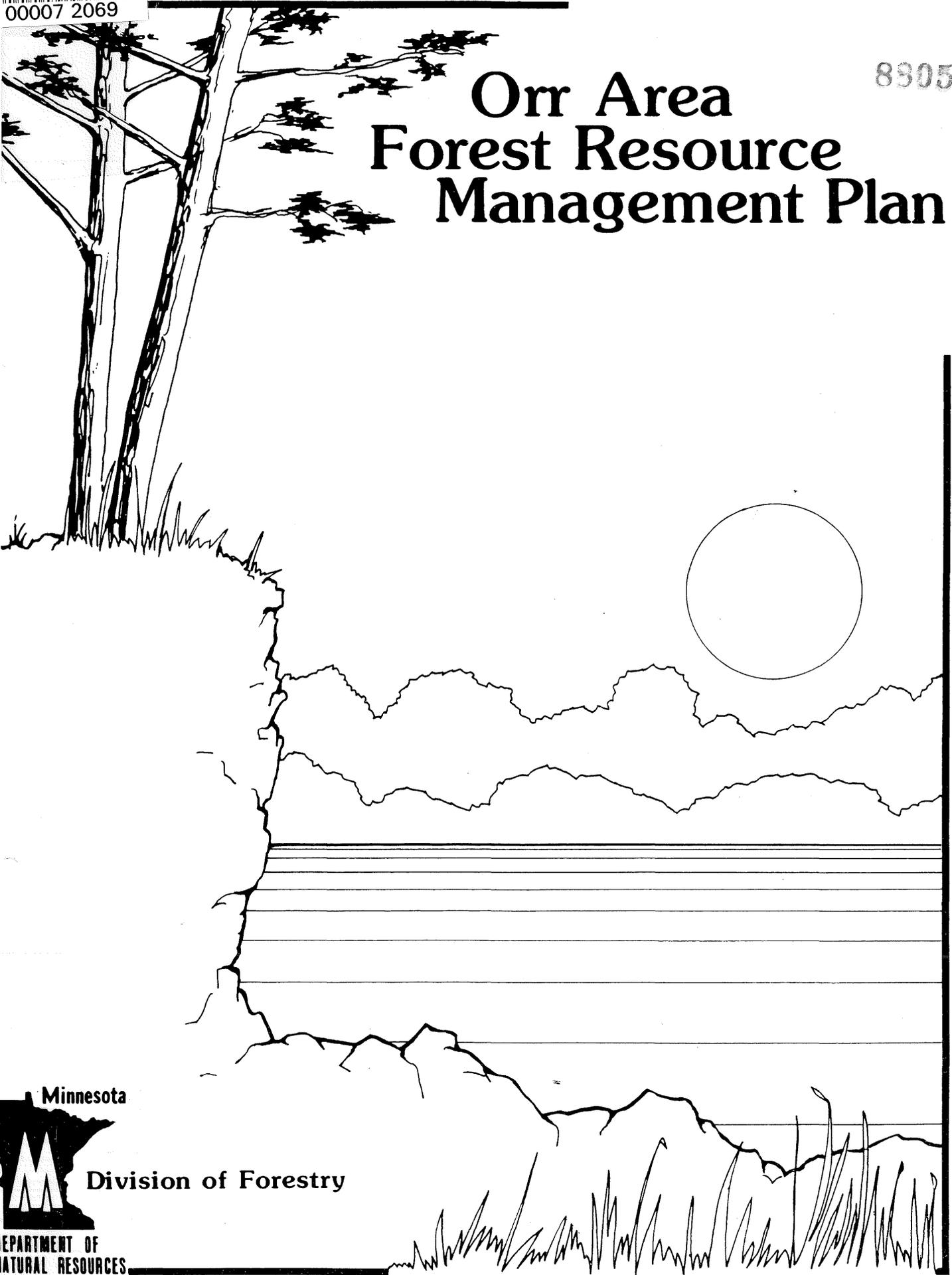


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Orr Area Forest Resource Management Plan



Minnesota

Division of Forestry
DEPARTMENT OF
NATURAL RESOURCES

ORR AREA

FOREST RESOURCE MANAGEMENT PLAN

This plan has been prepared and approved pursuant to Minnesota Statutes Section 89.012 which provides:

Each geographic administrative unit of the division of forestry identified by the commissioner as an appropriate unit for forest resource planning shall have a unit forest resource plan which is consistent with the forest resource management policy and plan, including state reforestation and road policies. The scope and content of the plan shall be determined by the commissioner. A unit plan shall not be implemented until approved by the commissioner.

A unit plan shall set forth the specific goals and objectives for the management, protection, development, and production of forest resources in the administrative unit. A unit plan shall be integrated with other uses not managed under the multiple use, sustained yield principles policy when those uses have been authorized and approved according to law, including compliance with environmental review procedures. Unit plans shall be revised as necessary to remain consistent with the forest resource management plan.

Joseph N. Alexander 15 Dec 87

Joseph N. Alexander, Commissioner
Minnesota Department of Natural Resources

Minnesota Department of Natural Resources
Division of Forestry
300 Paul, MN 55155-4044

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PLAN OUTLINE

Detailed tables of contents precede each chapter and appendix.

Chapters

- 1. Introduction
- 2. Area Assessment
- 3. Land Management Plan
- 4. Program Guidelines
- 5. Implementation and Monitoring

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Appendices

- A. Recreation Sub-Area Plan
- B. Timber Management Plan
- C. State Forest Road Plan
- D. Land Ownership and Administration
- E. Buildings
- F. Soil Management Guidelines
- G. Water Management Guidelines
- H. Rare or Unique Natural Features

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ORR AREA FOREST RESOURCE MANAGEMENT PLAN

1. INTRODUCTION

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DESCRIPTION OF THE ORR AREA

The Orr Area is one of 19 Division of Forestry administrative areas in Minnesota. Division offices are located at Orr, Cook, Tower, and on U.S. Highway 53 south of Lake Kabetogama. The area contains approximately 2.6 million acres in northern Minnesota. It includes the northern portions of Lake and St. Louis counties and six townships in eastern Koochiching County (see Figure 1.1). It is located between the Iron Range and Canada. The largest cities in the area include Ely, Babbitt, Cook, Tower, and Orr.

There are about 375,000 acres of Division of Forestry administered land in the area. Division administered lands are intermixed with other public and private lands. Other public lands in the Orr Area include Bear Head Lake and Tower Soudan state parks, portions of the Superior National Forest and Boundary Waters Canoe Area Wilderness, and part of Voyageurs National Park. Koochiching, Lake, and St. Louis counties administer 242,000 acres of tax-forfeited land within the area. About one-third of the land in the area is privately owned including large acreages owned by forest products companies.

AREA FOREST RESOURCE MANAGEMENT PLANS

The purpose of an Area Forest Resource Management Plan is to set forth specific goals and objectives for the management, protection, development, and production of forest resources in a Division of Forestry administrative area. An Area Forest Resource Management Plan is a combined land use and program plan. Area plans are designed to help coordinate the Division of Forestry's activities in an area with those of other DNR administrative units, other agencies, local governments, and the private sector.

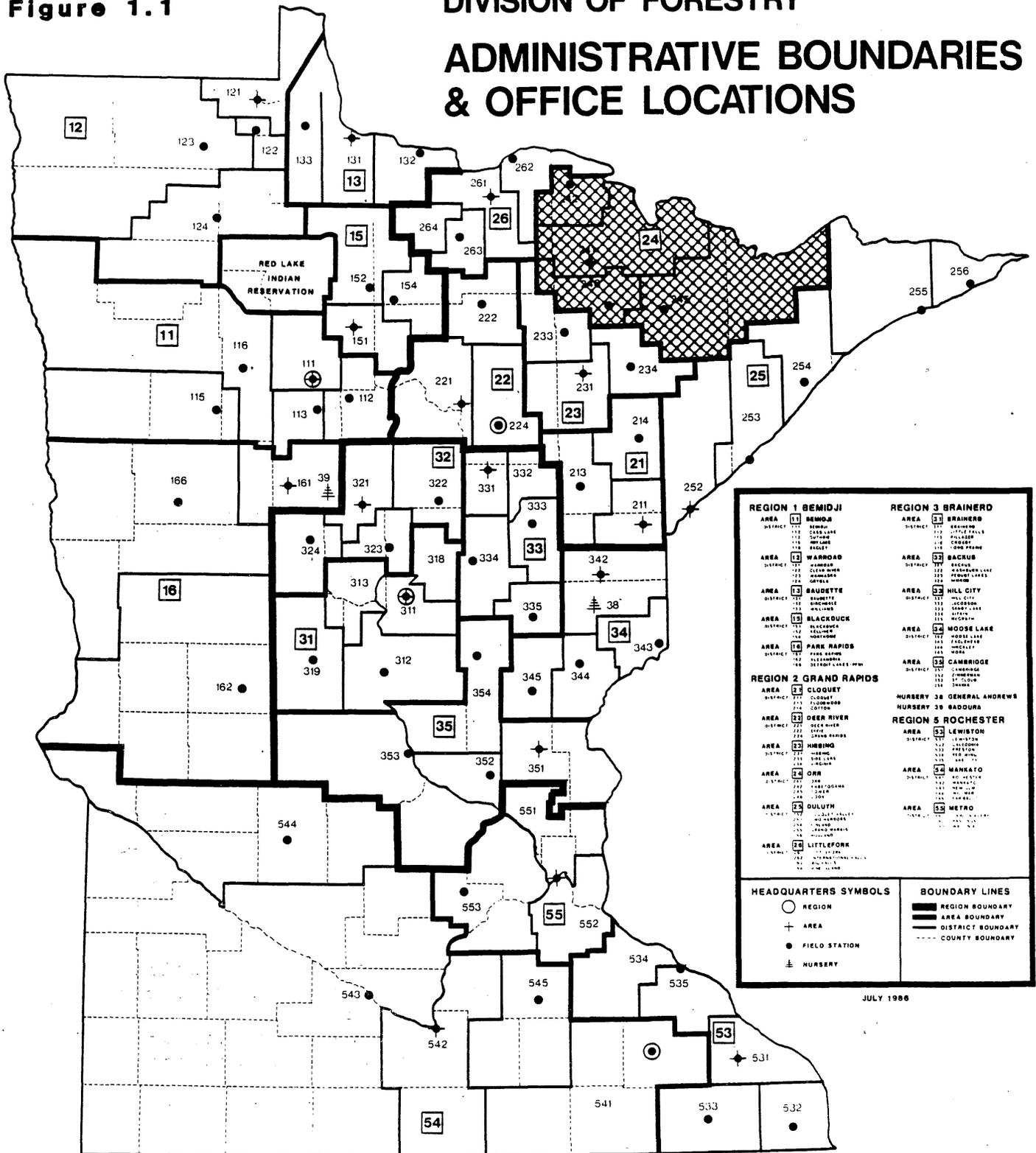
The Department of Natural Resources is required by section 6 of the Forest Resource Management Act of 1982 to complete forest resource plans for administrative areas. Section 7 of the act requires that the completed unit plans be presented to the standing committees of each house of the legislature with jurisdiction over natural resources or appropriation matters.

The Commissioner of Natural Resources also has general forest resource planning authority under Minnesota Statutes 89.01, Subd. 4, which states that the commissioner "...shall cooperate with the several departments of the state and federal governments and with the counties, towns,

Figure 1.1

DIVISION OF FORESTRY

ADMINISTRATIVE BOUNDARIES & OFFICE LOCATIONS



⊠ Orr Area

corporations, or individuals in the preparation of plans for forest protection, management, replacement of trees, wood lots, and timber tracts, using his influence as time will permit toward the establishment of scientific forestry principles in the management, protection, and promotion of the forest resources of the state."

INTERDISCIPLINARY PLANNING TEAM

The Forest Resource Management Act of 1982 defines forest resources as natural assets of forest lands including timber and other forest crops, recreation, fish and wildlife habitat, wilderness, rare and distinctive flora and fauna, air, water, soil, and educational, aesthetic, and historic values. The act also requires that the state's forest resources be managed according to multiple use principles. Multiple use management is defined as harmonious and coordinated management of the various forest resources to best meet the needs of the people of the state, without impairment of the productivity of the land, with consideration of the relative values of the resources, and not necessarily the combination of uses resulting in the greatest economic return or unit output. Furthermore the act requires integration of forest resource management with other uses of forest land including mining, utility or transportation corridors, and industrial, commercial, institutional, or residential development.

The provisions of the Forest Resource Management Act and the complexity of forest ecosystems necessitate the use of an interdisciplinary approach in developing forest resource management plans. Area Forest Resource Management Plans are developed by an interdisciplinary planning team directed by the Planning Team Leader and the Area Forest Supervisor. The interdisciplinary team consists of a variety of DNR resource specialists including foresters, wildlife managers, fisheries managers, recreation specialists, hydrologists, minerals specialists, enforcement officers, and others. The DNR interdisciplinary team consults with other interested agencies, organizations, and individuals in developing the plan.

The Planning Team Leader and other members of the Division of Forestry planning staff coordinate area planning efforts. They arrange necessary meetings, document the recommendations of interdisciplinary team members, research and compile data, write reports, provide liaison with the St. Paul forestry staff, edit the plan, and provide other support services for the planning team.

The Area Forest Supervisor is primarily responsible for implementing the Area Forest Resource Management Plan. Therefore the Area Forest Supervisor is the key DNR staff person in the field for plan coordination and development. Region, area, and district forestry personnel provide information, participate in planning team meetings, and develop area priorities.

Specialists from other disciplines provide information on plans and activities within their field, participate in planning team meetings, provide liaison with their respective divisions, and participate in plan development and review.

RELATIONSHIP TO THE MINNESOTA FOREST RESOURCES PLAN

The Forest Resource Management Act of 1982 requires the Department of Natural Resources to maintain a comprehensive statewide forest resource management plan designed to implement multiple use, sustained yield policies for management of forest lands under the authority of the commissioner. The Minnesota Forest Resources Plan (MFRP) provides the statewide policy and budget framework within which Area Forest Resource Management Plans are developed.

Since the program portion of the MFRP will be updated every four years, area plans must be flexible enough to allow for possible adjustments in budgets, management priorities, and program direction.

ORR AREA FOREST RESOURCE MANAGEMENT PLAN

2. AREA ASSESSMENT

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SOCIAL PROFILE

POPULATION

The Orr Area can best be described as sparsely populated. Most of the northern part of the area is public land with no permanent residents. Table 2.1 lists the 1980 population of minor civil divisions in and around the area. Many lakes in the area, particularly the large ones, including Kabetogama, Vermilion, Burntside, Shagawa, and White Iron, have concentrations of resorts and summer cabins on their shorelines. The population increases greatly during the summer months due to the influx of resort guests, cabin owners, and recreationists. The BWCAW and Voyageurs National Park attract large numbers of people into the backcountry each summer.

The area population has declined in the recent past and is expected to decrease further. St. Louis and Lake counties are projected to lose population throughout the period 1980 to 2010. Koochiching County is projected to grow through 1990 and then lose population through 2010 (Minn. Dept. of Energy, Planning, & Development - Demographer, 1983).

TRANSPORTATION

Highways

Major access to the area is provided by U.S. Highways 53 and 169 and State Trunk Highways 1 and 169. Numerous county state aid highways, county roads, township roads, and forest roads serve the area. Driving times to major population centers in the state include approximately two hours to Duluth and five hours to the Twin Cities.

The Division of Forestry has 56.5 miles of inventoried state forest road in the area. There is also a considerable mileage of non-inventoried primitive road on state forest land. The purpose of state forest roads is to provide access to state land for protection and management purposes. A significant portion of state land in the area is currently inaccessible.

Table 2.1. 1980 Population of Minor Civil Divisions
Wholly or Partially within the Orr Area.

Minor Civil Division	1980 Population
Alango	318
Angora	291
Babbitt	2,435
Bassett (a)	40
Breitung	933
Cook	800
Crystal Bay (a)	760
Ely	4,820
Embarrass	1,154
Fall Lake	522
Field	430
Greenwood	565
Hoyt Lakes (a)	3,186
Kugler	230
Leiding	386
Linden Grove	160
Morse	1,123
Orr	294
Owens	318
Portage	262
Pike	600
Stony River (a) (b)	0
Tower	640
Unorganized Territories of Koochiching County (a)	6,967
Unorganized Territories of Lake County (a)	2,281
Unorganized Territories of St. Louis County (a)	5,966
Vermilion Lake	379
Waasa	428
White (a)	2,246
Willow Valley	133
Winton	276
Area Total (c)	17,497 - 38,943

Notes:

- a. Only part of these minor civil divisions are located within the Orr Area.
- b. Stony River Township was part of the Unorganized Territory of Lake County in 1980.
- c. The total population for the area was within the range indicated. The lower figure is the total for MCD's wholly within the area while the higher figure includes all MCD's listed. The actual population was probably between 20,000 and 25,000.

Source: Minn. State Planning Agency - Demographer, 1984.

Airports

Key airports (i.e. with paved and lighted runway over 5,000 feet long) serving the Orr Area are located at Duluth, Ely, Hibbing, and International Falls. Intermediate airports (i.e. with paved lighted runway less than 5,000 feet long) are located at Cook, Orr, and Eveleth. A landing strip (i.e. turf runways) is located at Tower. The airports at Orr and Hibbing are used for various aspects of the Orr Area's fire protection program.

Railroads

Main railroad lines serving the Orr Area are the Duluth, Winnipeg and Pacific from Virginia to International Falls and the Duluth, Missabe and Iron Range line. Railroads are important in transporting finished forest products to markets.

ARCHAEOLOGICAL AND HISTORICAL RESOURCES

A review of the Minnesota Historical Society's records show many historical and archaeological sites in the Orr Area. The majority of sites are found along lakes and watercourses which were used as transportation routes. Thorough archaeological surveys have not been completed on the majority of known sites nor has there been any organized effort to survey the area for additional sites. It is likely that sites are much more prevalent than indicated by the records.

ENVIRONMENT AND NATURAL RESOURCES

CLIMATE

The following climatic information is adapted from the Soil Survey of the Kawishiwi Area, Minnesota (USDA Forest Service and Soil Cons. Service, 1978).

The Orr Area is dominated by a marked continental climate. Three main air masses prevail. Continental polar and arctic air masses forming in or north of the Saskatchewan plains flow south into Minnesota and bring severe winter weather. Maritime tropical air masses forming in the Gulf Coast area move up the Mississippi Valley and supply northeastern Minnesota with most of its precipitation. Air masses moving east from the Rocky Mountains and plains usually bring mild, dry weather to the area.

Annual precipitation in the Orr Area ranges from about 26 to 31 inches. Of this, about 60 percent falls between April 1 and November 1. About 40 percent of the precipitation is snow. Annual precipitation is generally greater in the eastern part of the area than in the western part, but this is subject to seasonal variations. Average annual snowfall is about 65 inches and duration of snow cover of 1 inch or more is about 153 days.

The annual growing season ranges from 100 to 123 days. The last killing frost in the spring can be expected between May 22 and June 5, and the first in the fall occurs between September 10 and September 27. The average temperature is 42 degrees in spring, 68 degrees in summer, 45 degrees in fall, and 12 degrees in winter. Summer temperatures higher than 90 degrees F. and winter temperatures lower than -40 degrees F. are uncommon.

GEOLOGY AND SOILS

Bedrock Geology and Mineral Potential

The Orr Area has a diverse bedrock geology. The rocks vary in age, composition, origin, and mineral potential. There are Archean rocks 2.7 billion years old and Proterozoic rocks of two ages, 1.8 and 1.1 billion years old. Compositionally, they range from ultramafic (iron and magnesium rich) to granitic. Origins include intrusive, volcanic, and both clastic and chemical sediments. These factors create a potential for the occurrence of a variety of mineral deposits.

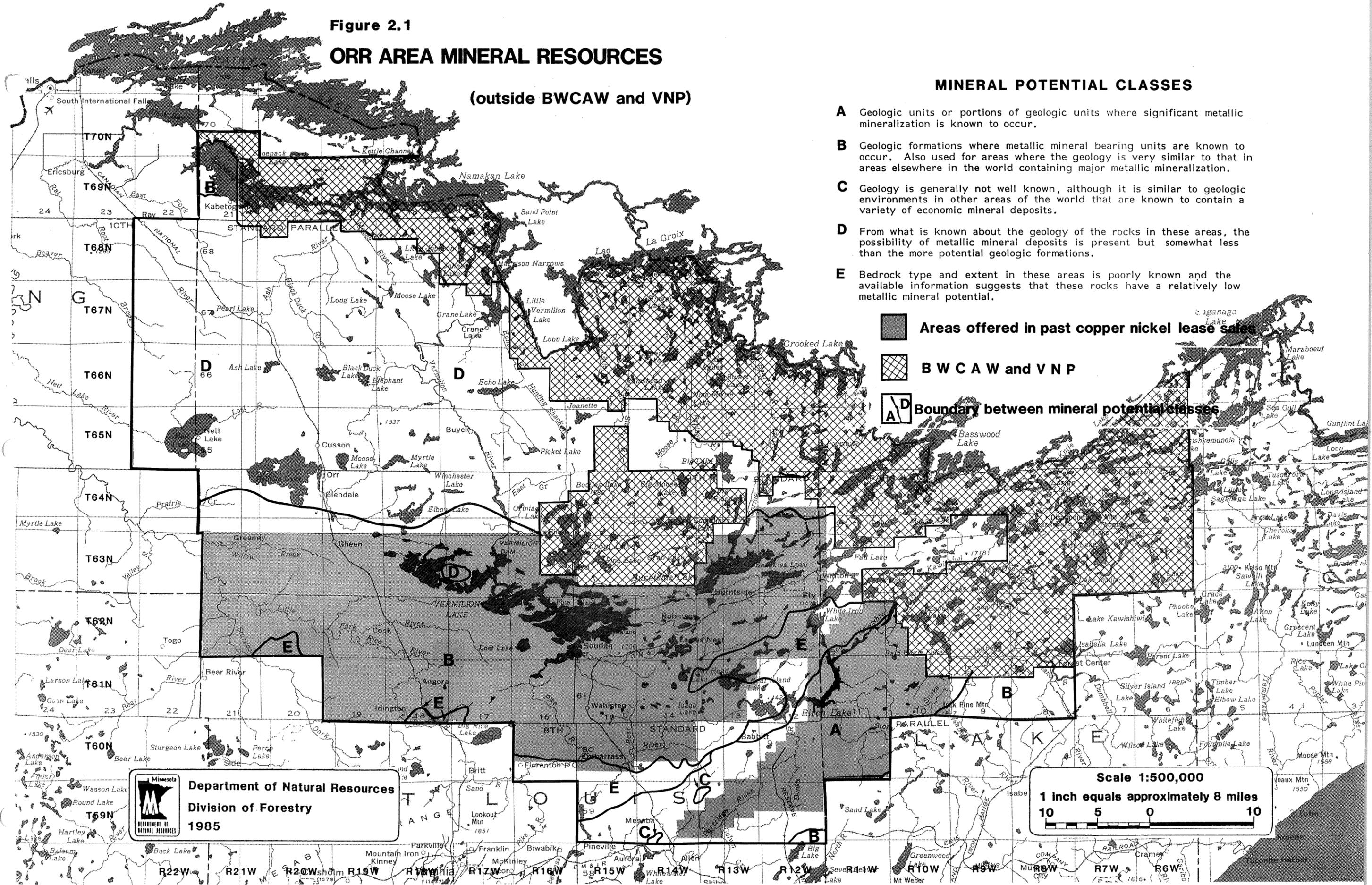
Figure 2.1
ORR AREA MINERAL RESOURCES

(outside BWCAW and VNP)

MINERAL POTENTIAL CLASSES

- A** Geologic units or portions of geologic units where significant metallic mineralization is known to occur.
- B** Geologic formations where metallic mineral bearing units are known to occur. Also used for areas where the geology is very similar to that in areas elsewhere in the world containing major metallic mineralization.
- C** Geology is generally not well known, although it is similar to geologic environments in other areas of the world that are known to contain a variety of economic mineral deposits.
- D** From what is known about the geology of the rocks in these areas, the possibility of metallic mineral deposits is present but somewhat less than the more potential geologic formations.
- E** Bedrock type and extent in these areas is poorly known and the available information suggests that these rocks have a relatively low metallic mineral potential.

-  Areas offered in past copper nickel lease sales
-  B W C A W and V N P
-  Boundary between mineral potential classes




Department of Natural Resources
Division of Forestry
1985

Scale 1:500,000
1 inch equals approximately 8 miles


A brief description of the geology and mineral potential of each generalized geologic terrain in the Orr Area is presented below. Figure 2.1 depicts the metallic mineral potential of the Orr Area outside of Voyageurs National Park and the Boundary Waters Canoe Area Wilderness.

A major zone of Archean volcanic-sedimentary rocks trends east-northeast and is approximately centered on the Tower Soudan area. Lithologic units include the Ely Greenstone, Knife Lake, Newton Lake, Soudan Iron, and Lake Vermilion formations and various unnamed rock units. Rock types include all types associated with this kind of terrain; ultramafic intrusive and extrusive rocks, mafic to felsic intrusive and extrusive rocks, and both clastic and chemical sedimentary rocks. In general, these rocks occur as strata with the ultramafic rocks below the felsic rocks.

These strata have often been intruded by later mafic to felsic intrusions. These volcanic sedimentary terrains are an extension of those in Canada which contain the greater part of Canada's mineral wealth. Consequently, this area has good potential for a variety of ore types including gold, silver, platinum, zinc-copper-lead, nickel-copper, iron, and other minerals.

To the northwest and southeast of the above rock units lie the Archean Vermilion Migmatite Massif and the Giants Range Batholith, respectively. These are granitic rocks consisting of a number of intrusive phases of varying composition and texture. Locally, they contain remnants of infolded, formerly overlying volcanic-sedimentary rocks. As a consequence of their mode of origin and composition, they have a somewhat different mineral potential than the volcanic-sedimentary terrains. There is some potential in the infolded volcanics for gold and zinc-copper deposits. The granitic units have potential for gold and pegmatite-associated mineralization such as tantalum, niobium, beryllium, uranium, and rare earth elements.

The Biwabik Iron Formation and the Virginia Formation overlie Giants Range rocks in the area extending northeastward from the Hoyt Lakes area. These are 1.8 billion year old Proterozoic rock units. The Biwabik has been mined for many years, first producing natural iron ores and now taconite ores.

The Virginia Formation is primarily a clastic, slaty unit overlying the Biwabik Formation, although it does contain minor chemical sediments and volcanics. There is a fair potential here for gold, silver, and base metals.

The Duluth Complex lies in the southeastern part of the area extending northeastward from the Hoyt Lakes area toward the South Kawishiwi area. The complex is a mafic body

consisting of multiple intrusive phases with the bulk of the known mineralization occurring in the basal zones. The complex is Proterozoic in age, 1.1 billion years old. It contains 4.4 billion tons of copper-nickel mineralization grading 0.66 percent copper with a copper to nickel ratio of 3.3:1. The bulk of this mineralization is in the Hoyt Lakes-South Kawishiwi area. Gold, silver, cobalt, and platinum may be recoverable as by-products. Vanadium is found in titaniferous magnetites and significant quantities of titanium are known to occur. Other types of occurrence that could be found as discrete bodies or zones include platinum group elements and chromium.

Mining and Exploration Activity

The Orr Area includes one of the most active regions of metallic mineral exploration in Minnesota. This region has been, is, and will be a center of mineral activity for years to come.

The ancient greenstone terrain which lies immediately south of the Boundary Waters Canoe Area Wilderness and in the central portion of the Orr Area contains banded iron formations which have been exploited since the earliest days of mining in Minnesota. Nine major mining operations in the Vermilion district contributed more than 100 million tons to Minnesota's iron ore production between 1884 and 1967. The Soudan and Pioneer properties still contain reserves of unmined ore.

Near the south central boundary of the Orr Area is the eastern extension of the Mesabi Range, a somewhat younger sedimentary terrain containing the Biwabik Iron Formation. Within the Orr Area there are two taconite facilities, Reserve Mining Company and Erie Mining Company. They produce pellets from ore which is about 24 percent magnetic iron and have annual rated capacity of 8.4 and 11.0 million tons, respectively.

The favorable mineral potential of this area has resulted in a great deal of mineral exploration activity in the past. The exploration has been for a variety of minerals including iron, gold, copper, nickel, silver, lead, and zinc.

An indication of the current level of exploration activity in this area is the amount of land under lease from the DNR and the number of bedrock drill holes completed. The DNR has conducted seven lease sales over portions of the Orr Area (see Figure 2.1). As a result 500 state copper-nickel leases have been issued within the Orr Area. A lease covers all state-controlled land within one section. As of January 1, 1985 there were 215 leases still active. A recent DNR Minerals Division tabulation shows 346 exploratory drill

holes have been completed on state and private leases within the Orr Area. Most of these holes represent exploration activity related to non-ferrous metal exploration. At present several companies are actively exploring in the region.

Gravel

The Vermilion Moraine from Babbitt through Nett Lake represents a dividing line pertaining to the availability of sand and gravel resources. The large area from the International Boundary to the Vermilion Moraine is an ice scoured rocky upland that was heavily glaciated by the Rainy Lobe. Consequently it has a thin cover of glacial drift, and gravel deposits are limited to bouldery esker ridges and scattered ice contact deposits. Sand and gravel deposits are more abundant in the southern portion of the area. The Vermilion Moraine contains significant deposits of ice contact sand and gravel related to the advance of the Rainy lobe. Usually the till is so bouldery and granular that it commonly will meet gravel specifications.

Extensive glacio-fluvial outwash sand and gravel deposits are found along the Vermilion Moraine from Babbitt to Aurora. These deposits were formed by meltwater discharged along the front of the Vermilion Moraine.

The extreme southwest part of the area, in the vicinity of Cook and Greaney, contains scattered sand and gravel deposits associated with shoreline beach ridges and offshore bars of Glacial Lake Agassiz.

Surficial Geology

The Minnesota Soil Atlas (Univ. of Minn. - Ag. Exp. Sta., 1971 & 1981) delineates portions of nine geomorphic regions in the Orr Area. Geomorphic regions are based on broad physiographic features and soil parent materials. Physiographic features in the area include lacustrine plains, moraines, outwash plains, and bedrock covered with thin patches of drift.

Most of the landforms in the Orr Area are the direct or indirect result of glacial action. The Rainy Lobe advanced from the northeast sometime between 16,000 and 35,000 years ago. The Mesabi Range and the Tower - Ely Glacial Drift and Bedrock Complex are characterized by bedrock overlain by thin patches of drift left by the Rainy Lobe. During the retreat of the Rainy Lobe the Allen Moraine, Wahlsten Moraine, Big Rice Moraine, and Vermilion Moraine were formed. Meltwater from the glacier produced the Big Rice and Sawbill outwash plains.

The western portion of the Orr Area was glaciated by the St. Louis Sublobe of the Des Moines Lobe. This sublobe advanced southeastward and eastward from the Red Lakes lowland leaving a thin layer of till which was subsequently covered by clayey lake sediments from Glacial Lake Agassiz. Lake Agassiz formed when meltwaters became ponded between the retreating ice and higher land to the south. After the lake receded large areas of peat formed over much of the poorly drained lake bed.

Soil Resource Units

The DNR Regional Soils Specialist has combined information from the Minnesota Soil Atlas (Univ. of Minn. - Ag. Exp. Sta., 1971 & 1981), the Superior National Forest Ecological Land Classification System, soil surveys, and high altitude aerial photographs to delineate units with similar soil associations, topography, and forest management restrictions (see Figure 2.2). The map scale limits the resolution of the soil resource units to about one mile. Soil units less than one square mile in size may not be shown. Thus the soil resource units are not intended for use in planning site specific activities. Each of these soil resource units are described in greater detail below.

Agassiz Lacustrine Plain - Little Fork River Section

This soil resource unit is located in the western portion of the Orr Area. It includes the area southeast of Ray, lands surrounding Nett Lake, and the headwaters of the Little Fork River from Lost Lake through Cook to the Greaney area. It covers about 352,000 acres or 13 percent of the Orr Area.

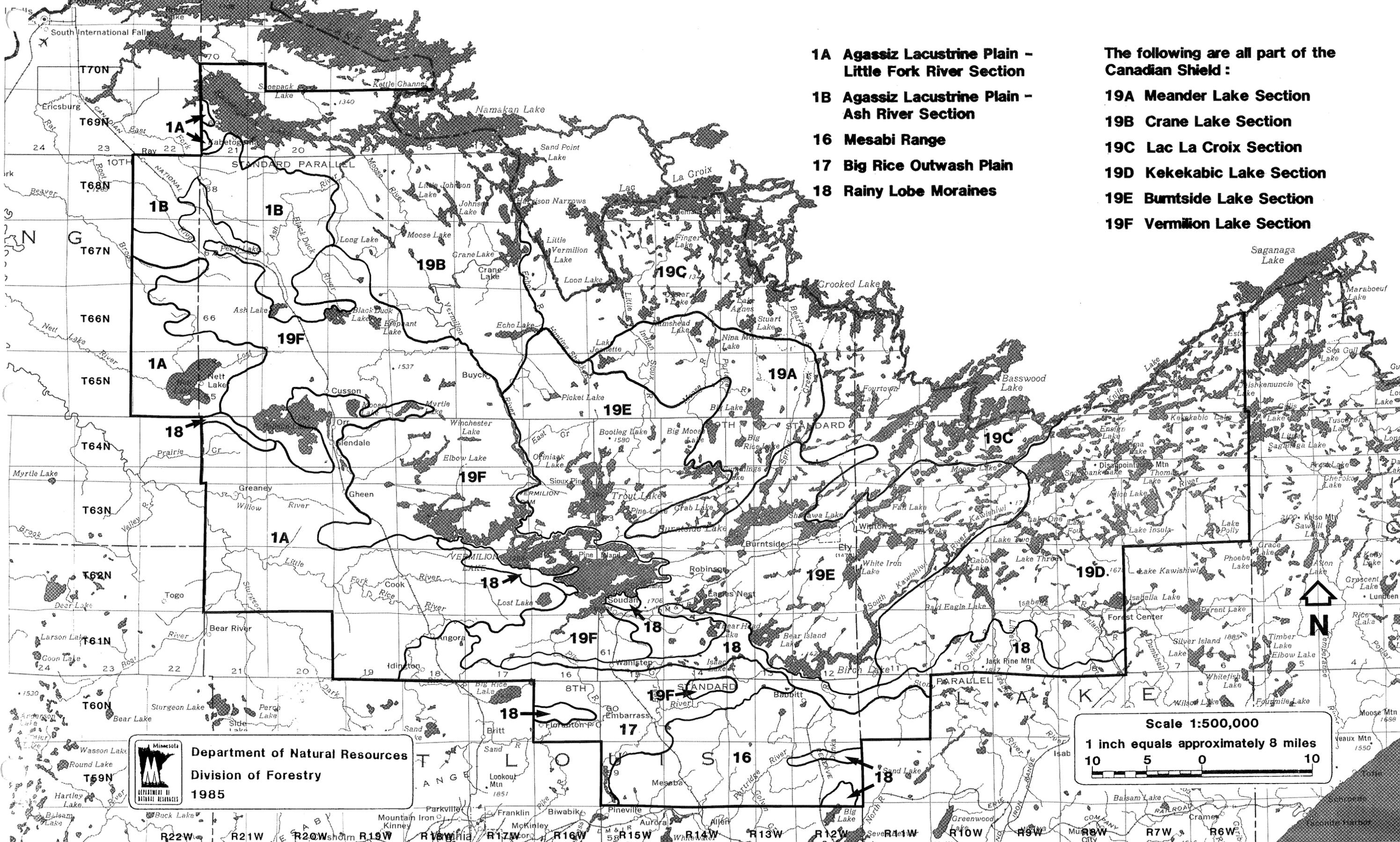
Terrain in the lacustrine plain is subdued. Slopes commonly range from 0 to 3 percent. Steeper slopes (25 - 60%) are found adjacent to bedrock outcrops and bordering rivers. Local relief generally ranges from 0 to 15 feet.

Soils are formed in 1 to 10 feet of grayish brown clayey and silty sediments underlain with gray calcareous loam or clay loam till. Bedrock is generally 50 to 150 feet below the surface except in areas adjacent to the Canadian Shield Soil Resource Unit. Organic soils generally have 0 to 5 feet of peat over clayey or silty sediments. Depth of peat may range up to 15 feet in small isolated areas.

The major soil types are Upland Clayey Dry (29% of the soil resource unit), Lowland Clayey Moist (23%), Lowland Organic Undifferentiated (20%), and Lowland Organic Acid to Neutral (9%).

The upland soils generally have a high productivity potential for timber and wildlife resources. The clayey

Figure 2.2
ORR AREA SOIL RESOURCE UNITS



- 1A Agassiz Lacustrine Plain - Little Fork River Section**
- 1B Agassiz Lacustrine Plain - Ash River Section**
- 16 Mesabi Range**
- 17 Big Rice Outwash Plain**
- 18 Rainy Lobe Moraines**

The following are all part of the Canadian Shield :

- 19A Meander Lake Section**
- 19B Crane Lake Section**
- 19C Lac La Croix Section**
- 19D Kekekabic Lake Section**
- 19E Burntside Lake Section**
- 19F Vermilion Lake Section**


Minnesota
Department of Natural Resources
Division of Forestry
1985

Scale 1:500,000
1 inch equals approximately 8 miles
 10 5 0 10

T70N T69N T68N T67N T66N T65N T64N T63N T62N T61N T60N
 R22W R21W R20W R19W R18W R17W R16W R15W R14W R13W R12W R11W R10W R9W R8W R7W R6W

soils have a relatively high amount of nutrients and a good moisture reserve. Excess soil water is the most limiting factor for timber production.

Agassiz Lacustrine Plain - Ash River Section

This soil resource unit is located along the Ash River from Ash Lake to just south of Lake Kabetogama. It is almost completely surrounded by the Canadian Shield Soil Resource Unit. This soil resource unit covers about 92,000 acres or 3 percent of the Orr Area.

Slopes commonly range from 0 to 12 percent. Steeper slopes are found adjacent to bedrock outcrops and bordering rivers. Local relief generally ranges from 0 to 15 feet.

Soils are formed in 1 to 10 feet of grayish brown clayey and silty sediments underlain with gray calcareous loam or clay loam till. Bedrock is generally 50 to 150 feet below the surface except in areas adjacent to the Canadian Shield Soil Resource Unit. Organic soils generally have 0 to 5 feet of peat over clayey or silty sediments. Depth of peat may range up to 15 feet in small isolated areas.

The major soil types are Upland Clayey Dry (57%), Lowland Organic Acid to Neutral (17%), Lowland Clayey Moist (12%), and Lowland Organic Acid (6%).

The upland soils generally have a high productivity potential for timber and wildlife resources. The clayey soils have a relatively high amount of nutrients and a good moisture reserve. Excess soil water is the most limiting factor for timber production.

Mesabi Range

The Mesabi Range Soil Resource Unit is located in the southern portion of the Orr Area. It extends from Wynne Lake in the southwest corner of the Orr Area to Babbitt on the north and into township 60, range 11 in the southeast part of the area. This soil resource unit covers about 134,000 acres or 5 percent of the Orr Area.

The terrain is largely determined by the underlying bedrock. The Rainy Lobe deposited till on top of the rock formations. Slopes are complex and irregular with gradients commonly ranging from 5 to 25 percent. Slope gradients up to 65 percent occur locally, particularly on Giants Range. Local relief commonly ranges from 50 to 100 feet but is often greater along Giants Range. Bedrock outcrops are common along ridge tops and at sharp slope breaks. The majority of soils are formed in brown acid sandy loam or loamy sand. Pebbles (0.25 to 3 inches in size) and cobbles (3 to 10 inches) commonly occupy 15 to 35 percent of the soil with higher amounts locally. Surface cobbles and

boulders (larger than 10 inches) occupy less than 10 percent of the surface but may range up to 35 percent locally. A discontinuous dense layer within the upper 2 feet occurs in local areas. Depth to bedrock ranges from 0 to over 20 feet.

The predominant soils are Upland Shallow Coarse Loamy Droughty (45%), Upland Coarse Loamy Droughty (20%), Lowland Organic Acid to Neutral Wet (13%), and Lowland Organic Undifferentiated (8%). Twelve percent of this unit has been disturbed by iron mining activities.

The productivity of the upland soils ranges from very low to medium for both timber and wildlife resources. The wide range is due to the variability of depth to bedrock, soil texture, and the amount of pebbles, cobbles, and boulders.

Big Rice Outwash Plain

This soil resource unit forms a 5 to 7 mile wide east-west band between the Mesabi Range on the south and the Wahlstén Moraine to the north. The outwash plain was formed about 14,000 to 16,000 years ago as the Rainy Lobe halted its retreat to the northeast. The meltwaters transported soil materials away from the stationary ice, sorting and depositing them as the water velocity decreased. Fine sand and clayey material were deposited in the Pike, Embarrass, and Sand river basins. The Big Rice Outwash Plain covers about 115,000 acres or 4 percent of the Orr Area.

Slope gradients range from 0 to 16 percent but steeper hills are common. Local relief is commonly 20 to 50 feet but may occasionally range up to 60 or 70 feet.

Soils are formed in brown acid sand and loamy sand. Gravel and cobbles occupy 0 to 90 percent of the soil. Less than 5 percent of the surface is occupied by cobbles and boulders. Organic soils generally have 0 to 5 feet of acid to neutral peat over clayey or sandy material.

Major soil types are Upland Sandy Droughty (60%), and Lowland Organic Undifferentiated (23%).

The upland soils generally have a medium productivity for timber and low productivity for wildlife. The major soils have a thin coarse loamy surface layer over gravel and sand. There is a moderate amount of nutrients and a low moisture reserve.

Rainy Lobe Moraines

This soil resource unit is primarily moraines formed by the Rainy Lobe between 14,000 and 16,000 years ago. The moraines are a nearly continuous series of ridges from 0.5

to 3 miles wide, extending from the Sawbill Landing area in the east along the south shore of Lake Vermillion to the Nett Lake area in the western portion of the Orr Area. This soil resource unit includes portions of the following Minnesota Soil Atlas geomorphic regions; Wahlsten Moraine, Big Rice Moraine, Vermilion Moraine, Allen Moraine, and Sawbill Outwash Plain. The Rainy Lobe Moraines Soil Resource Unit covers about 87,000 acres or 3 percent of the Orr Area.

Slopes are short, convex, and irregular in shape. Gradients commonly range from 6 to 25 percent, and occasionally reach 35 percent. Local relief commonly ranges from 50 to 100 feet.

The dominant soils are formed in brown acid sand and gravel with isolated areas of sandy loam. Pebbles and cobbles commonly occupy 35 to 90 percent of the gravelly sand soil. Cobbles and boulders usually occupy less than 10 percent of the surface. However, local areas with more surface cobbles and boulders do occur. The sandy loam soil contains 15 to 35 percent pebbles and cobbles. A discontinuous dense layer may occur within the upper two feet. The depth to bedrock ranges from 0 to over 20 feet. Peat greater than 5 feet deep is found in many of the depressions.

About 65 percent of this unit is occupied by Upland Gravelly Sandy Droughty soils. Lowland Organic Acid to Neutral (10%), Upland Shallow Coarse Loamy Droughty (10%), and Upland Coarse Loamy Dry (12%) soils are also prevalent.

The upland soils have a medium productivity for timber and wildlife resources. The major soils have a medium or coarse loamy surface layer that varies considerably in thickness (20 to 40 inches). This layer is the major factor influencing productivity. It has a moderate nutrient and moisture reserve.

Canadian Shield

The Canadian Shield Soil Resource Unit covers the northern portion of the Orr Area from the Canadian border south to Kabetogama, Pelican, Vermilion, and Birch lakes. This unit includes those portions of the Tower-Ely Glacial Drift and Bedrock geomorphic region within the Orr Area. Two major advances of the Rainy Lobe Glacier gouged out stream channels and bedrock faults to form long narrow depressions now occupied by lakes and bogs. The Canadian Shield Soil Resource Unit covers 1,867,000 acres or 70 percent of the Orr Area.

The terrain is determined by bedrock. Slopes are convex and irregular with gradients ranging from 0 to 50 percent. Local relief may range up to 200 feet. Bedrock outcrops occur at ridge tops and at sharp slope breaks, often forming a stair-step pattern.

The majority of soils are formed in brown acid sandy loam or loam. A discontinuous dense layer occurs throughout the unit. The amount of the ground surface occupied by cobbles and boulders is commonly less than 10 percent but may range up to 35 percent locally. Pebbles and cobbles commonly occupy 10 to 25 percent of the soil but will range to over 35 percent. Bedrock outcrops may comprise up to 30 percent of the surface area. Deep clayey and/or silty soils occur in the western portion of the unit in concave to slightly convex drainage ways and depressions below 1350 to 1400 feet in elevation. The majority of the peat is greater than 5 feet deep over lake sediments or glacial deposits.

The Canadian Shield Soil Resource Unit has been divided into 6 subunits based on differences in the prevalence of various soil types. Table 2.2 shows the major soil types in each subunit.

The productivity of the upland soils ranges from very low to medium for both timber and wildlife resources. The wide range is due to the variability of depth to bedrock, soil texture, and the amount of pebbles, cobbles, and boulders.

Table 2.2 Major Soil Types in Canadian Shield Soil Resource Subunits

Soil Type	Soil Resource Subunit					
	A	B	C	D	E	F
	(Percent of Subunit)					
Upland Shallow Loamy Dry	29	18	30	33	30	16
Lowland Org. Acid-Neutral	20	14	13	13	13	16
Upland Extremely Shallow Loamy Droughty	18	10	22	9	19	4
Upland Very Shallow Loamy Droughty	15	9	15	16	12	2
Upland Clayey Dry	0	16	0	0	0	2
Upland Coarse Loamy Dry	0	1	0	12	1	2
Upland Loamy Over Sandy Dry	0	7	8	5	7	37
Lowland Loamy Wet	6	2	6	6	9	3

WATERS

Lakes

Much of the Orr Area lies within Minnesota's famous "Border Lakes Region" which contains the Boundary Waters Canoe Area Wilderness and Voyageurs National Park. Over 1000 lakes in the Orr Area have been designated as public waters. Many of the lakes in the area are a product of glacial action on the bedrock of the Canadian Shield. Water quality within the Area's lakes is generally excellent because the majority of lands which surround them are forest covered and undeveloped.

Watersheds

Portions of three of Minnesota's 39 major watersheds drain the Orr Area. The majority of the Area's land drains into Hudson Bay through the Little Fork River and Rainy River watersheds. A small portion along the Area's southern boundary drains into Lake Superior via the St. Louis River.

The Rainy River watershed is characterized by a complex drainage network which is partially controlled by the bedrock structure of the Canadian Shield. A small portion of the watershed in the Area is on the former floor of Glacial Lake Agassiz. Most of the rock rimmed lakes of the Boundary Waters Canoe Area Wilderness are drained by the Rainy River system. Waters of the 4500 square mile drainage system flow westerly through Lake of the Woods and ultimately to Hudson Bay. For the most part the quality of the surface waters of the watershed are excellent. Acid precipitation caused by airborne industrial pollutants from industrial centers on the Great Lakes is seriously damaging a number of susceptible lakes in the watershed. Major tributaries of the Rainy River in the Orr Area include the Vermilion, Stony, Kawishiwi, Ash, Rat Root, and Isabella rivers.

The Little Fork River drains a small portion of the Orr Area that was formerly covered by Glacial Lake Agassiz. Lakes within this watershed are few. The large and shallow Nett Lake is on the Area's western boundary. Waters in the Little Fork River drainage system flow northwest through the Little Fork River to the Rainy River and ultimately to Hudson Bay. Major tributaries to the Little Fork River include the Sturgeon, Willow, and Nett Lake rivers and Beaver Brook.

The south central portion of the Orr Area is drained by the St. Louis River. This area, called the Hundred Mile Swamp, is at the head of the St. Louis River watershed. Lakes are few and small. Drainage is southward through the St. Louis River to Lake Superior. The Partridge River is the only major tributary to the St. Louis River in the Orr Area.

Protected Waters, Wetlands and Streams

Minnesota's waters and wetlands have been grouped into two categories for the purposes of regulating and encouraging the wise use and development of major waterbasins and watercourses. The waters are identified either as "protected" or "unprotected" depending on their size, physical characteristics and ownership of surrounding lands. Protected waters, basins, and wetlands are those waterbasins in unincorporated areas greater than 10 acres in size. Wetlands must be Type 3, 4 or 5 as defined in U.S. Fish and Wildlife Service Circular Number 39. Protected watercourses are those natural or altered natural watercourses that have a total drainage area in excess of two square miles, except that officially designated trout streams are protected waters regardless of size. Any person or agency proposing to alter the course, current or cross-section of the state's protected waters or wetlands must first obtain a permit from the Department of Natural Resources.

Additionally, most of the basins over 25 acres in size are subject to shoreland development regulations. These standards are administered by county zoning officials, subject to DNR monitoring. Shoreland districts include all lands within 1,000 feet of lakes and within 300 feet of streams. Shoreland management regulations can affect the choice and application of various forest management practices including clear-cutting and herbicide use.

VEGETATION

Presettlement Vegetation

The Orr Area falls primarily in the Border Lakes Landscape Region. Bedrock outcrops are common on hilltops and upper slopes. Intervening basins are filled with lakes. The Area lies in the transition zone between the northern boreal forest and the temperate deciduous forest.

The presettlement vegetation of the Orr Area was a mosaic of five major vegetation types: aspen-birch forest, boreal forest, Great Lakes pine forest, swamp, and bog. The old growth stands of red and white pine that were the prize of the late 19th century lumber industry are mostly gone today except in parts of the BWCAW. Logging, fires, agriculture,

mining, and residential development have altered the types and composition of vegetation in the area. Early successional communities such as aspen-birch and jack pine have replaced much of the old growth forest and are now the dominant forest types.

Present Land Cover

In 1969 forests covered 84 percent of the Orr Area. About 12 percent of the area is covered by water or marsh. Pastures, agricultural fields and other open areas account for about 2 percent of the area's land use. Extractive uses of the land, mostly iron mining on the Mesabi Iron Range, account for about 0.5 percent of the Area's land. Urban and residential development occupies 0.9 percent of the Area's land (MN State Planning Agency et al., 1971). Little change in land use is expected in the short term as the population is declining and the economic outlook is bleak. If the mining of copper-nickel or peat become practical, areas containing these resources will probably show a long term change in land use.

Rare Plants and Plant Communities

The presettlement forest communities of the Orr Area are considered well protected and have not been classified as protection priorities relative to communities in more threatened parts of the state. In fact the Border Lakes is one of the best preserved landscape regions in the state. The BWCAW alone contains over 400,000 acres of protected forest. However, further work is needed in locating and dedicating exemplary occurrences of selected forest cover types for research purposes. The Lac La Croix and Keeley Creek Research Natural Areas administered by the Superior National Forest include the Great Lakes pine forest, boreal forest, and bog forest ecosystems. The Natural Heritage Program recommends a systematic search for virgin forest types within the area. Outstanding examples of ecosystem types should then be considered for inclusion in the Scientific and Natural Area System or other appropriate programs.

There are two sites in the Orr Area with concentrations of rare plant species. Both the Lost Lake Peatland and the Wahlsten Station Peatland are of Scientific and Natural Area quality.

The Lost Lake Peatland is a relatively small peatland situated between the large peatlands of the Agassiz Lowlands and the Sand Lake Peatland. This peatland contains both bog and ribbed fen patterns, including an incipient ovoid island. These patterns are interrupted by Lost Lake and

mineral islands. The rare plant species located here are Carex exilis (sedge) and Juncus stygius (bog-rush). This peatland is considered a priority for protection by the DNR's peatland task force.

The Wahlsten Station Peatland is a small isolated peatland consisting of a sedge mat surrounding a bog lake. It is the site of three rare plant species: Rhynchospora fusca (Beak-rush), Triglochin palustris (marsh arrow-grass), and Eleocharis pauciflora (spike-rush). These species were located at this site in the early 1940's. A preliminary survey in 1983 relocated the Beak-rush and marsh arrow-grass. The spike-rush was not found although it is still believed to occur there.

In addition to the peatland species, two other rare plants are known to occur on Division of Forestry administered land in the Orr Area. They are Carex katahdinensis (Mt. Katahdin sedge) and Littorella americana (American shore-plantain). Mt. Katahdin sedge is currently listed as endangered in Minnesota and American shore-plantain is proposed to be listed as endangered. Both are shoreline plants, occurring on wet, sandy beaches in the western part of the Border Lakes region. Most known sites for these species occur on land managed by the Forest Service. One Division of Forestry administered Mt. Katahdin sedge site is on the beach at campsite #3 on Iron Lake (SWSW 35-67-13). The division's Littorella sites are the beach at Beatty Portage (Lac La Croix side) and the beach at Curtain Falls Portage (Iron Lake side). It is no coincidence that these species occur at campsites and portages. The sandy beaches that are attractive for recreational development are the only habitats suitable for these species. Fortunately, normal activity at these sites does not appear to threaten these species. For example the American shore-plantain population at Beatty Portage has been there for at least 30 years and does not appear to have suffered from the heavy boat traffic.

There are six additional rare plant species known to occur on federal or Indian land in the Orr Area. If these species are found on state land a special effort should be made to assure their survival. The species, their status, and preferred habitats are:

Arethusa bulbosa (dragon's mouth), special concern.
Occurs in sphagnum bogs and floating mats.

Caltha natans (floating marsh marigold), proposed endangered. Slow moving streams, creeks, and quiet bays.

Pyrola minor (small shinleaf), proposed threatened.
Bogs and moist woods.

Ranunculus lapponicus (Lapland buttercup), special concern. Sphagnum bogs.

Arenaria macrophylla (large-leaved sandwort),
 threatened.
 North-facing cliffs and ledges.
Geocaulon lividum (northern comandra).
 Black spruce bogs with deep sphagnum hummocks.

TIMBER RESOURCES

The following information on the timber resources of the Orr Area is based on analysis of data from the Resources Evaluation (Phase I Inventory) conducted by the North Central Forest Experiment Station (Jakes, 1980). In most cases the estimates are for 1977. The estimates are subject to sampling error.

Phase I Inventory data is used in the assessment portion of area forest resource management plans to describe timber resources on all lands and to compare state administered timber with that of other owners. The more detailed stand based Phase II Inventory is used in the state land management and program portions of area plans. Thus there may be variances in timber resource estimates in various parts of the plan due to differences between Phase I and Phase II definitions and procedures.

Forest Land Base

The Orr Area covers approximately 2.6 million acres of which 335,000 acres are water. Forest land accounts for 91 percent of the land area, however commercial forest land (CFL) covers only 56 percent of the land area. This is due to the large acreage of productive reserved forest land included in the BWCAW and Voyageurs National Park. The 1,271,000 acres of commercial forest land in the Orr Area is 9.3 percent of the statewide total of 13,695,100 acres.

Table 2.3 Acreage by Land Class in the Orr Area, 1977

Land Class	Acres
Gross Area	2,616,870
Water	334,683
Land	2,282,187
Forest Land	2,086,165
Non-forest Land	196,022
Commercial Forest	1,271,263
Non-commercial Forest	814,902

Ownership

The ownership of CFL in the Orr Area is primarily public with the US Forest Service being the largest holder (see Table 2.4).

Table 2.4 Ownership of Commercial Forest Land in the Orr Area

Owner	Acres	Percent
US Forest Service	339,000	31
Bureau of Land Mgt.	4,000	1
Indian	20,000	2
Misc. Federal	12,000	1
State	220,000	17
County	192,000	15
Forest Industry	147,000	11
Other Private	277,000	22
Total	1,271,000	100

Cover Types

Aspen is by far the predominant timber type, comprising 43 percent of the CFL. Aspen accounts for 37 percent of state-owned CFL. Generally, cover type composition on the state-owned land is similar to that on all CFL except that the state administers a slightly higher percentage of softwood types, especially the swamp conifer types (see Table 2.5).

Age Class Distribution

Table 2.6 gives the age class distribution by cover type for commercial forest land in the Orr Area. In a fully regulated sustained yield forest there would be equal acreages in each age class up to the recommended rotation age. For example if aspen were managed on a 40 year rotation there would be 137,000 acres in each of the 10 year age classes up to age 40. It is not realistic to expect fully regulated conditions on all commercial forest lands. Some owners do not intend to harvest timber, other areas are inaccessible or managed for non-timber resources, or timber supply may exceed demand. However, a severely skewed age class distribution presents several problems such as inability to meet future timber demand for certain species or sizes of timber, changes in wildlife habitat, and shifts in cover type acreage from early successional to climax types. The aspen, balsam poplar, and birch cover types have over 50 percent of their acreage in age classes beyond the recommended rotation age.

Table 2.5 Acres of Commercial Forest by Cover Type and Owner in the Orr Area

Cover Type	All Owners		State Land	
	Acres	Percent	Acres	Percent
Jack pine	59,000	5	14,000	6
Red pine	25,000	2	3,000	1
White pine	22,000	2	1,000	1
Balsam fir	99,000	8	22,000	10
White spruce	14,000	1	6,000	3
Black spruce	167,000	13	31,000	14
N. white cedar	66,000	5	15,000	7
Tamarack	13,000	1	4,000	2
Total Softwoods	465,000	37	96,000	44
Lowland hdwds.	40,000	3	4,000	2
Northern hdwds.	35,000	3	4,000	2
Aspen	548,000	43	82,000	37
Birch	130,000	10	18,000	8
Balsam poplar	42,000	3	14,000	6
Total Hardwoods	795,000	62	122,000	55
Non-stocked	11,000	1	2,000	1
Total	1,271,000	100	220,000	100

Insect and Disease Damage

Forest pests cause significant reductions in the quality and quantity of timber available for harvest. There have been periodic, serious outbreaks of spruce budworm, jack pine budworm, and forest tent caterpillar in the Orr Area. Table 2.7 lists the major pests associated with each cover type and the percent of each type showing damage and mortality. This information is based on Phase II Inventory data and is for state administered lands only. Forty seven percent of the state administered commercial forest land has some damage and 13 percent has suffered pest related mortality. White pine and aspen are the most severely affected types. As the forests in the Orr Area get older the threat of insect and disease damage will increase.

Table 2.6 Area of Commercial Forest by Cover Type and Age Class, Orr Area, 1977
(in thousand acres)

Cover Type	Age Class in Years											Total
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101+	
Jack Pine	3.8	2.1	-	4.2	11.9	12.5	15.8	-	4.2	2.5	2.0	59.0
Red Pine	-	-	-	4.2	4.6	4.2	2.0	5.9	2.1	2.0	-	25.0
White Pine	-	2.2	-	-	-	-	5.7	-	3.7	8.4	2.0	22.0
Balsam Fir	4.4	13.8	8.2	7.6	23.7	25.8	3.7	3.9	2.0	3.9	2.0	99.0
White Spruce	2.0	-	-	2.0	8.2	-	-	-	1.8	-	-	14.0
Black Spruce	-	26.9	25.9	25.9	13.0	23.9	13.7	11.8	15.5	8.4	2.0	167.0
No. White Cedar	-	-	-	5.8	4.1	5.5	13.3	9.1	11.4	1.7	15.1	66.0
Tamarack	-	2.5	3.5	1.7	-	1.9	1.9	-	-	-	1.5	13.0
Lowland Hardwoods	2.2	3.8	-	1.8	3.8	3.9	1.8	2.1	7.5	5.5	7.6	40.0
Northern Hardwoods	3.9	6.4	-	-	10.2	6.2	4.2	2.0	-	-	2.1	35.0
Aspen	76.7	54.8	24.7	49.3	120.5	115.1	60.3	32.9	5.5	6.0	2.2	548.0
Paper Birch	10.4	22.1	1.8	15.6	15.7	26.0	15.9	12.5	8.2	1.8	-	130.0
Balsam Poplar	7.6	5.5	-	7.5	7.6	9.7	1.9	2.2	-	-	-	42.0

Table 2.7 Prevalence of Insect and Disease Damage by Cover Type on State Lands in the Orr Area

Cover Type	Total Acres	% with Damage	% with Mortality	Major Pests
Aspen	116,397	64	17	Forest tent caterpillar, Hypoxylon, Phellinus
Birch	12,662	40	8	Birch decline, Bronze birch borer
Bl. spruce	45,881	21	9	Dwarf mistletoe, Root & butt rots
Jack pine	13,556	31	15	Jack pine budworm, Bark beetles, White pine weevil, Heart rot, Armillaria
Lowland hdwd.	6,840	22	9	Dutch elm disease, Heart rot, Cankers
Northern hdwd.	290	25	0	Stem cankers, Heart rot
Red pine	6,853	27	3	Bark beetles, Diplodia blight, Sirococcus, Armillaria
Balsam fir	11,726	39	5	Spruce budworm, Root & butt rots
Tamarack	3,456	15	5	Larch sawfly, Rots
N. white ced.	13,083	43	6	Butt rot
White pine	4,092	85	17	W. pine blister rust, W. pine weevil, Introduced pine sawfly
Wh. spruce	2,741	17	2	Yellowheaded spruce sawfly, Spruce budworm, W. pine weevil, Armillaria root rot
Total	237,577	47	13	

Fire Damage

The climate, sparse population, lack of access, and prevalence of hardwood and lowland forest types result in a lesser wildfire threat to timber in the Orr Area than in other parts of the state. For the period 1971 to 1978 there were an average of 5 fires per year affecting about 165 acres of timber. The remainder of the wildfires burned in non-forest types.

The highest risk of serious fires occurs north of the western end of Lake Vermillion in townships 64-17 and 64-18. These are largely pine cutover areas that contain heavy amounts of fuel due to logging operation residues. The problem is being mitigated somewhat as Potlatch Corporation, which owns large blocks in the area is doing a great deal of site preparation and slash burning which removes the fuel supply.

Harvest Levels

The total annual allowable harvest for all owners is estimated at 448,300 cords, of which aspen accounts for 191,700 cords. Table 2.8 indicates estimated allowable cut by species on all lands and on state lands. The allowable

cut estimates are based on Phase I Inventory data and state recommended rotation ages. The data is presented only to show the approximate relationship between allowable harvests on state lands and other ownerships. The actual planned cut on state lands will be determined using Phase II Inventory and thus may differ from the volumes shown below.

Table 2.8 Estimated Annual Allowable Harvest by Species and Ownership in the Orr Area

Species	All Owners	State Lands	% State

	Thousands of Cords		
Red & white pine	16.1	2.2	14
Jack pine	18.5	4.1	22
Spruce	36.9	7.3	20
Balsam Fir	52.5	9.3	18
Tamarack	3.3	0.8	41
N. white cedar	14.1	2.9	21
 Total Softwoods	 141.4	 26.6	 19
Aspen	191.7	29.8	16
Birch	62.7	9.7	15
Balsam poplar	25.6	5.4	21
Oak	1.3	0.2	15
Ash, elm	16.8	2.6	15
Basswood, maple	8.8	1.2	14
 Total Hardwoods	 306.9	 48.9	 16

Total	448.3	75.5	17

Table 2.9 indicates the estimated allowable cut and the 1983 harvest level for all ownerships in the Orr Area. Only 45 percent of the softwood and 57 percent of the hardwood allowable cut was harvested in 1983. The percent of allowable cut actually harvested may decline further for two main reasons: 1) the allowable cut is conservative as it is based on Phase I Inventory data which tends to underestimate actual resources, at least on state lands, and 2) Boise Cascade procured wood from this area in 1983 for its Insulite plant. With the plant's closure in 1984 the demand for aspen from this area will be reduced by as much as 40 to 50 thousand cords.

Table 2.9 Estimated Allowable Cut and 1983 Harvest by Species in the Orr Area.

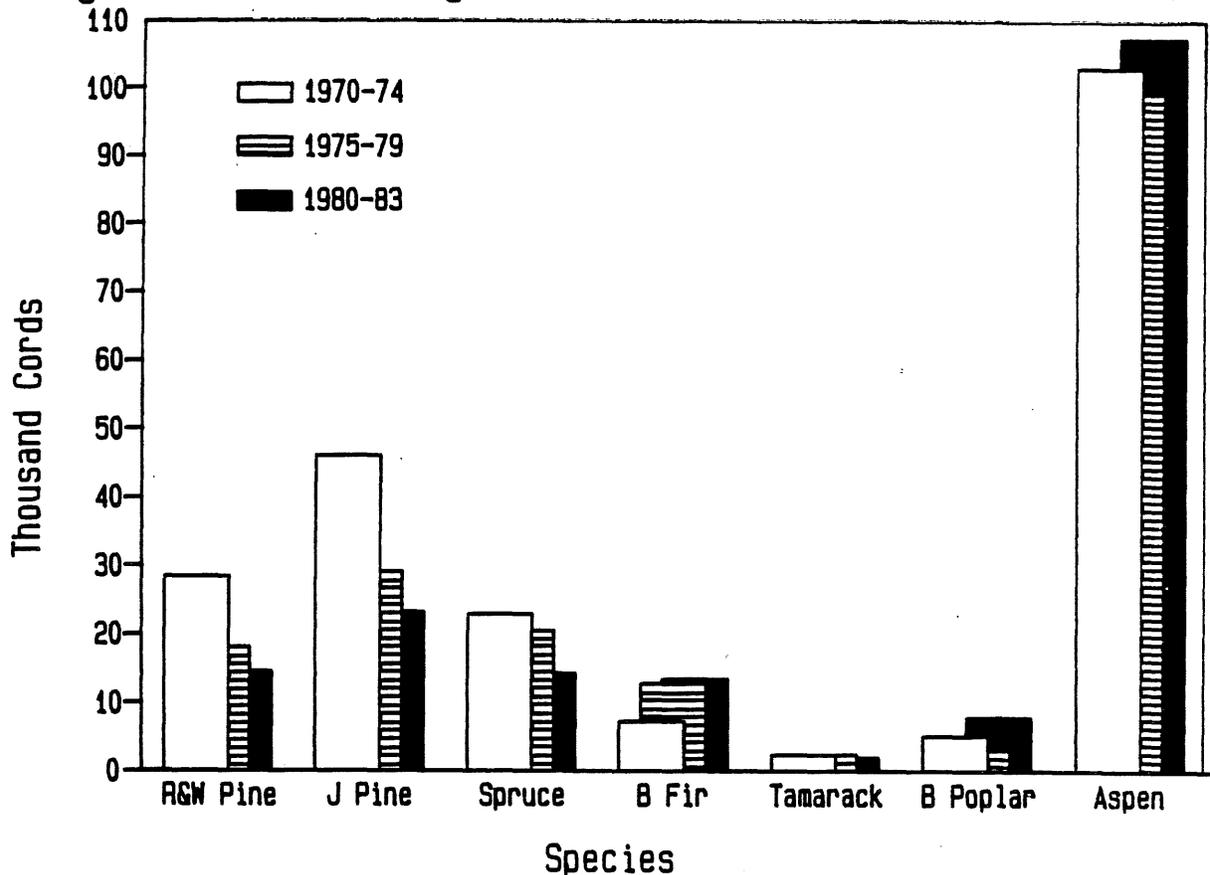
Species	Annual Allowable Harvest	1983 Harvest
----- Thousands of Cords		
Red & wh. pine	16.1	13.7
Jack pine	18.5	22.1
Spruce	36.9	12.0
Balsam fir	52.5	13.4
N. white cedar	14.1	1.9
Tamarack	3.3	1.0
Total Softwoods	141.4	64.1
Aspen	191.7	154.0
Birch	62.7	8.1
Balsam poplar	25.6	10.1
Oak	1.3	0.1
Ash, elm	16.8	1.1
Basswood, maple	8.8	0.5
Total Hardwoods	306.9	173.9
Total	448.3	238.0

Figure 2.3 shows the average annual harvest for each five year period since 1970 for the major pulpwood species. Softwood harvest has decreased significantly from 107,000 cords in the early 70's to about 70,000 cords. The hardwood cut, comprised almost entirely of aspen, remained relatively stable over the past 15 years.

When looking at the harvest of wood from the Orr Area over the last five years the trend changes somewhat. The softwood harvest has remained stable over this period and the hardwood (aspen) harvest has increased. The increase in aspen harvest in 1983 is due to the establishment of the oriented strand board plant in Cook. This increase may be offset in the future by the closing of the Insulite plant in International Falls.

Table 2.10 compares the harvest from all lands in the Orr Area with the harvest from state lands for the period 1979 to 1983. The state share of the total harvest has decreased for all species.

Figure 2.3 Average Annual Timber Harvest-Orr Area



Wood Use

Of the 1983 harvest of 238,000 cords, 182,600 cords or 77 percent was used in the pulp, paper, and fiber board industries. The two other major uses were sawlogs and bolts for the sawmill industry and fuelwood used primarily by local residents of the area.

Table 2.11 lists the major consumers of pulpwood from the Orr Area. In addition to these firms lesser amounts of pulpwood go to Superwood in Duluth, St. Regis in Sartell, Consolidated Paper in Wisconsin and Great Lakes Paper in Thunder Bay, Ontario. The new Louisiana Pacific waferboard plant in Two Harbors scheduled to be in operation in late 1985 should also draw some wood from this area primarily from the Tower District.

Table 2.10 Annual Timber Harvest from All Lands and State Lands in the Orr Area, 1979 - 1983.

Species & Ownership	1979	1980	1981	1982	1983

Thousands of Cords					
Red & wh. pine					
All land	13.7	12.2	12.8	18.9	13.7
State land	3.4	2.5	1.3	2.1	0.7
Jack pine					
All land	22.1	19.7	20.6	30.4	22.1
State land	4.4	4.9	3.7	3.7	1.5
Spruce					
All land	18.6	17.9	13.7	13.5	12.0
State land	7.2	6.9	4.8	5.9	1.5
Balsam fir					
All land	15.0	12.2	14.0	14.1	13.4
State land	4.0	6.6	2.7	3.2	1.3
Tamarack					
All land	1.6	2.5	1.1	3.1	1.0
State land	0.6	0.8	0.7	0.1	0.1
Aspen					
All land	103.9	85.5	97.4	92.7	154.0
State land	24.3	29.4	24.4	16.6	16.8
Balsam poplar					
All land	3.9	7.0	8.0	6.7	10.1
State land	2.5	3.1	3.7	3.7	1.3

Table 2.11 Major Consumers of Pulpwood from the Orr Area.

Firm	Species	Supplying Districts
Boise Cascade Int. Falls	All pulpwood species	Orr, Kabetogama and Crane Lake
Potlatch OSB Cook	Aspen	Orr, Crane Lake, Cook and Tower
Potlatch Paper Cloquet	All pulpwood except Tamarack	Orr, Crane Lake, Cook and Tower
Blandin Waferboard Grand Rapids	Aspen, Spruce	Orr, Cook and Tower
Blandin Paper Grand Rapids	Aspen, Spruce and Balsam	Orr, Cook, and Tower

Table 2.12 lists the major consumers of sawlogs and bolts from the Area. In addition to the mills listed, there are about 25 small to medium size sawmills located within the Orr Area. Individually these mills do not have a big impact on the total resource; however, collectively they are a very important part of the wood industry in the area.

Table 2.12 Major Consumers of Sawlogs and Bolts from the Orr Area.

Firm	Species
Orr Manufacturing Orr	All species
Hill Wood Products Cook	Aspen and Birch
J.C. Campbell Two Harbors	All species
Rajala Timber Company Big Fork	All species
Potlatch Sawmill Cloquet	Pine, Spruce, and Balsam
Hedstrom Lumber Company Grand Marais	All species
Green Forest Big Falls	Aspen and Cedar

Forest Products Outlook

From the standpoint of wood availability, economic development opportunities do exist in the forest products industry. Whether or not further economic development occurs depends almost entirely on state and national economic conditions. The following are development possibilities which are best suited to the available resource.

Board Plants

Waferboard, particleboard, and medium density fiberboard plants use primarily hardwood and aspen pulpwood. Some plants can also use sawmill residues. The main developments

which could occur in the near future and affect the harvest in the Orr Area are:

1. Louisiana Pacific Waferboard Plant in Two Harbors. Initially the plant will use 65 to 70 thousand cords of aspen annually. If favorable conditions exist the plant could double its production in 3-5 years.

2. Medium Density Fiberboard (MDF)

A MDF plant is being promoted for the Wood Industrial Park at Hibbing. This plant would use hardwood pulpwood and sawmill residue. Total use would be about 70 thousand cords per year.

Pulp and Paper

A surplus exists in most pulpwood species including softwoods so any firm which can utilize this material could draw additional wood from this area. Due to the large capital investment and volume of wood required for a new facility the best opportunities would be for the existing industry to expand. A potential development here is Blandin's plan to expand its paper production at Grand Rapids.

Wood Energy

Sizable volumes of wood suitable for chipping (e.g. logging and mill residue) and wood not suited for present markets due to species or quality are available. Firms which could use this material for fuel chips or the production of fuel pellets or charcoal have an opportunity to expand in this area.

Sawmills and Secondary Plants

Potential exists for expanding the sawmill industry. Approximately 25 percent of the hardwood surplus and 10 to 15 percent of the softwood surplus is suitable for sawing. Also much of the lumber currently being produced is exported from this area for further manufacturing. A potential development which could occur in the near future is start up of the Nett Lake operation. This operation includes sawmill, kiln, and planing capacity. The Nett Lake complex has been idle for the last 5 or 6 years.

RECREATION

Recreational Attractions

The Orr Area is rich in recreational amenities. It contains much of the Boundary Waters Canoe Area Wilderness which is the only designated water-based wilderness in the continental United States. Many beautiful lakes lie within the area outside of the BWCAW. Voyageurs National Park has been set aside to preserve a number of large lakes and to depict natural processes for present and future generations. A number of rivers have outstanding recreational features

including the Little Fork, Vermilion, Kawishiwi, Stony, Basswood, and Isabella. The Little Fork River is a State Canoe and Boating Route. Because much of the Area's land base is undeveloped and publicly owned, it provides a wide range of dispersed recreational opportunities such as hunting and nature observation. Recreational amenities in proximity to the Orr Area include the remainder of the Boundary Waters, many more lakes outside of the BWCAW, the North Shore of Lake Superior, and the St. Louis, Cloquet, Whiteface, and Sturgeon rivers.

Recreation Facilities

The Orr Area contains a number of well developed recreational facilities. Major public facilities are administered by the DNR, the U.S. Forest Service, and the National Park Service. The DNR Division of Parks and Recreation administers Bear Head and Tower Soudan state parks. The DNR Trails and Waterways Unit has responsibility for many public water accesses, the Little Fork River Canoe and Boating Route and its campsites, 207 miles of grants in aid trail and 92 miles of the Taconite and Tower to International Falls state trails. The DNR Division of Forestry administers 4 campgrounds, numerous dispersed campsites, many within the BWCAW, 1 day use area, and 100 miles of recreational trails. The Superior National Forest administers 8 campgrounds, numerous public accesses and dispersed camping sites both in and out of the BWCAW, and 274 miles of recreational trails. Voyageurs National Park administers dispersed campsites and 24 miles of recreational trails. In addition the Minnesota Department of Transportation provides highway rest areas and local units of government provide county and municipal parks and trails.

Private sector recreation facilities include 51 campgrounds and 8 group camps with 1,471 and 1,119 sites, respectively. There are a multitude of private resorts in the area serving a diverse clientele. A number of recreational outfitters are active in the area with the center of activity at Ely.

Major recreational facilities in proximity to the Orr Area include campgrounds, campsites, access, and trails in the remainder of the Superior National Forest and numerous state parks and waysides. Tourist attractions including the Iron Range Interpretative Center and the U.S. Hockey Hall of Fame are located at Chisholm and Eveleth respectively.

Recreational Use Projections

Recreational use statistics developed from data gathered through the State Comprehensive Outdoor Recreation Plan (SCORP) (MN DNR - Planning, 1985) surveys show that fishing, boating, camping, and canoeing are the recreational

activities which people participate in most in the Orr Area (Figure 2.4). The area provides a substantial percentage of statewide occasions for canoeing (17%), fishing (14%), and camping (12%). Percentages of occasions for other activities include boating (7%), swimming (3%), driving (2%), picnicking (2%), hiking (2%), ice fishing (2%), cross-country skiing (1%), and snowmobiling (1%).

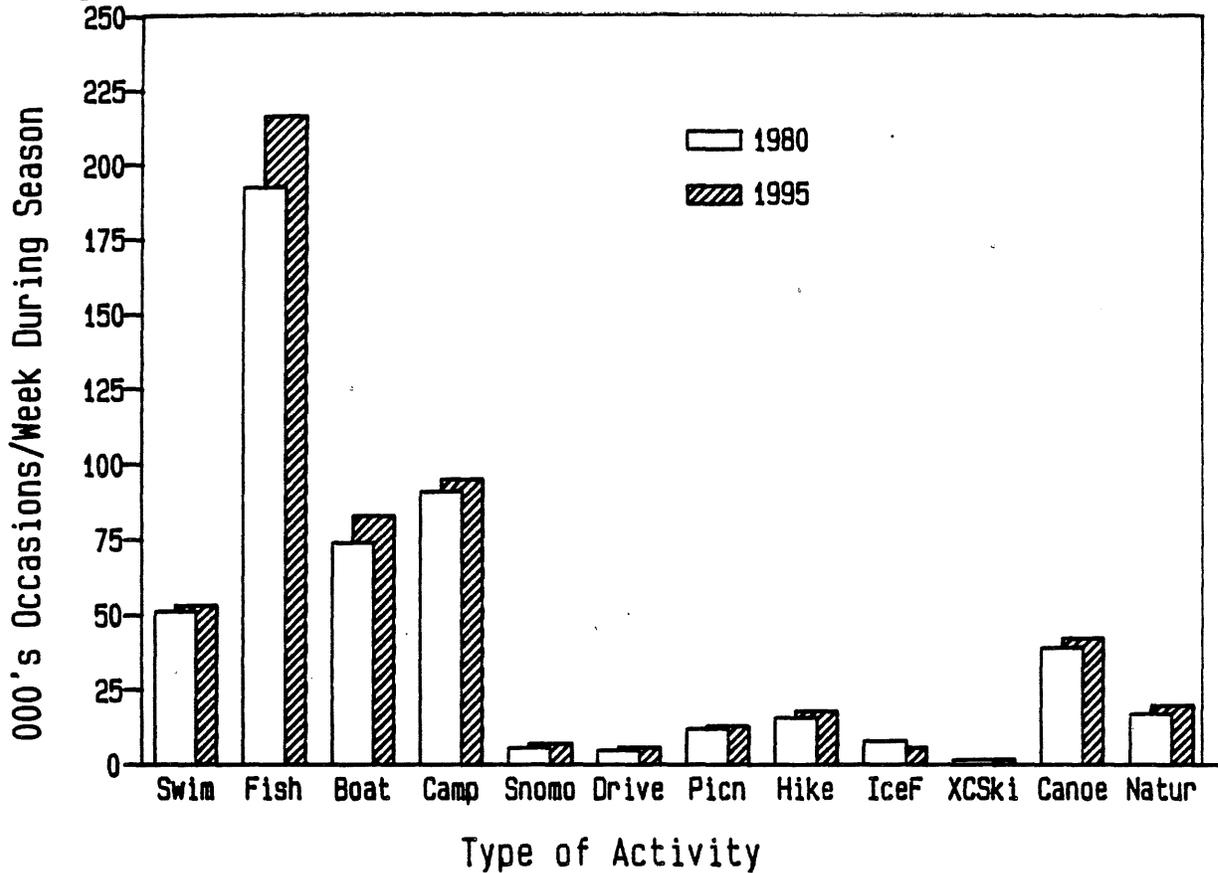
Use estimates for hunting, horseback riding, and three wheeling in the Orr Area were not generated. However, the 1979 SCORP (MN DNR - Planning, 1979) showed hunting to be the number one recreational activity requested by residents of the Arrowhead Region when they were questioned about needs for increased recreational opportunities. The 1979 SCORP also showed that approximately 7% of the horseback riding in the state occurs in the Arrowhead Region. Most of this riding activity probably occurs outside the Orr Area near the city of Duluth where riding facilities are present. Because of the recent advent of the three wheeler on the recreational scene, reliable figures regarding its use in the Area do not exist. A report on Off Road Vehicle Use In Minnesota (MN DNR, 1984) indicates that there were 30,000 three wheeled vehicles in the state in 1983. The report states that the amount and location of three wheel use is closely related to population density.

The 1979 SCORP projected a need for increased opportunities for the following forest related recreational activities in the Arrowhead Region: cross-country skiing, camping, hunting, fishing, bicycling, and swimming.

Further recreational use projections and needs assessments for various activities are included in the Recreation Sub-Area Plan (Appendix A).

The preponderance recreational activities which are taking place in the Orr Area require a high quality natural resource base (e.g. fishing and canoeing). The most popular activities occur during the summer months and are likely to require an extended stay. People are willing to travel a considerable distance to participate in the activities available in the area. The "Edge of the Wilderness Study" (MN DNR - Planning, 1985) indicated that 80 percent of the recreationists using the BWCAW and surrounding areas had travelled at least 100 miles. Thus facilities for overnight lodging such as campgrounds and resorts are a necessity. Winter recreational activity levels are lower than summer levels and fewer participants are from outside the area.

Figure 2.4 Orr Area Recreation Activities 1980-95



FISH AND WILDLIFE RESOURCES

Fisheries

The DNR Division of Fish and Wildlife classifies lakes for fisheries management purposes. The classes are named for the managed fish species, which exist because of variations in the species and numbers of other aquatic organisms, water chemistry, the shape and depth of lake basins, temperature, and characteristics of the surrounding shore and vegetation. Table 2.13 lists the fisheries management classification for about 400 surveyed lakes. The Orr Area has one of the highest concentrations of trout lakes in the state.

Table 2.13 Fisheries Management Classification of Lakes in the Orr Area

Fisheries Management Classification	Number of Lakes
Walleye	126
Northern Pike	63
Centrarchid (Pan Fish)	51
Lake Trout	37
Walleye-Centrarchid	28
Stream Trout	24
Warm-water Game Fish	14
Regular Winterkill	4
Unclassified	43

There are 30 designated trout streams (Table 2.14) in the Area and most of the rivers support fishable populations of warm-water game fish.

Table 2.14 Designated Trout Streams in the Orr Area

Stream Name	Township	Range	Section
LAKE COUNTY			
Arrowhead Creek	61	8	14, 15, 21, 22, 27, 28, 34
Camp Creek	61	8	33
Harris Lake Creek	61	10	19, 30, 31
Inga Creek	61	9	11, 12, 14, 22, 23, 27, 34, 35
Isabella River, Little	61	9	3, 4, 9, 10, 16, 17, 20-22, 29, 32
	62	9	34
Jack Creek	61	8	14, 23-26, 36
Jack Pine Creek	61	8	19, 20, 29-32
Mike Kelly Creek	60	11	14, 15, 23
Mitawan Creek	61	8	5-7, 18, 19, 31
	61	9	1, 2, 12, 13, 24, 25, 36
	62	9	35
Nip Creek	59	11	3, 4
	60	11	21, 22, 27, 28, 34
Nira Creek	61	11	22, 23, 27
Robin Creek	61	10	26, 35
Section 30 Creek	63	11	30
Snake Creek	61	9	19, 30, 31
	61	10	24, 25, 36
Snake River	60	10	3, 4
	61	9	7, 18, 19
	61	10	12, 23, 24, 26, 27, 33, 34
Sphagnum Creek	61	9	28, 29, 33

ST. LOUIS COUNTY			
Angora Creek	61	18	9, 10, 15, 16, 21, 22
Ash River	66	20	4, 5, 9
	67	20	4-6, 8, 9, 16-20, 28-32
	67	21	36
	68	19	17, 18
	68	20	13, 14, 20-24, 28
	68	21	36
Beauty Creek	67	21	23-26
Blackduck River	66	19	5, 6, 7, 8, 17
	66	20	1
	67	19	29, 31, 32
	67	20	2-4, 10, 14, 15, 23-26, 36
	68	20	26-28, 33, 34
Fawn Creek	66	20	1-4, 12
	67	20	15, 22, 23, 26, 34, 35
Grassy Creek	61	13	6
	61	14	1
Kinmount Creek	67	20	19
	67	21	13-15, 20-24
Lehtinen's Creek	61	17	13, 14
Longstorff Creek	62	12	6, 7
	63	12	31
Lost River	65	19	6
	65	20	1-8, 12
	65	21	1
	66	20	20, 25, 27, 29, 31-36
Nine Mile Creek	66	19	4
	67	19	7, 8, 18-21, 27-29, 33
	67	20	12-14, 23
Purvis Creek	62	13	28, 29, 33
Sand Creek	62	21	34
Section 30 Creek	63	12	24, 35
Two Rivers, East	61	14	7, 8
	61	15	1-4, 12
	62	14	29-32
	62	15	32-36
Two Rivers, West	61	15	6-9, 14-17
Unnamed Creek	65	19	4, 5
	66	19	33

The ability of these water bodies to support fish populations depends to a great extent on the quality of the terrestrial environment in which they are located. Lakes and streams in forested areas tend to have higher water quality and larger, more diverse fish populations than lakes and streams in more developed areas. Maintenance of vegetative buffer strips along streams and around lakes is highly beneficial to fish. These buffer strips help shade the water, control erosion, and maintain water quality. Several species of fish may be affected by forest management. The northern pike is particularly dependent on

temporary spawning marshes for its existence. Major alterations of spawning marshes could eliminate northern pike in a given area. Rainbow, brown, and brook trout are all dependent on cold, clear water. Shade from overstory vegetation and consistently high quality water supplies from forest watersheds are of particular importance. All three species of trout are sensitive to siltation, temperature variations and excessive runoff, especially during spawning.

Wildlife Habitat Types and Trends

Although the virgin forest of the Orr Area contained a mix of early, intermediate, and late successional communities the frequency of major natural disturbances in the Orr Area prior to settlement was most likely relatively low. Thus early successional vegetation types and wildlife species associated with them were probably uncommon. Logging, subsequent fires, and settler activity in the years between 1890-1930 changed the habitat to types that favor early successional species of wildlife (e.g. ruffed grouse, white-throated sparrow, white-tailed deer, yellow warbler, sharptailed grouse, red fox). These habitat conditions persisted until the 1950's when maturing forests, improved fire control, and farm abandonment again began to favor mature forest wildlife species. These habitat changes are still occurring. Due to past and current market conditions timber harvesting has not offset this trend.

Better soils, primarily in the southern part of the area, have favored a continuance of agricultural operations. Fire suppression and forest maturation affects habitat in the agricultural areas as well as in forested areas. For example, type 1 and type 2 wetlands are gradually converting to type 6 wetlands and upland brush areas are becoming forested. As a result open wetlands and brushlands that provide habitat for species like the sharptailed grouse and red-winged blackbird are deteriorating.

There are 217 wildlife species likely to occur in the Orr Area. These include 3 turtles, 4 snakes, 5 salamanders, 1 toad, 7 frogs, 54 mammals and 143 birds. Typical species are the white-tailed deer, ruffed grouse, moose, common loon, pileated woodpecker, and gray wolf. Wildlife species reflect the transitional nature of the vegetation in the area. Over one-third of the 54 mammal species present are either northern species near the southern edge of their geographical range or more southerly species close to the northern edge of their range.

Plant communities form what collectively makes up wildlife habitat. They provide the cover, structure, and, in many cases, food that wild animals need to survive. The

interdependence of plants and animals is demonstrated by the fact that certain wildlife species are abundant in only one particular plant community.

Forest management practices have the greatest immediate potential to significantly affect wildlife habitat. With the exclusion of fire from the northern forest ecosystem, almost all change results from planned management. This purposeful management determines the age, composition, size, and distribution of stands in the forest. All of these factors affect wildlife habitat.

Utilization

The wildlife species present in the Orr Area provide diverse opportunities for hunting, trapping, and observation. Although no data is available documenting license sales within the Orr Area, information is available for St. Louis and Koochiching counties, and probably reflects the trends in the Orr Area.

Since 1982 the numbers of resident firearms deer licenses sold in St. Louis and Koochiching counties have decreased. In 1982, 34,965 licenses were sold compared to 32,195 in 1984, a decrease of 8%. This is most likely due to a stable or declining deer population and possibly a declining human population in St. Louis County.

Small game and trapping license sales have also decreased since 1982. Small game license sales totaled 12,556 in 1982 and 11,448 in 1984. One thousand seven hundred and seven trapping licenses were sold in 1982 and 1,129 in 1984. The drop in small game license sales may be the result of the cyclical low in the ruffed grouse population. The decrease in trapping license sales can possibly be explained by the overall drop in fur prices.

Quantitative data on the demand for wildlife observation activities are virtually nonexistent. The 1979 SCORP (MN DNR - Planning, 1979) estimated that the number of occasions for bird watching and nature observation would increase by about 9 percent from 1980 to 1995. Despite the lack of data specific to the Orr Area, there is no indication that the demand for wildlife observation exceeds the supply.

Inventories

Few intensive surveys directed specifically at the wildlife resource have been conducted either recently or historically within the Orr Area. Because of the diversity and extent of forest cover types, low resident human population, and large acreage of public land, most wildlife populations are

probably in good condition. However, it is not possible to make definite statements about their well being because many of these wildlife species have not been inventoried or monitored. Obviously more detailed information is necessary for future management of many wildlife species.

Habitat Management Needs

While the overall condition of wildlife in the Orr Area is assessed as ranging from fair to good, there are some habitat types of importance and concern. These habitats are needed to maintain the rich diversity of wildlife that now exists. The following discussion highlights habitat types of concern. This is not a complete or comprehensive analysis. Greater detail can be found in the Forestry - Wildlife Guidelines to Habitat Management (MN DNR, 1985).

Wildlife Openings

Wildlife openings are of special importance to a number of wildlife species. An opening is defined as an upland grassy or herbaceous area with less than 10 percent shrub or tree cover. Recent studies in Wisconsin found that 36 species of birds and 15 species of mammals are associated with forest openings. Natural succession, plantation development, and fire control have reduced the number of forest openings in the Orr Area. In the examination of 91,303 acres of deer habitat in the Kabetogama District, Wildlife Habitat Specialists have found that only 0.03 percent of the upland deer habitat is made up of forest openings.

Contiguous Forest Areas

Recent studies suggest that many wildlife species require contiguous and extensive forest systems (Robbins 1979; Burgess et al. 1981). Bond (1957) reported that many songbird species adapted to living in forest interiors need large tracts of forest during the nesting season. When a forest area is fragmented due to suburban sprawl, super highways, pipelines, transmission lines, surface mining and agriculture, many of these species disappear. The implications of such findings are significant if we want to maintain the native wildlife species associated with the forest community.

Among the wildlife species of the Orr Area that could be adversely effected by a lack of contiguous forest cover are the neotropical migratory birds, including warblers. They prefer the interior of unbroken forest tracts. They spend the summer here and fly to Central and South America in winter. These birds are short lived, have open nests near the ground, have a low productive rate, and eat insects. Their populations will be low in forests that are fragmented by utility and road right-of-ways, agricultural fields, home

sites, site prep areas, and cutovers. Therefore, certain existing unfragmented forest areas should be identified for maintenance.

Old Growth Forest

An issue of concern is that of reserving some area of old growth forest. A general rule of thumb states that old growth begins at an age 1.5 times that of normal economic rotation. Old growth stands are essential for certain wildlife species like the pileated woodpecker, and pine marten.

The scarcity of living examples of old growth for many forest types, as well as its inherent variability make a precise definition difficult. However, a common element in all old growth is that of decay, characterized by abundant snags, cavity-forming trees, and large, decaying logs on the forest floor. Other identifying features include a dynamic, multi-layered vertical stratification (all age classes represented) and unique plant and animal communities.

The presence of old growth forest types in the BWCAW and VNP help to fill some of these habitat needs in the area. However, old growth stands outside the BWCAW need to be identified and efforts to preserve the highest quality old growth stands outside the BWCAW and VNP should be taken.

Riparian Zones

Riparian zones are of special concern for wildlife. Unique characteristics of these areas include high primary plant productivity and high species richness, often surrounded by less productive environments. A large, diverse number of animal species are generally associated with these systems due to the diverse vegetation and its high food value. Wetland zones are used by wildlife disproportionately more than other habitats. The fragility of this system suggests that a minimal or non-disturbance policy would be beneficial.

Forested riparian zones are prime candidates for permanent old growth designation. In addition to fulfilling old growth needs, these areas provide abundant snags and cavities. For more information on riparian zones see the Forestry - Wildlife Guidelines to Habitat Management (MN DNR, 1985).

Table 2.15 Wildlife Species Indicative of Quality Riparian Zones

Barred owl	Pileated woodpecker
Great blue heron	Otter
Wood duck	Beaver
Goldeneye	Mink
Broad-winged hawk	Belted kingfisher
Wood turtle	Snapping turtle
Spotted sandpiper	Numerous invertebrates
Green frog	Crayfish & other
crustaceans	
Black bear	Arthropods

Transition Habitat

Transition habitat is midway between the prairie and forest environment. It is an open habitat consisting of a mixture of grass, brush, trees, and marsh. This type provides critical habitat for a variety of wildlife species, including sharptailed grouse which are particularly sensitive to habitat changes. Transition habitat is characteristic of portions of the area near Greaney. Transition habitat is being eliminated by fire control and plantation development.

White Cedar Type

The white cedar forest type is heavily used by deer for winter cover and food. The white cedar type is in jeopardy because a reliable method of regenerating cedar stands has not been discovered. Acid soils conditions and in the past, during higher deer population levels, browsing by deer prevented the growth of seedlings. Where cedar stands occur they should be managed according to guidelines in the Manager's Handbook for Northern White-Cedar (USDA Forest Service, 1977) and every attempt should be made to regenerate the stand.

Northern Hardwoods and Oak Types

Another habitat of concern is that of northern hardwood and oak stands. Both of these, either as a mixture or in pure stands, are of high value to wildlife and are scarce in the Orr Area.

The growth form of northern hardwood species provides abundant natural cavities. Hardwoods also make long-lived snags (upright or fallen) which are used by reptiles, amphibians and insects, as well as mammals and birds. Many studies have shown that wildlife species prefer hardwood snags to conifer snags. Northern hardwood stands are typically all aged stands resulting in a variety of cavity and snag sizes.

Northern hardwood and oak stands are also important producers of mast which is eaten by many wildlife species. There are two kinds of mast. Hard mast refers to acorns or nuts of various tree species such as oak. Soft mast includes fruits and seeds of species such as maple, dogwood, cherry, and elm. Most wildlife species depend upon mast as a food source at some time during the year. Soft mast species such as cherries, birch and maple are important to nongame species because their production tends to be less variable than that of hard mast species.

Northern hardwood and oak stands need to be managed for their inherent unique qualities and associated wildlife. Because they are long lived, self perpetuating, and in low demand for wood fiber they are prime candidate areas for old growth designation.

Gravel Pits

Ideas on gravel pits and wildlife have changed. Formerly viewed as eyesores to be landscaped and revegetated as quickly as possible, gravel pits are now seen as a unique habitat meeting the specialized needs of certain wildlife species. Management guidelines for abandoned or inactive pits are contained in the Forestry - Wildlife Guidelines to Habitat Management (MN DNR, 1985).

Other Habitats of Concern

The Orr Area has fairly large acreages of lowland brush or shrub swamp. This type has limited commercial forest value but is very productive for other plants and animals. Productivity is especially high near the edge where upland and swamp meet. Game species that use this type for feeding are ring-necked duck, blue-winged teal, and American woodcock. Black ducks use this type for breeding. Other wildlife species found in this community include gray, mink, green, chorus, and wood frogs; American bittern; short-billed marsh wren; alder flycatcher; palm warbler; Arctic shrew; and meadow vole.

Management of the lowland brush type should, for the most part, be left to natural forces. Use of fire may be considered at certain times and locations.

Lowland deciduous types also are productive from a wildlife standpoint. Young stands of this type are home to the American redstart, rose-breasted grosbeak, mourning warbler, meadow jumping mouse, water shrew, chorus frog, and American toad. As stands of this type reach maturity they are used by several species of frogs, many small birds like the northern oriole, northern flying squirrel, and Cooper's and broad-winged hawks. Barred owls nest almost exclusively in older lowland deciduous stands.

The sedge meadow or lowland grass type is unique among northern forest communities in that it lacks any significant woody vegetation. As with the previous two types it is very productive of non-commodity resources, especially birds. In the Chippewa National Forest, 28 species of birds are associated with this type. Four frogs, one toad, and three small mammals are found here too. This type and its associated wildlife will benefit from periodic burning.

The wildlife species found in open and closed canopy lowland conifer stands are the same but different; i.e. some species are found in both types while others are particular about the amount of canopy closure. For example, the palm warbler, yellow-throat, and southern bog lemming are usually found in stands with a semi-open canopy, Species like the brown creeper, boreal chickadee, yellow-bellied flycatcher, and pileated woodpecker like more closed canopy stands. Birds such as great gray owls, ospreys, Connecticut warblers, and black-backed three-toed woodpeckers are found in both open and closed canopy stands. Thus, maintaining a diversity and dispersion of age classes is an important consideration for wildlife.

There are about 6,500 acres of balm of Gilead type in the Orr Area. Like other upland hardwood communities this type is rich in bird and mammal life. Balm of Gilead readily develops cavities used by small to medium sized cavity nesting birds. Maintaining this type will contribute to diversity in the area.

Endangered, Threatened, and Special Concern Species

There are 12 species that may occur in the Orr Area that are officially designated as endangered, threatened or of special concern (Table 2.16). The majority of these species are affected by forest management practices. Management needs vary depending on the species, and in some cases are not well documented. Specific information on these species is included in Appendix H, as is information on colonial waterbird nesting sites.

Table 2.16 Endangered, Threatened, or Special Concern
Wildlife Species in the Orr Area.

Species	Status
Peregrine falcon	Endangered, federal and state
Bald eagle	Threatened, federal and state
Gray wolf	Threatened, federal and state
Wood turtle	Threatened, state
Keen's myotis	Special concern, state
American bittern	Special concern, state
Rock vole	Special concern, state
Osprey	Special concern, state
Snapping turtle	Special concern, state
Heather vole	Special concern, state
Yellow rail	Special concern, state
Short-eared owl	Special concern, state

Game Wildlife Species

There are 26 principal game species found in the Orr Area (Table 2.17). Populations of some of these species have fluctuated greatly over the years due to the habitat changes mentioned previously. For instance, the best records available indicate that prior to 1860 white-tailed deer were very rare in the Orr Area. It has also been reported that moose and caribou were often seen in the Lake Vermilion country during the 1890's. By 1913, except for occasional animals, caribou had disappeared from the Orr Area. The moose population also declined during those years and the hunting season was closed from 1922 until 1971.

Table 2.17 Principal Game Species Found in the Orr Area.

White-tailed deer	Muskrat
Black bear	Spruce grouse
Moose	Ruffed grouse
Beaver	Sharptailed grouse
Snowshoe hare	American woodcock
Bobcat	Mallard
Pine marten	Blue-winged teal
Coyote	Wood duck
Raccoon	Ring-necked duck
Red fox	Common goldeneye
Otter	Lesser scaup
Mink	Hooded merganser
Fisher	Common merganser

White-tailed Deer

A tremendous white-tailed deer population resulted from the habitat changes that occurred during the early part of the 20th Century. This population peaked during the 1930's and 1940's and has since declined. The current population estimate in the Kabetogama Resource Management Unit (see Figure 2.5) is 16.6 deer per square mile of suitable habitat. The Greaney Resource Management Unit supports a population of 15 per square mile while the Ely area of the Hunting Shack Unit is at 13 per square mile. The recurrence of severe winters like 1981-82 and 1983-84, the slowdown in timber harvests because of the recent recession, and an expanding timber wolf population, may cause deer populations to stabilize near their present levels or decrease.

Moose

The decline in deer numbers over all of the Orr Area, but most noticeably in the Hunting Shack River and One Hundred Mile Swamp units and the BWCAW has led to an increase in the moose population. Average population estimates for the past three years range from 0.6 moose per square mile in the western portion of the Hunting Shack River Unit to 1.7 moose per square mile in the eastern portion.

Black Bear

The bear population in the forested portions of the Orr Area is estimated to average about 8-12 animals per township. Optimum bear habitat occurs in mixed deciduous forests. The mast found in oak stands and the fruits, berries, buds, and grasses found in forest openings and sapling stands are especially important to bears.

Beaver

Beaver occur throughout the Orr Area. They are most abundant along heavily wooded streams and lakeshores where aspen occurs within 300 feet of the water's edge. Beaver are censused by aerial counts made after leaf fall along designated routes. Four beaver routes are flown in the Orr Area. The number of live beaver colonies per route mile has averaged 1.47 and has ranged from a low of 1.2 in 1974 to a high of 1.8 in 1978.

Beaver harvests are controlled by pelt prices, season length, and harvest restrictions. In the fall and winter of 1979-80 the average price per pelt hit \$32.74, higher than it had been for many years (MN DNR - Section of Wildlife, 1984). Since beaver populations have remained high, there is currently no limit on the number of beaver each trapper can take. The season is long, running from late October through April. Unless fur prices increase, the demand for beaver will remain low and the annual harvest will not approach the available surplus of beaver.

High beaver populations can cause problems. Beaver plug ditches and culverts, cut ornamental trees, and flood roads, timber, and farmland. Conservation Officers spend a considerable amount of their time and money from the Game and Fish Fund removing nuisance beaver. Private individuals are permitted to remove or destroy beaver that are causing damage to their property. The beaver is also one of nature's best wildlife managers. Beaver cuttings produce browse areas, and beaver ponds create wetland habitat for mink, muskrat, otter, and waterfowl, and provide openings that benefit deer, bear, grouse, and many other forms of wildlife.

Management needs for beaver involve strict control of harvests when populations are low, and the maintenance of diverse aspen forests next to water areas. This type of aspen management also benefits deer, bear, and grouse.

Ruffed Grouse

The ruffed grouse is the major small game species in the Orr Area. Grouse are eagerly sought by hunters and sales of small game licenses rise and fall with grouse populations.

Grouse populations fluctuate from extreme scarcity to extreme abundance, roughly on a 10-year cycle. The most recent peak occurred in 1978-1980. Research has not yet determined exactly what causes these cycles. In good habitat, fall grouse populations can reach 150 to 200 birds per section at the peak of their cycle, but fall to 15 or 20 birds per section at the low in their cycle.

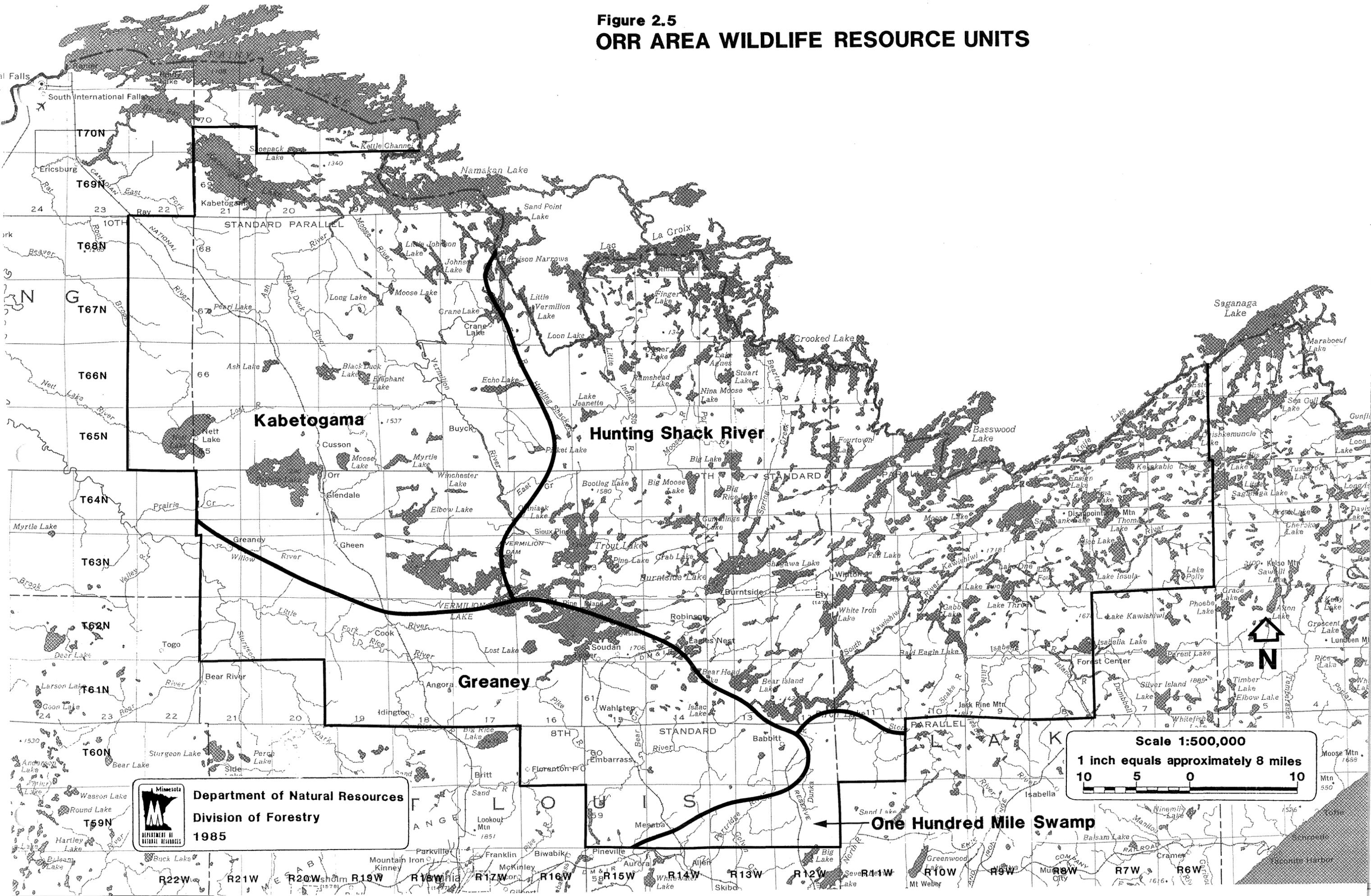
The ruffed grouse is a hardwoods-brushland species that is highly dependent upon aspen. Ideal grouse habitat in the aspen forest is made up of three age classes of aspen: saplings for brood rearing cover, young pole-sized stands for drumming and nest cover, and mature timber for winter food supplies of male aspen buds. The maintenance of high density grouse populations requires that the three age classes of aspen be well interspersed in small blocks of 5-10 acres.

Sharptailed Grouse

Sharptails became abundant in the late 1800's and early 1900's in the open country created by logging, fires and farm settlements. They were a popular game bird and thousands were harvested. The birds remained numerous until the early 1940's. Sharptail populations have declined to the point that only scattered, small flocks remain.

The sharptail populations are located mostly on private lands in habitats that contain a mixture of hay fields, oat stubble, wet meadows, brushland, and bogs. For high sharptail populations, the habitat structure needed is 35 percent grassland, 25 percent brushland, 18 percent

**Figure 2.5
ORR AREA WILDLIFE RESOURCE UNITS**



aspen-birch, 15 percent cropland, and 7 percent wet meadow-marshland. Sharptails do not tolerate tall brush or trees over 20 feet high within 1/8 mile of their spring dancing grounds.

Management practices include prescribed burning of wet meadows and brushlands to prevent their conversion to trees. Bog areas should be protected from over-development for peat mining or for agriculture. Sharptails are censused by spring dancing ground counts. The location and census of dancing grounds is presently incomplete.

American Woodcock

The woodcock is common in the Orr Area, which is located on one of the main migration routes for woodcock to and from wintering areas in Louisiana. No population or trend data is available on a county basis. Habitat management needs for this species include timber harvests that maintain a variety of age classes in close proximity to openings, maintenance of forest openings as singing grounds, and retaining alder stands on damp soils for feeding areas.

Waterfowl

Type 3, 4, and 5 wetlands and other small wetlands, including beaver ponds, found in the Orr Area do not provide the habitat base needed to produce numerous waterfowl. Some ducks are produced primarily ring-necked ducks, mallards, blue-winged teal, goldeneyes, hooded mergansers, and wood ducks in the marshes, beaver ponds, and streams. There is also some production on the marginal habitat of fish lakes. Unlike other parts of Minnesota, waterfowl habitat in the Orr area has not been altered to a large degree by man's activities. The increase in the beaver population experienced during the past several years has most certainly led to an increase in the number of those waterfowl species associated with beaver ponds. Forest maturation has also led to an increase in cavities in riparian zones. These cavities are required by wood ducks, goldeneyes, and mergansers for nesting.

Management needs include continued protection of wetlands, management of water levels where feasible, retention of nesting cavity trees, and artificial nest box placement.

LAND OWNERSHIP AND ADMINISTRATION

The Orr Area covers approximately 2.6 million acres, including over 300,000 acres of water. Table 2.18 lists the land acreage in various ownership classes. Federal agencies administer one-half of the land. Twenty-two percent of the land is privately owned. State and county agencies administer 17 and 11 percent of the land respectively.

Table 2.18 Land Ownership in the Orr Area

Ownership Class	Acres
Private	510,000
County (tax forfeited)	242,000
State	387,000
Federal	1,161,000
Total Land	2,300,000

STATE LANDS

Department of Natural Resources

The DNR administers about 380,000 acres of land in the area. Approximately 71 percent of the DNR administered lands are in management units such as state forests or state parks (Table 2.19). The lands outside of management units are primarily trust fund lands administered by the Division of Forestry. The lands administered by the various DNR divisions are described in greater detail below.

Division of Forestry

The Division of Forestry administers 375,560 acres in the Orr Area. About 70 percent of this land is within state forest boundaries.

Bear Island State Forest is located south and west of Ely in eastern St. Louis and western Lake counties. Its statutory boundary encompasses 141,187 acres of which 24,639 are administered by the division. The forest includes 10,310 acres of school trust, 9,537 acres of swamp trust, 4,374 acres of university trust, and 418 acres of acquired land. The Purvis Lake - Ober Foundation SNA and part of Bear Head Lake State Park are within the boundary of this state forest. The eastern part of the state forest is located within the Superior National Forest and small portions of townships 62-11 and 63-11 are within the BWCAW.

Table 2.19 DNR Management Units in the Orr Area

Management Unit	Administering Division	Acres (a)
<u>State Forests</u>		
Bear Island	Forestry	24,639
Burntside	Forestry	24,675
Insula Lake	Forestry	485
Kabetogama	Forestry	154,796
Koochiching (b)	Forestry	28,804
Lake Isabella	Forestry	66
Lake Jeanette	Forestry	1,357
Sturgeon River	Forestry	29,346
Admin. & Scattered (b) 4,839 (b)	Forestry	
<u>State Parks</u>		
Bear Head Lake	Parks & Recreation	2,048
Tower Soudan	Parks & Recreation	895
<u>Fisheries Management Areas</u>		
Pike River Walleye Hatchery	Fish & Wildlife	1
Shagawa Rearing Pond	Fish & Wildlife	90
Tower Fish Hatchery	Fish & Wildlife	45
Wolf Lake Rearing Pond	Fish & Wildlife	145
<u>Scientific & Natural Areas</u>		
Purvis Lake - Ober Foundation	Fish & Wildlife	140
<u>State Trails</u>		
Taconite	Trails & Waterways	(c)
Tower to Int. Falls	Trails & Waterways	(c)
<u>Water Access Sites</u>		
Fall Lake	Trails & Waterways	1
Myrtle Lake	Trails & Waterways	1
<u>Land Not in Management Units</u>		
Forestry Administered	Forestry	135,357
Minerals Administered	Minerals	753

Total DNR Administered Land		379,679

Notes:

(a) Acreage listed is for land within the unit coded to the administering division only.

(b) There are 2,759 acres of land that are in both the Koochiching and Administrative & Scattered state forests as a result of 1985 Minn. Laws Chapter 191.

(c) These trails are on lands administered by other divisions and owners.

Source: DNR Land Ownership/Classification Report 7/1/84

Burntside State Forest is located north and west of Burntside Lake in northeastern St. Louis County. It encompasses 62,782 acres of which 24,675 are division administered. This is the second oldest state forest in Minnesota. It was established in 1905 after the US Congress granted the state 20,000 acres of land for forestry purposes. In addition to the land acquired by congressional grant, the forest includes 3,578 acres of school trust and 1,097 acres of swamp trust land. The Burntside State Forest lies within the Superior National Forest and much of it is within the BWCAW.

Insula Lake State Forest is located in north central Lake County. It consists of one section on the south shore of Insula Lake and contains 485 acres of school trust land. The entire forest is within the BWCAW.

Kabetogama State Forest is located in northwestern St. Louis and eastern Koochiching counties (the small portion in Koochiching County is outside of the Orr Area). It encompasses 697,363 acres. The portion of the forest in the Orr Area includes 77,277 acres of school trust, 57,949 acres of swamp trust, 749 acres of university trust, and 18,821 acres of acquired land for a total of 154,796 acres administered by the division. The Kabetogama State Forest overlaps portions of Voyageurs National Park and Superior National Forest. Three sections of the forest south of Trout Lake in township 63-16 are in the BWCAW.

Koochiching State Forest is located in eastern Koochiching County. The forest was enlarged in 1985 to include 28,804 acres of state land in the Koochiching County portion of the Orr Area. The Orr Area portion of the forest includes 3,200 acres of school trust, 4,486 acres of indemnity school trust, 17,519 acres of swamp trust, 840 acres of swamp trust exchange, 1,960 of school trust M&O, and 799 acres of swamp trust M&O land. The 2,759 acres of M&O lands are currently in both the Koochiching and Administrative & Scattered state forests as a result of the 1985 changes to the Koochiching State Forest boundary.

Lake Isabella State Forest is located in north central St. Louis County. It consists of one section on Lake Isabella and contains 66 acres of school trust land. The entire forest is within the BWCAW.

Lake Jeanette State Forest is located along the Echo Trail in north central St. Louis County. The forest includes 10,725 acres of which 1,357 are division administered swamp trust land. The US Forest Service administers most of the land in the forest. Two sections in the southeast corner of the forest are in the BWCAW.

Sturgeon River State Forest is located in west central St. Louis County. The forest is split between the division's Orr and Hibbing areas. The division administers 29,346 acres in the Orr Area portion of the forest. This includes 4,731 acres of school trust, 24,606 acres of swamp trust, and 10 acres of acquired land. Part of the Sturgeon River State Forest is within the Superior National Forest.

There are 4,839 acres of Administrative and Scattered State Forest land in the Orr Area. This includes 2,918 acres of school trust, 1,809 acres of swamp trust, and 112 acres of acquired land.

The Division of Forestry administers 135,357 acres of land outside of state forests in the Orr Area. This includes 72,989 acres of school trust, 60,408 acres of swamp trust, and 1,960 acres of university trust land.

Division of Parks and Recreation

There are two state parks in the Orr Area. State parks are managed in accordance with Department Policy #13 entitled Natural State Parks or Department Policy #14 entitled Recreational State Parks and the management plan for each park.

Bear Head Lake State Park is located 20 miles southwest of Ely. The Division of Parks and Recreation administers 2,048 acres of acquired land within the park. The Division of Forestry has administrative control of 679 acres of trust fund land in the park. Management guidelines for the park are contained in A Management Plan for Bear Head Lake State Park (MN DNR - Planning, 1982).

Tower Soudan State Park is located between the communities of Tower and Soudan on the south shore of Lake Vermilion. The division administers 895 acres that were acquired as a gift from US Steel. The park features underground iron mine tours and is managed in accordance with A Management Plan for Tower Soudan State Park (MN DNR - Planning, 1981).

Division of Fish and Wildlife

The Section of Fisheries administers 280 acres of acquired land in four units in the Orr Area. All of these sites are used for fish propagation.

The Section of Wildlife - Scientific and Natural Area Program administers the Purvis Lake - Ober Foundation SNA located about two miles east of Bear Head Lake State Park. The SNA consists of 140 acres acquired as a gift and is described in the resource inventory and management plan (MN DNR - Fish & Wildlife, 1981 & 1983).

Division of Minerals

The Division of Minerals administers 753 acres acquired by gift and purchase in three separate parcels in the southern part of the Orr Area.

Trails and Waterways Unit

The Trails and Waterways Unit administers the land on which the Fall Lake and Myrtle Lake water accesses are located. The unit is also involved in managing state trails, canoe and boating routes, and water access sites on lands administered by other divisions in the Orr Area.

Other State Agencies

State agencies other than the DNR (e.g. Dept. of Transportation, Historical Society, Community Colleges) administer approximately 7,000 acres in the Orr Area.

FEDERAL LANDS

US Department of Agriculture

The Department of Agriculture - Forest Service administers about 1,050,000 acres in the Orr Area. The Forest Service administers the Superior National Forest and Kabetogama Purchase Unit. About one-half of the land is in the BWCAW. Management direction for Forest Service lands is contained in the Superior National Forest Land and Resource Management Plan (USDA - Forest Service, 1986).

US Department of the Interior

The National Park Service administers the Voyageurs National Park which covers approximately 90,000 acres of land in the Orr Area. The park is managed in accordance with the Voyageurs National Park Master Plan (USDI - NPS, 1980).

The Bureau of Indian Affairs assists in the management of about 20,000 acres of Indian land in the Nett Lake and Vermilion Lake reservations.

COUNTY LANDS

County governments in the Orr Area administer 242,388 acres of tax-forfeited land. The title to these lands is held by the state in trust for local taxing districts. The lands are managed by the respective County Land Departments.

Koochiching County administers 5,075 acres within the Orr Area. None of this land, which is concentrated in the north half of township 68-22 and the Nett Lake Reservation, has been designated as county memorial forest.

Lake County administers 13,275 acres within the Orr Area. These lands are located outside of memorial forest boundaries in the Fall Lake to Snowbank Lake area. The Lake County Board adopted a plan for the management of the county's tax-forfeited lands in 1983 (Lake County, 1983).

St. Louis County administers 224,038 acres within the Orr Area. There are 113,013 acres in the Pelican Lake and Lake Vermilion memorial forests and 111,025 acres outside of memorial forest boundaries.

PRIVATE LANDS

There are approximately 510,000 acres of privately owned land in the Orr Area. About 424,000 acres of this is classified as commercial forest land.

Forest products companies own an estimated 152,700 acres of land in the area (Table 2.20). Most of this land is actively managed to produce sustained yields of timber.

Of the remaining 357,300 acres of privately owned land it is estimated that 277,000 acres are commercial forest land.

Table 2.20 Industrial Forest Land Ownership by Company and District in the Orr Area, 1985 (a)

Company	District					Total
	Orr	Kabet.	Crane Lk.	Tower	Cook	
	(Thousand Acres)					
Boise Cascade	29.6	44.0	0.2	-	0.4	74.2
Diamond Int.	15.5	-	0.1	-	6.0	21.6
La. Pacific	-	-	-	6.1	-	6.1
Potlatch	7.7	-	17.6	18.2	6.1	49.6
Other	-	1.1	-	-	0.1	1.2
Total	52.8	45.1	17.9	24.3	12.6	152.7

(a) Acreages estimated by District Foresters, March 1985.

Table 2.21. Orr Area Plan Issue Questionnaire Results

Issue	Yes	No	Ave. Importance
1. Timber Markets	18	0	4.1
2. Scattered Land Base	18	0	4.0
3. Timber Composition	18	0	3.9
4. Relationship to other Plans	18	0	3.9
5. BWCAW Lands	17	1	3.8
6. Shoreland Management	18	0	3.8
7. Recreation Demand	18	0	3.6
8. Recreation Development	18	0	3.4
9. Old Growth Component	17	1	3.4
10. Trails and Roads	17	1	3.2
11. Mgt. & Protection of Rare Resources	17	1	3.2
12. Building Needs	17	1	3.2
13. Equipment Needs	16	2	2.9
14. Effect of Expected Recreation Emphasis	17	1	2.9
15. Overlapping Discipline Boundaries	14	4	2.8
16. Coop. Management Agreements	13	5	2.7
17. Trails Regulation	17	1	2.7
18. Voyageurs National Park Periphery	15	3	2.6
19. Cooperative Recreation	15	3	2.6
20. Lakeshore Leases	13	5	2.6
21. DNR Information Distribution	11	7	2.3
22. Timber and Peat	13	5	2.2
23. Prescribed Burning	14	4	2.1
24. Recreational Funding	10	8	1.7
25. Division of Enforcement's Role	11	7	1.6

ORR AREA FOREST RESOURCE MANAGEMENT PLAN

3. LAND MANAGEMENT PLAN

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INTRODUCTION

This chapter includes three parts. The first part explains the relationship between the land management plan, statewide policy, and program plans. The second part documents areawide management guidelines for various programs. The last part consists of resource descriptions and specific guidelines or proposed projects for each of the ten resource management units in the Area.

RELATIONSHIP TO STATEWIDE POLICY

The DNR develops written policy to ensure consistency in carrying out its resource management responsibilities across the state and over time. Policy can take the form of Agency Rules, DNR Policy, Operational Orders, Commissioner's Orders, Circular Letters, or Manuals. The Minnesota Forest Resources Plan (MN DNR - Forestry, 1987) also sets goals and objectives for Division of Forestry programs. Statewide policy and program goals were considered in developing areawide guidelines and project proposals. In most cases the guidelines and projects proposed in this plan are consistent with statewide policy. Where there are known exceptions to statewide policy, justification for the deviation is given.

RELATIONSHIP TO PROGRAM PLANS

Resource management objectives and budgets within the Division of Forestry are developed on a program basis. There are 19 programs operating in the Orr Area (see Chapter 4). Several program plans affect state land management in the Orr Area. Some of these program plans were developed prior to this plan (e.g. Area Fire Plan) while others were developed in conjunction with this plan (e.g. timber plan, land administration plan).

One of the functions of this chapter is to make sure that management activities proposed for a given land unit are coordinated. For example, an action proposed in the timber plan may require acquisition of an easement (land program), development of a road (road program), and creation of a wildlife opening (fish and wildlife habitat program). Program plans are published as separate documents or as appendices to this plan. They were used in developing the management guidelines and project proposals for each resource management unit.

AREAWIDE MANAGEMENT GUIDELINES

This section contains areawide guidelines for various resource management programs. These guidelines cover all management activities in the Orr Area without regard to the resource management unit in which the activity occurs. If more restrictive guidelines apply to a particular resource management unit, they will be listed under the guidelines for that RMU.

Land Ownership and Administration

The Minnesota Forest Resources Plan (MN DNR - Forestry, 1987) includes a goal of achieving an optimum land ownership pattern for management of forest resources. This plan proposes use of land exchange, transfer of administrative control within the DNR, land sales, leasing, and land acquisition to improve the land ownership pattern.

Division of Forestry administered lands in the Area include large contiguous blocks and small isolated parcels. The checkerboard pattern of land ownership is inefficient to manage for some purposes. Dispersed ownership increases the costs of locating property corners and lines, providing road access, preventing trespass, and conducting a wide range of land management activities. Consolidation of ownership into larger blocks can reduce these costs.

An expanded land exchange effort is proposed to consolidate Division of Forestry administered land. The major project will be to exchange state land in the BWCAW for US Forest Service administered land outside of the wilderness. This will help consolidate ownerships and will reduce the amount of trust fund land in non-income producing units. Exchanges with counties and private land owners are also possible.

The trust designation of trust fund land in non-income producing areas or areas where revenue is dedicated to specific funds (e.g. BWCAW, state parks or state forest campgrounds) will be transferred to other lands that can be managed to provide income for the trust in accordance with the goal of the permanent school fund (MN Laws 1985, Chapt. 116, Sec. 2). Administrative control of forestry administered land in state parks would then be transferred to the Division of Parks and Recreation.

A limited amount of land will be purchased, usually to permit road or recreational facility development.

More detailed land administration guidelines and lists of land parcels proposed for exchange or transfer of administrative control are included in Appendix D.

The Orr Area administers over 500 lakeshore, hunting cabin, commercial, and miscellaneous leases. Some lakeshore lots may be sold under the provisions of a law passed by the 1986 legislature. No additional hunting cabin or lakeshore homesite leases will be offered. Gravel leases should incorporate provisions to create wildlife habitat when the pit is inactive or exhausted [see Forestry - Wildlife Guidelines to Habitat Management (MN DNR, 1985)].

Permanent road easements or leases will not be issued to individuals; only to units of government. This will prevent the cancellation of the lease after the road is built and will help ensure continued public access and maintenance of the road.

Soil and Water Resource Protection

Soils

The DNR Regional Soil Specialist has developed management guidelines for the major soil types occurring in the Orr Area. The guidelines provide information on the soil's typical landscape position, parent materials, water movement, typical vegetation, timber productivity, equipment operability, recommended site preparation techniques, regeneration techniques, and wildlife habitat conditions. The guidelines for each soil are included in Appendix F.

Waters

The majority of the Orr Area lies within the area covered by the provisions of the federal and state Shipstead - Newton - Nolan acts. These laws are designed to conserve the natural beauty of shorelines by restricting the sale of public land and timber along lakes and streams and by prohibiting the alteration of natural water levels. See Appendix G for details.

To maintain or improve water quality the following guidelines will be applied:

1. Maintain vegetative shading of trout streams to prevent increases in water temperature.
2. Design forest roads and harvest areas to minimize erosion and sedimentation.
3. Follow label directions and DNR Guidelines for Pesticide Use (MN DNR, 1987 review draft) to protect water resources.
4. Submit all project proposals for campgrounds, water access sites, roads, or other developments to the Area Hydrologist for review to ensure compliance with shoreland and floodplain regulations.

5. Prohibit placement of slash in areas subject to flooding to limit the debris carried by a flooding stream. Bridge and culvert failure is often caused by buildup of debris.

Forest Roads

The Division of Forestry will develop and maintain a system of forest roads that provide access to, and permit management, protection, and development of state forest resources as required by state law (MS 89.002). Statewide forest road policies covering road classification, siting, criteria, construction and maintenance, mapping, road names and numbers, signing, securing of rights of way, water permits, transfer of responsibility, abandonment, seasonal closures, cooperative agreements, and evaluation and prioritization of road projects will be used in the Orr Area.

The following areawide guidelines will apply to the state forest road program in the Orr Area:

1. Develop cooperative road agreements with federal agencies (USFS), counties (St. Louis, Lake, and Koochiching), and private industrial concerns (timber and mining companies) when lands of these owners need to be crossed to access state lands.
2. Acquire easements across the lands of federal agencies, counties and private industrial concerns when the state will be spending money to construct, reconstruct, or maintain permanent roads across these lands to serve state lands. These rights-of-way will then become state forest roads and should be entered on the State Forest Road Inventory
3. Acquire unrestricted, permanent easements across the lands of private individuals to state lands where ongoing management is planned. All easement proposals must be checked to see that legal right-of-way has not already been acquired through prescription. If permanent easements cannot be acquired, allow logger to acquire temporary access for harvesting and management activities. These parcels should be reevaluated for appropriate disposition when the Area Plan is updated.
4. Work with loggers to determine the best route for roads that they are developing in conjunction with timber sales on state lands so that access is gained systematically. These roads should be added to the State Forest Road Inventory.
5. If lands which are proposed for exchange are scheduled for harvest, acquire easements only if they are donated, otherwise allow the logger to acquire access and develop roads to the parcel at no cost to the state. (Some lands which are proposed for exchange are listed in the timber management plan because of the uncertainties connected with exchanges).

6. All roads on state lands or on other ownerships where the state holds legal right-of-way should be recorded on a comprehensive inventory. The roads on this inventory will be the state forest road system for the Orr Area.
7. Certain roads may be closed to vehicular traffic on a temporary or permanent basis to prevent roadway damage, to reduce maintenance costs, or to protect resources.
8. Snowmobiles will be allowed to use unplowed state forest roads that have not been closed to traffic under the previous guideline.
9. When trails or roads used for snowmobiling are plowed to allow timber hauling an alternate trail will be provided if feasible. If it is not feasible to reroute the trail, signs will be posted to warn users of hazards.
10. The DNR will cooperate with other agencies and land owners to limit average road density in areas of actual or potential wolf habitat to no more than 1 mile of road per square mile [see Appendix H and draft "Road Densities and Wolf Populations - Guidelines for Management" (MN DNR - Wildlife, 1987)].

Right-of-way acquisition and road construction, reconstruction, and maintenance proposals are included in Appendix C.

Forest Recreation

DNR Policy #9 - Recreational Use of Minnesota State Forests (revised 1/26/81) provides guidelines for planning, development, and management of state forest campgrounds and day use areas.

The following DNR policies will guide trail development, maintenance, and use in the Area:

- Policy # 10 - State Trails (revised 4/23/82).
- Policy # 11 - Trails in DNR Units (revised 4/23/82).
- Policy # 12 - Grants-in-Aid Trails (revised 4/23/82).

The policy on timber harvest and extractive operations on state lands adjacent to recreational trails is contained in Division of Forestry Circular Letter 3501 (dated 9/9/80).

In the absence of rules governing the use of recreational motor vehicles on state forest land, the following guidelines will be applied to protect natural resources, resolve use conflicts, and provide for the safety of users:

1. Trails and roads may be designated and signed for specific uses to prevent user conflicts and to provide for safety.

2. Certain roads or trails may be closed to vehicular traffic on a temporary or permanent basis to prevent roadway damage or to protect resources.
3. Snowmobile trails are closed to other types of recreational off road vehicle use from December 1 through April 1 of the following year.

Additional recreation management guidelines and recreational development proposals are included in Appendix A.

Fish and Wildlife Habitat Management

The Division of Forestry and Section of Wildlife will review management practices as provided in the Wildlife/Forestry Coordination Policy (DNR Policy #8, revised 5/3/82).

The Division of Forestry and Section of Wildlife will use practices contained in the Forestry - Wildlife Guidelines to Habitat Management (MN DNR, 1985) on all state administered lands. Both disciplines will follow these guidelines when planning and implementing forestry and wildlife management practices, recognizing that whenever possible management objectives should be met through forest management practices.

In the Orr Area the following specific guidelines will apply in addition to or in place of the general guidelines referred to above:

1. Forestry personnel will notify Area Wildlife Managers of the location of all suitable log landings so that they may be maintained as wildlife openings.
2. Forestry personnel will identify those sites (trails and landings) that are suitable for herbaceous seeding. Locations of these sites will be provided to wildlife personnel. Suitable sites will be seeded cooperatively by forestry and wildlife personnel before June 1 of each year or after August 15.
3. All oak stands in the Orr area will be managed for mast production through long rotation ages. Fuelwood sales in oak stands on state administered lands will not be permitted unless approved by the Area Wildlife Manager.

Timber Management

The Division of Forestry administers nearly 250,000 acres of commercial forest land in the Orr Area. State statutes require that the timber on these lands be managed in accordance with multiple use, sustained yield policies. The division is also required to reforest harvested lands and other deforested or poorly stocked lands.

Within these statutory guidelines, the division's timber management activities will create and maintain diverse and productive forests to meet anticipated resource demands.

The division has adopted or developed the following documents which provide general guidelines for the management of state timber:

Manager's Handbooks for various timber types published by the North Central Forest Experiment Station (1977).
Timber Sales Manual (MN DNR - Forestry, 1982).
Timber Management Planning Information System (MN DNR - Forestry, 1984).
Forestry - Wildlife Guidelines to Habitat Management (MN DNR, 1985).

Additional timber management guidelines addressing the following topics are included in Appendix B:

Appraisal and Marketing
Sale Regulations and Utilization Standards
Sale Administration
Regeneration Standards
Coordination with Other Agencies and Landowners
Management Guidelines by Cover Type
Insect and Disease Management

Cooperative Forest Management

Private Forest Management

Guidelines for this program are found in the Private Forest Management Service Manual (MN DNR - Forestry, 1985).

Urban Forestry Program

Guidelines for urban forest management are contained in the Private Forest Management Service Manual - Section K (MN DNR - Forestry, 1985).

Forest Inventory

Guidelines for developing and altering forest inventory information are contained in the Forest Survey Manual (MN DNR - Forestry, no date).

Phase II alterations will be submitted with timber sale closures unless there are adjacent lands scheduled for harvest or planting within the next year.

Phase II alterations will be submitted for all planting projects, lowland seeding, or natural regeneration when the

3 year survival check is made. Upland seeding alterations will be made after the two year regeneration check.

Alterations for other disturbances such as fires, destructive leases, and road widening will be submitted as they occur.

There will be a thorough update of the entire inventory on approximately five percent of the Orr Area each year.

RESOURCE MANAGEMENT UNITS

DELINEATION OF RESOURCE MANAGEMENT UNITS

Early in the process of developing the Orr Area Plan, various DNR personnel identified a need to delineate land management units smaller than the area. These units would allow tailoring of management guidelines to reflect local differences in resources and demands. The planning team decided to use resource management units (RMUs) delineated on the basis of similarities in landform, soils, timber productivity, wildlife habitat conditions, mineral potential, land use, and land ownership (see Figure 3.1).

As part of the area assessment, resource specialists on the planning team described and mapped fairly homogeneous units with respect to their particular resource. The Regional Soil Specialist identified 11 soil resource units based on differences in landform and frequency of occurrence of various soils. Five metallic mineral potential classes were mapped. Wildlife Managers identified four wildlife units based on relative deer populations and availability of habitat for other selected species. Foresters divided the area into units with significantly different productivity for aspen.

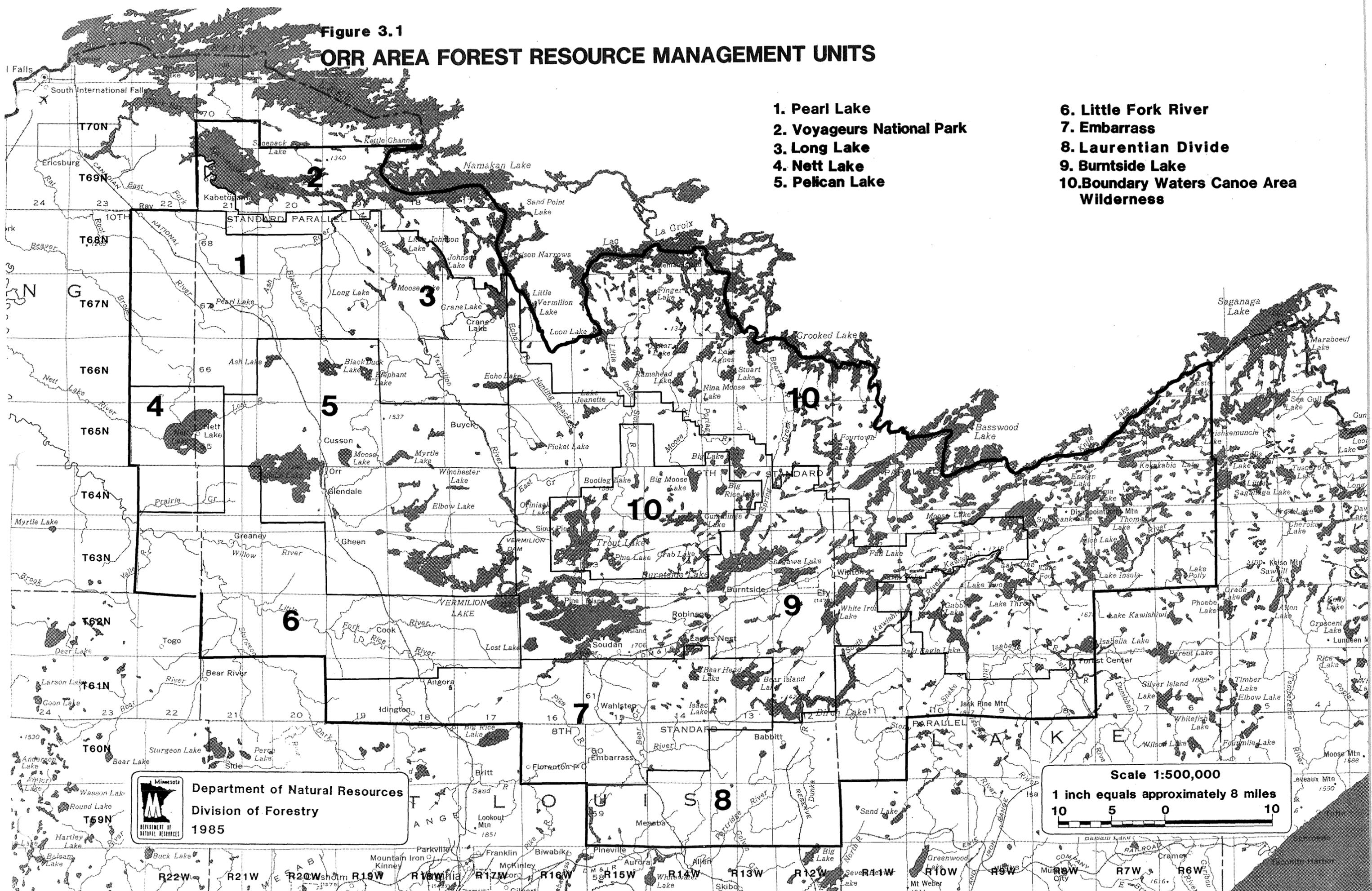
The various single resource maps were overlain on a base map showing state, county, federal, and private land ownership. The timber, wildlife, and soils maps contained boundaries that nearly coincided with the major landforms (e.g. Agassiz Lacustrine Plain, Canadian Shield, Vermilion Moraine). Seven general RMUs were mapped and approved by the planning team. The RMU boundaries were adjusted to follow township or section lines to facilitate computer sorting and analysis of land ownership and timber inventory data. Three other RMUs (i.e. Voyageurs National Park, Nett Lake Reservation, and BWCAW) were added to recognize the unique management guidelines that apply to these units.

Figure 3.1

ORR AREA FOREST RESOURCE MANAGEMENT UNITS

- 1. Pearl Lake
- 2. Voyageurs National Park
- 3. Long Lake
- 4. Nett Lake
- 5. Pelican Lake

- 6. Little Fork River
- 7. Embarrass
- 8. Laurentian Divide
- 9. Burntside Lake
- 10. Boundary Waters Canoe Area Wilderness




Department of Natural Resources
Division of Forestry
 1985

Scale 1:500,000
1 inch equals approximately 8 miles
 10 5 0 10

PEARL LAKE RESOURCE MANAGEMENT UNIT -- RMU 1

Pearl Lake RMU, consisting of 150,000 acres of land and water, is located in the northwest corner of the Orr Area. The town of Ray is the only part of the RMU with significant population. Much of the land in this unit is intensively managed for timber production. An abundance of forest roads and wildlife populations found in the diverse aged aspen forest have made this unit a popular outdoor recreation area.

Land Use, Ownership and Administration

Description

Land Use - From the time of the first logging activity in the area (circa 1910) to the present, land use has been almost exclusively forest related, with timber production being the primary use. Other uses are seasonal and generally recreation oriented. These include hunting, trapping, and berry picking.

Drastic changes in land uses in the short term are not expected. What can be expected is more demand for use of forest land for special uses. In 1983, intensive testing of the granitic bedrock formations near Pearl Lake was done to determine the suitability of the site for a hazardous waste repository. These types of granitic formations are also candidate sites for nuclear waste storage.

Land Ownership and Administration - The Pearl Lake Unit consists of approximately 150,000 acres of land and water. Ownership is 39% state (57,807 acres), 2% county (2,250 acres), 24% industrial, 20% federal, and 15% private. Major land administrators include the DNR Division of Forestry, Superior National Forest, and Boise Cascade. Ownership by the major landowners is for the most part in a number of fairly large blocks. Despite this fact, there are many opportunities to further consolidate ownerships to improve management efficiency.

All DNR administered lands within the St. Louis County portion of this RMU are part of the Kabetogama State Forest. In Koochiching County, there are 28,804 acres in the Koochiching State Forest. Ninety seven percent of the DNR land in the RMU is trust fund land; the remaining three percent was acquired by purchase (see Table 3.1).

Table 3.1 Land Status and Management Unit Designation of DNR Administered Land in the Pearl Lake RMU.

Land Status	Management Unit	
	Kabetogama SF	Koochiching SF*
AA School Trust	4,800	3,200
BA Indem School Trust	12,790	4,486
AB School Trust Exch.	150	--
BJ School Trust M&O	--	1,960
CA Swamp Trust	6,672	17,519
CB Swamp Trust Exch.	2,052	840
CJ Swamp Trust M&O	569	799
LG Acquired Purchase	1,970	--
Total	29,003	28,804

* There are 1,960 acres of BJ land and 799 acres of CJ land that are in both Admin. & Scattered and Koochiching state forests as a result of mistakes in 1985 Minn. Laws Chapter 191.

The entire Pearl Lake RMU falls within the Metallic Mineral Potential Class D. Very little mineral exploration has been done in this unit. No extensive surveys of the peat resource have been conducted. Gravel deposits in this RMU are associated with the Canadian Shield landform. There are 13 gravel pits in this RMU.

The Division of Forestry administers 22 leases in this RMU. Nearly one-half of the hunting cabin leases in the Orr Area are in this RMU.

Table 3.2 Forestry Administered Leases in the Pearl Lake RMU.

Purpose	#
Gravel	1
Park	1
Service Station	1
TV Signal Tower	1
Radio Tower	1
Road Right of Way	2
Hunting Cabin	15
Total	22

Guidelines

There are two alternative land ownership strategies for this RMU. The first involves exchange of state administered lands in the BWCAW for federal lands in the Kabetogama Purchase Unit. Under this alternative the state would acquire all or most of the federal land in the RMU while retaining existing state lands. The second alternative would simply consolidate state ownership in the RMU without making major changes in the total acreage administered by various landowners. The first alternative is preferred.

Under the second alternative the state would try to consolidate its ownership in townships 68-20 and 68-21. Other areas to be acquired by exchange would include lands adjacent to County Road 520 and Pearl Lake State Forest Road in 67-21, Sheep Ranch State Forest Road in 67-20, and County Road 518 in 66-21.

Koochiching County administers 2,208 acres of land in the north half of 68-22. Exchanges to consolidate state holdings in this township would be beneficial.

There are opportunities to consolidate state and Boise Cascade ownerships in the Koochiching County portion of this RMU.

Appendix D lists 2,266 acres of state land that would be available for exchange in this RMU under the second alternative.

Soil and Water Resource Protection

Description

Soils - Three soil resource units predominate: The Agassiz Lacustrine Plain - Little Fork River Section (1A), Agassiz Lacustrine Plain - Ash River Section (1B), and Canadian Shield - Vermilion Lake Section (19F). Soils within units 1A and 1B are generally clayey. Soil types in 19F vary considerably but are generally classified as upland loamy-sandy soils. Shallow depth to bedrock is often encountered on 19F soils. Table 3.3 lists the soil types within the RMU and the percentage of the unit occupied by each.

Large areas of upland varying in relief from 50-100 feet, interspersed with shallow peat swamps and waterways are the major landforms of this unit. Topographical relief tends to be greater in the eastern and southern portions of the unit.

Table 3.3 Soil Types in the Pearl Lake RMU

Atlas Code	Soil Type Description	Percent of RMU
CCWL	Upland Clayey Dry	33
RLWL	Upland Shallow Coarse Loamy Dry	25
NP	Lowland Organic Acid to Neutral	20
AP	Lowland Organic Very Acid	6
R	Upland Extremely Shallow Coarse Loamy Droughty	4
RLWL	Upland Very Shallow Coarse Loamy Droughty	3
SSWL	Upland Sandy Dry	3
CSPL	Lowland Sandy over Clayey Wet	3
CCPL	Lowland Clayey Moist	3

Data Sources: Minnesota Soil Atlas (Univ. Minn., 1971 & 1981) and Superior National Forest Ecological Land Classification System

Soil productivity as it relates to timber production is very high for most upland soil types. Fully stocked aspen stands on the better sites in soil resource units 1A and 1B commonly yield 50-60 cords/acre at 50 years. The average yield for stands 51-60 years old with a site index of 71 or greater is 38-43 cords/acre. Yields from stands in landscape unit 19 F are somewhat lower, with the better sites averaging 32-35 cords/acre at 51-60 years.

The clayey soils, which predominate in this unit, are particularly vulnerable to degradation from compaction and rutting. Management activities including timber harvesting, site preparation, and road building can adversely effect future productivity of the soils. Factors such as activity location, timing, and type of equipment can have a direct bearing on the degree of impact a particular activity has on a site.

Waters - There are two lakes in this RMU; Pearl Lake (90 acres) and Little Lake (18 acres). Both lakes are primarily surrounded by state land (Pearl 75%) and (Little 80%). These lakes are bog lakes with large areas of muskeg contiguous to the open water. There is no game fish population in either lake. There are nine rivers and streams within this RMU classified as protected waters.

Guidelines

Soils - Management guidelines for the major soil types are in Appendix F.

Waters - Areawide guidelines apply.

Forest Roads

Description

The scattered land ownership pattern in the Pearl Lake RMU is responsible for the development of an administratively complex system of roads. Most of the existing forest road system has been constructed and maintained by the Boise Cascade Corporation, their loggers, or the Superior National Forest. The alignment of these roads naturally favors Boise Cascade and Superior National Forest lands, but management of state lands has also benefited. The system however is not fully developed nor does it entirely serve the needs of state land management or the state's responsibility for fire protection.

Table 3.4 Inventoried State Forest Roads in the Pearl Lake RMU.

Number	Road Name	Miles	Class
190	Pearl Lake/Johnson Farm	7.0	4
189	Sheep Ranch	3.5	4
Total		10.5	

Guidelines

The Rat Root River Road project in T68 R21 and T68 R22 will provide access to about 6,600 acres of state land. The project includes 4.5 miles of new road construction and 1.6 miles of reconstruction at class 4 standards. A bridge will be constructed across the Rat Root River. Since wildlife habitat improvement will be done in the area served by the road, a portion of the project may be funded through the Reinvest in Minnesota (RIM) program. The reconstruction is across Boise Cascade land so a 1.6 mile easement is necessary.

The Pearl Lake Road is an existing road on state land in T67 R21. Three and two tenth mile of road needs upgrading to class 4 to provide access to an area of high fire potential including areas of logging slash and young plantations. There will be limited timber harvesting during the first ten year period but activity will increase significantly in the second ten year period.

The Biondich Road is an existing non-inventoried road that crosses Boise Cascade, USFS, and state land in the southern portion of T67 R22. The project includes upgrading 6.5

miles of road to class 4 standards to provide access to state lands for timber management and fire protection. Three easements totaling 4.6 miles are necessary.

Additional easements to insure access to state lands include:

Location	Miles
T68 R20 S31	0.25

The mileage of maintained state forest road in this RMU is expected to increase from the current 12 miles to 23 miles by 1996.

Supporting documentation and cost estimates for these road projects are included in Appendix C.

Forest Recreation

Description

Hunting, trapping, berry picking, snowmobiling, and ATV use are the primary recreational activities in this unit. Developed recreational facilities are few. Use is seasonally heavy with people from the local communities and the Iron Range being the primary users. Resource characteristics which attract the user are:

1. Good populations of game species because of habitat created by extensive timber harvesting operations.
2. Good access to the forested area via extensive network of forest roads and logging trails.
3. Hunting cabin leases on Boise Cascade and state lands. The state administers 15 hunting cabin leases in this unit.

A portion of the Ash River Falls Hiking and Ski Trail crosses sections 21 and 22 of 68-20.

The Tower to International Falls State Trail crosses this unit from north to south, roughly parallel to and east of Highway 53.

This resource unit has the potential to provide increased dispersed recreation opportunities.

Guidelines

There are no plans for facility development in this unit except in conjunction with existing trails. Hunting and other dispersed recreation uses will be promoted.

Fish and Wildlife Habitat Management

Description

The Pearl Lake RMU is an excellent one for the management of white tailed deer, black bear, ruffed grouse, woodcock, snowshoe hare, beaver, otter, and fisher. There are other game species in this RMU but because of their low densities they are of lesser importance.

About 75% (40,000 acres) of the state land in the unit is considered deer habitat. Much of the state land is accessible both for harvest and management purposes.

This RMU currently has 183 acres of documented openings. This is far short of the 5% (1,338 acre) goal. Even if the road right of way along Highway 53, power line rights of way, and rock outcrops are included the goal is not approached.

The deer winter cover in this RMU totals 2,776 acres and is scattered in relatively small blocks. The three largest wintering complexes are:

1. Along highway 53 from the gateway store to the Ash River Trail.
2. Section 23, Township 66N Range 22W.
3. Along the Ash River in a series of cedar stands.

Other suitable stands exist but have not yet been field checked for current use.

The aspen type comprises 66% of the deer habitat in this RMU. Aspen is very important to deer and should be maintained at this level. The Forestry - Wildlife Guidelines to Habitat Management recommend that aspen in habitat compartments be distributed equally among age classes. Evaluation shows that this RMU is short by 1,625 acres in the 1-10 year age class. The Division of Wildlife has provided the District Forester with evaluations for all four square mile compartments which detail where cutting should occur for maximum deer habitat benefit. These evaluations were used in developing the Timber Management Plan (Appendix B).

Three areas of particular importance to wildlife in the RMU are:

1. The Ash River bottomlands which provide a unique habitat combining aesthetics, unique plant communities, and special habitat for non-game species.
2. Township 67-21 where federal lands have been heavily cut with much of the land being converted to a conifer type. Deer and grouse census information show this area as having some of the lowest populations counts in the RMU.

3. Pearl Lake is used by duck hunters, but no hunter use surveys have been done on it. The Division of Wildlife is currently trying to establish wild rice in the lake and may possibly put up waterfowl nesting boxes in the area. Forest management should have little effect on the lake.

Guidelines

The three major objectives for deer habitat in this RMU are:

1. Increase permanent wildlife openings - 1,338 acres of opening are the goal which should be met through the maintenance of log landings and clearing to create new openings.
2. Maintain and enhance winter cover areas as identified in four square mile compartment analysis.
3. Disperse cutting within four square mile compartments to improve cover type and age class distributions.

Construct the Rat Root River Road in 68-22 and 68-21 north of the railroad tracks and west of the East Fork of the Rat Root River to provide access to aspen that is in need of harvesting for wildlife values.

Keep disturbance to bottomlands along the Ash and Black Duck rivers at a minimum to protect their unique wildlife habitat.

Manage state lands in township 67-21 to benefit deer and grouse to offset heavy cutting and conifer planting on federal lands.

Reserve scattered large white pine along rivers as potential bald eagle nesting sites.

Timber Management

Description

This RMU contains some of the most productive aspen sites in the Orr Area. Its proximity to International Falls markets makes it highly suitable for intensive timber management. Aspen, black spruce, and northern white cedar are the most prevalent types. Pulpwood is the primary product.

The commercial forest land base for this unit is made up of 66% upland cover types and 34% lowland cover types.

Table 3.5 Pearl Lake RMU Timber Summary

Type	Acres	% Of RMU	Avg Site Index	Avg % Updated	Over Rot. Age	% At High Risk
Ash	1304	2	42	97	73	1
Lowland Hardwoods	960	2	50	101	63	13
Aspen	23835	41	71	40	51	7
Birch	864	1	52	68	76	2
Balm of Gilead	2996	5	66	46	63	2
White Pine	537	1	44	80	53	26
Red Pine	869	1	53	51	14	1
Jack Pine	985	2	52	47	43	1
White Spruce	1212	2	59	37	24	1
Balsam Fir	2278	4	50	54	69	6
Black Spr. Lowland	7351	13	33	74	30	3
Tamarack	652	1	44	64	29	4
N. White Cedar	4829	8	27	105	23	3
Black Spr. Upland	467	1	39	52	24	0
Cutover Area	1100	2	--	--	--	--
Lowland Grass	158	0	--	--	--	--
Upland Grass	328	1	--	--	--	--
Lowland Brush	2900	5	--	--	--	--
Upland Brush	66	0	--	--	--	--
Unproductive Forest	2809	5	--	--	--	--
Non Forest	1982	3	--	--	--	--
Total	58,482	100				

On state lands, aspen is by far the most prevalent cover type, covering nearly 50% of the commercial forest land area. Though there has been substantial harvest in this type over the past 25 years, 51% of the cover type acres are over rotation age. These stands are averaging 34-35 cords per acre but the usable volume is decreasing due to disease as the stands advance in age. The harvest and regeneration of these stands over the next 20 years is essential to maximize utilization and to regulate the type to assure future sustained harvests.

The upland conifer cover types collectively make up 12% of the state commercial forest land base. The pine, balsam fir and white spruce cover types are important components in the upland forest as they break up the large, contiguous hardwood acres to create diversity in forest uses and products. Twenty four percent of the upland conifer acres are under stocked. Since 1981 there has been an expanded effort to upgrade and increase the acreage of upland conifer in this unit. Fifteen hundred acres of planting and seeding

has been accomplished over this period. This effort will continue with more emphasis placed on salvage and regeneration of the understocked stands.

The lowland forests make up 28% of the commercial forest land in this unit. Black spruce and northern white cedar predominate. Fifteen percent of the lowland conifer acres are stocked at below marketable levels. Black spruce markets have been poor in recent years. As demand increases, opportunities for increasing the productivity of the lowland sites will become available through fully restocking stands after harvest and salvaging and regenerating the poorly stocked and nonstocked lowland sites to suitable species.

The management of the northern white cedar cover type is a major concern of resource managers. The lack of cedar regeneration being the main concern. Efforts are under way to locate suitable planting sites and to evaluate various methods to successfully establish cedar. Of no less concern is the need to balance the reservation of certain existing cedar stands for winter white-tailed deer cover with the demand for quality cedar timber. Survey data beyond that collected by the phase II inventory is necessary to identify which cedar stands are or have potential to be deer yards and to determine their potential product quality.

The Ash River and Black Duck River bottomlands have been identified as a unique community by area wildlife managers. The state owns 12 miles and about 1000 acres of nearly contiguous lands along these rivers composed mostly of ash and lowland hardwoods. Nearly half of this area is managed under provisions of the Shipstead-Newton-Nolan law. The area of the bottomland outside this protective zone will be managed extensively on an all aged basis to maintain the desired wildlife habitat condition.

Access to the unit for timber management is very good as a whole. However, large tracts of state land have limited or no access. Sixty five percent of the 10 year planned harvest is located in stands one or more miles from a maintained all weather road. All weather access is at this time a major limiting factor to managing state lands in this unit. Road development will be necessary to approach the accomplishments proposed in the timber management plan.

Guidelines

Based on existing cover type conditions, timber markets, wildlife concerns, land administration proposals, and economic and biologic limitations and potentials, the composition goals listed in Table 3.6 have been established for this unit.

Timber management activities in this unit are designed to:

1. Maintain or increase the present acreage in the aspen cover type.
2. Slightly increase acreage of upland conifers by conversion of poorly stocked and poor site aspen, poor site birch and balm of Gilead, and restocking cutover and upland brush sites. The productivity of existing upland conifer will increase as salvage and regeneration of poorly stocked stands is accomplished.
3. Slightly increase lowland conifer acres mainly by conversion of low site balsam fir to tamarack and black spruce and restocking productive lowland brush areas. Increase the productivity of understocked stands through salvage and regeneration efforts.
4. Maintain the acreage in the ash and lowland hardwoods types.

Table 3.6 Pearl Lake RMU Cover Type Composition Goals

Cover Type	Present		Ten Year		Long-term	
	Acres	%	Acres	%	Acres	%
Ash	1304	2	1332	2	1332	2
Lowland Hardwoods	960	2	960	2	960	2
Aspen	23835	41	23905	41	24312	42
Birch	864	1	480	1	348	1
Balm of Gilead	2996	5	2682	5	1796	3
White Pine	537	1	299	1	151	0
Norway Pine	869	1	1502	3	2151	4
Jack Pine	985	2	1810	3	1810	3
White Spruce	1212	2	2218	4	3345	6
Balsam Fir	2278	4	1078	2	442	1
Black Spruce Lowland	7351	13	7691	13	6653	11
Tamarack	652	1	1496	3	2699	5
N. White Cedar	4829	8	4815	8	4815	8
Black Spruce Upland	467	1	453	1	179	0
Cutover Area	1100	2	272	0	0	0
Lowland Grass	158	0	126	0	126	0
Upland Grass	328	1	17	0	17	0
Lowland Brush	2900	5	2550	4	2550	4
Upland Brush	66	0	5	0	5	0
Unproductive Forest	2809	5	2809	5	2809	5
Non Forest	1982	3	1982	3	1982	3
Total	58,482	100	58,482	100	58,482	100

Much of the planned aspen harvest for this ten year period occurs in large stands or in areas of many contiguous stands of the same relative age and condition. In order to distribute the harvest and best approach the compartment guidelines set forth for wildlife management, 50% of the

cover type acres will be scheduled for harvest in these large stands for this 10 year period. Close coordination between wildlife and forestry personnel will be required to plan both the location and timing of these harvests.

Cedar stands which are known or potential deer wintering areas will be reserved for this management period. All cedar stands selected for harvest will be field checked jointly by wildlife and forestry personnel to make final determinations on reservation or harvest. All harvested cedar stands will be evaluated for cedar regeneration. Other suitable sites, particularly the poorly stocked cedar stands and nonstocked lowland sites will also be evaluated for cedar regeneration.

Ash (354 acres) and lowland hardwood (622 acres) stands in the bottomlands of the Ash and Black Duck rivers provide unique wildlife habitats and will be managed on an all aged basis. Disturbance in these areas will be kept to a minimum to protect unique wildlife habitat.

The recommended harvest for most types exceeds the sustained allowable cut so that age class regulation can be achieved in less than one rotation.

Table 3.7 summarizes the management prescriptions by type for the next ten years in the Pearl Lake RMU. Appendix B contains regeneration plans, projected future harvest levels, and lists of stands to receive various treatments.

Harvest - Up to 8,654 acres containing 239,000 cords could be harvested in this RMU in the next ten years. Hardwood types account for 76% of the area and 86% of the volume. Upland conifer types account for 11% of the area and 6% of the volume. Lowland conifer types account for 15% of the area and 8% of the volume. Recommended harvest for aspen and balsam of Gilead exceed the sustained allowable cut which reflects the age class imbalance and efforts to regulate these cover types within this unit. The recommended harvest in balsam fir reflects the need for treating a large portion of the type acreage which is over age 60.

Salvage and Recycle - Up to 1916 acres could be salvaged and an additional 4092 acres have been identified for regeneration without harvest. Upland sites have the highest potential productivity and will be evaluated first. Locating potential northern white cedar sites will also be given high priority. Attempts will be made to market merchantable timber from these stands.

Table 3.7 Management Prescriptions By Cover Type - Pearl Lake RMU

COVER TYPE	CLEAR CUT		THINNING		ALL-AGED		SALVAGE		REGEN		TOTAL	
	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES
ASH	10	114	0	0	15	354	5	74			30	542
LOW HW	3	32	0	0	25	711	0	0	2	45	30	788
ASPEN	252	5793	0	0	0	0	13	321	17	303	282	6417
PBIRCH	7	113	0	0	0	0	9	202	7	158	23	473
BALM	39	717	0	0	0	0	5	36	5	76	49	829
W PINE	2	40	0	0	0	0	6	123	2	18	10	181
N PINE	6	70	4	66	0	0	7	172	0	0	17	308
J PINE	11	153	0	0	0	0	12	185	1	7	24	345
WH SPR	11	154	0	0	0	0	6	39	1	78	18	271
BALSAM	30	390	0	0	0	0	11	150	37	680	79	1220
BL SPR	39	663	0	0	0	0	12	190	35	767	86	1620
TMRACK	3	50	0	0	0	0	9	115	7	121	19	286
WCEDAR	27	318	18	498	0	0	14	248	13	240	72	1304
UPBSPR	4	47	0	0	0	0	1	61	0	0	5	108
CUT	0	0	0	0	0	0	0	0	59	845	59	845
LOGRAS	0	0	0	0	0	0	0	0	2	32	2	32
UPGRAS	0	0	0	0	0	0	0	0	16	311	16	311
LOBRSH	0	0	0	0	0	0	0	0	14	350	14	350
UPBRSH	0	0	0	0	0	0	0	0	7	61	7	61
TOTAL	444	8654	22	564	40	1065	111	1916	225	4092	842	16291

Thinning - The potential for thinning exists on 564 acres. Of this, 498 acres are in the cedar cover type. This is part of the cedar management strategy. Stands over 200 sq. ft. of basal area will be evaluated for partial harvest to determine if some wood products can be removed while still providing adequate winter deer cover.

Artificial Regeneration - If all stands identified for harvest, salvage and regeneration without harvest are treated 6,435 acres will be artificially regenerated over the next 10 years. Appendix B contains detailed regeneration plans.

Cooperative Forest Management

Description

This RMU contains only a small amount of nonindustrial private land with a limited amount of opportunity for PFM. Most of the private landowners are absentee. Few management plans have been developed for lands within this RMU.

Guidelines

This is a low priority unit for PFM. PFM services will be provided on request.

Description

Voyageurs National Park contains 219,128 acres of land and water along the Canadian border. The Orr Area includes the southern portion of the park. Recreational uses of the park include fishing, boating, camping, hiking, nature observation, berry picking, snowmobiling, and cross country skiing. Hunting, commercial timber harvesting, and mining are not allowed. The National Park Service administers the park.

Legislation authorizing Voyageurs National Park was passed in 1971 and the park was established in 1975. The Voyageurs National Park Master Plan (US Dept. of the Interior, 1980) guides development of the park. The National Park Service is currently developing a trail plan for the park.

The Division of Forestry administers three recreational facilities immediately adjacent to the park. They are the Wooden Frog Campground (the main public campground serving Voyageurs National Park), the Ash River Campground, and the Ash River Hiking and Cross Country Ski Trail. The Park Service conducts interpretive programs at Wooden Frog Campground.

Portions of the park boundary have not been surveyed and marked on the ground.

The DNR and the National Park Service have cooperative agreements covering fire control responsibilities and other topics.

Guidelines

Maintain cooperative agreements covering fire control and other topics of mutual concern.

Survey and mark park boundaries adjacent to state land in cooperation with the National Park Service.

Explore possible park trail system connections with Wooden Frog Campground and the Ash River Hiking and Cross Country Ski Trail.

The Master Cooperative Agreement between the two agencies should be revised to include a policy on state timber sales near the park. The policy should address water quality, wildlife, and aesthetic concerns.

LONG LAKE RESOURCE MANAGEMENT UNIT -- RMU 3

The 170,000 acre Long Lake RMU is south of Voyageurs National Park. Residential and recreational development in the RMU is concentrated along the shores of Kabetogama and Crane lakes. The southern and western portions of the RMU are remote and sparsely populated. State land management in this RMU emphasizes recreation, timber, and wildlife habitat.

Land Use, Ownership and Administration

Description

Land Use - Forest based land uses, including timber production, recreation, and wildlife production, dominate this RMU. The only communities in the unit are Kabetogama, Ash River, and Crane Lake. Seasonal cabins are common on Kabetogama and Crane lakes. Little change in the existing land use pattern is anticipated.

Land Ownership and Administration - The Long Lake RMU encompasses about 170,000 acres of land and water. The land ownership distribution is 37% federal, 20% forest industry, 18% state, 17% nonindustrial private, and 8% county.

All 29,621 acres of DNR administered land in the unit are within Kabetogama State Forest and are managed by the Division of Forestry. St. Louis County administers 9,095 acres in the Pelican Lake Memorial Forest and 3,763 acres outside of memorial forests. All federal lands in the unit are part of the Superior National Forest or Kabetogama Purchase Unit. Boise Cascade is the major forest industry landowner.

Nearly all of this RMU falls within Metallic Mineral Potential Class D. A small area on the shore of Lake Kabetogama in township 69-21 has class B mineral potential. There is little peat in this RMU. The peat that is present is in small basins and drainages. Gravel resources are adequate to serve local needs.

The Division of Forestry administers 156 leases on state lands in this RMU (see Tables 3.9 & 3.10).

Table 3.8 Land Status and Management Unit Designation of DNR Administered Land in the Long Lake RMU.

Land Status	Management Unit
	Kabetogama SF
AA School Trust	7,392
AB School Trust Exch.	2,083
BA Indem School Trust	3,273
BB Indem School Trust Exch.	18
CA Swamp Trust	5,500
CB Swamp Trust Exch.	2,576
CJ Swamp Trust M&O	262
LE Acquired Condemn.	3
LG Acquired Purchase	8,514
Total	29,621

Table 3.9 Long Lake RMU - Lakeshore Homesite Leases.

Lake Name	#
Lake Kabetogama	63
Crane Lake	22
Sand Point Lake	17
Vermilion River	4
Ash River	10
Total	116

Table 3.10 Long Lake RMU - Other Leases.

Purpose	#
Gravel	3
Resorts	6
Parking Lots	1
Radio Broadcasting Towers	1
Sheriff's Building	1
Interpretive Center	1
TV Signal Tower	1
Road Right of Way	4
Multiple Use - With Buildings	1
Boat Landing/Boat Dock	10
Hunting Cabins	11
Total	40

Guidelines

The overall objective for land ownership adjustments in this RMU is to consolidate DNR administered land into larger and more accessible blocks. The major blocks of DNR administered land are currently located in townships 68-19, 68-20, and 68-21. Federal lands in these three townships are in the Superior National Forest's Kabetogama Purchase Unit and could be acquired by exchanging state land in the BWCAW.

The City of Tower has expressed an interest in exchanging its Gunderson Municipal Forest lands (except shorelands) in this RMU for lands south of township 64. Some City of Tower lands in the following sections are adjacent to state forest land and could be acquired by exchange to consolidate ownerships: 15-67-17, 2-67-19, 3-67-19, 4-67-19, 9-67-19, 10-67-19, 9-68-19, and 17-68-19. This involves about 1200 acres of city land.

The US Forest Service administers the majority of the land in the eastern portion of this RMU (ranges 17 and 18). The land north and west of the Vermilion River is in the Kabetogama Purchase Unit while that south and east of the river is in the Superior National Forest. The state could acquire federal land in the purchase unit in exchange for state land in the BWCAW. However acquisition of these large blocks of federal land would have lower priority than lands further west.

Appendix D lists 4,744 acres of state land that could be exchanged under certain circumstances to consolidate ownerships in this RMU. Many of these lands would not be exchanged if the BWCAW exchange is implemented.

Transfer the trust fund status from Wooden Frog Campground lands to acquired lands without recreation facilities so that receipts can continue to be placed in the dedicated campground fund without reducing the income generating capacity of trust lands.

Lot 3 in 17-68-19 should be acquired from Boise Cascade to permit extension of the Ash River Hiking and Ski Trail to Ash River Falls.

Soil and Water Resource Protection

Description

Soils - The majority of Long Lake RMU occurs in the Crane Lake Section of the Canadian Shield Soil Resource Unit (19B). The terrain consists of bedrock controlled hills and ridges interspersed with long, narrow drainage ways or

basins generally oriented in a northwest-southeast direction. The majority of the upland soils are formed in coarse loamy or clayey material. Pebbles and cobbles occupy 10 to 35 percent of the soil. Cobbles and boulders occupy roughly 2 to 10 percent of the ground surface. Bedrock occurs at a depth of 40 inches or less in roughly 38 percent of the unit. A dense layer commonly occurs on the coarse loamy soils. The lowlands are generally clayey or organic. The organic soils are commonly composed of more than 5 feet of moderately decomposed peat. Slope gradients range from 6 to 50 percent. Local relief may be as much as 200 feet. Minor inclusions of other soil resource units - the Vermilion Lake Section of the Canadian Shield (19F) and the Ash River Section of the Agassiz Lacustrine Plain (1B) - occur on the southwest edge of the RMU..

Table 3.11 Soil Types in the Long Lake RMU

Atlas Code	Soil Type Description	Percent of RMU
RLWL	Upland Shallow Coarse Loamy Dry	18
CCWL	Upland Clayey Dry	16
NP	Lowland Organic Acid to Neutral	14
RLWL	Upland Extremely Shallow Coarse Loamy Droughty	10
RLWL	Upland Very Shallow Coarse Loamy Droughty	10
RLWL	Upland Medium Loamy Dry	8
RLWL	Upland Coarse Loamy Over Sandy Dry	6
CCPL	Lowland Clayey Moist	6
CCPD	Lowland Clayey Wet	7
	Minor Types	5

Data Sources: Minnesota Soil Atlas (Univ. Minn., 1971 & 1981) and Superior National Forest Ecological Land Classification System

The potential productivity of the RMU for fiber production is moderate to low, however, it varies considerably depending on soil type. The upland clayey and medium loamy soils have a medium to high potential productivity while the shallow soils have very low to low productivity.

Management activities including timber harvesting, site preparation, and road building can adversely affect future productivity of a site. The clayey and medium loamy soils are susceptible to compaction and rutting. Controllable factors such as activity location, timing, and type of equipment or operation can have a direct bearing on the degree of impact a particular activity has on a site.

Waters - About 100 miles of streams and 30 lakes and wetlands within this RMU are classified as protected waters. The Vermilion, Pelican, and Ash rivers are the major streams. Lakes are well distributed throughout the unit with Kabetogama, Crane, and Johnson being the largest.

Guidelines

Soils - Duff and topsoil should not be removed to maintain the effective rooting depth in the shallow soils and to reduce frost heaving on the clayey soils. See Appendix F for additional guidelines by soil type.

Waters - Areawide guidelines apply. Shipstead-Newton-Nolan restrictions apply to about 1,000 acres of state land in this RMU.

Forest Roads

Description

Much of the DNR administered land in this RMU is inaccessible by road, especially in the eastern portion. The Forest Service administers most of the roads in ranges 17 and 18. Continued access to state land in much of the unit depends on cooperation with the Forest Service and Boise Cascade. Existing roads have been largely developed by loggers and cross several ownerships. Formal easements for right of way have not been recorded in most cases. Boise Cascade has not been willing to grant formal easements for roads crossing its lands.

There are 1500 acres of state land in township 67-19. The primary road which traverses this township is maintained by Boise Cascade. It is a segment of a multi-agency (DNR, USFS, Boise Cascade) road which links highway 53 on the west to the USFS system roads in T67 R18 and T66 R18. DNR and USFS portions of this road have recently been rebuilt. The state has interest in keeping this road in good repair primarily for access for fire control.

Township 68-19 contains about 7,000 acres of state land, the majority of which has no access or very limited winter access. In the past, the state has been able to sell softwood adjacent to the primary winter roads. The harvest of aspen has been very limited, due mainly to the fact that winter aspen is quite abundant and readily available closer to the markets. The 10 year plan calls for considerable treatment in the aspen cover type as well as harvest and salvage of over mature softwood stands and regenerating areas harvested in the past which have not been adequately restocked by natural means. To accomplish this management, the Division of Forestry will have to provide access either

by building and maintaining an all weather road or by providing winter access to stands scheduled for treatment. Building an all weather road in this area is costly due to the terrain but is the preferred alternative as it would access stands for the higher demand summer market and provide increased recreational opportunities as well. The Gannon Amundsen Road project was proposed in FY 81 (12 miles new class 4 construction). Preliminary engineering was completed on 11 miles in FY 82. This project has not been funded and is resubmitted as part of the Orr Area road plan for this ten year period.

There is considerable state ownership in larger tracts in townships 68-20, 68-21, and 69-21. Access to stands scheduled for treatment for this ten year period is adequate, using the existing winter/summer road system. The recently completed renovation at Wooden Frog Campground did not include the construction of the new access road which was in the original plan.

Table 3.12 Inventoried State Forest Roads in the Long Lake RMU

Number	Road Name	Miles	Class
185	Elephant Creek	4.0	4
187	Crane Lake Look Out Tower	1.1	4
188	Wooden Frog	0.7	4
352	Gold Mine Access	1.6	4
Totals		7.4	

Guidelines

The Wooden Frog Campground Recreation Sub-Area Plan (MN DNR - Forestry, 1984) included a plan to reroute the campground entry road to separate incompatible campground and resort traffic. The road project was deleted due to budget constraints when the campground was rehabilitated in 1985-86. The road should be completed as originally planned.

The Gannon Amundsen Road proposal is designed to provide access to about 5,500 acres of state land in townships 67-19 and 68-19. The proposed road would head north from the existing multi-agency road in T67 R19. This project will require acquisition of 5.1 miles of easements to ensure continuous public access from Highway 53. One and two tenths mile of the easement will be on existing road across Boise Cascade lands. The proposal calls for construction of 12 miles of new class 4 road.

The mileage of maintained state forest road in this RMU is expected to increase from the current 7.4 miles of inventoried road to about 20 miles by 1996.

Additional information on these road proposals is included in Appendix C.

Forest Recreation

Description

Hunting, trapping, camping, fishing, boating, snowmobiling, and nature observation are the primary recreational activities within this RMU. This RMU forms the southern border of Voyageurs National Park and contains the majority of developed recreational facilities which serve the park. There are many private resorts and lake shore cabins on Kabetogama, Crane, Elephant, and Ash lakes. Public recreation facilities are administered by the Division of Forestry and Superior National Forest. These include 3 campgrounds, a picnic area, many miles of snowmobile trail and short mileages of cross-country skiing and hiking trail.

Division of Forestry administered recreation facilities in this unit include the Wooden Frog Campground, Ash River Campground, and the Ash River Hiking and Ski Trail. The Tower to International Falls State Trail crosses the western portion of this RMU. The Division of Forestry and the US Forest Service maintain portages and campsites along the Vermilion River. Detailed descriptions of these facilities are included in Appendix A.

Guidelines

Proposed recreation developments in this RMU are:

1. Establish trees and vegetative screening between campsites, gravel roads and campsite spurs, and add two picnic sites at the Ash River Campground.
2. Designate the Vermilion River as a Canoe and Boating Route. Update the DNR - Forest Service Cooperative Management Agreement for the Vermilion River
3. Evaluate the Pelican River as a potential Canoe and Boating Route.
4. Develop a spur trail from the Ash River Hiking and Ski Trail to Ash River Falls. Develop dispersed campsites in the vicinity of Ash River Falls.
5. Consider linking the Ash River Hiking and Ski Trail to the Voyageurs National Park trail system.

6. Consider developing a hiking and interpretive trail from Wooden Frog Campground in conjunction with Voyageurs National Park.

7. Evaluate possibilities for developing or improving public access to Crane, Long, Gannon, and Amundsen lakes.

Fish and Wildlife Habitat Management

Description

This RMU includes many small lakes and the Vermilion, Ash, Pelican, and Moose rivers. It provides high value habitat for white tailed deer, black bear, ruffed grouse, woodcock, snowshoe hare, beaver, otter, and fisher. Eagles and ospreys nest in the RMU.

Approximately 78 percent (25,500 acres) of the state land in this RMU is deer habitat. Presently 60 acres of wildlife openings have been documented - far short of the five percent (1,275 acre) goal for deer habitat. There are 1,271 acres of aspen in the 1 to 10 year age class. The goal is to have 3,545 acres in that age class. Approximately 3,000 acres of deer winter cover are available in fairly scattered and relatively small blocks. The winter cover areas will be field checked to determine levels of use.

Areas of particular importance to wildlife in this RMU are:

1. The Vermilion and Pelican river rice beds. These unique areas provide feeding areas for migratory waterfowl as well as hunting opportunities for sportsmen. Wildlife personnel plan to survey waterfowl production on several lakes and streams and to conduct hunter bag checks.
2. The riparian zones associated with the rivers, streams, and lakes.
3. The oak and northern hardwood cover types which occur in limited quantities.

Guidelines

Deer habitat management objectives for this RMU are creation of permanent wildlife openings; identification, retention, and management of winter cover; and determination of deer habitat compartments that are in need of aspen or other hardwood cutting.

A 200 acre wildlife openings creation project is planned for the summers of 1986 and 1987 on state and federal lands.

Prescribed burning of rock outcrops will be done to increase blueberry production and enhance wildlife habitat.

Timber Management

Description

This unit consists mainly of aspen and upland conifer types. Management activity in the recent past has not been adequate to maintain the desired age class and stocking conditions. The majority of the stands are over mature with only about 20 percent of the commercial forest acreage under 50 years of age. The resulting decline in stand quality is particularly evident in the aspen and white pine cover types. There are significant acreages of poorly stocked upland conifers. Of increasing significance is an apparent buildup of the spruce budworm population in this RMU.

Table 3.13 Long Lake RMU Timber Summary

Type	Acres	% Of RMU	Avg Site Index	Avg % Over Updated Age	% At Rot. High Age	Risk
Ash	815	3	44	97	54	0
Lowland Hardwoods	114	0	51	82	28	0
Aspen	13068	44	71	49	68	11
Birch	390	1	54	64	66	0
Balm of Gilead	1259	4	67	49	74	0
Northern Hwds.	132	0	41	52	71	0
Oak	17	0	45	15	0	0
White Pine	2010	7	44	89	28	1
Red Pine	1111	4	46	74	16	0
Jack Pine	1674	5	53	63	83	4
White Spruce	515	2	55	59	38	5
Balsam Fir	1172	4	52	57	77	1
Black Spr. Lowland	1106	4	31	80	28	5
Tamarack	139	0	42	77	6	0
N. White Cedar	2043	7	27	114	33	2
Black Spr. Upland	152	1	43	65	44	0
Cutover Area	417	1	--	--	--	--
Lowland Grass	250	1	--	--	--	--
Upland Grass	68	0	--	--	--	--
Lowland Brush	1471	5	--	--	--	--
Upland Brush	212	1	--	--	--	--
Unproductive Forest	297	1	--	--	--	--
Non Forest	1475	5	--	--	--	--
Total	29,907	100				

Scattered ownership and difficult terrain contribute to the less than desirable access situation in this RMU. Access to state land in the central and eastern portions of the unit are inadequate to allow full implementation of the ten year

timber management plan. Where only winter access is possible, only softwood or softwood dominated sales can be sold, as winter access aspen is available closer to the mills. In the past, summer access aspen, if well presented, has eventually been sold.

Guidelines

The present hardwood to softwood ratio can provide a desirable mix of forest products provided the proper forest management practices are used to distribute age classes and provide for fully stocked stands. Table 3.14 lists the cover type composition goals for this RMU.

Table 3.14 Long Lake RMU Cover Type Composition Goals

Cover Type	Present		Ten Year		Long-term	
	Acres	%	Acres	%	Acres	%
Ash	815	3	815	3	815	3
Lowland Hardwoods	114	0	96	0	96	0
Aspen	13068	44	13146	44	13167	44
Birch	390	1	248	1	86	0
Balm of Gilead	1259	4	1160	4	902	3
Northern Hardwoods	132	0	24	0	24	0
Oak	17	0	17	0	17	0
White Pine	2010	7	1523	5	787	3
Norway Pine	1111	4	1556	5	2224	7
Jack Pine	1674	5	2648	9	3199	11
White Spruce	515	2	824	3	1298	4
Balsam Fir	1172	4	809	3	187	1
Black Spruce Lowland	1106	4	1141	4	1226	4
Tamarack	139	0	493	1	556	2
N. White Cedar	2043	7	1990	7	1990	7
Black Spruce Upland	152	1	87	0	3	0
Cutover Area	417	1	12	0	0	0
Lowland Grass	250	1	229	1	229	1
Upland Grass	68	0	52	0	52	0
Lowland Brush	1471	5	1265	4	1265	4
Upland Brush	212	1	0	0	0	0
Unproductive Forest	297	1	297	1	297	1
Non Forest	1475	5	1475	5	1475	5
Total	29,907	100	29,907	100	29,895	100

Timber management activities in this RMU are designed to:

1. Maintain the present acreage in the aspen cover type.
2. Slightly increase the upland conifer acreage by conversion of poor site aspen, birch, and balm of Gilead; and restocking deforested areas. White spruce, Norway pine, and jack pine acreages will increase.
3. Slightly increase lowland conifer acreage. The tamarack type will increase through the conversion of balsam fir.
4. Maintain the ash and lowland hardwood types.

Table 3.15 summarizes the management activities that could be carried out in the Long Lake RMU over the next ten years if markets and budgets were available. The actual level of management activities will likely be well below potential. Appendix B contains lists of stands available for various treatments, regeneration plans, and projections of long term sustained yields.

Table 3.15 Management Prescriptions By Cover Type - Long Lake RMU

COVER TYPE	CLEAR CUT		THINNING		ALL-AGED		SALVAGE		REGEN		TOTAL	
	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES
ASH	7	96	0	0	4	79	2	42	0	0	13	217
LOW HW	0	0	0	0	1	12	0	0	1	18	2	30
ASPEN	146	2699	0	0	0	0	14	279	18	319	178	3297
PBIRCH	4	57	0	0	0	0	3	39	4	51	11	147
BALM	16	308	0	0	0	0	2	15	1	4	19	327
NOR HW	1	58	0	0	0	0	0	0	2	50	3	108
OAK	0	0	0	0	1	17	0	0	0	0	1	17
W PINE	7	129	9	287	0	0	22	462	1	6	39	884
N PINE	6	78	8	62	0	0	17	332	0	0	31	472
J PINE	15	350	0	0	0	0	3	41	10	115	28	506
WH SPR	5	71	0	0	0	0	2	30	0	0	7	101
BALSAM	14	176	0	0	0	0	4	44	12	192	30	412
BL SPR	8	149	0	0	0	0	5	76	3	44	16	269
TMRACK	1	9	0	0	0	0	0	0	1	6	2	15
WCEDAR	15	154	13	124	0	0	5	137	4	64	37	479
UPBSPR	2	27	0	0	0	0	2	14	1	24	5	65
CUT	0	0	0	0	0	0	0	0	30	405	30	405
LOGRAS	0	0	0	0	0	0	1	11	0	0	1	11
UPGRAS	0	0	0	0	0	0	0	0	1	16	1	16
LOBRSH	0	0	0	0	0	0	4	103	6	103	10	206
UPBRSH	0	0	0	0	0	0	0	0	6	212	6	212
TOTAL	247	4361	30	473	6	108	86	1625	101	1629	470	8196

Harvest - Up to 4,361 acres containing 116,000 cords could be harvested from this RMU over the next ten years. Hardwood types account for 74 percent of the area available for harvest; upland conifers 19 percent; and lowland conifers 7 percent. Hardwoods comprise 67 percent of the volume available for harvest and softwoods 33 percent. The aspen market must improve and access must be developed if the available timber is to be sold. Under present conditions an estimated 30 percent of the available wood could be sold.

Salvage and Recycling - Up to 1,625 acres could be salvaged and an additional 1,629 acres could be regenerated without harvest. Aspen and upland conifer stands have the highest potential productivity and will be evaluated first. Attempts will be made to market commercial timber. Without an improved aspen market, stands will have to be recycled if the aspen type acreage is to be maintained and a desirable age class distribution attained.

Thinning - There are 473 acres that could be thinned. Approximately 500 cords of hardwoods and 2,500 cords of softwoods could be thinned from the Norway and white pine types. There is demand for quality cedar products and for winter deer cover. Cedar stands with basal areas over 200 sq. ft. were selected for partial harvests to determine if wood products can be harvested while still providing adequate winter deer cover.

Artificial Regeneration - If all stands available for harvest, salvage, and recycling are treated there will be 3,534 acres in need of artificial regeneration. Planting would be done on 1,612 acres and seeding on 1,922 acres. Appendix B contains detailed regeneration plans.

Management Restrictions - This entire RMU is within the area covered by the Shipstead-Newton-Nolan acts (Appendix G). These acts prohibit timber harvesting within 200 feet, and restrict harvesting between 200 and 400 feet of certain lakes and streams. Approximately 1,000 acres of state land fall within the SNN zones.

Timber harvest is also restricted on 302 acres of land with exceptional recreation or scenic values. Timber harvest on these lands is restricted to partial harvest of dead or dying timber, hazard reduction, or removal for facility development. Most of this land is near the Wooden Frog or Ash River campgrounds or adjacent to summer homesite leases on Kabetogama Lake or the Ash River.

Fire Management

Description

The DNR has wildfire control responsibility for all lands in this RMU. In general there is a low frequency of occurrence for fires in this unit. Fire hazards include upland conifers on droughty ridgetops, budworm killed balsam fir in the eastern portion of the unit, and slash in township 67-19. Lightning has been a major cause of fires in this unit.

Kabetogama and Crane Lake have volunteer fire departments. The DNR and Voyageurs National Park have a cooperative agreement on fire control along the park boundary. The unit is adequately covered by Township Fire Wardens.

Guidelines

Improve access to the unit and increase harvest activity in the over mature balsam fir and mixed hardwood/conifer stands.

Cooperative Forest Management

Description

Opportunities for PFM activities in this unit are limited because of the large amount of public land. Only 17% of this RMU is held by nonindustrial private landowners. A significant portion of this private land is held by absentee owners for recreational purposes. Most of the PFM work in this RMU has been in township 69-21. The area with the most potential for PFM activities lies between Crane Lake and Buyck.

The Division of Forestry provides management assistance to the City of Tower for about 4,000 acres of its Gunderson Municipal Forest Lands in this unit.

Boise Cascade has approximately 15,000 acres of its land in this RMU under auxiliary forest contract.

The DNR has cooperative agreements with Voyageurs National Park covering fire protection, fish and wildlife management, and use of DNR facilities at Wooden Frog and the old Kabetogama ranger station. VNP personnel have expressed concerns relating to boundary identification and vegetation management on state land adjacent to the park.

Guidelines

PFM services will be provided on request. As the forest matures wind and disease damage will become more apparent to landowners,

resulting in more request for assistance. Current PFM plans call for approximately 16 acres of TSI on private land in 69-21 between 1987 and 1996.

Assist the City of Tower in its efforts to exchange its land in this unit for lands closer to Tower.

All auxiliary forest cutting requests will be photo checked. Field check cruises will be made periodically on individual tracts.

The Master Cooperative Agreement between the DNR and VNP should be revised to:

1. Clarify regulation of burning permits on private land within the park.
2. Include policy on establishment and marking of the park/state land boundary.
3. Establish policy for vegetation management on state land adjacent to the park with respect to water quality, esthetics, and wildlife habitat.

Eighteen acres of land and the buildings at the old Kabetogama ranger station and 120 acres of land in section 1-68-20 will be transferred from state ownership to VNP in 1987 as part of a prior agreement. The water access at the old ranger station will be a DNR access maintained by the park.

Forest Inventory

Description

The Phase II inventory in this unit was completed in 1979-80. The majority of the field data was collected on white sheets.

Guidelines

Lands in this unit should be the first in the Kabetogama District to be reinventoried.

NETT LAKE RESOURCE MANAGEMENT UNIT -- RMU 4

Description

The Nett Lake RMU located on the western side of the Orr Area contains approximately 64,000 acres of land and water. The reservation is sparsely populated. There are no state owned lands within the boundaries of the reservation. St. Louis and Koochiching counties each have some land holdings within the reservation. The reservation contains the large but shallow Nett Lake which is a productive waterfowl resource.

Guidelines

Maintain cooperative agreements covering fire control and other topics of mutual concern.

PELICAN LAKE RESOURCE MANAGEMENT UNIT -- RMU 5

The 310,000 acre Pelican Lake RMU is located in the west central portion of the Orr Area. The southern border of the RMU roughly follows the Vermilion Moraine from Lake Vermilion to Pelican Lake. Forest related land uses dominate this RMU. Residential development is concentrated around the towns of Orr and Buyck, along highways, and on lakeshores. Timber production, wildlife habitat, and recreation are the primary uses of state land in this unit.

Land Use, Ownership and Administration

Description

Land Use - Land use within this unit is almost entirely forest related with timber production being the primary use. Other uses are seasonal and generally recreation oriented. These include hunting, trapping, and berry picking. The majority of the residential development within the unit occurs in the small towns of Orr, and Buyck, along the roads that connect these communities and around the shorelines of Pelican Lake, Lake Vermilion and a number of smaller lakes within the unit. No major land use changes are foreseen.

Land Ownership and Administration - The boundaries of the Pelican Lake RMU enclose approximately 310,000 acres of land and water. Of the approximately 270,000 acres of land in the unit 27% (73,450 acres) is administered by the DNR, 29% (76,971) by the county, 20% by nonindustrial private owners, 15% by the federal government, and 10% by industry. Major land administrators in the unit include the DNR Division of Forestry, St. Louis County, Superior National Forest and Potlatch Corporation. The land ownership pattern is more fragmented than in other RMU's. Land exchanges which would consolidate land ownerships and improve management efficiency would appear desirable within the unit.

All of the Division of Forestry administered lands in this RMU are within the boundaries of the Kabetogama State Forest.

Minerals - The northerly two thirds of the unit are in Metallic Mineral Potential Class D and the southern third is class B.

Peat - There are no large contiguous areas of peat within this unit. The peat which exists is found in small randomly scattered blocks and is generally shallow in depth.

Table 3.16 Land Status and Management Unit Designation of DNR Administered Land in the Pelican Lake RMU.

Land Status	Management Unit	
	Kabatogma SF	Water Access
AA School Trust	13,007	
BA Indem. Sch. Trust	16,751	
AB School Trust Exch.	2,643	
BB Indem. Sch Tr. Ex.	164	
BJ School Trust M&O	256	
CA Swamp Trust	24,923	
CB Swamp Trust Exch.	4,591	
CJ Swamp Trust M&O	2,812	
LB Acquired Exch.	40	
LC Acquired Gift	16	
LF 50-50	160	
LG Acquired Purchase	8,081	6
Total	73,444	6

Table 3.17 Pelican Lake RMU - Lakeshore Homesite Leases

Lake Name	
Lake Vermilion	37
Black Duck Lake	28
Pelican Lake	3
Total	68

Table 3.18 Pelican Lake RMU - Other Leases

Purpose	#
Gravel	7
Road Rights of Way	14
Telephone Station	1
Boat Landing/Boat Dock	1
Garbage Canister Collection	1
Warehouse	1
Boathouse	1
Hunting Cabin	7
Total	33

Gravel - There is high potential for gravel throughout this unit and many pits are in existence.

Leases - There are 101 leases in the unit.

Guidelines

The land ownership adjustment goal for this RMU is to consolidate DNR administered lands into larger blocks through land exchange. Appendix D lists 3,384 acres of land that are available for exchange under certain conditions.

Transfer the trust fund status from Wakemup and Hinsdale Island campgrounds to acquired lands without recreation facilities so that receipts can continue to be placed in the dedicated campground fund without reducing the income generating capacity of trust lands.

Soil and Water Resource Protection

Description

Soils - The majority of the Pelican Lake RMU occurs in the Vermilion Lake section of the Canadian Shield Soil Resource Unit (19F). Minor soil resource units include the Agassiz Lacustrine Plain (1A & 1B), the Crane Lake and Burntside Lake sections of the Canadian Shield (19B & 19E), and the Rainy Lake Moraines (18).

The terrain consists of bedrock controlled hills and ridges interspersed with long narrow drainages and lowlands. Slope gradients range from 6 to 35 percent and local relief is 50 to 100 feet.

Upland soils comprise roughly 65 percent of the RMU, as shown in Table 3.19. The majority are formed in sandy loam or loam. The amount of gravel and cobbles in the soil usually ranges from 20 to 35 percent but may be as high as 85 percent. Cobbles and boulders occupy less than 10 percent of the surface. Roughly one-third of the upland soils are less than 40 inches thick over bedrock.

Clayey soils occupy about 14 percent of the RMU in both the upland and lowland positions. They usually occur at elevations lower than 1,350 feet, primarily north and west of T65N R17W. Lowlands occupy about one-third of the RMU. The majority have either organic or clayey soils.

The potential productivity for fiber production is generally moderate, though a wide range occurs. The two major upland soils have relatively shallow rooting zones which may dry

out in the later part of the growing season. The upland clayey and medium loamy soils have the highest productivity.

Table 3.19 Soil Types in the Pelican Lake RMU

Atlas Code	Soil Type Description	Percent of RMU
RLWL&	Upland Coarse Loamy over Sandy Dry	35
RSWL	Upland Shallow Coarse Loamy Dry	16
NP	Lowland Organic Acid to Neutral	16
CCPL	Lowland Clayey Moist	6
CCPD	Lowland Clayey Wet	4
CCWL	Upland Clayey Dry	4
AP	Lowland Organic Very Acid	4
RLWL&	Upland Extremely Shallow Coarse Loamy Droughty	4
RSWL	Upland Medium Loamy Dry	3
	Lowland Loamy Wet	2
	Lowland Loamy Moist	2
RLWL&	Upland Very Shallow Coarse Loamy Droughty	2
RSWL		
SSWL	Upland Coarse Loamy Dry	2

Data Sources: Minnesota Soil Atlas (Univ. Minn., 1971 & 1981) and Superior National Forest Ecological Land Classification System

Equipment operability is fair to good on the uplands. The two dominant soils have no major limitations other than slope. The remaining soil landscape units which occur throughout the RMU have more limitations. The clayey and loamy soils in upland and lowland positions are susceptible to compaction and rutting. Controllable factors such as activity location, timing, and type of equipment or operation can have a direct bearing on the degree of impact a particular activity has on a site.

Waters - Over 160 miles of stream and about 40 lakes and wetlands have been classified as protected waters by the DNR Division of Waters. Major streams include the Vermilion and Pelican Rivers both of which have recreational amenities that may qualify them for inclusion in the State Canoe and Boating Route System. Larger lakes in the unit include Vermilion, Pelican, Elbow, Myrtle, Elephant, Black Duck, and Ash. These and a number of other lakes in the unit are used by fishermen hunters and boaters. Division of Forestry administered lands form at least a portion of the shoreline for most of the unit's lakes and streams.

Guidelines

Soils - Management guidelines for major soil types are in Appendix F.

Waters - Areawide guidelines apply.

Forest Roads

Description

The scattered land ownership pattern within this RMU makes it necessary to acquire numerous easements to insure access to lands scheduled for management in the next ten year period. New and upgraded roads are needed in a number of instances to enable planned harvesting and management activities to occur.

Table 3.20 State Forest Roads in the Pelican Lake RMU

Number	Road Name	Miles	Class
356	Ash Lake Access	0.4	4
244	Myrtle Lake Branch	1.3	4
355	Black Duck Lake Access	1.0	4
354	Elephant Lake Lookout	0.5	4
222	Elbow Lake	5.2	4
353	Niles Bay	3.1	4
183	Townline	9.5	4
Total Miles		21.0	

Guidelines

The Wakemup Bay Campground Road project is a 0.5 mile, class 2, reroute of a county road which currently passes through the Wakemup Bay Campground. The existing road which serves cabin owners presents a safety hazard to campground, beach, and access users at the campground. The rerouting of this road should be a cooperative project with St. Louis County.

The Shively Falls Access Road project in T63 R17 S2 is for construction of 0.75 miles of class 4 road to access state land and to serve as a parking area for a carry-in water access site on the Vermilion River near Shively Falls.

The Haley Road project in T63 R19 S4, 5, 9, 10, 11, 14, 15, 16, and 23 is for 6 miles of new class 4 road to provide summer access to about 3,800 acres of state land. Several

easements totaling 2 miles are necessary. This road should be gated after construction.

The "5" Bones Road project in T63 R17 S20, 16, and 17 is for 5.75 miles of class 4 road to provide summer access to about 1,200 acres of state land. This project includes the upgrading of two non-inventoried roads, the 1.5 mile Niles Bay Extension Road and 1.75 miles of an unnamed road and constructing 3.0 miles of new road. One easement of 0.7 miles is necessary from the county.

The Black Duck Grade project in T66 R19 S8, and 7 and T66 R20 S1, 11, 12 is for 1.5 miles of of class 4 road to provide summer access to 1400 acres of state land. This project includes the upgrading of 0.5 miles non-inventoried road and construction of 1.0 mile of new road. It requires acquisition of one 0.3 mile easement.

The Hanson Road project in T65 R20 S5, and 6 and T66 R20 S1 is for 2.5 miles of class 4 road to provide summer access to 4,800 acres of state land. This project includes the upgrading of 1.5 miles of non-inventoried road and construction of 1.0 mile of new road.

The Cut Root Road project in T63 R19 S27, 28, 29, 33, and 34 is for 2 miles of class 4 road to provide summer access to 1,000 acres of state land.

The Hoodoo Lake Road project in T63 R19 S3 is for the reconstruction of 0.75 miles of non-inventoried class 5 road to provide winter access to about 300 acres of state land.

The Bearscratch Road project in T66 R19 S8 is for the upgrading of 2 miles of non-inventoried road to class 4. This road was originally built with wildlife funds and accesses 2,900 acres. Funds from the Reinvest in Minnesota program could be used for a portion of this project since it will be used to improve wildlife habitat.

The Clover Road project in T66 R19 S26, and 27 is for the upgrading of 1.5 miles of non-inventoried road to class 4. This road was originally built with wildlife funds and accesses 2,000 acres. Funds from the Reinvest in Minnesota program could be used for this project since it will be used to improve wildlife habitat.

The Niles Bay Road project in T63 R17 S10 is to reconstruct 3.1 miles of deteriorated class 4 road. This road accesses a large block of conifer plantation and several lake homes.

The Autio Road project in T64 R19 S15 and 16 is to upgrade 1 mile of non-inventoried road to class 4. This road provides access to about 720 acres of state land. Because of the

large amount of county land in the vicinity of this road the possibility of a cooperative project with St. Louis County should be explored.

Additional easements needed to insure access to state lands include:

Location	Miles	Location	Miles
T63 R19 NE 1/4	.50	T63 R19 S7	.50
T63 R19 S21	1.50	T63 R19 S21	1.00
T63 R19 S17,18,20,21	.50	T66 R20 S17, 20	.75
T65 R18 S23	.50	T64 R17 S35, 36	.25
T66 R20 S26	.25	T65 R21 S27, 23	.50
T64 R19 S1	.25	T64 R19 S20	.25
T65 R18 S23	.50		

Maintained state forest road in this RMU could increase from the current 21 miles of inventoried road to about 50 miles by 1996 if all proposed road projects are completed.

Forest Recreation

Description

Fishing, hunting, swimming, camping, snowmobiling, ATV use, berry picking, and nature observation are the primary outdoor recreation activities in this unit. Use is seasonal with most use occurring during the summer and hunting season. The unit's large lakes, particularly Pelican and Vermilion, draw large numbers of recreationists from outside the local area. The Vermilion and Pelican rivers are used by canoeists, fishermen, and hunters. The unit's large public land base is well suited to dispersed recreational activities.

Recreation development includes summer homesite and resort development on most of the larger lakes. A number of the resorts have small camping areas. Almost all of the public outdoor recreation facilities within the unit are administered by the DNR Division of Forestry. These include campgrounds, trails, and a beach. The DNR Trails and Waterways Unit administers the Tower to International Falls State Trail which passes through the unit.

There appears to be a need for increased public recreation development to meet demand for camping and cross country skiing in portions of this unit where no public facilities currently exist. There also appears to be a need to provide more dispersed campsites for motor boat users to replace sites lost when BWCAW lakes were closed to motorized traffic.

Division of Forestry administered recreation facilities in the Pelican Lake RMU are:

Wakemup Bay Campground - Located on Wakemup Bay on Lake Vermilion (36-63-18). Facilities include 21 campsites, 8 pit toilets, a 3 site picnic area with pavilion, a beach with changing houses, a water access and a short hiking trail.

Hinsdale Island Campground - Located on Lake Vermilion (36-63-17). Facilities include 10 individual primitive campsites on an island in Lake Vermilion.

Vermilion River CCC Camp Day Use Area - Located on the Vermilion River (35-65-17). Facilities include one picnic site, two pit toilets, a five car parking lot, and a carry in water access.

Haley Snowmobile Trail - This 12 mile snowmobile trail connects Cook and Gheen. Portions of this trail have recently been incorporated into the Tower to International Falls State Trail.

Frazer Bay Snowmobile Trail - This 12 mile snowmobile trail runs from Frazer Bay on Lake Vermilion to Cook. The entirety of this trail has been incorporated into the Tower to International Falls State Trail.

Elbow River Snowmobile Trail - The eastern most 6 miles of this snowmobile trail is now a portion of the Tower to International Fall State Trail. The western four miles is part of a route that leads to the city of Orr.

Myrtle Lake Snowmobile Trail - The entirety of this trail has recently been incorporated into the Tower to International Falls State Trail.

Ash Lake Snowmobile Trail - This 16 mile trail connects Orr and Ash Lake. The potential exists to extend this trail to the east to connect to the Tower to International Falls State Trail. This additional trail segment would form a loop system with Orr being the major beginning and ending point.

Guidelines

Upgrade Wakemup Bay Campground by carrying out the following actions:

1. Enlarge access parking lot.
2. Construct portable dock.
3. Construct fish cleaning house.
4. Construct 8 vault toilets; 2 should be handicapped accessible.

5. Reroute road around campground in cooperation with St. Louis County.
6. Remove abandoned road in campgrounds.
7. Expand beach area.
8. Develop 3 campsites on abandoned roadway.
9. Remove 3 or 4 campsites from lower portion of campground.
10. Plant trees in areas where campsites are removed and in other open areas of the campground.
11. Construct 4 tent only campsites.
12. Construct parking area for tent only campsites.
13. Regravel all interior campground roads and install erosion control measures on hill portions of road.
14. Regravel and define all campground spurs with poles.
15. Develop fishing pier.
16. Develop information board.
17. Repair and define tent pads.

Develop 3 new sites at Hinsdale Island Campground.

Upgrade the Vermilion River CCC Camp by carrying out the following actions:

1. Develop three carry in campsites.
2. Construct one unisex handicapped accessible vault toilet.
3. Gravel road and parking lot.
4. Place sign at entry to road.
5. Place information board at the water access site.

Develop 10 dispersed campsites on Wolf Bay of Lake Vermilion with picnic tables, fire rings, and open air pit toilets. Provide landing and mooring areas for boats. Areas selected for campsites must first be evaluated as potential eagle nesting habitat.

Delete those portions of snowmobile trail which have been incorporated into the Tower to International Falls State Trail from unit trail inventory records. Continue to maintain those portions of the Elbow Lake Trail and the Ash Lake Trail which were not incorporated and extend the Ash Lake Trail to connect to the Tower to International Falls Trail. These segments of the Elbow Lake, Ash Lake, and Tower to International Falls Trails would then form a loop system with the major beginning and terminating point at Orr. Discontinue maintenance of the portion of the Haley Trail which was not incorporated into the Tower to International Falls Trail and delete it from the trail inventory records.

Develop 11 miles of cross-country ski trail (Pin Cherry Road Ski Trail) fifteen miles north of Cook on County Road #24.

Propose the inclusion of the Pelican and Vermilion rivers in the State Canoe and Boating Route System. Update the DNR - Forest Service Cooperative Agreement for Management of the Vermilion River.

Fish and Wildlife Habitat Management

Description

There are many lakes in this unit including parts of Lake Vermilion and Pelican Lake. These two lakes as well as several other lakes and rivers have nesting bald eagles and ospreys. Exceptional streams with valuable adjoining wildlife habitat include the Vermilion, Pelican and Elbow rivers. Duck hunting is an important activity on many of this RMU's lakes and streams. Waterfowl nesting boxes have been installed on a yearly basis in this RMU.

Over 70% of this unit's state land is upland deer habitat. Wildlife management has been directed primarily towards white tailed deer. This RMU currently has 159 acres of documented openings with another 126 acres scheduled for treatment during the summer of 1986. This is far short of the 5% (2,709 acre) goal. Although a considerable portion of this unit has been logged in the recent past, less than 10% of the aspen is in the 1-10 year old age class.

Northern white cedar stands in this RMU are of critical importance to wintering deer. Numerous deer wintering areas are found in the RMU. The Elephant Lake complex has received considerable attention from wildlife personnel and a plan has been written for its management. Additional surveys are needed to locate and assess the importance of the other wintering areas in this unit.

A ruffed grouse management area has been established in 16-64-20. Cutting in this section is done to maximize ruffed grouse habitat.

There are large acreages of lowland brush, black ash, black spruce, and birch in this RMU with significant wildlife value.

Guidelines

Wildlife personnel will complete compartment evaluations for the Pelican Lake RMU and will make them available to the Division of Forestry.

Ongoing wildlife opening maintenance and development is planned on state and federal land in this unit.

A hardwood hand felling project to be funded by wildlife is proposed in the Elephant Lake deer wintering area.

The great blue heron nesting colonies found in this unit will be managed in accordance with the Forestry - Wildlife Guidelines to Habitat Management.

Surveys of waterfowl hunting activities on lakes and streams should be completed to provide a better picture of resource use. Additionally, the RMU's lakes and streams should be surveyed and hunters bags checked to better determine management needs and goals. Waterfowl nesting boxes should continue to be installed on an annual basis.

Young hardwoods particularly in the 1-20 year age class are of particular importance to a variety of wildlife species. Forestry and Wildlife personnel should work together towards improving the age class distribution of the hardwoods (aspen, birch) in this RMU. Management options for the birch resource in this RMU should be jointly reviewed by forestry and wildlife personnel.

The cutting of northern white cedar should be delayed until it is absolutely necessary to maintain this important deer winter habitat. When cedar is cut every effort should be made to regenerate this species. If areas suitable for planting white cedar are found, consideration should be given to establishing additional acres of this species.

Continue to follow the cutting plan in the Ruffed Grouse Management Area (16-64-20).

The Elephant Lake deer wintering area in township 66-19 has been managed cooperatively by all public agencies owning land within the township. This cooperation should continue so that the value of this wintering area is insured and habitat improvement goals are achieved.

Timber Management

Description

Aspen is the most common type covering 40 percent of the state land in this RMU. Black spruce is the most prevalent softwood type with 13 percent of the RMU. Unproductive forest types and lowland brush comprise 10 percent of the area.

Table 3.21 Pelican Lake RMU Timber Summary

Type	Acres	% Of Area	Avg Site Index	Avg % Updated Age	% Over Rot. Age	% At High Risk
Ash	1296	2	43	100	53	2
Lowland Hardwoods	159	0	43	88	78	0
Aspen	30720	40	68	49	62	21
Birch	4323	6	52	71	73	12
Balm of Gilead	289	0	66	50	44	10
Northern Hwds.	82	0	51	33	35	0
White Pine	382	1	47	98	53	5
Red Pine	2998	4	52	57	14	1
Jack Pine	2536	3	55	51	37	17
White Spruce	623	1	54	42	1	0
Balsam Fir	4081	5	50	57	82	4
Black Spr. Lowland	9537	13	33	74	22	2
Tamarack	537	1	36	73	0	1
N. White Cedar	4203	6	27	113	33	3
Black Spr. Upland	290	0	43	89	78	19
Cutover Area	2103	3	--	--	--	--
Lowland Grass	448	1	--	--	--	--
Upland Grass	44	0	--	--	--	--
Lowland Brush	3930	5	--	--	--	--
Upland Brush	189	0	--	--	--	--
Unproductive Forest	3535	5	--	--	--	--
Non Forest	3933	5	--	--	--	--
Total	76,238	100				

Guidelines

Table 3.22 lists the cover type composition goals for this RMU. Birch and balsam fir types will decline and Norway and jack pine types will increase.

Table 3.23 summarizes the management activities that could be carried out in the Pelican Lake RMU over the next ten years if markets and budgets were available. The actual level of management activities will likely be well below potential. Appendix B contains lists of stands available for various treatments, regeneration plans, and projections of long term sustained yields.

Table 3.22 Pelican Lake RMU Cover Type Composition Goals

Cover Type	Present		Ten Year		Long-term	
	Acres	%	Acres	%	Acres	%
Ash	1296	2	1201	2	1500	2
Lowland Hardwoods	159	0	107	0	70	0
Aspen	30720	40	30750	40	30750	41
Birch	4323	6	3232	4	2300	3
Balm of Gilead	289	0	270	0	270	0
Northern Hardwoods	82	0	58	0	80	0
White Pine	382	1	375	0	750	1
Norway Pine	2998	4	5116	7	5538	7
Jack Pine	2536	3	3849	5	4000	5
White Spruce	623	1	1060	1	1600	2
Balsam Fir	4081	5	3152	4	2000	3
Black Spruce Lowland	9537	13	9703	12	9700	13
Tamarack	537	1	822	1	1200	2
N. White Cedar	4203	6	4277	6	4277	6
Black Spruce Upland	290	0	190	0	140	0
Cutover Area	2103	3	1870	2	0	0
Lowland Grass	448	1	448	1	448	1
Upland Grass	44	0	5	0	5	0
Lowland Brush	3930	5	3753	5	3000	4
Upland Brush	189	0	22	0	22	0
Unproductive Forest	3535	5	3535	5	3535	5
Non Forest	3933	5	3933	5	3933	5
Total	76,238	100	77,728	100	75,118	100

Harvest - The TMPIS identified 13,589 acres available for harvest by clear cutting in this RMU over the next ten years. The aspen type accounts for 73 percent of this acreage.

Salvage and Recycling - Up to 2,159 acres could be salvaged and an additional 2,711 acres could be regenerated without harvest. These activities are designed to replace marginally commercial and noncommercial stands on productive sites with fully stocked stands suited to the site. Aspen accounts for 1,770 acres to be salvaged or recycled. Treatment of these stands will improve the aspen age class distribution, provide wildlife habitat, and help ensure a sustained yield of aspen in the future.

Thinning - There are 198 acres of Norway pine that should be thinned.

Table 3.23 Management Prescriptions By Cover Type - Pelican Lake RMU

COVER TYPE	CLEAR CUT		THINNING		ALL-AGED		SALVAGE		REGEN		TOTAL	
	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES
ASH	13	149	0	0	0	0	0	0	7	127	20	276
LOW HW	3	18	0	0	0	0	1	13	1	21	5	52
ASPEN	319	9871	0	0	0	0	38	1032	36	738	393	11641
PBIRCH	34	757	0	0	0	0	9	228	16	352	59	1337
BALM	5	76	0	0	0	0	0	0	3	81	8	157
NOR HW	1	8	0	0	0	0	0	0	2	25	3	33
W PINE	2	29	0	0	0	0	6	69	0	0	8	98
N PINE	22	262	19	198	0	0	4	199	3	26	48	685
J PINE	37	450	0	0	0	0	1	18	3	32	41	500
WH SPR	4	32	0	0	0	0	4	179	0	0	8	211
BALSAM	35	799	0	0	0	0	2	18	8	134	45	951
BL SPR	47	688	0	0	0	0	18	403	17	339	82	1430
TMRACK	4	43	0	0	0	0	0	0	3	48	7	91
WCEDAR	27	343	0	0	9	206	0	0	8	120	44	669
UPBSPR	2	64	0	0	0	0	0	0	3	52	5	116
CUT	0	0	0	0	0	0	0	0	10	233	10	233
LOGRAS	0	0	0	0	0	0	0	0	0	0	0	0
UPGRAS	0	0	0	0	0	0	0	0	3	39	3	39
LOBRSH	0	0	0	0	0	0	0	0	6	177	6	177
UPBRSH	0	0	0	0	0	0	0	0	14	167	14	167
TOTAL	555	13589	19	198	9	206	83	2159	143	2711	809	18863

Artificial Regeneration - If all stands available for harvest, salvage, and recycling are treated there will be 6,827 acres in need of artificial regeneration. Planting would be done on 4,373 acres and seeding on 2,454 acres. Appendix B contains detailed regeneration plans.

Fire Management

The lack of people in much of the backcountry area of this unit accounts for the low historical incidence of fire. Heavy fuels (in large contiguous plantations), hilly topography, and lack of fire breaks give this unit high potential for severe forest fires. Certain areas within the unit have higher than average potential for fire problems. These include heavily developed lakeshores and areas in proximity to cities. Other areas of high fire potential include large contiguous pine plantations from 15 to 25 years of age in townships 64-17 and 64-18. Plantations in 63-17 will reach that age in the next 10 years. Because of the large number of lakes and lack of roads it is often necessary to use boats to get to fires.

Cooperative Forest Management

Description

Auxiliary Forests - Boise Cascade Corporation has lands in this RMU designated as auxiliary forest for which the Division of Forestry must approve management practices.

Private Forest Management - PFM potential is high within this unit as approximately 21% or 57,000 acres are held by private nonindustrial land owners. There are a number of old fields in townships 64-17 and 65-17 which have the potential to be planted. These fields also provide sharp tail grouse habitat in their open state.

Urban Forestry - Urban Forestry in this unit has been minimal. Some potential exists in the small municipalities for urban tree planting.

School and Municipal Forests - The Orr School District has a 40 acre forest in 7-64-19. The Division of Forestry is responsible for management assistance on this parcel if requested by the school board. There are also City of Tower Municipal Forest lands in this unit.

Guidelines

Private Forest Management - Actively contact individuals with old fields in unit and discuss forestry and wildlife opportunities. Work with personnel from the Division of Wildlife during the initial contact phase and during the development of subsequent management plans. Current PFM plans list approximately 14 acres of TSI to be done in private plantations between 1987 and 1996.

School and Municipal Forests - Assist The City of Tower in exchanging approximately 1,100 acres of land in this unit for lands closer to Tower.

Forest Inventory

Description

Much of the forest inventory for this unit is among the oldest in the state. Its age and poor quality dictates a need for update.

Guidelines

Inventory for townships 63-17, 63-18, 63-19, 64-17, 64-18, and 64-19 should be updated because of age and poor quality.

LITTLE FORK RIVER RESOURCE MANAGEMENT UNIT -- RMU 6

Summary

The 225,000 acre Little Fork River RMU is located in the southwest portion of the Orr Area. Roughly it extends from Lake Vermilion on the east to the western border of the Area. Forests cover about 75% of the RMU with open or agricultural land accounting for most of the remaining area. This RMU contains the highest percentage of agricultural land in the Orr Area. The majority of the RMU's population lives in the city of Cook and surrounding agricultural areas. There are numerous seasonal cabins on the shore of Lake Vermilion's Frazer Bay. Timber production, wildlife habitat, and recreation are the primary uses of state land in this unit.

Land Use, Ownership and Administration

Description

Land Use - Forests cover about 75% of this RMU with open or agricultural land accounting for most of the remaining area. Major forest uses are timber production and recreation, including hunting and trapping. Approximately 15% of the RMU is currently used for agricultural crops. This RMU has more agricultural use than any other in the Orr Area. Farms are most prevalent in townships 61-18, 61-19, 62-19, and 63-20.

The remaining open land is abandoned marginal farmland that may be occasionally used for hay or crop production or is in various stages of reversion to brush and tree cover. The amount of land actively farmed varies with changes in the agricultural economy.

Cook is the largest city in the RMU. The majority of the population lives in Cook and the surrounding agricultural areas. There are several seasonal cabins on Frazer Bay of Lake Vermilion.

Little land use change is foreseen.

Land Ownership and Administration - The Little Fork River RMU contains approximately 225,000 acres of land and water. Of the approximately 223,000 acres of land in the unit 28% (61,400 acres) is administered by the DNR, 16% (36,482 acres) by the county, 1% by the federal government, 51% by nonindustrial private landowners, and 4% by industry. Major land administrators in the unit include the DNR Division of Forestry, St Louis County, Koochiching County, the U.S. Forest Service, and Diamond International Corporation. The

land ownership pattern in the unit is scattered although four relatively large contiguous blocks of state land do exist.

Table 3.25 Land Status and Management Unit Designation of DNR Administered Land in the Little Fork River RMU.

Land Status	Management Unit				Not in Unit
	Kabetogama SF	Kooch. SF	Sturgeon R. SF	Admin. & Scat.	
AA Sch. Tr.	3329	1467	1618		2471
BA Indem Sch. Tr.	9391	391	160		2302
AB School Tr. Ex.	80		153		40
CA Swamp Tr.	7711	6087	20090		5326
CB Swamp Tr. Ex.	160		160		20
EB University EX.	353				
IC Acq. Gift		80	10		
IG Acq. Purchase				<1	
Total	21024	8025	22191	<1	10159

Minerals - Over 90% of this RMU falls within Metallic Mineral Potential Class B. There are two small areas rated as Class E along the southern border of the unit in townships 61-18, 62-20, and 62-21. The entire unit has been offered in past copper nickel lease sales.

Peat - The largest concentration of peat in this RMU is located west of Lost Lake in township 62-17. The Lost Lake Peatland has been proposed for designation as a Scientific and Natural Area.

Gravel - Gravel has been mined from pits on state land. There is potential for development of additional pits.

Table 3.26 Little Fork River RMU - Leases

Purpose	#
Gravel	2
Radio Tower	1
Storage Area	1
Road Right of Way	2
Total	6

Guidelines

Management of the Lost Lake Peatland area should protect significant features pending evaluation and possible designation as a SNA (see Appendix H). All land not in management units should be given state forest status.

Soil and Water Resource Protection

Description

Soils - The majority of the Little Fork River RMU is in the Little Fork River Section of the Agassiz Lacustrine Plain (1B). The terrain consists of broad flat areas of clayey soils interspersed with large bodies of organic soils. Scattered knobs of sandy material occur throughout the RMU. About half of the clayey soils are upland clayey dry and commonly occur adjacent to major rivers. The remaining clayey soils are either moist or wet. Slope gradients in the RMU generally range from 0 to 10 percent with topographic relief of about 0 to 15 feet. Slopes along rivers have gradients of 10-25% and elevation changes 15 to 70 feet. The slopes are steeper and longer in the western part of the RMU. Other soil resource units include the Vermilion Section of the Canadian Shield (19F), the Rainy Lake Moraines (18), and the Big Rice Outwash Plain (17) on the northeast and southeast edges of the RMU.

Table 3.27 Soil Types in the Little Fork River RMU

Atlas Code	Soil Type Description	Percent of RMU
CCWL	Upland Clayey Dry	34
CCPL	Lowland Clayey Moist	28
P	Lowland Organic Undifferentiated	19
SSWL	Upland Sandy Dry	6
CCPD	Lowland Clayey Wet	5
RSWL/RLWL	Upland Shallow Coarse Loamy Dry	3
LLWL/XCWL	Upland Fine Loamy Moist	2
LLWL	Upland Coarse Loamy Dry	2
RCWL	Upland Shallow Clayey Dry	1

Data Source: Minn. Soil Atlas (Univ. Minn., 1971 & 1981)

This RMU has a moderate to high productive potential for uplands and lowlands in the Orr Area. Excess soil moisture and cool soil temperatures are the most limiting factors.

The clayey soils, which dominate this unit, are vulnerable to degradation from compaction and rutting. Management activities including timber harvesting, site preparation, and road building can adversely effect future productivity of the sites. Controllable factors such as activity location, timing, and type of equipment or operation can have a direct bearing on the degree of impact a particular activity has on a site.

Waters - About 200 miles of stream and 2 lakes in this RMU have been classified as protected waters by the DNR Division of Waters. Most streams are tributaries of the Little Fork River which flows through the unit. In addition to the Little Fork River other larger streams include the Willow, Sturgeon and Rice rivers. The only two lakes which exist in the unit are a portion of Lake Vermilion and Little Lost Lake, a lake of about 40 acres which is in a peatland area that is being considered for designation as a state Scientific and Natural Area.

Guidelines

Soils - Appendix F contains management guidelines for the major soil types.

Waters - Areawide guidelines apply.

Forest Roads

Description

The scattered land ownership pattern within this RMU makes it necessary to acquire numerous easements to insure access to lands scheduled for management in the next ten year period. A small amount of new road is necessary to provide winter access to blocks of state land.

Table 3.28 Inventoried State Forest Roads in the Little Fork River RMU

Number	Road Name	Miles	Class
262	Smith Road	3.6	4

Guidelines

The Cheney Road project in T61 R19 S5, and 6 is for 1.5 miles of class 5 road to provide winter access to 1,200 acres of state land.

The Koscielak Road project in T62 R17 S34 is for 1 mile of class 5 road to provide winter access to 640 acres of state land.

The Smith Road project in T64 R21 S25,26,27,36 involves gravelling and reconstruction of portions of this existing state forest road.

Additional easements to insure access to state lands include:

Location	Miles	Location	Miles
T63 R20 S1, 2	.50	T62 R20 S16	.25
T62 R20 S17, 20	.25	T63 R20 S2	.50
T62 R21 S16, 15	.50	T62 R21 S28	.50
T64 R22 S27	.50	T64 R22 S32	.25
T63 R20 S27	.50	T64 R22 S36	.25
T63 R20 S22,23,24,25,26	.25	T63 R22 S15, 16	.50
T63 R22 R18	.25	T62 R17 S7, 8, 9	.25
T63 R22 S28	.25	T62 R17 S28, 29	.50
T64 R22 S27	.50	T62 R17 S28, 29	.50
T62 R18 S36, 25	.50	T62 R19 S16	.25

Maintained state forest road in this RMU is expected to increase from the current 3.6 miles of inventoried road to 14 miles by 1996.

Forest Recreation

Description

Hunting is the primary outdoor recreation activity within this unit. Other activities include canoeing on the Little Fork River which is a State Canoe and Boating Route, snowmobiling on various grants in aid trails and on a short portion of the Tower to International Falls State Trail, and fishing on Frazer Bay of Lake Vermilion. Frazer Bay, which has heavy homesite development, represents almost all of the lake acreage within the unit. Other recreational development in the unit is limited to three small picnic areas and a water access site on Frazer Bay.

There is high potential for hunter walking trails on logging roads in the unit.

Guidelines

Portions of the Haley Snowmobile Trail were incorporated into the Tower to International Falls State Trail. The

remainder of the trail will be abandoned. The entire Frazer Bay Snowmobile Trail is now part of the state trail and will be maintained by the Trails and Waterways Unit.

There are no plans for additional recreational facility development. Maps showing ownership patterns and logging roads should be made available to hunters.

Fish and Wildlife Habitat Management

Description

This unit is characterized by numerous scattered small private land holdings, the presence of many old fields, and large bogs. The Little Fork, Sturgeon, and Rice rivers are the main streams.

Historically, white tailed deer have received the majority of the attention from wildlife personnel. Due to the fact that only 40% of the state land in the RMU is deer habitat, the potential of the private land base is being explored. It appears that because of the large amount of open fields on private land in this RMU that less state land will have to be put into openings than is recommended by the Forestry - Wildlife Guidelines to Habitat Management. In fact, large blocks of state land may be the best areas to maintain areas of contiguous forest cover in this RMU. The completion of compartment evaluations for this RMU will assist in determining the need for and location of openings on state lands.

Several sharptail grouse dancing grounds have been identified in this unit and sandhill cranes and great gray owls have been reported. The 1300 acres of tamarack in this unit may be important for great gray owl nesting.

Part of the Lost Lake peatland which has been proposed as a SNA is located within this unit (see Appendix H).

Guidelines

Complete compartment evaluations within this RMU. The need for openings and their location on state land should be documented.

Forest composition goals for state land in the unit are as follows:

1. 25% of all aspen (3647 acres) should be in the 1-10 year old age class. Currently 8% (1248 acres) are in this age class.

2. 5% of the upland acreage (1242 acres) should be in wildlife openings. This amount may be reduced because of the numerous private fields adjacent to state lands within this unit.

3. Young hardwoods particularly in the 1-20 year old age class are of critical importance to a variety of wildlife species. Forestry and Wildlife personnel should work together towards improving the age class distribution of hardwoods (aspen and birch) in the RMU.

Carry out surveys to monitor the status of sharptail grouse.

Prescribe or advocate the controlled burning of lowland brush and old field areas to maintain sharptail grouse habitat in portions of townships 62-18, 62-19, and 62-20.

Develop a ruffed grouse management area in 16-62-21 and manage by harvesting timber to maximize grouse habitat.

Determine location of great grey owl habitat and assess potential of managing a contiguous tract for this species.

Due to the important role private lands play in determining the abundance and distribution of wildlife in this RMU all PFM work in the unit should be coordinated with wildlife personnel as directed in the Forestry/Wildlife Coordination Policy.

Timber Management

Description

Lowland cover types are more prevalent on state land in this RMU than in the rest of the Orr Area. Commercial black spruce covers 25 percent of the RMU, unproductive lowland types cover 24 percent, and lowland brush covers 6 percent. Aspen stands, which cover 24 percent of the RMU, are on the average younger than aspen in other RMUs. There is less cover type diversity in this RMU than in the rest of the Orr Area. With the exception of aspen and black spruce, no commercial forest type comprises more than 3 percent of the RMU.

Table 3.29 Little Fork River RMU Timber Summary

Type	Acres	% Of Area	Avg Site Index	Avg % Updated	Avg % Over Rot. Age	% At High Risk
Ash	1239	2	43	87	48	5
Lowland Hardwoods	270	0	52	77	30	10
Aspen	14564	24	68	42	25	13
Birch	1990	3	54	79	99	5
Balm of Gilead	1849	3	62	53	64	16
Northern Hwds.	7	0	54	74	0	0
White Pine	60	0	45	78	0	70
Red Pine	192	0	54	68	0	0
Jack Pine	68	0	60	54	0	0
White Spruce	987	2	59	26	4	0
Balsam Fir	1598	3	52	51	56	8
Black Spr. Lowland	15512	25	33	69	12	1
Tamarack	1280	2	40	64	21	3
N. White Cedar	1126	2	26	110	56	21
Black Spr. Upland	12	0	45	91	0	0
Cutover Area	721	1				
Lowland Grass	190	0				
Upland Grass	81	0				
Lowland Brush	3476	6				
Upland Brush	53	0				
Unproductive Forest	14953	24				
Non Forest	1488	2				
Total	61716	100				

Guidelines

Table 3.30 lists cover type composition goals for this RMU. There will be only minor changes in cover type acreages - black spruce, white spruce, tamarack, jack pine, and Norway pine will show small gains in acreage.

Table 3.31 summarizes the management activities that could be carried out in the Little Fork River RMU over the next ten years if markets and budgets were available. The actual level of management activities will likely be well below potential. Appendix B contains lists of stands available for various treatments, regeneration plans, and projections of long term sustained yields.

Table 3.30 Little Fork River RMU Cover Type Composition Goals

Cover Type	Present		Ten Year		Long-term	
	Acres	%	Acres	%	Acres	%
Ash	1239	02	1243	02	1273	02
Lowland Hardwoods	270	00	193	00	70	00
Aspen	14564	24	15237	25	15590	25
Birch	1990	03	1386	02	849	01
Balm of Gilead	1849	03	1807	03	1753	03
Northern Hardwoods	7	00	7	00	7	00
White Pine	60	00	82	00	90	00
Norway Pine	192	00	547	01	841	01
Jack Pine	68	00	153	00	375	01
White Spruce	987	02	1464	02	1784	03
Balsam Fir	1598	03	860	01	347	01
Black Spruce Lowland	15512	25	16102	26	16282	26
Tamarack	1280	02	2173	04	2223	04
N. White Cedar	1126	02	1129	02	1061	02
Black Spruce Upland	12	00	0	00	0	00
Japanese Larch	0	00	34	00	34	00
Cutover Area	721	01	86	00	86	00
Lowland Grass	190	00	190	00	190	00
Upland Grass	81	00	56	00	56	00
Lowland Brush	3476	06	2512	04	2350	04
Upland Brush	53	00	14	00	14	00
Unproductive Forest	14953	24	14953	24	14953	24
Non Forest	1488	02	1488	02	1488	02
Total	61,716	100	61,716	100	61,716	100

Harvest - The TMPIS identified 5,304 acres available for harvest by clear cutting in this RMU over the next ten years. The acreage recommended for harvest exceeds the long term allowable cut in all types except white spruce, black spruce, and tamarack. The intent is to prevent loss of over mature timber to insects and diseases and to reach regulation at an earlier date.

Salvage and Recycling - Up to 3,654 acres could be regenerated without harvest and an additional 969 acres could be salvaged. These activities are designed to replace marginally commercial and noncommercial stands on productive sites with fully stocked stands suited to the site.

Artificial Regeneration - If all stands available for harvest, salvage, and recycling are treated there will be 4,069 acres in need of artificial regeneration. Planting would be done on 2,103 acres and seeding on 1,966 acres.

Table 3.31 Management Prescriptions By Cover Type - Little Fork River RMU

COVER TYPE	CLEAR CUT		THINNING		ALL-AGED		SALVAGE		REGEN		TOTAL	
	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES
ASH	19	342	0	0	7	116	4	105	3	74	33	637
LOW HW	2	34	0	0	0	0	1	14	1	29	4	77
ASPEN	130	2630	0	0	0	0	1	25	29	483	160	3138
PBIRCH	11	248	0	0	0	0	14	513	5	340	30	1101
BALM	16	453	0	0	0	0	5	120	5	125	26	698
NOR HW	0	0	0	0	0	0	0	0	0	0	0	0
W PINE	2	46	0	0	0	0	0	0	0	0	2	46
N PINE	2	22	0	0	0	0	1	24	0	0	3	46
J PINE	2	14	0	0	0	0	0	0	1	11	3	25
WH SPR	6	65	0	0	0	0	0	0	3	97	9	162
BALSAM	23	276	0	0	0	0	5	85	17	377	45	738
BL SPR	55	1020	0	0	0	0	1	10	11	121	67	1151
TMRACK	6	55	0	0	0	0	3	48	10	329	19	432
WCEDAR	8	87	0	0	0	0	1	25	1	5	10	117
UPBSPR	2	12	0	0	0	0	0	0	0	0	2	12
CUT	0	0	0	0	0	0	0	0	64	635	64	635
LOGRAS	0	0	0	0	0	0	0	0	0	0	0	0
UPGRAS	0	0	0	0	0	0	0	0	3	25	3	25
LOBRSH	0	0	0	0	0	0	0	0	27	964	27	964
UPBRSH	0	0	0	0	0	0	0	0	3	39	3	39
TOTAL	284	5304	0	0	7	116	36	969	183	3654	510	10043

Fire Management

Description

The highest incidence and potential for fire occurs in agricultural areas where fields have converted to upland and lowland grass types. These grass types are often burned in spring. Very little land is being cleared at this time due to the availability of abandoned cleared land and the poor farm economy. Fires resulting from land clearing are less frequent than in the past.

Prescribed burning within this unit could be a valuable tool to dispose of slash, reduce fire hazard or to provide enhanced wildlife habitat. Prescribed burns offer training opportunities for local fire protection crews.

Guidelines

Develop fire management and prevention guidelines for land clearing and pasture burning.

Increase use of prescribed burns as a resource management tool.

Cooperative Forest Management

Description

Private Forest Management - This unit has high potential for PFM activities because of the large amount of private land. Most private ownership within this unit is in fairly large blocks which are held by absentee owners. Most landowners requesting assistance do so to enhance wildlife habitat on their lands. Five townships in the western part of this unit have fallow fields which could be converted to forest land. Landowners should be made aware that these fields also provide sharp tail grouse habitat in their open state.

School Forests - The 72.06 acre Cook School Forest is located in lots 5 and 6 of 31-62-18.

Guidelines

Private Forest Management - Actively contact landowners concerning forestry and wildlife management opportunities. Work with personnel from the Section of Wildlife during the initial contact stage and if necessary when developing subsequent management plans. Current PFM plans show approximately 35 acres of private plantations in need of TSI.

Forest Inventory

Lands in Kabetogama State Forest and in 63-21 require reinventory because of the age and poor quality of existing information.

Utilization and Marketing

Small stockpiling areas at local timber processing facilities are a constraining factor on state timber sales. Development of winter wood stockpiling areas on state land would aid the sale of winter wood to local loggers.

EMBARRASS RESOURCE MANAGEMENT UNIT -- RMU 7

The 200,000 acre Embarrass Resource Management is located in the south central portion of the Orr Area. Forests cover approximately 95% of the unit. The remaining 5% of the land is largely in residential development which is heavy along roads in the southern portion of the unit because of their proximity to Iron Range cities. It is also heavy along the shores of larger lakes including Bear Island and Birch. Timber production is the primary use of the unit's lands. Dispersed recreation activities are another important use. Little land use change is expected.

Land Use, Ownership and Administration

Description

Land Use - Approximately 95% of the land use in this unit is forest related with timber production being the primary use. Dispersed recreation which includes hunting, trapping, berry picking, snowmobiling, and three wheeling is a secondary use. The remaining 5% of the land is in residential development or agricultural use. The residential development is particularly intense along roads in the southern portion of the unit, as this is part of the bedroom community to the Iron Range, and along the shores of the larger lakes which include Bear Island and a portion of Birch. The agricultural development is primarily small hay fields many of which have been abandoned and are reverting to brush. There has been a substantial reduction in population within the unit in the recent past due to the decline of employment opportunity on the Iron Range. Despite this fact no major land use change is projected to occur in the foreseeable future.

Land Ownership and Administration - The Embarrass RMU contains approximately 200,000 acres of land and water. Of the approximately 180,000 acres of land, 15% (27,034 acres) are administered by the DNR, 29% (52,470 acres) by the county, 10% by the federal government, 5% by industrial interests and 41% by nonindustrial private land owners. Major land administrators in the unit include the Division of Forestry, the Superior National Forest and St. Louis County. Superior National Forest and St. Louis County have large blocks of contiguous land ownership in the unit. State lands for the most part are scattered in smaller blocks.

Table 3.32 Land Status and Management Unit Designation of DNR Administered Land in the Embarrass RMU.

Land Status	Management Unit				
	Bear Is. SF	Sturgeon River SF	Bear Head Lake SP	Tower Hatch.	Not In Unit
AA School Tr.	2076	2560	605		5245
BA Indem Sch. Tr.	1761	160	88		208
AB School Tr. Ex.		80			
CA Swamp Trust	2471	4316	65		1619
CJ Swamp Tr. M&O	31	40			
LG Acq. Purchase			227	45	
EA University Tr.	4374		494		
LF 50 50 Lands	145		1821		
Total	10,858	7,156	3,300	45	7,072

There are 494 acres of University Trust land and 79 acres of Indemnity School Trust land within the boundaries of Bear Head Lake State Park administered by the Division of Forestry and coded as part of the Bear Island State Forest. An additional 605 acres of School Trust, 65 acres of Swamp Trust, and 8 acres of Indemnity School Trust land within the boundaries of Bear Head Lake State Park are administered by the Division of Forestry as forestry land outside of state forest boundaries. The Division of Parks and Recreation is coded as administrator of 145 acres of Bear Island State Forest land (50-50 land) within Bear Head Lake State Park.

Minerals - Almost all of this unit is Metallic Mineral Potential Class B. There are small scattered areas of class E.

Gravel - There is a high potential for gravel throughout this unit and many pits are in existence.

Table 3.33 Embarrass RMU - Lakeshore Homesite Leases

Lake Name	# of Leases
Bear Island Lake	61
Birch Lake	43
Total	104

Table 3.34 Embarrass RMU - Other Leases

Purpose	# of Leases
Gravel	3
Agriculture	1
Boat Landing/Boat Dock	1
Tailings Pond	1
Mining Facilities	1
Telephone Station - No Tower	1
Drain Field	1
Road Right of Way	4
Total	13

Guidelines

Transfer the trust status from all trust lands in Bear Head Lake State Park to lands that can be managed to produce income for the trust fund. Transfer administrative control of all lands within the park to the Division of Parks and Recreation. Adjust boundaries of management units and update land records as necessary.

Undedicated lands should be given state forest status.

Soil and Water Resource Protection

Description

Soils - The Embarrass RMU includes three soil resource units; the Big Rice Outwash Plain (17), the Rainy Lobe Moraines (18), and the Canadian Shield (19). The moraines run east and west through the RMU forming a distinct separation between the Outwash plain and the Canadian Shield.

The terrain on the moraine is characterized by short steep slopes in a long narrow formation. Slope gradients vary from 6 to 35 percent; local relief is 50 to 100 feet. Many lakes, small potholes, and depressions occur, particularly in the eastern portion. Soils on the moraine are formed in sand and sandy loam. A discontinuous dense layer occurs sporadically throughout the land form. Gravel and cobbles occupy 35 to 90 percent of the soil. Less than 10 percent of the surface is covered with cobbles or boulders.

North of the moraine, the terrain consists of bedrock controlled hills and ridges interspersed with lowlands. Slope gradients range from 6 to 50 percent; local relief is 50 to 100 feet. Slopes are steeper and bedrock is closer to

the surface in the eastern half. Soils are formed in sandy loam or loamy sand. The content of gravel and cobbles is usually 25 to 35 percent but may range up to 35 percent in isolated areas. Cobbles and boulders usually occupy less than 10 percent of the surface but may be up to 25 percent locally.

The terrain south of the moraine is characterized by rolling hills with slope gradients of 0 to 16 percent. Hills with steeper slopes, 20 to 25 percent, and possibly bedrock occasionally occur. The soils are formed in sand. The content of gravel and cobbles is extremely variable, 0 to 90 percent. Cobbles and boulders usually cover less than 5 percent of the surface.

Table 3.35 Soil Types in the Embarrass RMU

Atlas Code	Soil Type Description	Percent of RMU
SSWL	Upland Sandy Droughty	43
P	Lowland Organic Acid to Neutral	21
SSWL	Upland Gravelly Sand Droughty	11
RSWL& RLWL	Upland Shallow Coarse Loamy Dry	8
RSWL& RLWL	Upland Coarse Loamy Over Sandy Dry	8
RSWL& RLWL	Upland Very Shallow Coarse Loamy Droughty	3
RSWL& RLWL	Upland Extremely Shallow Coarse Loamy Droughty	3
SSPL	Upland Coarse Loamy over Sandy Moist	3

Data Sources: Minn. Soil Atlas (Univ. Minn., 1971 & 1981) and Superior National Forest Ecological Land Classification System

The potential productivity for fiber is moderate. Tree growth is limited primarily by the low amount of available water in the dominant soils.

A low potential for erosion exists in this unit. Operability is generally good on the uplands due to the high sand content and rapid drainage. Steep slopes on the moraine and Canadian Shield may limit some operations.

Waters - Over 130 miles of stream and about 50 lakes and wetlands in this RMU have been classified as protected waters by the DNR Division of Waters. The streams are generally tributary streams to larger rivers outside of the unit. The larger streams include the Embarrass, Pike, and Rice rivers. Few lakes are present in the western portion

of the unit. Most lakes in the unit are small, not exceeding 40 acres in size. Notable exceptions include a portion of Pike Bay of Lake Vermilion, Bear Head, Bear Island, and Birch lakes.

Guidelines

Soils - Summer logging will be allowed on all upland mineral soil types in this unit. Additional guidelines for major soil types are in Appendix F.

Waters - Area guidelines apply.

Forest Roads

Description

The scattered land ownership pattern within this RMU makes it necessary to acquire numerous easements to insure access to lands scheduled for management in the next ten year period. A small amount of new road is necessary to provide winter access to blocks of state land.

Table 3.36 Inventoried State Forest Roads in the Embarrass RMU

Number	Road Name	Miles	Class
360	South Bear Head	7.7	4
208	Bear Island Lake	2.2	4
210	Birch Lake	1.6	4
184	Baldrige	.5	4
Total Miles		12.0	

Guidelines

The Murray Spur Road project in T62 R15, T62 R14, and T61 R14 is to extend and upgrade a non-inventoried class 5 road to class 4. This road will also serve a large block of county land and should be a cooperative project. Acquisition of about 3.5 miles of easement on county and private land are necessary for this project.

The Bear Island Spur Road project in T61 R13 S4 and 9 is for 0.75 miles of class 5 road to provide access to about 1,000 acres of state land.

The 35 South Road project in T61 R19 S35 and 36 is for 1.5 miles of new class 5 road to provide winter access to 700 acres to state land. One 0.25 mile easement is necessary.

The Old Winter Road project in T61 R18 S36 is for 1 mile of new class 5 road to provide winter access to 640 acres of state land. One 0.25 mile easement is necessary.

Additional easements needed to access state lands include:

Location	Miles	Location	Miles
T61 R13 S27	.50	T60 R15 S16	.25
T61 R13 S19	.50	T61 R19 S27	.50
T61 R14 S3	.50	T61 R19 S28	.50
T61 R14 S36	1.25	T61 R19 S29,30,31,32	.50
T60 R14 S23,26,35	3.00	T60 R15 S25	.50
T61 R19 S33	.25	T61 R18 S24	.75

Maintained state forest road mileage in this RMU is expected to increase from 12 to 23 miles by 1996.

Forest Recreation

Description

Fishing, hunting, swimming, camping, snowmobiling, cross country skiing, ATV use, berry picking, and nature observation are the primary outdoor recreation activities in this unit. Use is seasonal with most use occurring in the summer or during the hunting season. The eastern portion of the unit, where the larger lakes occur, is the hub of recreation activity. Bear Head Lake State Park with camping, fishing, hiking, snowmobiling, and cross country skiing is within the unit. The unit's large public land base is well suited to dispersed recreation.

Recreation development includes summer homesites and resort development on the larger lakes. A number of resorts have small camping areas. Public campgrounds include campgrounds at Bear Head Lake State Park, and a Superior National Forest Campground at Pfeiffer Lake. The Tower to International Falls and Taconite state trails pass through the unit.

Division of Forestry Administered Recreation Facilities in the Embarrass RMU are:

Putnam Lake Snowmobile Trail - This 7 mile trail is a portion of a proposed loop trail system around Bear Head Lake State Park.

Fishing Lakes Snowmobile Trail - This 11 mile trail is a portion of a proposed loop trail system around Bear Head Lake State Park.

Guidelines

A five mile segment of snowmobile trail on existing logging roads is proposed to complete a loop trail around Bear Head Lake State Park. This trail system would include a portion of the Taconite State Trail, the Putnam Lake Trail, the Fishing Lakes Trail and a grants in aid trail east of Bear Head Lake State Park. See Appendix A for details.

Fish and Wildlife Habitat Management

Description

This unit is characterized by the presence of many old fields, lowland bogs, the Pike and Embarrass rivers and many scattered small, private land holdings. Forest fragmentation may therefore be a concern in managing state lands. There are very few deep water lakes located within the unit.

The upland aspen - birch types in this RMU provide habitat for deer, grouse, and other game and non-game species. The lowland swamp conifers and associated lakes and streams provide habitat for waterfowl, beaver, and other wetland wildlife.

Deer have been the primary species for management by Wildlife personnel, within this unit. Sixty-nine percent (16,615 acres) of the state land in the RMU can be classed as deer habitat. The state ownership is a small portion of the total acres within the RMU boundary.

Most of the RMU is fairly good deer habitat. However, the maturing vegetation and brush encroachment in natural openings and abandoned farm fields will require active management to maintain deer habitat quality.

The northern white cedar cover type provides quality winter cover. Some cedar stands, because of their condition and location, are of critical value.

Forest composition goals for state land are: 25% of all aspen (1,833 acres) should be in the 1-10 year old age class. Five percent of the upland acreage or 830 acres should be in wildlife openings. Completed compartment evaluations will assist in determining the need for openings and in prioritizing other habitat improvement projects.

This RMU contains northern hardwoods stands (most are on non-state land) which are remnants of the original vegetation. These stands should be retained because they are scarce and they provide important habitat for cavity nesting, and old growth dependent species.

Two peatland areas with special characteristics in this RMU are the Lost Lake Bog (rare fen type) and Wahlsten Station Peatland (three rare plants). The Lost Lake Bog has been proposed for legislative inclusion in the State Scientific and Natural Areas Program and the Wahlsten Station Peatland as an administrative inclusion in the same program.

Guidelines

The predominance of county and private land in this unit will influence the success of deer and other wildlife management. State lands should be managed to provide habitat that is insufficient or completely lacking on other lands. Upland opening development and maintenance needs to be increased on state lands due to the successional loss of natural and farmland openings. In areas without adequate openings, each upland forest management activity should include provisions to establish an opening.

Critical cedar stands will be identified and maintained and managed for wildlife habitat.

The Lost Lake Bog and the Wahlsten Station Peatland should be managed to protect the significant features found in each. See Appendix H for further guidelines for these peatlands.

Timber Management

Description

Birch stands cover 9 percent of this RMU, which is more on a percentage basis, than any other RMU in the Orr Area. Aspen (31%), black spruce (15%), birch (9%), and unproductive types (10%) are the most prevalent cover types on state land in this RMU. This RMU has a relatively low incidence of high risk stands.

Table 3.37 Embarrass RMU Timber Summary

Type	Acres	% Of Area	Avg Site Index	Avg % Updated Age	% Over Rot. Age	% At High Risk
Ash	615	3	40	97	56	1
Lowland Hardwoods	32	0	41	104	100	0
Aspen	7331	31	61	45	58	15
Birch	2200	9	51	67	80	10
Balm of Gilead	137	1	57	58	93	0
White Pine	36	0	47	115	50	0
Red Pine	869	4	54	58	4	0
Jack Pine	1115	5	58	54	64	7
White Spruce	113	0	53	22	0	0
Balsam Fir	674	3	49	54	70	3
Black Spr. Lowland	3632	15	33	64	14	1
Tamarack	588	2	40	76	10	0
N. White Cedar	565	2	27	115	39	5
Black Spr. Upland	81	0	48	76	58	0
Cutover Area	563	2				
Lowland Grass	69	0				
Upland Grass	11	0				
Lowland Brush	1777	7				
Upland Brush	21	0				
Unproductive Forest	2339	10				
Non Forest	1191	5				
Total	23,959	100				

Guidelines

Table 3.38 lists the cover type composition goals for this RMU. The birch type will decrease due to lack of markets and difficulty in regenerating birch stands with a considerable aspen component. Balsam fir acreage will decrease because of spruce budworm. Lowland brush and cutover areas will be converted to productive types.

Table 3.39 summarizes the management activities that could be carried out in the Embarrass RMU over the next ten years if markets and budgets were available. The actual level of management activities will likely be well below potential. Appendix B contains lists of stands available for various treatments, regeneration plans, and projections of long term sustained yields.

Harvest - The TMPIS identified 3,954 acres available for harvest by clear cutting in this RMU over the next ten years. The proposed harvest in the aspen, birch, and jack pine types substantially exceeds the long term allowable cut. The increased harvest is designed to avoid losses to insect and disease in over mature stands and to improve age class distribution.

Table 3.38 Embarrass RMU Cover Type Composition Goals

Cover Type	Present		Ten Year		Long-term	
	Acres	%	Acres	%	Acres	%
Ash	615	2	615	2	615	2
Lowland Hardwoods	32	0	32	0	32	0
Aspen	7331	31	7635	32	6735	28
Birch	2200	9	1508	6	1508	6
Balm of Gilead	137	1	119	0	119	0
White Pine	36	0	54	0	54	0
Norway Pine	869	4	1499	6	1769	7
Jack Pine	1115	5	1321	6	1501	6
White Spruce	113	0	394	2	844	4
Balsam Fir	674	3	475	2	475	2
Black Spruce Lowland	3632	15	3823	16	3823	16
Tamarack	588	2	700	3	700	3
N. White Cedar	565	2	565	2	565	2
Black Spruce Upland	81	0	38	0	38	0
Cutover Area	563	2	19	0	19	0
Lowland Grass	69	0	69	0	69	0
Upland Grass	11	0	11	0	11	0
Lowland Brush	1777	7	1543	6	1543	6
Upland Brush	21	0	9	0	9	0
Unproductive Forest	2339	10	2339	10	2339	10
Non Forest	1191	5	1191	5	1191	5
Total	23,959	100	23,959	100	23,959	100

Salvage and Recycling - There are 530 acres that should be salvaged and an additional 1,070 acres that could be regenerated without harvest. These activities replace marginally commercial or noncommercial stands on productive sites with fully stocked stands.

Thinning - There are 256 acres of Norway pine available for thinning.

Artificial Regeneration - If all stands available for harvest, salvage, and recycling are treated, there will be 1,987 acres in need of artificial regeneration. Planting would be done on 1,283 acres and seeding on 704 acres.

Table 3.39 Management Prescriptions By Cover Type - Embarrass RMU

COVER TYPE	CLEAR CUT STD ACRES	THINNING STD ACRES	ALL-AGED STD ACRES	SALVAGE STD ACRES	REGEN STD ACRES	TOTAL STD ACRES
ASH	4 67	0 0	0 0	3 23	0 0	7 90
ASPEN	91 2207	0 0	0 0	13 233	4 31	108 2471
PBIRCH	23 700	0 0	0 0	2 37	2 23	27 760
BALM	4 57	0 0	0 0	1 9	0 0	5 66
W PINE	1 18	0 0	0 0	0 0	0 0	1 18
N PINE	5 62	22 256	0 0	0 0	0 0	27 318
J PINE	22 373	0 0	0 0	0 0	2 35	24 408
BALSAM	9 129	0 0	0 0	8 85	1 39	18 253
BL SPR	16 272	0 0	0 0	12 119	6 96	34 487
TMRACK	1 8	0 0	0 0	2 24	3 56	6 88
WCEDAR	1 30	0 0	0 0	0 0	0 0	1 30
UPBSPR	3 31	0 0	0 0	0 0	0 0	3 31
CUT	0 0	0 0	0 0	0 0	30 544	30 544
LOGRAS	0 0	0 0	0 0	0 0	0 0	0 0
UPGRAS	0 0	0 0	0 0	0 0	0 0	0 0
LOBRSH	0 0	0 0	0 0	0 0	10 234	10 234
UPBRSH	0 0	0 0	0 0	0 0	2 12	2 12
TOTAL	180 3954	22 256	0 0	41 530	60 1070	303 5810

Fire Management

This RMU has a high potential for fires because of the large amount of dispersed housing development particularly in the south. Trash burning is the primary cause. Grass fires on old fields are also a continuing problem. The Division of Forestry has the responsibility for fires on most of the unit's land base. The US Forest Service has fire responsibility in township 61-17.

Cooperative Forest Management

Description

Private Forest Management - This unit has high potential for PFM activities. Former agricultural fields, which are reverting to brush, particularly in the southern portion of this unit, have excellent potential for PFM activities. Land owners should be aware that that these fields, in addition to having timber potential, also provide sharptail grouse habitat in their open state. Large lot residential development (40 acres or more) occurs in the southern part of this unit.

School and Municipal Forests - Portions of the City of Tower's Gunderson Memorial Forest are within this RMU.

Guidelines

Private Forest Management - Actively promote PFM activities in this unit. Make land owners aware of wildlife potential of old fields by involving personnel from the Section of Wildlife in developing plans for these lands. Approximately 120 acres of private plantations should be thinned during the next ten years. This includes plantations that had basal areas over 90 and were 12 years or older when the plantation survey was done in 1980.

School and Municipal Forests - Assist City of Tower in exchanging its outlying lands for lands closer to Tower.

LAURENTIAN DIVIDE RESOURCE MANAGEMENT UNIT -- RMU 8

The 260,000 acre Laurentian Divide RMU is located in the southeastern portion of the Orr Area. The majority of the land in this unit is forested except where large scale open pit iron mines exist. The unit contains a portion of the Mesabi Iron Range and mining activity is particularly prevalent in townships 59-14, 59-15, 60-12, 60-13, and 61-12. The primary use of forested lands in this unit is timber production. Other uses include dispersed recreation activities such as hunting. The possibility of land use change is high because of the likelihood of future minerals development. Babbitt is the only community in the RMU.

Land Use, Ownership and Administration

Description

Land Use - The majority of the land in this unit is forested except where large scale open pit iron ore mines exist. The Mesabi Iron Range covers much of the southern portions of this unit. Large open pit mines and their residues are found in townships 59-14, 59-15, 60-12, 60-13, and 61-12. Babbitt is the only community in the RMU.

The primary use of forested lands within the unit is timber production. Other uses are seasonal and generally recreation oriented. These include hunting, trapping, and berry picking.

The possibility of land use change is high because of the likelihood of future minerals development. Changes in land use from forestry to mining can occur rapidly and at any time.

Land Ownership and Administration - The boundaries of the Laurentian Divide RMU enclose approximately 260,000 acres of land and water. Of the approximately 215,000 acres of land in the unit 12% (24,994 acres) is administered by the DNR, 4% (8,544 acres) by the county, 45% by the federal government, 10% by nonindustrial private landowners, and 30% by industry (mostly mining companies). Major land administrators in the unit include the Superior National Forest, the DNR Division of Forestry, various mining companies, and St. Louis and Lake counties.

Minerals - The western two-thirds of the unit are primarily Metallic Mineral Potential Class A and the eastern one-third is primarily class B.

Table 3.40 Land Status and Management Unit Designation of DNR Administered Land in the Laurentian Divide RMU.

Land Status	Management Unit		
	Bear Is. SF	Minerals	Not In Unit
AA School Trust	2176		8840
BA Indem School Trust			1216
CA Swamp Trust	1961		8089
EA University Trust			1960
LC Acq. Gift		680	
LG Acquired Purchase		72	
Total	4137	752	20,105

Peat - There are no large contiguous areas of peat within this unit. The peat which does exist is found in small randomly scattered areas and is generally shallow in depth.

Gravel - Gravel can be found throughout this unit.

Table 3.41 Laurentian Divide RMU - Leases

Purpose	#
Gravel	3
Mine Reclamation	1
Mining Facilities	6
Railroad Right of Way	2
Garage	1
Road Right of Way	2
Total	15

Guidelines

Appendix D lists 1,424 acres of state land potentially available for land exchanges to consolidate ownerships.

Division of Forestry administered undedicated lands should be given state forest status.

Soil and Water Resource Protection

Description

Soils - The Laurentian Divide RMU is composed of three soil resource units; the Mesabi Range (16), the Rainy Lobe Moraines (18), and the Kekekabic Lake Section of the Canadian Shield (19D). The moraine runs east and west through the RMU forming a distinct boundary between the other two units.

The terrain on the moraine is characterized by short steep slopes in a long narrow formation. Slope gradients vary from 6 to 35 percent; local relief is 50 to 100 feet. Many lakes, small potholes, and depressions occur particularly in the eastern portion. Soils on the moraine are formed in sand and sandy loam. A discontinuous dense layer occurs sporadically throughout the land form. Gravel and cobbles occupy 35 to 90 percent of the soil. Less than 10 percent of the surface is covered with cobbles or boulders.

The terrain in the remainder of the RMU consists of bedrock controlled hills and ridges. Slope gradients north of the moraine range from 6 to 50 percent. Local relief is up to 200 feet. Soils are formed in sandy loam or loam. The content of gravel, cobbles, and boulders in the soil is 5 to 35 percent. Cobbles and boulders usually cover 10 percent or less of the surface. About 58 percent of the uplands have bedrock within 40 inches of the surface.

Slope gradients south of the moraine range from 10 to 25 percent. Soils are formed in sand or sandy loam. The content of gravel and cobbles in the soils is usually 15 to 25 percent. Cobbles and boulders occupy less than 10 percent of the surface. Roughly 35 percent of the uplands have bedrock within 40 inches of the surface.

The potential productivity of the RMU for fiber is moderate to low. Tree growth is limited primarily by a lack of water in the mid to late portion of the growing season.

Operability is generally fair to good. Steep slopes and rock outcrops may limit operations in some areas. Soils that contain a hardpan will remain wet longer in the spring and are easily rutted.

Waters - About 130 miles of stream and 45 lakes and wetlands in this RMU have been classified as protected waters by the DNR Division of Waters. Most of the stream mileage is in small tributary streams which lead to larger rivers. Larger rivers in the unit include the Rice, Stony, Isabella and Kawishiwi. Birch Lake is the largest lake in the RMU.

Table 3.42 Soil Types in the Laurentian Divide RMU

Atlas Code	Soil Type Description	Percent of RMU
RSWL/RLWL	Upland Shallow Coarse Loamy Droughty	32
SSWL	Upland Gravelly Sandy Droughty	19
NP	Lowland Organic Acid to Neutral	12
P	Lowland Organic Undifferentiated	8
MD	Mine Disturbance	8
RLWL	Upland Very Shallow Coarse Loamy Droughty	8
LLWL	Upland Coarse Loamy Dry	6
R/RLWL	Upland Extremely Shallow Coarse Loamy Droughty	4
SSWL	Upland Sandy Droughty	2
LLPL	Lowland Coarse Loamy Moist	1

Data Sources: Minn. Soil Atlas (Univ. Minn., 1971 & 1981) and Superior National Forest Ecological Land Classification System

Guidelines

Soils - Appendix F contains management guidelines for the major soil types.

Waters - Areawide guidelines apply.

Forest Roads

Description

There are no inventoried state forest roads in this unit. Forest Service and mining company roads currently provide the access which exists.

Guidelines

The Benville Road project in T60 R13 S9 and 16 is for about 1 mile of class 4 road and the replacement of a deteriorated bridge to provide summer access to over 700 acres. This project includes the upgrading of 0.7 miles of non-inventoried class 5 road and 0.3 miles of new construction. Two easement totaling 0.55 miles are necessary to secure the right of way.

The Wampus Lake Road project in T60 R10 S31 and T60 R11 S36 is for 1.25 miles of class 4 road to provide summer access to about 700 acres of state land. Two easements totaling 0.5 miles are necessary to secure the right of way.

The Birch Lake Road project is described in RMU 9. One easement is necessary to secure the right of way within RMU 8.

Additional easement needed to access to state land:

Location	Miles
T61 R11 S9	.25

There are currently no inventoried state forest roads in this RMU. The amount of maintained road is expected to increase to two miles by 1996.

Forest Recreation

Description

Hunting, berry picking, and nature observation are the primary outdoor recreation activities in this unit. Most use occurs during the fall hunting seasons. Amenities for recreational development are somewhat limited within this unit as there are few lakes and few quality streams. The notable exceptions to this situation are Birch Lake and the Stony River. There are numerous public and private developments on the shores of Birch Lake and the Stony River is increasing in popularity as a whitewater stream. A private outfitter is currently offering raft trips on the Stony.

The U.S. Forest Service has the only developed public recreation facilities in this unit. They consist of one campground, one picnic area and a snowmobile trail. There are no Division of Forestry administered recreation facilities within this unit.

There are few private recreation facilities within the unit. Among the most notable is a portion of the Giants Ridge Ski Area in the extreme western portion of the unit.

The lack of recreational facilities within this unit is tempered by the fact that the unit to the north is well developed for both public and private recreational facilities. These include numerous resorts and campgrounds in the Ely area and the BWCAW.

Guidelines

There are no recreation facility developments proposed for this unit.

Fish and Wildlife Habitat Management

Description

This unit is characterized by an extensive area of mining influence and activity in the St. Louis County portion of the RMU. This activity limits wildlife habitat management until reclamation steps are begun.

The RMU has very few large lakes, but has many small streams, and three major rivers, the Stony, Partridge, and South Kawishiwi. Riparian zones should be managed to protect vegetation and wildlife habitats along these streams.

Wildlife management activities in this unit will be designed to provide quality deer and grouse habitat in the St. Louis County portion of the unit and moose habitat in Lake County. Forest habitat composition goals are being developed by the Section of Wildlife on four square mile compartments to determine the best vegetative mix for wildlife.

Habitat is also available for other game and non-game species associated with upland and lowland forest communities. Habitats of special importance include winter deer concentration areas, moose feeding sites, mineral licks, small wetlands, upland openings, and cedar stands. The birch and northern hardwood types need to be maintained for species which are dependent on them.

Guidelines

Manage the St. Louis County portion of the unit for deer and the Lake County portion for moose.

Manage heavily used moose feeding sites as permanent browse management areas. Within moose management zones a forest cover type composition of 60% hardwood and 40% softwood is preferred. At least 30% of the hardwood and jack pine types should be less than 20 years old. Conifer types dense enough to provide winter cover should cover 15% of the area. The recommended minimum composition goals for uplands are: aspen 40%, birch 5%, mixed conifer/deciduous stands 15%, jack pine 10%, red and white pine 5%, upland spruce/fir 15% (of which at least 5% is true balsam fir type), and grass and brush openings 3%. All existing northern hardwood acreage should be maintained. In lowland areas, northern white cedar and black ash types should be maintained. Dense stands of black spruce, which are potential winter cover, should not be converted to tamarack.

Maintain the birch and northern hardwood components for species requiring these types.

Increase upland openings development and maintenance on portions of the RMU in St. Louis County. Openings should be established for each upland forest management activity. Deer yard improvement work needs to be accomplished in the Snort Lake Deer Yard (T60 R12 S12, 13, 14).

Long range planning for the reclamation of mining lands to benefit wildlife needs to be undertaken and implemented.

Timber Management

Description

Mining has resulted in a higher percentage of nonforested state land (17%) in this RMU than in the rest of the Orr Area. Jack pine is the most prevalent upland conifer here, in contrast to the western portion of the Orr Area where white spruce and red pine are the major upland conifer types. Upland black spruce covers more of this RMU (5%) than it does in any other RMU.

Table 3.43 Laurentian Divide RMU Timber Summary

Type	Acres	% Of Area	Avg Site Index	Avg % Updated	Avg % Over Age	% At Rot. High Risk
Ash	192	0	32	114	51	0
Aspen	5879	24	59	44	54	16
Birch	1485	6	50	63	66	11
White Pine	18	0	46	83	61	0
Red Pine	79	0	47	77	13	0
Jack Pine	2378	10	54	46	30	7
White Spruce	96	0	47	58	0	0
Balsam Fir	808	3	43	40	0	5
Black Spr. Lowland	3653	15	33	65	61	5
Tamarack	373	2	36	69	0	2
N. White Cedar	372	2	26	94	20	0
Black Spr. Upland	1242	5	41	53	27	3
Cutover Area	409	2				
Lowland Grass	41	0				
Upland Grass	53	0				
Lowland Brush	1178	5				
Upland Brush	154	0				
Unproductive Forest	2125	9				
Non Forest	4288	17				
Total	24823	100				

Guidelines

Table 3.44 lists the cover type composition goals for this RMU. Birch and balsam fir types will decrease significantly. The long term increase in the white pine type is dependent on future availability of blister rust resistant stock. Aspen, jack pine, and Norway pine type acreages will increase.

Table 3.44 Laurentian Divide RMU Cover Type Composition Goals

Cover Type	Present		Ten Year		Long-term	
	Acres	%	Acres	%	Acres	%
Ash	192	1	196	1	196	1
Aspen	5879	24	6351	26	6850	28
Birch	1485	6	991	4	300	1
White Pine	18	0	11	0	200	1
Norway Pine	79	0	305	1	400	2
Jack Pine	2378	10	2524	10	2950	12
White Spruce	96	0	160	1	250	1
Balsam Fir	808	3	843	3	480	2
Black Spruce Lowland	3653	15	3760	16	3800	16
Tamarack	373	1	453	2	435	2
N. White Cedar	372	2	403	2	403	2
Black Spruce Upland	1242	5	1061	4	600	2
Cutover Area	409	2	79	0	100	0
Lowland Grass	41	0	41	0	41	0
Upland Grass	53	0	5	0	200	1
Lowland Brush	1178	5	1073	4	1051	4
Upland Brush	154	1	154	1	154	1
Unproductive Forest	2125	9	2125	9	2125	9
Non Forest	4288	17	4288	17	4288	17
Total*	24,823	100	24,823	100	24,823	100

* Includes 370 acres of commercial forest land administered by the DNR Division of Minerals.

Table 3.45 summarizes the management activities that could be carried out in the Laurentian Divide RMU over the next ten years if markets and budgets were available. The actual level of management activities will likely be well below potential. Appendix B contains lists of stands available for various treatments, regeneration plans, and projections of long term sustained yields.

Harvest - The TMPIS identified 3,297 acres available for harvest by clear cutting in this RMU over the next ten years. The recommended harvest in the aspen and birch types

exceeds the long term allowable cut in order to improve the age class distribution.

Salvage and Recycling - There are 403 acres that should be salvaged and an additional 941 acres that could be regenerated without harvest. These activities replace marginally commercial and noncommercial stands on productive sites with fully stocked stands.

Table 3.45 Management Prescriptions By Cover Type - Laurentian Divide

COVER TYPE	CLEAR CUT STD ACRES		THINNING STD ACRES		ALL-AGED STD ACRES		SALVAGE STD ACRES		REGEN STD ACRES		TOTAL STD ACRES	
ASH	3	20	0	0	4	41	1	5	0	0	8	66
ASPEN	69	1623	0	0	0	0	6	99	7	254	82	1976
PBIRCH	17	509	0	0	0	0	2	29	3	79	22	617
W PINE	1	7	0	0	0	0	0	0	0	0	1	7
N PINE	4	21	0	0	0	0	0	0	0	0	4	21
J PINE	42	402	0	0	0	0	0	0	0	0	42	402
WH SPR	2	34	0	0	0	0	0	0	0	0	2	34
BALSAM	10	105	0	0	0	0	6	102	2	37	18	244
BL SPR	27	325	0	0	0	0	8	129	1	15	36	469
TMRACK	4	34	0	0	0	0	1	3	0	0	5	37
WCEDAR	2	18	0	0	0	0	1	4	0	0	3	22
UPBSPR	15	199	0	0	0	0	3	32	0	0	18	231
CUT	0	0	0	0	0	0	0	0	22	403	22	403
LOGRAS	0	0	0	0	0	0	0	0	0	0	0	0
UPGRAS	0	0	0	0	0	0	0	0	3	48	3	48
LOBRSH	0	0	0	0	0	0	0	0	2	105	2	105
UPBRSH	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	195	3297	0	0	4	41	28	403	40	941	268	4682

Artificial Regeneration - If all stands available for harvest, salvage, and recycling are treated, there will be 1,076 acres in need of artificial regeneration. Planting will be done on 507 acres and seeding on 569 acres. Artificial regeneration investments should be limited on sites with high potential for minerals development.

Fire Management

The US Forest Service has fire responsibility for about two-thirds of this unit. The DNR Division of Forestry has responsibility for the remaining third, most of which is in the heavily mined area. Within this area mining companies have historically responded to and extinguished fires. About 80% of the fires in the mining area are caused

directly by mining activities. Areas immediately adjacent to railroad tracks have traditionally been high fire hazard areas within this unit.

Cooperative Forest Management

Description

Private Forest Management - Most private land within this unit is held by mining companies which retain a forester for harvesting or reclamation projects. There is limited potential near the city of Babbitt.

Guidelines

PFM - This is a low priority unit for PFM activities. Any work in the unit will be generated by land owner requests.

BURNTSIDE LAKE RESOURCE MANAGEMENT UNIT -- RMU 9

The 400,000 acre Burntside Lake RMU is located in the east central portion of the Orr Area. Timber production and dispersed recreation are the major land uses. The northern and western portions of this unit are for the most part remote and undeveloped. Residential development is almost entirely limited to the southern and eastern portions. Ely, Tower, and Winton are the only cities with substantial populations. The shore lines of the larger lakes including Vermilion, Shagawa, and Burntside are heavily developed with seasonal residences.

Land Use, Ownership and Administration

Description

Land Use - Timber production and recreation are the major land uses within this RMU. Recreational uses include fishing, hunting, camping, trapping, canoeing, boating, snowmobiling, cross-country skiing, nature observation, and berry picking. Residential development is almost entirely limited to the southern and eastern portions of this unit. The northern and western portions are for the most part remote and undeveloped. Ely (population 4820), Tower (640) and Winton (276) are the only cities with substantial populations within the unit. The shorelines of the larger lakes including Vermilion, Shagawa, and Burntside are heavily developed with seasonal residences. A shift toward increased recreational use is projected for this unit as a substantial tourism marketing effort is underway.

Land Ownership and Administration - The boundaries of the Burntside Lake RMU enclose approximately 400,000 acres of land and water. Of the approximately 387,000 acres of land in the unit 10% (38,698 acres) is administered by the DNR, 11% (43,901 acres) by St. Louis and Lake counties, 57% by the federal government, 16% by nonindustrial private land owners, and 6% by industrial interests. Major land administrators include the Division of Forestry, Superior National Forest, and St. Louis and Lake counties. All the major landowners have some substantial blocks but each also has large acreages of scattered ownership.

Minerals - The southern and eastern portions of the unit are classified as Metallic Mineral Potential Class B except for a small area of class E in the extreme southeast. The northern and western portions of the unit are class D.

Table 3.46 Land Status and Management Unit Designation of DNR Administered Land in the Burntside Lake RMU.

Land Status	Management Unit							Not In Unit
	Bear Is. St Forest	Burntside St Forest	Kabetogama St Forest	L Jeanette St Forest	Admin & Scat SF	Tower Soudan SP	Fisheries Mgt Area	
AA School Trust	2510	1603	1111					10226
BA Indem. Sch. Tr.	1195	533						713
BB Indem. Sch. Exch.		5						
BJ School Trust M&O					93			
CA Swamp Trust	4994	750	80	980				9297
EA Univ. Trust			19					
CJ Swamp Trust M&O					10			
LA Burntside Grant		2783						
LC Acq. Gift	558					1035		
LG Acq. Purchase	1				108		81	
LE Acq. Condemn.		75					85	
LF 50-50 Lands		70					70	
Total	9,258	5,819	1,210	980	211	1,035	236	20,236

Notes on overlapping boundaries:

- 140 acres of land (LC) within the Tower Soudan State Park and also in the Bear Island State Forest are administered by the Department.
- 145 acres of fisheries land (LE and LF) are also in the Burntside State Forest.
- 1 acre of fisheries land (LG) is also in the Bear Island State Forest.

Peat - There are no large contiguous areas of peat within this unit. The peat which exists is generally shallow in depth.

Gravel - There is a high potential for gravel throughout this unit and many pits are in existence.

Table 3.47 Burntside Lake RMU - Lakeshore Homesite Leases

Lake Name	# of Leases
Fall Lake	15
Burntside Lake	19
Lake Vermilion	31
Sand Point Lake	12
Total	77

Table 3.48 Burntside Lake RMU - Other Leases

Purpose	# of Leases
Gravel	3
Camp/campground	2
Resort	1
Multiple Uses With Buildings	1
Boat Landing/Dock	1
Snowmobile Trail	1
Radio Tower	1
Road Rights of Way	6
Hunting Cabin	8
Training Area Non Firearm	1
Total	25

Guidelines

Appendix D lists 2,468 acres of state land potentially available for exchange to consolidate ownerships.

Undedicated lands should be given state forest status.

Soil and Water Resource Protection

Description

Soils - The Burntside RMU is dominated by the Burntside Lake Section of the Canadian Shield Soil Resource Unit (19E). Smaller portions of the RMU fall within the Meander Lake (19A), Crane Lake (19B), Lac LaCroix (19C), and Vermilion Lake (19F) sections of the Canadian Shield.

The terrain consists of bedrock controlled hills and ridges interspersed with scattered lowlands. Slope gradients range from 6 to 50 percent. Local relief is up to 200 feet. About 75 percent of the RMU is upland. The majority of upland soils are formed in sandy loam or loam. The soil usually contains 20 to 35 percent gravel and cobbles. Cobbles and boulders commonly cover less than 10 percent of the surface but may range up to 25 percent in isolated areas. About 80 percent of the upland soils have bedrock within 40 inches of the surface. Of these shallow soils, roughly half have bedrock within 20 inches of the surface. Bedrock outcrops are numerous. The lowlands are commonly long and narrow, and are associated with streams.

Table 3.49 Soil Types in Burntside Lake RMU

Soil Type Description	Percent of RMU
Upland Shallow Loamy Dry	30
Upland Extremely Shallow Loamy Droughty	19
Upland Very Shallow Loamy Droughty	12
Lowland Organic Medium Acid to Neutral	13
Lowland Loamy Moist	9
Upland Deep Loamy Over Sandy Dry	7
Upland Deep Medium Loamy Dry	5
Lowland Clayey Wet	2
Lowland Organic Very Acid	1
Upland Deep Sandy Droughty	1
Upland Deep Coarse Loamy Dry	1

Data Source: Superior National Forest Ecological Land Classification System

The potential productivity for fiber is generally low to very low. The shallow bedrock underlying the majority of the soils limits the amount of rooting space. The soils often become droughty in mid to late parts of the growing season.

Operation of heavy equipment is limited by steep slopes, rock outcrops, and scattered lowlands. Soils at or near the bottom of slopes may remain wetter for a longer period in the spring because of downslope water movement. Rutting will easily occur during wet conditions.

Waters - Except for the BWCAW this unit, which is on the lake rich Canadian Shield, contains more lakes and streams than any other unit in the Orr Area. Over 200 miles of stream and 160 lakes and wetlands have been classified as protected waters by the DNR Division of Waters. Most of the streams are small tributaries to larger rivers or river/lake systems. Many streams flow into the BWCAW. Larger rivers in the unit include the Kawishiwi, Little Indian Sioux, and Moose. In general lakes, which are largely a result of glacial actions on the Laurentian Shield bedrock, are situated in a northeast to southwest direction. Lake Vermilion is the largest lake in the unit. Other large lakes include Burntside, Shagawa, White Iron, Fall, and Farm.

Guidelines

Soils - Appendix F contains management guidelines for the major soil types.

Waters - Areawide guidelines apply.

Forest Roads

Description

The scattered state land ownership pattern and the distance to major timber markets explain the paucity of state forest roads in this RMU.

Table 3.50 State Forest Roads in the Burntside Lake RMU

Number	Road Name	Miles	Class
236	Coxey Pond	1.2	4
308	North Bay	0.8	4
Total Miles		2.0	

Guidelines

The Murray Spur Road project in T62 R15 S25, T62 R14 S30 and 31, and T61 R14 S4, 5, 6, 8, and 9 is for 6 miles of class 4 road to provide access to 1800 acres of state land. This project includes 4 miles of reconstruction of a non-inventoried road on an old rail bed and two miles of new construction. Two easements totaling 1.5 miles are necessary to secure the right of way. This road will also serve a large block of county land and should be developed as a cooperative project with St. Louis County. A portion of this road is in RMU 7.

The Little Long Lake Road project in T63 R12 S10, 15, and 16 is for 0.75 miles miles of new class 4 road to provide summer access to 200 acres of state land. Two easements covering 0.5 miles are necessary to secure the right of way.

The North Bay Road project in T61 R12 S16, 17 is for 1 mile of new class 5 road to provide summer access to about 1200 acres of state land. One easement over 0.3 miles is necessary to secure the right of way.

The Birch Lake Road project in T61 R11 S6, T61 R12 S1, 2, 11, 12, and T62 R12 S36 is for 2 miles of class 4 road to provide access to about 2,000 acres of state land. This road is partially in RMU 8 where an easement is needed to secure the right of way.

The Big Lake Road project in T65 R13 S35 and 36, and T64 R13 S2, 11, 10, 9, and 4 is for 6 miles of class 4 road to provide access to 2,500 acres of state land. Easements for 2.6 miles are necessary to secure the right of way. This

road will also serve federal lands and should be undertaken in cooperation with the Forest Service.

The South Kawishiwi Road project in T62 R11 S28, 21, 20, and 17 is for 2.75 miles of class 4 road to provide summer access to over 1,000 acres of state land. This project includes the upgrading of 0.5 miles of non-inventoried road. One easement for 1.25 miles is necessary to secure the right of way.

Additional easements needed to access state lands include:

Location	Miles
T64 R10 S36	.25
T64 R12 S36	.30
T63 R14 S34	.75

Maintained state forest roads in this RMU are expected to increase from the current 2 miles to 21 miles by 1996.

Forest Recreation

Description

This unit has the strongest recreation orientation in the Orr Area. Primary recreational activities include fishing, canoeing, hunting, swimming, camping, snowmobiling, cross-country skiing, ATV use, berry picking, and nature observation. The city of Ely is a hub of recreational activity with food, lodging, outfitters, and other recreational services. Many of the lakes in the unit including Vermilion, Burntside, and Shagawa are heavily developed with seasonal recreational dwellings, resorts, and group camps. Entry to the western portions of the Boundary Waters Canoe Area Wilderness are gained through this unit.

Public recreational facilities are plentiful within this unit. Superior National Forest has five campgrounds and numerous miles of hiking, snowmobile, and cross country skiing trails. The City of Tower maintains a campground on Lake Vermilion. Tower Soudan State Park provides interpretive tours of an underground iron ore mine. The Purvis Lake - Ober Foundation Scientific and Natural Area is within the unit and the Taconite State Trail runs westward through the unit from Ely. The City of Ely operates cross country ski trails and a ski jump on Division of Forestry administered land in Section 36-63-12.

There are no Division of Forestry facilities in this unit. There appears to be a need to provide additional dispersed campsites for motorboaters who were displaced from the BWCAW when some lakes were closed to motorized traffic. Opportunities exist to provide some sites on state land on Lake Vermilion and Bear Island Lake.

The use of ATV's within this unit is increasing at a rapid rate.

Guidelines

Construct 8 primitive boat in campsites on Pine Island and along the north shore of Lake Vermilion with fire rings, and open air pit toilets. Provide landing and mooring areas for boats. Construct two dispersed campsites on Bear Island Lake. Areas selected for campsites must first be evaluated as potential eagle nesting habitat.

Fish and Wildlife Habitat Management

Description

This unit is characterized by Canadian Shield topography. Its many large, deep lakes make for ideal conditions for nesting eagles, ospreys, loons, and herons. Historically, this RMU was a major sport hunting area for deer. Large populations of deer resulted from the early logging activities and the younger forests created by those activities. The maturing of these same forests, combined with severe winters, has resulted in a moderate deer population today. Moose populations since 1970 have been gradually increasing in the northwest portion of this unit, due to relatively large areas of vegetative disturbance caused by fires, and large scale logging activities.

Most of this RMU will be managed to provide moose habitat while small portions will emphasize deer habitat. Several deer concentration areas and major deer yards (e.g. Garden Lake, Mud Creek, Shagawa Lake, and Birch Lake) are located in this unit. Wetland management is limited by the deep lakes and rocky shorelines found in this RMU. Habitats of special importance in this unit include heavily used feeding sites and small wetlands within the moose management areas and cedar stands and upland openings within the deer management areas. A large portion of the known eagle nests, osprey nests, and heron rookeries in the Orr Area are located in this RMU.

Guidelines

Manage the majority of this unit for moose. Manage heavily used moose feeding sites as permanent browse production areas. Within moose management zones a forest cover type composition of 60% hardwood and 40% softwood is preferred. At least 30% of the hardwood and jack pine types should be less than 20 years old. Conifer types dense enough to provide winter cover should cover 15% of the area. The recommended minimum composition goals for uplands are: aspen 40%, birch 5%, mixed conifer/deciduous stands 15%, jack pine 10%, red and white pine 5%, upland spruce/fir 15% (of which at least 5% is true balsam fir type), and grass and brush openings 3%. All existing northern hardwood acreage should be maintained. In lowland areas, northern white cedar and black ash types should be maintained. Dense stands of black spruce, which are potential winter cover, should not be converted to tamarack.

Within the deer management zones emphasis will be on creation of upland openings and maintaining 25% of the aspen type in the 1 to 10 year age class.

Follow specific habitat management guidelines contained in the Garden Lake Deer Yard Management Plan (MN DNR - Wildlife, 1985). Complete projects to improve the Garden lake, Mud Creek, Shagawa Lake, and Birch Lake deer yards.

Manage existing white pine stands for future bald eagle nesting sites.

Timber Management

Description

Aspen and jack pine are by far the most prevalent types in this RMU, covering 32 and 13 percent of the land, respectively. Most types in this RMU have high average ages and a significant portion of the timber is over mature. Distance to markets has been the major factor constraining harvests in this RMU.

Table 3.52 lists the cover type composition goals for this RMU.

Table 3.53 summarizes the management activities that could be carried out in the Burntside Lake RMU over the next ten years if markets and budgets were available. The actual level of management activities will likely be well below potential. Appendix B contains lists of stands available for various treatments, regeneration plans, and projections of long term sustained yields.

Table 3.51 Burntside Lake RMU Timber Summary

Type	Acres	% Of Area	Avg Site Index	Avg % Updated	Avg Age	% Over Rot. Age	% At High Risk
Ash	345	1	41	95	59	1	
Aspen	12567	32	60	51	69	22	
Birch	2006	5	53	67	68	7	
White Pine	802	2	48	95	41	14	
Red Pine	1175	3	48	86	20	2	
Jack Pine	5197	13	51	64	71	8	
White Spruce	33	0	55	65	70	0	
Balsam Fir	562	1	45	36	47	5	
Black Spr. Lowland	3561	9	32	76	19	2	
Tamarack	277	1	38	73	15	0	
N. White Cedar	266	1	29	103	28	0	
Black Spr. Upland	2143	5	40	64	53	3	
Cutover Area	1900	5					
Lowland Grass	163	0					
Upland Grass	105	0					
Lowland Brush	1528	4					
Upland Brush	5	0					
Unproductive Forest	3420	9					
Non Forest	3255	8					
Total	39,310	100					

Harvest - The TMPIS identified 7,049 acres available for harvest by clear cutting in this RMU over the next ten years.

Salvage and Recycling - There are 1,009 acres that should be salvaged and an additional 1,669 acres that could be regenerated without harvest. These activities replace marginally commercial or noncommercial stands on productive sites with fully stocked stands.

Thinning - There are 87 acres of Norway pine to be thinned in this RMU.

Artificial Regeneration - If all stands available for harvest, salvage, and recycling are treated, there will be 3,835 acres in need of artificial regeneration. Planting will be done on 1,691 acres and seeding on 2,144.

Table 3.52 Burntside Lake RMU Cover Type Composition Goals

Cover Type	Present		Ten Year		Long-term	
	Acres	%	Acres	%	Acres	%
Ash	345	1	345	1	345	1
Aspen	12567	32	12636	32	11386	29
Birch	2006	5	1561	4	1461	4
European Larch	0	0	37	0	37	0
White Pine	802	2	678	2	332	1
Norway Pine	1175	3	1491	4	2565	7
Jack Pine	5197	13	6061	15	5711	15
White Spruce	33	0	735	2	1907	5
Balsam Fir	562	1	387	1	387	1
Black Spruce Lowland	3561	9	3513	9	3113	8
Tamarack	277	1	414	1	814	2
N. White Cedar	266	1	273	1	273	1
Black Spruce Upland	2143	5	1558	4	1358	3
Cutover Area	1900	5	1272	3	1272	3
Lowland Grass	163	0	163	0	163	0
Upland Grass	105	0	18	0	18	0
Lowland Brush	1528	4	1493	4	1493	4
Upland Brush	5	0	0	0	0	0
Unproductive Forest	3420	9	3420	9	3420	9
Non Forest	3255	8	3255	8	3255	8
Total	39,310	100	39,310	100	39,310	100

Table 3.53 Management Prescriptions By Cover Type - Burntside Lake RMU

COVER TYPE	CLEAR CUT		THINNING		ALL-AGED		SALVAGE		REGEN		TOTAL	
	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES
ASH	2	21	0	0	0	0	2	21	0	0	4	42
ASPEN	129	3510	0	0	10	209	26	724	18	644	183	5087
PBIRCH	15	420	0	0	8	238	2	33	6	52	31	743
W PINE	8	124	0	0	2	60	0	0	1	17	11	201
N PINE	12	120	5	87	0	0	0	0	0	0	17	207
J PINE	101	1852	0	0	8	79	4	38	2	35	115	2004
WH SPR	1	20	0	0	0	0	0	0	0	0	1	20
BALSAM	7	94	0	0	0	0	0	0	7	110	14	204
BL SPR	23	269	0	0	0	0	10	129	2	20	35	418
WCEDAR	0	0	0	0	1	5	0	0	0	0	1	5
UPBSPR	34	619	0	0	3	36	4	64	1	36	42	755
CUT	0	0	0	0	0	0	0	0	26	628	26	628
LOGRAS	0	0	0	0	0	0	0	0	0	0	0	0
UPGRAS	0	0	0	0	0	0	0	0	3	87	3	87
LOBRSH	0	0	0	0	0	0	0	0	1	35	1	35
UPBRSH	0	0	0	0	0	0	0	0	1	5	1	5
TOTAL	332	7049	5	87	32	627	48	1009	68	1669	485	10441

Fire Management

Most of the fire protection within this unit is provided by Superior National Forest. The DNR Division of Forestry has fire control responsibility in townships 62-14, 62-15, and 62-16.

Heavily developed lakeshore areas within this unit have a high potential for fire occurrence because of the high population levels. The western portion of this unit is a prime area for the outbreak of a large fire because of lack of access and the distribution and age class of jack pine which is a highly explosive fuel source.

Cooperative Forest Management

Description

Private Forest Management - The western portion of this unit has no PFM potential because essentially all of the land is in public ownership. Potential in the remainder of the unit is limited due to the unit's heavy recreational emphasis. Areas with moderate potential are near Ely and along the Fernberg Road.

School and Municipal Forests - The City of Tower administers portions of its Gunderson Memorial Forest within this unit with the assistance of the Division of Forestry.

The Division of Forestry has an agreement with Vermilion Community College to allow their use of section 36-63-12 for educational purposes.

Guidelines

Private Forest Management - Actively contact landowners to discuss the opportunities available through the PFM program.

School and Municipal Forests - Assist the City of Tower in exchanging its outlying lands for lands in townships 62-14, 62-15, and nearby townships in the Embarrass RMU.

Forest Inventory

Inventory information is new and of good quality. This unit should be among the last in the Orr Area to be reinventoried.

BOUNDARY WATERS CANOE AREA WILDERNESS RESOURCE MANAGEMENT
UNIT -- RMU 10

Description

This unit is coincident with that portion of the Boundary Waters Canoe Area Wilderness (BWCAW) in the Orr Area. The BWCAW is a congressionally designated wilderness area. Use is primarily for non-motorized low impact types of recreation such as canoeing, hiking, backpacking, hunting, fishing, and berry picking. Uses of the land such as timber harvesting and mining are not allowed. This unit is characterized by the forests and lakes of the Canadian Shield. The majority of this 1,000,000 acre wilderness area (about 670,000 acres are in the Orr Area) is administered by the U.S. Forest Service. The DNR Division of Forestry administers about 75,000 acres of land in the Orr Area portion of the BWCAW. Most of this land is trust fund land (57,800 acres) which is currently producing no income for the trust funds because of its wilderness status. Developments on state lands include about 16 miles of portage trail and 51 campsites on 28 lakes. The Division supplied about seven employee months for maintenance of BWCAW recreational facilities in 1985.

There are 19,000 acres of of Division of Forestry administered land in the Burntside State Forest within the boundaries of the BWCAW. Most of this land was granted to the state by the federal government for forest management purposes in 1905. Prior to inclusion in the BWCAW the Burntside State Forest was intensively managed for timber and other purposes. Intensive management was possible because all receipts from the Burntside State Forest were deposited in a special account dedicated for management of the forest. Timber management activities in the Burntside have resulted in over 1,000 acres of plantations and over 25 miles of roads. These extensive areas of young red pine (10 - 25 years old) are fairly unique in the BWCAW because fire suppression efforts in other areas have prevented natural regeneration of red pine stands. The former roads have potential for future recreational development.

There are 2 commercial leases for motorized portages on state lands within the BWCAW. There are also 2 lakeshore homesite leases on the north shore of Lake Vermilion and a state owned cabin on Insula Lake that the Division of Enforcement uses for administrative purposes.

Table 3.54 Land Status and Management Unit Designation of DNR Administered Land in the Boundary Waters Canoe Area Wilderness RMU.

Land Status	Management Unit							
	Burntside St Forest	Bear Is. St Forest	Insula St Forest	L.L Jeanette St Forest	Kabetogama St Forest	L Isabella St Forest	Admin & Scat SF	Not In Mgt Unit
AA School Trust	1,270	592	485			66		25,255
BA Indem School Tr.	167						58	8,795
BJ School Tr. M&O							806	18,138
CA Swamp Trust	346	80		377			86	
CJ Swamp Trust M&O							914	
EA University Tr.					377			
LA Acq. Cong. Grant	17,217							
Totals	19,000	672	485	377	377	66	1,864	52,188

There are two main access roads to the Burntside State Forest portion of the BWCAW. The Coxey Pond State Forest Road accesses land in township 64-13 and the Wolf Lake road accesses township 63-14. Public access to portions of the BWCAW is currently restricted on the Wolf Lake Road by gates installed by private landowners who contend that these are not public roads. These gates limit public use of the area, hinders trail development and maintenance, and precludes effective enforcement of regulations prohibiting use of all terrain vehicles in the BWCAW.

Guidelines

Land Administration - The state owned trust land currently administered by the Division of Forestry should be exchanged for Superior National Forest land outside of the BWCAW so that the trust lands can be managed to produce revenue for the trust. The lakeshore homesite leases within the BWCAW will not be renewed in 1990 as recommended in the DNR's report to the legislature on the future of lakeshore leases. The leases for mechanical portages on state land will be continued as allowed by the 1978 BWCAW act. The Division of Enforcement will be responsible for justifying the continued administrative use of the cabin on Insula Lake and planning for its eventual disposition.

Land Administration and Recreation - State administered lands within the Burntside State Forest should continue to be managed by the Division of Forestry. The Recreation Sub-Area Plan (Appendix A) contains proposals for recreational trails development on old logging roads within the BWCAW portion of the Burntside State Forest.

ORR AREA FOREST RESOURCE MANAGEMENT PLAN

4. PROGRAM GUIDELINES

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INTRODUCTION

This chapter includes proposed objectives and staffing levels for each Division of Forestry program in the Orr Area. The proposed programs follow the framework provided by the Minnesota Forest Resources Plan (MFRP) (MN DNR - Forestry, 1987). Statewide direction set in the MFRP has been adapted for the Orr Area using information from the Assessment and Land Management chapters of this plan.

The next section of this chapter is a comparison of past and proposed levels of effort for various programs. The remainder of the chapter consists of specific program proposals. Each program write-up includes a program description, a list of accomplishments for fiscal year 1985, and proposed accomplishments for fiscal years 1987, 1991, and 1996. These three years are used to show the trend in accomplishments and staffing over the ten year planning cycle. For programs that have major capital requirements (e.g. roads, recreation, buildings) a prioritized list of projects and estimated costs are also included.

The accomplishment and staffing level projections are presented as general guides rather than absolute targets. Unexpected events such as severe fire seasons, insect or disease problems, significant changes in resource demands, or major changes in the Division of Forestry's responsibilities, organization, or budget could alter the projections.

PROGRAM STAFFING SUMMARY

Table 4.1 shows past and projected staffing levels for Division of Forestry programs in the Orr Area. This information provides only a rough indication of the relative emphasis placed on each program. Certain programs are sensitive to outside factors such as weather (e.g. fire), or economic conditions (e.g. timber sales). Other programs rely heavily on contracted labor that is not reflected in the time summaries.

Table 4.1 Time Spent on Division Programs by Orr Area Personnel in Fiscal Years 1983 - 85 with Projections for FY 87, 91, and 96.

Program	Staffing in Full Time Equivalents (a)					
	FY83	FY84	FY85	FY87	FY91	FY96
Coop. County Forest Mgt.	0.1	0.1	0.1	0.1	0.1	0.1
Fire Management	1.6	1.3	1.7	1.7	1.9	1.8
Fish & Wildlife Habitat	0.1	0.1	0.2	0.2	0.3	0.2
Forest Recreation	1.7	1.2	1.2	1.2	2.3 ^c	2.4
Forest Resource Inventory	2.2	2.1	1.4	1.5 ^c	1.7	1.7
Forest Roads	0.9	0.7	0.9	0.9	0.9	0.9
Information & Education	0.2	0.2	0.2	0.2	0.2	0.2
Land Administration	0.6	0.5	0.5	0.5	1.5	1.5
Law Enforcement	0.1	<.05	0.1	0.2	0.2	0.2
Nursery & Tree Improvement	0.1	0.1	0.1	0.2	0.2	0.2
Maint. & Administration	3.6	3.5	3.9	3.9	3.9	3.9
Planning & Env. Review	<.05	<.05	0.1	0.1	0.1	1.0
Pest Management	<.05	0.1	0.3	0.3	0.4	0.4
Private Forest Management	1.0	0.8	0.7	0.7	2.5	3.0
Soils	<.05	<.05	<.05	<.05	<.05	0.1
Timber Management	9.1	9.4	10.7	10.5	11.0	11.5
Training	0.2	0.2	0.2	0.2 ^c	0.8	0.9
Urban & Community Forestry	<.05	0.1	0.1	0.1	0.1	0.1
Utilization & Marketing	<.05	<.05	<.05	<.05	<.05	<.05
Total (b)	21.4	20.8	22.9	22.5	28.1	29.1

Notes: (a) A full time equivalent (FTE) is 1,730 hours per year and is based on an average division employee.

(b) Sum of program staffing may not equal total due to rounding error.

(c) See program descriptions for explanation of proposed staffing level changes.

Source: MN DNR Division of Forestry time summaries (unpublished) for FY 83 - 85. Program managers' projections for FY 87 - 96.

STATE LAND MANAGEMENT PROGRAMS

LAND ADMINISTRATION

Description

Land administration involves land acquisition, exchange, sales, and leasing; land classification; and maintaining land records. Area personnel identify proposed acquisitions, sales, or exchanges and inspect leases.

The land ownership pattern in the Orr Area is scattered and complex. Division of Forestry administered lands include large contiguous blocks and small isolated parcels. Approximately 64 percent of land administered by the Division of Forestry is contained in one of seven state forests or is designated as Administrative and Scattered State Forest. The remainder of the Division administered land is not in designated management units.

The Division administers 75,000 acres of land in the Orr Area that are within the Boundary Waters Canoe Area Wilderness (BWCAW). About 57,800 acres of this land is trust fund land which is currently not providing revenue for the trust because of its wilderness status. Other trust lands, notably those which occur in State Parks or those on which some Division of Forestry recreation facilities are located are also not providing revenue for the trust. The trust lands in State Parks are coded in the DNR Land Record as being administered by the Division of Forestry even though the division has little real role in their management.

The Orr Area currently administers 521 leases, mostly for seasonal lakeshore homes and hunting cabins (Table 4.2). In FY 1985 area personnel spent 0.5 FTE on land administration activities.

Table 4.2 Leases Administered by the Orr Area, 1985

Type of Lease	Number of Leases
Lakeshore homesites	365
Hunting cabin	41
Resorts	7
Other Commercial	34
Rights-of-way	34
Gravel	22
Miscellaneous	18
Total	521

Program Direction

The Minnesota Forest Resources Plan (MN DNR - Forestry, 1987) includes a goal of achieving an optimum land ownership pattern for management of forest resources. This plan proposes use of land exchange, transfer of administrative control within the DNR, leasing, and land acquisition to improve the land ownership pattern.

Division of Forestry administered lands in the Area include large contiguous blocks and small isolated parcels. The checkerboard pattern of land ownership is inefficient to manage for some purposes. Dispersed ownership increases the costs of locating property corners and lines, providing road access, preventing trespass, and conducting a wide range of land management activities. Consolidation of ownership into larger blocks can reduce these costs.

A major objective of this plan is to consolidate scattered lands into larger more contiguous units for ease and efficiency of management. The first priority for consolidating lands is to exchange Division of Forestry administered trust lands within the BWCAW (except land within the Burntside State Forest) for Superior National Forest lands outside of the wilderness. The second priority will be to block land by exchanging with the various other owners whose lands are also scattered throughout the area. Lands which are available for exchange are listed in the Land Ownership and Administration Plan (Appendix D).

The trust status of non-income producing lands in State Parks or Division of Forestry recreation areas should be transferred to parcels that can be managed to provide revenue for the school trust fund. The lands which occur in State Parks should then be coded on the DNR Land Records as Division of Parks and Recreation administered.

A limited amount of land will be purchased, usually to permit road or recreational facility development.

The DNR is beginning to implement the provisions of the 1986 lakeshore lot sale legislation. The Land Bureau has submitted a study to the legislature indicating which lake shore homesite leases could be sold and which should be retained for natural resource management. Area staff will be involved in administering any resultant lake shore lease sales program. This sales program could add significantly to the Area land administration workload through 1992.

For ease of administration and to provide a more uniform and understandable system, all lands administered by the Division of Forestry which are not part of some other state management unit should be designated State Forest lands.

Staff time spent on land administration is projected to increase to 1.5 FTE by FY 1996 because of the lake shore lease sale program and increased emphasis on land exchange.

Program Priorities for 1987-96

- Increase revenue for the school trust and consolidate Division of Forestry lands for increased manageability by exchanging state trust lands in the BWCAW for federal lands outside of the BWCAW.
- Block Division of Forestry lands and those of various other owners for increased manageability through exchange of scattered lands.
- Transfer trust status from non-income producing units.
- Manage lease sites appropriately.

Table 4.3 Land Administration - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.5	0.5	1.5	1.5
<u>Objectives</u>					
<u>Leases and Permits</u>					
1. Administer leases	leases	521	530	550	575
2. Process special use permits	permits	0	0	0	0
<u>Acquisition, Sale, Exchange</u>					
1. Propose or review exchanges	acres	2000	5500	8000	8000
2. Propose or review sales	acres	0	0	40	40
3. Acquire rights-of-way	miles	See Roads Program			
4. Other acquisitions	acres	0	31	0	0
5. Transfer admin. control	acres	0	50	80	80
6. Transfer trust status	acres	0	22	93	93

FOREST RECREATION

Description

The goal of the forest recreation program is to fulfill the outdoor recreation potential of Minnesota forest lands by providing developed recreational areas and opportunities for dispersed recreational activities. State forest recreation areas include campgrounds, day-use areas, and recreational trails. These facilities are managed in accordance with DNR Policy # 9, Recreational Use of Minnesota State Forests (MN DNR, 1981).

Forest recreation management activities include planning, development, and maintenance of facilities, enforcement of rules and regulations, and distribution of maps and other interpretive materials. Appendix A is the Recreation Sub-Area Plan for the Orr Area. It assesses recreation demand and describes the facilities to be provided.

In FY 1985 Orr Area personnel spent 1.2 FTE on recreation programs. Most of the development and maintenance work is done by local contractors. Existing recreation facilities administered by the Division of Forestry include 4 campgrounds with 79 campsites, 1 day-use area, 13 water access sites, 29 miles of recreational trails and 51 wilderness campsites and 16 miles of portages in the BWCAW. Major rehabilitation of the Wooden Frog Campground was completed in 1985-86.

Program Direction

The direction of the recreation program in the Orr Area is to upgrade and adequately maintain existing recreational facilities and to provide a limited number of new facilities on Division administered lands where there appears to be demand and resource characteristics allow. Annual maintenance costs are expected to increase from \$90,000 to \$135,000 over the life of the plan (Table 4.4). The estimated cost of the proposed recreation related capital improvements is \$465,000. (Table 4.5). Increased staffing is necessary for maintenance and administration of Wooden Frog Campground as documented in the Wooden Frog Campground and Recreation Area Sub-Area Plan (MN DNR - Forestry, 1984). Additional staffing increases over the ten year period reflect time currently being spent by forestry staff from outside the Orr Area who are maintaining campsites within the Boundary Waters Canoe Area Wilderness and the necessity for maintenance of newly developed facilities.

Coordination and cooperation with other recreation providers including the U.S. Forest Service, the National Park Service, various counties and private recreational interests will be ongoing over the ten year period. The Area will also work with the local tourism industry to better promote recreational opportunities in the Orr Area.

Program Priorities for 1987-96

- Adequately operate and maintain forest recreation facilities.
- Improve enforcement of forest recreation regulations in cooperation with the Division of Enforcement and local law enforcement agencies.
- Rehabilitate or expand existing facilities and develop new facilities as outlined in the Recreation Sub-Area Plan for the Orr Area (Appendix A).
- Cooperate with other recreation providers, including other DNR divisions, units, and bureaus, other agencies and the private sector to more fully develop area recreational opportunities.
- Cooperate with state and local tourism associations and other agencies to market outdoor recreation and tourism opportunities.
- Assist in the development of new state forest user maps in cooperation with other DNR divisions, units, and bureaus.
- Revise the recreation sub-area plan as needed.

Table 4.4 Estimated Maintenance Costs for Recreation Facilities and Trails in the Orr Area, 1985 and 1995.

	1985	1995*
Recreation Facilities	80,000	120,000
Trails	10,000	15,000
Totals	90,000	135,000

* 1995 figures are projected on a constant dollar basis.

Table 4.5 Recreation Capital Improvements, Year Funding Requested, and Estimated Costs by Funding Source

Project	Year Funding Requested	Costs
FORESTRY FUNDED PROJECTS		
1. Wakemup Bay Campground *	85	\$34,000
2. Wakemup Bay Road & Related Projects	87	224,000
3. Wooden Frog Road	89	35,000
4. Hinsdale Island Campground Dev. and Rehab.	89	10,000
5. Ash River Dispersed Campsites	89	4,000
6. Vermilion River CCC Camp	89	15,000
7. Ash River Campground Rehab.	89	15,000
8. Pine Island & other Dispersed Campsites	89	8,000
9. Bear Island Lake Dispersed Campsites	89	2,000
10. Wolf Bay Dispersed Campsite Dev.	91	10,000
Subtotal		\$357,000
TRAILS AND WATERWAYS FUNDED PROJECTS		
1. Pin Cherry Road X-C Trail Dev.	87	8,000
2. Bear Island Lake Snowmobile Trail Dev.	87	1,000
3. Ash River Trail Rehab.	89	26,000
4. Pelican Lake Access (New Campground)	89	20,000
5. Pelican River Canoe Route	89	3,000
6. Vermilion River Canoe Route	89	2,000
7. Crane Lake Access	91	38,000
8. Burntside State Forest Trails Dev.	95	10,000
Subtotal		\$108,000
GRAND TOTAL		\$465,000

* Funding received in 1985.

Table 4.6 Forest Recreation - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
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Staffing

1. Area	fte	1.2	1.2	2.3	2.4
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Objectives

Development/Rehab.

1. Development/rehab. See Table 4.5
and Appendix A

Operations/Maint.

1. Operate & maintain facilities

- campgrounds	campgrounds	4	4	7	9
- campsites	campsites	79	79	122	140
- water accesses	accesses	13	13	14	14
- trails winter	miles	29	29	50	65
- trails summer	miles	9	9	9	24

* Area snowmobile trails will be maintained by the DNR
Trails and Waterways Unit.

FOREST ROADS

Description

The purpose of the forest road program is to develop and maintain a state forest road system that permits protection, management, and recreational use of state forest lands.

The Orr Area has 56.5 miles of inventoried state forest roads (Table 4.7). This figure is misleading however as none of the Area's class 5 and 6 roads have been inventoried.

In FY 1985 area personnel spent 0.9 FTE on the forest road program.

Table 4.7 State Forest Roads in the Orr Area

Road #	Road Name	Miles by Road Class			
		3	4	5	6
183	Townline Road		9.5		
184	Baldrige		0.5		
185	Elephant Creek Road		4.0		
187	Crane Lake Lookout Tower		1.1		
188	Wooden Frog		0.7		
189	Sheep Ranch Road		3.5		
190	Pearl Lake - Johnson Farm		7.0		
208	Bear Island S. Home Sites		2.2		
210	Birch Lake		1.6		
222	Elbow Lake		5.2		
236	Coxey Pond		1.2		
244	Myrtle Lake Branch		1.3		
262	Smith Road		3.6		
308	North Bay		0.8		
353	Niles Bay		3.1		
354	Elephant Lake Lookout Tower		0.5		
356	Ash Lake Access		0.4		
355	Black Duck Lake Access		1.0		
352	Gold Mine Access		1.6		
360	South Bear Head Lake		7.7		
Total			56.5		

Program Direction

The objectives for the road program in the Orr Area for the ten year period include adequate maintenance of the existing state forest roads, reconstruction and construction of state forest roads, establishment of legal right-of-way to additional state land, and updating the state forest road inventory. The road project proposals contained in this plan are designed to provide legal access to major blocks of state land that will be managed on an ongoing basis. The priority assigned to each project reflects the current thoughts as to the likely order in which access to various areas will be needed. The projections for new construction and total maintained mileage are estimates based on the best available information on resource demand. It may take more than ten years to adequately access all large blocks of state land depending on markets, management needs, and budgets.

For the most part maintenance will be done by Area staff. The estimated annual cost of maintaining state forest roads is projected to increase to \$50,000 by 1996.

Major reconstruction or new construction of class 1 to 4 roads will be contracted and timber access roads (class 5 and 6) will generally be constructed by the loggers who are harvesting the timber.

The establishment of legal access to state lands that the Division of Forestry intends to manage on an ongoing basis is an objective of the Orr Area. Various owners, including the U.S. Forest Service, counties, forest industries, and private individuals control lands that must be crossed to manage state lands. The development of cooperative agreements with government agencies and forest industries, and the acquisition of easements to cross other private properties will be the preferred methods of right-of-way establishment. Right-of-way establishment will be coordinated with the land ownership adjustment proposals.

Class 5 and 6 roads which are presently not inventoried will be inventoried during the ten year period. New roads will be added to the inventory when they are completed. The 4 mile Elephant Creek State Forest Road will be transferred to the US Forest Service.

Public use of some state forest roads may be restricted by gating or posting. This will be done when necessary to reduce road system maintenance costs and to protect the roads and adjacent lands and resources from damage. The DNR will cooperate with other agencies and land owners to limit average road density in areas of existing or potential wolf habitat to no more than 1 mile of road per square mile [see Appendix H and draft "Road Densities and Wolf Populations - Guidelines for Management" (MN DNR - Wildlife, 1987)].

Time spent on this program is expected to remain constant during the ten year period.

Program Priorities for 1987-96

- Maintain the existing state forest road system.
- Update and maintain the state forest road inventory.
- Clarify responsibility for the construction, maintenance, and use of roads accessing areas of mixed land ownership. This includes the development of cooperative agreements and the acquisition of easements to insure access to lands that the Division of Forestry intends to continue to manage.
- Reconstruct existing forest roads where needed.
- Construct new state forest roads to access forest lands in need of management.
- Develop a forest road and right-of-way maintenance schedule for area roads.

Table 4.8 Summary of Orr Area State Forest Road Construction Proposals by Priority

Road Name	Location	RMU	Miles	Class	Cost
1. Rat Root River	68-21	1	4.50	4	\$230,000
2. Haley	63-19	5	6.00	4	120,000
3. Gannon Amundsen	67-19	3	12.00	4	450,000
	68-19				
4. Murray Spur	61-14	7	2.00	4	90,000
5. "5" Bones	63-17	5	3.00	4	125,000
6. Black Duck Grade	66-19	5	1.00	4	75,000
	66-20				
7. Little Long Lake	63-12	9	0.75	5	35,000
8. Hanson	65-20	5	1.00	4	35,000
	65-21				
9. North Bay	61-12	9	1.00	5	5,000
10. Birch Lake	61-11	9	2.00	4	80,000
	61-12				
	62-12				
11. Bear Island L. Spur	61-13	7	0.75	5	10,000
12. Cut Root	63-19	5	2.00	4	80,000
13. Big Lake ^a	65-13	9	6.00	4	270,000
	64-13				
14. Benville	60-13	8	0.30	5	3,000
15. South Kawishiwi	62-11	9	2.25	4	110,000
16. Wampus	60-10	8	1.25	4	15,000
	60-11				
17. Cheney	61-19	6	1.50	5	10,000
18. 35 South	61-19	7	1.50	5	30,000
19. Old Winter	61-18	7	1.00	5	15,000
20. Koscielak	62-17	6	1.00	5	10,000
Total			50.80		\$1,798,000

Note: a. Cooperative project with USFS cost sharing anticipated.

Table 4.9 Summary of Orr Area Recreation Related State Forest Road Construction Proposals by Priority

Road Name	Location	RMU	Miles	Class	Cost
1. Wooden Frog Cpg.	69-21	3	0.30	3	\$18,000
2. Shively Falls	63-17	5	0.75	4	30,000
3. Wakemup Bay Cpg.	63-18	5	0.50	2	250,000
Total			1.55		\$298,000

Table 4.10 Summary of Orr Area State Forest Road Reconstruction Proposals by Priority

Road Name	Location	RMU	Miles	Class	Cost
1. Rat Root River	68-21	1	1.60	4	\$32,000
2. Pearl Lake	67-21	1	3.20	4	60,000
3. Niles Bay Extension	63-17	5	1.50	4	45,000
4. Hoodoo Lake	63-19	5	0.75	5	5,000
5. Murray Spur ^a	62-15&14 61-14	9&7	4.00	4	80,000
6. "5" Bones	63-17	5	1.75	4	60,000
7. Black Duck Grade	66-19	5	0.50	4	10,000
8. Hanson	65-20	5	1.50	4	35,000
9. Bearsclatch ^b	66-19	5	2.00	4	50,000
10. Clover ^b	66-19	5	1.50	4	38,000
11. Biondich	67-22	1	6.50	4	162,000
12. Niles Bay	63-17	5	3.10	4	108,000
13. Benville	60-13	8	0.70	5	7,000
14. South Kawishiwi	62-11	9	0.50	4	10,000
15. Autio	64-19	5	1.00	4	45,000
16. Smith	64-21	6	3.60	4	4,000
Total			33.70		\$751,000

Notes: a. Cooperative project with St. Louis County cost share.
 b. Cooperative project with Division of Fish & Wildlife cost share.

Table 4.11. Forest Roads - Orr Area
 Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.9	0.9	0.9	0.9
<u>Objectives</u>					
1. Road construction	miles		5	5	5
2. Road reconstruction	miles		3	3	3
3. Bridge repair/replacement	bridges	0	1	1	0
4. Maintain class 1-4 roads	miles	56	56	81	106
5. Establishment of Rights-of-way	miles		5	5	5
# of easements necessary	#		8	8	8
6. Maintain gravel stockpile for road repairs	cu. yds.	5000	5000	5000	5000

TIMBER MANAGEMENT

Description

The goal of the timber management program is to maintain diverse and productive state forests through the application of multiple use sustained yield management principles. The program consists of interrelated timber sales and silvicultural sub-programs. The objective of the timber sales efforts is to provide a sustained supply of timber to meet demands for wood products, energy, and other uses. Silvicultural efforts control the establishment, composition, and growth of forest stands.

Timber Sales

Timber sales activities include preparation of planned cut lists, appraising and marking stands for sale, conducting auctions and informal sales, enforcing timber sale regulations, scaling products, and processing paperwork for sales and billing. In FY 1985 the Orr Area offered 55 thousand cords of state timber appraised at \$374,000. Thirty nine thousand cords of timber actually sold. Area personnel spent 6.3 FTE on timber sales activities.

Silviculture

Silvicultural activities include planning, site preparation, regeneration, release, and timber stand improvement. Silvicultural accomplishments in FY 1985 included: 1178 acres of site preparation, 1200 acres of natural regeneration, 119 acres seeded, 1107 acres planted, 596 acres released, and 100 acres of other timber stand improvements. Area personnel spent 4.4 FTE on silvicultural activities in FY 1985.

In FY 1986 the area began a pilot aspen recycling project to employ loggers affected by the closing of the Boise Insulite plant, to improve wildlife habitat, and to improve the age class distribution of the aspen type. About 300 acres were recycled at an average cost of \$129 per acre.

Program Direction

Appendix B contains the timber management plan for the Orr Area. It was prepared in 1986 using Phase II forest inventory information and the Timber Management Planning Information System (TMPIS). Appendix B can be viewed as the optimal silvicultural plan. It includes timber management activities that could be done if there were no constraints on budget and staff and if markets existed for all timber to

be sold. The following program direction and objectives are based on Division of Forestry projections for budget, staffing, and market demand. In most cases the objectives are considerably less than the silvicultural optimum.

The aspen recycling program will be continued. Approximately 5,600 acres of aspen are available for salvage or regeneration without harvest over the next ten years. The Reinvest in Minnesota (RIM) program includes \$1,000,000 in bonding authority for aspen recycling statewide.

Timber demand (and harvest levels) are expected to remain near FY 1985 levels for the next three years or so. Harvest levels are expected to increase when the proposed Insulite plant, Blandin expansion, Lake Superior Paper plant, Hill wood chip operation, and other forest products industries begin operation. Silvicultural accomplishments (except recycling) will also decrease early in the ten year period due to elimination of the reforestation backlog, lower harvest levels, and possible funding shortages. Later in the ten year period silvicultural treatments will reflect changes in harvest levels.

There will be an effort to increase the efficiency of the timber sales program through increased use of auction sales, more consumer scaling, less pre-sale cruising and appraisal, longer auction periods, and use of designated cutting blocks on larger sales. Some of these changes will require modification of Division policy or timber sale legislation.

Program Priorities for 1987-96

- Maintain and update the timber management plan for the area.
- Administer the sale of timber on state owned lands.
- Conduct silvicultural activities in accordance with Division guidelines.
- Increase efforts to integrate timber, wildlife, and recreation management on state forest lands.
- Evaluate proposals for old growth management areas.
- Evaluate proposals for maintenance of unfragmented forest areas.

Table 4.12 Timber Management - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	10.7	10.5	11.0	11.5
<u>Objectives</u>					
<u>Timber Sales</u>					
1. Volume offered	M cords	55	65	75	95
2. Volume sold	M cords	39	45	57	76
3. Allowable harvest area					
- clear cut	acres	4360	5725	5725	5725
- partial cut	acres	413	413	413	413
Acres of actual harvest					
- clear cut	acres	2221	2143	2714	3620
- partial cut	acres	50	200	200	200
4. Special fuelwood sales	permits	35	35	35	35
5. Timber scaling					
- Division scaled	M cords	16	17	15	15
- Consumer scaled	M cords	38	40	45	50
<u>Silviculture</u>					
1. Regeneration surveys	acres	3500	4000	4900	5700
2. Reforestation					
- site preparation	acres	1178	1120	1120	1100
- natural regen.	acres	1200	1300	1600	2200
- seeding	acres	119	200	400	700
- planting	acres	1107	700	700	700
3. Release	acres	596	200	200	200
4. TSI	acres	100	157	157	157
5. Aspen recycling	acres	0	361	361	361
6. Update TMPIS plan	plans	0	0	1	1

FISH AND WILDLIFE HABITAT MANAGEMENT

Description

Forests and associated waters on Division of Forestry administered lands provide habitat for a variety of fish and wildlife species. The multiple use policy included in the Forest Resource Management Act of 1982 requires integrated management of fish, wildlife, timber, and other resources on state forest land. The Wildlife/Forestry Coordination Policy (DNR Policy #8, revised 5/3/82) and the Forestry - Wildlife Guidelines to Habitat Management (MN DNR, 1985) were developed to improve timber and wildlife management practices.

The Division of Forestry's fish and wildlife habitat management efforts are designed to maintain or improve habitat through integration of timber and wildlife management. Typical activities include timber management to maintain a diversity of cover types and age classes, maintenance of wildlife openings, protection of critical habitats, construction of roads and trails, prescribed burning, and reforestation. Regular meetings between forestry and wildlife personnel are an important part of maintaining coordinated management efforts.

During FY 1985 Orr Area personnel recorded 0.2 FTE on fish and wildlife habitat management efforts. The 0.2 FTE figure is misleading however because much time spent on other programs directly benefits wildlife. Examples include time and accomplishments associated with timber harvest activities which are coded under the Timber Management or the PFM programs.

Past projects include intensive deer habitat management in the Elephant Lake area, cooperative road development for management and hunter access, and seeding of selected roads and landings with clover.

Program Direction

The direction for this program is to improve and protect fish and wildlife habitat through forest management practices. Habitats of special importance were identified and protective measures established as part of this planning process. Actual habitat work will be accomplished through timber management activities (harvest and reforestation). These activities have been planned cooperatively by Division of Forestry and Section of Wildlife personnel using the Timber Management Planning Information System (TMPIS) which is a computerized timber planning model (see Timber Management Plan, Appendix B). The timber plan includes goals that will result in improved cover type and age class distributions for wildlife. If the work identified in the timber plan is accomplished it will be a step toward achieving the deer habitat composition goals for the four square mile compartments established by the Section of Wildlife.

Forestry and wildlife personnel will continue to cooperate and plan for wildlife concerns on timber sales and forest development projects. Wildlife personnel will be involved in developing PFM plans for landowners who express an interest in wildlife management. There should be at least three formal meetings per year between forestry and wildlife personnel. Cooperation and communication could be enhanced

by stationing a wildlife manager in the Orr Area Office. Plans currently being developed by the Division of Fish and Wildlife will be reviewed by Area forestry personnel.

It is anticipated that time recorded for this program will remain nearly constant because of the amount of preplanning that has been accomplished and because most wildlife accomplishments are reported under other programs by forestry staff. A slight increase in FTEs is projected for 1991 to rerun the TMPIS model.

Program Priorities for 1987-96

- Work toward forest composition goals, an appropriate mix of cover types and a diversity of age classes as set forth in the Timber Management Plan and the four square mile wildlife habitat compartment analyses.
- Work to establish and maintain wildlife openings.
- Maintain special habitats.
- Increase coordination and cooperation between the Area PFM program and Division of Wildlife personnel.
- Cooperate on special projects. (e.g. aspen recycling, RIM)
- Assist in developing, reviewing, and conducting prescribed burns for wildlife habitat improvement.
- Review Division of Fish and Wildlife plans.
- Have a wildlife manager stationed in the Orr Area Office, on a permanent or regularly scheduled basis.
- Evaluate proposals for old growth management areas.
- Evaluate proposals for maintenance of unfragmented forest areas.
- Conduct appropriate wildlife management activities in corridors along major streams and around lakes.

Table 4.13 Fish and Wildlife Habitat Management - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.2	0.2	0.3	0.2
<u>Objectives</u>					
1. Permanent wildlife openings	acres	0	25	75	125
	maintained				
2. Browse regeneration	acres	0	124	90	90
3. Aspen recycling	acres	0	361	361	361
4. Forestry/wildlife coord.	meetings	3	3	3	3
	meetings				
5. Update TMPIS plan	plan	--	--	1	--
6. Non-game wildlife mgt.	projects	--	4	4	4

COOPERATIVE FOREST MANAGEMENT PROGRAMS

PRIVATE FOREST MANAGEMENT

Description

The private forest management (PFM) program promotes improved multiple use management of non-industrial private forest lands (NIPF) to benefit the landowners, economy, and environment of Minnesota. The PFM program provides technical assistance, cost-sharing, and information on tax incentives for forest management.

Approximately 22% (277,000 acres) of the commercial forest land in the Orr Area is owned by non-industrial private landowners. Typical PFM activities in the Orr Area include: 1) promoting forest management through personal contacts with landowners; 2) conducting educational workshops and field days; 3) developing management plans for landowners; 4) providing technical and financial assistance; and 5) providing utilization and marketing assistance for landowners planning timber harvests. The Area also assists the City of Tower in managing its 6,000 acre Gunderson Municipal Forest. Area personnel spent 0.7 FTE on PFM activities in FY 1985.

Program Direction

There will be a substantial increase in PFM efforts in the Orr Area over the next ten years. Reforestation will be emphasized early in the planning period due to limited markets at the present time. There will be an attempt to develop a pilot aspen recycling program (site prep for natural regeneration) on private lands using cost share money and wildlife habitat improvement as incentives. Later in the ten year period there will be increased emphasis on harvesting aspen, spruce, and balsam fir when the International Falls sheathing plant reopens and the Lake Superior Paper mill starts operation. The Area PFM Specialist will increasingly serve as a program coordinator with the District personnel doing more PFM field work.

There will be increased efforts to coordinate timber and wildlife management on private lands. Sharp tailed grouse habitat needs will be considered in recommending sites for reforestation. Wildlife managers will participate in the initial field examination and plan development on lands where the owner has expressed an interest in wildlife habitat management.

Staff time spent on PFM will increase steadily throughout the period, reaching 3.0 FTE in FY 1996.

Program Priorities for 1987-96

- Emphasize reforestation in the Orr and Cook districts.
- Promote aspen recycling on private lands.
- Assist in marketing wood from private lands through posting of sales in forestry offices and other methods.
- Develop a written agreement with the City of Tower regarding services to be provided by the Division of Forestry for the Gunderson Municipal Forest.

Table 4.14 Private Forest Management - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.7	0.7	2.5	3.0
<u>Objectives</u>					
1. Technical assists					
- field	assists	100	150	250	250
- incidental	assists	25	25	25	25
2. Management plans					
- comprehensive plans	plans	20	20	30	35
	acres	1800	2000	2200	2200
- brief plans	plans	20	40	50	25
	acres	500	500	800	300
3. Site preparation					
- natural	acres	0	20	100	100
- artificial	acres	20	40	100	50
4. Reforestation	acres	180	200	300	150
5. Timber stand improvement					
- release	acres	50	65	60	60
- other TSI	acres	-	5	10	10
6. Habitat improvement	acres	100	200	200	200
7. Recreation improvement	acres	-	-	-	-
8. Timber sales	sales	5	8	15	20
- acres	acres	250	250	450	600
- cords	cords	4000	4000	5000	7000
9. Referrals to consultants	referrals	3	5	10	10
10. U&M assists	assists	5	5	5	5
11. PFM articles & news releases	number	5	5	5	5
12. Forestry field days	field days	1	1	1	1
13. Displays and exhibits	number	1	1	2	2
14. Tree Farms					
- inspections	number	7	7	10	12
- new certifications	number	5	3	15	15

COOPERATIVE COUNTY FOREST MANAGEMENT

Description

The goal of the Cooperative County Forest Management Program (CCFM) is to provide professional forest management support to county forest management programs. The CCFM program provides forest management support to counties in their efforts to intensify the multiple use, sustained yield management of county administered tax-forfeited lands. This assistance is tailored to meet a variety of needs, and is intended to complement the management efforts of the counties involved.

In FY 1985 there were two program foresters assigned to St. Louis County and one in Lake County. In addition, area personnel spent 0.1 FTE on county forestry programs. State funding for foresters working for the counties was eliminated in 1986 and the program is being reduced in scope. Area personnel are no longer responsible for check appraisals of county timber sales.

Lake County completed a plan for the management of its tax-forfeited lands in 1983. The CCFM program is also responsible for administering legislative grants for county forestry intensification.

Program Direction

As a result of recent restructuring of this program, the Area no longer has any direct involvement in county timber and land sale processes. The amount of time spent on county forestry activities will decrease slightly. Area personnel will continue to coordinate management activities with county foresters.

Program Priorities for 1987-96

- Improve cooperation and working relationships with county foresters by involving county foresters in Area meetings and training sessions.
- Promote state/county land exchanges to consolidate ownerships and increase management efficiency.
- Clarify policies and procedures relating to temporary use of roads crossing state and county lands. Develop a cooperative road agreement with St. Louis county.

Table 4.15 Cooperative County Forest Management - Orr Area
Staffing, FY85 and Projections for FY87, 91, & 96.

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.1	0.1	0.1	0.1

URBAN AND COMMUNITY FORESTRY

Description

The goal of the urban and community forestry program is to help cities, towns, and schools maintain and improve their forests and to assist homeowners with the management of any trees or associated plants they are growing for ornamental, aesthetic, or conservation purposes.

Urban forestry activities include helping communities develop tree inventories, management plans, tree ordinances, and forestry budgets. Community officials and homeowners are advised in the selection of plant materials, planting techniques, and spacing of trees in urban and residential areas. Identification of insect and disease problems affecting trees in urban or residential areas is also considered urban forestry. Work with school forests and Arbor Day celebrations are also urban forestry. Table 4.16 lists existing school and municipal forests in the Orr Area. Area personnel spent 0.1 FTE on urban forestry activities in FY 1985.

Table 4.16 School and Municipal Forests in the Orr Area

Name of Forest	Acres	Location
Cook School Forest	72	Lots 5&6 31-62-18
Orr School Forest	43	Lot 3 19-64-19
Willow Valley Twp. Forest	37	SENW 25-63-20
Gunderson Municipal Forest	6,000	Various locations

Program Direction

The Urban and Community Forestry program will be used as a means to inform local governments, educational institutions, and homeowners about the Division of Forestry and its activities. Time spent on this program will remain at 0.1 FTE per year through FY 1996.

Program Priorities for 1987-96

- Promote community tree management in Area municipalities.
- Participate in local Arbor Day celebrations.
- Beautify DNR facilities by landscaping as an example of urban forestry and backyard wildlife habitat for communities and homeowners.

Table 4.17 Urban & Community Forestry - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.1	0.1	0.1	0.1
<u>Objectives</u>					
1. Community assists	number	5	5	5	5
2. School forest assists	number	3	3	3	3

FOREST PEST MANAGEMENT

Description

The goal of the forest pest management program is to reduce resource losses and constraints on forest productivity to acceptable levels. The efficient accomplishment of this goal requires integration of pest management techniques into ongoing timber management practices from site preparation to harvest. The pest management program monitors pest populations and provides management guidelines and risk evaluation systems. The pest management program is also responsible for reviewing the division's use of pesticides.

Area personnel are responsible for selecting and carrying out appropriate pest management techniques on state lands. They also identify pests and recommend management practices for private landowners. The Grand Rapids Regional Insect and Disease Specialist provides technical assistance to the Orr Area. The major historic pest problems in the Area include Hypoxylon canker and white rot of aspen, dwarf mistletoe on black spruce, forest tent caterpillar, spruce budworm, jack pine budworm, white pine blister rust, birch decline, and drought mortality. Area personnel spent 0.3 FTE on pest management activities in FY 1985.

Program Direction

To reduce the high level of insect and disease caused losses, Orr Area foresters will increase efforts to integrate the insect and disease management guidelines into forest resource management activities. Insect and disease guidelines for various cover types are included in the Timber Management Plan (Appendix B). It is not enough to deal with pest problems once they have developed. Emphasis will be placed on preventing losses to pests in the future. Pest problems can be reduced by preharvest planning of timber sale size and layout, consideration of surrounding cover types, control of the harvest method and timing, selection of site preparation techniques, matching the regeneration species to the site, providing habitat for insects, birds and mammals that prey on forest pests, and limiting the size of single species plantations. The Area will begin to risk rate existing stands to identify stands needing shortened rotations, harvest, or timber stand improvement.

In the herbicide program, the use of ground application equipment is likely to increase in the next ten year period.

Staffing required to meet pest management objectives is projected to remain at 0.3 FTE in FY 1987 and increase to 0.4 FTE by FY 1991.

Program Priorities for 1987-96

- Use the Insect and Disease Management Guidelines when planning harvest, regeneration, release, and TSI activities.
- Conduct surveys to detect the presence of forest pests and evaluate their potential impact on forest resources. Area personnel will place emphasis on survey of young plantations and balsam fir and jack pine stands.
- Monitor disease incidence and development in aspen stands to evaluate and refine the aspen management guidelines.
- Evaluate the effectiveness of prescribed pest management techniques and alternative control strategies.
- Review forest development proposals using pesticides to ensure their safe, effective, and economical use.
- Risk rate jack pine stands for susceptibility to jack pine budworm.

Table 4.18 Forest Pest Management - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.3	0.3	0.4	0.4
<u>Objectives</u>					
State/Federal Coop Targets					
1. Forest pest surveys	M acres	900	900	900	900
Integration w/ Forest Management					
1. Apply I&D guidelines for each major type in Area	# types	0	13	13	13
2. Begin risk rating forest stands	M acres	0	3	3	3
Surveys, Evaluations, & Research					
1. Field review of projects using pesticides to effectiveness & possible improvements	% of projects	100	100	100	100
2. Monitor water quality near projects using pesticides	% of projects	10	10	10	10
3. Gypsy moth monitoring	# traps	17	17	17	17
4. Participate in Division review of sites with repeated forest mgt. failures related to insects or diseases	field reviews	2	2	3	3
Training					
1. Maintain expertise in forest pathology, entomology, silviculture and use of pesticides through continuing education	hours	40	80	80	80
2. Provide at least 1 day of field pest mgt. training per biennium for foresters	person days	20	25	26	27
Special Projects					
1. Jack pine budworm monitoring	# plots	1	11	11	11
2. Spruce budworm monitoring	# plots	3	6	12	12
3. Aspen pests	# plots	0	0	1	1

SOILS

Description

The forest soils program exists to:

- Enhance forest resource management and productivity through the application of technical forest soils information.
- Disseminate forest soils information to field forest managers.
- Assist forest managers in focusing management efforts and investments on the most productive sites.
- Participate in land use planning and decision making.

The Grand Rapids Regional Forest Soils Specialist serves the Orr Area. Most of the time spent by Area personnel using soils information gets coded to other programs such as timber management or forest roads. As a result less than 0.05 FTE were coded to the soils program in FY 1985.

Program Direction

The Forest Soil Specialist will continue to provide site specific soil analyses for state forest lands. Cooperative soil survey work, special studies, and training for field foresters will also be done. The time spent by Area personnel on soils related projects will increase slightly to 0.1 FTE by FY 1996.

Program Priorities for 1987-96

- Collect forest site index information in conjunction with the St. Louis County soil survey project.
- Conduct a study of aspen harvest sites in a four to six township area of the Pearl Lake RMU to determine the effects of various harvest techniques on regeneration success.
- Have the Soil Specialist review all sites where use of soil active herbicides is planned.
- Develop guidelines for forestation of lowland brush sites.
- Use Forest Service soils maps and aerial photos to provide soils information for scattered parcels of state land surrounded by federal land.
- Better utilize Soil Specialist's time by using TMPIS output to provide lists of stands that will need site specific soils information over a period of years.
- Improve field foresters knowledge of soils through participation in field workshops on a regular basis.

Table 4.19 Soils - Orr Area
 Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
------------------	-----------------	------	------	------	------

Staffing

1. Area	fte	<.05	<0.05	<0.05	0.1
---------	-----	------	-------	-------	-----

Objectives

1. Provide site specific soils info. for regen. & other projects	acres	200	200	250	300
2. Soils training for field foresters	workshops	1	1	1	1

FOREST RESOURCE ASSESSMENT PROGRAMS

FOREST RESOURCE INVENTORY

Description

The goal of the forest resource inventory program is to collect and maintain the data needed for effective forest management.

The Phase II forest inventory has been completed on all DNR administered lands in the Orr Area (except for BWCAW lands outside of the Burntside State Forest). Field work for the initial inventory in the area was completed between 1976 and 1984.

The inventory program also coordinates the acquisition of aerial photography for the division. The most recent photos for the area were taken in 1980 - 81.

In FY 1985 area personnel spent 1.4 FTE collecting and maintaining forest inventory data.

Program Direction

Area personnel will be responsible for maintaining Phase II inventory on about 200,000 acres of commercial forest land. An inventory specialist will be stationed in the Orr Area to update information on Phase I inventory plots during 1987-88.

Program Priorities for 1987-96

- Update inventory data on ten percent of the acres in the area each year through alteration or reinventory.
- Cooperate in the update of Phase I plot information.
- Obtain new aerial photos every 8 years.

Table 4.20 Forest Resource Inventory - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	1.4	1.5 ^a	1.7	1.7
<u>Objectives</u>					
Phase II					
1. Alterations	M acres	5	5	5	5
2. Reinventory	M acres	15	15	15	15
3. Private lands	M acres	0	0	0	0
Phase I					
1. Plot measurements	plots	0	150	0	0
<u>Aerial Photography</u>					
1. 9x9 photos	MM acres	0	0	1.8	0
2. 35 mm photos	M acres	1	1	1	1

Notes: (a) The staffing increase for FY 87 is due to the inventory specialist assigned to Orr Area to update Phase I plot data.

UTILIZATION AND MARKETING

Description

The goals of the Utilization and Marketing (U&M) program are: to increase the use of Minnesota's wood resources, to increase the economic benefits of forest product manufacturing in the state, and to increase the wood using efficiency of the state's forest industries.

St. Paul and Regional specialists are primarily responsible for the U&M program accomplishments. Orr Area personnel spent less than 0.05 FTE on U&M activities in FY 1985.

Program Direction

U&M program staffing is projected to remain at FY 1985 levels through FY 1996.

Program Priorities for 1987-96

- Improve the timber sale marketing skills of field foresters.
- Promote development of small primary and secondary forest product manufacturers to utilize the Area's diverse resource (e.g. pine posts and poles; birch, ash, and lowland hardwood sawtimber).
- Work to further develop wood energy markets.
- Cooperate with local development agencies in attracting and expanding forest industries.

Table 4.21 Utilization and Marketing - Orr Area
Staffing, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	<.05	<.05	<.05	<.05

FIRE MANAGEMENT PROGRAM

Description

The goals of the fire management program are to provide effective wildfire protection and to promote the safe and effective use of fire as a resource management tool.

The Orr Area Fire Plan (MN DNR Forestry, 1983) contains a detailed analysis of fire information for the period 1971-1981. Between 1971 and 1978 there were an average of 38 fires per year with an average size per fire of 7 acres. The major causes of wildfires are incendiarism, campfires, debris burning, smoking, and lightning.

Because of the intermixed ownership pattern in the Orr Area, the DNR and the US Forest Service have entered into cooperative agreements outlining the areas where each agency assumes primary responsibility for wildfire control regardless of ownership (see Figure 4.1).

The Area also administers the Rural Community Fire Protection Program locally. This program is designed to assist rural communities in the Area in fire protection and to aid their respective fire departments in developing and improving their wildland and structural fire prevention and suppression capabilities. A federal matching fund is utilized with the fire department providing 50 percent of the project cost.

In FY 1985 area personnel spent 1.7 FTE on fire program activities.

Program Direction

The Orr Area Fire Plan calls for increased efforts in fire prevention activities. Use of prescribed fire for wildlife habitat management, site preparation, and fuels management is expected to increase in the future. Presuppression, detection, training, and suppression activities will remain at current levels.

Program Priorities for 1987-96

- Increase prevention activities, including writing more articles on fire protection for local newspapers.
- Increase use of prescribed burning in resource management.
- Maintain expertise of local fire departments through continued training.
- Refine manning guides to provide adequate protection and to increase efficiency.

Table 4.22 Fire Management - Orr Area
 Staffing and Objectives, FY85 and Projections for FY87, 91, & 96.

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	1.7	1.7	1.9	1.8
<u>Objectives</u>					
<u>Training</u>					
1. Meet training requirements for:					
- Level II Enforcement	people	dist. specs. & techs.			
- Overhead team members	people	3	2	3	3
- Basic Firefighter	people	all area personnel			
- Rural Fire Departments	departments	12	12	12	12
<u>Fire Management</u>					
1. Use prescribed fire as a resource mgt. tool	projects	8	8	12	12
<u>Prevention</u>					
1. Improve cost collection percentages	% of fires billed	50	65	80	80
<u>Presuppression</u>					
1. Issue & inspect burning permits	permits	1935	1935	1935	1935
2. Weather observations	hours	140	140	140	140
3. Recruit & train township fire wardens	wardens	76	76	76	76
4. Inspect & inventory excess property	inspections	10	12	14	16
5. Update area fire plan	plans	0	0	1	0
6. Update dispatch plan	plans	1	1	1	1
7. Maintain equipment	agreements	12	12	12	12
8. Detection (4 towers)	hours	250	250	250	250
9. Detection (standby plane)	planes	1	1	1	1
<u>Suppression</u>					
1. Suppress wildfires	fires	20	38	38	38
2. Prepare fire reports	reports	20	38	38	38

NURSERY AND TREE IMPROVEMENT PROGRAM

Description

The nursery program provides seed and planting stock for public and private lands. Nursery stock can be used for afforestation, reforestation, soil and water conservation, wildlife habitat, and environmental education. The tree improvement program seeks to increase the productivity of forest lands by providing genetically improved stock.

Nursery and tree improvement specialists at the General Andrews and Badoura nurseries are responsible for most program activities. Area staff assist in selecting seed sources and purchasing seeds and cones. There are currently no designated seed orchards or seed production areas in the Orr Area. In FY 1985 area personnel spent 0.1 FTE on nursery and tree improvement activities.

Program Direction

The Orr Area will continue to acquire seeds and cones as directed by the nursery staff. Emphasis will be placed on purchasing extra seed during good crop years. Seed collected will continue to be identified by its source.

The Area will provide the nursery with estimates of regeneration material needs on a timely basis. The accuracy of these projections should increase now that the TMPIS program is being used to summarize regeneration plans. The Area wants to increase paper birch regeneration and may consider limited hybrid aspen planting. Birch and aspen regeneration materials will be requested on a special order basis as projects are planned.

There will be continued efforts to improve the handling of seedlings from the time they leave the nursery until they are planted. Improvements in the tree storage bunker, use of refrigerated vans, and development of portable cold storage boxes for use at planting sites should improve seedling survival.

There will be an effort to establish seed production areas; especially for tamarack and northern white cedar.

Area personnel will spend an estimated 0.2 FTE per year on nursery and tree improvement activities over the next ten years.

Program Priorities for 1987-96

- Purchase adequate seed to meet Area needs. Acquire surplus seed in bumper crop years.
- Provide nurseries with estimates of regeneration material needs.
- Assist Nursery and Tree Improvement Specialists in the selection, development, and maintenance of seed production areas, seed orchards, and progeny tests.
- Improve cold storage facilities for seedlings.
- Return stock quality reports to nursery and attempt to relate stock quality to plantation survival rates.

Table 4.23 Nursery and Tree Improvement - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.1	0.2	0.2	0.2
<u>Objectives</u>					
1. Tamarack seed prod. areas	#	0	1	3	3
2. Cedar seed prod. areas	#	0	1	3	3

TECHNICAL AND ADMINISTRATIVE SUPPORT PROGRAMS

MAINTENANCE AND ADMINISTRATION

Description

This program provides the administrative support needed to achieve the goals of other Division of Forestry programs. The major activities are fiscal and personnel management, equipment maintenance, and building maintenance.

Fiscal and Personnel Management

Fiscal management includes developing annual spending plans, bill processing, contract administration, and related activities. The Orr Area complement currently consists of 19 permanent full time employees and two 90% employees (Table 4.24). Temporary laborers or contractors and volunteers are used for projects such as tree planting, fire detection, recreation facility maintenance, and timber management. Personnel management activities include recruitment, selection, supervision, evaluation, and payroll and records processing. In FY 1985 area personnel worked 1.4 FTE on fiscal and personnel management.

Equipment Maintenance

Equipment maintenance includes repair and ongoing maintenance of the Area's equipment. In FY 1985 Area personnel spent 1.9 FTE on equipment maintenance.

Table 4.25 lists the current and proposed inventory of major equipment for the Orr Area. The table also includes estimated maintenance costs and replacement schedules. Many pieces of equipment currently in use in the Area are well beyond acceptable replacement age and some are obsolete.

Building Maintenance

Building maintenance includes minor maintenance and cleanup of Division of Forestry facilities in the Orr Area. Area personnel spent 0.7 FTE on building maintenance in FY 1985. Major facility repair, remodeling, or construction is handled by the Bureau of Field Services located at the Grand Rapids Regional Office. Appendix E contains an inventory of the buildings in the Orr Area along with proposals for repairs, improvements, and new construction.

Table 4.24 Orr Area Personnel, June 1986.

Working Title	Civil Service Class	Notes
Area Forest Supervisor	NR Spec 4	
Asst. Area Forest Supv.	NR Spec 2 (Forester)	
Area Silviculturist	NR Spec 2 (Forester)	
Area PFM Specialist	NR Spec 2 (Forester)	
Area Repairman	General Repair Worker	
Area Office Assistant	Clerk 3	
Orr District Forester	NR Spec 2 (Forester)	
Orr Asst. Dist. Forester	NR Spec 2 (Forester)	
Orr Dist. Technician	NR Tech (Forestry)	
Orr Dist. Technician	NR Tech (Forestry)	vacant
Kabetogama Dist. Forester	NR Spec 2 (Forester)	
Kabetogama Dist. Tech.	NR Tech (Forestry)	
Kabetogama Dist. Tech.	NR Tech (Forestry)	
Kabetogama Dist. Tech.	NR Tech (Forestry)	90% time
Tower District Forester	NR Spec 2 (Forester)	
Tower Asst. Dist. Forester	NR Spec 2 (Forester)	
Tower Dist. Technician	NR Tech (Forestry)	
Tower Dist. Technician	NR Tech (Forestry)	90% time
Cook District Forester	NR Spec 2 (Forester)	
Cook Dist. Technician	NR Tech (Forestry)	
Cook Dist. Technician	NR Tech (Forestry)	vacant

Table 4.25 Orr Area Equipment Inventory, Replacement Schedule, and Maintenance Costs

Item	Present Inventory	Recommended Inventory	Life	Replacement Cost/Unit	Average Replacement Cost/Year	Annual Maint. Cost/Unit	Total Maint. Cost/Yr.
			Expectancy (years)				
<u>Vehicles</u>							
Pickup 1/2 ton 4x2	5	5	6	\$8000	\$6667	\$300	\$1500
Pickup 3/4 ton 4x4	12	12	6	10000	20000	370	4440
Truck 1 ton 4x4	1	4	8	14200	7100	165	660
Truck 1 ton 4x2	1	0					
Truck 2 ton dump	1	0					
Truck 2 ton dump tandem	0	1	12	19400	1617	615	615
Truck 2.5 ton SB	1	1	12	19400	1617	230	230
Van	1	1	6	10000	1667	50	50
Truck 1 ton stake rack	1	1	8	14200	1775	100	100
<u>Tractor/Crawlers</u>							
Small cat (JD 350)	1	1	20	32000	1600	250	250
Backhoe/loader	1	1	20	20000	1000	300	300
Grader	1	1	20	23000	1150	300	300

All Terrain Vehicles

Bombardier	1	3	20	4500	6750	150	450
Snowmobile trail groomer	1	1	10	1200	120	100	100
Ski trail groomer	0	2	10	500	50	100	100

Snowmobiles/Cycles

Snowmobiles	1	6	10	2500	1500	75	450
ATC 3 wheeler	1	3	5	1300	780	50	150
ATC 4 wheeler	3	7	5	1300	1820	50	350

Boats and Motors

18' Queen Mary	2	2	25	2700	216		
18' Aluminum	1	1	15	1700	113		
16' Aluminum	1	2	25	1500	120		
14' Aluminum	1	1	25	750	30		
12' Aluminum	2	2	25	450	36		
Canoes	5	4	20	350	70		
80 HP outboard	2	3	20	1500	225	150	450
70 HP outboard	1	0					
50 HP outboard	0	1	20	1150	58	120	120
40 HP outboard	1	0					
10 HP outboard	4	5	25	900	180	50	250
3 HP outboard	1	0					

Trailers

Boat	2	3	10	350	105	50	150
Snowmobile single axle	1	5	10	350	175	50	250
Snowmobile tandem	1	1	20	750	38	50	50
6-10 ton	1	1	25	1800	72	120	120
2-4 ton	1	2	25	1500	120	50	100
GI utility	1	2	25	500	40	25	50

Fire Equipment

Slip-ons	11	10	10	2500	2500	30	300
Fire pumps	34	25	10	800	2000	30	750
Tank trailers	4	4	20	1500	300		
Porta tanks	2	2	10	1200	240		

Radios

Base	4	4	10	4000	1600	160	640
Mobile	16	21	15	1500	2100	40	840
Portable	21	26	15	1200	2080	40	1040

Miscellaneous

Personal computers	1	5	5	1500	1500	150	750
Lawnmower riding	1	2	5	850	340	300	600
Lawnmower self propelled	1	1	5	400	80	20	20
Lawnmower power push	5	2	5	175	70	20	40
Tractor (cub)	1	1	10	1300	130	50	50
Snowplows	2	3	25	1200	144		

\$69,895

\$16,615

Program Direction

Time spent in carrying out this program should remain constant at about 3.9 FTE per year.

Fiscal and Personnel Management

The projected staffing level to accomplish the program objectives set forth in this plan decreases slightly from 22.9 FTE in FY 1985 to 22.5 FTE in FY 1987. Projected staffing levels based on work loads for 1987 were originally higher but existing budget constraints required a lowering of the FTEs to match the reduced budget. Projected staffing increases to 28.1 FTE in FY 1991, and 29.1 FTE in FY 1996. A portion of the increase will be due to a change in the Division's time reporting system. An inventory specialist and personnel assigned to BWCAW maintenance will charge their time to the Orr Area beginning in FY 1987. The plan also calls for a part time technician to maintain Wooden Frog Campground. The proposed classification and location of other additional personnel will be determined at a later date. The Area has begun to adopt the organizational structure recommended in the Division of Forestry Administrative Realignment Plan (MN DNR - Forestry, 1984). Two districts currently have both District Foresters and Assistant District Foresters. The Crane Lake and Orr Districts have been consolidated. No further consolidations are anticipated. The Area Repairman position will be retained because the nearest locations for contract repair work would be in Virginia or International Falls.

Equipment Maintenance

If a timely replacement schedule for equipment can be implemented the time spent on equipment maintenance should decrease. The estimated average annual cost for equipment maintenance and replacement is \$86,510 (Table 4.25).

Building Maintenance

Table 4.26 is a prioritized list of building improvement and construction needs for the Orr Area. These projects are described in more detail in Appendix E. Funding for major building improvement and construction projects will be requested through the DNR Capital Improvement Budget.

Program Priorities for 1987-96

- Carry out fiscal and personnel management responsibilities.
- Obtain the equipment necessary to carry out area workloads.
- Upgrade, repair, or construct facilities necessary for staff to carry out their jobs.
- Convert BWCAW funded positions to permanent classified status.
- Hire additional personnel to cover projected staffing needs for all programs.

Table 2.26 Orr Area Building Projects by Priority

Building Location	Project Description	Est. Cost
1. Orr Area Office	Major renovation and expansion	\$110,000
2. Cook Dist. Office	Roof, siding, wiring, replace windows, plumbing	13,000
3. Orr Residence	Basement repair, door sills	10,000
4. Kab. Residence	Insulation, vapor barriers, sheetrock	8,000
5. Cook Oil House	Acquire land, construct oil storage building	1,500
6. Kab. Oil House	Construct oil storage building	1,500
7. Orr Repair Shop	Expand, roof, siding, install hydraulic lift	40,000
8. Tower Warehouse	Siding, replace doors, new concrete apron, heat one stall	12,000
9. Tower Office	Insulation, replace windows	3,500
10. Cook Warehouse	Roof, siding, concrete apron, replace windows, install winch	9,000
11. Crane L. Warehouse at Orr	Siding, roofing, wiring	4,000
12. Orr New Warehouse	Construct new six stall warehouse	50,000
13. Orr Oil House	Siding, roof, underground gas tank	1,500
14. Kab. Garage	Partial residing, wiring	300
15. Orr Res. Garage	Roof, Rewiring	5,000
16. Orr Tree Bunker	Wiring, new door, insulation on south side	1,500
17. Orr Seed House	Roofing, siding	1,000
18. Cook Parking Lot	Acquire land, construct lot	5,000
19. Elephant L. Tower	Relocate near Buyck	0
Total Costs		\$276,800

Table 4.27 Maintenance and Administration - Orr Area
 Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	3.9	3.9	3.9	3.9
<u>Objectives</u>					
<u>Fiscal & Personnel</u>					
1. Prepare annual spending plan	plan	1	1	1	1
2. Conduct annual performance evaluations	reviews	20	20	28	29
3. Revise position descriptions	PDs	20	20	28	29
<u>Equipment</u>					
1. Maintain area equipment	See Equipment Inventory Table	4.25			
<u>Buildings</u>					
1. Maintain buildings	#	21	21	21	21
2. Maintain fire towers	#	6	4	4	4

INFORMATION AND EDUCATION

Description

The goal of the information and education program is to increase public awareness and understanding of the Division of Forestry. Typical activities include preparing news releases and feature articles for local media, presenting audio-visual programs, developing and distributing maps, brochures, and other documents, organizing field days and other events, and providing displays at fairs.

In FY 1985 the area spent 0.2 FTE on information and education activities.

Program Direction

Information and education activities will continue at about the same level as in past years. Fire prevention will continue to be the major focus. Maps and advertisement of recreational facilities are needs that should be addressed on a statewide level.

Program Priorities for 1987-96

- Develop calendar listing annual or seasonal events requiring I&E efforts.
- Develop slide/tape program about the Orr Area.
- Cooperate in development and distribution of maps and publicity for recreational facilities.

Table 4.28 Information and Education - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.2	0.2	0.2	0.2
<u>Objectives</u>					
1. Issue news releases to local newspapers	releases	12	12	12	12
2. Make presentations to groups, classes, or clubs	presentations	4	4	4	4

LAW ENFORCEMENT

Description

The Division of Enforcement is primarily responsible for natural resource law enforcement. The Division of forestry has a role in enforcement of various statutes and regulations relating to forest fire control, timber sales, forest recreation, and use of state lands. The Law Enforcement Manual (MN DNR - Forestry, 1985) describes the division's enforcement responsibilities and procedures.

The Orr Area cooperates with ten Conservation Officers and three Sheriff's departments in providing law enforcement. An Area staff member has received fire investigator training and serves as the Area enforcement specialist. Forest Officers patrol Wooden Frog and Wakemup campgrounds on summer weekends. Area personnel spent 0.1 FTE on enforcement activities in FY 1985.

Program Direction

The Division of Forestry will continue to carry out its enforcement responsibilities in cooperation with the Division of Enforcement. There will be increased fire cause investigation and fire cost collection efforts. All District personnel should have level II enforcement training and the Area enforcement specialist will maintain level III training. Enforcement program staffing is projected at 0.2 FTE per year through FY 1996.

Program Priorities for 1987-96

- Provide adequate enforcement training for Division personnel.
- Increase fire cause investigation efforts.
- Maintain informal cooperative enforcement activities with Conservation Officers and Deputy Sheriffs.

Table 4.29 Law Enforcement - Orr Area
Staffing, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.1	0.2	0.2	0.2

PLANNING AND ENVIRONMENTAL REVIEW

Description

The primary role of the planning program in the Orr Area is to maintain a comprehensive plan to guide the protection, management, and use of the Area's forest resources. Other planning and environmental review activities include helping prepare management plans for DNR lands administered by other divisions and reviewing other agency plans to determine the impact on forest resources.

Area personnel spent 0.1 FTE on planning activities in FY 1985.

Program Direction

The major planning activity during the life of this plan will be preparing annual work plans and accomplishment reports as part of the implementation and monitoring process (see Chapter 5). An annual meeting will be held to review the past year's accomplishments and to discuss the new annual work plan.

Planning assistance and plan review will be provided on request. Staff time spent on planning activities is projected to be about 0.1 FTE through FY 1995. A major effort will be required to rewrite the area plan in 1996.

Program Priorities for 1987-96

- Develop annual work plans and accomplishment reports.
- Help prepare management plans for DNR lands administered by other divisions.
- Participate in updates of the Minnesota Forest Resources Plan.
- Update the Orr Area Forest Resource Management Plan by 1996.

Table 4.30 Planning and Environmental Review - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.1	0.1	0.1	1.0
<u>Objectives</u>					
1. Prepare annual work plan	plans	1	1	1	1
2. Prepare annual accomp. report	reports	1	1	1	1
3. Review and comment on plans and proposals	plans	2	3	3	4
4. Participate in MFRP updates		0	1	1	0

TRAINING

Description

Training and continuing education are necessary if Division of Forestry employees are to acquire and maintain the up-to-date knowledge and skills needed to effectively manage natural resources. The training program goal is to have each employee spend approximately five percent of their work time on training and continuing education. The type and amount of training each individual receives will vary depending on their position, experience, and career objectives.

Training plans are developed for each employee as part of the annual performance evaluation. In the past most training was coded to the program or subject being taught. Therefore the amount of time coded to training has been considerably less than the five percent goal. In the future all time spent giving or receiving training (except for fire related training) will be coded to training to allow evaluation of training and continuing education efforts.

Program Direction

The Area will gradually increase the time spent on training and continuing education so that it meets the Division goal of five percent of employee time by the end of the ten year period. Emphasis will be on ensuring that all employees meet the recommended minimum qualifications for training and experience for their position as outlined in the Personnel Development Manual (MN DNR - Forestry, 1985).

Time spent on training will increase from 0.2 FTE in FY 1987 to 0.9 FTE in FY 1996.

Program Priorities for 1987-96

- Maintain training and continuing education plans for all Area employees.
- Each employee will meet recommended training guidelines.

Table 4.31 Training - Orr Area
Staffing and Objectives, FY85 and Projections for FY87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
<u>Staffing</u>					
1. Area	fte	0.2	0.2 ^a	0.8	0.9
<u>Objectives</u>					
1. Maintain individual training plans	plans	0	22	28	29

Notes: (a) Staffing increase primarily due to change in coding of time spent on training. In the past time was coded to the benefitted program. Training time should increase to 80 hr./person/year in FY 96.

ORR AREA FOREST RESOURCE MANAGEMENT PLAN

5. IMPLEMENTATION AND MONITORING

<u>Chapter Contents</u>	<u>Page</u>
Implementation.....	5.2
Annual Work Plans.....	5.2
Annual Spending Plans.....	5.2
Position Descriptions.....	5.2
Monitoring.....	5.3
Accomplishment Reports.....	5.3
Time Summaries.....	5.3
Employee Performance Reviews.....	5.3
Plan Revision.....	5.3

IMPLEMENTATION

The Orr Area staff will have primary responsibility for the implementation of the plan as part of their ongoing job requirements. Assistance will be available from various regional and St. Paul program specialists.

The development of annual work plans, annual spending plans and the updating of position descriptions will enable the Area to refine, update, and accomplish plan objectives to the extent that actual funding and staffing levels permit.

ANNUAL WORK PLANS

Annual work plans will be developed at the beginning of each fiscal year. To the extent possible these plans will be based on the actual budget appropriation for that year. Annual work plans should document anticipated accomplishments following Area Plan objectives to the greatest extent practicable. Past time summaries should be used to estimate staffing levels required to accomplish plan objectives. If diversions from the Area Plan are necessary because new information becomes available, circumstances change, or fiscal or staffing constraints exist these also should be documented. The Orr Area staff will conduct an annual meeting with other units of the DNR to inform them of the proposed forest management activities which are contained in the annual work plan.

The Area work plan is part of the Region work plan (MN DNR - Forestry, 1987). Accomplishment targets will be negotiated with regional staff. Special emphasis projects for the year will also be described in the annual workplan.

ANNUAL SPENDING PLAN

An annual spending plan will be developed in conjunction with the annual work plan. This plan will distribute the dollars available to the area in various accounts (e.g. general fund, BWCA, forest management fund) to permit accomplishment of the objectives in the annual work plan.

POSITION DESCRIPTIONS

Position descriptions should be reviewed and revised as necessary to ensure that job responsibilities and time allocations will allow timely completion of the objectives in the annual work plan. The staffing estimates in the annual work plan should match time allocation in the position descriptions.

MONITORING

Monitoring is necessary to determine if objectives are being met. Monitoring tools include accomplishment reports, time summaries, and annual performance reviews.

ACCOMPLISHMENT REPORTS

Accomplishment reports will be compiled quarterly and at the end of each fiscal year. The reports will compare actual accomplishments with objectives established in the annual work plan. Reports will include explanations for differences between objectives and accomplishments.

TIME SUMMARIES

Time summaries will be used to determine if objectives in the annual work plan are being accomplished with the staff time allocated to various programs. Time summaries will also be helpful in establishing refined staffing projections for specific objectives for future annual work plans.

EMPLOYEE PERFORMANCE REVIEWS

Employee performance indicators and time allocations will be related to annual work plan objectives. Changes in the employees position description should be made as necessary to meet the objectives in the next fiscal year's work plan.

PLAN REVISION

The Orr Area Plan is meant to provide guidance to the Orr Area for a period of ten years. An overall rewrite of the plan will be completed no later than 1996. The rewrite will include a reassessment of the Area's land base and program direction.

Revision of the Orr Area Plan will be necessary to ensure its lasting utility and effectiveness. Minor revisions affecting accomplishment levels and project priorities or details will be documented in the annual work plans.

ORR AREA FOREST RESOURCE MANAGEMENT PLAN

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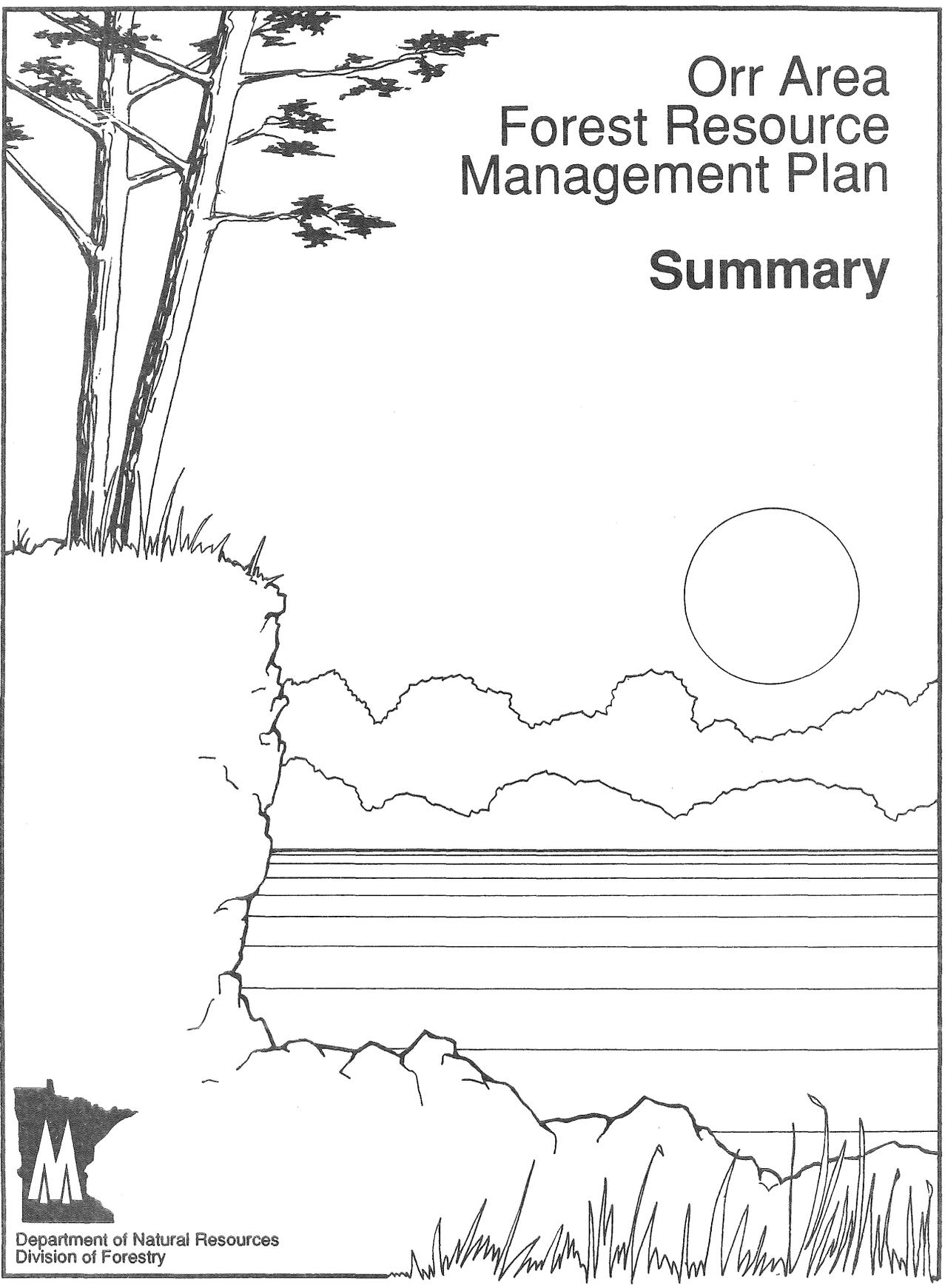
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Orr Area Forest Resource Management Plan

Summary



Department of Natural Resources
Division of Forestry

EXECUTIVE SUMMARY

The Orr Area Forest Resource Management Plan sets forth the proposed management program for 375,000 acres of land and 19 programs administered by the Division of Forestry in the Orr Area. The plan covers the period from 1987 to 1996.

The plan proposes exchanging most of the state trust fund land in the Boundary Waters Canoe Area Wilderness (BWCAW) for federal land outside the wilderness to increase income for the school trust fund and to consolidate ownership patterns. This proposal will not result in an increase in the total amount of public land in the Area or in the BWCAW. The plan also includes provisions to allow sale of some existing lakeshore homesites, and to use the land exchange process to consolidate ownership patterns where possible. Most of the state land outside management units is proposed for inclusion in state forests.

The Division will maintain or improve most of its existing state forest recreation facilities and will encourage dispersed recreational use of state forests. Dispersed campsites for use by motorboaters will be developed on two lakes. Wilderness recreation will be provided in the portion of the Burntside State Forest that is within the BWCAW. The Vermilion and Pelican rivers are proposed as Canoe and Boating Routes.

Up to 52 miles of state forest road could be constructed and 34 miles reconstructed if timber demand and budgets are adequate. The roads will provide improved access to state lands for timber and wildlife habitat management, fire protection, and dispersed recreation use. Public use of some state forest roads may be restricted by gating or posting.

The Orr Area can sustain a much higher level of timber harvest than has occurred in the past if market demand and budgets are adequate. Increased harvesting and regeneration will improve habitat for deer, moose, grouse and other wildlife species requiring immature forests. Vegetation and wildlife management

activities will be coordinated to provide a diversity of habitats for game, nongame, endangered, threatened, and special concern species.

Cooperative forest management programs will continue to provide assistance and advice to private, industrial, school, and municipal forest managers. The Division of Forestry will work to improve cooperation with county and federal forestry agencies.

The Division will continue to work with the Forest Service, National Park Service, Bureau of Indian Affairs, and local fire departments to provide effective wildfire protection in the Orr Area. There will be an increased emphasis on use of fire as a resource management tool.

Six additional full time staff will be required over the next ten years to fully implement the objectives in this plan.



**SUMMARY OF THE
ORR AREA
FOREST RESOURCE
MANAGEMENT PLAN**

November 1987

Prepared Pursuant to the
Forest Resource Management Act of 1982
(Minnesota Statutes Section 89.012)

Minnesota Department of Natural Resources
Division of Forestry
Box 44, 500 Lafayette Road
St. Paul, MN 55155-4044

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History of the Orr Area

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INTRODUCTION

FORMAT AND CONTENT

This document summarizes the Orr Area Forest Resource Management Plan. The plan will guide management of all lands and programs administered by the Department of Natural Resources - Division of Forestry in the Orr Area from 1987 to 1996. The complete plan contains five chapters and eight appendices:

Chapters

1. Introduction
2. Area Assessment
3. Land Management Plan
4. Program Guidelines
5. Implementation and Monitoring

Appendices

- A. Recreation Sub-Area Plan
- B. Timber Management Plan
- C. State Forest Road Plan
- D. Land Ownership and Administration
- E. Buildings
- F. Soil Management Guidelines
- G. Water Management Guidelines
- H. Rare or Unique Natural Features

Complete copies of the Orr Area Forest Resource Management Plan are available for review at the following locations:

DNR Division of Forestry
Orr Area Forest Supervisor
Orr Forestry Station
Orr, MN 55771
(218) 757-3274

DNR Division of Forestry
Forest Planning Unit
Box 44, 500 Lafayette Road
St. Paul, MN 55155-4044
(612) 297-2116

PLANNING PURPOSE AND PROCESS

The purpose of an Area Forest Resource Management Plan is to set forth specific goals and objectives for the management, protection, development, and production of forest resources in a Division of Forestry administrative area. An Area Forest Resource Management Plan is a combined land use and program plan. The Department of Natural Resources is required by the Forest Resource Management Act of 1982 to complete forest resource plans for Division of Forestry administrative areas.

The Forest Resource Management Act defines forest resources as natural assets of forest lands including timber and other forest crops, recreation, fish and wildlife habitat, wilderness, rare and distinctive flora and fauna, air, water, soil, and educational, aesthetic, and historic values. The act requires that the state's forest resources be managed according to multiple use principles.

The provisions of the Forest Resource Management Act and the complexity of forest ecosystems require the use of an interdisciplinary approach in developing forest plans. The Orr Area Plan was developed by an interdisciplinary planning team of DNR resource specialists including foresters, wildlife managers, fisheries managers, recreation specialists, hydrologists, minerals specialists, enforcement officers, and others. The DNR interdisciplinary team worked with other interested agencies, organizations, and individuals in developing this plan.

The Minnesota Forest Resources Plan (MFRP) provides the statewide policy and budget framework within which Area Forest Resource Management Plans are developed.

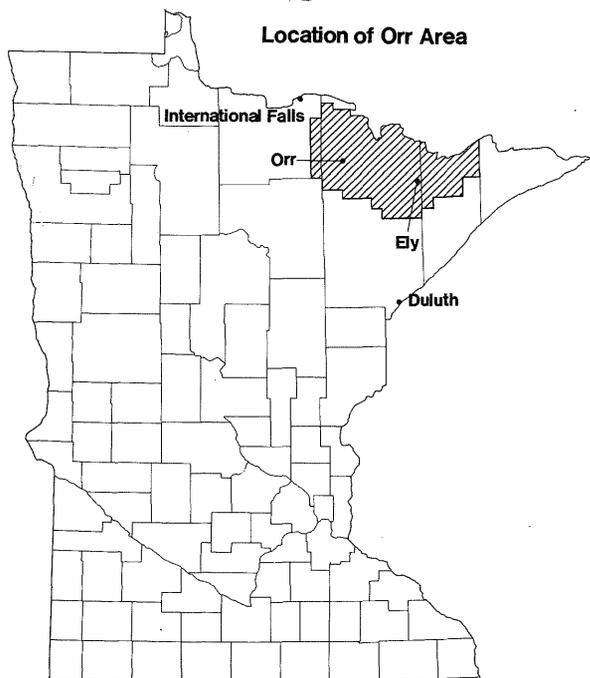
AREA OVERVIEW

LOCATION

The Orr Area is one of 19 Division of Forestry administrative areas in Minnesota. Division offices are located at Orr, Cook, Tower, and on U.S. Highway 53 south of Lake Kabetogama. The Area contains approximately 2.6 million acres in the northern portions of Lake and St. Louis counties and six townships in eastern Koochiching County (Figure 1). The largest cities in the Area include Ely, Babbitt, Cook, Tower, and Orr.

There are about 375,000 acres of Division of Forestry administered land in the area. Other public lands in the Orr Area include Bear Head Lake and Tower Soudan state parks, portions of the Superior National Forest and Boundary Waters Canoe Area Wilderness (BWCAW), and part of Voyageurs National Park. Koochiching, Lake, and St. Louis counties administer 242,000 acres of tax-forfeited land within the Area.

Figure 1



POPULATION

The Orr Area can best be described as sparsely populated. Most of the northern part of the area is public land with no permanent residents. The current population of the Area is estimated to be between 20,000 and 25,000. Many lakes in the Area, particularly the large ones, have concentrations of resorts and summer cabins on their shorelines. The population increases greatly during the summer months due to the influx of resort guests, cabin owners, and outdoor recreation enthusiasts. The BWCAW and Voyageurs National Park attract large numbers of people into the back-country each summer.

The Area population has declined in the recent past and is expected to decrease further. St. Louis and Lake counties are projected to lose population throughout the period 1980 to 2010. Koochiching County is projected to grow through 1990 and then lose population through 2010.

CLIMATE

The Orr Area is dominated by a marked continental climate. Annual precipitation in the Orr Area ranges from about 26 to 31 inches. Of this, about 60 percent falls between April 1 and November 1. About 40 percent of the precipitation is snow. Annual precipitation is generally greater in the eastern part of the area than in the western part, but this is subject to seasonal variations. Average annual snowfall is about 65 inches and duration of snow cover of 1 inch or more is about 153 days.

The annual growing season ranges from 100 to 123 days. The last killing frost in the spring can be expected between May 22 and June 5, and the first in the fall occurs between September 10 and September 27. Summer temperatures higher than 90 degrees F. and

winter temperatures lower than -40 degrees F. are uncommon.

GEOLOGY AND SOILS

Bedrock Geology and Mineral Potential

The Orr Area has a diverse bedrock geology. The rocks vary in age, composition, origin, and mineral potential. There are Archean era rocks 2.7 billion years old and Proterozoic era rocks of two ages, 1.8 and 1.1 billion years old. Bedrock origins include intrusive, volcanic, and both clastic and chemical sediments. These factors create a potential for the occurrence of a variety of mineral deposits.

A major zone of Archean volcanic-sedimentary rocks trends east-northeast and is approximately centered on the Tower Soudan area. This zone includes the Ely Greenstone, Knife Lake, Newton Lake, Soudan Iron, and Lake Vermilion formations and various unnamed rock units. These volcanic-sedimentary rocks are an extension of those in Canada which contain the greater part of Canada's mineral wealth. Consequently, this area has good potential for a variety of ore types including gold, silver, platinum, zinc-copper-lead, nickel-copper, iron, and other minerals.

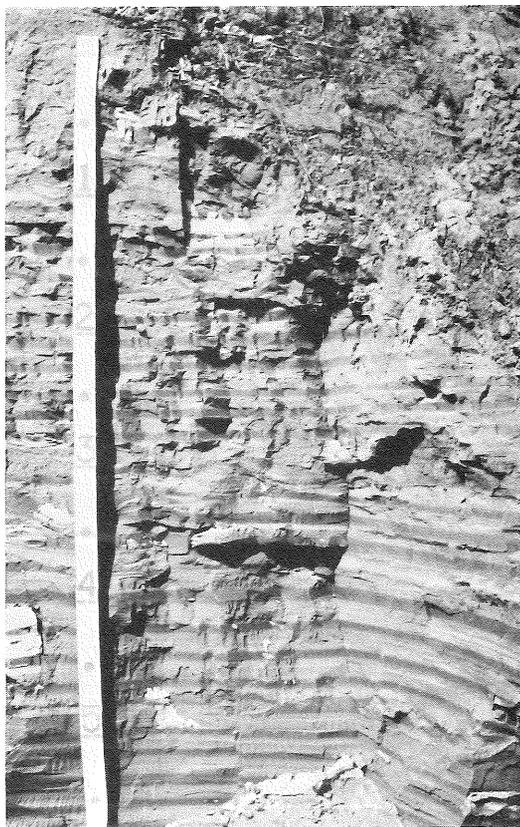
To the northwest and southeast of the volcanic-sedimentary rock units lie the Archean Vermilion Migmatite Massif and the Giants Range Batholith, respectively. These are granitic rocks. There is some potential in folded volcanics for gold and zinc-copper and the granitic units have potential for gold and pegmatite-associated mineralization.

The Biwabik Iron Formation and the Virginia Formation overlie Giants Range rocks in an area extending northeastward from Hoyt Lakes. These are 1.8 billion year old Proterozoic rock units. The Biwabik has been mined for many years, first producing natural ores and now taconite ores. The Virginia For-

mation has a fair potential for gold, silver, and base metals.

The Duluth Complex lies in the southeastern part of the Area, extending northeastward from the Hoyt Lakes area toward the South Kawishiwi area. The complex is 1.1 billion years old. It contains copper-nickel mineralization. The bulk of this mineralization is in the Hoyt Lakes-South Kawishiwi area. Gold, silver, cobalt, and platinum may be recoverable as by-products. Vanadium is found in titaniferous magnetites and significant quantities of titanium are known to occur.

The Orr Area includes one of the most active regions of metallic mineral exploration in Minnesota. This region has been and will be a center of mineral activity for years to come.



Gravel

The Vermilion Moraine from Babbitt through Nett Lake represents a dividing line in terms of sand and gravel availability. The large area from the International Boundary to the Vermilion Moraine is an ice scoured rocky upland that was heavily glaciated by the Rainy Lobe. Consequently it has a thin cover of glacial drift, and gravel deposits are limited to bouldery esker ridges and scattered ice contact deposits. Sand and gravel deposits are more abundant in the southern portion of the area. The Vermilion Moraine contains significant deposits of ice contact sand and gravel related to the advance of the Rainy lobe. Usually the till is so bouldery and granular that it commonly will meet gravel specifications. Extensive glacio-fluvial outwash sand and gravel deposits are found along the Vermilion Moraine from Babbitt to Aurora. The extreme southwest part of the area, in the vicinity of Cook and Greaney, contains scattered sand and gravel deposits associated with shoreline beach ridges and offshore bars of Glacial Lake Agassiz.



Surficial Geology and Soils

The Minnesota Soil Atlas delineates portions of nine geomorphic regions in the Orr Area. Most of the landforms in the Orr Area are the direct or indirect result of glacial action. The Rainy Lobe advanced from the northeast sometime between 16,000 and 35,000 years ago. The Mesabi Range and the Tower - Ely Glacial Drift and Bedrock Complex are characterized by bedrock overlain by thin patches of drift left by the Rainy Lobe. During the retreat of the Rainy Lobe the Allen Moraine, Wahlsten Moraine, Big Rice Moraine, and Vermilion Moraine were formed. Meltwater from the glacier produced the Big Rice and Sawbill outwash plains. The western portion of the Orr Area was glaciated by the St. Louis Sublobe of the Des Moines Lobe. This sublobe advanced southeastward and eastward from the Red Lakes lowland, leaving a thin layer of till which was subsequently covered by clayey lake sediments from Glacial Lake Agassiz. Lake Agassiz formed when meltwaters became ponded between the retreating ice and higher land to the south. After the lake receded large areas of peat formed over much of the poorly drained lake bed.

The DNR Regional Soils Specialist has combined information from the Minnesota Soil Atlas, the Superior National Forest Ecological Land Classification System, soil surveys, and high altitude aerial photographs to delineate the following soil resource units with similar soil associations, topography, and forest management restrictions.

Agassiz Lacustrine Plain

This glacial lake plain covers about 16 percent of the Orr Area. Soils are formed in 1 to 10 feet of grayish brown clayey and silty sediments. These soils are the most productive in the Orr Area and are subject to compaction by heavy equipment during wet periods. Portions of the lake plain are covered by organic soils.

Mesabi Range

The Mesabi Range Soil Resource Unit is located in the southern portion of the Orr Area. This soil resource unit covers about 5 percent of the Area. The terrain is largely determined by the underlying bedrock. The Rainy Lobe deposited till on top of the rock formations. Local relief commonly ranges from 50 to 100 feet but is often greater along Giants Range. The majority of soils are formed in brown acid sandy loam or loamy sand.

Big Rice Outwash Plain

This soil resource unit forms a 5 to 7 mile wide east-west band between the Mesabi Range on the south and the Wahlsten Moraine to the north. Glacial meltwaters transported soil materials away from the stationary ice, sorting and depositing them as the water velocity decreased. The Big Rice Outwash Plain covers about 4 percent of the Orr Area. Soils are formed in brown acid sand and loamy sand. Organic soils generally have 0 to 5 feet of acid to neutral peat over clayey or sandy material.

Rainy Lobe Moraines

This soil resource unit is primarily moraines formed by the Rainy Lobe between 14,000 and 16,000 years ago. The moraines are a nearly continuous series of ridges from 0.5 to 3 miles wide, extending from the Sawbill Landing area in the east along the south shore of Lake Vermillion to the Nett Lake area in the western portion of the Orr Area. The Rainy Lobe Moraines Soil Resource Unit covers about 3 percent of the Orr Area. The dominant soils are formed in brown acid sand and gravel with isolated areas of sandy loam. A discontinuous dense layer may occur within the upper two feet. The depth to bedrock ranges from 0 to over 20 feet. Peat greater than 5 feet deep is found in many of the depressions.

Canadian Shield

The Canadian Shield Soil Resource Unit covers the northern portion of the Orr Area from the Canadian border south to Kabetogama, Pelican, Vermilion, and Birch

lakes. Two major advances of the Rainy Lobe Glacier gouged out stream channels and bedrock faults to form long narrow depressions now occupied by lakes and bogs. The Canadian Shield Soil Resource Unit covers 70 percent of the Orr Area. The majority of soils are formed in brown acid sandy loam or loam. Bedrock outcrops may comprise up to 30 percent of the surface area. Deep clayey and/or silty soils occur in the western portion of the unit in concave to slightly convex drainage ways and depressions below 1350 to 1400 feet in elevation. The majority of the peat is greater than 5 feet deep over lake sediments or glacial deposits.

WATERS

Much of the Orr Area lies within Minnesota's famous Border Lakes Region which contains the Boundary Waters Canoe Area Wilderness and Voyageurs National Park. Over 1,000 lakes in the Orr Area have been designated as protected waters. Many of the lakes in the Area are a product of glacial action on the bedrock of the Canadian Shield. Water quality is generally excellent because the majority of lands which surround the lakes are forest covered and undeveloped.

Portions of three of Minnesota's 39 major watersheds drain the Orr Area. The majority of the Area's land drains into Hudson Bay through the Little Fork River and Rainy River watersheds. A small portion along the Area's southern boundary drains into Lake Superior via the St. Louis River.

VEGETATION

Presettlement Vegetation

The presettlement vegetation of the Orr Area was a mosaic of five major vegetation types: aspen-birch forest, boreal forest, Great Lakes pine forest, swamp, and bog. Logging, fires, agriculture, mining, and residential development have altered the types and composition of vegetation in the area. Early successional communities such as aspen-birch and jack pine have replaced much of the old growth forest and are now the dominant forest types.

Rare Plants and Plant Communities

There are two sites in the Orr Area with concentrations of rare plant species. The Lost Lake Peatland is a relatively small peatland located about 6 miles northwest of Tower. This peatland contains both bog and ribbed fen patterns, including an incipient ovoid island. These patterns are interrupted by Lost Lake and mineral islands. The rare plant species located here are Carex exilis (sedge) and Juncus stygius (bog-rush). The Wahlsten Station Peatland is a small isolated peatland, about 14 miles north of Aurora, consisting of a sedge mat surrounding a bog lake. It is the site of three rare plant species: Rhynchospora fusca (Beak-rush), Triglochin palustris (marsh arrow-grass), and Eleocharis pauciflora (spike-rush).

In addition to the peatland species, two other rare species are known to occur on Division of Forestry administered land in the Orr Area. They are Carex katahdinensis (Mt. Katahdin sedge) and Littorella americana (American shore-plantain).

TIMBER RESOURCES

Description

The Orr Area covers approximately 2.6 million acres, including 335,000 acres of water. Forest land accounts for 91 percent of the land area, but commercial forest land (CFL) covers only 56 percent of the land area. This is due to the large acreage of productive reserved forest land included in the BWCAW and Voyageurs National Park. The 1,271,000 acres of commercial forest land in the Orr Area is 9.3 percent of the statewide total of 13,695,100 acres.

Table 1. Acreage by Land Class in the Orr Area, 1977

Land Class	Acres
Gross Area	2,616,870
Water	334,683
Land	2,282,187
Forest Land	2,086,165
Non-forest Land	196,022
Commercial Forest	1,271,263
Non-commercial Forest	814,902

Aspen is by far the predominant timber type, comprising 43 percent of the CFL. Figure 2 illustrates the cover type classification of CFL in the Area. Many of the cover types have a skewed age class distribution with a concentration of acreage in the older classes.

The ownership of CFL in the Orr Area is primarily public with the US Forest Service being the largest holder (Fig. 3).

Forest pests cause significant reductions in the quality and quantity of timber. There have been periodic, serious outbreaks of spruce budworm, jack pine budworm, and forest tent caterpillar in the Orr Area. White pine and

Figure 2 Orr Area Commercial Forest by Cover Type – All Owners

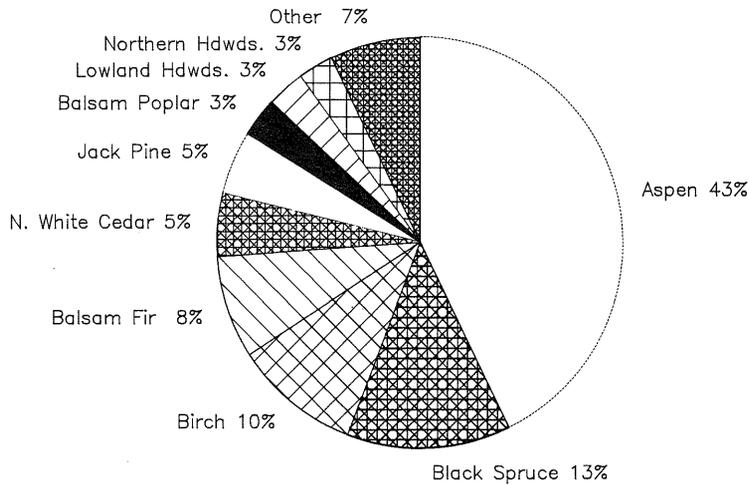
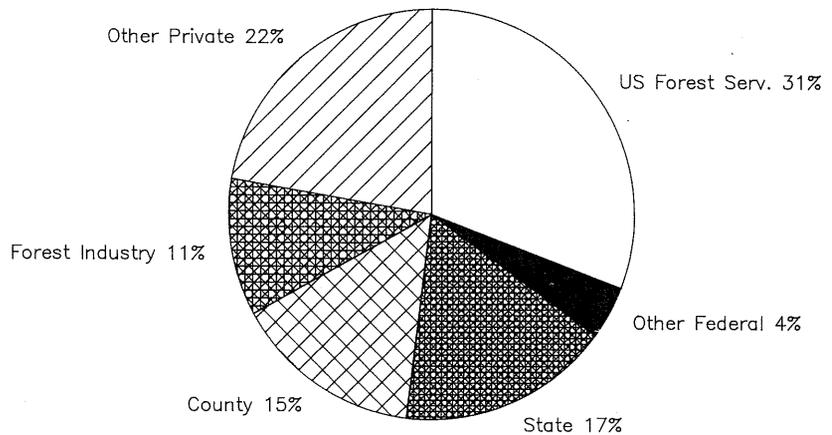


Figure 3 Orr Area Commercial Forest Land Ownership



aspen are the types most severely affected by insects and disease. As the forests in the Orr Area get older the threat of insect and disease damage will increase.

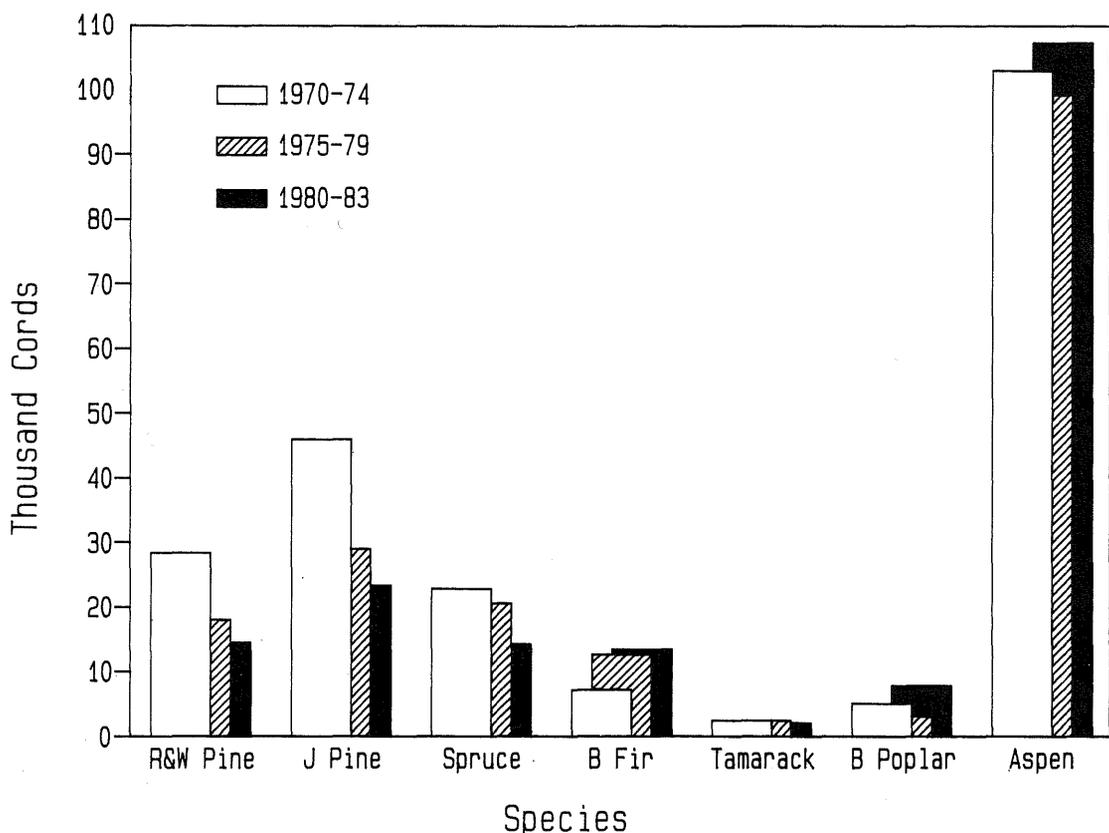
Use

The total annual allowable timber harvest in the Orr Area is estimated at 448,300 cords, of which aspen accounts for 191,700 cords. Figure 4 shows the average annual harvest for each five year period since 1970 for the major

pulpwood species. Softwood harvest has decreased significantly from 107,000 cords in the early 70's to about 70,000 cords. The hardwood cut, comprised almost entirely of aspen, remained relatively stable over the past 15 years. Of the 1983 harvest of 238,000 cords, 182,600 cords (77 percent) was used in the pulp, paper, and fiber board industries. The two other major uses were timber for sawmills and fuelwood used primarily by local residents.

Figure 4

Average Annual Timber Harvest - Orr Area



RECREATION

Recreational Attractions

The Orr Area is rich in recreational amenities. It contains much of the Boundary Waters Canoe Area Wilderness (BWCAW), which is the only water-based wilderness in the continental United States. Voyageurs National Park has been set aside to preserve a number of large lakes and to depict natural processes

for present and future generations. Because much of the Area's land base is undeveloped and publicly owned, it provides dispersed recreational opportunities such as hunting and nature observation.

The Orr Area contains a number of well developed recreational facilities. The DNR Division of Parks and Recreation administers Bear Head Lake and Tower Soudan state parks. The DNR Trails and Waterways Unit has responsibility for many public water ac-

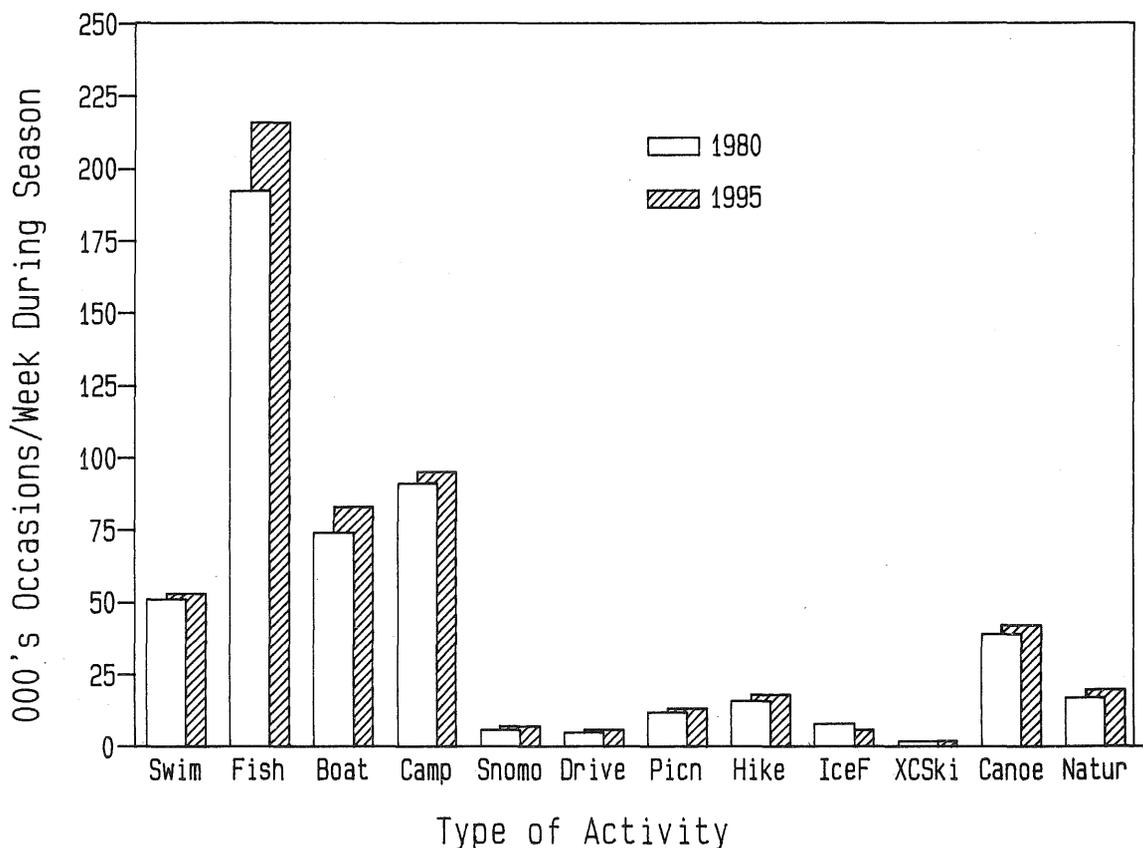
cesses, the Little Fork River Canoe and Boating Route, 207 miles of grants-in-aid trail and 92 miles of the Taconite and Tower to International Falls state trails. The DNR Division of Forestry administers 4 campgrounds, numerous dispersed campsites within the BWCAW, 1 day use area, and 100 miles of recreational trails. The Superior National Forest administers 8 campgrounds, numerous public accesses and dispersed camping sites both in and out of the BWCAW, and 274 miles of recreational trails. Voyageurs National Park administers dispersed campsites and 24 miles of recreational trails. Private sector recreation facilities include 51 campgrounds, 8 group camps, many resorts, and recreational outfitters serving wilderness users.

Recreational Use Projections

Recreational use statistics developed from data gathered through the State Comprehensive Outdoor Recreation Plan (SCORP) surveys show that fishing, boating, camping, and canoeing are the outdoor recreational activities which people participate in most in the Orr Area (Figure 5). The Area provides a substantial percentage of statewide occasions for canoeing (17%), fishing (14%), and camping (12%). Percentages of occasions for other activities include boating (7%), swimming (3%), driving (2%), picnicking (2%), hiking (2%), ice fishing (2%), cross-country skiing (1%), and snowmobiling (1%). Use estimates for hunting, horseback riding, and three wheeling in the Orr Area were not generated.

Figure 5

Orr Area Recreation Activities 1980-95



FISH AND WILDLIFE RESOURCES

Fisheries

The DNR Division of Fish and Wildlife classifies lakes for fisheries management purposes. Table 2 lists the fisheries management classification for about 400 surveyed lakes. The Orr Area has one of the highest concentrations of trout lakes in the state. There are also 30 designated trout streams in the Area. Most of the rivers support fishable populations of warm-water game fish.

Table 2. Fisheries Management Classification of Lakes in the Orr Area

Classification	Number of Lakes
Walleye	126
Northern Pike	63
Centrarchid (Pan Fish)	51
Lake Trout	37
Walleye-Centrarchid	28
Stream Trout	24
Warm-water Game Fish	14
Regular Winterkill	4
Unclassified	3

Wildlife Habitat Types and Trends

Although the virgin forest of the Orr Area contained a mix of early, intermediate and late successional communities, the frequency of major natural disturbances in the Orr Area prior to settlement was most likely relatively low. Thus early successional vegetation types and wildlife species associated with them were probably uncommon. Logging, subsequent fires, and settler activity in the years between 1890-1930 changed the habitat to types that favor early successional species of wildlife (e.g. ruffed grouse, white-throated sparrow, white-tailed deer, yellow warbler, sharptailed grouse, red fox). These

habitat conditions persisted until the 1950's when maturing forests, improved fire control, and farm abandonment again began to favor mature forest wildlife species. These habitat changes are still occurring. Due to past and current market conditions timber harvesting has not offset this trend.

There are 217 wildlife species likely to occur in the Orr Area. These include 3 turtles, 4 snakes, 5 salamanders, 1 toad, 7 frogs, 54 mammals and 143 birds. Typical species are the white-tailed deer, ruffed grouse, moose, common loon, pileated woodpecker, and gray wolf. Wildlife species reflect the transitional nature of the vegetation in the area. Over one-third of the 54 mammal species present are either northern species near the southern edge of their geographical range or more southerly species close to the northern edge of their range.



Plant communities form what collectively makes up wildlife habitat. They provide the cover, structure, and, in many cases, food that wild animals need to survive. The interdependence of plants and animals is demonstrated by the fact that certain wildlife species are abundant in only one particular plant community. Forest management practices significantly affect wildlife habitat.

While the overall condition of wildlife in the Orr Area is assessed as ranging from fair to good, there are some habitats of importance and concern. These habitats are needed to maintain the rich diversity of wildlife that now exists. Habitats of concern include openings, extensive areas of unbroken forest, old growth forests, riparian zones, gravel pits, and white cedar, oak and northern hardwood types.

Endangered, Threatened, and Special Concern Species

There are 13 species that may occur in the Orr Area that are officially designated as endangered, threatened or of special concern (Table 3). The majority of these species are affected by forest management practices.

Table 3. Endangered, Threatened, or Special Concern Wildlife Species in the Orr Area.

Species	Status
Peregrine falcon	Endangered
Bald eagle	Threatened
Gray wolf	Threatened
Wood turtle	Threatened
Keen's myotis	Special concern
American bittern	Special concern
Rock vole	Special concern
Osprey	Special concern
Snapping turtle	Special concern
Heather vole	Special concern
Yellow rail	Special concern
Short-eared owl	Special concern
Pine marten	Special concern

Game Species

There are 26 principal game species found in the Orr Area (Table 4). Populations of some of these species have fluctuated greatly over the years due to habitat changes.

Table 4. Principal Game Species Found in the Orr Area.

White-tailed deer	Muskrat
Black bear	Spruce grouse
Moose	Ruffed grouse
Beaver	Sharptailed grouse
Snowshoe hare	American woodcock
Bobcat	Mallard
Pine marten	Blue-winged teal
Coyote	Wood duck
Raccoon	Ring-necked duck
Red fox	Common goldeneye
Otter	Lesser scaup
Mink	Hooded merganser
Fisher	Common merganser



LAND OWNERSHIP AND ADMINISTRATION

The Orr Area covers approximately 2.6 million acres, including over 300,000 acres of water. Table 5 lists the land acreage in various ownership classes. Federal agencies administer one-half of the land. Twenty-two percent of the land is privately owned. State and county agencies administer 17 and 11 percent of the land respectively.

Table 5. Land Ownership in the Orr Area

Ownership Class	Acres
Private	510,000
County (taxforfeited)	242,000
State	387,000
Federal	1,161,000
Total Land	2,300,000

DNR Management Units

The DNR administers about 380,000 acres of land in the Area. Approximately 65 percent of the DNR administered lands are in management units such as state forests or state parks (Table 6).

Division of Forestry

The Division of Forestry administers 375,560 acres in the Orr Area. Sixty-four percent of this land is within state forest boundaries.

Bear Island State Forest is located south and west of Ely in eastern St. Louis and western Lake counties. Its statutory boundary encompasses 141,187 acres of which 24,639 are administered by the division.

Burntside State Forest is located north and west of Burntside Lake in northeastern St. Louis County. It encompasses 62,782 acres

of which 24,675 are division administered. This is the second oldest state forest in Minnesota, established in 1905 after the US Congress granted the state 20,000 acres of land for forestry purposes.

Insula Lake State Forest is located in north central Lake County. It consists of one section on the south shore of Insula Lake and contains 485 acres of land.

Kabetogama State Forest is located in northwestern St. Louis and eastern Koochiching counties. It encompasses 697,363 acres. The portion of the forest in the Orr Area includes 154,796 acres administered by the division.

Lake Isabella State Forest is located in north central St. Louis County. It consists of one section on Lake Isabella and contains 66 acres of state land.

Lake Jeanette State Forest is located along the Echo Trail in north central St. Louis County. The forest includes 10,725 acres of which 1,357 are division administered.

Sturgeon River State Forest is located in west central St. Louis County. The forest is split between the Orr and Hibbing areas. The Division administers 29,346 acres in the Orr Area portion of the forest.

There are 4,839 acres of Administrative and Scattered State Forest land in the Orr Area.

The Division of Forestry administers 135,357 acres of land outside of state forests in the Orr Area.

Division of Parks and Recreation

There are two state parks in the Orr Area. Bear Head Lake State Park is located 20 miles southwest of Ely. The Division of Parks and Recreation administers 2,048 acres of acquired land and the Division of Forestry has administrative control of 679 acres of trust fund land in the park. Tower Soudan State

Table 6. DNR Management Units in the Orr Area

Management Unit	Administrator	Acres (a)
<u>State Forests</u>		
Bear Island	Forestry	24,639
Burntside	Forestry	24,675
Insula Lake	Forestry	485
Kabetogama	Forestry	154,796
Koochiching	Forestry	28,804(b)
Lake Isabella	Forestry	66
Lake Jeanette	Forestry	1,357
Sturgeon River	Forestry	29,346
Admin. & Scattered	Forestry	4,839(b)
<u>State Parks</u>		
Bear Head Lake	Parks & Recreation	2,048
Tower Soudan	Parks & Recreation	895
<u>Fisheries Management Areas</u>		
Pike River Walleye Hatchery	Fish & Wildlife	1
Shagawa Rearing Pond	Fish & Wildlife	90
Tower Fish Hatchery	Fish & Wildlife	45
Wolf Lake Rearing Pond	Fish & Wildlife	145
<u>Scientific & Natural Areas</u>		
Purvis Lake - Ober Fdn.	Fish & Wildlife	140
<u>State Trails</u>		
Taconite	Trails & Waterways	(c)
Tower to Int. Falls	Trails & Waterways	(c)
<u>Water Access Sites</u>		
Fall Lake	Trails & Waterways	1
Myrtle Lake	Trails & Waterways	1
<u>Land Not in Management Units</u>		
Forestry Administered	Forestry	135,357
Minerals Administered	Minerals	753
Total DNR Administered Land		379,679

(a) Acreage listed is for land within the unit coded to the administering division only.

(b) There are 2,759 acres of land that are in both the Koochiching and Administrative & Scattered state forests as a result of 1985 Minn. Laws Chapter 191.

(c) These trails are on lands administered by other divisions and owners.

Source: DNR Land Ownership/Classification Report 7/1/84

Park is located between the communities of Tower and Soudan on the south shore of Lake Vermilion. The Division of Parks and Recreation administers 895 acres that were acquired as a gift from US Steel. The park features underground iron mine tours.

Division of Fish and Wildlife

The Section of Fisheries administers 280 acres of land in four units in the Orr Area. All of these sites are used for fish propagation.

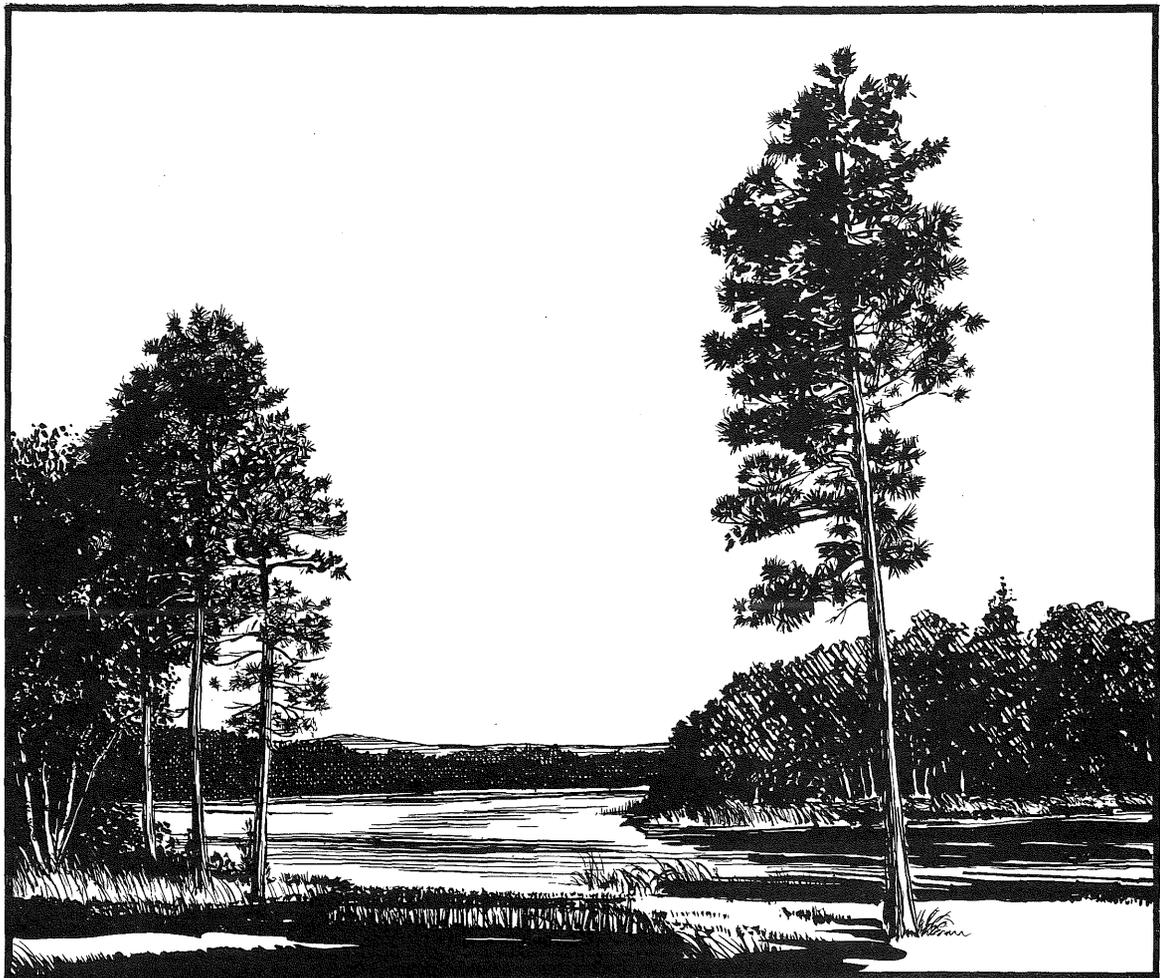
The Section of Wildlife - Scientific and Natural Area Program administers the Purvis Lake - Ober Foundation SNA located about two miles east of Bear Head Lake State Park. The SNA consists of 140 acres acquired as a gift.

Division of Minerals

The Division of Minerals administers 753 acres acquired by gift and purchase in three separate parcels in the southern part of the Orr Area.

Trails and Waterways Unit

The Trails and Waterways Unit administers the land on which the Fall Lake and Myrtle Lake water accesses are located. The unit is also involved in managing state trails, canoe and boating routes, and water access sites on lands administered by other DNR divisions.



LAND MANAGEMENT PLAN

INTRODUCTION

The land management plan describes how Division of Forestry administered land in the Orr Area will be managed. Proposed actions are described for each of the ten Resource Management Units (RMU) in the Area. RMUs and the location of many of the proposed actions are shown on the Area map enclosed in this summary.

DELINEATION OF RESOURCE MANAGEMENT UNITS

Early in the process of developing the Orr Area Plan, various DNR personnel identified a need to delineate land management units smaller than the Area. These units would allow tailoring of management guidelines to reflect local differences in resources and demands. The planning team decided to use RMUs delineated on the basis of similarities in landform, soils, timber productivity, wildlife habitat conditions, mineral potential, land use, and land ownership.

Various single resource maps were overlaid on a base map showing state, county, federal, and private land ownership. The timber, wildlife, and soils maps contained boundaries that nearly coincided with the major landforms (e.g. Agassiz Lacustrine Plain, Canadian Shield, Vermilion Moraine). Seven general RMUs were mapped and approved by the planning team. The RMU boundaries were adjusted to follow township or section lines to facilitate computer sorting and analysis of land ownership and timber inventory data. Three other RMUs (i.e. Voyageurs National Park, Nett Lake Reservation, and BWCAW) were added to recognize the unique management guidelines that apply to these units.

PEARL LAKE RESOURCE MANAGEMENT UNIT -- RMU 1

Pearl Lake RMU, consisting of 150,000 acres of land and water, is located in the northwest corner of the Orr Area. The town of Ray is the only part of the RMU with significant population. Much of the land in this unit is intensively managed for timber production. An abundance of forest roads and wildlife populations favored by the aspen forest have made this unit a popular outdoor recreation area.

The state and federal governments and Boise Cascade Corporation are the major land managers in this RMU. Sixty one percent of the land is in public ownership. The DNR administers 58,000 acres. The state land ownership strategy is to enlarge its ownership blocks by exchanging state land in the BWCAW for federal land in the Kabetogama Purchase Unit and to consolidate its ownership through exchange.

The demand for pulpwood over the last 25 years has resulted in development of 200 miles of timber access roads in this unit. Boise Cascade has built and maintains most of the forest roads which are predominantly located on Boise and Forest Service lands. State lands are not as accessible. The present road system legally accesses only 20 percent of the state lands in the unit. Cooperative road use and maintenance agreements covering the primary roads should be developed to ensure continued access and permit greater flexibility in managing state lands. State forest road system proposals for the ten-year period include 6 miles of new road construction, 13.5 miles of reconstruction, and securing right of way for 4 miles of existing road.

The forests of this unit provide excellent habitat for white tailed deer, black bear, ruffed grouse, woodcock, snowshoe hare, beaver, otter, fisher, and a wide variety of non-game species including the threatened gray wolf. Timber harvesting has helped maintain habitat for species like deer, bear, and grouse that require openings and timber of a variety of ages. Wildlife management objectives for state lands are designed to improve habitat by dispersing the harvest, creating permanent openings, and maintaining winter cover areas. The Ash River and Black Duck River bottoms will be managed to provide a continuous cover of older lowland hardwoods.

Ninety two percent of the state land in this unit is classified as commercial forest land. Aspen is the major type, covering 44 percent of the commercial forest area. The upland clayey soils support highly productive stands of aspen, balm of Gilead, balsam fir, and white spruce. Black spruce and northern white cedar are the predominant lowland types. Pulpwood is the major product and the primary market is Boise Cascade in International Falls. Demand for state wood has decreased significantly since the closure of Boise Cascade's Insulite plant in 1984. Development of new local and regional markets will provide opportunities to increase harvests. There are 8,654 acres available for harvest in this unit over the next ten years. Salvageable wood in poorly stocked stands on 1,916 acres is also available for market. There are 4,092 acres of poorly stocked or nonstocked commercial forest that could be recycled to establish fully stocked stands if funding is available.

There is little demand for private forest land management assistance in this unit. Assistance will be provided on request. The major cooperative forestry responsibility is administration of the Auxiliary Forest Tax Law which covers most of the Boise Cascade lands in this unit.

VOYAGEURS NATIONAL PARK RESOURCE MANAGEMENT UNIT -- RMU 2

Voyageurs National Park contains 219,128 acres of land and water along the Canadian border. The Orr Area includes the southern portion of the park. Recreational uses of the park include fishing, boating, camping, hiking, nature observation, berry picking, snowmobiling, and cross country skiing. Hunting, commercial timber harvesting, and mining are not allowed. The National Park Service administers the park.

Legislation authorizing the Voyageurs National Park was passed in 1971 and the park was established in 1975. The Voyageurs National Park Master Plan guides development of the park. The National Park Service is currently developing a trail plan for the park.

The Division of Forestry administers three recreational facilities immediately adjacent to the park. They are the Wooden Frog Campground (the main public campground serving Voyageurs National Park), the Ash River Campground, and the Ash River Hiking and Cross Country Ski Trail. The Park Service conducts interpretive programs at Wooden Frog Campground. Portions of the park boundary have not been surveyed and marked on the ground.

The DNR and the National Park Service have cooperative agreements covering fire control responsibilities and other topics.

The DNR will work with the National Park Service to:

- Maintain cooperative agreements covering fire control and other topics of mutual concern.
- Survey and mark park boundaries adjacent to state land in cooperation with the National Park Service.
- Explore possible park trail system connections with Wooden Frog Campground and the Ash River Hiking and Cross Country Ski Trail.
- Revise the Master Cooperative Agreement between the two agencies to include a policy on state timber sales near the park. The policy should address water quality, wildlife, and aesthetic concerns.



LONG LAKE RESOURCE MANAGEMENT UNIT -- RMU 3

The 170,000 acre Long Lake RMU is south of Voyageurs National Park. Residential and recreational development in the RMU is concentrated along the shores of Kabetogama and Crane lakes. The southern and western portions of the RMU are remote and sparsely populated. State land management in this RMU emphasizes recreation, timber, and wildlife habitat.

The Division of Forestry currently administers about 30,000 acres of land in this RMU. State land is concentrated in the northern portion of the RMU. The US Forest Service administers most of the land in the southern and eastern portions of the unit. The DNR wants to consolidate its ownership in this unit by exchanging state land in the BWCAW for federal land in this unit. Some of the summer homesite lease areas may be sold to private owners under the terms of legislation passed by the 1986 legislature.

Much of the DNR administered land in this RMU is inaccessible by road. Consolidation of ownership and road development will allow improved forest management. The 7.4 miles of existing State Forest Road will be maintained. New road proposals include rerouting of 0.3 miles of the Wooden Frog Campground road and construction of 12 miles of new road to access state lands in the east half of township 68-19 (Gannon - Amundsen Lake area).

This RMU has more Division of Forestry administered recreation facilities and summer homesite leases than any other in the Orr Area. Recreation will continue to be an important forest use, especially near major lakes and streams. Wooden Frog and Ash River

campgrounds will be improved. The Ash River Hiking and Ski Trail will be extended to the Ash River Falls. The Vermilion and Pelican rivers are proposed for inclusion in the Canoe and Boating Route program. The former ranger station site at Crane Lake should be developed as a public water access site. Water accesses may also be developed at Gannon, Amundsen, and Long lakes.

This RMU provides valuable habitat for white tailed deer, black bear, ruffed grouse, woodcock, snowshoe hare, beaver, otter, fisher, and many species of non-game wildlife. Eagles and ospreys nest in the unit. Deer habitat management objectives for this unit are creation of permanent wildlife openings; identification, evaluation, and management of winter cover areas; and adequate dispersion of timber harvest activities in the aspen type. A project to create 200 acres of wildlife openings on state and federal land is planned.



The Long Lake RMU is located on the Canadian Shield landform. It has lower average productivity for timber than RMU's to the west and south, but higher average productivity than other Canadian Shield units to the east. Aspen and other upland hardwoods cover 50 percent of the state land. Upland conifer types comprise 22 percent. Poor access, long distances to markets, and slack market demand for aspen and black spruce are the major constraints to timber management. State lands in the unit could sustain harvest levels twice as large as has occurred in the past ten years. If aspen markets do not improve it may be necessary to regenerate stands without harvest to meet timber and wildlife goals. If markets and budgets are adequate, state land timber management accomplishments over the next ten years could include harvest of 4,361 acres, thinning of 473 acres, salvage of 1,625 acres, regeneration without harvest of 1,629 acres, and artificial regeneration of 3,534 acres. Spruce budworm and jack pine budworm pose significant threats to the over mature conifer types in this RMU. Pest populations will be closely monitored and appropriate actions taken.

Cooperative forest management activities in this RMU include providing management assistance for nonindustrial private and municipal forests and monitoring auxiliary forest contracts covering about 15,000 acres.

NETT LAKE RESOURCE MANAGEMENT UNIT -- RMU 4

The Nett Lake RMU located on the western side of the Orr Area contains approximately 64,000 acres of land and water. The reservation is sparsely populated. There are no state owned lands within the boundaries of the reservation. St. Louis and Koochiching counties each have some land holdings within the reservation. The reservation contains the large but shallow Nett Lake which is a productive waterfowl resource.

The DNR will maintain cooperative agreements covering fire control and other topics of mutual concern.



PELICAN LAKE RESOURCE MANAGEMENT UNIT -- RMU 5

The 310,000 acre Pelican Lake RMU is located in the west central portion of the Orr Area. The southern border of the RMU roughly follows the Vermilion Moraine from Lake Vermilion to Pelican Lake. Forest related land uses dominate this RMU. Residential development is concentrated around the towns of Orr and Buyck, along highways, and on lakeshores. Timber production, wildlife habitat, and recreation are the primary uses of state land in this unit.

Almost 75 percent of the land in this unit is publicly owned. The DNR administers 73,450 acres. The largest blocks of state land are north of Pelican Lake. The ownership pattern in the eastern portion of this RMU is more fragmented than in other RMU's in the Orr Area. The DNR has identified 3,384 acres of state land it would consider exchanging to consolidate its ownership. There are a total of 68 lakeshore homesite leases on Vermilion, Black Duck, and Pelican lakes. Some of these leased areas may be sold to private owners as a result of legislation passed in 1986.

There are seven inventoried, class 4 state forest roads in this RMU totalling 21 miles in length. Proposals call for reconstruction of 13.6 miles of existing, non-inventoried road and construction of 15.45 miles of additional road. The proposals also call for the acquisition of easements for 9.75 miles of right-of-way to secure access to scattered lands on which the DNR has scheduled management activities for this ten-year period and foresees continued management in the future. Most of the new road proposals are designed to provide summer access to state land so that timber and wildlife management objectives

can be met. The proposed improvements at Wakemup Bay Campground will require rerouting of a county road.

Two improvement projects are planned for the Wakemup Bay Campground. The first involves installation of a dock, fish cleaning house, and toilets. The second project involves rerouting the county road that separates the campground and lake front facilities. Besides increasing user safety and enjoyment, the road rerouting will allow expansion of the beach and water access site and relocation of selected campsites. Three additional dispersed campsites will be developed on Hinsdale Island. Ten additional dispersed campsites will be developed on Wolf Bay in Lake Vermillion to help replace campsites lost to motor boaters when some lakes in the BWCAW were closed to motorized traffic. Three carry in campsites and a toilet will be added at the Vermillion River CCC Camp. An 11-mile cross country ski trail will be developed 15 miles north of Cook on County Road 24. The Vermillion and Pelican rivers are proposed Canoe and Boating Routes.

Wildlife habitat projects in this RMU include improvements in the Elephant Lake Deer Wintering Area, modification of timber harvest practices to benefit ruffed grouse in section 16 of T64,R20, and protection of existing heron rookeries. Ongoing efforts include creation and maintenance of wildlife openings and improvement of the aspen and birch age class distribution.

The Pelican Lake RMU has a higher proportion of sandy and loamy soils than surrounding RMUs. Overall wood fiber productivity in this RMU is moderate, though a wide range of productivity occurs. Aspen covers 40 percent of the RMU; other hardwoods cover 8 percent; upland conifers 14 percent; and lowland conifers 20 percent. If markets and budgets are adequate, state land timber management accomplishments over the next ten years could include harvest of 13,589 acres, thinning of 198 acres, salvage of 2,159 acres, regenera-

tion without harvest on 2,711 acres, and artificial regeneration of 6,827 acres.

Cooperative forest management activities in this RMU include promoting timber and wildlife management on private lands, providing technical assistance for management of Tower Municipal Forest and Orr School Forest on request, and monitoring auxiliary forest contracts.

Inventory data for townships 63-17, 63-18, 63-19, 64-17, 64-18, and 64-19 will be updated over the next ten years.



LITTLE FORK RIVER RESOURCE MANAGEMENT UNIT -- RMU 6

The 225,000 acre Little Fork River RMU is located in the southwest portion of the Orr Area. It extends from Lake Vermilion on the east to the western border of the area. Forests cover about 75% of the unit with open or agricultural land accounting for most of the remaining area. This RMU contains the highest percentage of agricultural land in the Orr Area. The majority of the RMU's population lives in the city of Cook and surrounding agricultural areas. There are numerous seasonal cabins on the shore of Lake Vermilion's Frazer Bay. Timber production, wildlife habitat, and recreation are the primary uses of state land in this unit.

About 41% of the land in this RMU is publicly owned. The DNR administers 61,400 acres. A number of large blocks of state land do exist. Other state lands are scattered and of relatively small acreages. Six special use leases occur on state lands in the RMU.

One inventoried class 4 State Forest Road totaling 3.6 miles exists in this unit. Proposals call for the construction of 2.5 miles of new class 5 road to provide winter access for timber harvesting. Also proposed is the purchase of easements on 7.75 miles of right-of-way to secure access to scattered lands on which the DNR has scheduled management activities for this ten-year period and foresees continued management in the future.

The Tower to International Falls State Trail, administered by the Trails and Waterways Unit, passes through the RMU. All or portions of two trails which were formerly administered by the Division of Forestry have been incorporated into the state trail or closed and deleted from the trail system. There are no

plans for additional recreational facility development by the Division of Forestry within the unit.

Ongoing wildlife habitat management efforts in this RMU include the creation and maintenance of wildlife openings and improvement of aspen and birch age class distribution to benefit deer and grouse. The Section of Wildlife encourages maintenance of old fields in the RMU. These fields occur primarily on private land and are important to sharptail grouse populations and also provide wildlife openings important to other species. The Divisions of Forestry and Wildlife will coordinate work on private lands in the unit through the Private Forest Management (PFM) program. A ruffed grouse management area is proposed for section 16 of T62,R21.

In relation to the Orr Area as a whole this RMU has moderate to high productive potential for timber on sites where commercial timber grows. The clayey soils, which dominate this unit, are vulnerable to degradation from compaction and rutting. Major cover types in the unit include commercial black spruce (25%), aspen (24%), and unproductive lowland types (24%). If markets and budgets are adequate, state land timber management accomplishments over the next ten years could include the harvest of 5,304 acres, regeneration without harvest of up to 3,645 acres and 969 acres of salvage. If all of the above activities take place there will be 4,069 acres in need of artificial regeneration. Planting would be done on 2,103 acres and seeding on 1,966 acres.

The highest incidence and potential for fire in this RMU occurs in agricultural areas where fields have converted to grass types. An ongoing fire prevention and suppression program is needed to reduce indiscriminate burning of these grassy areas and to minimize property loss.

Cooperative forest management activities in this RMU include promoting timber and wildlife

management on private lands. PFM activities will be coordinated with wildlife management concerns, particularly in areas where old fields exist.

Inventory data for lands in Kabetogama State Forest and in T63 R21 are among the oldest in the Area and need updating because of age and poor quality.



EMBARRASS RESOURCE MANAGEMENT UNIT -- RMU 7

The 200,000 acre Embarrass Resource Management is located in the south central portion of the Orr Area. Forests cover approximately 95% of the unit. The remaining 5% of the land is largely in residential development which is heavy along roads in the southern portion of the unit because of their proximity to Iron Range cities. It is also heavy along the shores of larger lakes including Bear Island and Birch. Timber production is the primary use of the unit's lands. Dispersed recreation activities are another important use. Little land use change is expected over the next ten years.

About 44% of the land in this RMU is publicly owned. The DNR administers 27,034 acres including the 3,300 acre Bear Head Lake State Park. Lands administered by the Division of Forestry are scattered throughout the unit. About 1,252 acres of trust fund land in Bear Head Lake State Park are administered by the Division of Forestry. It is proposed that the trust status of these lands be transferred to revenue producing lands administered by the Division of Forestry and that the lands within the park be transferred to the administrative control of the Division of Parks and Recreation.

Four inventoried class 4 State Forest Roads totaling 12 miles exist in this unit. Proposals call for the construction of 5.25 miles of road. The reconstruction of a small segment of road that is largely in RMU 9 is also called for. In addition the acquisition of easements is proposed for 13 miles of right-of-way to secure access to scattered lands on which the DNR has scheduled management activities for this ten-year period and foresees continued management in the future.

A five mile segment of snowmobile trail on existing logging roads will be added to a trail system which includes a portion of the Taconite State Trail, the Putnam Lake Trail, the Fishing Lakes Trail and a grants-in-aid trail segment on the east side of Bear Head Lake State Park. This system will then provide a loop trail around the park for snowmobiles.

Ongoing wildlife efforts in this RMU include the creation and maintenance of wildlife openings and improvement of the aspen age class distribution to benefit deer and grouse. The successional loss of natural and agricultural openings makes openings creation a priority in this RMU. Critical cedar stands which provide wildlife habitat will be maintained to the extent possible.

Two peatland areas within this RMU have been identified as having special characteristics. The Lost Lake Bog (rare fen type) and the Wahlsten Station Peatland (three rare plant species) are candidates for inclusion in Scientific and Natural Areas. The Lost Lake Bog peatland covers 7,900 acres (28% is state land). The Wahlsten Station Peatland covers about 80 acres of county and private land. In the interim, these areas will be managed to protect the significant features found in each.

The potential productivity for fiber is moderate in this RMU due mainly to the low amount of available water in the dominant soils. Birch stands cover 9% of this unit, which is more, on a percentage basis, than any other RMU in the Orr Area. Aspen (31%), black spruce (15%), birch (9%) and unproductive types (10%) are the most prevalent cover types on state land. If markets and budgets are adequate, state land timber management accomplishments over the next ten years could include the harvest of 3,954 acres, regeneration without harvest of 1,070 acres and the salvage of 530 acres. There are 256 acres of Norway Pine available for thinning. If the above activities are completed, 1,283 acres will need to be planted and 704 acres seeded.

Cooperative forest management activities in this RMU include promoting timber and wildlife management on private lands. This RMU has high PFM potential because of old fields and large lot residential development. PFM activities will be coordinated with wildlife management concerns, particularly in areas where old fields exist.



LAURENTIAN DIVIDE RESOURCE MANAGEMENT UNIT -- RMU 8

The 260,000 acre Laurentian Divide RMU is located in the southeastern portion of the Orr Area. The majority of the land in this unit is forested except where large scale open pit iron mines exist. The unit contains a portion of the Mesabi Iron Range. Mining activity is particularly prevalent in townships 59-14, 59-15, 60-12, 60-13, and 61-12. The primary use of forested lands in this unit is timber production. Other uses include dispersed recreation activities such as hunting. The possibility of land use change is high because of the likelihood of future minerals development. Babbitt is the only community in the RMU.

About 58% of this unit is publicly owned. The U.S. Forest Service (45%) is the largest single owner. An additional 30% is owned by industry (mostly mining companies). The DNR administers 24,994 acres or about 12% of the land base. DNR lands are scattered and no large blocks exist. The DNR has identified 1,424 acres that it would consider exchanging to consolidate its ownership for management efficiency. Fifteen leases for various activities (e.g. roads, mining facilities, gravel) occur on state land in this RMU.

There are no inventoried state forest roads in this unit. Proposals call for the construction of 1.55 miles of new state forest road and for the reconstruction of 0.7 miles of non-inventoried road. Also included is the purchase of 6 easements for 1.55 miles of right-of-way to secure access to scattered lands on which the DNR has scheduled management activities for this ten-year period and foresees continued management in the future.

There are no Division of Forestry recreation facilities in this unit and none are proposed.

In general, the St. Louis county portion of the RMU will be managed for deer and the Lake county portion for moose. Heavily used moose feeding sites will be managed as permanent browse management areas. Creation and maintenance of wildlife openings are a priority in the St. Louis County portion of the RMU. Deer yard improvement work needs to be accomplished in the Snort Lake Deer Yard. Long range planning for the reclamation of mining lands to benefit wildlife needs to be undertaken and implemented.

In relation to the Orr Area as a whole this RMU has moderate to low potential for fiber growth. The major cover types in this RMU are aspen (24%), lowland black spruce (15%), and jack pine (10%). Upland black spruce (5%) covers a greater percentage of this unit than any other in the area. If markets and budgets are adequate, state land timber management accomplishments over the next ten years could include the harvest of 3,297 acres, regeneration without harvest of 941 acres and 403 acres of salvage. If all of the above activities take place planting will need to be done on 507 acres and seeding on 569 acres.

The U.S. Forest Service has fire responsibility for about two-thirds of this unit. The remaining third is in the heavily mined area where mining companies have historically responded and extinguished fires. About 80% of the fires in the mining area are caused directly by mining activities.

Most of the private land in this unit is held by mining companies that retain a forester for harvesting or reclamation projects. There is a limited potential for PFM activities near Babbitt.

BURNTSIDE LAKE RESOURCE MANAGEMENT UNIT -- RMU 9

The 400,000 acre Burntside Lake RMU is located in the east central portion of the Orr Area. Timber production and dispersed recreation are the major land uses. The northern and western portions of this unit are for the most part remote and undeveloped. Residential development is almost entirely limited to the southern and eastern portions. Ely, Tower, and Winton are the only cities with substantial populations. The shore lines of the larger lakes including Vermilion, Shagawa, and Burntside are heavily developed with seasonal residences.

About 78% of this unit is publicly owned, with the United States Forest Service (57%) being the largest land owner. The DNR administers 38,698 acres or about 10% of the area. Included in the DNR acreage is the 1,035 acre Tower Soudan State Park and 256 acres administered for fisheries management. The remainder of the state acreage is administered by the Division of Forestry. The DNR has identified 2,468 acres that it would consider exchanging to consolidate its ownership for management efficiency. There are 77 lakeshore home site leases on state land in this RMU and 25 other leases, including 2 leases for resorts, and 8 hunting cabin leases.

There are 2 miles of inventoried state forest road in this unit. Proposals call for the construction of 12 miles of new road and the reconstruction of 0.5 miles of non-inventoried forest road. Also included is the purchase of easements for 6.45 miles of right of way to secure access to lands on which the DNR has scheduled management activities for this ten-year period and foresees continued management in the future.

There are currently no Division of Forestry recreational facilities in this unit. Eight dispersed campsites for boat in camping are proposed on Lake Vermilion at Pine Island and along the north shore of the lake on state lands. Two dispersed campsites are proposed for Bear Island Lake. These sites are proposed to replace sites lost to motorized users when the BWCAW was expanded.

The majority of this unit will be managed for moose with some small areas being managed for deer. Within the deer zones emphasis will be on the creation of upland openings and maintaining 25% of the aspen cover type in the 1 to 10 year age class. A large portion of the known eagle and osprey nests and heron rookeries in the Orr Area are located in this RMU. When these occur on state lands they will be managed for minimal disturbance according to established guidelines. Projects to improve a number of deer yards will take place in the RMU.

In relation to the Orr Area as a whole this RMU has low to very low potential for fiber production. The shallow bedrock underlying the majority of the soils limits the amount of rooting space. Major cover types in the unit include aspen (32%) and jack pine (13%). Most of the types in this RMU have high average ages and a significant portion of the timber is over mature. Distance to markets has been the major factor constraining harvests in this RMU. If markets and budgets are adequate, state land timber management accomplishments over the next ten years could include the harvest of 7,049 acres, regeneration without harvest of 1,669 acres and the salvage of 1,009 acres. If all of the above activities take place planting will need to be done on 1,691 acres and seeding on 2,144 acres. Eighty seven acres of Norway pine are scheduled to be thinned.

The U.S Forest Service has wildfire control responsibility for most of this unit. The Division of Forestry has responsibility in townships 62-14, 62-15, and 62-16. Heavy

potential for fire exists in areas of high populations and in the western portion of the unit where access is limited and the distribution and age class of jack pine provide a highly explosive fuel source.

Potential for PFM activities in the unit are low because of the large amount of public ownership. The greatest potentials exist near Ely and along the Fernberg road.

Inventory information for this RMU is new and of good quality.



BOUNDARY WATERS CANOE AREA WILDERNESS RESOURCE MANAGEMENT UNIT --RMU 10

This unit is coincident with that portion of the Boundary Waters Canoe Area Wilderness (BWCAW) in the Orr Area. The BWCAW is a congressionally designated wilderness area. Use is primarily for non-motorized low impact types of recreation such as canoeing, hiking, backpacking, hunting, fishing, and berry picking. Uses of the land such as timber harvesting and mining are not allowed. This unit is characterized by the forests and lakes of the Canadian Shield. The majority of this 1,000,000 acre wilderness area (about 670,000 acres are in the Orr Area) is administered by the U.S. Forest Service. The DNR Division of Forestry administers about 75,000 acres of land in the Orr Area portion of the BWCAW. Most of this land is trust fund land (57,800 acres) which is currently producing no income for the trust because of its wilderness status. Developments on state lands include about 16 miles of portage trail and 51 campsites on 28 lakes. The Division supplied about seven employee months for maintenance of BWCAW recreational facilities in 1985.

There are 19,000 acres of Division of Forestry administered land in the Burntside State Forest within the boundaries of the BWCAW. Most of this land was granted to the state by the federal government for forest management purposes in 1905. Prior to inclusion in the BWCAW the Burntside State Forest was intensively managed for timber and other purposes. Intensive management was possible because all receipts from the Burntside State Forest were deposited in a special account

special account dedicated for management of the forest. Timber management activities in the Burntside have resulted in over 1,000 acres of plantations and over 25 miles of roads. These extensive areas of young red pine (10 - 25 years old) are fairly unique in the BWCAW because fire suppression efforts in other areas have prevented natural regeneration of red pine stands. The former roads have potential for future recreational development.

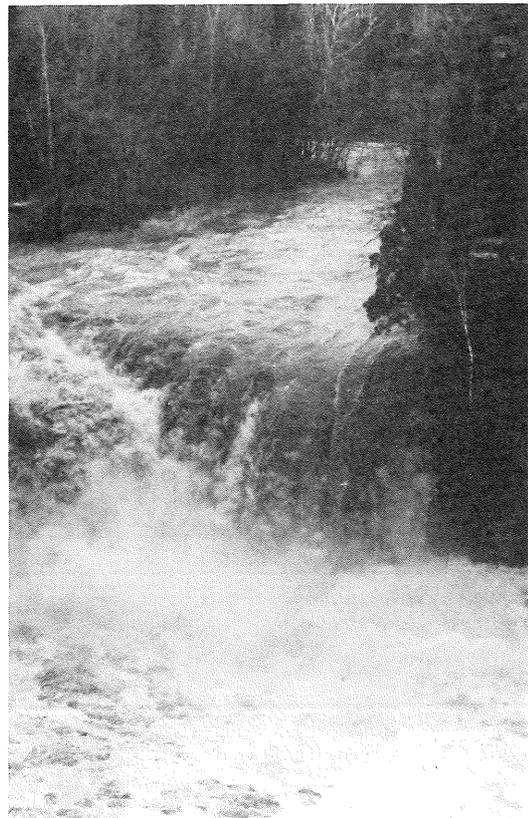
There are two commercial leases for mechanical portages on state lands within the BWCAW.

There are two main access roads to the Burntside State Forest portion of the BWCAW. The Coxey Pond State Forest Road accesses land in township 64-13 and the Wolf Lake road accesses township 63-14. Public access to portions of the BWCAW is currently restricted by gates installed on the Wolf Lake Road by private landowners who contend that it is not a public road. These gates limit public use of the area, hinder trail development and maintenance, and preclude effective enforcement of regulations that stop the illegal use of all-terrain-vehicles in the BWCAW.

The state owned trust land currently administered by the Division of Forestry should be exchanged for Superior National Forest land outside of the BWCAW so that the trust lands can be managed to produce revenue for the trust. The state may retain small parcels of land inside the BWCAW, including those with enforcement cabins or under leases issued by the state. The trust status of any lands retained by the state should be transferred to lands outside of the wilderness that are capable of producing income for the trust fund.

State administered lands within the Burntside State Forest should continue to be managed by the Division of Forestry in accordance with state and federal wilderness management

guidelines. Wilderness management of non-trust state lands in the Burntside State Forest is compatible with the terms of the original congressional grant, the Outdoor Recreation Act, and the Forest Resource Management Act of 1982. The trust status of 1,783 acres of trust land in the BWCAW portion of the Burntside State Forest should be transferred to income producing lands outside of the wilderness. Recreational trails will be developed on old logging roads within the BWCAW portion of the Burntside State Forest in accordance with wilderness management guidelines.



PROGRAM GUIDELINES

PROGRAM STAFFING SUMMARY

This chapter includes proposed objectives and staffing levels for each Division of Forestry program in the Orr Area. The proposed programs follow the framework provided by the Minnesota Forest Resources Plan (MFRP). Statewide direction set in the MFRP has been modified for the Orr Area

using information from the Assessment and Land Management chapters of this plan.

Table 7 shows past and projected staffing levels for Division of Forestry programs in the Orr Area. The table is followed by a description and list of priorities for each program. For programs that have major capital requirements (e.g. roads, recreation, buildings) a prioritized list of projects and estimated costs are also included.

Table 7. Time Spent on Division Programs by Orr Area Personnel in Fiscal Years 1983 - 85 with Projections for FY 87, 91, and 96.

Program	Staffing in Full Time Equivalents (a)					
	FY83	FY84	FY85	FY87	FY91	FY96
County Assistance Program	0.1	0.1	0.1	0.1	0.1	0.1
Fire Management	1.6	1.3	1.7	1.7	1.9	1.8
Fish & Wildlife Habitat	0.1	0.1	0.2	0.2	0.3	0.2
Forest Recreation	1.7	1.2	1.2	1.2	2.3	2.4
Forest Resource Inventory	2.2	2.1	1.4	1.5	1.7	1.7
Forest Roads	0.9	0.7	0.9	0.9	0.9	0.9
Information & Education	0.2	0.2	0.2	0.2	0.2	0.2
Land Administration	0.6	0.5	0.5	0.5	1.5	1.5
Law Enforcement	0.1	<0.05	0.1	0.2	0.2	0.2
Nursery & Tree Improvement	0.1	0.1	0.1	0.2	0.2	0.2
Maint. & Administration	3.6	3.5	3.9	3.9	3.9	3.9
Planning & Env. Review	<0.05	<0.05	0.1	0.1	0.1	1.0
Pest Management	<0.05	0.1	0.3	0.3	0.4	0.4
Private Forest Management	1.0	0.8	0.7	0.7	2.5	3.0
Soils	<0.05	<0.05	<0.05	<0.05	<0.05	0.1
Timber Management	9.1	9.4	10.7	10.5	11.0	11.5
Training	0.2	0.2	0.2	0.2	0.8	0.9
Urban & Community Forestry	<0.05	0.1	0.1	0.1	0.1	0.1
Utilization & Marketing	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total (b)	21.4	20.8	22.9	22.5	28.1	29.1

Notes: (a) A full time equivalent is 1,730 hours per year and is based on an average division employee.

b) Sum of program staffing may not equal total due to rounding.

Source: MN DNR Division of Forestry time summaries (unpublished) for FY 83 - 85. Program managers' projections for FY 87 - 96.

The program priorities and staffing level projections are presented as general guides rather than absolute targets. Unexpected events such as severe fire seasons, insect or disease problems, significant changes in resource demands, or major changes in the Division of Forestry's responsibilities, organization, or budget could alter the projections.

Overall Area staffing is projected to increase from 23 full time equivalents (fte) to 29 fte between 1987 and 1996. Programs that will have significant increases in staffing are forest recreation, land administration, private forest management, timber management, and training. The remaining programs will have stable or slightly higher staffing levels. Program targets generally show larger percentage increases than do staffing levels, indicating an increasing reliance on contracted labor and equipment to accomplish forest management objectives.

LAND ADMINISTRATION

Description

Land administration involves land acquisition, exchange, sales, and leasing; land classification; and maintaining land records. Area personnel identify proposed acquisitions, sales, or exchanges and inspect leases.

The Orr Area currently administers 521 leases, mostly for seasonal lakeshore homes and hunting cabins. In FY 1985, Area personnel spent 0.5 FTE on land administration activities.

Program Direction

A major objective of this plan is to consolidate scattered lands into larger more contiguous units for ease and efficiency of management. The first priority for consolidating lands is to

exchange Division of Forestry administered trust lands within the BWCAW (except land within the Burntside State Forest) for Superior National Forest lands outside of the wilderness. The second priority will be to block land by exchanging with the various other owners whose lands are also scattered throughout the area.

Staff time spent on land administration is projected to increase to 1.5 FTE by FY 1991 and remain at that level through FY 1996 because of the lake shore lease sale program and increased emphasis on land exchange.

Program Priorities for 1987-96:

- Increase revenue for the school trust and consolidate Division of Forestry lands for increased manageability by exchanging state trust lands in the BWCAW for federal lands outside of the BWCAW.
- Transfer trust status from non-income producing units.
- Manage lease sites appropriately.
- Block Division of Forestry lands and those of various other owners for increased manageability through exchange of scattered lands.

FOREST RECREATION

Description

The goal of the forest recreation program is to fulfill the outdoor recreation potential of Minnesota forest lands by providing developed recreation areas and opportunities for dispersed recreational activities. State forest recreation areas include campgrounds, day-use areas, and recreational trails. Forest recreation management activities include planning, development, and maintenance of facilities, enforcement of rules and regulations, and distribution of maps and other interpretive materials.

In FY 1985 Orr Area personnel spent 1.2 FTE on recreation programs. Existing recreation facilities administered by the Division of Forestry include 4 campgrounds with 79 campsites, 1 day-use area, 13 water access sites, 29 miles of recreational trails, and 51 wilderness campsites and 16 miles of portages in the BWCAW.

Program Direction

The direction of the recreation program in the Orr Area is to upgrade and adequately maintain existing recreational facilities and to provide a limited number of new facilities where there appears to be demand and resource characteristics allow. Increased staffing is necessary for maintenance and administration of Wooden Frog Campground. Additional staffing increases over the ten-year period reflect time currently being spent by forestry staff from outside the Orr Area who are maintaining campsites within the Boundary Waters Canoe Area Wilderness and the necessity for maintenance of newly developed facilities.

Program Priorities for 1987-96:

- Adequately operate and maintain forest recreation facilities.
- Improve enforcement of forest recreation regulations in cooperation with the Division of Enforcement and local law enforcement agencies.
- Rehabilitate or expand existing facilities and develop new facilities as outlined in the Recreation Sub-Area Plan for the Orr Area (Appendix A of the Orr Area Plan).
- Cooperate with other recreation providers, including other DNR divisions, units, and bureaus, other agencies and the private sector to more fully develop area recreational opportunities.
- Cooperate with state and local tourism associations and other agencies to market outdoor recreation and tourism opportunities.
- Assist in the development of new state forest user maps in cooperation with other DNR divisions.
- Revise the recreation sub-area plan as needed.



Table 8. Recreation Capital Improvements, Year Funding Requested, and Estimated Cost by Funding Source, Orr Area 1987-96.

Project	Year Funding Requested	Costs
FORESTRY FUNDED PROJECTS		
1. Wakemup Bay Campground	85	\$34,000
2. Wakemup Bay Road & Related Projects	87	224,000
3. Wooden Frog Road	89	35,000
4. Hinsdale Island Campground Development and Rehab.	89	10,000
5. Ash River Dispersed Campsites	89	4,000
6. Vermillion River CCC Camp	89	15,000
7. Ash River Campground Rehab.	89	15,000
8. Pine Island & other Dispersed Campsites	89	8,000
9. Bear Island Lake Dispersed Campsites	89	2,000
10. Wolf Bay Dispersed Campsite Development	91	10,000
Subtotal	\$357,000	
TRAILS AND WATERWAYS FUNDED PROJECTS		
1. Pin Cherry Road X-C Trail Development	87	8,000
2. Bear Island Lake Snowmobile Trail Development	87	1,000
3. Ash River Trail Rehab.	89	26,000
4. Pelican Lake Access	89	20,000
5. Pelican River Canoe Route	89	3,000
6. Vermillion River Canoe Route	89	2,000
7. Crane Lake Access	91	38,000
8. Burntside State Forest Trails Development	95	10,000
Subtotal	\$108,000	
GRAND TOTAL		\$465,000

* Funding received in 1985.

FOREST ROADS

Description

The purpose of the forest road program is to develop and maintain a state forest road system that permits protection, management, and recreational use of state forest lands.

The Orr Area has 56.5 miles of inventoried state forest roads. This figure is misleading, however, as none of the Area's class 5 and 6 roads have been inventoried. In FY 1985 Area personnel spent 0.9 FTE on the forest road program.

Program Direction

The objectives for the road program in the Orr Area for the ten-year period include adequate maintenance of the existing state forest roads, reconstruction and construction of state forest roads, establishment of legal right-of-way to additional state land, and updating the state forest road inventory. Tables 9 - 11 are prioritized lists of state forest road construction and reconstruction proposals.

Public use of some state forest roads may be restricted by gating or posting. This will be done when necessary to reduce road system maintenance costs and to protect the roads and adjacent lands and resources from damage. The DNR will cooperate with other agencies and land owners to limit average road density in areas of existing or potential wolf habitat to no more than 1 mile of road per square mile.

Time spent on this program is expected to remain constant during the ten-year period.

Program Priorities for 1987-96

- Maintain the existing state forest road system.

- Update and maintain the state forest road inventory.
- Clarify responsibility for the construction, maintenance, and use of roads accessing areas of mixed land ownership. This includes the development of cooperative agreements and the acquisition of easements to insure access to lands that the Division of Forestry intends to continue to manage.
- Reconstruct existing forest roads where needed.
- Construct new state forest roads to access forest lands in need of management.
- Develop a forest road and right-of-way maintenance schedule for area roads.



Table 9. Summary of Orr Area State Forest Road Construction Proposals by Priority

Road Name	Location	RMU	Miles	Class	Cost
1. Rat Root River	68-21	1	4.50	4	\$230,000
2. Haley	63-19	5	6.00	4	120,000
3. Gannon-Amundsen	67-19	3	12.00	4	450,000
	68-19				
4. Murray Spur	61-14	7	2.00	4	90,000
5. "5" Bones	63-17	5	3.00	4	125,000
6. Black Duck Grade	66-19	5	1.00	4	75,000
	66-20				
7. Little Long Lake	63-12	9	0.75	5	35,000
8. Hanson	65-20	5	1.00	4	35,000
	65-21				
9. North Bay	61-12	9	1.00	5	5,000
10. Birch Lake	61-11	9	2.00	4	80,000
	61-12				
	62-12				
11. Bear Island L. Spur	61-13	7	0.75	5	10,000
12. Cut Root	63-19	5	2.00	4	80,000
13. Big Lake ^a	65-13	9	6.00	4	270,000
	64-13				
14. Benville	60-13	8	0.30	5	3,000
15. South Kawishiwi	62-11	9	2.25	4	110,000
16. Wampus	60-10	8	1.25	5	15,000
	60-11				
17. Cheney	61-19	6	1.50	5	10,000
18. 35 South	61-19	7	1.50	5	30,000
19. Old Winter	61-18	7	1.00	5	15,000
20. Koscielak	62-17	6	1.00	5	10,000
Total			50.80		\$1,798,000

Note: a. Cooperative project with USFS cost sharing anticipated. Estimated cost is for the entire project.

Table 10. Summary of Orr Area Recreation Related State Forest Road Construction Proposals by Priority

Road Name	Location	RMU	Miles	Class	Cost
1. Wooden Frog Cpg.	69-21	3	0.30	3	\$18,000
2. Shively Falls	63-17	5	0.75	4	30,000
3. Wakemup Bay Cpg.	63-18	5	0.50	2	250,000
Total			1.55		\$298,000

Table 11. Summary of Orr Area State Forest Road Reconstruction Proposals by Priority

Road Name	Location	RMU	Miles	Class	Cost
1. Rat Root River	68-21	1	1.60	4	\$32,000
2. Pearl Lake	67-21	1	3.20	4	60,000
3. Niles Bay Extension	63-17	5	1.50	4	45,000
4. Hoodoo Lake	63-19	5	0.75	5	5,000
5. Murray Spur ^a	62-15&14 61-14	9&7	4.00	4	80,000
6. "5" Bones	63-17	5	1.75	4	60,000
7. Black Duck Grade	66-19	5	0.50	4	10,000
8. Hanson	65-20	5	1.50	4	35,000
9. Bearscratch ^b	66-19	5	2.00	4	50,000
10. Clover ^b	66-19	5	1.50	4	38,000
11. Biondich	67-22	1	6.50	4	162,000
12. Niles Bay	63-17	5	3.10	4	108,000
13. Benville	60-13	8	0.70	5	7,000
14. South Kawishiwi	62-11	9	0.50	4	10,000
15. Autio	64-19	5	1.00	4	45,000
16. Smith	64-21	6	3.6	4	4,000
Total			33.70		\$751,000

Notes: a. Cooperative project with St. Louis County cost share.

b. Cooperative project with Division of Fish & Wildlife cost share. Estimated costs are for the entire project.

TIMBER MANAGEMENT

Description

The goal of the timber management program is to maintain diverse and productive state forests through the application of multiple use, sustained yield management principles. The program consists of interrelated timber sales and silvicultural sub-programs. The objective of the timber sales efforts is to provide a sustained supply of timber to meet demands for wood products, energy, and other uses. Silvicultural efforts control the establishment, composition, and growth of forest stands.

Timber sales activities include preparation of planned cut lists, appraising and marking stands for sale, conducting auctions and informal sales, enforcing timber sale regulations, scaling products, and processing paperwork for sales and billing. In FY 1985 the Orr Area offered 55 thousand cords of state timber appraised at \$374,000. Thirty nine thousand cords of timber actually sold. Area personnel spent 6.3 FTE on timber sales activities.

Silvicultural activities include planning, site preparation, regeneration, release, and timber stand improvement. Silvicultural accomplishments in FY 1985 included: 1178 acres of site preparation, 1200 acres of natural regeneration, 119 acres seeded, 1107 acres planted, 596 acres released, and 100 acres of other

timber stand improvements. Area personnel spent 4.4 FTE on silvicultural activities in FY 1985.

In FY 1986 the area began a pilot aspen recycling project to employ loggers affected by the closing of the Boise Insulite plant in International Falls, to improve wildlife habitat, and to improve the age class distribution of the aspen type. About 300 acres were recycled at an average cost of \$129 per acre.

Program Direction

Timber demand (and harvest levels) are expected to remain near FY 1985 levels for the next three years or so. Harvest levels are expected to increase when the proposed Insulite plant, Blandin expansion, Lake Superior Paper plant, Hill wood chip operation, and other forest industry expansions begin operation. Silvicultural accomplishments (except recycling) will also decrease early in the ten-year period due to elimination of the reforestation backlog, lower harvest levels, and possible funding shortages. Later in the ten-year period, silvicultural treatments will reflect increases in harvest levels.

The efficiency of the timber sales program will be improved through increased use of auction sales, more consumer scaling, less pre-sale cruising and appraisal, longer auction periods, and use of designated cutting blocks on larger sales. Some of these changes will require modification of Division policy or timber sale legislation.

The aspen recycling program will be continued. Approximately 5,500 acres of aspen are available for salvage or regeneration without harvest over the next ten years.

Program Priorities for 1987-96:

- Maintain and update the timber management plan for the Area.
- Implement the timber management plan to the extent possible within market and budget constraints.
- Conduct silvicultural activities in accordance with Division guidelines.
- Increase efforts to integrate timber, wildlife, and recreation management on state forest lands.



FISH AND WILDLIFE HABITAT MANAGEMENT

Description

The Division of Forestry's fish and wildlife habitat management efforts are designed to maintain or improve habitat through integration of timber and wildlife management. Typical activities include timber management to maintain a diversity of cover types and age classes, maintenance of wildlife openings, protection of critical habitats, and prescribed burning. Regular meetings between forestry and wildlife personnel are an important part of maintaining coordinated management efforts.

During FY 1985 Orr Area personnel recorded 0.2 FTE on fish and wildlife habitat management efforts. The 0.2 FTE figure is misleading because much time spent on other programs directly benefits wildlife. Examples include time and accomplishments associated with timber harvest activities which are coded under the Timber Management or the PFM programs.

Past projects include intensive deer habitat management in the Elephant Lake area, cooperative road development for management and hunter access, and seeding of selected roads and landings with clover.

Program Direction

Forestry and wildlife personnel will continue to cooperate and plan for wildlife concerns on timber sales and forest development projects. Wildlife personnel will be involved in developing PFM plans for landowners who express an interest in wildlife management. There should be at least three formal meetings per year between forestry and wildlife personnel. Cooperation and communication could be enhanced by stationing a wildlife manager in the Orr Area office.

It is anticipated that time recorded for this program will remain nearly constant because of the amount of preplanning that has been accomplished and because most wildlife accomplishments are reported under other programs by forestry staff.

Program Priorities for 1987-96:

- Work toward forest composition goals, an appropriate mix of cover types and a diversity of age classes as set forth in the Area Timber Management Plan and the four square mile wildlife habitat compartment analyses.
- Work to establish and maintain wildlife openings.
- Maintain special habitats for endangered, threatened, special concern, and other nongame wildlife species.
- Follow the Wolf Management - Road Density guideline to maintain or improve wolf habitat.
- Increase coordination and cooperation between the Area PFM program and Division of Fish and Wildlife personnel.
- Cooperate on special projects (e.g. aspen recycling).
- Assist in developing, reviewing, and conducting prescribed burns for wildlife habitat improvement.
- Review Division of Fish and Wildlife plans.
- Have a wildlife manager stationed in the Orr Area office, on a permanent or regularly scheduled basis.
- Evaluate proposals for old growth management areas.
- Evaluate proposals for maintenance of unfragmented forest areas.
- Conduct appropriate wildlife management activities in corridors along major streams and around lakes.

PRIVATE FOREST MANAGEMENT

Description

The private forest management (PFM) program promotes improved multiple use management of non-industrial private forest lands (NIPF) to benefit the landowners, economy, and environment of Minnesota. The PFM program provides technical assistance, cost-sharing, and information on tax incentives for forest management.

Approximately 22% (277,000 acres) of the commercial forest land in the Orr Area is owned by non-industrial private landowners. The Area also assists the City of Tower in managing its 6,000 acre Gunderson Municipal Forest. Area personnel spent 0.7 FTE on PFM activities in FY 1985.



Program Direction

There will be a substantial increase in PFM efforts in the Orr Area over the next ten years. Reforestation will be emphasized early in the planning period due to limited markets at the present time. There will be an attempt to develop a pilot aspen recycling program (site preparation for natural regeneration) on private lands using cost share money and wildlife habitat improvement as incentives. Later in the ten-year period there will be increased emphasis on harvesting aspen, spruce, and balsam fir when the International Falls sheathing plant reopens and the Lake Superior Paper mill starts operation. The Area PFM Specialist will increasingly serve as a program coordinator with the District personnel doing more PFM field work.

There will be increased efforts to coordinate timber and wildlife management on private lands. Wildlife managers will participate in the initial field examination and plan development on lands where the owner has expressed an interest in wildlife habitat management.

Staff time spent on PFM will increase steadily throughout the period, reaching 3.0 FTE in FY 1996.

Program Priorities for 1987-96:

- Emphasize reforestation in the Orr and Cook districts.
- Promote aspen recycling on private lands.
- Assist in marketing wood from private lands through posting of sales in forestry offices and other methods.
- Develop a written agreement with the City of Tower regarding services to be provided by the Division of Forestry for the Gunderson Municipal Forest.

COUNTY ASSISTANCE PROGRAM

Description

The goal of the County Assistance Program (CAP) is to improve the efficiency and effectiveness of county forest management programs. The CAP provides forest management support to counties in their efforts to intensify the multiple use, sustained yield management of county administered tax-forfeited lands. This assistance is tailored to meet a variety of needs, and is intended to complement the management efforts of the counties involved.

In FY 1985 there were two CAP foresters assigned to St. Louis County and one in Lake County. In addition, Area personnel spent 0.1 FTE on county forestry programs. State funding for CAP foresters working for the counties was eliminated in 1986 and the program is being reduced in scope. Area personnel are no longer responsible for check appraisals of county timber sales.

Lake County completed a plan for the management of its tax-forfeited lands with CAP assistance in 1983. The CAP is also responsible for administering legislative grants for county forestry intensification.

Program Direction

As a result of recent restructuring of the CAP, the Area no longer has any direct involvement in county timber and land sale processes. The amount of time spent on CAP activities will decrease slightly. Area personnel will continue to coordinate management activities with county foresters.

Program Priorities for 1987-96:

- Improve cooperation and working relationships with county foresters by involving county foresters in Area meetings and training sessions.
- Promote state/county land exchanges to consolidate ownerships and increase management efficiency.
- Clarify policies and procedures relating to temporary use of roads crossing state and county lands. Develop a cooperative road agreement with St. Louis County.



URBAN AND COMMUNITY FORESTRY

Description

The goal of the urban and community forestry program is to help cities, towns, and schools maintain and improve their forests and to assist homeowners with the management of any trees or associated plants they are growing for ornamental, aesthetic, or conservation purposes.

Urban forestry activities include helping communities develop tree inventories, management plans, tree ordinances, and forestry budgets. Identification of insect and disease problems affecting trees in urban or residential areas and work with school forests and Arbor Day celebrations are also considered urban forestry. Area personnel spent 0.1 FTE on urban forestry activities in FY 1985.

Program Direction

The Urban and Community Forestry program will be used as a means to inform local governments, educational institutions, and homeowners about the Division of Forestry and its activities. Time spent on this program will remain at 0.1 FTE per year through FY 1996.

Program Priorities for 1987-96:

- Promote community tree management in Area municipalities.
- Participate in local Arbor Day celebrations.
- Beautify DNR facilities by landscaping as an example of urban forestry and backyard wildlife habitat for communities and homeowners.

FOREST PEST MANAGEMENT

Description

The goal of the forest pest management program is to reduce resource losses and constraints on forest productivity to acceptable levels. The efficient accomplishment of this goal requires integration of pest management techniques into ongoing timber management practices from site preparation to harvest. The pest management program monitors pest populations and provides management guidelines and risk evaluation systems. The pest management program is also responsible for reviewing the Division's use of pesticides.

Area personnel are responsible for selecting and carrying out appropriate pest management techniques on state lands. They also identify pests and recommend management practices for private landowners. The Grand Rapids Regional Insect and Disease Specialist provides technical assistance to the Orr Area. The major historic pest problems in the area include Hypoxylon canker and white rot of aspen, dwarf mistletoe on black spruce, forest tent caterpillar, spruce budworm, jack pine budworm, white pine blister rust, birch decline, and drought mortality. Area personnel spent 0.3 FTE on pest management activities in FY 1985.

Program Direction

To reduce losses to insects and diseases, Orr Area foresters will increase efforts to integrate the insect and disease management guidelines into forest resource management activities. In the herbicide program, the use of ground application equipment is likely to increase in the next ten-year period.

Staffing required to meet pest management objectives is projected to remain at 0.3 FTE in FY 1987 and increase to 0.4 FTE by FY 1991.

Program Priorities for 1987-96:

- Use the Insect and Disease Management Guidelines when planning harvest, regeneration, release, and timber stand improvement activities.
- Conduct surveys to detect the presence of forest pests and evaluate their potential impact on forest resources. Area personnel will place emphasis on survey of young plantations and balsam fir and jack pine stands.
- Monitor disease incidence and development in aspen stands to evaluate and refine the aspen management guidelines.
- Evaluate the effectiveness of prescribed pest management techniques and alternative control strategies.
- Review forest development proposals involving pesticides to ensure safe, effective, and economical use and compliance with regulations and guidelines.
- Risk rate jack pine stands for susceptibility to jack pine budworm.

SOILS

Description

The forest soils program exists to:

- Enhance forest resource management and productivity through the application of technical forest soils information.
- Disseminate forest soils information to field forest managers.
- Assist forest managers in focusing management efforts and investments on the most productive sites.
- Participate in land use planning and decision making.

The Grand Rapids Regional Forest Soils Specialist serves the Orr Area. Most of the time spent by Area personnel using soils information gets coded to other programs such as timber management or forest roads. As a result less than 0.05 FTE were coded to the soils program in FY 1985.

Program Direction

The Forest Soil Specialist will continue to provide site specific soil analyses for state forest lands. Cooperative soil survey work, special studies, and training for field foresters will also be done. The time spent by Area personnel on soils related projects will increase slightly to 0.1 FTE by FY 1996.

Program Priorities for 1987-96:

- Collect forest site index information in conjunction with the St. Louis County soil survey project.
- Conduct a study of aspen harvest sites in a four to six township area of the Pearl Lake RMU to determine the effects of various harvest techniques on regeneration success.

- Have the Soil Specialist review all sites where use of soil active herbicides is planned.
- Develop guidelines for forestation of lowland brush sites.
- Use Forest Service soils maps and aerial photos to provide soils information for scattered parcels of state land surrounded by federal land.
- Better utilize the Soil Specialist's time by using the lists of stands in the timber management plan to identify areas that will need site specific soils information over a period of years.
- Improve field foresters knowledge of soils through participation in field workshops on a regular basis.



FOREST RESOURCE INVENTORY

Description

The goal of the forest resource inventory program is to collect and maintain the data needed to develop effective forest management programs.

The stand level forest inventory has been completed on all DNR administered lands in the Orr Area (except for BWCAW lands outside of the Burntside State Forest). Field work for the initial inventory was completed between 1976 and 1984. The inventory program also coordinates the acquisition of aerial photography.

In FY 1985 area personnel spent 1.4 FTE collecting and maintaining forest inventory data.

Program Direction

Area personnel will be responsible for maintaining the stand level inventory on about 200,000 acres of commercial forest land.

Program Priorities for 1987-96:

- Update inventory data on ten percent of the acres in the Area each year through alteration or reinventory.
- Cooperate in the update of statewide forest inventory plot information.
- Obtain new aerial photos every 8 years.

UTILIZATION AND MARKETING

Description

The goals of the Utilization and Marketing (U&M) program are: to increase the use of Minnesota's wood resources, to increase the economic benefits of forest product manufacturing in the state, and to increase the wood using efficiency of the state's forest industries.

St. Paul and Regional specialists are primarily responsible for the U&M program accomplishments. Orr Area personnel spent less than 0.05 FTE on U&M activities in FY 1985.

Program Direction

U&M program direction and staffing are projected to remain at FY 1985 levels through FY 1996.

Program Priorities for 1987-96:

- Improve the timber sale marketing skills of field foresters.
- Promote development of small primary and secondary forest product manufacturers to utilize the Area's diverse resources (e.g. pine posts and poles; birch, ash, and lowland hardwood sawtimber).
- Work to further develop wood energy markets.
- Cooperate with local development agencies in attracting and expanding forest industries.

FIRE MANAGEMENT PROGRAM

Description

The goals of the fire management program are to provide effective wildfire protection and to promote the safe and effective use of fire as a resource management tool.

Orr Area personnel control an average of 38 fires per year with an average size per fire of 7 acres. The major causes of wildfires are incendiary, campfires, debris burning, smoking, and lightning. Because of the intermixed ownership pattern in the Orr Area, the DNR and the US Forest Service have entered into cooperative agreements outlining the areas where each agency assumes primary responsibility for wildfire control regardless of ownership.

In FY 1985 Area personnel spent 1.7 FTE on fire program activities.



Program Direction

The Orr Area Fire Plan calls for increased efforts in fire prevention activities. Use of prescribed fire for wildlife habitat management, site preparation, and fuels management is expected to increase in the future. Presuppression, detection, training, and suppression activities will remain at current levels.

Program Priorities for 1987-96:

- Increase prevention activities, including writing more articles on fire protection for local newspapers.
- Increase use of prescribed burning in resource management.
- Maintain expertise of local fire departments through continued training.
- Refine manning guides to provide adequate protection and to increase efficiency.



NURSERY AND TREE IMPROVEMENT PROGRAM

Description

The nursery program provides seed and planting stock for public and private lands. Nursery stock can be used for afforestation, reforestation, soil and water conservation, wildlife habitat, and environmental education. The tree improvement program seeks to increase the productivity of forest lands by providing genetically improved stock.

Nursery and tree improvement specialists at the General Andrews and Badoura nurseries are responsible for most program activities. Area staff assist in selecting seed sources and purchasing seeds and cones. There are currently no designated seed orchards or seed production areas in the Orr Area. In FY 1985 area personnel spent 0.1 FTE on nursery and tree improvement activities.

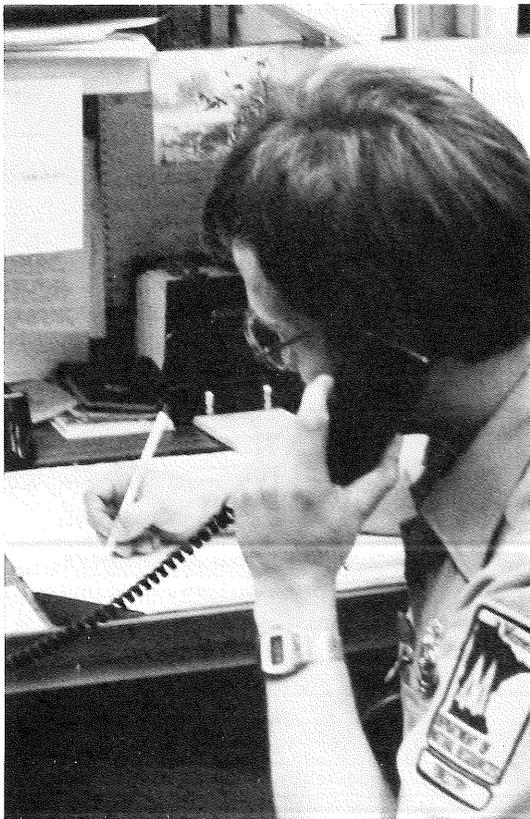
Program Direction

The Orr Area will continue to acquire seeds and cones as directed by the nursery staff. Emphasis will be placed on purchasing extra seed during good crop years. Seed collected will continue to be identified by its source. There will be an effort to establish seed production areas; especially for tamarack and northern white cedar.

Area personnel will spend an estimated 0.2 FTE per year on nursery and tree improvement activities over the next ten years.

Program Priorities for 1987-96:

- Purchase adequate seed to meet Area needs. Acquire surplus seed in bumper crop years.
- Provide nurseries with estimates of regeneration material needs.
- Assist Nursery and Tree Improvement Specialists in the selection, development, and maintenance of seed production areas, seed orchards, and progeny tests.
- Improve cold storage facilities for seedlings.
- Return stock quality reports to nursery and attempt to relate stock quality to plantation survival rates.



MAINTENANCE AND ADMINISTRATION

Description

This program provides the administrative support needed to achieve the goals of other Division of Forestry programs. The major activities are fiscal and personnel management, equipment maintenance, and building maintenance.

Fiscal management includes developing annual spending plans, bill processing, contract administration, and related activities. The Orr Area complement currently consists of 19 permanent, full-time employees and two 90% employees. Personnel management activities include recruitment, selection, supervision, evaluation, and payroll and records processing. In FY 1985 area personnel worked 1.4 FTE on fiscal and personnel management.

Equipment maintenance includes repair and ongoing maintenance of the Area's equipment. In FY 1985 Area personnel spent 1.9 FTE on equipment maintenance. Building maintenance includes minor maintenance and cleanup of Division of Forestry facilities in the Orr Area. Area personnel spent 0.7 FTE on building maintenance in FY 1985.

Program Direction

The projected staffing level to accomplish the program objectives set forth in this plan decreases slightly from 22.9 FTE in FY 1985 to 22.5 FTE in FY 1987. Projected staffing levels based on work loads for 1987 were originally higher but existing budget constraints required a lowering of the FTEs to match the reduced budget. Projected staffing increases to 28.1 FTE in FY 1991, and 29.1 FTE in FY 1996. A portion of the increase will be due to a change in the Division's time reporting system. If a timely replacement schedule for equipment can be implemented

the time spent on equipment maintenance should decrease. The estimated average annual cost for equipment maintenance and replacement is \$86,510. Table 12 is a prioritized list of building improvement and construction needs for the Orr Area. Funding for major building improvement and construction projects will be requested through the DNR Capital Improvement Budget.

Time spent in carrying out this program should remain constant at about 3.9 FTE per year.

Program Priorities for 1987-96:

- Carry out fiscal and personnel management responsibilities.
- Obtain the equipment necessary to carry out Area workloads.
- Upgrade, repair, or construct facilities necessary for staff to carry out their jobs.
- Convert BWCAW funded positions to permanent classified status.
- Hire additional personnel to cover projected staffing needs for all programs.

Table 12. Orr Area Building Projects by Priority

Building Location	Project Description	Cost
1. Orr Area Office	Major renovation and expansion	\$110,000
2. Cook Dist. Office	Roof, siding, wiring, replace windows, plumbing	13,000
3. Orr Residence	Basement repair, door sills	10,000
4. Kabetogama Residence	Insulation, vapor barriers, sheetrock	8,000
5. Cook Oil House	Acquire land, construct oil storage building	1,500
6. Kabetogama Oil House	Construct oil storage building	1,500
7. Orr Repair Shop	Expand, roof, siding, install hydraulic lift	40,000
8. Tower Warehouse	Siding, replace doors, new concrete apron, heat one stall	12,000
9. Tower Office	Insulation, replace windows	3,500
10. Cook Warehouse	Roof, siding, concrete apron, replace windows, install winch	9,000
11. Crane L. Warehouse at Orr	Siding, roofing, wiring	4,000
12. Orr New Warehouse	Construct new six stall warehouse	50,000
13. Orr Oil House	Siding, roof, underground gas tank	1,500
14. Kabetogama Garage	Partial residing, wiring	300
15. Orr Residence Garage	Roof, Rewiring	5,000
16. Orr Tree Bunker	Wiring, new door, insulation on south side	1,500
17. Orr Seed House	Roofing, siding	1,000
18. Cook Parking Lot	Acquire land, construct lot	5,000
19. Elephant L. Tower	Relocate near Buyck	0
Total Costs		\$276,800

INFORMATION AND EDUCATION

Description

The goal of the information and education program is to increase public awareness and understanding of the Division of Forestry. Typical activities include preparing news releases and feature articles for local media, presenting audio-visual programs, developing and distributing maps, brochures, and other documents, organizing field days and other events, and providing displays at fairs.

In FY 1985 the Area spent 0.2 FTE on information and education activities.

Program Direction

Information and education activities will continue at about the same level as in past years. Fire prevention will continue to be the major focus. Maps and advertisement of recreational facilities are needs that should be addressed on a statewide level.

Program Priorities for 1987-96:

- Develop calendar listing annual or seasonal events requiring information and education efforts.
- Develop slide/tape program about the Orr Area.
- Cooperate in development and distribution of maps and publicity for recreational facilities.

LAW ENFORCEMENT

Description

The Division of Enforcement is primarily responsible for natural resource law enforcement. The Division of Forestry has a role in enforcement of various statutes and regulations relating to forest fire control, timber sales, forest recreation, and use of state lands.

The Orr Area cooperates with ten Conservation Officers and three Sheriff's departments in providing law enforcement. An Area staff member has received fire investigator training and serves as the Area enforcement specialist. Area personnel spent 0.1 FTE on enforcement activities in FY 1985.

Program Direction

The Division of Forestry will continue to carry out its enforcement responsibilities in cooperation with the Division of Enforcement. There will be increased fire cause investigation and fire cost collection efforts. All District personnel should have level II enforcement training and the Area enforcement specialist will maintain level III training. Enforcement program staffing is projected at 0.2 FTE per year through FY 1996.

Program Priorities for 1987-96:

- Provide adequate enforcement training for Division personnel.
- Increase fire cause investigation efforts.
- Maintain informal cooperative enforcement activities with Conservation Officers and Deputy Sheriffs.

PLANNING AND ENVIRONMENTAL REVIEW

Description

The primary role of the planning program in the Orr Area is to maintain a comprehensive plan to guide the protection, management, and use of the Area's forest resources. Other planning and environmental review activities include helping prepare management plans for DNR lands administered by other divisions and reviewing other agency plans to determine the impact on forest resources.

Area personnel spent 0.1 FTE on planning activities in FY 1985.

Program Direction

The major planning activity during the life of this plan will be preparing annual work plans and accomplishment reports as part of the implementation and monitoring process. An annual meeting will be held to review the past year's accomplishments and to discuss the new annual work plan.

Staff time spent on planning activities is projected to be about 0.1 FTE through FY 1995. A major effort will be required to rewrite the area plan in 1996.

Program Priorities for 1987-96:

- Develop annual area work plans and accomplishment reports.
- Help prepare management plans for DNR lands administered by other divisions.
- Participate in updates of the Minnesota Forest Resources Plan.
- Update the Orr Area Forest Resource Management Plan by 1996.

TRAINING

Description

Training and continuing education are necessary if Division of Forestry employees are to acquire and maintain the up-to-date knowledge and skills needed to effectively manage natural resources. The training program goal is to have each employee spend approximately five percent of their work time on training and continuing education. The type and amount of training each individual receives will vary depending on their position, experience, and career objectives.

Program Direction

The Area will gradually increase the time spent on training and continuing education so that it meets the Division goal of five percent of employee time by the end of the ten-year period. Time spent on training will increase from 0.2 FTE in FY 1987 to 0.9 FTE in FY 1996.

Program Priorities for 1987-96:

- Maintain training and continuing education plans for all area employees.
- Each employee will meet recommended training guidelines.

HISTORY OF THE ORR AREA

The Orr Area has a long and colorful history dating from the infancy of the Minnesota Forest Service in 1911. The current Area boundaries encompass parts of the original Orr and Tower Ranger Districts. The Tower Ranger District was split between the Orr and Duluth areas in 1964.

The first Ranger at Orr was Fred Bessette, a slightly built man, a woodsman of surprising endurance, and evidently a resourceful ranger as well. With no office, Bessette was forced to do business out of his hotel room or a quiet corner of William Orr's saloon. He was able to get a promise of land and building supplies from Mr. Orr to construct the first forestry office. The sixteen foot square palisade building was furnished with materials "borrowed" from Orr's warehouse and saloon, including such necessities as spittoons. Apparently Orr never requested nor received payment for the supplies. Bessette would later serve in the state legislature where he authored important legislation establishing state forests, requiring burning permits, and providing job benefits for state employees.

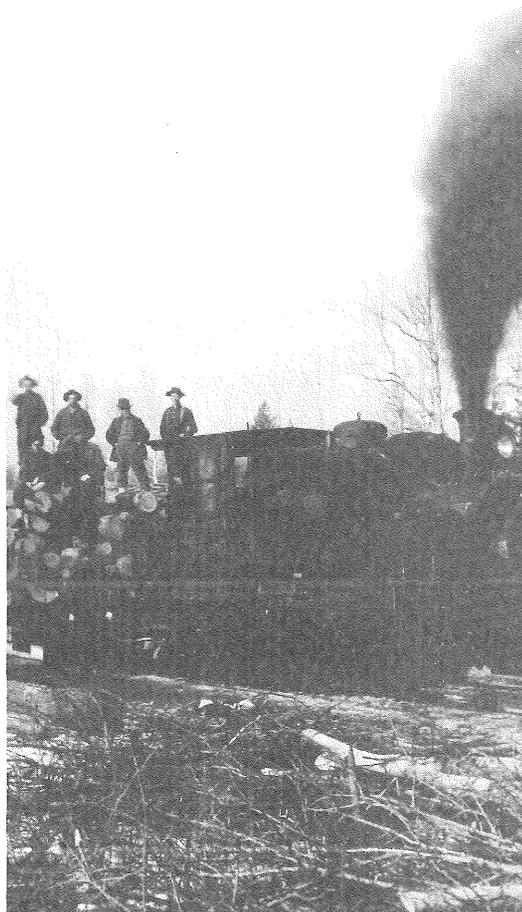
Les Beatty followed Bessette as District Ranger at Orr, returning to the district where he had started as a forest patrolman in 1911. Transportation in the early days of the district was by foot, canoe, or horse, unless you were lucky enough to hitch a ride on the cabooses of a logging train or a steam powered tow boat. The first state owned vehicle in the Orr Area was a short-lived hand and foot powered three-wheeled track velocipede. Unfortunately, Beatty flattened Bessette's pride and joy when he could not clear it from the tracks before an oncoming logging train.

The Burntside Forest Reserve was established in 1903. In 1915, 200,000 seedlings were planted in the Burntside. State forest campgrounds were established on Lake Kabetogama and Burntside Lake in the early 1920's. The Kabetogama and Koochching state forests were established in 1931. Later additions to the state forest system included

the Sturgeon River, Lake Insula, Lake Jeanette, and Bear Island forests.

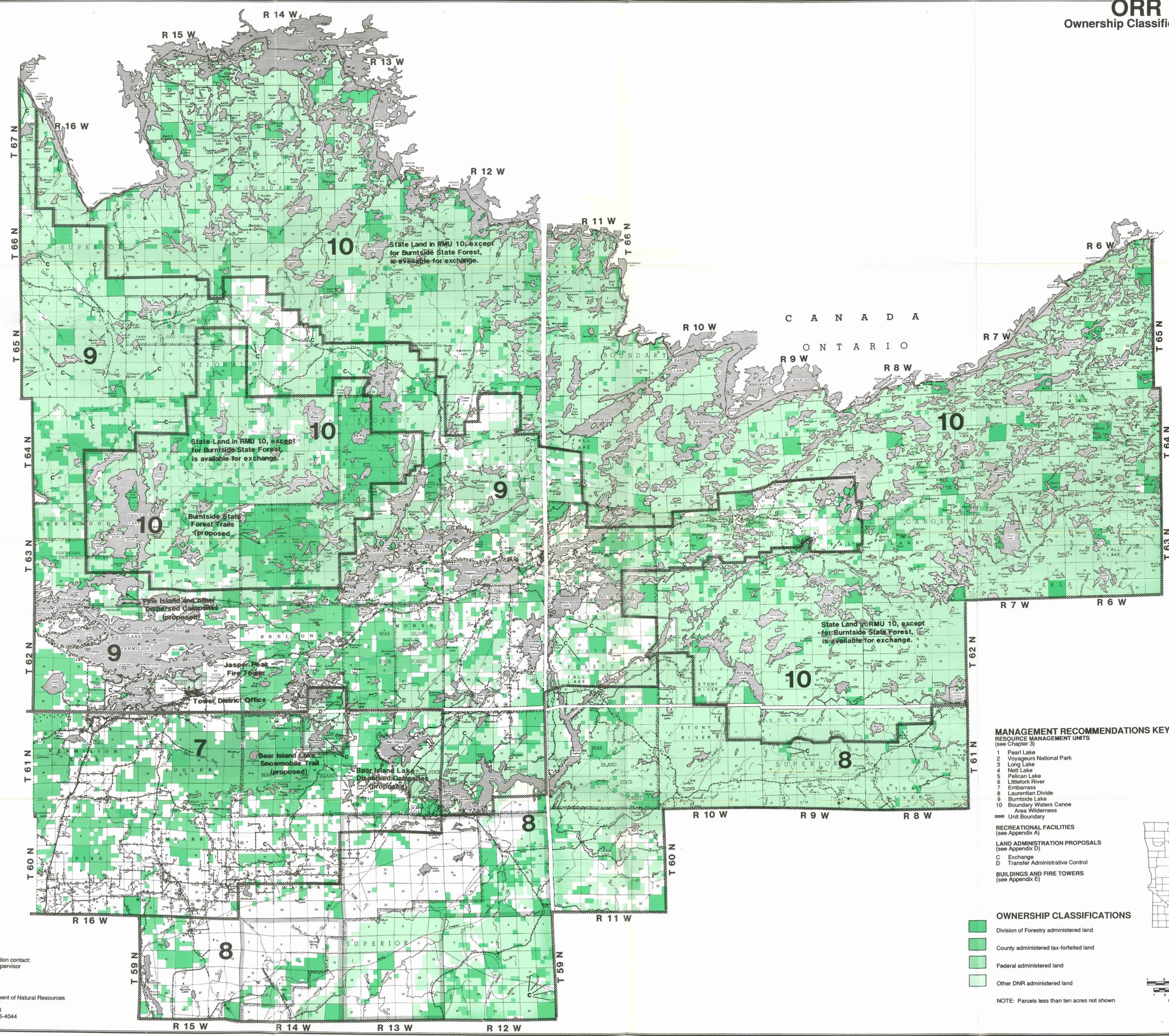
Three Civilian Conservation Corps (CCC) camps operated in the Area, providing crews for conservation work and fire fighting. The largest of these camps was located at the Virginia-Rainy Lake Lumber Company camp at Cusson which had been abandoned since 1927.

Following Beatty as rangers at Orr were Earl Eddy, Alex Gurber, Harold Schuppel, and Ken Anderson. Robin Nelson has been the Area Forest Supervisor since 1969. The Area currently has forestry stations at Orr, Kabetogama, Cook, and Tower.



ORR EAST

Ownership Classification Map



MANAGEMENT RECOMMENDATIONS KEY

RESOURCE MANAGEMENT UNITS
(see Chapter 3)

- 1 Pearl Lake
- 2 Voyageurs National Park
- 3 Long Lake
- 4 Nett Lake
- 5 Pelican Lake
- 6 Littlefork River
- 7 Embarrass
- 8 Laurentian Divide
- 9 Burnside Lake
- 10 Boundary Waters Canoe Area Wilderness

RECREATIONAL FACILITIES

(see Appendix A)

LAND ADMINISTRATION PROPOSALS

(see Appendix D)

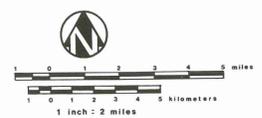
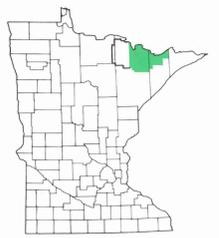
- C Exchange
- D Transfer Administrative Control

BUILDINGS AND FIRE TOWERS

(see Appendix E)

OWNERSHIP CLASSIFICATIONS

- Division of Forestry administered land
- County administered tax-forfeited land
- Federal administered land
- Other DNR administered land



NOTE: Parcels less than ten acres not shown

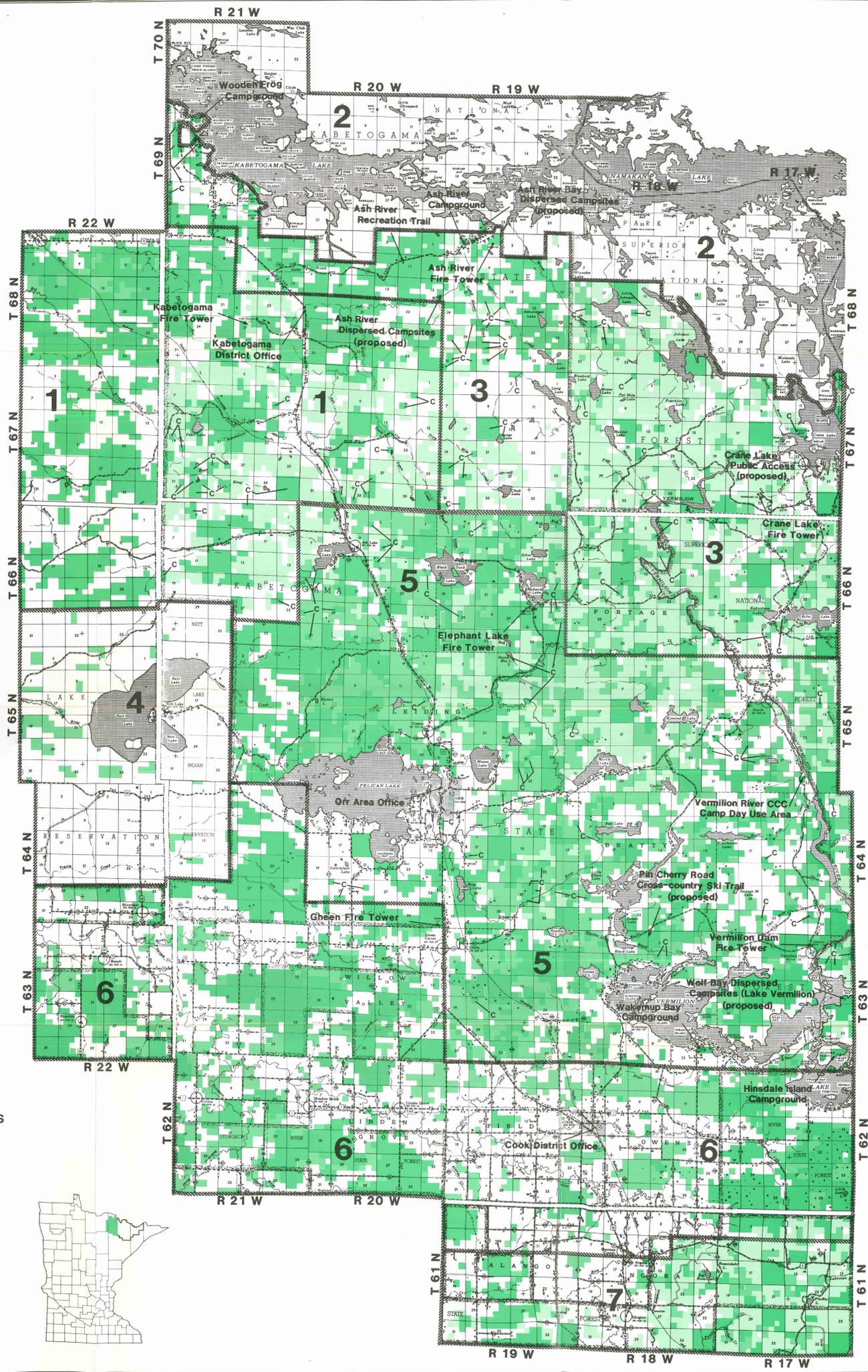
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ORR WEST

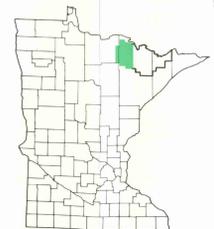
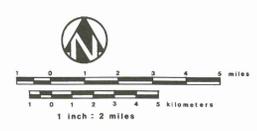
Ownership Classification Map



- MANAGEMENT RECOMMENDATIONS KEY**
RESOURCE MANAGEMENT UNITS
 (see Chapter 3)
- 1 Pearl Lake
 - 2 Voyageurs National Park
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 - 4 Nett Lake
 - 5 Pelican Lake
 - 6 Littlefork River
 - 7 Embarrass
 - 8 Laurentian Divide
 - 9 Burntside Lake
 - 10 Boundary Waters Canoe Area Wilderness
- Unit Boundary
- RECREATIONAL FACILITIES**
 (see Appendix A)
- LAND ADMINISTRATION PROPOSALS**
 (see Appendix D)
- C Exchange
 - D Transfer Administrative Control
- BUILDINGS AND FIRE TOWERS**
 (see Appendix E)

- OWNERSHIP CLASSIFICATIONS**
- Division of Forestry administered land
 - County administered tax-forfeited land
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NOTE: Parcels less than ten acres not shown



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