A Management Plan
for the

Fond du Lac
ski touring and hiking trail

State Forest Day Use Sub-Area

Preliminary Draft
July, 1978

Minnesota Department
of Natural Resources

Table of Contents

FOREWORD

It is the purpose of this document to serve as both a management plan for the development and maintenance of the Fond du Lac Ski Touring and Hiking Trail (day use sub-area), and as an environmental assessment of this action. The development and maintenance procedures described in this document will insure that the scenic, historic, scientific and recreational qualities of the trail are properly managed for the use and enjoyment of the citizens of Minnesota. The environmental impacts of this action have also been assessed to measure their effects on the environment. This assessment may be used in the event that the Department of Natural Resources - Division of Forestry decides to seek Land and Water Conservation Funding (LAWCON).

SUMMARY

The major sections of the document are: the Introduction, Description of the Proposed Action, Description of the Environment, and Environmental Impact of the Proposed Project.

The Introduction includes: an overview of pertinent legislation the authority for state forest sub areas, and the goal and objectives for the state forest ski touring and hiking program. The DNR's overall goal is also revealed.

The Description of the Proposed Action reveals: the location of the project, the unit goal and objectives, existing and proposed development, maintenance, how the plan will be implemented, and whose recreational needs will be served.

The Description of the Environment is an inventory-analysis of the natural and socio-economic resources of the project area. This section attempts to "tie together" the interrelated resource factors that are vital in the planning of this unit.

The final section, the Environmental Impacts of the Proposed Project, deals with the possible affects that the proposed action may incur.

The Fond du Lac Ski Touring and Hiking Trail management plan will be filed with and be available from Documents Section, Room 140, Centennial Building, St. Paul, Minnesota, 55155.

Introduction to the Plan

Multiple Use Concept

It is the policy of the Department of Natural Resources, Division of Forestry, to protect, develop and administer the renewable resources of Minnesota's fifty-six state forests so they are utilized in the combination of uses that will best meet the needs of Minnesota citizens. This requires harmonious and coordinated management of the forest resources to bring about their maximum productivity as well as providing other public benefits.

The primary management objective is to maintain a maximum sustained yield of various forest products while utilizing renewable forest resources to benefit the greatest number of people. Renewable forest resources that require management and protection include timber, wildlife, soil and water. Management practices such as timber production and harvest, watershed protection, wildlife habitat maintenance, and recreational development are all carried out on lands best suited for each use.

This multiple use approach to management is intended to provide equal opportunity for all citizens to enjoy and utilize our forest resource. This means that the forest is a shared resource that must be utilized by various user groups in harmony with each other.

With this multiple use concept in mind, the legislature included state forests in Minnesota's Outdoor Recreation System. This system, created in 1975 by the

Outdoor Recreation Act (ORA), incorporated all state recreation lands into eleven different kinds of areas, each with its own classification. The eleven classifications are: Natural State Parks; Recreational State Parks; State Trails; Scientific and Natural Areas; State Wilderness Areas; State Forests; State Wildlife Management Areas; State Water Access Sites; State Wild, Scenic and Recreational Rivers; State Historic Sites; and State Rest Areas. Each member of the system is referred to as a "unit".

By passing the ORA, the legislature revealed its awareness of a growing problem in Minnesota: The increasing number of people using state lands each year for more diverse forms of recreation. While some areas could withstand higher levels of use, other areas experienced overcrowding and conflicts between different recreational users.

To insure that the administration of each unit is managed in a manner that is consistent with the purposes for which the unit was authorized, it is required by the ORA that the managing agency prepare a master plan for each unit. The act states:

> "No construction of new facilities or other development of an authorized unit, other than repairs and maintenance, shall commence until the managing agency has prepared and submitted to the state planning agency and the state planning agency has reviewed, pursuant to this section, a master plan for administration of the unit in conformity with this section. This requirement shall not apply to an existing unit until

August 1, 1977."

The following day use sub-area plan has been prepared by the DNR to fulfill the requirements of this act as it pertains to state forests. This day use sub-area plan will be incorporated into the overall state forest unit master plan when that plan is prepared.

This day use sub-area plan has been written prior to the state forest master plan so that monies from the Outdoor Recreation Bonding Bill can be utilized this year. (Laws 1977, Chapter 421, Section 13, Subdivision 4)

Under the terms of this bill, the DNR has been allocated $1,105,000:

"For betterment of public land and improvements needed for trails for skiing, hiking, and bicycling within state parks and recreation areas as listed and described in sections 85.012 and 85.013 and state Forests, as listed and described in section 89.021."

The Authority

The authority for establishment of these ski touring-hiking trails (day use sub areas) was granted by Minnesota Statutes 86.01 (the Outdoor Recreation Act) subdivision 7 which states:

"Subd. 7. STATE FORESTS AND STATE FOREST SUB-AREAS; PURPOSE; RESOURCE AND SITE QUALIFICATIONS; ADMINISTRATION. (a) A state forest, as established by Minnesota Statutes, Section 89.021, shall be administered to

accomplish the purposes set forth in that section, and a state forest sub-area shall be established to permit development and management of specialized outdoor recreation at locations and in a manner consistent with the primary purpose of the forest.

(b) No unit shall be authorized as a state forest sub-area unless it is located within a state forest and contains suitable natural resources to accommodate any of the following uses:

(1) Day use areas. Areas which permit recreational use of the forest in its natural state, not requiring an overnight stay, including but not limited to picnicking, fishing, swimming, boat launching, hiking, interpretation and nature observation.

(2) Campground. Provide minimum facilities to accommodate overnight camping.

(c) Outdoor recreation sub-areas located within state forests shall be administered by the commissioner of natural resources in a manner which is consistent with the purposes of this subdivision."

Goals and Objectives

The statutes and laws previously cited outline the legislation pertaining to state forest ski touring and hiking trails in regard to funding, planning, and establishment. Along with this legislation, it is important to establish a goal for the overall State Forest Ski Touring and Hiking Program.

State Forest Ski Touring and Hiking Program Goal

The goal of the State Forest ski touring and hiking program is to provide

Minnesotans with the highest possible variety of quality ski touring and hiking trails. These ski touring and hiking trails shall be developed so that they may be enjoyed for years to come.

However, since the state forest ski touring-hiking is only a part of the program, it is equally important to recognize the overall DNR ski touring-hiking program.

Overall Program Goal

The goal of the overall DNR Ski Touring and Hiking Program (which includes Natural and Recreational State Parks, Recreation Areas, and State Forests), is to provide Minnesotans with the finest ski touring and hiking trails in the nation.

Objectives for Overall State Forest Ski Touring-Hiking Program

* To provide ski touring-hiking **opportunities** in **state forests** which are accessible to all citizens of Minnesota.

* To improve existing 64 miles of ski touring-hiking trails in state forests throughout Minnesota.

* To develop 150 miles of new or additional ski touring-hiking trails where feasible in state forests throughout Minnesota.

* To provide a variety of ski touring-hiking experiences in state forests taking advantage of scenic, topographic, historic, and recreational areas.

* To provide complementary facilities along each state forest ski touring-hiking trail to insure the rest and comfort of the trail user.

* To implement a system of signing design and specifications that is consistent along each state forest ski touring-hiking trail which promotes user enjoyment and safety.

* To disseminate current, accurate literature of each state forest ski touring-hiking trail for public information and use.

* To provide interpretation on the cultural, historic and vegetative features along state forest ski touring-hiking trails.

* To involve the governor's appointed ski touring task force and other concerned citizens in the planning and design of trails.

Description of the Proposed Action

Purpose of the Action

The Fond du Lac ski touring-hiking trail will be developed and maintained to provide a safe, enjoyable ski touring-hiking experience. It is the purpose of this action to serve the non-motorized trail needs of the Duluth area and the rest of the state.

Location of the Project

The proposed ski touring-hiking trail is located in the Fond du Lac State Forest which is about 20 miles west of Duluth (see figure 1). Within the forest, the proposed trail system is located in the northwestern edge, which is approximately four miles northeast of Cromwell, Minnesota (see figure 2).

Magnitude of the Project

Goal Statement

It is the goal of the Department of Natural Resources to develop and maintain the Fond du Lac ski touring-hiking trail for the highest quality experience possible.

Objectives

* To gain approval of this plan for the development and management of this day use sub-area.

* To properly develop and maintain this trail in light of other on-going management activities.

Fig. 1

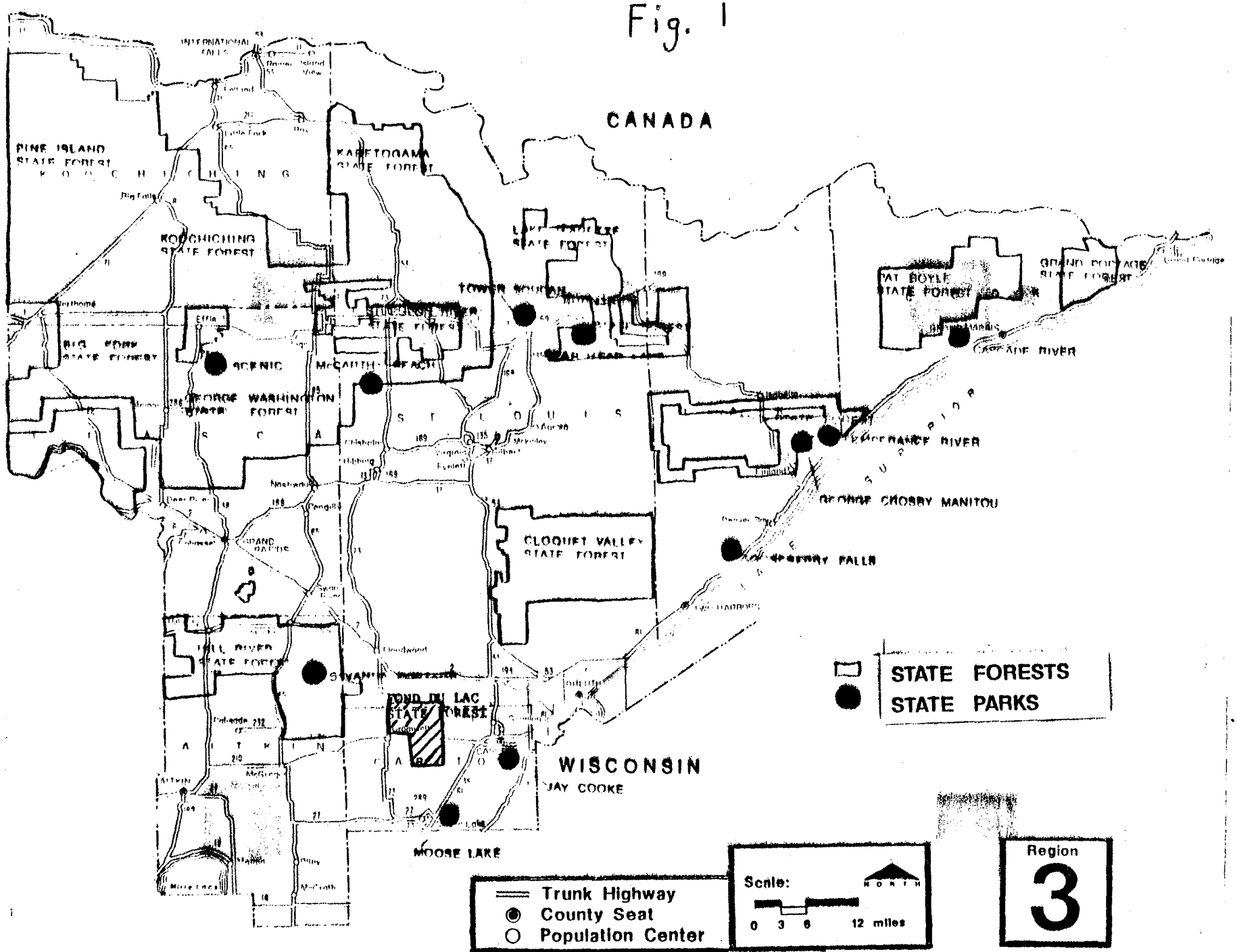
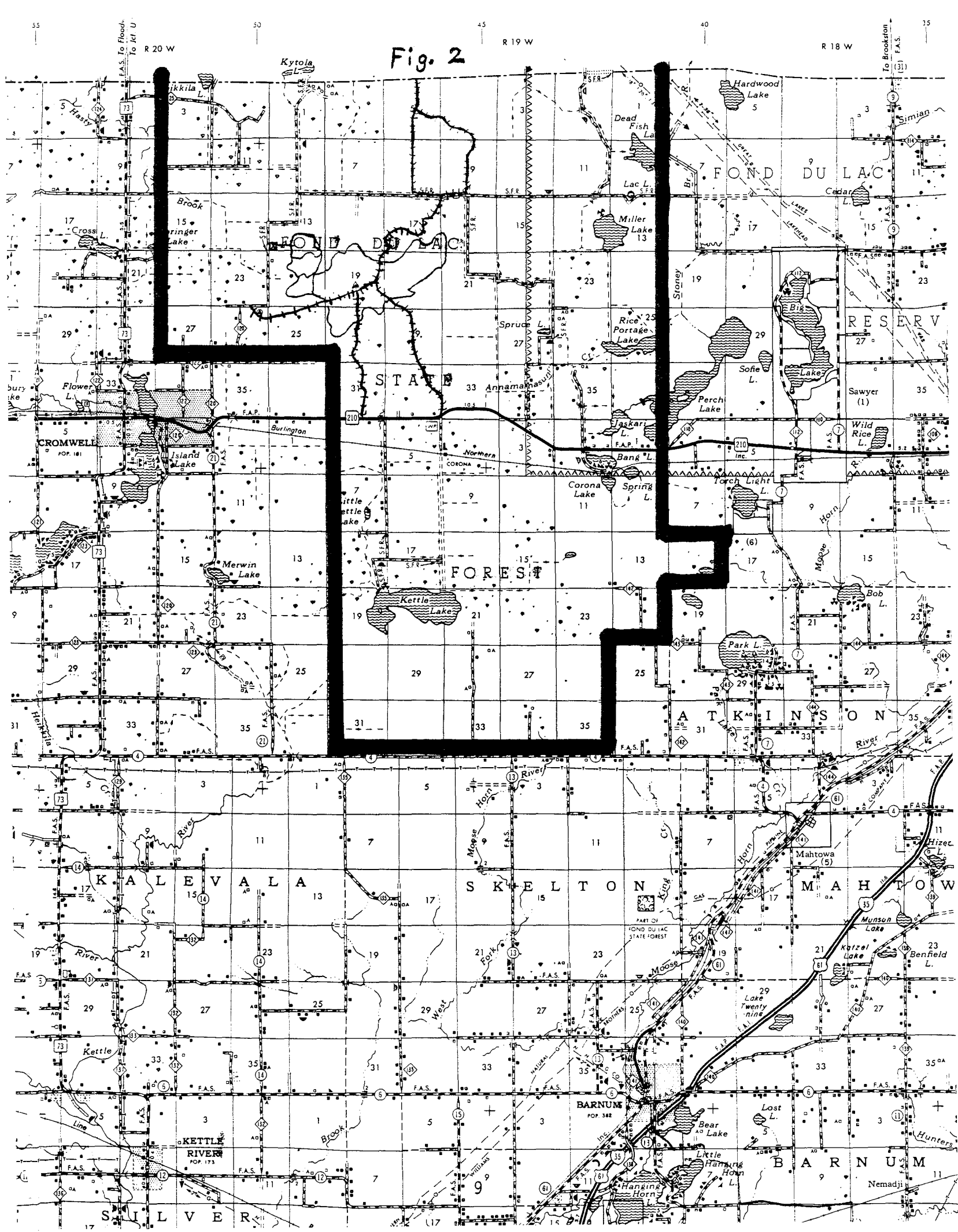

CANADA
PINE ISLAND STATE FOREST
KOOCHICHING
KABETOGAMA STATE FOREST
KOOCHICHING STATE FOREST
TOWER
SCENIC
McCARTHY BEACH
GEORGE WASHINGTON STATE FOREST
S T L O U I S
CLOQUET VALLEY STATE FOREST
PAT BOYLE STATE FOREST
GRAND PORTAGE STATE FOREST
CROSBY MANITOU
CROSBY FALLS
JAY COOKE
WISCONSIN
MOOSE LAKE
STATE FORESTS
STATE PARKS
Trunk Highway
County Seat
Population Center
Scale:
NORTH
0 3 6 12 miles
Region
3

Fig. 2


R 20 W
R 19 W
R 18 W
To Flood
To Jct U
To Brookston
F.A.S.
Kytola L.
Hardwood Lake
Dead Fish La.
Simian
Hasty
Brook
Cross L.
Lac L.
Cedar L.
Miller Lake
FOND DU LAC
STATE FOREST
Spruce L.
Rice Portage Lake
Stoney
Big
RESERV
Sofie L.
Lake
Sawyer (1)
Flower L.
Annamakasun
Perch Lake
Wild Rice L.
Burlington
Northern
CROMWELL
POP. 181
Island Lake
CORONA
Askari L.
Bang L.
Corona Lake
Spring L.
Torch Light L.
Horn
Merwin Lake
Kettle Lake
Moose
Bob L.
Park L.
ATKINSON
Hemlock
River
Fork
Mahtowa (5)
Hizer L.
KALEVALA
SKELTON
MAHTOW
King
PART OF FOND DU LAC STATE FOREST
Munson Lake
Katzel Lake
Benfield L.
Lake Twenty nine
West
Kettle
Line
Brook
BARNUM
POP. 382
Bear Lake
Lost L.
Hunters
KETTLE RIVER
POP. 173
Little Hanging Horn L.
Hanging Horn L.
Nemadji
SILVER

* To complete the development as outlined in this plan by the winter of 1978-79 (i.e. 8-12 new miles of ski touring-hiking trail).

* To establish this trail for ski touring and hiking through formal designation of it as a day use sub-area.

* To develop and implement a maintenance program which will sustain the quality of the trail for the future.

Existing Development

There has been no development on the Fond du Lac ski touring-hiking trail thus far except for preliminary investigation.

Proposed Development

Development will include 8-12 miles of trail, a rest area and a parking lot. The trail will consist of a non-motorized multi-loop system. Pit toilets may be added to the parking area. Also an additional rest area along the trail will be added if necessary.

Trail Alignment

A preliminary alignment for the Fond du Lac ski touring-hiking area has been drawn on the map in figure 3. The parking lot and rest area have also been identified. These proposed alignments and complementary facilities are only general and are subject to revision as development commences.

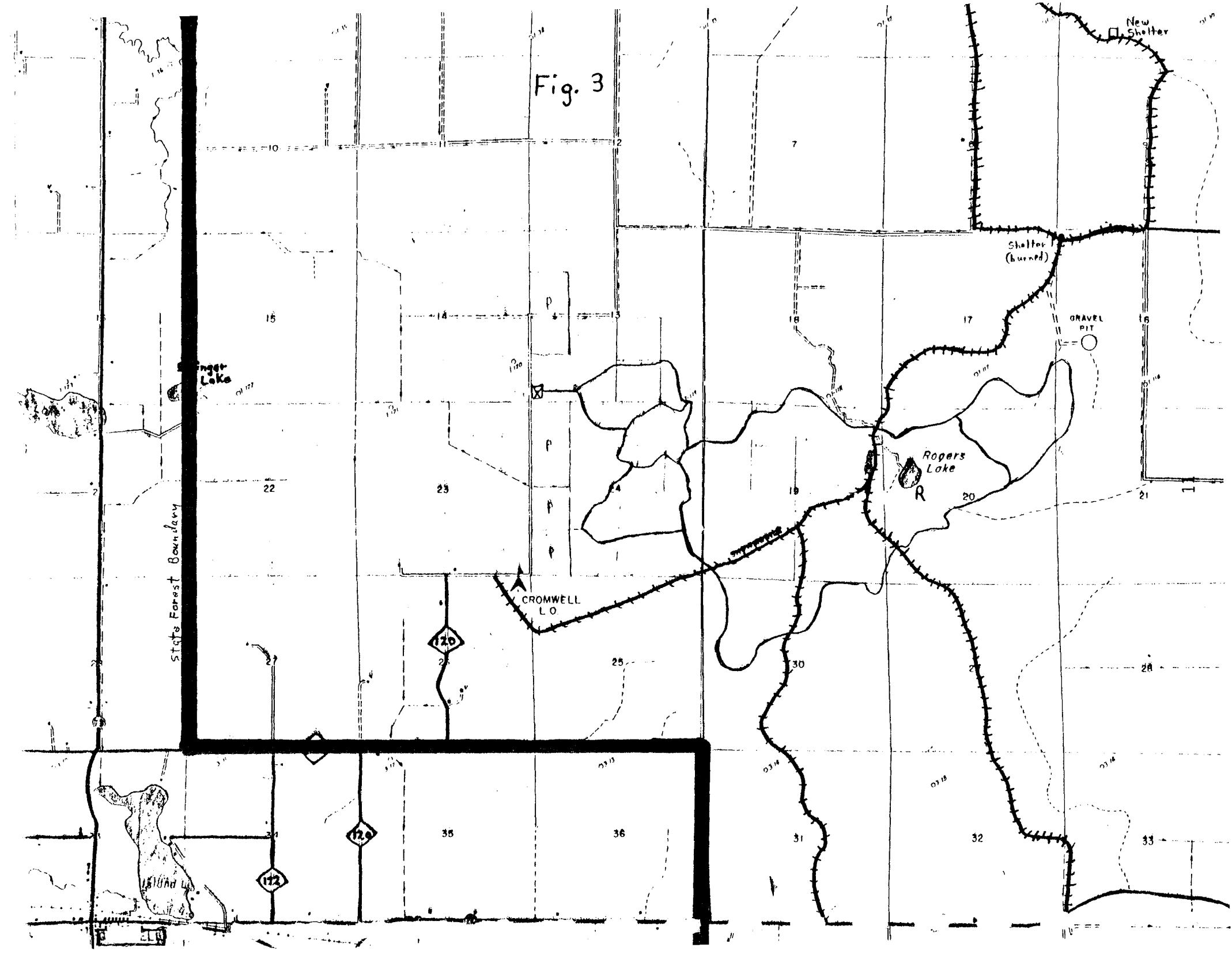


Fig. 3
New Shelter
Shelter (burned)
GRAVEL PIT
Rogers Lake
R
CROMWELL L.O.
State Forest Boundary
120
122
Island

To finalize the sites, DNR personnel and possibly a member of a local ski touring club will inspect the preliminary route on the ground and make recommendations for changes. After the changes have been agreed upon, the route will be flagged with plastic ribbon and any alterations of the site specifics will be noted on a map. Drainage problems, bridge sites and other problem areas will also be marked on the map. It should be mentioned that the trail's alignment will retain certain flexibility in the event it has to be moved in the future.

Trail Design

The trail width will vary from 8-12 feet depending on the terrain and difficulty rating of the loop (see figure 4). This width is required to accommodate grooming and maintenance vehicles.

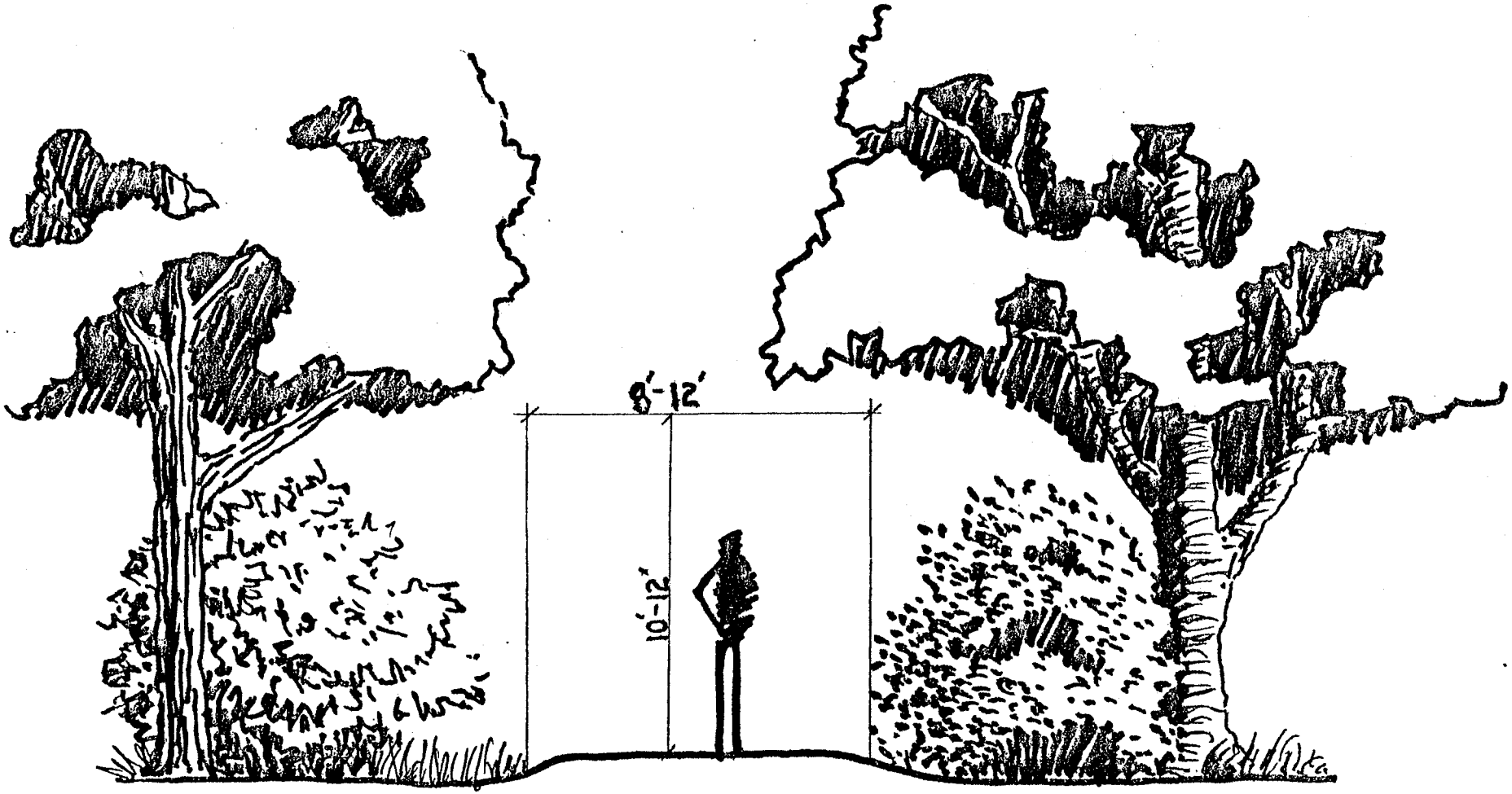
Slopes of not more than 15% are recommended for the novice trail. Gradients up to 25-40% can be utilized for the more advanced loops. Runouts at the bottom of steep hills will be cleared to allow skiers to slow down safely. A minimum width of 6-8 feet is required on hills to allow the skier to herringbone or sidestep up hills and to snowplow down hills.

Trail Construction

Trail construction will involve the removal of all trees, brush and branches to the desired height and width of the right-of-way. Larger trees should be cut at a height of 2-3 feet to allow a crawler tractor a chance to get good leverage for stump removal.

Fig.4

Ski Touring Trail Treadways



minimum clearances needed
for ski touring trails

width varies with terrain
height varies with snow depth

Trees and branches removed from the right-of-way should be cut into merchantible lengths or scattered away from the trail. Brush and stump piles can be used to provide wildlife habitat.

Stumps and rocks should be pushed into piles in designated areas which are inconspicuous from the trail. After clearing the vegetation, the treadway should be leveled with a slight pitch to allow for proper drainage. Cut and fill techniques should be used on side slopes (see figure 5).

All areas where earth is disturbed will be seeded with a wildlife or other seed mixture to prevent erosion.

Wet areas along the trail will require corduroy and/or other fill to allow for multi-season use. Where the treadway is elevated by these methods, culverts may be necessary to maintain natural drainage (see figure 6). Where there is erosion, water bars as shown in figure 7 may be used.

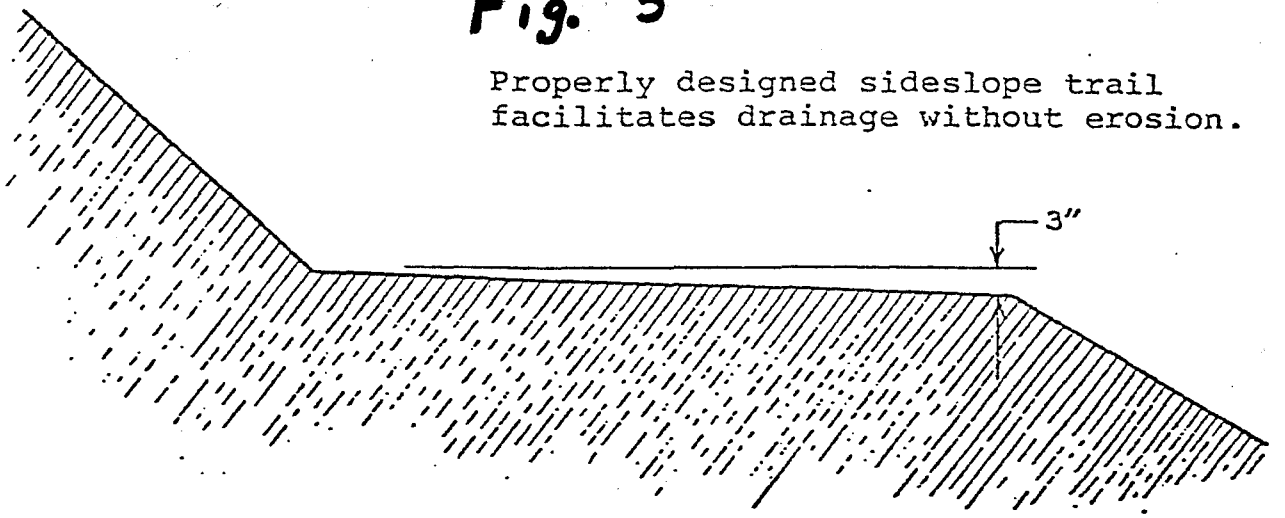
Bridges

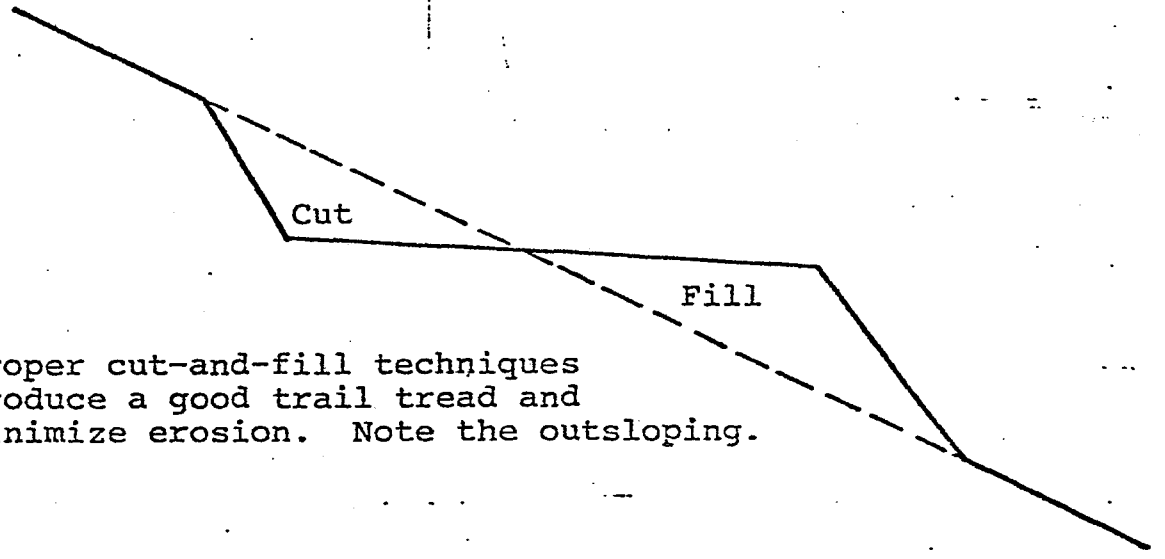
No bridge crossings have been identified at this time. Should a bridge crossing become necessary after field alignment, the following guidelines will apply:

Bridges will be constructed over any large free flowing stream or wet area. Bridge types will vary according to stream width and expected use. Bridge

Fig. 5

Properly designed sideslope trail facilitates drainage without erosion.





Proper cut-and-fill techniques produce a good trail tread and minimize erosion. Note the outsloping.

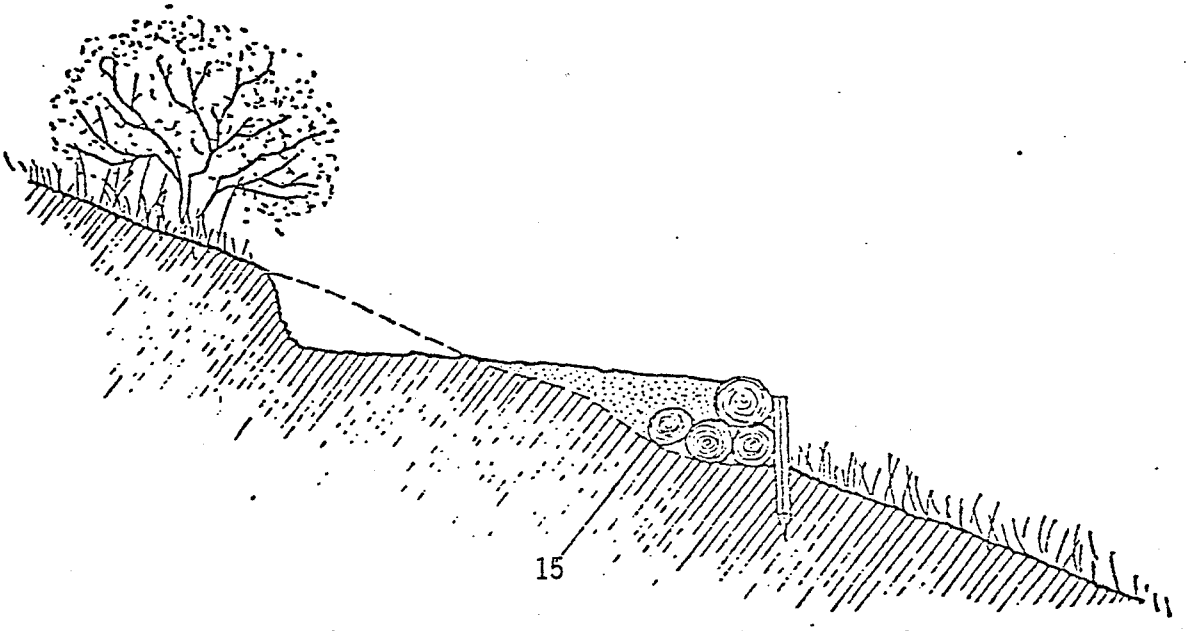
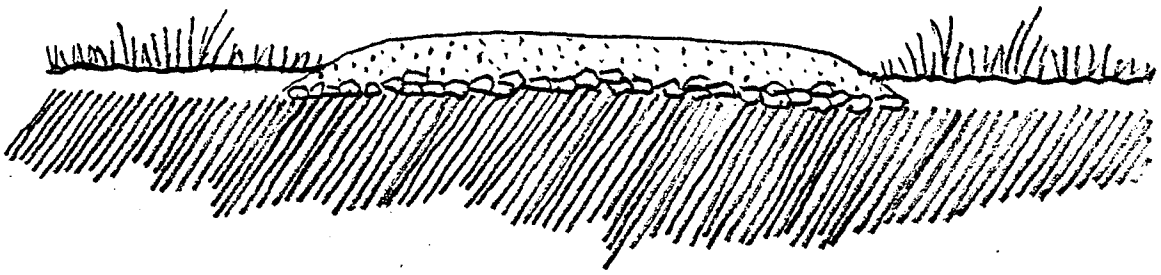


Fig. 6



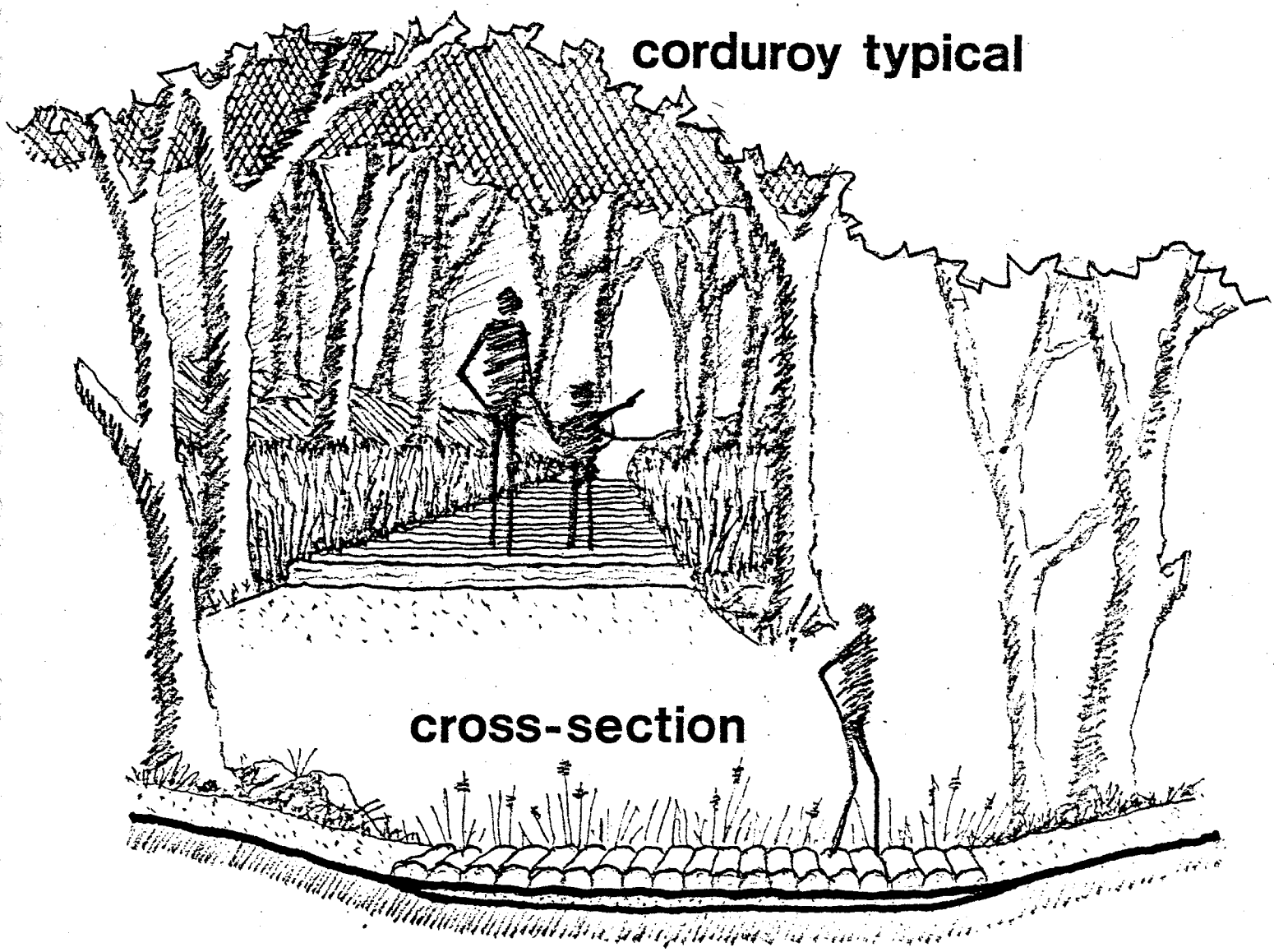
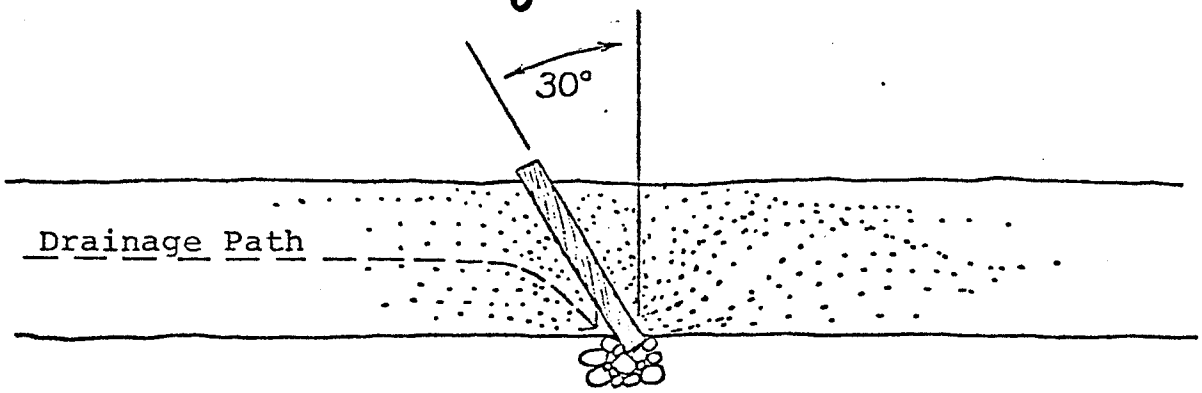
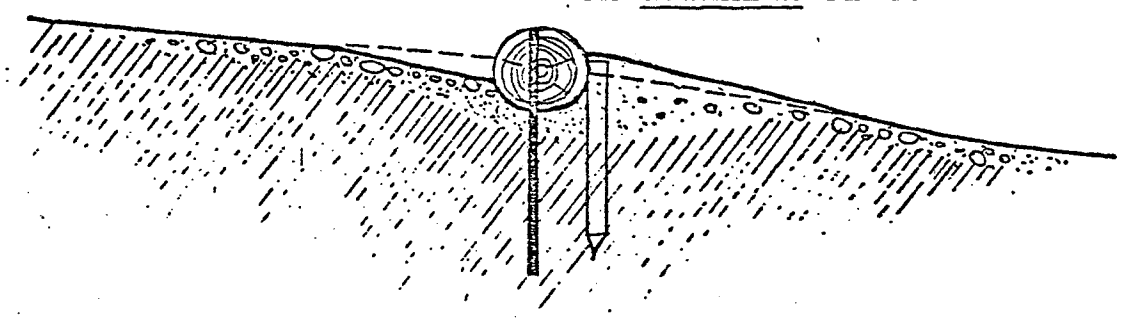


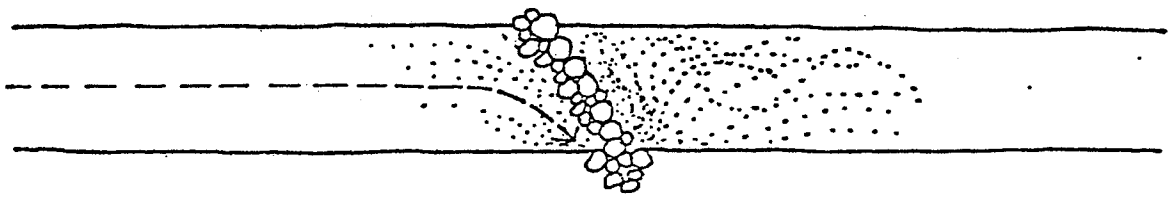
Fig. 7



Landscape soil to top of water bar on downhill side.



Water Bars
Note log is held in place by steel pin and/or wooden stake. Below, stones are used as a water bar.



design will be up to the unit manager with help from the Bureau of Engineering. Where possible, bridges should be made of natural materials which blend into the natural setting of the area(see figures 8 & 9) Permits will be required from the Division of Waters before any construction which effect waterflow is started.

Barriers

Natural or constructed barriers will be utilized at trail entrances, road crossings or other problem areas. Narrowing of trail width is the most simple, economical way and should be utilized whenever possible. This method, however, is not feasible unless other access points can be provided for grooming equipment.

If constructed barriers are necessary, the unit manager should decide what type of barrier will suffice.

Rest Area

One rest area site has been identified for construction at this time (see map in figure 3, page11). The rest area will include a trail shelter and fire ring (see typical in figure 10, page 21). A pit toilet may be added later if necessary.

Shelters will be constructed according to Bureau of Engineering standards (see typical) and will be placed a short distance from the treadway in a manner which will block the prevailing wind. Open spaces between the logs of the

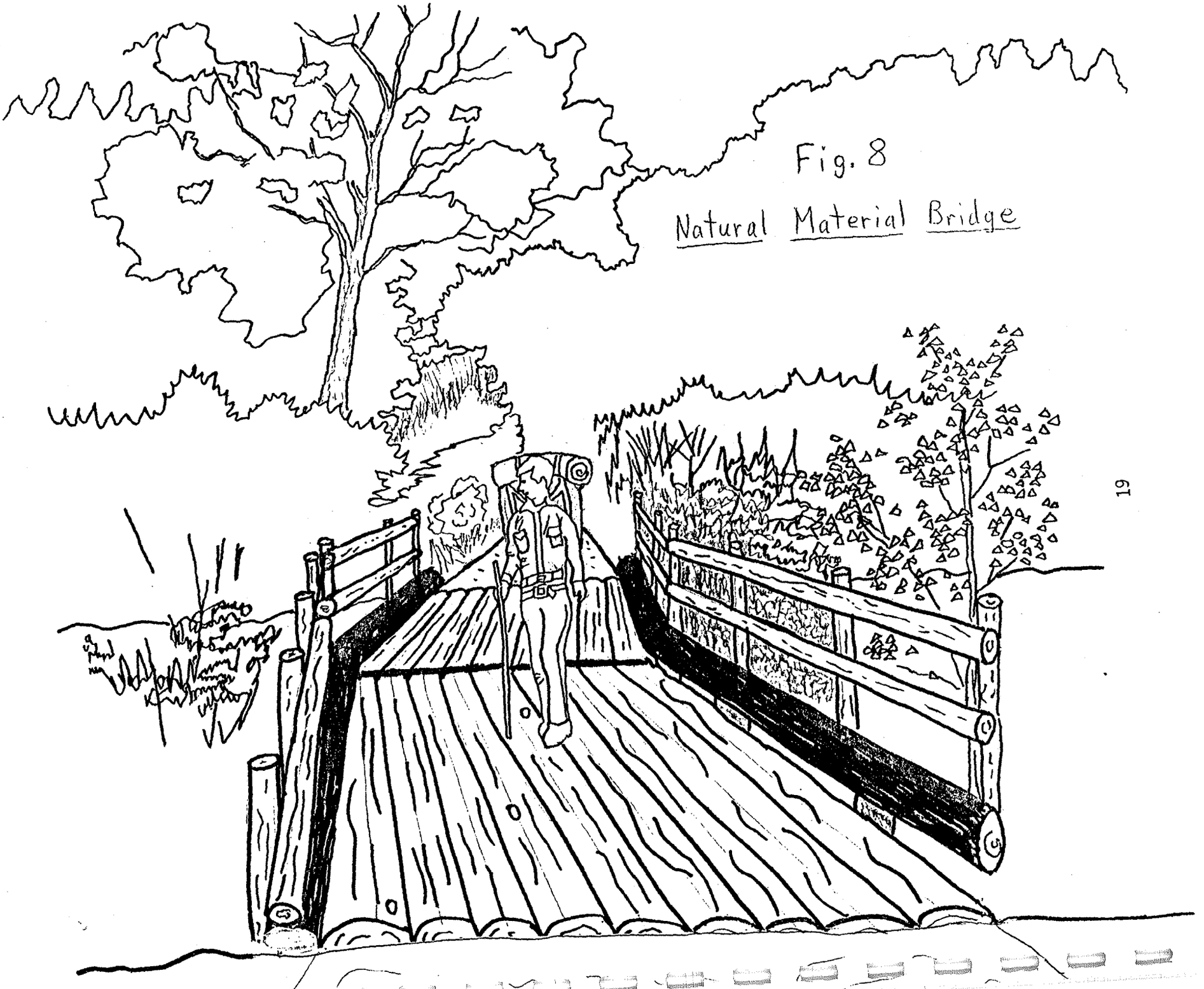
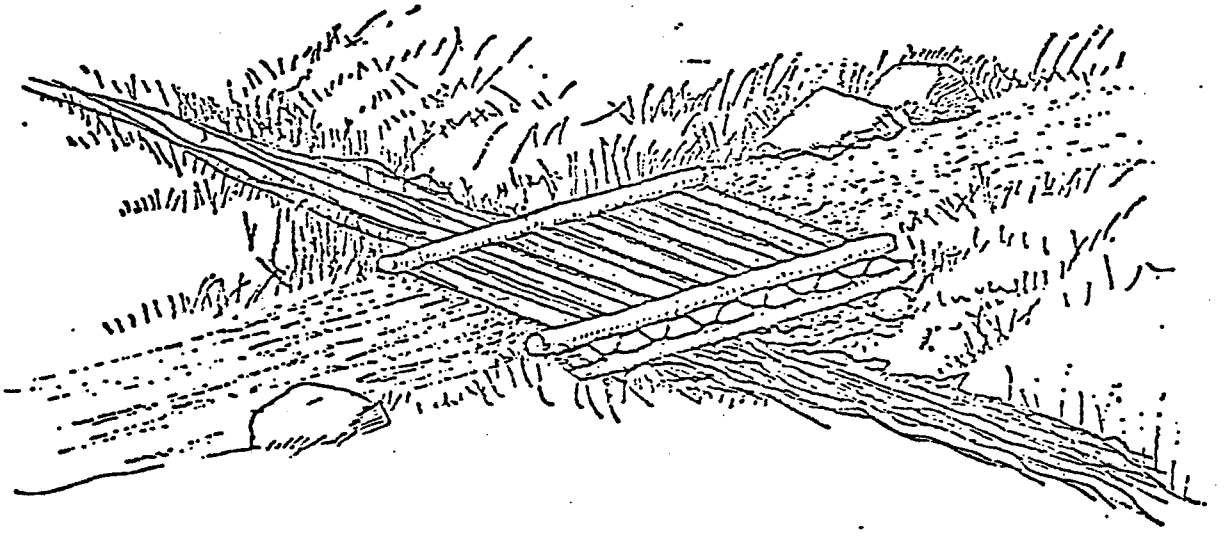


Fig. 8

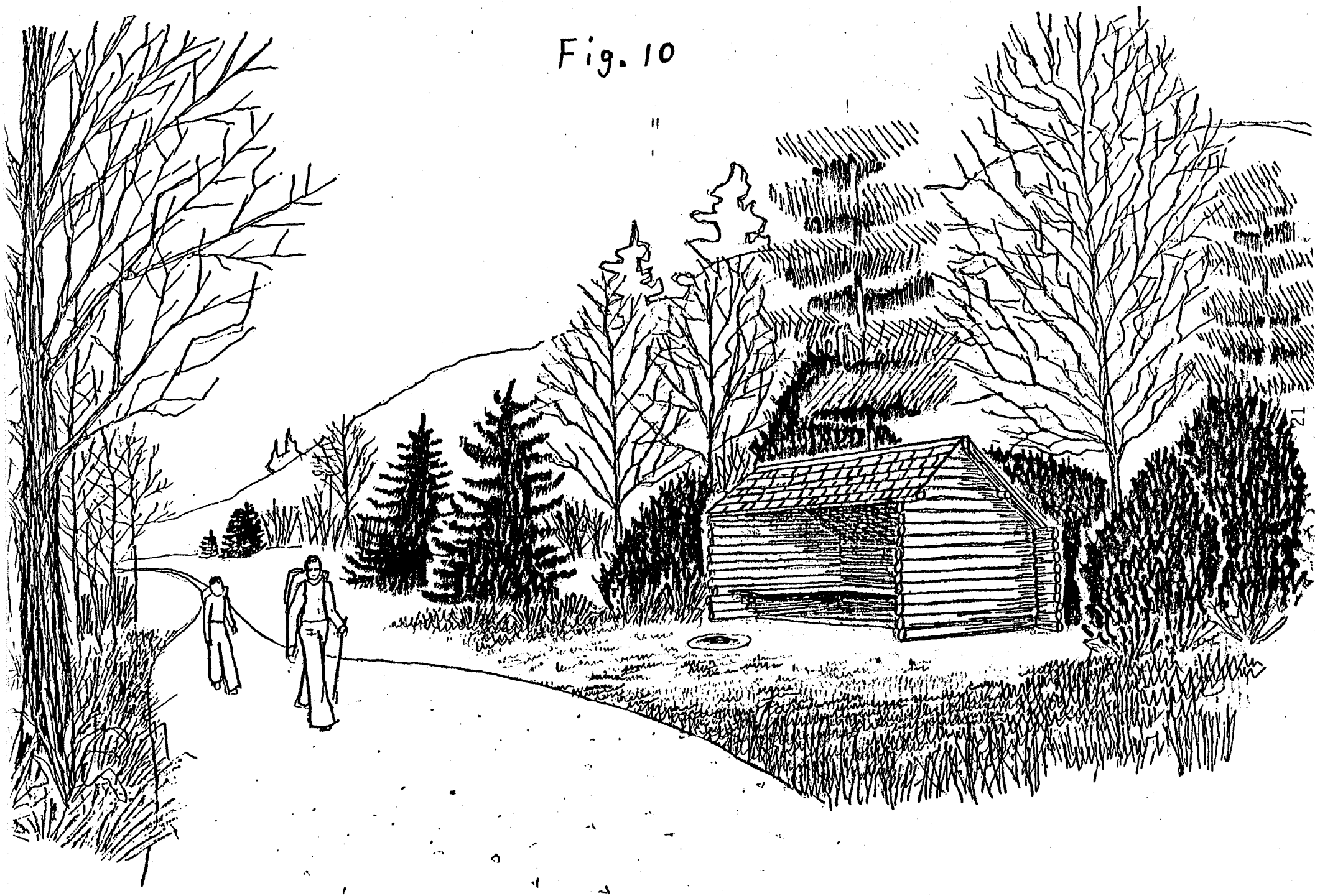
Natural Material Bridge

Fig.9 Small Natural Material Bridge



This is a smaller natural materials bridge. It should be utilized over small stream crossings, drainage ditches and in some cases, over excessive wet lands.

Fig. 10



shelter should be properly chinked with natural materials. Bottoms of shelters should be banked to stop wind flow.

A fireplace ring will be placed in front of the shelter to allow for warmth and cooking. Firewood should also be provided, so that trees near the site are not destroyed. Another reason firewood should be provided is because snowcover in the winter greatly hinders wood scavanging.

Simple log benches every 2-3 miles along the trail will provide users an additional chance to stop and enjoy the surroundings. These benches should be of the primitive type and located a short distance off the trail (see figure 10.5).

The pit toilet, if necessary, will be constructed according to Bureau of Engineering standards (see figure 11) and should be located a short distance from the rest and parking areas.

Parking Lot

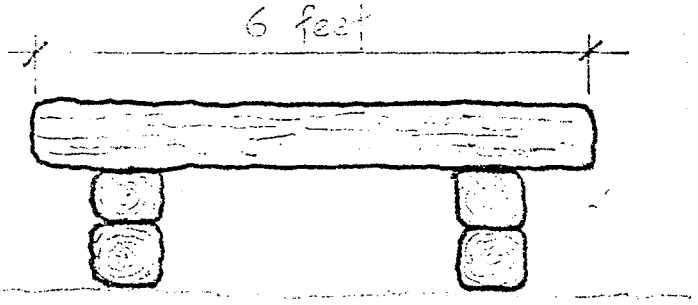
A parking lot will be constructed in the area marked on the map in figure 3, page 5. A 10-15 car lot should be adequate (see typical in figure 12). Surfacing of this lot with Class V gravel may be necessary to make it useable year-around.

A wood routed sign as shown in figure 13, page 26, will be placed on the main roads to mark access to the trail parking lot.

Signs

A wood routed trailhead sign showing the layout of the ski trail will be constructed at each trail entrance. An informational bulletin board con-

Fig. 10.5
Simple Log Bench



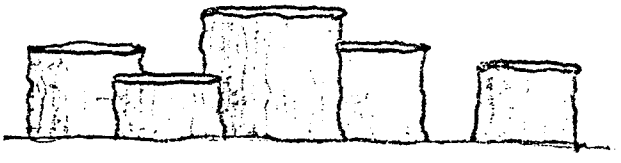
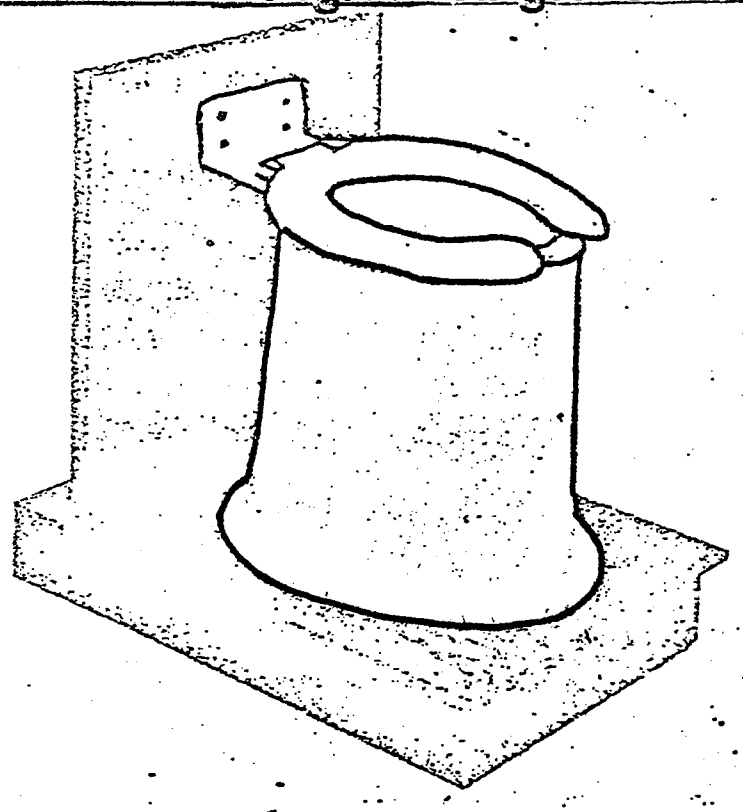
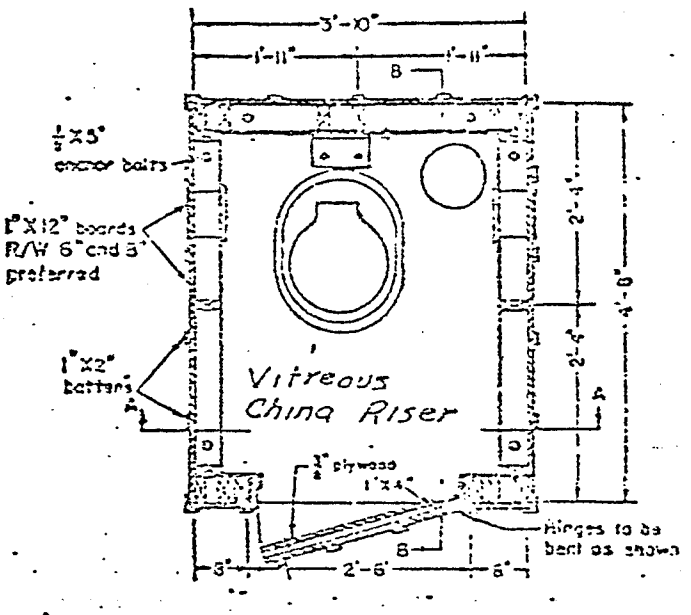
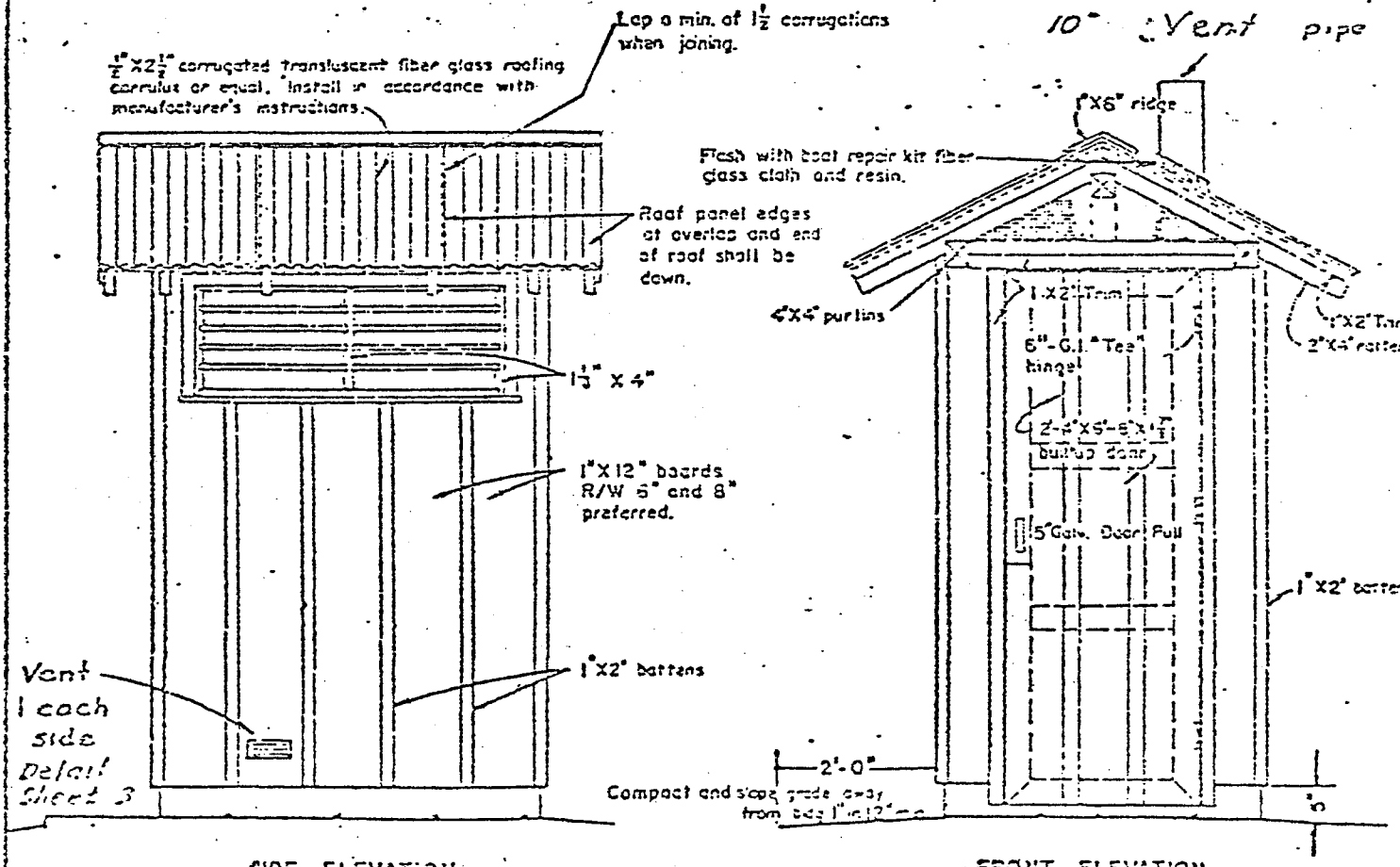


Fig.11 Single Seat Pit Toilet





PLAN



SIDE ELEVATION
(OPPOSITE SIDE SIMILAR)

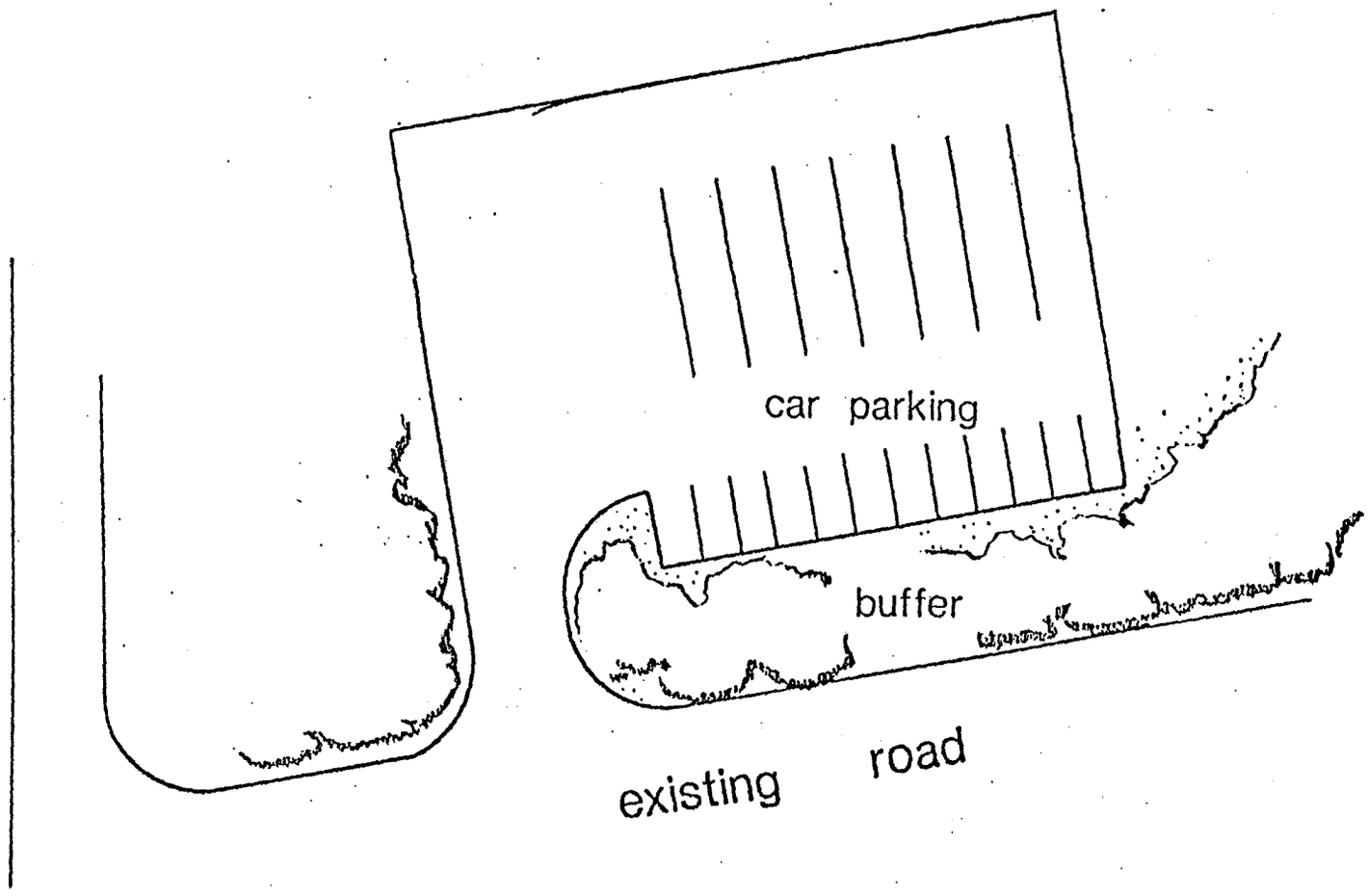
FRONT ELEVATION

Scale

Fig. 12

PARKING LOT TYPICAL

PLAN VIEW



taining a printed trail map, emergency phone numbers, trail regulations, and other information will also be built here (see sign typicals in figure 13).

"You are Here" signs will be placed at all trail junctions, and trail difficulty markers will be placed in strategic locations. Warning, regulatory, and information signs will also be erected in appropriate locations (see sign typicals in figures 13 & 14).

Maps

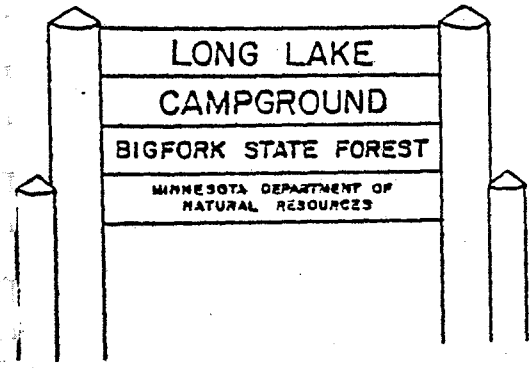
User maps are extremely important and will be used in conjunction with the signing system. Maps will show a generalized location of the forest and the trail route with mileages. Interpretive information about the history, development, and management of the area will be included on the back.

Maintenance

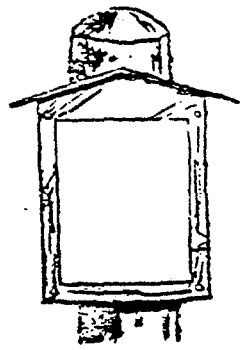
Maintenance of the Fond du Lac ski touring-hiking trail after development is the most important tool for sustaining their quality. Therefore, maintenance monies are essential if the area is to become a quality ski touring and hiking area.

At present, there are no funds earmarked for maintenance of ski touring and hiking areas developed through the bonding bill program. Therefore, it is a recommendation of this plan that maintenance money be made available through legislation to insure the quality of this area.

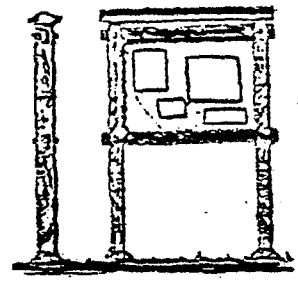
Fig. 13 Sign Typicals



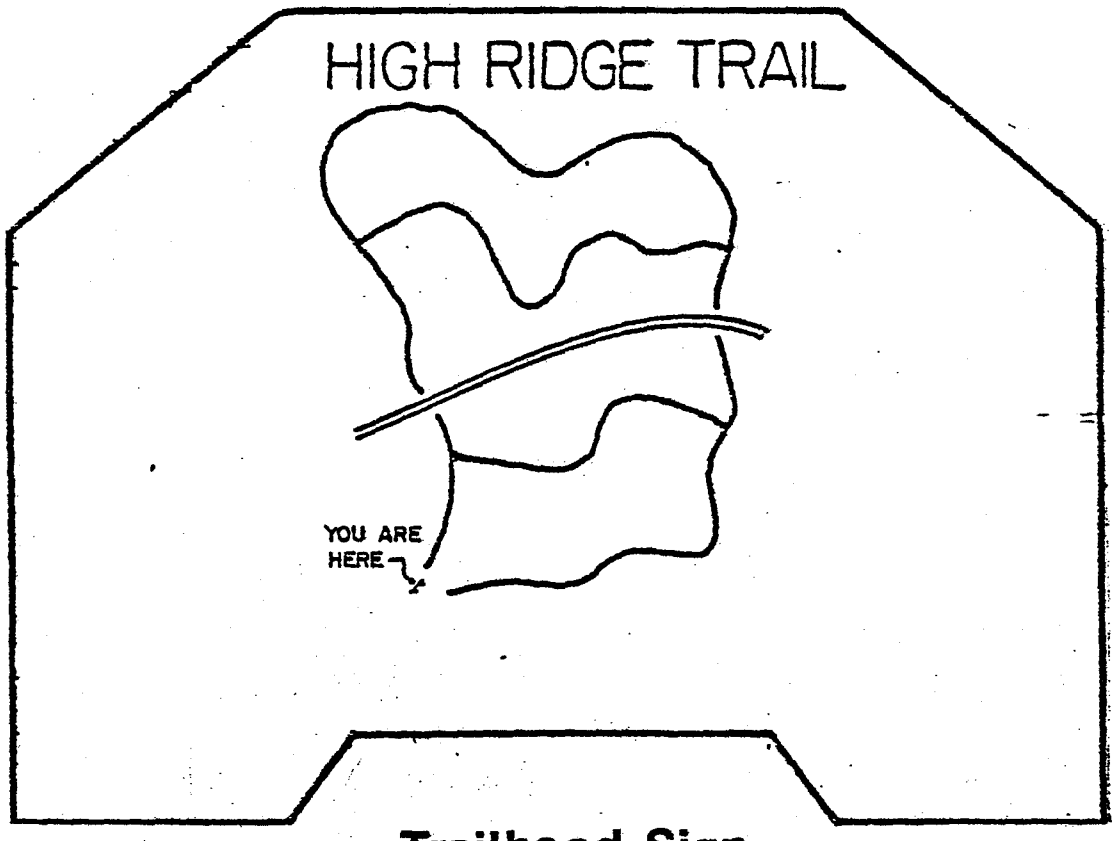
Entrance Sign



"You are Here" Sign



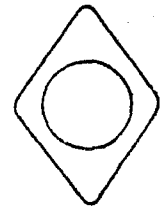
Information Bulletin Board



Trailhead Sign

Ski Decal

Hiker Decal

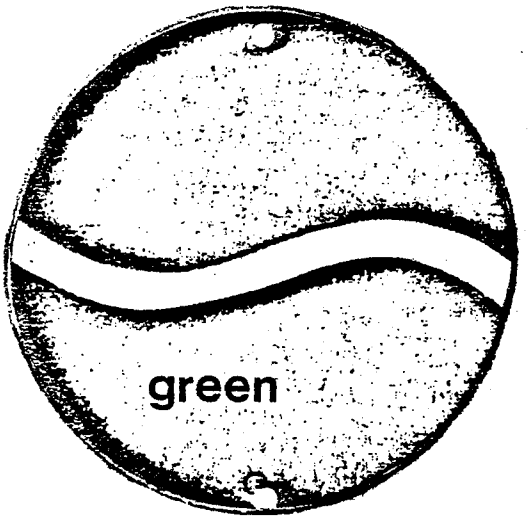


Blazer

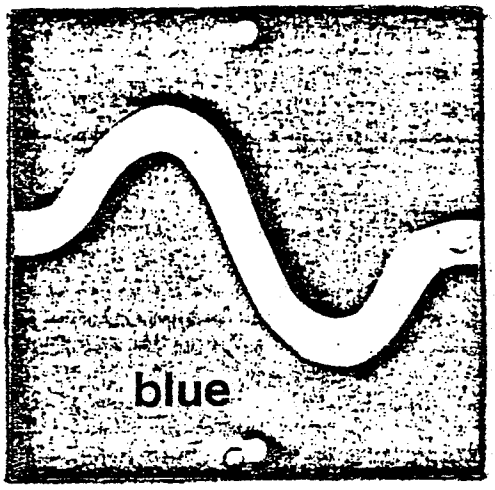
Fig. 14

Trail Difficulty Symbols

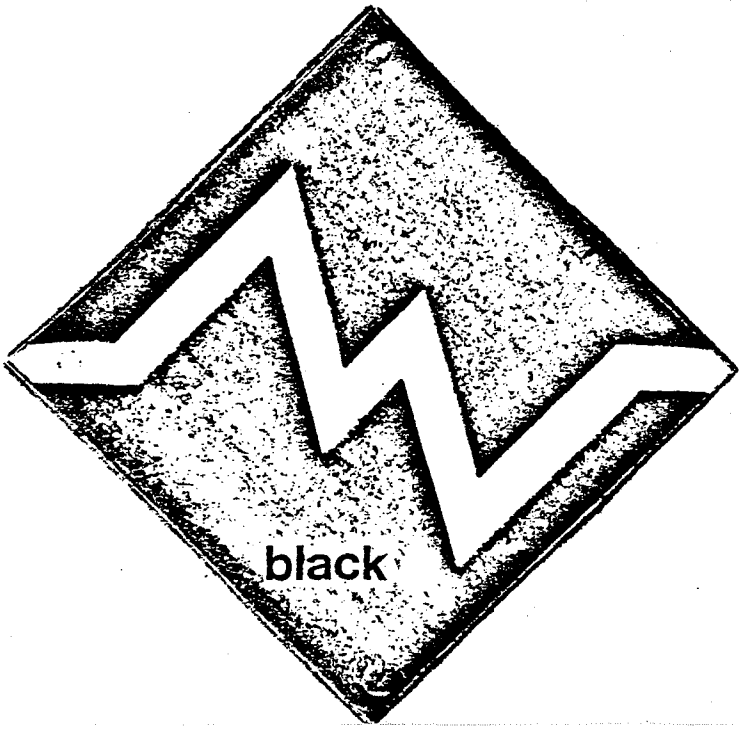
easy



more difficult



most difficult



Maintenance of the Fond du Lac ski touring-hiking trail will require a year-around program. Routine maintenance will include litter pick-up, cleaning shelters and toilets, stacking firewood, clearing surface vegetation, and replacement of signs. Major maintenance will involve removal of windfalls, painting and repairing of structures, and controlling erosion where necessary.

Winter grooming of the ski treadway will be done on a contract basis or by state employees using DNR equipment. No equipment is available for state use at this time, therefore, if a contractor cannot be found to groom the treadway, suitable equipment will have to be purchased. Winter grooming will be set up on a flexible schedule to allow for periods of high and low use.

Periodic inspections will be made throughout the year to evaluate maintenance problems and actions needed. Inspections may be made by the District Forester or his designate (i.e. maintenance foreman or by the person in charge of trail grooming). The Regional Trails Coordinator and St. Paul staff may also inspect the trail if necessary.

Steps Involved in the Planning Process

1. Project proposal is initiated by district forester and is submitted through the area and regional foresters (at this time, the proposal is evaluated for worthiness and the potential for public support).

2. After proven feasible and consistent with the state forest multi-use concept, the proposal is sent to St. Paul.

3. Proposal is then investigated by the Bureau of Planning and Research with the input of the regional trails coordinator, area and district foresters, and other involved divisions.

4. Area of study is defined and a preliminary plan is prepared based on this study. Regional trails coordinator, and the area and district foresters perform necessary "groundwork" and pass input on to St. Paul. Also, input is received from various levels of government, special interest groups, and others.

5. Preliminary plan is sent out to DNR divisions involved for review.

6. Plan is revised subject to this input and printed for public hearing.

7. A public hearing is held in the local area of the unit.

8. Plan is revised again taking into account public, departmental, and other agency review.

9. Plan is submitted to State Planning Agency for review for consistency with the Outdoor Recreation Act of 1975.

10. Possible revision subject to State Planning Agency review.

11. Final Review by State Planning Agency.

Note: Planning is an on-going process which does not stop after final State Planning Agency review. The management plan's built-in flexibility allows for site specific decision at the time of development. After development is completed, periodic re-evaluation of the management program is required for response to changing conditions.

Implementation

The structure of the Department of Natural Resources is such that the bureau of planning and research - trails section is responsible for the planning process and general implementation monitoring. After the plan is reviewed for the last time by the State Planning Agency, trail development can begin.

The assistant commissioner for operations, through the division of parks and recreation - trails section, has the responsibility for funding the project. They are also responsible for monitoring development and maintenance to insure that funds are spent in compliance with the bonding bill and master plan.

The regional administrator implements the plan by assigning the appropriate regional personnel to carry out development and maintenance of the trail. This development and maintenance must be in compliance with the bonding bill and master plan. The regional trails coordinator will coordinate other managers' activities within the region. He will also coordinate design of trails and facilities with the area and district foresters. Actual construction and maintenance of the trails will be the primary responsibility of the

area and district foresters with input from the regional trails coordinator. Schedules and contracts will be worked out by these three prople.

Changes to the management plan must be cleared through the Bureau of Planning and Research - Trails Section.

Estimated Costs

Parking Lot	- 1,000
Entrance Signs, Trailhead Signs and Bulletin Boards	- 2,000
Trail Treadway Construction	- 6,000 - 10,000
Rest Area Construction	- 1,000
Trail Signs and Maps	- 1,000
Estimated Cost	11 - 15,000

Maintenance Costs

Maintenance costs will be worked out by the District Forester, Area Forester, and Regional Trails Coordinator. A rough estimate of maintenance costs is $1,000/year.

Timing of the Project

Sixteen state forest ski touring and hiking areas have been identified as prime areas for development or improvement during 1978. The Fond du Lac ski touring-hiking trail is one of these projects.

The proposed developments are scheduled to be constructed during the summer and fall of 1978 so that they will be ready for use in the winter of 1978-79.

The area will be monitored continually by the district forester and other personnel to assess any problems that have occurred or to assess any additional developments which may be necessary.

Future Potential Expansion

No future expansion areas are being studied for the Fond du Lac State Forest at this time. It is believed that the proposed system will meet the needs in this area. It should be mentioned that an area on the eastern side was considered for development and may have future potential. If additional mileage and/or facilities become necessary, their development will be consistent with this plan. Any future recreational development will be coordinated with this plan and the overall plan for the Fond du Lac State Forest.

Recreational Needs to be Served by the Project

Ski touring and hiking are two activities that have experienced a tremendous growth in popularity in recent years. The 1974 Minnesota State Comprehensive Outdoor Recreation Plan (SCORP) identified ski touring and hiking as two of the fastest growing recreational activities in the state.

At that time, it was estimated that the number of Minnesotans participating in hiking was 300,000 users and it was projected that over 100,000 Minnesotans

would be participating in ski touring by 1975. SCORP also emphasized that these activities would continue to grow in popularity in the future.

The potential use area for the Fond du Lac unit includes Economic Regions III, V, VII, and XI. Most day use can be expected from local area residents, Cloquet, the Duluth area, and possibly the Iron Range cities. The map in figure 15 shows the hypothetical area from which "day users" might be attracted. This area is defined as the distance people would travel to use this area without requiring overnight facilities. Weekend or other extended time users can be expected from Regiona VII and XI, in particular, because of their larger population centers in the state. Many of these people will travel to northern areas for quality ski touring and hiking.

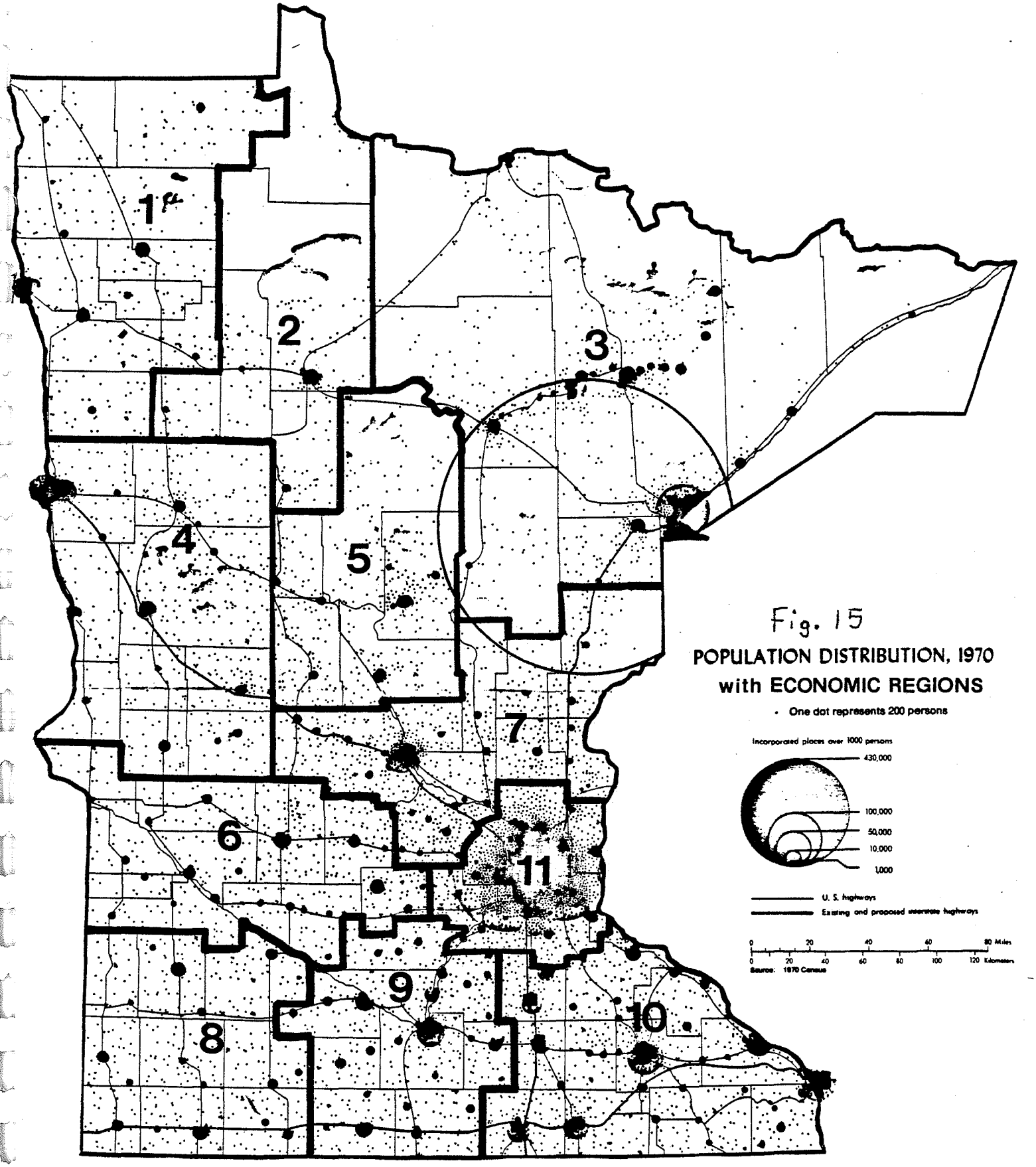


Fig. 15

POPULATION DISTRIBUTION, 1970
with ECONOMIC REGIONS

• One dot represents 200 persons

Description of the Environment

Topography

The topography of the proposed Fond du Lac day use unit is highly suitable for a quality ski touring-hiking trail. It varies from irregular terrain with rolling hills to flat lowland areas. Elevations range from 1,350 feet above mean sea level to 1,400 feet above mean sea level.

Soils and Geology

The Fond du Lac ski touring-hiking trail lies within a geomorphic area called the Automba Drumlin Area, Loamy. A drumlin is a streamlined (cigar shaped) hill of glacial drift with the long axis parallel to the direction of the flow of the glacier.

A detailed soil survey is not presently available for the area of Fond du Lac ski touring-hiking trail. A broader soil survey report reveals that the majority of the area consists of deep silty or loamy, well drained, light colored soils. The major soil series are Milaca-Mora- and Bock. Milaca is well drained, Mora moderately well, and Bock somewhat poorly drained. The subsoil often has a somewhat impermeable layer and this hampers the rate of water infiltration and the development of the roots of the deep-rooted legumes. Stoniness is a major management problem.

Also found in this area are acid organic soils. The major soil series are peat, swatera and spooner. This is a level area of organic peat soils with islands of mineral soils. The light colored mineral soils have formed from

calcarious laucustrive find sand (Swatara) and silt loam (Spooner). Swatara is well drained and Spooner poorly drained.

Climate

The area of the Fond du Lac ski touring-hiking trail has suitable climate for year-around trail activities. A climate data summary is given below:

Climate Data

Temperature (^{o}F.)

January	-	mean maximum -	18^{o}
	-	mean minimum -	-6^{o}
July	-	mean maximum -	80^{o}
	-	mean minimum -	54^{o}

Precipitation

annual normal precipitation - 27"

annual normal snowfall - 50"

Average annual number of days with snowcover of:

1" or more 130 days

3" or more

6" or more

Water Resources

Surface water resources near the Fond du Lac ski touring-hiking trail consists of one small lake and numerous lowland areas. The trail may pass near Rogers Lake when the best alignment is determined.

Mineral Resources

The vast peat areas in the southern half of Fond du Lac State Forest are being explored as to quality and volume. One of the largest peat processing plants in the state, the Red Wing Peat Corporation, is located along Highway #210 and is consuming a small part of this resource. No other economic concentrations of mineral resources are known to occur within the Fond du Lac State Forest.

Vegetative Cover

Vegetative cover in the vicinity of the proposed trail consists of mixed hardwoods, prominent stands of paper birch and large growths of balsam fir on the uplands. In the lowlands, northern white cedar, ash and tamarack were observed. Further elaboration of the covertypes of the forest is found in the Land and Timber Resources section.

Wildlife

The Fond du Lac State Forest is a home for numerous species of wildlife. Primary consideration in the management of wildlife is given to the white-tailed deer and ruffed grouse. Indirect benefits are derived by the coyote, snowshoe hare, cotton-tailed rabbit and woodcock. It was recommended by the Cromwell District #5 management plan - 1966, that the access roads and trail program be emphasized and continued. The Fond du Lac ski touring-hiking trail will be planted to clover so as to benefit wildlife as a food source. Brush cutting along the trail should be done after July 15, to protect ground nesting birds and mammals.

Land and Timber Resource

The Fond du Lac State Forest is located in both Carlton and St. Louis Counties. State ownership totals 40,050 acres with State Trust Fund accounting for 10,144 acres and Fish and Wildlife, four acres. The Fond du Lac State Forest consists of the following cover types: 26% Aspen-Birch, 3% Cedar, 6% Bottomland and Northern Hardwoods, 1% pine (jack, norway, and white), 9% Black Spruce, six percent Spruce-Balsam, 5% Tamarack, 22% Deforested, 12% Nonproductive, and ten percent Nonforest.

Of these covertypes, 47% is in the reproduction classification, 57% is in the pole timber classification, and 1% is in the saw timber classification. The recommended annual cut is 371 acres for the aspen type, which equals 79% of all cuts. This type is followed by tamarack with 12% and spruce-balsam with five percent. Cedar, hardwoods, and black spruce make up the remaining 4%.

Air and Water Quality

The Fond du Lac State Forest is located near Cloquet and Duluth, which are two of the larger population centers in the area.

Industrial air pollution from Cloquet may exist at times, but should not be a problem here. Duluth is located too far away to have a significant effect on air quality.

Surface water quality is reasonably good and water pollution is not considered to be a problem in the area.

Historical and Archaeological Resources

Little history is known of the Fond du Lac State Forest.

The original purpose of establishing this as a state forest is unknown except that it was recommended by some local person or organization.

No archaeological sites have been identified within the area of the proposed trail to date. An archaeological study will be conducted before any earth is removed or cut. The DNR will contact the Minnesota Historical Society to do the investigation.

Transportation and Utilities

The proposed Fond du Lac ski touring-hiking trail is considered highly accessible for the population centers of Cloquet and Duluth. State Highway 210 provides a route to the forest from these population centers. Interstate 35 and State Highway 23 provide routes from the Minneapolis-St. Paul area and St. Cloud area, respectively.

Access to the trail area can be gained by highway 120 just east of Cromwell. Then, the township road which passes by the Cromwell lookout tower leads to the proposed parking lot (see map in figure 3, page11). Signs will be placed so the traveler can clearly see where to go.

No utilities (telephone or electricity) are presently available within the vicinity of the proposed trail. Utilities are available to residences and facilities near Fond du Lac State Forest.

Socio Economic Factors

The Minnesota State Planning Agency (SPA) population projections for Carlton County and Economic Development Region 3 reveals an increase for the next ten to fifteen years. The data is revealed below:

Year	Carlton County	Region 3
1980	29,300	330,300
1985	30,300	332,600
1990	30,900	332,400
1995	31,100	330,200
2000	30,800	325,400

Four areas of major employment for Carlton County are: 1) Operatives, except transport - 19.3%; 2) Craftsmen, foremen, and kindred workers - 14.6%; 3) Service workers, except private household - 13.9%; and 4) professional, technical, and kindred workers - 12.8%.

Tourist travel expenditures during 1974 totaled $2,601,182 in Carlton County. These expenditures accounted for 1.0% of gross sales ranking Carlton County fifty-nine of 87 counties.

Land Use and Development Trends

Carlton County General Land Use
(Forty Acre Parcels)

Forested	9,409	Marsh	621
Cultivated	1,145	Urban	326
Pasture and Open	2,274	Extractive	15
Water	202	Transportation	8
Total	14,000		

Agriculture:

Current agricultural land use within Carlton County is not intensive or extensive. Dairy farming is a common practice while crops include: corn for silage; small grain; and legume-grass hay or pasture.

Residential:

Present residential land use does not or will not effect the proposed Fond du Lac ski touring-hiking trail because of state and county lands which surround it. Residential use, however, is increasing around the lakes in the county.

Commercial/Industrial:

No commercial or industrial developments are located near the proposed trail. Timber harvesting is permitted. This activity, however, will not have an adverse effect on the trail. Peat mining has occured in the forest but this should not effect the trail since it will be located on a highland drumlin area.

Facilities in Region 3

Economic Region 3 encompasses all of northeastern Minnesota, a region that has a great number of outdoor recreation facilities. Two national forests, the BWCA, 16 state parks, four corridor trails, 12 historic sites, 22 state forests, 559 miles of ski trails and 1,800 miles of snowmobile trails can be found there. One reason for this area's large number of recreational facilities is that over 85% of the land in this region is in public ownership.

Numerous resorts, motels, hotels and campgrounds can also be found throughout the region. Many of these facilities are open year-around to accomodate the needs of outdoor enthusiasts. Gas stations, repair shops and ski shops can also be found throughout the region.

Facilities Within Fond du Lac State Forest

The Fond du Lac State Forest is relatively undeveloped. Although there are many unmarked logging roads and trails, there is a need for well designed, signed and maintained trails. Currently, one marked snowmobile trail exists in the Forest. Other opportunities in the forest include: hunting; fishing; and hiking.

Management Programs Within the Forest

Management of the Fond du Lac State Forest is based on recommendations outlined in the Cromwell District Forest Management Plan. These plans are formulated for each forestry district throughout the state and are based on the state "Timber Management Guide" and other policy manuals. The management program is based on a ten year period, while necessary adjustments are made to fit local conditions.

The management program includes timber, wildlife, soils, water, and recreation. Management of these resources requires a coordinated program which brings about maximum productivity and protection as well as providing other public benefits such as recreation.

Development of the Fond du Lac ski touring and hiking trail will be an integral part of this management program and will not inhibit other forest management practices.

Necessary adjustments will be made in the area to avoid conflicts between other management activities and the trail. Development of the ski touring and hiking trail, however, will not exclude use of administrative vehicles and/or contractors who have been assigned to do work in the area. It will also not exclude automobiles from roads which are normally plowed during the winter.

When timber harvest is recommended in the area, cutting and hauling will try to be scheduled between May 1 and November 1 to avoid conflicts between skiers and contractors. In some instances, such as when swamp conifer types are recommended for harvest, logging operations will have to be performed in the winter to take advantage of frozen ground conditions. In these instances, portions of the trail treadway may have to be closed or rerouted temporarily to permit timber harvest operations to be run efficiently.

Timber sale contracts will be adjusted to insure that trees are not felled blocking the treadway. Provisions will be written so that the trail treadway, if damaged, will be returned to its original condition. Provisions will also be written to insure that slash and other debris are scattered away from the trail.

It should be emphasized at this point, that some forest trails will not always be permanent. As forests change in age, timber harvest will preclude established trail use in some areas. To adjust for these changing conditions, the trail will be rerouted into other areas in the forest. Thus, while trail

use will be an established use in state forests, the trail location may not.

All management decisions concerning the area will be made in a manner that insures that the needs of other management activities and recreation are met with the least possible conflict.

Potential Concerns and Considerations

A major concern in the development of the Fond du Lac ski touring-hiking trail is the possible conflict with an established snowmobile trail. Since the proposed ski trail will probably cross the existing snowmobile trail at least two times, it is conceivable that conflict could result. However, it has been shown that signing and a higher level of awareness by each user has greatly minimized problems. It is strongly believed that through signing and cooperation, both uses could exist in harmony with each other.

Environmental Impact of the Proposed Project

Impact on the Physical and Biological Environment

Soil Compaction: This will only be a problem in areas of high use. This effect should be minimized through the selection of dry soil locations.

Soil Erosion: This effect will be minimized by route selection, retaining the natural ground slope, seeding, water bars, courdoroy, culverts, and bridges where necessary. No siltation of streams or lakes is expected.

Wildlife: Wildlife will be disturbed during construction, maintenance, and use of the trail. This effect, however, will be minimal. The long run effect may result in more wildlife being harvested adjacent to the trail by hunters using the trail for access. This effect may be beneficial in regard to harvesting surplus wildlife where natural preditors are absent. In addition, wildlife will benefit from "edge" effect and re-seeding.

Vegetation: Denudation of vegetation may occur in areas of high use. Re-seeding of the treadway should help minimize this concern. Also since firewood will be provided at rest areas, the site should not become overly "scavenged".

Air and Water: The proposed action will not effect air or water quality. Auto emissions and heavy equipment exhaust will easily be assimulated by the environment. As for water, culverts, courdoroy, bridges, and other

erosion control techniques will minimize alterations of surface and ground water quality.

Impact on the Historical and Archaeological Resources

No impact on these resources has been identified at this time. Further investigation by the Historical Society may reveal sites which must be avoided during development.

Impact on Transportation and Utilities

Expected increases in use of the trail will not have a significant impact on traffic volumes in the Cromwell area. Access to the area via state highway 210 should not be adversely affected. The unpaved roads leading to the trail parking lot may experience wear when they are soft from moisture.

No impact on utilities will occur.

Impact on Socio Economic Factors

Since all of the land is already in public ownership, no loss from local tax revenue will occur. Beneficial impacts on the local economy will be realized. This will result from increased tourist travel expenditures in the area. Other positive effects on socio-economic factors, of which are less tangible, are:

1) The trail will satisfy the immediate area and statewide needs for ski

touring-hiking in a manner that is compatible with the environment and on-going management practices.

2) The trail will provide Minnesotans an opportunity to enjoy, acknowledge, and better understand the natural forest community and management of it.

Impacts on Land Use

Development of the trail will not change or affect the land use in the area.

Impact on Management of the Forest

Normal forest management activities will only be slightly affected by the development and maintenance of this trail. The area and district foresters, and the regional trails coordinator will be delegated further jurisdiction and responsibility by this action. Management of structures, the trail treadway, and the users will be made necessary by the development of this trail.

References

Facilities In Economic Region III

1. Minnesota State Comprehensive Outdoor Recreation Plan - Minnesota DNR - Bureau of Environmental Planning and Protection, 1974.

Climate

2. Climate of Minnesota Part III. "Temperature and its Application"; Donald G. Baker and Joseph H. Strub, Jr., University of Minnesota Agriculture Experiment Station, 1965.

3. "Minnesota Soil Atlas - Duluth Sheet", University of Minnesota Agriculture Experiment Station, 1969.

Topography

4. "Minnesota Soil Atlas - Duluth Sheet", University of Minnesota Agriculture Experiment Station, 1969.

Vegetative Cover, Wildlife Timber Resource, and Management Program

5. Sand Lake District Management Plan - Minnesota DNR - Division of Forestry, 1970.

Soils

6. "Minnesota Soil Atlas - Duluth Sheet", University of Minnesota Agriculture Experiment Station, 1969.

7. "Soils of Minnesota", H.F. Arneman, University of Minnesota, Agriculture Experiment Station, June 1963.

Development Specifications

8. "The Ski Touring Trail Planner", Timothy B. Knopp and Jack P. Maloney, 1972.

9. "Trail Construction Guidelines", Ontario Ministry of Natural Resources, 1976.