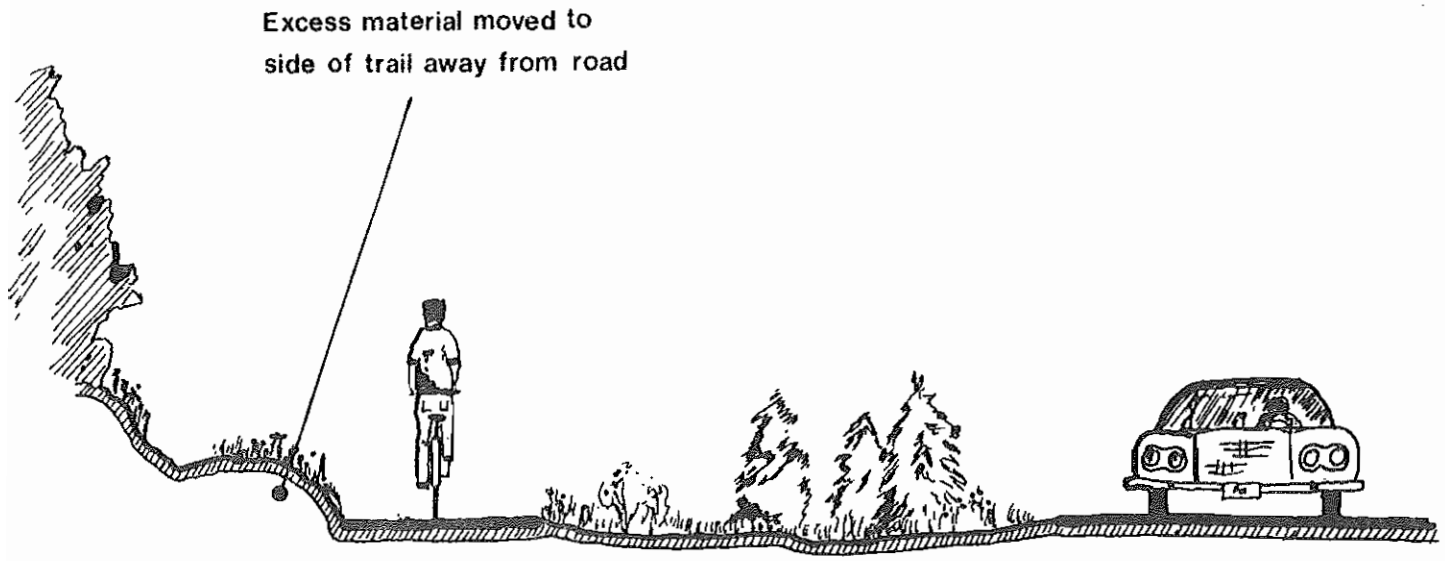
Grading

Careful grading is essential to provide maximun buffering from the highway - especially true where the trail is very close to the highway. Where possible, excess roadbed should be placed on the highway side of the trail (Figure 23, page 67) so as to provide a screen between the trail and the highway.

Trail Waysides

Kabekona Bay Bridge - The nine acre parcel of land, north of Kabekona Bay Bridge will be developed consisting of a small shelter of primitive character, an orientation/interpretation display, approximately ten picnic tables, toilet facilities and a water supply. No parking lot or access from TH 371 will be permitted.

PRESENT SOLUTION



PROPOSED TYPICAL SOLUTION

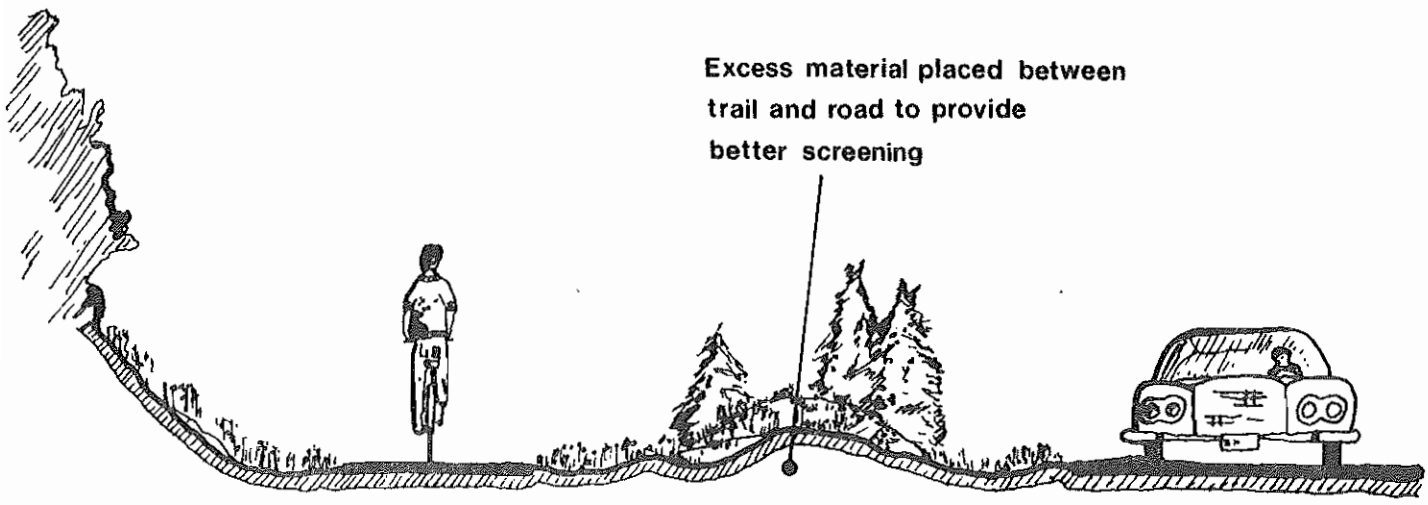


Figure 23 - Grading Typical

Development of this area similar to the Dorset wayside was considered. However, lack of adjoining businesses and residences who might informally surpervise this area and its remoteness in relation to TH 371 indicate the location's potential for vandalism. Along with this comes the possibility of the occurrences of unauthorized, and perhaps, disruptive parties. Camping was also considered, but is not recommended. The noise generated by TH 371 traffic would have an adverse effect on those desiring a primitive experience, while those seeking a more developed experience have numerous options in private campgrounds in the immediate vicinity.

Wilkinson - The Wilkinson wayside will serve as an additional access and rest point. Here, a parking lot, an orientation/interpretation display, a small number of picnic tables, sanitation facilities, a snowmobile unloading ramp, and a water supply will be developed.

Cass Lake - A facility is planned within Cass Lake similar to that in Dorset. It should be located such that it would be accessible to other potential corridor trails (e.g., a trail connecting passing through Cass Lake to Grand Rapids). Development will include a shelter similar to that purchased for Akeley, an orientation/interpretation display, a parking lot, picnic tables, sanitation facilities, and a snowmobile unloading ramp.

Rest Areas

As in the Park Rapids to Walker stretch, the small benches made of native stone or other natural materials serve as a spot to rest. Two such structures are needed.

RESOURCE MANAGEMENT

Vegetation

Overall Considerations

Restoration of major elements of the presettlement vegetation, control of noxious weeds and enhancement of the character of impacted towns are primary objectives of this plan. It is essential, however, that the exact placement of vegetation species, be guided towards:

1. controlling erosion;
2. providing visual and audio screen from adjoining highways;
3. providing a modulation of views, vistas, and enclosures;
4. forming natural preventative barriers keeping trail users in the ROW;
5. creating a separation of trail alignments;
6. retaining snow on the trail; and
7. providing wildlife habitat.

Vegetation Reestablishment

Modern man has had a significant impact on the area's vegetation. Logging, farming, settlements, and control of fire have greatly modified the area. To whatever extent possible, management will be directed towards restoring these vegetational patterns. Admittedly, this will never be possible through the towns. In heavily disturbed areas, this process may take many years. Figure 24, page 70 will serve as a blueprint for this effort. A fuller explanation of the vegetation types is contained in the Appendix.

REVEGETATION GUIDELINES

after F. J. Marschner (1930)
with interpretation from P. Rundell (1978)

MHP MIXED HARDWOOD AND PINE
Red Sugar Maple, White Pine, Basswood, Oaks, Ironwood, Ash, Elm, American, Red, Aspen, Birch

WNP WHITE AND NORWAY PINE GROVE
Nearly pure stands of pine, Green Ash, Red Maple.

AsB ASPEN-BIRCH
Will eventually become Conifer. Includes White and Norway Pine, Balsam, Green Ash, Northern Pine, Oak, Balsam Fir, Birch, White Spruce, as associated species.

CBS CONFIER BOGS AND SWAMPS
Black Spruce, Tamarack, White Cedar, Arborvitae, Balsam and Mountain Ash.

WPM WET PRAIRIES, MARSHES AND SLOUGHS
Marsh-grasses, Flags, Reeds, Rushes, Wild Rice, with Willow and Alder-brush in places.

BrP BRUSH PRAIRIE
Grass and Brush of Aspen, Balm of Gilead and little Oak and Hazel.

JPB JACK PINE BARRENS AND OPENINGS
Jack Pine with Oak, Aspen, Hazel-brush and occasionally Norway Pine.

In addition - caragena in disturbed areas and Choke Cherry and sumac throughout.

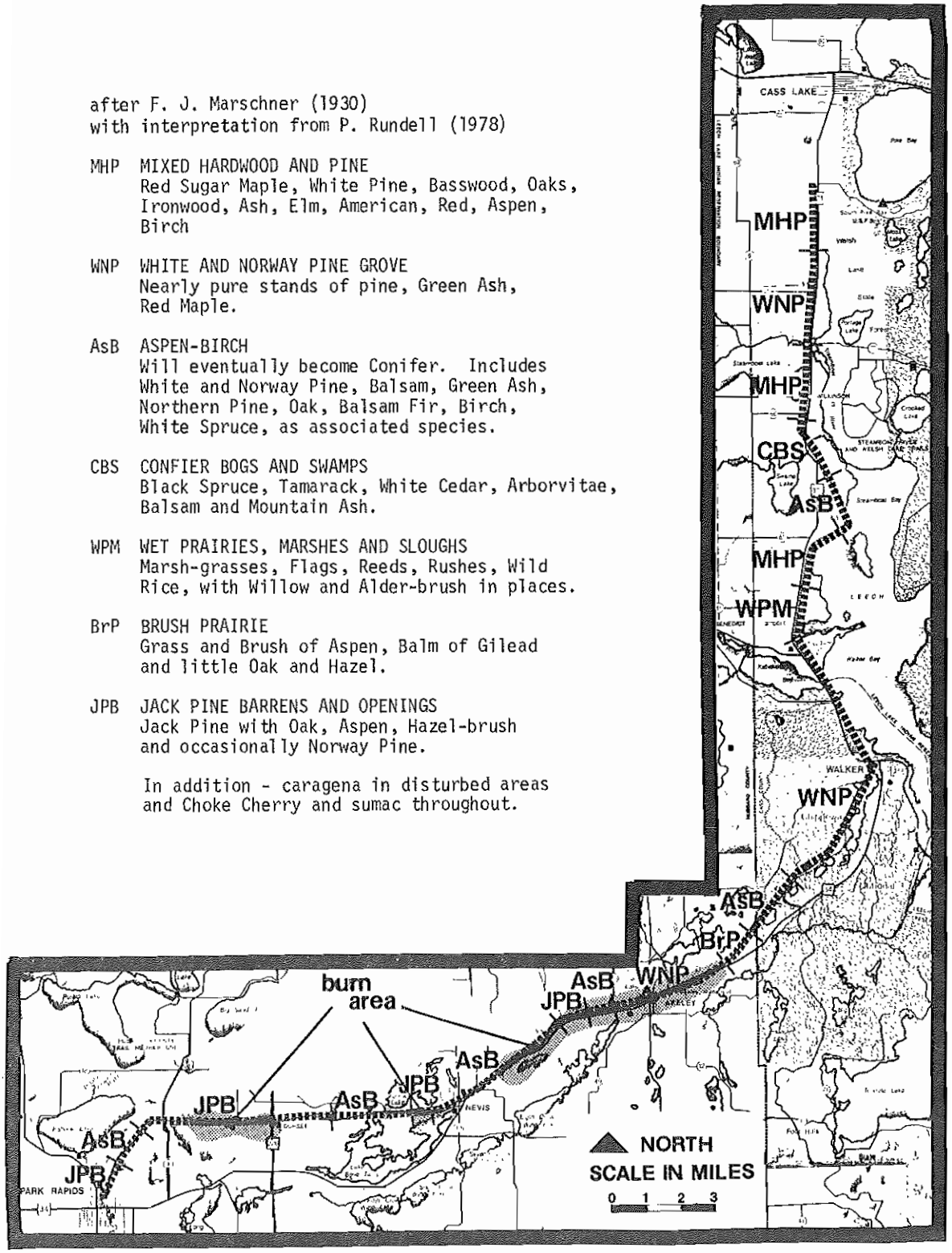


Figure 24

The original vegetation of the area was closely related to fires which periodically burned throughout the area. To some extent, this management technique should be reestablished on the trail ROW. (Appendix D). While a well thought out and carefully executed burn program poses virtually no threat to adjoining landowners, burning will be confined to remote areas having the greatest potential for reestablishment. These areas include to the west of TH 226, and portions of the ROW just east of Nevis to the Hubbard County line.

The use of the trail by snowmobiles throughout the width of the corridor ROW jeopardizes seedling plantings. Experimentation is recommended to find ways to protect young trees until they are established. One such method is to use a tree spade to create a perimeter of trees and shrubs which will surround a planting of saplings (Figure 25, page 72).

Weed Control

Disturbance of natural vegetation for agricultural purposes has caused excessive weed growth. Until a suitable plant growth is established to replace crops, noxious weed growth must be controlled. The DNR controls weeds in two phases. First, where there is an immediate weed problem, further infestation is controlled by cultural or chemical methods. Second, for long-term weed control, native vegetation is established that will shade out undesirable weed species while providing wildlife habitat and restoring the trail area to its original beauty.

Impacted Towns

The authorized trail passes directly through Dorset, Nevis and Akeley. Although waysides at these towns are nearing completion, the expanded rights of way have yet to be fully developed. In

TYPICAL PLANTINGS

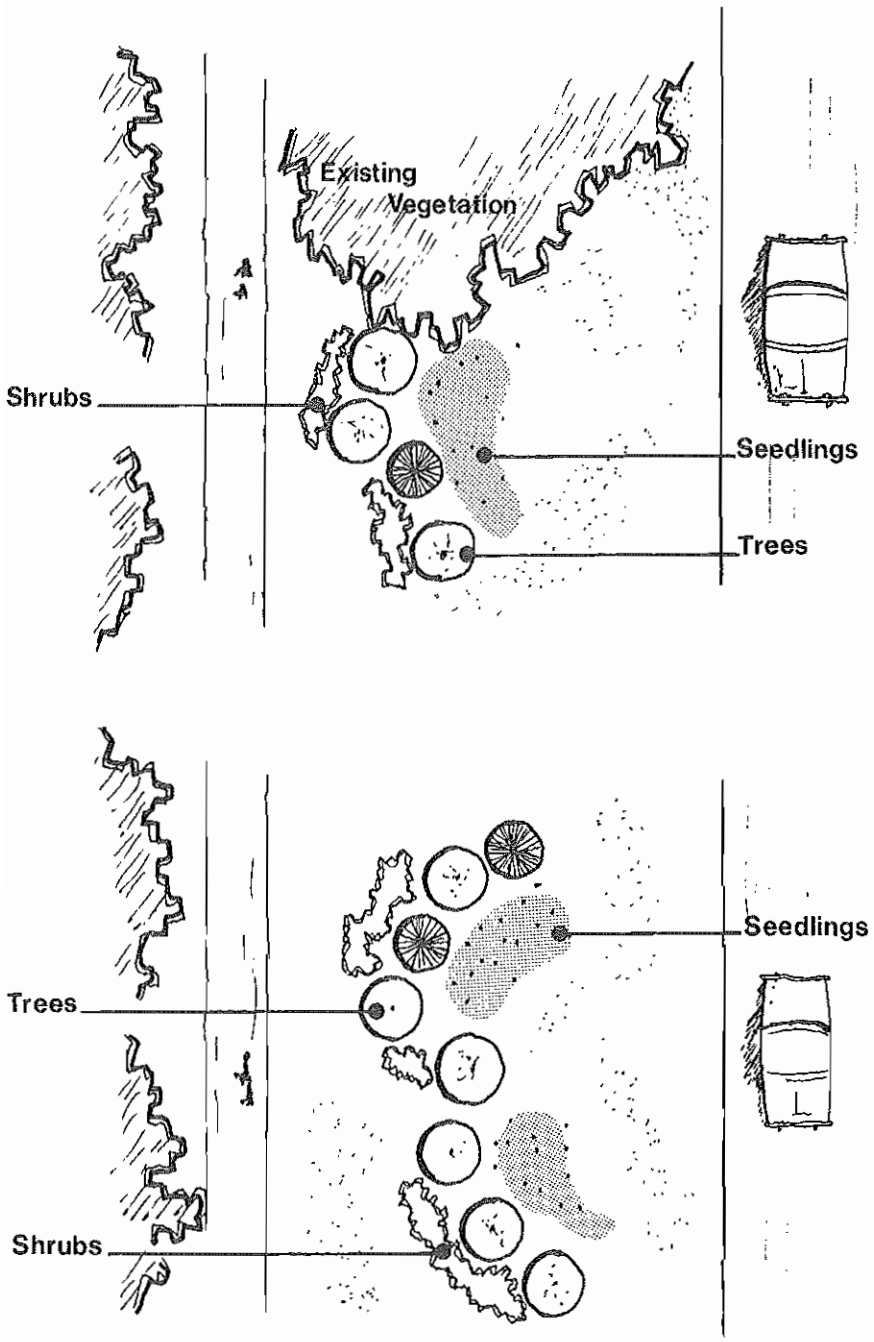


Figure 25

the interim, a number of adjoining landowners have begun to use the land for their own purposes (page 89). This is in direct conflict with the rules and regulations guiding the use of Federal Land and Water Conservation Funds (LAWCON) and DNR policy.

A detailed planting plan will be developed by the Bureau of Engineering creating a modestly priced scenic boulevard requiring a minimum of maintenance. Due to its potential impact on these communities, consultation with local officials is a necessary prerequisite to finalization of this plan. In addition, the impact of deleting lands now being used for unauthorized purposes should be addressed and forwarded to the Region and the Division of Parks and Recreation for a final disposition decision.

Soils

The primary objectives of this plan, in terms of soil, are to prevent or minimize erosion, compaction, and contamination problems in the most practical way.

Before facilities such as wells, pit toilets, shelters and picnic areas are developed, a soil study of the project area should be conducted. Evaluation of the results along with input from federal, county, local and other state agencies will aid in selecting the most feasible location for development. Using such means to determine a site will minimize erosion, ground water contamination, and excess soil compaction.

If a desirable site has unsuitable soils, development will not proceed until a detailed site-specific study is conducted and proper techniques to overcome development limitations are recognized.

When the trail was originally graded, deep cuts into the adjoining slopes left erosion problems for the trail and exposed roots of many trees. In order to remove this visual blight,

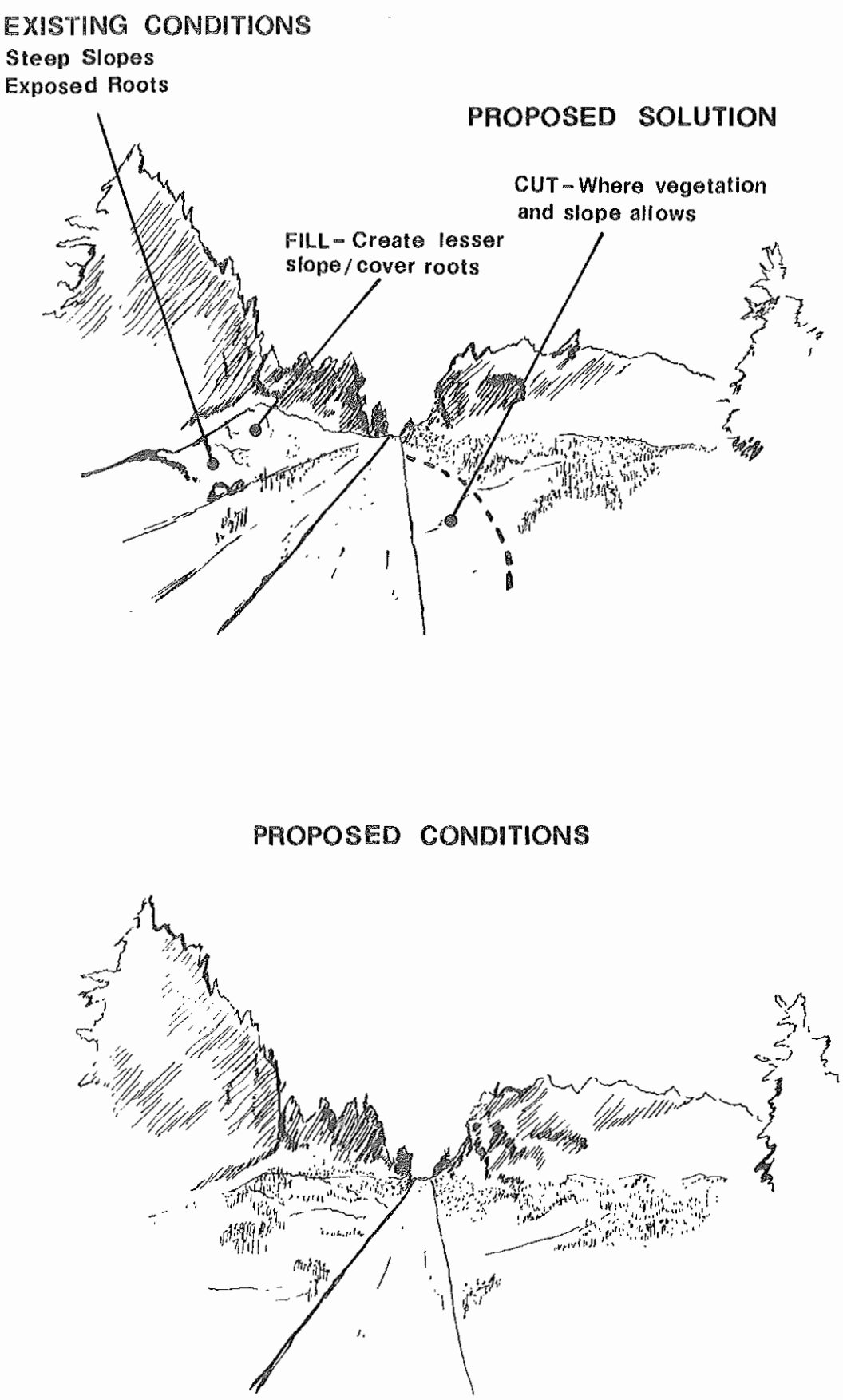


Figure 26 - Erosion Repair

areas should be cut into gradually, with the fill generated being applied to areas where trees have their roots exposed (Figure 26, page 74). This will also partially destroy part of the routineness of the trail and consequently the perceived tunnel effect by the long straight lines on either side.

Since excessive "handwork" would be involved, it is recommended that the Youth Conservation Corps (YCC) or Young Adults Conservation Corps (YACC) be employed to do this work.

In areas where erosion is still a problem, the state will sample soils to determine the best possible means of erosion control. First priority is to use natural erosion-control techniques such as restoration and maintenance of adequate ground cover. When this is not feasible, control structures such as rip-rap and retaining walls will be utilized. Because these techniques detract from the natural scheme of the area, they will be used only when absolutely necessary.

Where natural erosion control techniques can be used, selection of plantings, correct seed mixture, fertilizer and mulch for hydroseeding will be considered after careful evaluation of soils and slope. Physical characteristics of the site and desirable ground cover will determine plant types to be used in restoration.

Water Resources

To protect against pollution of surface and ground water sources in the Heartland Trail area, the Department of Natural Resources will:

1. use proper techniques in utilizing natural amenities of the trail
2. continue to develop facilities in accordance with state and county water and shoreland regulations
3. closely monitor private construction and development to insure compliance with necessary regulations.

INTERPRETATION (OUTLINE)

Theme

The Heartland Trail neatly transects Minnesota's Pine Moraines Landscape Region. Thus, it presents an excellent opportunity to give trail users a cross-section of the natural and cultural values associated with this part of the state. Each feature interpreted will provide a new perspective on the identity of the Pine Moraines and its relationship to the lives of Minnesotans now and in the past.

Culturally, emphasis will be placed on Native American history and modern society through focus on community facilities at Walker and Cass Lake, signing at trail crossings with traditional travel routes--land trails as well as waterways--and site-specific interpretation of present day ricing, fishing, and maple sugaring along the Walker to Cass Lake segment. These interpretive media should be developed in coordination with the Leech Lake Tribal Council.

The second major area of emphasis will be early exploration and settlement patterns by people of European descent. Logging and homesteading lifestyles, and early railroads and steamboats will be featured. Each interpretive message will focus on a point of interest along the trail corridor. Signing locations will capitalize on existing structures such as bridges or rest stops wherever possible to minimize intrusions.

The final area of cultural emphasis will be social and land use patterns today; the importance of diversity in maintaining the health and beauty of the region, and the positive roles that people can play in managing resources and directing their activities to assist in perpetuating that diversity.

Biotic emphasis will build on the changing land surface along the trail corridor and the inter-relationships of landforms and life forms. At least four major landscape features or geological

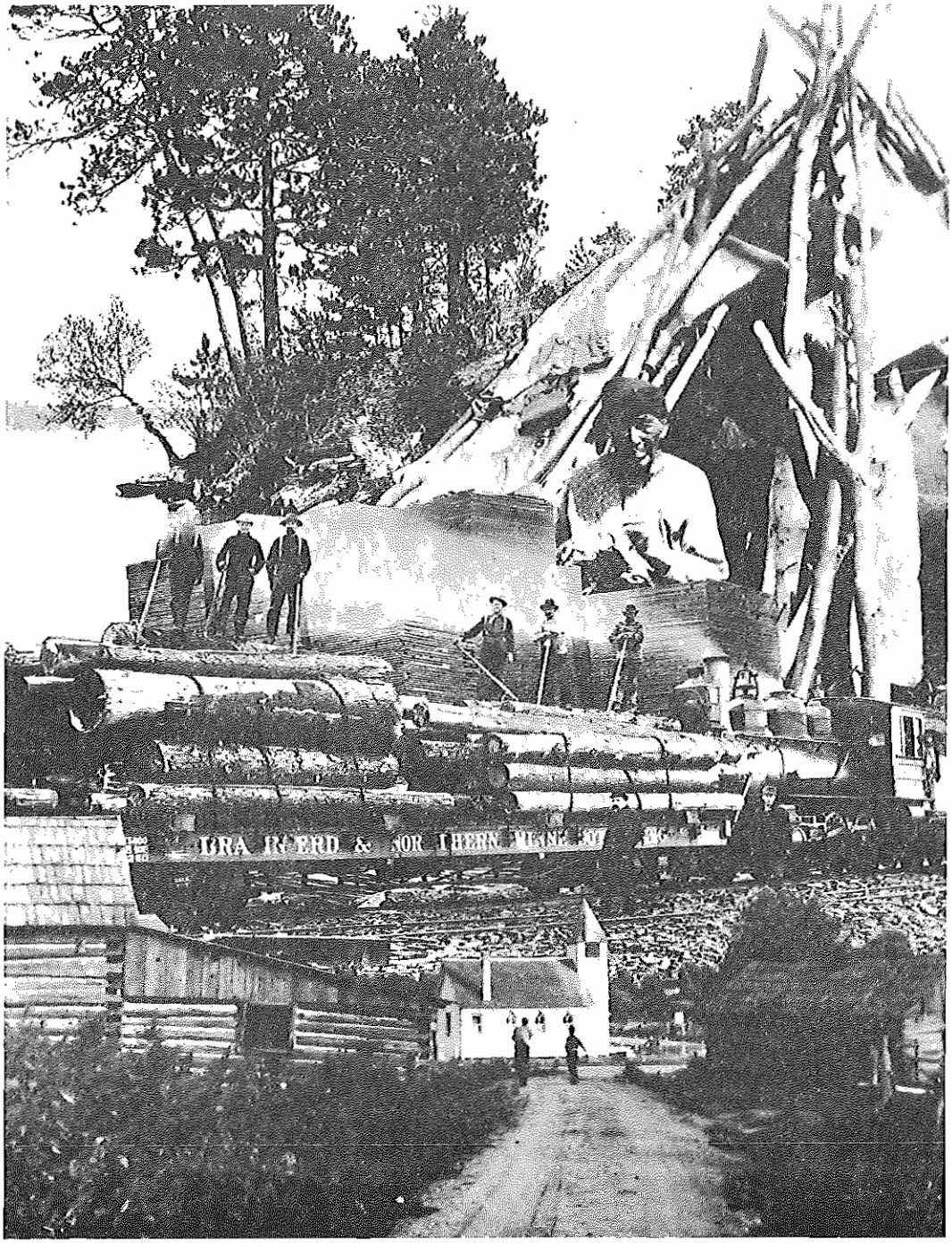


Figure 27

Historic Perspective

transitions that are highly visible and distinctive could be featured in interpretive publications and signing. There are exceptional opportunities for short, interpretive, self-guiding hiking or skiing loops and spurs off the main trail. These would focus on the following contrasting natural communities: prairie, mixed forest, cedar bog, and aquatics. These loops or spurs would emphasize the adaptations and interdependencies of living things and the significance of human activities impacting these environments.

Media

Since trail users are moving at varying rates of speed most of the time, interpretive signing at points of interest either must be quick-hitting or designed to encourage the trail users to stop and look closely at display information or read the appropriate text from a self-guiding publication. An effective medium for attracting attention and getting general information to trail users would be a standard design, rustic, three-panel roofed kiosk with interchangeable interpretive visuals and printed texts. Two of the three panels, facing opposite trail segments, would provide information on what lies ahead. The third panel, facing away from the trail toward the rest area, would feature a trail logo; a statement of goal, function and benefits; off-trail conveniences; recreational facilities and points of interest; rules and regulations; and emergency information. These kiosks would be located principally at trail access points near towns or at major rest and camping areas. Unobstructive routed signs off the treadways would also be provided where necessary to identify and briefly explain major features.

Self-guiding printed media would fall into at least three categories:

1. A standard trail guide periodically revised from the basic trail handout now in general free circulation
2. An interpretive Heartland Trail Highlights, covering each segment in detail with ample illustrations

showing the range of recreational opportunities, biocultural values, and specific points of interest along the trail and in the immediate vicinity for sale as a booklet or accordion-folded pamphlet

3. Short, interpretive leaflets for free distribution at spring-loaded boxes at specific, self-guiding loops or spur segments off the main corridor - these might be recycled through a return drop box at opposite ends of the segment or loop.

The multi-media trails production developed by the DNR Northwest Region Trails Section features the Heartland Trail, and, when accompanied by a DNR spokesperson, is suited to use with clubs, schools, and other groups. An additional slide series focusing exclusively on the Heartland Trail is needed for single projector use, notably as a rear-screen orientation device at local chambers of commerce. This program could be packaged with audio tape narration or with written messages superimposed on slides for continuous, quiet operation using automatically advancing carousel-type projector.

With the eventual extension of DNR interpretive naturalist positions beyond summer season programs only at a limited number of state parks, qualified personnel will be available to conduct guided, interpretive excursions throughout the year on a specially-scheduled basis. These tours may begin on a pilot basis by 1980, pending authorization and funding for program expansion. Another important service for promoting and interpreting the Heartland Trail to prospective and actual users is the DNR Bureau of Information and Education. Periodic news releases and features distributed to local newspapers and broadcasters will help to complete the public's picture of trail development, etc.

Outstanding Features

There are many trail features needing interpretive programming. At this time, these features include the following:

Park Rapids to Nevis

Kiosks at Park Rapids, Dorset and Nevis; Interpretive Loop at north edge of Schweitzer Lake; Firetower: fire hazards and prairie management using fire signing (routed), and in same general area, geologic transition from outwash sediments to rocky ground moraine; fishing bridge on Shallow Lake - fish and fishing opportunities.

Nevis to Walker

Possible rest area, spring and fall best due to insects, on small lake off Highway - potential for flora or fauna guide; bridge just before Akeley possible site for railroads or Crow Wing Lakes interpretation; ROW in Akeley Site for Red River Logging Company display; mile 21 - rugged ablation moraine; mile 23 - change in forest character, especially interesting cedar glade with bog flora for interpretive loop, short boardwalk, changes in water levels brought about by railroad grade changed forest to ash, later flooded and killed by beaver, new nesting cavities for birds, etc. Kiosks at Nevis, Akeley and North Country Trail intersection and Walker; near North Country intersection at overlook rest on ravine - interpret recessional moraines.

Walker to Cass Lake

Possible overlook spur to KNMT tower or vicinity for geologic overlook Walker Moraine Complex and Lake Plain; Indian ricing, fishing, and maple sugaring interpretation potential at appropriate stops along route; Steamboat Swing Bridge; Sawmills Walker and Cass Lake; U. S. Forest Service Headquarters; Kiosk at Cass Lake, Wilkinson, and Kabekona Bay Bridge.

MAINTENANCE

Waysides

The DNR will be responsible for maintaining facilities that it develops along the trail. The only exception will be rest areas located within some communities along the trail. In these cases, maintenance agreements will be worked out with these communities before development begins. The DNR feels that maintenance by the communities will reduce vandalism and provide the control necessary to lessen unauthorized use of the area.

Litter

Litter along the right of way will be removed by state maintenance crews or refuse collectors contracted by the DNR. Litter receptacles will be placed at trail access points and waysides. The litter problem is expected to be minimal because the mode of transportation on the trail will limit the amount of litter a user can carry.

Grooming

Grooming of the snowmobile trails will be done on a contract basis or by state employees using DNR equipment partially as a result of a user survey completed in 1975 (page 44). Winter snowmobiling trail grooming will be set up on a bi-weekly schedule based on expected high use on this trail. Ski groups may make specific requests to have the trail groomed prior to special events.

Vistas

Although most of the trail needs additional vegetative screening, there are portions where the vegetation must be trimmed in order to provide key vistas. In the years to come, this practice will require increasingly more time.

Surface

Park Rapids to Walker - Except for the previously mentioned washboarding problem and the occasional emergence of vegetation

through the asphalt, little daily maintenance is required. However, the surface should be seal-coated as soon as possible and at least once every five years. In the future years, maintenance should increase as pot holes develop, and the surface degrades.

FENCING

The DNR fencing policy follows Minnesota Statutes 1978, Chapter 344. This law states that fencing costs are to be shared between adjacent property owners. Costs may be handled in one of the following ways: 1) each property owner may fence one-half of te distance of the common boundary or 2) one party may agree to pay the other party one-half of the cost of materials and construction. In all cases, the private landowner will enter into agreement to maintain the fence for 21 years.

Fencing materials will be provided by the state where permanent pasture land lies adjacent to the trail. Where a common property line already has a fence and the adjacent property is enclosed on all sides, the state will construct a new fence only when deemed necessary. Where there is no existing fence and the pasture land is enclosed on all other sides, the state will supply the materials for the fence and the property owner will erect the fence.

Where presently existing fence is improperly placed on state land, the state will replace the fence on the appropriate common boundary line. If the fence cannot be properly constructed on the appropriate boundary line because of a high water table, excess snow or because a land exchange the process, the state will supply the necessary fencing materials and the landowner will be responsible for erecting the fence.

Fencing materials will not be provided by the state if the adjacent property is not permanently pastured. However, in cases where repeated trespassing or property damage by trail users can

be proven, the state will provide necessary materials and labor costs for construction of a fence if all other sides of the property are fenced. The adjacent property owner is then responsible for erecting the fence.

In residential areas affected by fencing ordinances, fencing materials and labor costs will be provided to adjacent landowners when repeated trespassing or property damage by trail users can be proven. Materials provided will be sufficient to construct a fence that will be consistent with minimum standards for that area. If fencing is not covered by a local ordinance, the minimum standards stated in Minnesota Statutes 344.02 shall apply. A fence will be 48 inches high, posts will be 12 feet apart and wire will be barbed, smooth or woven, depending on the fence along the other three sides. If the landowner wishes to construct a more elaborate fence, he will be responsible for the cost difference.

In cases where a landowner is unable to erect the fence on the common boundary line, the state may erect the fence and bill the landowner for one-half the cost of materials and labor.

ENFORCEMENT

To encourage safe use of the trail, a common sense approach must be used in enforcing trail rules and regulations (Minn. Reg. NR 20). Posted signs will advise trail users of the regulations applying to trail use. Any violation of the rules and regulations is a misdemeanor subject to a fine of up to $500 and/or ninety days in jail.

Enforcement of Minn. Reg. NR 20 is the responsibility of the DNR regional conservation officers in cooperation with local law enforcement agencies. The sheriff's office in each county along the trail will be asked to aid in control of trail use. Funds to assist local enforcement agencies in leasing equipment for trail patrol through county sheriff departments are available from the DNR Enforcement Division.

Supplementary Enforcement

The following four methods of law enforcement are used to supplement the action of conservation officers:

1. Grant-in-aid money is authorized to local units of government to assist enforcement of laws pertaining to snowmobile use. County boards in several counties along the trail have applied for assistance for enforcement purposes.
2. A volunteer snowmobile safety patrol may be authorized to patrol during the snowmobile season. It may be possible to involve horseback riding clubs as volunteer patrols during summer months. Such patrols are subject to Minnesota Statutes 1971, Chapter 629.39 which states, "Every private person who shall have arrested another for the commission of a public offense shall, without unnecessary delay, take him before a magistrate or deliver him to a peace officer."
3. Minnesota Statutes 1976, Chapter 84, Section 84.029, authorizes each DNR employee, "while engaged in his employment in connection with such recreational areas, has and possesses the authority and power of a peace officer when so designated by the commissioner."

   Classroom training through the DNR Enforcement Division or Bureau of Criminal Apprehension is suggested to acquaint employees with the appropriate methods and actions of peace officers.

4. Policy Directive #22 gives DNR employees, while engaged in their employment, the authority to write infractions of the rules and regulations on Conservation Officer Form #145. Such a report constitutes a record of evidence admissable in court. Employees doing this must witness the violation and are advised to understand the constitutional rights of individuals.

LAND USE ZONING (EXPECTED IMPACT)

It is the DNR's intent to allow the trail to casually unfold the rural landscape; to allow the trail to just "be there". A trail dotted with hot dog stands, pop machines, amusement parks, or any other similar commercial ventures is not desirable.

Unfortunately, this situation will not be easy to accomplish. To date there has been little pressure on the trail from private developments, but with completion and increased recognition this may not be true. Three basic alternatives have been identified: a) purchase a buffer strip on each side of the trail; b) take an easement on each side; c) look to the counties to provide zoning protection; or d) any combination of the above.

The best course of action is to approach Hubbard and Cass Counties to secure zoning protection. At least a 200-foot buffer strip should be established on each side of DNR ownership, excepting the Chippewa National Forest and corporate limits of communities and cities. With a few exceptions, this strip should be classified as agricultural.

PERSONNEL

Each year the trail will require increasing amounts of maintenance. The asphalt surface requires patching and sweeping. In addition, the numerous land use violations in the ROW suggest the need for more supervision (page 89). Finally, the need for more regulation of trail use was cited as a local enforcement concern in the public meetings reviewing the draft of this plan. These three observations point to the need for some permanence in the assignment of supervisory trail personnel.

Presently, the maintenance crew works on a variety of trail work throughout the DNR Region. Perhaps because no one constantly answers for the trail, a number of administrative and enforcement problems arise. Although the exact personnel requirements have yet to be determined, the DNR recommends a position similar to a

park manager be established for the trail. The personnel move would complement the development proposal for a trail headquarters (page 60).

TRAIL EXPANSIONS

Acquisition of Authorized Lands

Disputed Lands

The ownership controversy involving the Leech Lake Indian Band has already been discussed (page 18). Due to the length involved and the lack of a suitable alternative, this is the most important pending Heartland Trail acquisition problem.

Expansion of Authority Along Trail

Walker Connection

Because bicyclists will utilize existing streets in Walker which join the two segments of the trail, the need for land is not anticipated (page 63). But, since snowmobiles are prohibited from trunk highway shoulders, it will be necessary to pass through the Chippewa National Forest. Although preliminary approval of such an agreement has been given, the final agreement has yet to be worked out. Some private land (probably in the form of easements) may also be necessary to complete this union.

Steamboat Bay

Because of the "rough" terrain, it is doubtful that bikers will utilize the alignment paralleling TH 371, however, snowmobiles and hikers will use this section of the trail (page 62). A field study and further negotiations are necessary for final route determination.

Camping Area and Marsh Observation Deck

Two areas which will allow important user amenities have yet to be acquired. Approximately ten acres is needed for the proposed primitive campground (page 62) and three acres for the proposed Marsh Observation Deck (page 63).

Cass Lake Wayside Rests

After all acquisition to make the trail a continuous corridor is complete, it will be necessary to acquire land for support facilities between Walker and Cass Lake. These wayside rests will cover approximately three acres of land each. The DNR recommends that the first site be located near Wilkinson (page 68) and the second be located in Cass Lake (page 68). Because this section of trail is flanked by private land, land for the above mentioned support facilities will have to be acquired from willing landowners.

Cass Lake Area

At present, the authorization for the Heartland Trail stops two miles south of Cass Lake and lacks provision for connection to the proposed Pike Bay Bicycle route. The user's experience could be enhanced by promoting use of the town's resources (e.g., the Chippewa National Forest Headquarters) and the Forest's potential (e.g., its campgrounds and swimming beaches). Extension into the town might also serve as an important recreation junction if rail abandonments occur as far to the east as Grand Rapids.

Bemidji to Cass Lake

The 120-mile bicycle circle route has already been discussed (page 41). It has the potential of presenting a unique recreation experience to its user. As proposed it would connect Bemidji, Lake Itasca, Park Rapids, Walker, Cass Lake which eventually reconnects to Bemidji. The DNR should remain vigilent to opportunities which might further this vision.

TRAIL DELETIONS

Since its authorization in 1974 several unauthorized trail uses have emerged (Figure 28, page 89). Some have resulted as a carryover from railroad days, some through ignorance of DNR restrictions, while others appear to be a willful challenge to the Department's authority. Whatever the reason, these uses are not authorized by the trail's funding source - (federally

sponsored Land and Water Conservation Fund). These violations will have to be eliminated or the land must be deleted from DNR ownership. If deleted, the federal money used for purchase will have to be returned.

Because the ROW purchased from the railroads was generally 100 feet wide, any loss of land will have a significant effect on the user experience. However, once a violation has existed for some time, unspoken approval is implied, and it becomes increasingly difficult for the state to exercise its legal right to the land. This being the case, a careful review of the situation by the Division of Parks and Recreation on a case by case basis is in order.

The following guidelines are given from a planning point of view and may not be all inclusive:

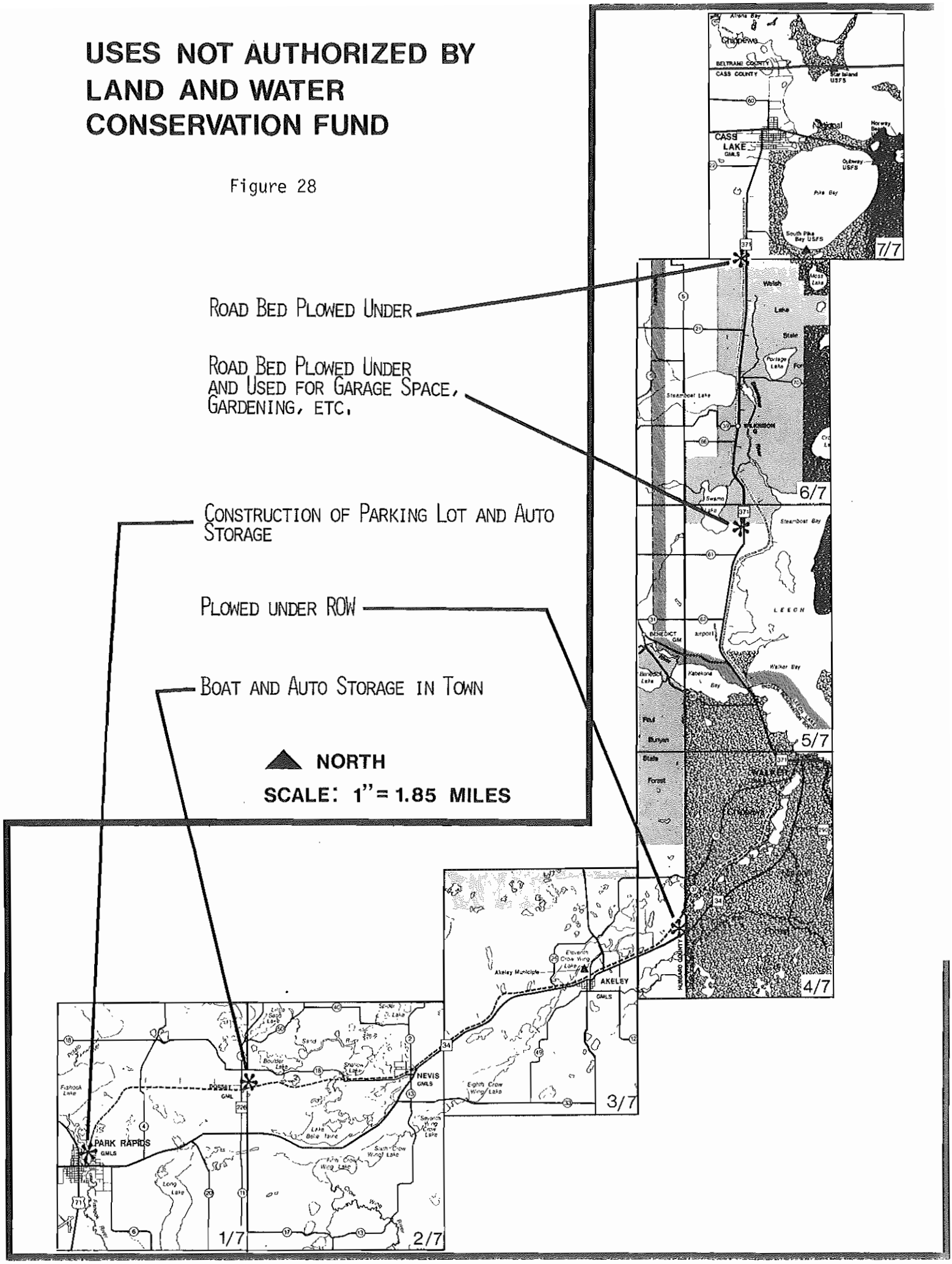
1) - No land should be sold which would jeopardize the trail's continuity. For example, the parcels within Steamboat Bay should not be disposed of until a permanent alignment is located and secured.

2) - No land should be sold which will preclude trail continuity in the event of further abandonment. For example, the land at the end of the trail in Park Rapids would be necessary if further abandonments to the south of town should occur.

3) - No land should be sold which jeopardizes the aesthetic quality of the trail. For example, if products are to be stored on the land, as in the case of old cars, a mutually acceptable screening plan is essential. Furthermore, a perpetual scenic easement will have to be retained to guarantee future compliance.

USES NOT AUTHORIZED BY LAND AND WATER CONSERVATION FUND

Figure 28

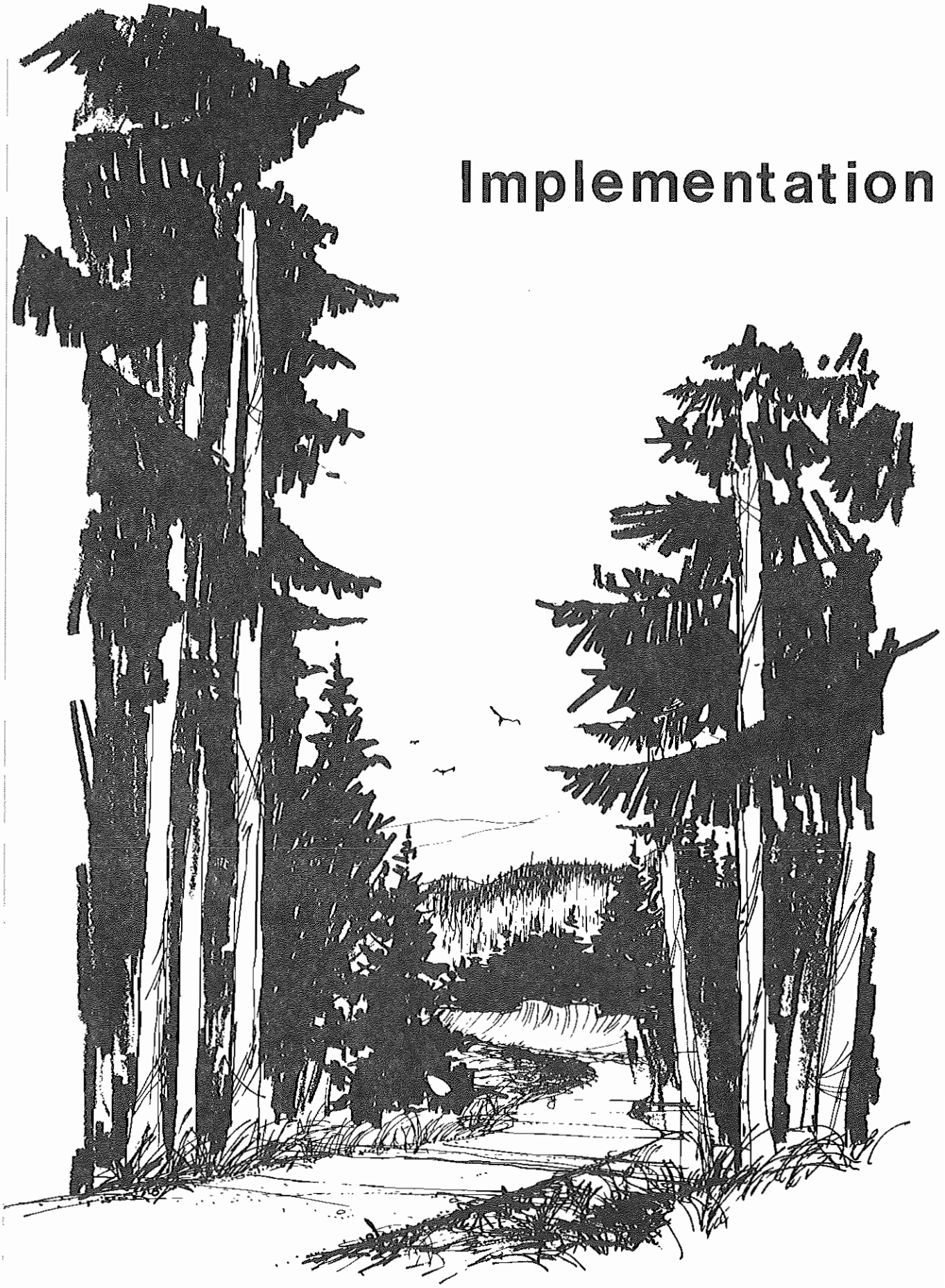


ALIGNMENT ALTERNATIVES (Walker to Cass Lake)

The DNR will pursue the litigation currently underway with the Department of Interior (page 18) over title to portions of the railroad grade. Mn/DOT and DNR will jointly consider the potential for using the right of way of TH 371 for a trail. Two options are readily apparent. They are: 1) development of a bike-only shoulder as part of a potential upgrading of this segment of TH 371; 2) development of a trail on the back slope of the TH 371 right of way. This trail could be used by bicyclists and other users. However, neither has been explored in detail thus far. It may be possible to combine these two options to provide the best trail experience. That is to say, the Mn/DOT could provide the treadway, while the DNR could provide lands for waysides and interpretative programming.

Due to the radical nature of these alternatives, public notice would have to be given and citizen input solicited for this coordinated inter-agency effort prior to changing this plan (page 49).

Implementation



IMPLEMENTATION

OVERALL AUTHORITIES (as of 9/78)

Parks and Recreation (St. Paul)

General

Once the management plan has been completed and approved, it shall become the responsibility of the director of Parks and Recreation to assure proper implementation of the concepts established in the plan. As such, the director shall provide the necessary coordination and liaison between the planning staff, regional staff, local officials, and the general public to insure that the plan is kept current, remains on schedule, and becomes a reality.

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

Specific Requirements

The director and his staff shall:

1. Coordinate and administer field operations.
2. Develop and administer all programs necessary to accomplish plan goals and objectives. Programs include those necessary to implement management plans, to maintain and operate trails and other programs assigned to the division.
3. Prepare policies, guidelines, procedures, and standards necessary to implement programs established in the plan.
4. Prepare and coordinate with DNR legislative liaison, legislation necessary to provide program funding, boundary changes, and operational authorities.
5. Review and approve all detailed plans, specifications, and project proposals prepared by the Bureau of Engineering or field staff. Coordinate on-site field staking and site layouts with Bureau of Engineering (BOE) and regional staff.
6. Coordinate division administrative functions with other DNR administrative offices.
7. Coordinate with DNR's federal grant specialists in order to obtain maximum federal funding (LAWCON, etc.) for all division programs.
8. Recommend modifications and provide information necessary to update the management plan. All modifications to the concepts established in the approved plan will be processed through the Office of Planning and Research. The director will submit his request in writing, stating his justification for change and what impact the change would have on the overall management plan. If comments and rationale for opposing a proposed change are not received within 25 working days, agreement is implied. In the event that significant change in the direction of the plan is proposed (e.g., altering goals and/or objectives of the plan) it will be necessary to follow the same procedures established in developing the original plan. If the director of Parks and Recreation and the Office of Planning and Research cannot come to an agreement on the requested change, the director of Parks and Recreation will then submit the request to the Commissioner's committee on trails.
9. Assign responsibilities and funding for implementing of the development program to BOE for contracts and to the regional staff for force account projects. In addition, the director shall coordinate the implementation of resource management programs.
10. Make recommendations for evaluating progress toward the achievement of goals and objectives stated in the plan.

Regional Office

General

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

Specific Requirements

1. The regional administrator will assign qualified staff to help implement this management plan. The district forester and wildlife managers should be involved in the implementation of the vegetation management and wildlife portions of this plan, and other specialists should be consulted on aspects of implementation.
2. The regional park supervisor, through the regional trails coordinator, will supervise and direct appropriate trail personnel to assure that the management plan is implemented correctly.
3. The regional park supervisor, through the regional trails coordinator, will regularly field-inspect all management improvements of the trail and report his findings to the regional administrator and to the director of Parks and Recreation.
4. The regional park supervisor, through the regional trails coordinator, will submit written reports as necessary to keep the regional administrator and the director of Parks and Recreation informed concerning the progress of implementation and any problems encountered.
5. The regional park supervisor, through the regional trails coordinator, shall submit information to facilitate plan updates and changes. The regional park supervisor, through the regional trails coordinator, shall submit his recommendations for change in writing to the regional administrator and the director of Parks and Recreation. The recommendations should include rationale and an analysis of the impact the requested change will have on the management plan.
6. The regional park supervisor, through the regional trails coordinator, will submit project proposals to the regional administrator and the division for review and approval by the director. The director and staff will review all project proposals to assure that they comply with the intent of the plan and its schedule.

The region may implement approved project proposals once detailed specifications have been prepared and funding has been provided. The division will monitor this implementation.

Trail Manager

General

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

Specific Requirements

The trail manager will:

1. Seek the assistance of the regional trails coordinator in the resolution of any major implementation problems.
2. Consult the regional trails coordinator if uncertain, concerned, or opposed to the recommended management of a specific item within the plan.
3. Assist and give direction to field personnel assigned to the implementation of specific sections of this management plan.
4. Maintain records on the development of specific items in this plan to assure future continuity and to provide reference for up dating and revisions.
5. Coordinate with the regional trails coordinator in initiating project proposals to be submitted to the director for review and approval.
6. Submit to the regional trails coordinator information to aid in up dating the plan and in recommending changes in the plan.

Office of Planning and Research

General

The Office of Planning and Research will monitor and evaluate implementation of the management plan and make revisions to the plan as necessary.

Specific Requirements

The Office of Planning and Research will:

1. Review all requisitions to BOE and project proposals to evaluate the proposed actions for consistency with the approved plan. Comments, suggestions, or corrections will be submitted to the director.
2. Process all modifications to the approved management plan (see Parks and Recreation section).
3. Provide additional information and justification for specific recommendations within the plan when requested by the division.
4. Maintain contact with the public, local officials, legislators, and DNR staff regarding the up dating of the plan.
5. Monitor trail development for the purpose of improving the planning process.

PROCEDURES

Development

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

Contract	Force Account
Director initiates project by preparing a program which complies with the management plan.	Director initiates project by preparing the program, complying with the management plan.
Director distributes copies of preliminary program and drawings to the planning section and regional staff for review.	Director distributes copies of preliminary program and drawings to the planning section and regional staff for review.
Director requests BOE to prepare detail drawings and specifications in accordance with approved program.	Director assigns funds to regional administrator.
BOE prepares detailed drawings and specifications and submits them to the director.	Regional administrator directs regional park supervisor and necessary staff to implement program.
Director approves drawings and specifications, assuring compliance with management plan's objectives and goals, and submits them to the BOE.	Regional park supervisor may: Request that the BOE prepare detailed drawings and specifications for review by the director.
BOE processes contract documents through the Department of Administration, Division of Procurement for bidding and contract award procedures.	Assign the park manager to complete the project with field personnel.
BOE provides contractor directions by establishing site location and field staking.	Assign park manager together with the regional staff to let bids to local contractors.
BOE supervises construction and approves completed work according to contract documents.	Supervision will be the responsibility of regional, divisional or BOE staff, depending on the complexity of the specific project.
Director and staff monitor the progress, funding, and necessary coordination between other state agencies and funding sources.	Regional park supervisor through the regional trails coordinator will certify to the division that the project has been completed as planned.
	Director and staff will monitor the progress of the development program.

Resource Management

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

Contract	Force Account
Director initiates project by preparing the program in compliance with the management plan.	Director initiates project by preparing the program in compliance with the management plan.
Director distributes copies of preliminary program and drawings to the planning section and regional staff for review.	Director distributes copies of preliminary program and drawings to the planning section and regional staff for review.

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

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

Director supervises and monitors the program.

Director approves the completed project.

Director assigns funds to regional administrator.

Regional administrator directs regional park supervisor through the regional trails coordinator and necessary resource management staff to implement program.

Regional trails coordinator and resource staff prepare detailed resource implementation program.

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

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

- Assign the trail manager and field personnel to implement program.
- Prepare contract to be let through the region to local contractors or consultants to implement program.

Regional staff supervises project.

Regional park supervisor through the regional trails coordinator certifies to the director that the project has been completed as planned.

Director monitors the progress of the resource management program.

Maintenance and Operations

The Division of Parks and Recreation will provide the regional staff the necessary direction to maintain and operate DNR recreational trails. The Director will establish rules and regulations pursuant to the ORA'75 for administering state trails. In addition, training courses will be provided and manuals on park operations, maintenance, enforcement, signing and construction standards will be prepared by the division. If necessary, special operational orders will be prepared for specific problem areas. The following illustrates the general operation and maintenance procedures:

Director will establish policies, guidelines, and statewide procedures for maintenance and operations of all state park facilities.

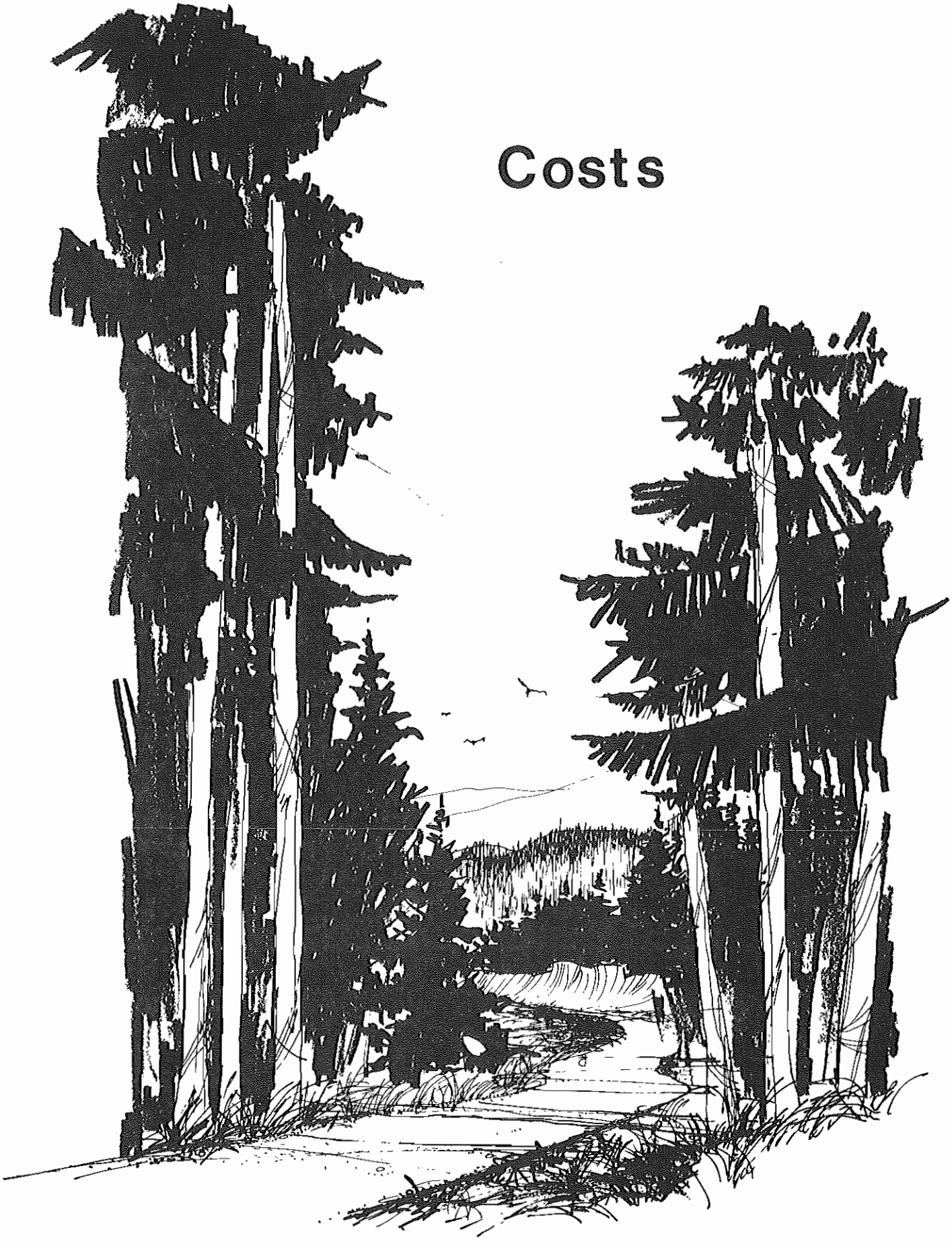
The regional park supervisors will follow the Division of Parks and Recreation's policies, guidelines, and statewide procedures, as well as commissioner's orders.

The regional park supervisor will provide the necessary supervision and direction to the regional trails coordinators and others to assure that these policies, guidelines, and procedures are followed.

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

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

Costs



DEVELOPMENT	COSTS Fiscal '79	Fiscal '80-'81	Fiscal '82-'83	Fiscal '84-'85	Fiscal '86-'87	TOTAL '79-'87
Park Rapids - Walker						
-Washboarding (assuming approx. 10% trail deterioration)	15,000	5,000	5,000	5,000	5,000	$ 35,000
-Seal Coating	50,000		50,000		50,000	150,000
-Trail Waysides						
Dorset	11,000					11,000
Nevis	19,000					19,000
Akeley	7,000	6,000				13,000
-Bridge Repairs						
Park Rapids (most materials already purchased)	6,000					6,000
Akeley		700				700
-Rest Areas (3)		200	200	200		600
-Trail Headquarters in Nevis (remodeling)	1,000 basic only	4,000 completion				5,000
-Camping Area (assuming vault toilet)			20,300			20,300
-Marsh Observation Deck			5,000			5,000
-Walker Access	6,000					6,000
-Walker By-Pass approx. 6 miles (snowmobile trail)		24,000				24,000
Walker to Cass Lake						
-Steamboat Bay (excluding acquisition costs)						
Alt. 1 - new alignment		9,000				9,000
Alt. 2 - using Township Road ROW		9,000				9,000
-Bridge Repairs						
Kabekona Bay	30,000					30,000
Rice Bed Bridge		5,000				5,000
Swinging Bridge		20,000				20,000
SUBTOTAL - 1	145,000	82,900	80,500	5,200	55,000	$368,600

COSTS (cont'd.)

	Fiscal '79	Fiscal '80-'81	Fiscal '82-'83	Fiscal '84-'85	Fiscal '86-'87	TOTAL '79-'87
-Surface		completion				
Grading	14,000	7,000				$ 21,000
Surface (6' clay-sand mix)	only non-con-	4,200				4,200
Construction (pneumatic rubber tired roller harrow)	structed areas	6,300				6,300
Calcium Chloride (1 gal./6 running feet)	7,000	14,000	14,000	14,000	14,000	63,000
Miscellaneous		2,000	1,000	1,000	1,000	5,000
-Trail Waysides						
Kabekona Bay Bridge (assuming single uni-sex vault toilet)	2,500	25,000				27,500
Wilkinson (assuming single uni-sex vault toilet)	grading and veg. only		30,000			30,000
Cass Lake				46,000		46,000
-Rest Areas (2)			200		200	400
-Interpretive (signs, handout development, displays, etc.)	10,000	10,000	3,300	3,300	3,400	30,000
RESOURCE MANAGEMENT						
Vegetation						
-Vegetation reestablishment						
Transplanting	4,000	4,000				8,000
Seedlings	1,000	3,000				4,000
-Burning	1,000	1,000	1,000	1,000	1,000	5,000
-Weed Control	500	500	500	500	500	2,500
-Town Plantings (assuming every 30 both sides)						
Akeley (5808' ROW)		19,500				19,500
Nevis (2640' ROW)		9,000				9,000
Dorset (792' ROW)		3,000				3,000
SUBTOTAL - 2	40,000	108,500	50,000	65,800	20,100	$284,400

COSTS (cont'd.)

	Fiscal '79	Fiscal '80-'81	Fiscal '82-'83	Fiscal '84-'85	Fiscal '86-'87	TOTAL '79-'87
EROSION						
Rehabilitation (Park Rapids to Walker)	3,000	3,000	1,000	500	500	$ 8,000
INTERPRETATION						
Programming (signs, handout development, etc.)	10,000	10,000	3,300	3,300	3,400	30,000
MISCELLANEOUS COSTS (Fencing, signing, etc.)	5,000	5,000	5,000	5,000	5,000	25,000
SUBTOTAL - 3	18,000	18,000	9,300	8,800	8,900	$ 63,000

FINAL TOTALS

	Fiscal '79	Fiscal '80-'81	Fiscal '82-'83	Fiscal '84-'85	Fiscal '86-'87	Total '79-'87
SUBTOTAL - 1	$145,000	$ 82,900	$ 80,500	$ 5,200	$ 55,000	$368,600
SUBTOTAL - 2	40,000	108,500	50,000	65,800	20,100	284,400
SUBTOTAL - 3	18,000	18,000	9,300	8,800	8,900	63,000
TOTAL	$203,000	$209,400	$139,800	$ 79,800	$ 84,000	$716,000

TOTAL COST '79-'87 = $716,000

GLOSSARY

ABLATION - An area worn away by wind erosion or other weathering agents such as water or ice.

AMENITY - Pleasantness; an attractive feature or convenience.

ASPHALT EMULSION - See Emulsion, Asphalt.

BOG - See Conifer Bog.

CALCAREOUS - Any material being of, or like, limestone, calcium, or lime.

CLUB TRAIL - See Trail, Club.

COALESCE - The uniting or mixing of two separate parts or areas into a new unit or area.

CONIFER - A cone-bearing tree or shrub - usually evergreen - with needle-shaped leaves.

CONIFER BOG - A forested, soft, wet, spongy land consisting mainly of decaying organic matter (peat). See also - Appendix C.

CRETACEOUS - A period during the late Mesozoic era (approximately 90,000 years ago) in which chalk beds, calcareous materials, and coal were deposited across much of the U. S. west of the Great Plains.

CRYSTALLINE - Being made of crystals, though not necessarily having the external form of a crystal.

CULTIVATION - The act of preparing the land for growing crops; namely, plowing the soil and killing the weeds.

D.N.R. - Department of Natural Resources

DEFOLIANT - Any chemical spray that strips a growing plant of its leaves.

DOMAIN, EMINENT - See Eminent Domain.

DROUGHTNESS - For soil, the state or quality of being dry.

EASEMENT - A liberty, privilege, or advantage which a person or the general public may have regarding the land of another person. An easement is a middle ground between zoning and outright purchase; it is the buying of limited rights to another person's land.

EMINENT DOMAIN - The right of a government to acquire private property for public use or benefit upon fair payment of the owner of that property through a due process of law.

EMULSION, ASPHALT - A mixture of asphalt dispersed in a liquid which is then sprayed onto a suitable base forming a solid surface.

FOREST - A thick growth of trees, shrubs, etc., covering a large tract of land.

FOREST - Aspen-Birch, see Appendix C.

FOREST - Boreal - A coniferous forest typical of the northern regions of the northern hemisphere.

FOREST - Hardwood, see Appendix C.

GLACIAL DRIFT - Deposits made by a glacier consisting of scattered rock fragments, till, and outwash.

GLACIAL OUTWASH - A deposit consisting of gravel and sand carried by the melt waters of a glacier laid down in stratified layers.

GLACIAL TILL - Unlayered glacial drift with materials ranging in size from clay particles to boulders.

GRANT-IN-AID MONEY - A subsidy by one public body to another. Grant-in-aid monies may be from the federal government to states, counties, and cities; or from state governments to counties and cities. Grant-in-aid monies may be for the acquisition and development of open space, urban beautification, and conservation, along with many other urban purposes.

HYDROSEEDING - A method of seeding vegetation in which the seed is suspended in water and then sprayed onto the soil surface.

INTERPRETIVE FRAMEWORK - An outline constructed to point out the major points and themes which are to be developed along the trail.

JACK PINE OPENINGS - See Appendix C.

KIOSK - A stand or booth where information is provided. In this plan, a kiosk is a three-paneled stand covered by a roof.

LENSE - A geologic deposit shaped like a double convex optical lens; often composed of sandstone, gravel, limestone, sand, etc.

MARSH - A tract, a soft, wet land usually treeless, characterized by grasses, cattails, etc. See also Appendix C.

METAMORPHIC ROCK - A type of rock whose original structure has been changed by the action of either heat, pressure, water or any combination thereof. A metamorphic rock is more compact and more highly crystallized than the original form of the rock.

Mn/DOT - Minnesota Department of Transportation.

MORAINE - An accumulation of earth, stones, etc., carried and finally deposited by a glacier. A moraine formed at the end of a glacier is called a terminal moraine; at the side, a lateral moraine; in the center and parallel with its sides, a medial moraine; and beneath the glacier but not at its end or sides, a ground moraine.

MULCH - Leaves, straw, etc., spread on the ground to prevent freezing of roots, rhizomes, etc.

NOXIOUS - To be harmful to health or morals; injurious or unwholesome.

ORIENTATION/INTERPRETATION DISPLAY - A three-panel roofed kiosk with interchangeable visuals and printed texts. These visuals and texts provide users with trail information such as history, points of interest, etc.

OUTWASH - See Glacial Outwash.

PARCEL (of land) - A piece (of land).

PERPETUAL SCENIC EASEMENT - An easement which does not provide for the public right to the use of land, but rather limits the uses to which the owner may put his land. The public gains the right to use the land for scenic enhancement. Such an easement usually bars the owner from changing the use or appearance of his land without consent from the public agency which purchased the easement.

PINE GROVES - See Appendix C.

PRAIRIE, WET - See Wet Prairie.

PRE-CAMBRIAN - The period relating to all geologic history prior to the Cambrian period. The Pre-Cambrian period occurred 620 million years ago and earlier.

RIGHT OF WAY - A legal right of passage over another person's ground. A path or thoroughfare one may lawfully use (as in crossing the property of another). See also, Trail.

RIP-RAP - Coarse stones, natural boulders, cobbles, or artificially broken fragments laid (either loosely or cemented) on an embankment slope to prevent erosion.

ROTO-TILL - To turn or stir soil by means of a rotary plow or rotary tiller. Such an implement is power-driven and consists of a series of revolving blades or prongs.

SEDIMENTARY ROCK - A type rock formed of mechanical, chemical, or organic sediment by: the means of transport and deposition by water (sandstone); the settling of material (limestone); or the precipitation of a substance (gypsum).

SLOUGH - An area of soft, deep mud. The soil in such an area is mineral as compared to a conifer bog where the soil is organic (peat). See also, Appendix C.

SOIL ASSOCIATION - A group of defined, named, and classified soil units occurring together in an individual and characteristic pattern over a geographic region.

STATE CORRIDOR TRAIL - See Trail, State Corridor.

STATE FOREST TRAIL - See Trail, State Forest.

STATE PARK TRAIL - See Trail, State Park.

TERMINUS - In the case of a trail, its end.

TILL - See Glacial Till.

TOPOGRAPHY - The surface features of the earth (i.e. hills, valleys, prairies, cliffs, etc).

TRAIL - An extended and usually continuous strip of land (or water) established independently of other routes of travel and dedicated, by ownership or easement, to recreational travel including hiking, bicycling, horseback riding, snowmobiling, canoeing, snowshoeing, and cross-country skiing.

TRAIL - Club - A trail developed and managed by a specific club (e.g., snowmobile club), usually funded through grants-in-aid.

TRAIL - Grant-in-Aid - A trail funded and developed by units of government, user groups, and landowners. Such trails are under the jurisdiction of local units of government.

TRAIL - State Corridor - Trails developed and managed by the Department of Natural Resources designed to provide recreational opportunities in accordance with the Outdoor Recreation Act of 1975 (see Appendix A).

TRAIL - State Forest - Usually a short loop trail located within a state forest which is designated for a single use during a particular season.

TRAIL - State Park - Usually a short loop trail located within a state park which is designated for a single use during a particular season.

TRAIL CORRIDOR - A trail right of way having the appearance of a long hall. This appearance is accomplished by placement of vegetation and tree pruning.

TRAIL WAYSIDE - A relatively small area along a trail selected for their scenic or historical significance. A wayside provides the traveler with an opportunity to relax, enjoy a scenic view, read a historical marker, have a picnic lunch, or secure information.

TREADWAY - The surface upon which a person walks.

UTILITARIAN - Stressing usefulness over beauty or other considerations.

WASHBOARDING - The rippling and cracking of a paved surface. Especially a problem with asphalted surfaces.

WATERSHED - The ridge or crest line dividing two drainage areas from which the natural drainage flows in opposite directions; water parting; divide. The region or area drained by a river or stream, etc.; drainage area.

WET PRAIRIE - A seasonally-flooded grassland occurring on mineral soils. Compare with CONIFER BOG, MARSH, SLOUGH.

YACC - Young Adults Conservation Corps.

YCC - Youth Conservation Corps.

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