PARK RAPIDS AREA FOREST RESOURCE MANAGEMENT PLAN

DECEMBER 1987

Prepared Pursuant to the
Forest Resource Management Act of 1982
(Minnesota Statutes Section 89.012)

Minnesota Department of Natural Resources
Division of Forestry
St.Paul, MN 55146

INTRODUCTION

PLANNING PURPOSE AND PROCESS

Planning is being conducted in response to recent legislative direction which requires the DNR to complete both statewide and "unit forest resource plans" for each geographic administrative unit of the Division of Forestry (Minnesota Laws 1982, Chapter 511). The statewide Minnesota Forest Resources Plan (MFRP) was completed in 1983 and is currently being updated. The Division has selected its administrative areas as the appropriate planning unit.

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 area. Area plans provide guidance for area forestry programs and management activities. The plans are also designed to help coordinate the Division of Forestry's activities in an area with those of other DNR units, other agencies, local governments and the private sector. Area plans are developed by an interdisciplinary planning team consisting of DNR natural resource specialists including foresters, wildlife managers, fisheries managers, hydrologists, recreation and minerals specialists, enforcement officers and others. Several portions of this plan were developed by these resource specialists as part of the planning process.

MEMBERS OF THE INTERDISCIPLINARY TEAM

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IMPLEMENTATION AND MONITORING

IMPLEMENTATION

The Park Rapids Area staff will have the 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, 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 Park Rapids 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 will be developed in conjunction with the Region work plan. Accomplishment targets will be negotiated with regional staff.

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 Park Rapids Area Plan is meant to provide guidance to the 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 Park Rapids 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.

WORK PLANS AND ACCOMPLISHMENT REPORTS

(To be developed and appended to Area Plan each year.)

LAND BASE

The Park Rapids Area includes approximately 5.8 million acres in portions of 10 counties in west-central Minnesota (Figure 1). The area covers approximately 10% of the State of Minnesota.

The landscape is characterized in the western third by the Red River Valley, a nearly flat plain covered by rich clay and silty soils deposited on the bottom of glacial Lake Agassiz. In the northeast, the northern pine moraine forms ranges of hills containing primarily sandy or course soils and pock-marked with countless lakes, ponds and bogs. This area is predominantly forested with pine, aspen and birch. Encompassing the east-central portion of the area is the northern Alexandria moraine complex and outwash plain. This area has sandy textured soils and is characterized by rolling terrain and maple-basswood and aspen-oak forest vegetation. The southeast portion consists of rolling hills on the prairie fringe created by repeated glaciation. The south-central portion of the area, a part of the Minnesota River Valley, originally supported prairie vegetation, most of which has been cleared for agriculture.

There are about 102,243 acres of division administered land in the area, most of which (85,154 acres) is located in six state forests: the Paul Bunyan, Two Inlets, Smoky Hills, Badoura, and White Earth, and Huntersville state forests. Division of Forestry offices are located at Park Rapids, Alexandria and Detroit Lakes.

LAND USE

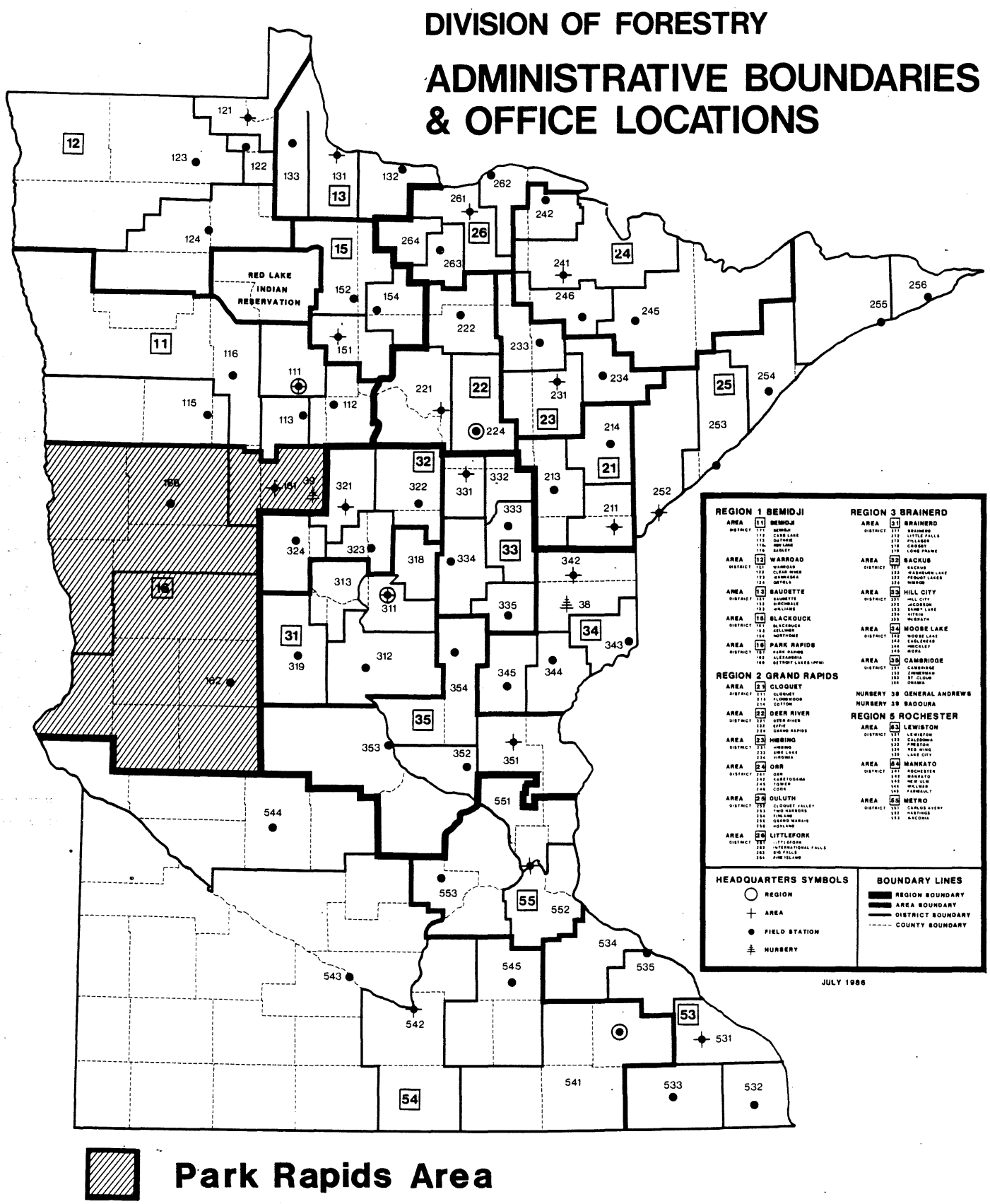
Total acreage within the Park Rapids Area is 5,835,800 acres, including water. Of the total land base in the Park Rapids Area, the largest land use class is crop land (4,060,400 acres). There are 745,000 acres of commercial forest land, with an additional 10,500 acres classified as unproductive forest land and 1,600 acres classified as productive-reserved forest land. Table 1 shows land use by ownership class for the Park Rapids Area.

Land Use Trends

Because of expected population increases, the general land use pattern in the area will change over time, with the most drastic changes occurring near Park Rapids, Detroit Lakes, Alexandria, and the forest and lakes areas of Hubbard, Becker, Otter Tail and Douglas counties.

Increased urban and residential land demands will likely be experienced in future years throughout the Park Rapids Area. Permanent single-family home development pressures will be greatest within 5 miles of existing population centers, cities, along major transportation routes, and in close proximity to

Figure 1. Park Rapids Area Map.



lakes, river, and parks. Seasonal home development will also expand considerably near the area's lakes, rivers, and aesthetically appealing woodland settings.

Some agricultural clearing still occurs, although to a limited degree due to the present depressed state of the agricultural economy. In fact, some marginal farmlands with highly erodible sandy soils and rolling hills are now no longer being farmed. With the passage of the 1986 Federal Conservation Reserve Program (CRP), it is expected that several thousand acres will be withdrawn from agricultural production and seeded to permanent grasses or planted to trees over the next 10 years.

Table 1. Total Area of Cover Type by Ownership Class (in thousands of acres).

	Indian Land	Misc. Federal	State Land	County & Munic.	Forest Industry	Other Private	Unknown	Total (1,000 acres)
Commercial Forest	4.0	23.9	90.5	98.7	16.7	510.9	0.0	744.8
Cropland (no trees)	0.0	0.0	0.0	0.0	0.0	7.5	4053.0	4060.4
Cropland (with trees)	0.0	0.0	0.0	0.0	0.0	4.5	4.2	8.8
Farm (with farmstead)	0.0	0.0	0.0	0.0	0.0	1.2	44.6	45.8
Idle Farm/Some Trees	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
Marsh	0.0	1.2	4.8	2.9	0.0	23.1	172.3	204.3
Productive Reserved	0.0	0.0	0.0	1.6	0.0	0.0	0.0	1.6
Range Land (no trees)	0.0	0.0	0.0	0.0	0.0	0.0	94.8	94.8
Range Land/Some Trees	0.0	0.0	0.0	0.0	0.0	4.2	9.9	14.0
Unproductive F. land	0.0	0.0	0.0	1.6	0.0	8.9	0.0	10.5
Urban and Others	0.0	0.0	0.0	0.0	0.0	12.9	171.7	184.6
Water (1-39 acres)	0.0	0.0	0.0	0.0	0.0	0.0	61.9	61.9
Water (40 acres +)	0.0	0.0	0.0	0.0	0.0	0.0	353.8	353.8
Windbreaks (120 ft. -)	0.0	0.0	0.0	0.0	0.0	2.7	8.1	10.8
Wooded Pasture 0.0	0.0	0.0	0.0	0.0	8.5	8.5	17.0	
Wooded Strips 0.0	0.0	0.0	0.0	0.0	4.5	17.1	21.6	
TOTAL	4.0	25.1	95.3	104.9	16.7	589.0	5000.7	5835.8

Note: Unproductive Forest Lands - Land incapable of yielding crops of industrial wood because of adverse site conditions.

Source: North Central Forest Experiment Station,1980.

SOCIAL PROFILE

History

The Park Rapids Area is quite diversified in character ranging from unpopulated, publicly owned forest areas in the north; scattered lakes and privately owned tracts in the central and southern areas; to very small farm woodlots and extensive agricultural land in the western areas. Lakes, rivers, and wetlands are common over most of the area. The abundance of natural resources in the Park Rapids Area has contributed significantly to its development. However, due to man's intervention, some natural resources have been depleted.

The first white settlement began in the southern and western parts of the Park Rapids Area and spread slowly north and east. Agriculture became the dominant use of the rich, loamy soils of the western and southern parts of the area. Woodlands were rapidly cleared and native prairies plowed to develop agricultural lands. In much of the area only a few remnants remain of the original prairies and hardwood forests.

The heavily forested areas were settled in the late 1800's. In 1879 the first settlers reached southern Hubbard County. Many tried to log and convert the land to agricultural use. However, the light, sandy soils and short growing seasons were not conducive to successful agricultural ventures.

But timber was the big attraction! In the 1880's much settlement occurred as the villages of Hubbard, Park Rapids, Nevis, and Akeley were established. By 1891 rail transportation had reached all but the village of Hubbard, and the boom had begun. Although logging and agriculture were the initial attraction, the large number of pristine northern lakes began to attract tourists to the area. Tourism also became an important early industry in the Detroit Lakes, Fergus Falls and Alexandria areas.

On December 24, 1880 the St. Paul Pioneer Press published an article on the immensity of the pine forests of Minnesota. It is quoted here in order to present the opinion of that day that the forests were practically inexhaustible:

> To the general reader, a brief reference to the country from which the immense crop of pine logs are harvested may be of interest, as comparatively few have any idea of the extent of the great pine forests from which all this lumber is supplied.
>
> Not one-hundredth part of it ever has been or will be required by the lumbermen who annually infest the region to carry on the process of denuding the pine forests.

As settlement moved north and east, small sawmills sprang up in the 1890's to manufacture building materials. In 1899 the giant Red River Lumber Company became established at Akeley, in the heart of virgin stands of white pine and Norway pine. They began by sawing up to 375,000 board feet per day. But in 1909 this sawmill burned down, and was replaced by a mill which produced 500,000 board feet of lumber per day! At peak production as many as 5,000 men were employed in the woods, supply logs for this mill.

By 1902 a logging railroad with an extensive system of spurs was being pushed into the area that is now the Paul Bunyan State Forest. Once the system was completed, the railroad allowed for even more rapid movement of large quantities of logs and lumber. At peak production Red River Lumber Company once shipped 43 carloads of lumber in one day. Much of this went to develop large cities like Minneapolis, St. Paul, Milwaukee, Chicago and St. Louis.

By 1915 much of the extensive cutting was done; mills were dismantled, and companies moved west. Since much of the land was cleared, settlers then tried to convert some of the land to agricultural production. Promiscuous slash burning destroyed most of the small remnants of good timber.

These lands were not as productive for agriculture as people thought they would be. Drought, fires, and crop failures of the 1930's forced many to abandon their farms. Much of the land was forfeited to the counties for tax-delinquency.

As the land was abandoned, natural regeneration of forest types occurred. Because of sprouting and prolific seeding, much of the abandoned land regenerated to aspen and northern hardwoods.

Public appreciation for fire prevention and protection of natural resources increased with each year. The late 1800's and early 1900's was considered a time of changing attitudes toward the use of natural resources in Minnesota and in the nation as a whole. The concept of conservation gained popularity among lawmakers as well as the general public. Much of this concern was generated because of abuses of the past, which resulted in scarred, eroded hillsides and catastrophic fires.

New laws enacted by the legislature in 1911 provided for preservation of forest land, reforestation and the prevention of forest fires throughout the state. This enabled the State Forestry Board to take responsibility and action against forest fires. Thus the Minnesota Forest Service was established as an organization. In 1914 an amendment to the constitution of the state providing for authorization to set aside state trust fund lands as state forests was passed.

Starting about 1890, the general direction of public forest land use in Minnesota was toward reservation of large areas for management purposes and the gradual adoption of scientific forest management practices. During this same period, new demands for all forest resources evolved, and the forests were expected to meet the needs of an increasingly varied group of users.

The Park Rapids office was established in 1911 to fight fires and administer state lands in the area.

Demographics

The estimated 1983 population of the Park Rapids Area was 215,869, an increase of 26,057 since 1970. This increase of 13.7 percent compares to an 8.9 percent increase statewide for the same period. Population changes between 1970 and 1983 for each county varied considerably (Table 2). The western agricultural counties of Traverse, Wilkin, Stevens and Grant lost population over this period, ranging from -0.2% in Stevens to -13.6% in Traverse. Counties dominated by lakes made substantial gains in population over the same period. The forested counties of Hubbard and Becker grew the fastest, with population increases of 57.9% and 28.6% respectively.

Table 2. Population of the Park Rapids Area by County.

County	1970	1980	% Change 1970-1980	1983**	% Change 1970-1983
Becker*	24,372	29,336	20.4	31,354	28.6
Hubbard*	4,395	5,342	44.3	6,939	57.9
Clay	46,608	49,327	5.8	49,203	5.6
Wilkin	9,389	8,459	-10.0	8,348	-11.1
Traverse	6,254	5,542	-11.4	5,402	-13.6
Stevens	11,218	11,322	0.9	11,191	-0.2
Pope	11,107	11,657	5.0	11,854	6.7
Grant	7,462	7,171	-3.9	7,209	-3.4
Otter Tail	46,097	51,937	12.7	54,864	19.0
Douglas	22,910	27,839	21.5	29,505	28.8
TOTAL	189,812	207,932	9.5	215,869	13.7

*Figures include only the portions of the counties within the Park Rapids Area.
**1983 population figures are estimates.

Source: Datanet, Minnesota State Planning Agency, 1983.

Most of this population was living in rural areas or small rural communities with less than 5,000 residents except for the cities of Moorhead (29,996), Fergus Falls (12,519), Alexandria (7,608), Detroit Lakes (7,106), and Morris (5,367). Population changes in the larger cities with over 5,000 residents were consistent with the the changes in counties where they are located (see Table 3). Cities in counties where recreation is a major business grew along with the recreation industry, while cities in counties dominated by agriculture tended to lose population along with a decline in the agricultural economy.

Table 3. Population of the Major Municipalities in the Park Rapids Area by County in 1983.

Clay		Pope	
Moorhead	29,996	Glenwood	2,523
Dilworth	2,585	Starbuck	1,224
Barnsville	2,207		
Hawley	1,634	Grant	
		Elbow Lake	1,358
Wilkin			
Breckenridge	3,909	Douglas	
		Alexandria	7,608
Traverse		Osakis	1,355
Wheaton	1,969		
		Otter Tail	
Stevens		Fergus Falls	12,519
Morris	5,367	Perham	2,066
		Pelican Rapids	1,867
Becker			
Detroit Lakes	7,106	Hubbard	
Frazee	1,284	Park Rapids	2,976

Source: Datanet, Minnesota State Planning Agency, 1983.

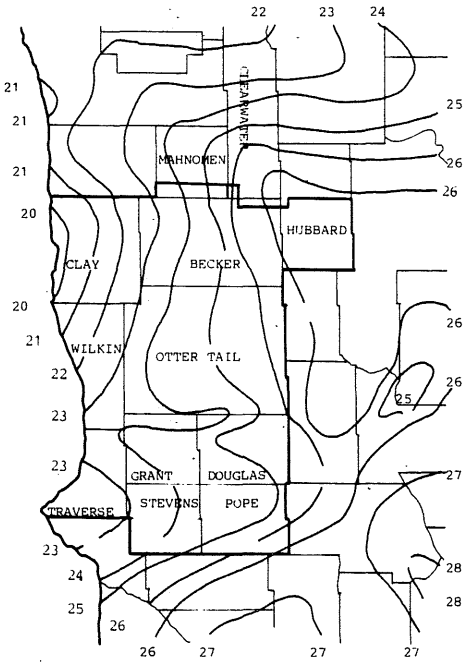
PHYSICAL RESOURCES

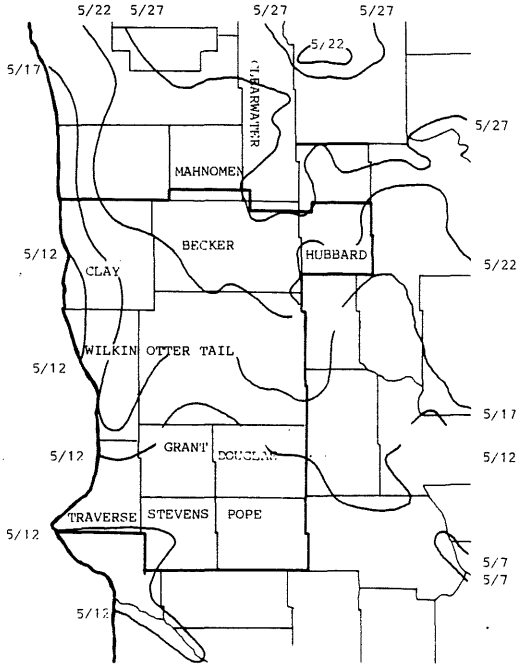
Climate

The temperate, continental climate of the Park Rapids Area is characterized by moderate annual precipitation and seasonal extremes in temperature. The average annual precipitation at Park Rapids is about 26 inches with a range from 17 to 38 inches. The normal annual total precipitation for the area is shown in (Figure 2).
Summers are moderately warm at Park Rapids with temperatures occasionally rising above 90°F. The frost free period

averages 127 days(figure 3). Winters are cold with about 40 inches of snowfall. The ground is covered by snow from early November until about April 1 in the fields and until mid-April or later in the woods.

Figures 2 & 3





Soils and Geology

The soils of the Park Rapids Area have been directly influenced by the ice sheets of the Wisconsin glacial age. The parent material from which these soils formed originated from southern Manitoba and is referred to as calcareous gray drift. This drift was deposited in 3 general ways and greatly affected the soils that formed. Some materials were deposited directly off the ice sheets as till plains and moraines, and resulted in loamy textured soils with varied topography and drainage. Other materials were deposited from glacial meltwaters (outwash) and resulted in sandy textured soils, while other materials were deposited from glacial lakes (predominantly Lake Agassiz) which resulted in clayey and silty textured soils with nearly level topography.

The Park Rapids Area can be split into 4 general soil types (Figure 4).

1. These soils consist of predominantly level, poorly drained, silty and clayey textured soils formed in lacustrine sediments of glacial Lake Agassiz. Beach ridges are common on

Figure 4. General Soil Types.

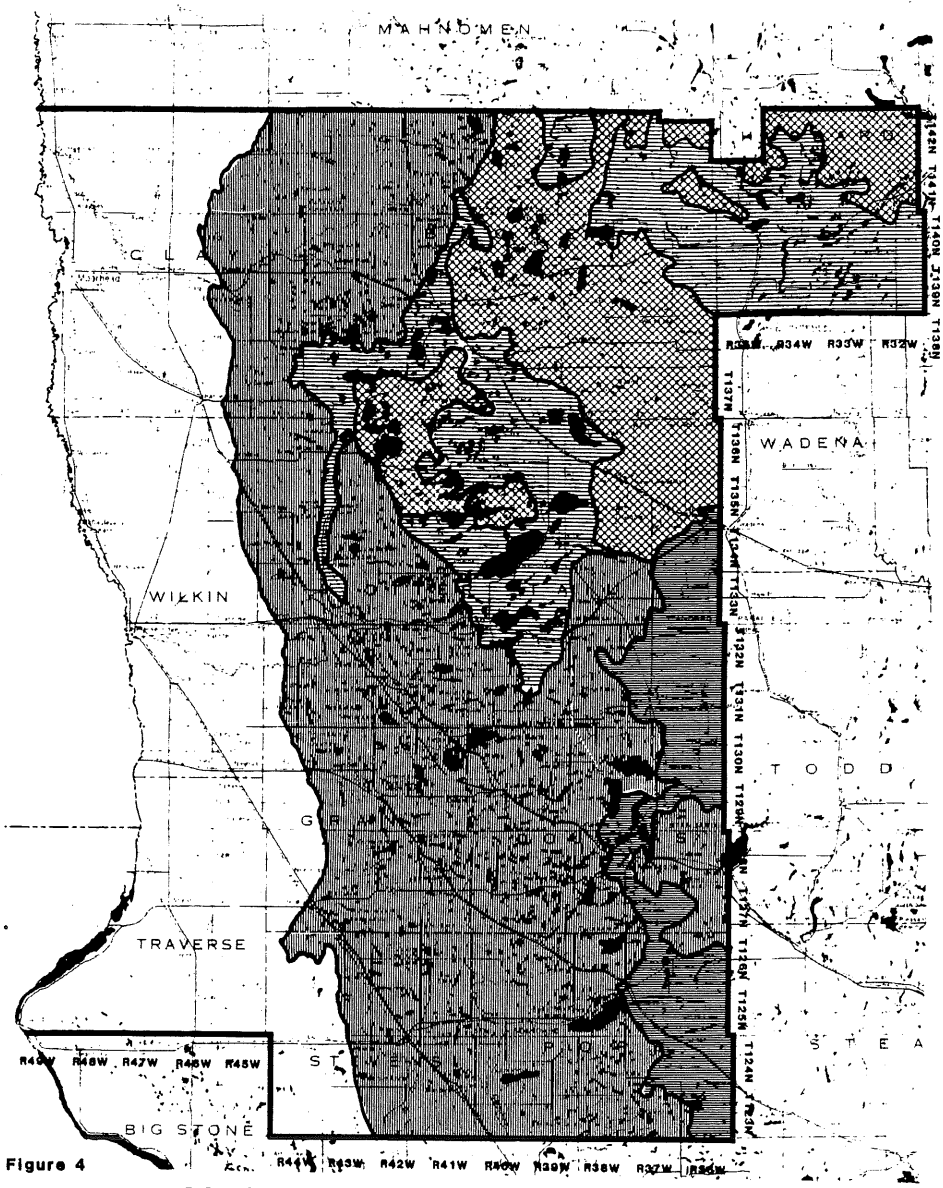


Figure 4

SOILS

1. **Soils formed in silty clayey lacustrine sediments**
2. **Soils formed in calcarious loamy glacial till**
3. **Soils formed in calcarious sandy loam glacial till**
4. **Soils formed in sandy glacial outwash**

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SCALE:
0 10 15 20 30
MILES

the eastern edge of this unit and consist of well to excessively well drained sands and gravel. The clay and silt soils are very productive and are currently under cultivation.

2. These soils are primarily moderately well to well drained loamy soils formed in calcareous glacial till. This unit consists of rolling to steep topography with numerous small lakes and potholes. Inclusions of clayey soils or of small sandy outwash areas can be found throughout this unit. This is a very productive soil for both forestry and agriculture. Much of this area is currently under cultivation. Some areas limit farming due to steep terrain or presence of boulders and cobbles on the surface. Forested areas range from large block holdings in the northern portion to scattered woodlots throughout the agricultural areas, often located on soils too steep, droughty or rocky for cultivation.

3. These soils consist of predominantly well to somewhat excessively well drained sandy loam soils formed in calcareous sandy loam glacial till. This unit consists of rolling to steeply irregular topography with numerous potholes and small lakes. Inclusions of heavier soils or sandy outwash areas can be found throughout this unit. Much of this area is under cultivation,about 40-50% is forested. Most of the forested area is in large block holdings in the north and northeastern portion of this unit.

4. These soils consist of predominantly well to excessively well drained soils formed in glacial outwash deposits. Soils range from sand to sandy loam surface underlaid by sand and gravel. The area around Park Rapids and to the south tends to have nearly level to rolling topography, whereas the area in Otter Tail County tends to be rolling to steeply undulating. Much of the area is under cultivation. Approximately 20-30% is forested. This unit contains many popular recreational lakes.

Sand and Gravel Deposits

The east half of the Park Rapids Area contains excellent glaciofluvial gravel resources deposited by multiple glaciers that moved into the state's central lowland. Subsequently, meltwater from successive glaciers was focused into this area, which concentrated sorting of the glacial material into broad outwash plains of well graded sand and gravel.

Six significant outwash plains of sand and gravel are located within the eastern half of this unit:

1. Park Rapids Outwash - covers large parts of eastern Becker and southern Hubbard counties, and contains significant gravel deposits.

2. Otter Tail Outwash - this outwash begins along the Otter Tail River in southeast Becker County and broadens into a large sand plain covering most of central and southeast Otter Tail County.
3. Pelican River Outwash - consists of a narrow outwash extending along the Pelican River in west Otter Tail County from Dunvilla to Pelican Rapids to Fergus Falls.
4. Alexandria Outwash - begins in eastern Douglas County trending south of Alexandria and on into Pope County where it then merges with the large Glenwood Outwash near Villard.
5. Glenwood-Villard-Brooten Outwash - this outwash flows eat from the moraine Lake Minnewaska at Glenwood and develops into a broad sand plain in northeast Pope County and eventually connects to the outwash deposits found along the Sauk River to St. Cloud in Stearns County.
6. Pomme DeTerre Outwash - this outwash forms a narrow sand plain about one to two miles wide and 50 miles long parallel to the Pomme DeTerre River that trends in a north-south direction through eastern Grant and Stevens counties.

The rugged, hilly terrain that follows a curving trend north to - south through the central part of this region represents end moraines of the Wadena and Des Moines lobes. Ice contact deposits of sand and gravel found within the moraine topography are an important alternate source of aggregates where outwash deposits are not readily available.

The western part of this region, encompassing Clay, Wilkin, and Traverse counties, contains primarily clay and silt-rich lake sediments associated with Lake Agassiz, bordered on the east by a strip of clay-rich ground moraine that flanks the inner side of the end moraine topography. Sand and gravel deposits are limited primarily to a succession of beach ridges, often miles in length, that mark the former shorelines of Lake Agassiz. These deposits are long, narrow, and shallow, often less than 10 feet in depth.

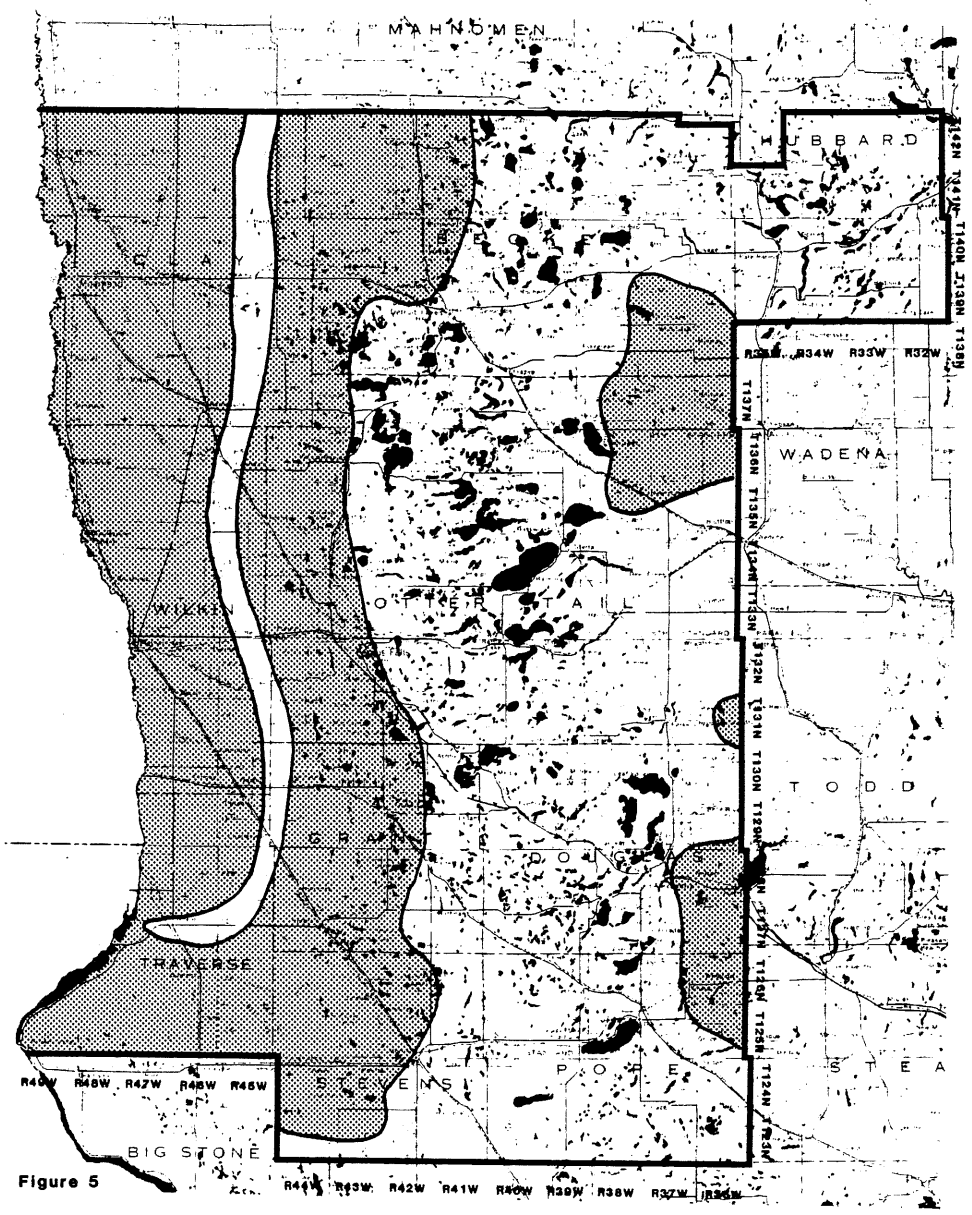
Although the western part of the lake basin is primarily constructed of clay and silt, a few buried glacio-fluvial sand and gravel deposits exist at scattered locations beneath the heavy cover of lake sediments.

In summary, gravel resources in the Lake Agassiz and ground moraine areas located in the western part of this region are considered to be inadequate for supplying local aggregate markets. In comparison, the large outwash and ice contact deposits in the eastern half of the region have ample gravel supplies. Figure 5 illustrates this situation.

Bedrock Geology and Metallic Mineral Potential

The bedrock geology of the Park Rapids Area consists of granite-greenstone rocks overlain in the western and southern parts of the area by younger sedimentary rocks. The

Figure 5. Aggregate Resources.



geology has been delineated largely by geophysical methods (seismology) as most of the area is blanketed by a thick covering of glacial overburden. The geophysical data has been supplemented by data from well drilling and by a limited number of exploration drill holes. Since the bedrock geology is not well-defined, geologic maps are constantly changing as new data becomes available. The aeromagnetic data being generated by the Minnesota Geologic Survey is proving invaluable in this respect. The granite-greenstone bedrock is divided into two terrains, a slightly younger terrain in the northern part of the area and an older terrain in the southern part. These are separated by a zone of strongly deformed rocks known as the Great Lakes Tectonic Zone.

The rock types present in the northern part of this area, are similar to Canadian greenstone belts which hold the majority of that country's mineral wealth, and suggest potential for a wide variety of mineral deposits. These include zinc-copper, nickel-copper, platinum group metals, gold, iron and others. Minor amounts of silver, lead,and cobalt, might be associated with some of these deposits.

The older rock units in the southern part of the area would probably have somewhat lower potential for the same minerals as the greenstone.

The area referred to earlier as the Great Lakes Tectonic Zone has a potential for zinc-copper-lead, copper-nickel, gold, silver, iron, manganese, platinum group metals and others.

In addition to the metallic mineral potential noted, there is some potential for clays formed as a result of Cretaceous weathering.

There has been a limited amount of modern mineral exploration activity carried out by industry in this area. The reason this area has not received more attention is probably because of the thick layer of glacial overburden covering the bedrock. As mineral exploration techniques improve, the ability to evaluate the bedrock through thick glacial deposits will also improve, and this area will probably be more extensively explored in the future.

Figure 6 depicts the generalized metallic mineral potential of the Park Rapids Area. The mineral potential categories on this map represent mineral potential categories used for the MN DNR Land Suitability Classification Study done in 1985. A definition of these categories accompanies the mineral potential map and a detailed description of the evaluation process used for the selection of these categories is available in the MN DNR Land Suitability Report.

Figure 6. Metallic Mineral Potential

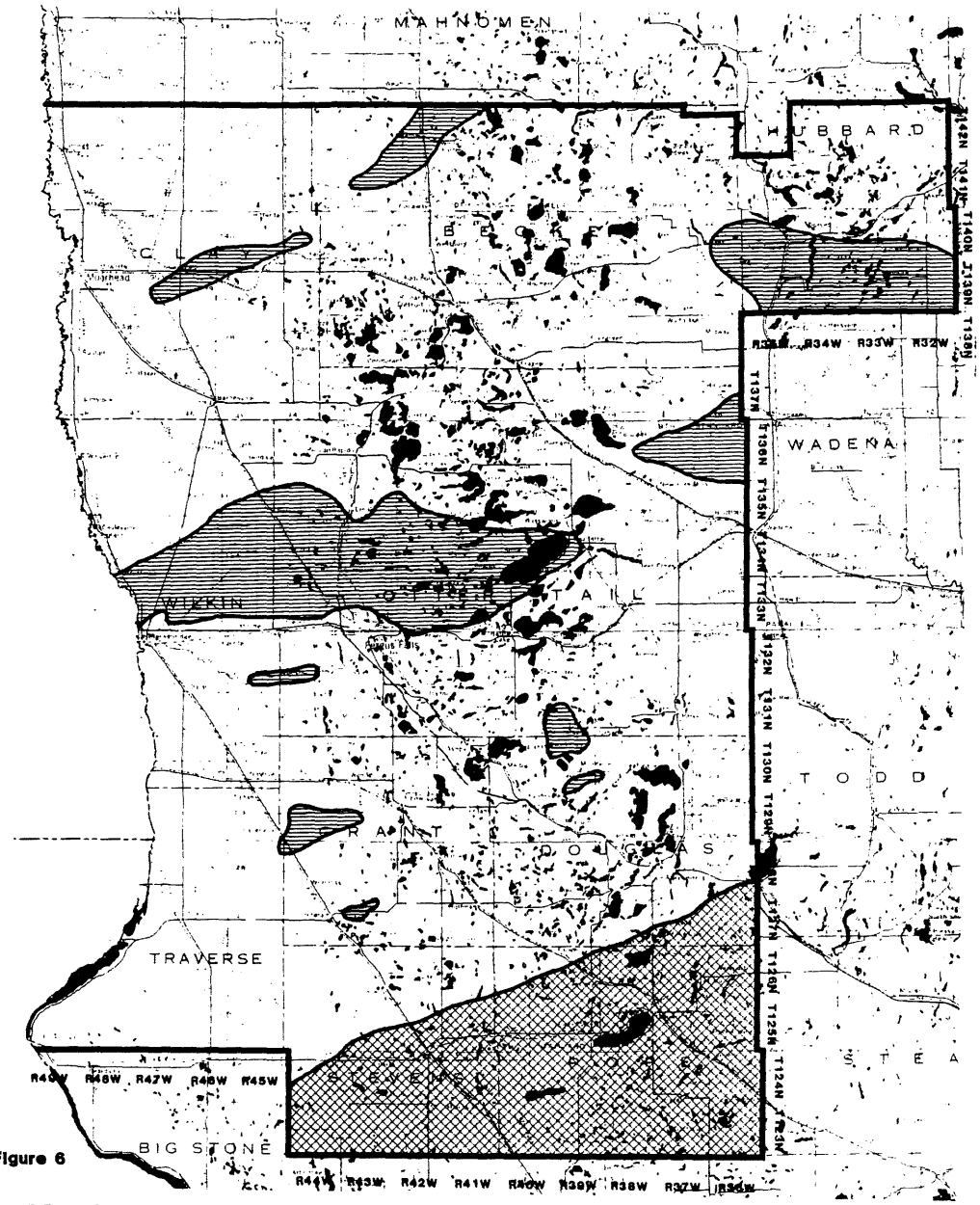


Figure 6

Metallic Mineral Potential

Represents geologic formations where metallic mineral bearing units are known to occur in the geologic formation. This category is also used for areas where the geology is very similar to that in areas elsewhere in the world containing major metallic mineralization.

The geology of these areas is generally not well know although it is similar to geologic environments in other areas of the world that are know to contain a variety of economic mineral deposits.

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.

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SCALE:

0 10 15 20 30

MILES

Waters

Watersheds

Portions of the four major watersheds shown in Figure 7 drain the Park Rapids Area. The majority of the area's land drains into Hudson Bay through the Red River of the North watershed. Part of the area, basically from central Becker County east, drains into the upper Mississippi River basin. The south central part of the area drains into the Mississippi River through the Minnesota River Basin.

The Buffalo, Otter Tail and Wild Rice rivers are the three major tributaries in the Red River Basin. These three rivers drain the central and western portion of the Park Rapids Area. They are very similar in character in that they all have their headwaters in the high moraines along the eastern shore of Glacial Lake Agassiz. Headwater streams of these rivers are generally clear and rocky and many flow through wild rice marshes and chains of clear lakes. As they reach the lower portions and near the Red River they become typical of prairie rivers. Their velocity slows down, they begin to meander, and they become muddy and cloudy.

Two tributaries of the Minnesota River basin drain the south-central portion of the area. They are the Pomme De Terre and Chippewa rivers. Both of these rivers are similar to the river tributaries of the Red River. They also have their headwaters in the rugged glacial moraine of the lake region. As they flow toward the Minnesota River they too slow down, meander and become silt laden.

Most of the northeastern portion of the area drains into the upper Mississippi River basin through the Crow Wing River and its headwaters tributaries. They include the Shell, Straight and Fish Hook rivers. The Redeye, Leaf and Wing rivers drain the east central portion of the area. While the watershed of the Long Prairie River, a large tributary of the lower Crow Wing River drains the northeastern corner of Douglas County.

The extreme northeastern portion of the area in Hubbard County drains directly into the Upper Mississippi Watershed.

Lakes

The Park Rapids Area has the highest concentration of lakes in central Minnesota. Of the 15,291 lakes in Minnesota, the Park Rapids Area has 2,905 lakes or more than 18.9% of the state's total. These lakes have a total area of 422,164 acres and account for 7.9% of the surface area. The majority of lakes in the area are managed for walleye, while the lakes bordering the Dakota's are managed for centrarchids (pan fish). Because of the large number of lakes, water recreation and sport fishing is one

Figure 7. Watershed Areas.

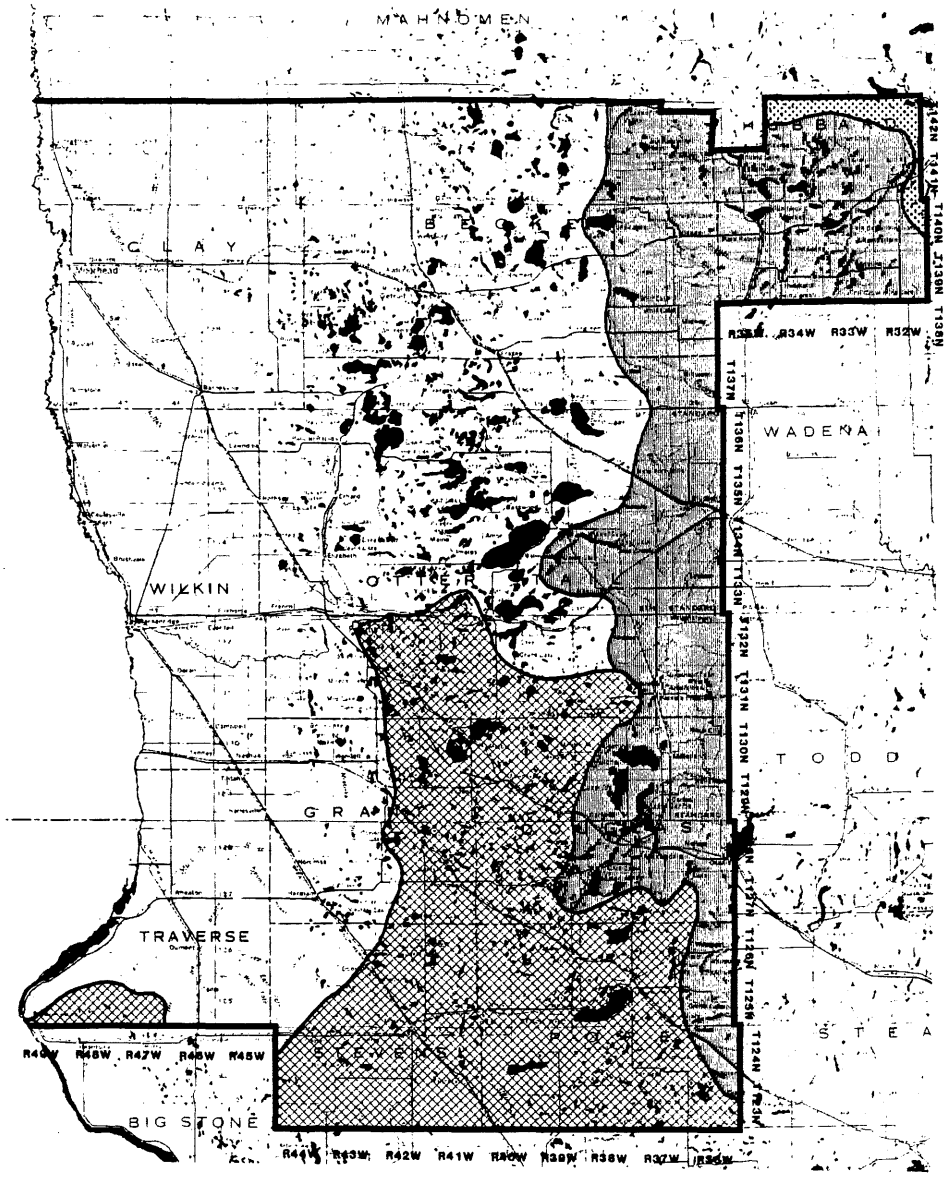

Figure 7

Watershed Areas

- Minnesota River
- Red River
- Crow Wing River
- Mississippi River

DIVISION of FORESTRY
PARK RAPIDS AREA

SCALE:
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MILES

of the major economic activities in the area. Park Rapids, Detroit Lakes and Alexandria are three of the major resort areas in the state. Table 4 indicates that Douglas County has the highest percentage of area in lakes, followed by Otter Tail and Becker counties.

There are 74 lakes larger than 1000 acres in the Park Rapids Area.

Table 4. Lakes in the Park Rapids Area.

County	Number of Lakes	Lake Area	Total County Area	% of County in Lakes
Becker*	662	94,578	914,560	10.3
Clay	107	4,650	673,280	0.7
Douglas	375	65,519	462,720	14.2
Grant	307	24,582	367,360	6.7
Hubbard*	313	48,318	637,440	7.6
Ottertail	1,048	173,851	1,416,320	12.3
Wilkins	25	675	481,280	0.1
Traverse	68	9,991	371,840	0.3
TOTAL	2,905	422,164	5,324,800	7.9

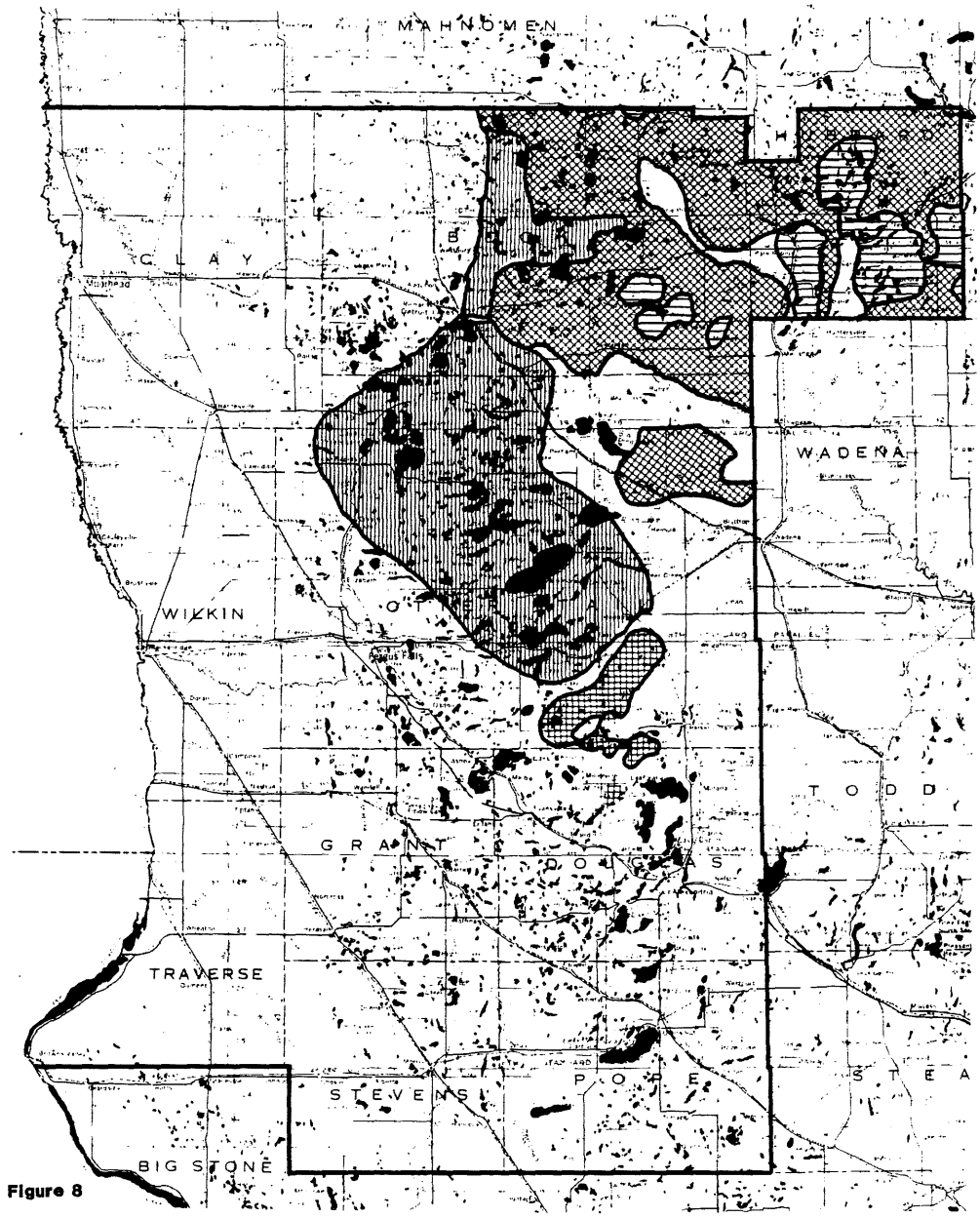
*Figures represent the entire county

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, Division of Waters. Permits are also required from the U.S. Army Corp of Engineers.

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

Figure 8. Major Forest Timber Types.



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.

Forest Cover and Timber Resources

Forest Cover

Park Rapids Area consists of all or a portion of 10 counties. Most of these counties are agricultural with less than 5% being wooded. However, Hubbard, Becker, and Ottertail counties in the Park Rapids Area are heavily wooded. More than one half (56%) of the forest land is in the aspen type. Approximately 200,000 acres are 40 years old or more. Some of these overmature aspen stands are being invaded by northern hardwoods, especially in the southern portions of the area. The five major forest cover types are illustrated in figure 9.

Timber Resources

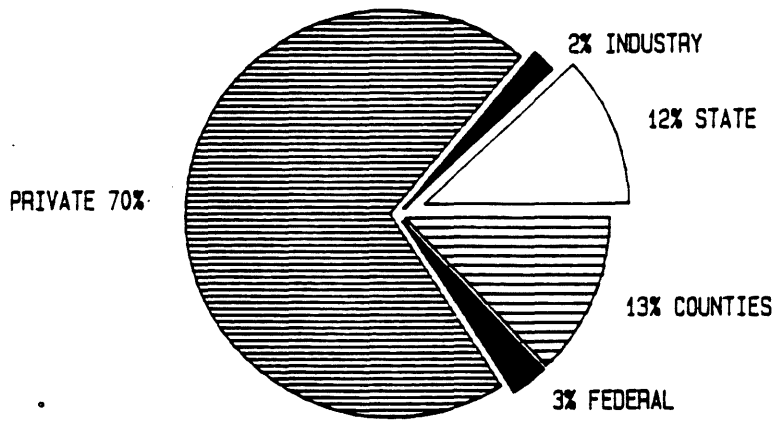
Commercial Forest Types

In the Phase I Forest Survey,(a statistical survey conducted by the U.S. Forest Service, North Central Forest Experiment Station) 21 forest types were recognized in addition to nonstocked forest land. See Table 6 which illustrates commercial cover type with total area to the nearest 1000 acres.

Commercial Forest Land Ownership

Public owners hold 28% (213,000 of the 745,000 acres) of the Park Rapids Area's commercial forest land (Figure 9). The State of Minnesota is the second largest public commercial forest landowner with 12%. Counties own 13%, and Federal government owns 3%. The remaining commercial forest land is held by private landowners (70%) with forest industries owning the remaining 2%.

Figure 9. Commercial Forest Land Ownership.



Stand-Size Class

Forest lands are separated into four stand-size classes: sawtimber, poletimber, seedling and sapling (restocking) stands, and nonstocked areas. This classification is useful in determining a stand's stage of development, the forest products it can produce, and whether or not deforested areas are being restocked.

Hardwood forest types account for 84 percent of the sawtimber stand acreage, 86 percent of the poletimber stand acreage and 71 percent of the seedling and sapling stands. Softwood forest types comprise the remainder of the acreage for each stand-size class (Table 5).

Table 5. Timber Types and Percent by Size Class in the Park Rapids Area.

HARDWOODS		SOFTWOODS
84%	Sawtimber	16%
86%	Poletimber	14%
71%	Seedlings/Saplings	29%

Age class distributions reveal the acreages of a given type within each 10-year age class. A balanced age class distribution, one in which each age class has the same number of acres, is ideal from a timber production standpoint for types managed on an even-aged basis. As forest stands reach maturity and are harvested, an equivalent acreage would have to be reforested to provide for a sustained yield of timber products. The age class distribution of each forest type in the Park Rapids Area is listed in Table 6.

Table 6. Total Area by Commercial Cover Type by Age Class (in 1,000 acres)

Commercial Cover Type	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121-140	Total (1,000 acres)
Aspen	33.9	18.4	16.0	53.4	88.8	80.3	24.8	12.1	2.6	0.0	0.0	0.0	330.4
Balsam Fir	0.0	2.7	2.6	0.0	1.9	3.0	1.6	0.0	0.0	0.0	0.0	0.0	13.4
Balsam Poplar	1.1	2.4	0.0	2.9	0.0	3.3	0.0	3.0	1.5	0.0	0.0	0.0	14.3
Black Spruce	0.0	3.1	0.0	1.6	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2
Jack Pine	0.0	2.6	2.8	13.0	18.8	6.8	3.6	1.1	0.0	0.0	0.0	0.0	48.8
Lowland Hdws.	3.6	2.9	1.8	0.0	2.1	2.7	2.8	2.8	2.9	0.0	0.0	0.0	21.6
Northern Hdws.	0.0	3.1	2.0	7.9	5.5	16.1	29.7	37.6	13.8	5.9	3.8	0.0	125.4
Oak	4.7	2.8	0.0	4.1	4.0	6.8	25.1	9.6	13.3	17.7	1.4	0.0	89.5
Paper Birch	0.0	1.6	1.3	4.3	13.9	7.3	6.8	4.0	2.0	1.3	0.0	0.0	42.5
Red Pine	3.9	0.0	0.0	0.0	0.0	2.7	1.2	1.4	0.0	1.3	0.0	0.0	10.5
Tamarack	2.1	9.3	1.1	0.0	0.8	4.5	1.6	3.0	3.9	0.0	3.2	1.6	31.0
White Pine	0.0	1.9	0.0	0.0	1.4	0.0	0.0	1.8	0.0	0.0	0.0	0.0	5.2
TOTAL	49.0	51.0	28.0	87.0	139.0	134.0	97.0	78.0	40.0	26.0	8.2	1.6	739.0

Source: North Central Forest Experiment Station, 1980.

Fish and Wildlife

Fish

The Department of Natural Resources, Section of Fisheries has primary responsibility for managing the state's fisheries resources. Fisheries managers and hatchery stations are located in Park Rapids, Detroit Lakes, Fergus Falls, and Glenwood. Fisheries management is accomplished through the protection and development of habitat for gamefish, propagation and distribution of fishes, control of roughfish and rehabilitation of lakes. An extensive survey program is maintained to provide current information on the status of fish populations. A program of individual waters planning requires managers to prioritize their lakes to identify the largest, most heavily used waters and requires a lake fisheries management plan to be written for each of them.

The Section of Fisheries has classified lakes by management classification for fish management purposes. The key species denotes the fish or fishes and their common associates which are most important to the sport fishery. Under any one management classification there may be other species that must be considered along with the key species. The most usual example is the northern pike which should be considered in the management plans for nearly all types of lakes. Most of the area's lakes are managed for walleye but there are also many lakes managed for centrarchids (bass-panfish). Seven area lakes are managed exclusively for stream trout and four lakes support both trout and warmwater fish populations (Table 7). Wilkin, Traverse, Clay and Grant counties have basically game lakes that are managed for waterfowl and aquatic furbearers, not fish. Thirty-seven streams in the area are designated trout streams. Fisheries management activities on designated trout streams consist primarily of survey work, fish stocking and stream habitat improvement projects. Many of these streams contain good to excellent trout habitat.

Table 7. Lake Management Classifications in the Park Rapids Area.

Stream Trout	7*
Centrarchid (bass-panfish)	194
Walleye-Centrarchid	177
Walleye	43
Warm Water Game Fish	61
Regular Winter Kill	142
Unclassified	99
Two Story (trout and warm water species)	4

* The figures include all of Hubbard and Becker counties.

The quality of water bodies depends to a large 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 agricultural areas. Regardless of the primary vegetative cover type, maintenance of forest or other 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.

Minnesota waters contain 151 species of fish, including minnows. The Park Rapids Area contains 21 of these species (Table 8).

Table 8. Gamefish Found in the Park Rapids Area.

Northern Pike	Black Crappie	Brown Trout
Silver Pike	White Crappie	Brook Trout
Muskellunge	Bluegill Sunfish	Lake Whitefish
Walleye	Pumpkinseed Sunfish	Channel Catfish
Yellow Perch	Green Sunfish	Brown Bullhead
Largemouth Bass	Rock Bass	Yellow Bullhead
Smallmouth Bass	Rainbow Trout	Black Bullhead

Of the game fish listed in Table 8, several 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 severely reduce or eliminate northern pike populations 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 important to the existence of trout species. All three species of trout are sensitive to siltation, temperature variations, and excessive runoff, especially during spawning time.

Wildlife

Wildlife Habitat

The presettlement vegetation of the Park Rapids Area was a mosaic of four major vegetation types; the Pine Forests of Hubbard and eastern Becker counties, the Northern Hardwood-Conifer Forests in central Becker and Otter Tail counties, the Mixed Grasslands and Hardwood Forests in OtterTail and Douglas counties, and the Grasslands in western Becker and Otter Tail counties and Clay, Douglas, Grant and Traverse counties.

Original vegetation of the Park Rapids Area includes a portion of the prairie-forest border; a broad transition zone found between the coniferous forest and the western prairies. As a result of this intermediate location, the area has a varied and dynamic vegetation pattern. Tallgrass prairie was the original

vegetation of the largest portion of the area. White pine, red pine and aspen-birch forests were common northeast of the transition zone in the Park Rapids vicinity. The prairie forest border vegetation included southern maple-basswood and oak forests, oak savanna, jack pine barrens, and oak-aspen brushlands. Along the border, temporal variations in distribution and abundance of these types resulted from fluctuations in climate and fire patterns.

The pine forests of Hubbard and eastern Becker counties have undergone great alteration. Logging and subsequent intense fires converted most of the pine forests to aspen-birch forests, although jack pine is still a major component in the remaining pine forest. While old growth stands are rare, there are numerous 100 year old second growth Norway and White pine stands in the Paul Bunyan State Forest.

The most extensive forest cover in the area occurs in Hubbard and eastern Becker county where there are sizable holdings of state and county land. Such large tracts of public ownership provide wildlife management opportunities not available on private land. Many wildlife species and songbird species need large extensive forest systems to survive.

Only a fraction of the original grassland acreage remains today due to conversion to agriculture. These remaining prairie tracts are extremely fragile, with unique wildlife populations, and require protection from further degradation.

Wildlife Habitat Trends

Major land conversions and habitat changes have altered the distribution of wildlife species in the Park Rapids Area. Moose formerly ranged throughout Hubbard and Becker counties. Prairie chicken, elk, and buffalo existed inhabited the prairie woodlands which once comprised over 70% of the Park Rapids Area.

In the early 1900's logging, fires, and agricultural development favored wildlife species such as the sharp-tailed grouse, and prairie chicken by providing vast areas in early successional stages. These habitat conditions diminished in quality with time to a critical point in the mid-1960's. Maturing forests, improved fire control, wetland drainage and conversion to agriculture in the grassland areas reduced favorable habitat for the deer, sharp-tailed grouse, prairie chicken and waterfowl. Also, in the mid-60's there was a series of severe winters with deep snow that dealt a very damaging blow to deer and pheasant populations. Since 1980, accelerated cutting of aspen in the Paul Bunyan State Forest has improved the deer and ruffed grouse habitats. Continued agricultural development and drainage in the transitional zone will further reduce favorable habitats for waterfowl and pheasants.

Wildlife Resources

Plant communities form what collectively makes up wildlife habitat. Habitat provides cover and food that wild animals need to survive. The interdependence of plants and animals is demonstrated by certain wildlife species being present in only one particular plant community.

Forest management practices have a great potential to significantly affect wildlife habitat in the forested portion of Minnesota. Due to the suppression of wildfires in the northern forest ecosystem, most changes in habitat presently result from planned management practices. This purposeful management determines the age, composition, size and distribution of timber stands in the forest. All of these attributes affect a stand's value as wildlife habitat. Habitat diversity is the focus of wildlife management in relation to forest management.

The Park Rapids Area has a diverse assemblage of wildlife species due primarily to the variety of plant communities. Prairie, wetland, coniferous, and deciduous forests types are all represented.

There are 26 species of reptiles and amphibians, 307 species of birds and 62 species of mammals recorded in the Park Rapids Area. Some of these species are casual migrants or nesters, irregular migrants or accidental. A complete species list for the Park Rapids Area is available in the Wildlife Technical Report filed at the Park Rapids Area Office, DNR-Forestry.

There are 37 resident game species in the Park Rapids Area. The major game species are bear, deer, ruffed grouse, pheasant, mallard, wood duck, ringnecked duck, blue winged teal, Canada goose, mink, muskrat, red fox, raccoon, and beaver. Of these deer, bear, ruffed grouse and wood ducks are most affected by forest management practices. Maintenance of a variety of timber age classes, permanent openings, and forest wetlands is the key to their future needs. The pheasant, mallard, ring-necked duck, Canada goose and muskrat are also affected by many practices in the forest, transition and agricultural area. They have been mostly affected by loss of upland nesting cover and wetlands. Management and improvement of nesting cover and wetlands is essential for their future needs.

Some wildlife species occurring in the Park Rapids Area require specific attention because they are endangered, threatened or special concern species in Minnesota. Colonial nesting water birds for example use specific nesting locations that need to be considered in future management. Bald eagle, osprey and red-shouldered hawk are forest species that have specific habitat and management needs. Prairie chickens and sandhill cranes are prairie and wetland species with special habitat needs.

There are 25 known bald eagle nesting territories that occur in eastern Becker and Hubbard counties. The osprey is a common raptor in this same area with 20 known nesting sites. Red shouldered hawks have recently been found nesting in the same area.

There is a population of prairie chickens and sandhill cranes found in southeastern Hubbard County. This is part of the north central prairie chicken range of Minnesota. This range is separate from the major prairie chicken range in western Minnesota. They occur here because of the early vegetational stages produced by major forest fires in the recent past (1959 & 1976). Special management practices will be required on upland sites both on public and private land in order for these species to survive.

Natural Heritage Elements

The Natural Heritage Program gathers statewide data on the location and status of natural communities which have been little modified by man's activities. Occurrences of natural communities that have maintained (or regained) their presettlement features have been greatly reduced in extent and now represent only a small fraction of the Minnesota landscape. To date, twenty-two natural communities have been identified as ecologically sensitive, i.e., high quality occurrences of the community type are now rare and in jeopardy of being destroyed or degraded. These community types, called elements, are ranked by the NHP according to their relative rarity and endangerment throughout their range. This ranking is program-defined and does not represent an official federal or state status. Elements are ranked as follows:

Endangered Throughout Range
Endangered Throughout Range or Critically Endangered in State
Endangered in State
Threatened in State
Status Undetermined, possibly in peril
Apparently Secure but Deserving Special Concern
Demonstrably Secure

A detailed description and the protection status of Heritage elements in the Park Rapids Area can be obtained from the Natural Heritage Program staff in St. Paul. A summary is available in an appendix to this plan.

Scientific and Natural Areas

The Outdoor Recreation Act of 1975, Minnesota Statutes 86A.01 to 86A.11, establishes an outdoor recreation system which will preserve an accurate representation of Minnesota's natural and historical heritage for public understanding and enjoyment and to provide an adequate supply of scenic, accessible, and usable lands and waters to accommodate the outdoor recreational needs of Minnesota,s citizens. Scientific and Natural Areas (SNAs) are established as part of this outdoor system.

There are currently six SNA's in the Park Rapids Area. They are shown on the large map of the area and listed in the appendix on Natural Heritage.

Recreation

The Park Rapids Area includes a wide variety of recreation resources. The prairie lands of western Becker, Clay, Wilkin, Traverse and Stevens counties offer excellent open land and waterfowl hunting as well as a variety of other recreational opportunities. The forested, lake regions of eastern Becker, southern Hubbard, Otter Tail, Grant, Douglas and Pope counties have a wider variety of recreational opportunities. Abundant resources exist for almost all types of fishing and hunting as well as other types of summer and winter activities. The majority of the developed facilities are operated by the private sector. These private facilities rely heavily on the recreation lands and waters managed by the public sector to provide a base for recreational activities.

Almost all of the parks, resorts, campgrounds, trails and other facilities in the area have been developed in the lake region. Most of the facilities in the nonforested area are private, county or municipal with the exception of four state parks (Lake Carlos, Maplewood, Glacial Lake, and Buffalo River), and many wildlife management areas and refuges. The DNR Forestry facilities are all located in the forested, lakes region.

Most of the state forest lands in the Park Rapids Area are located in eastern Becker, and Hubbard counties. The majority of these lands are located in the Paul Bunyan, Two Inlets, White Earth, Smoky Hills and Badoura state forests. In general, the facilities, which are designed not to have any significant effect on other forest resources, are primitive and are limited to the minimum amount of development needed to accommodate the intended use. In most cases, state forest recreational activities do not conflict with other forest uses and complement other existing facilities, both public and private.

Supply of Recreation Resources

Private Facilities

Private facilities play an important role in serving recreational needs in the Park Rapids Area. Compared to the public sector, the private sector provides more capital intensive, service oriented facilities ranging from overnight lodging in resorts to outfitting recreationists for all types of outdoor experiences. Some facilities provide on-site recreational experiences, using the northwoods setting for a background, while others rely heavily on nearby public lands and facilities to attract users.

Private resorts, campgrounds, water accesses, outfitters, as well as other private facilities and services have a direct effect on Minnesota's public lands and waters by providing access and complementary facilities. The 1985 State Comprehensive Outdoor Recreation Plan, shows one of the highest concentrations in the state of resorts and other recreation facilities around the public land and water areas in the Park Rapids Area. By far the majority of other recreation facilities like campgrounds, accesses, marinas and beaches are privately owned and managed. In addition to the private recreation facilities, many local businesses rely heavily on tourist/travel expenditures.

DNR Managed Facilities

The Department of Natural Resources manages many types of recreation facilities ranging from state forests which may contain several thousand acres of public land, to state trails which provide a variety of recreational opportunities.

Division of Forestry Facilities

Campgrounds, Water Accesses and Trails

- Hungryman Lake Campground
- Cedar Lake Picnic Area and Public Access
- Mantrap Lake Campground, Picnic Area and Public Access
- Paul Bunyan State Forest Trails
- Two Inlets State Forest Trails
- Smoky Hills State Forest Trails
- 13 Public Accesses Maintained by the Division of Forestry

Transportation Systems

Highways

The Park Rapids Area is reasonably well served by existing transportation facilities. Interstate 94 runs diagonally through the southwestern portion of the area. State highways 64 and 71 provide north-south transportation and highways 10,34 and 113 provide east-west access through the area. Other state highways, county and township roads feed into these major arteries providing good access to the entire area. With the exception of highway 113, which is rated as a 10-ton road in the winter, 9-ton in the summer and 5-ton in the spring, the ability to transport forest products throughout the year is fairly good.

The 1986 State Transportation Act calls for the Commissioner of Transportation and the Commissioner of Natural Resources to establish standards and a plan for trunk highway segments located in areas of unusual scenic interest.

Access to state forest land is provided by 144 miles of state forest roads which are open all year. State forest road maps, inventory information,and other information is described in the State Forest Road Plan (MN DNR, Division of Forestry, 1982).

Airports

There are numerous airports in the Park Rapids Area which serve local aviation needs. The only scheduled passenger flights serving the area are from Bemidji, 50 miles to the north of Park Rapids and from Fargo on the western border of the area.

Railroads

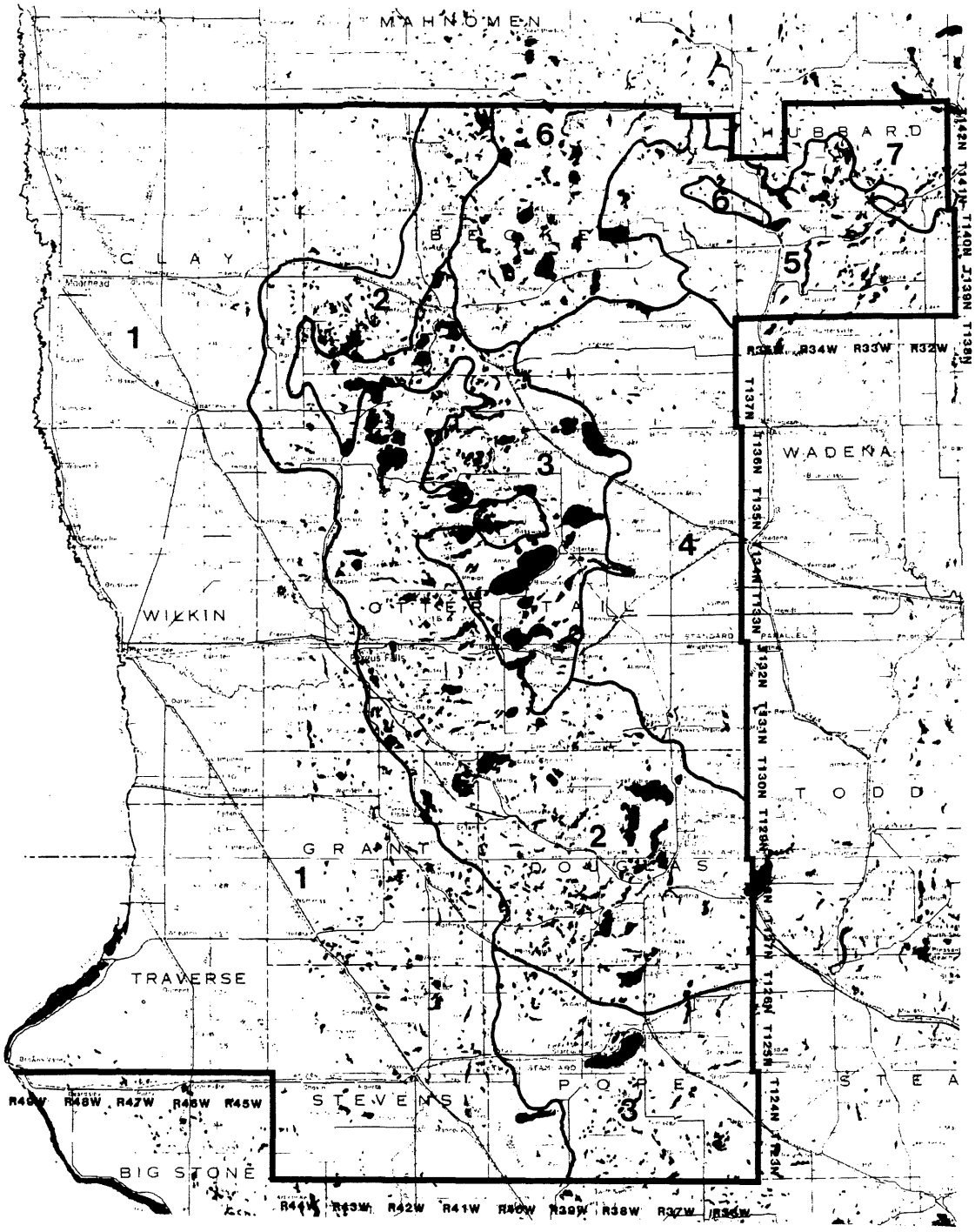
The Park Rapids Area is served by both the Burlington Northern and the Soo Line railroads. Both railroad companies have major routes passing through the area. The lines are generally east-west routes located in the western prairie, a considerable distance from the northeastern forested portions of the area. Many of the local branch lines which hauled forest products in the past have been abandoned and removed.

RESOURCE MANAGEMENT UNITS

The Park Rapids Area has been sub-divided into seven units for the purpose of developing resource management strategy.The RMU's were developed by the Regional Soil Specialist working with the District Foresters and Area Forestry personnel. RMU's were delineated by using differences in landforms (surficial geology) and other resources. They first developed the map showing the natural boundaries (Fig 10). Due to the fact that all computerized data on timber,land and other resources are described on a legal basis, the natural boundaries were modified to ones that follow legal boundaries(Fig 11). Considering the scale of the units and the general nature of the stratey statements the deviation is not significant.

This strategy is quite distinct between some RMU's and similar in others depending on the particular program. For example the differences between the Red River Valley and the heavily wooded rolling terrain of Paul Bunyan State Forest have a significant impact on what can hoped to be accomplished from a forestry standpoint. The distinctions between some other RMU's are based on less dramatic soil, timber, and land ownership pattern differences. Figure 12 shows the comparative amounts of timber on state administered land in the different RMU's. These distinctions have,in most cases,a definite influence on the type and amount of forest management that can be accomplished.

The following detailed descriptions of resource management units are concluded with some implications for forest management along with some comparisons with other units. Figures 13 through 18 show the differences in topography in RMU's.



Natural Resource Management Boundaries

Figure 10

DIVISION of FORESTRY
PARK RAPIDS AREA

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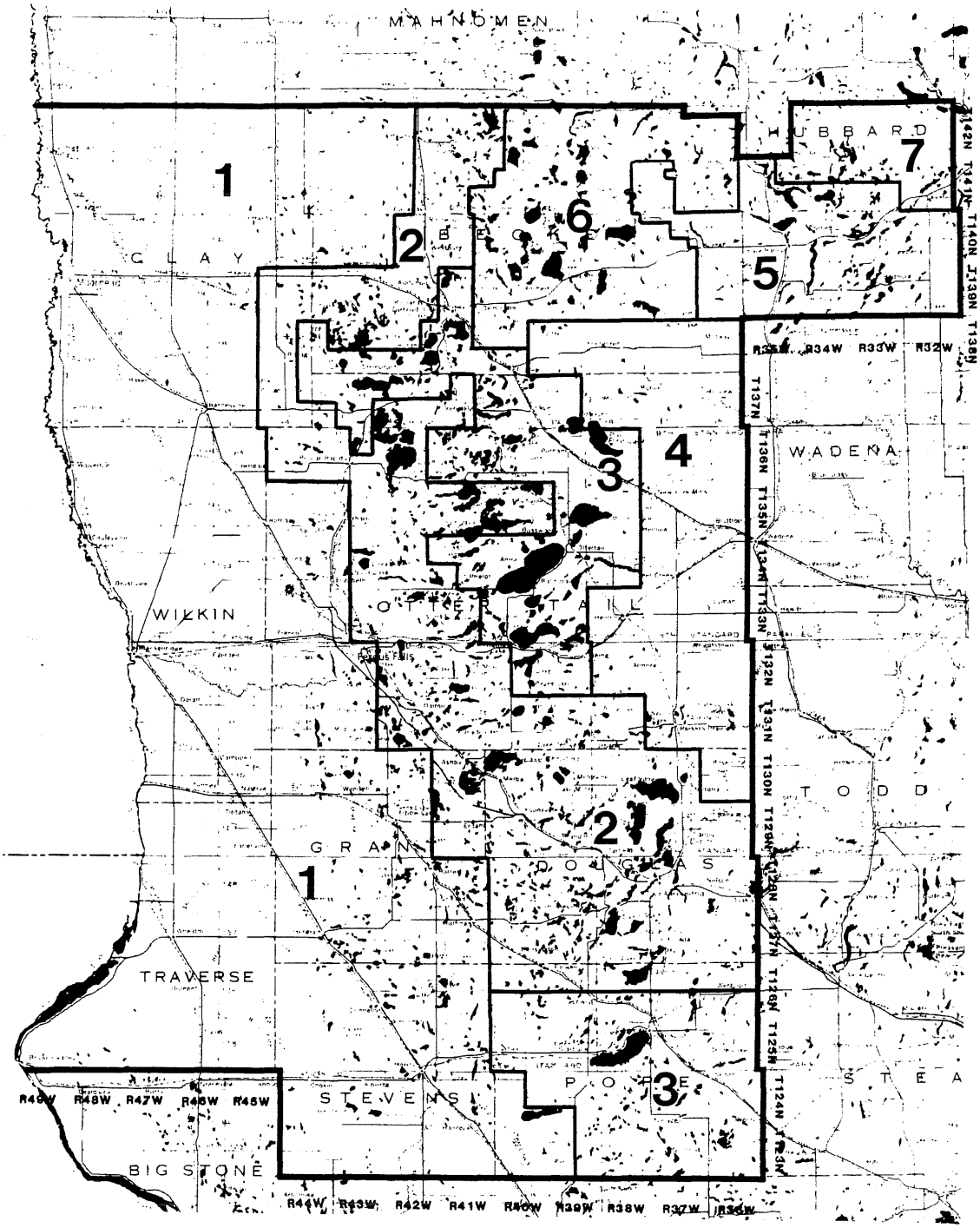

Natural Resources
Management Unit Boundaries

Figure 11

DIVISION of FORESTRY
PARK RAPIDS AREA

SCALE:

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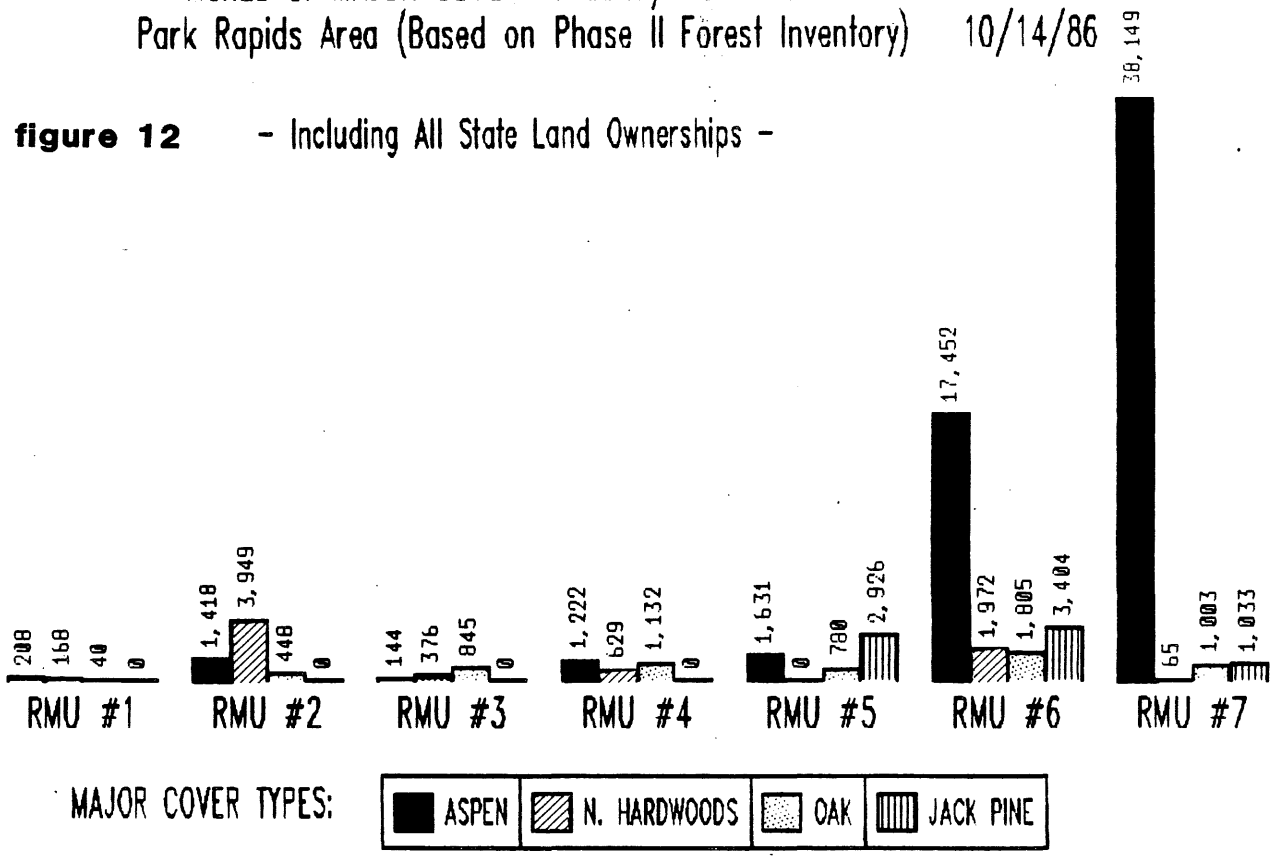
ACRES of MAJOR COVER TYPES by RESOURCE MANAGEMENT UNIT
Park Rapids Area (Based on Phase II Forest Inventory) 10/14/86

figure 12 - Including All State Land Ownerships -



RESOURCE MANAGEMENT UNIT 1 (RED RIVER VALLEY)

This unit consists of two lacustrine plains(old lake sediments) and a series of till plains (mixed deposits left by glaciers). Meltwaters from a large glacier were trapped in what is now the Red River Valley. As this meltwater emptied to the south(glacial river Warren)it formed a series of beach ridges running north and south along the eastern edge of the Red River Valley.

Topography in the lake plain is level to gently undulating (See fig 13). The Agassiz plain slopes gradually from east to west at approximately 1 ft./mile. Local relief generally ranges from 0-15 ft. Beach ridges vary from a few rods to a half mile in width and from 5-20 feet in height. Topography in the till plains is nearly level to rolling with small potholes and marshes common.

Dominant soils in the lake plains consist of deep deposits of clayey, silty and loamy sediments. Seventy percent of these soils are poorly drained. Beach ridges typically consist of 1-2 ft loamy sand over sand and gravel, and are well to excessively drained. Soils in the eastern portion formed in loamy calcareous glacial till with a variety of textures. About 70% of the soils are well drained.

The original vegetation was tall grass prairies with some northern hardwoods in the eastern portions of this unit. Today this area is predominantly under cultivation and very few native prairies exist. Timber species consist mainly of northern hardwoods and are isolated along lakes and streams.

An estimated 80-90% is under cultivation. The remainder consists of native grasses and pasture with isolated woodlots. Beach ridges have provided excellent gravel sources in an otherwise gravel scarce area. Main agricultural crops include: barley, oats,wheat,soybeans,corn,flax,potatoes and sugar beets.

The combination of nearly level topography and deep rich soils of prairie origin have made this area one of the most productive agricultural areas in the country. The neighboring unit 2 has not developed into such a productive area due to increased topography, more occurrence of stones, and an influence of soil development. Unit 1 does not have the numerous lakes as unit number 2.

Forest management is quite restricted due to very little state ownership and obvious emphasis on agriculture. Most forest management is done on private land.

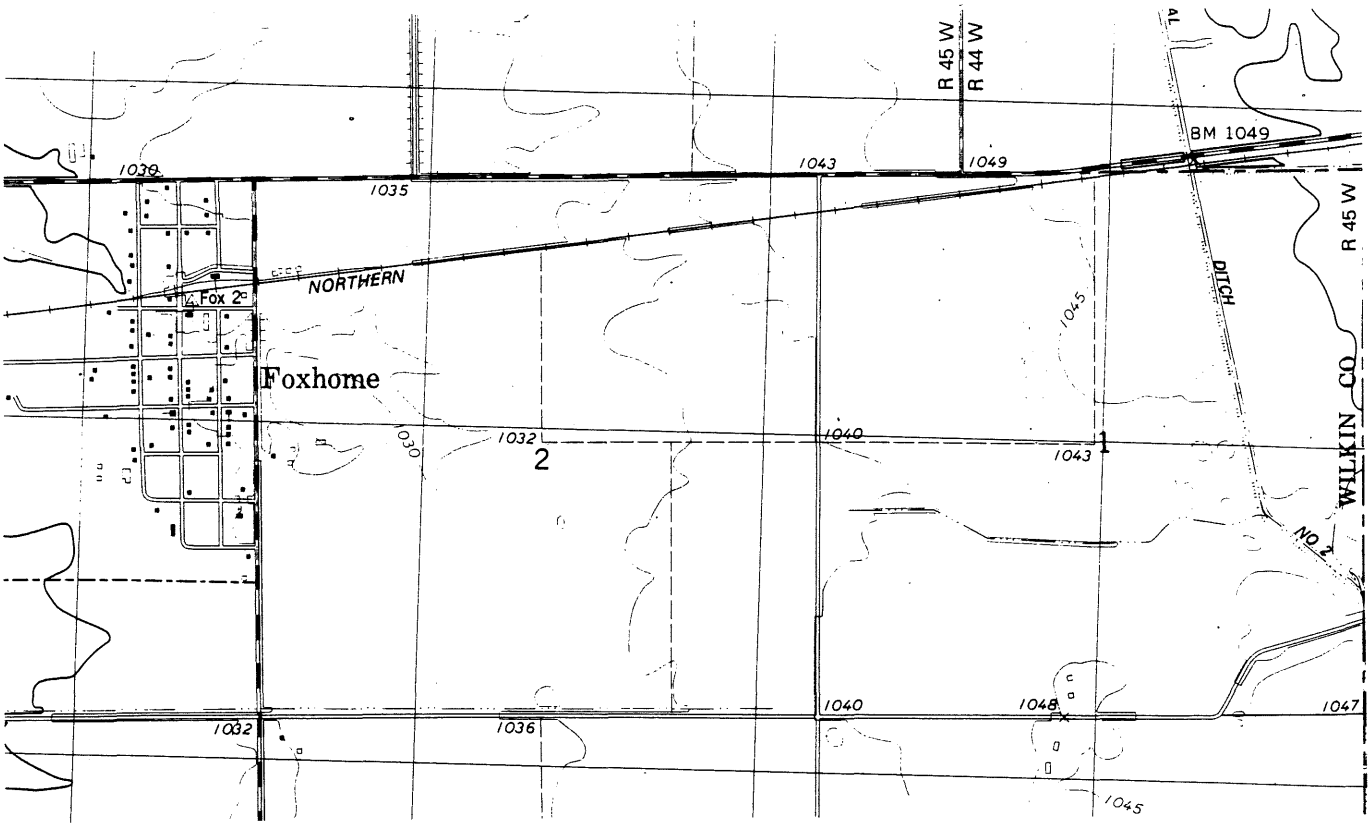


Figure 13. Typical Topography in RMU 1

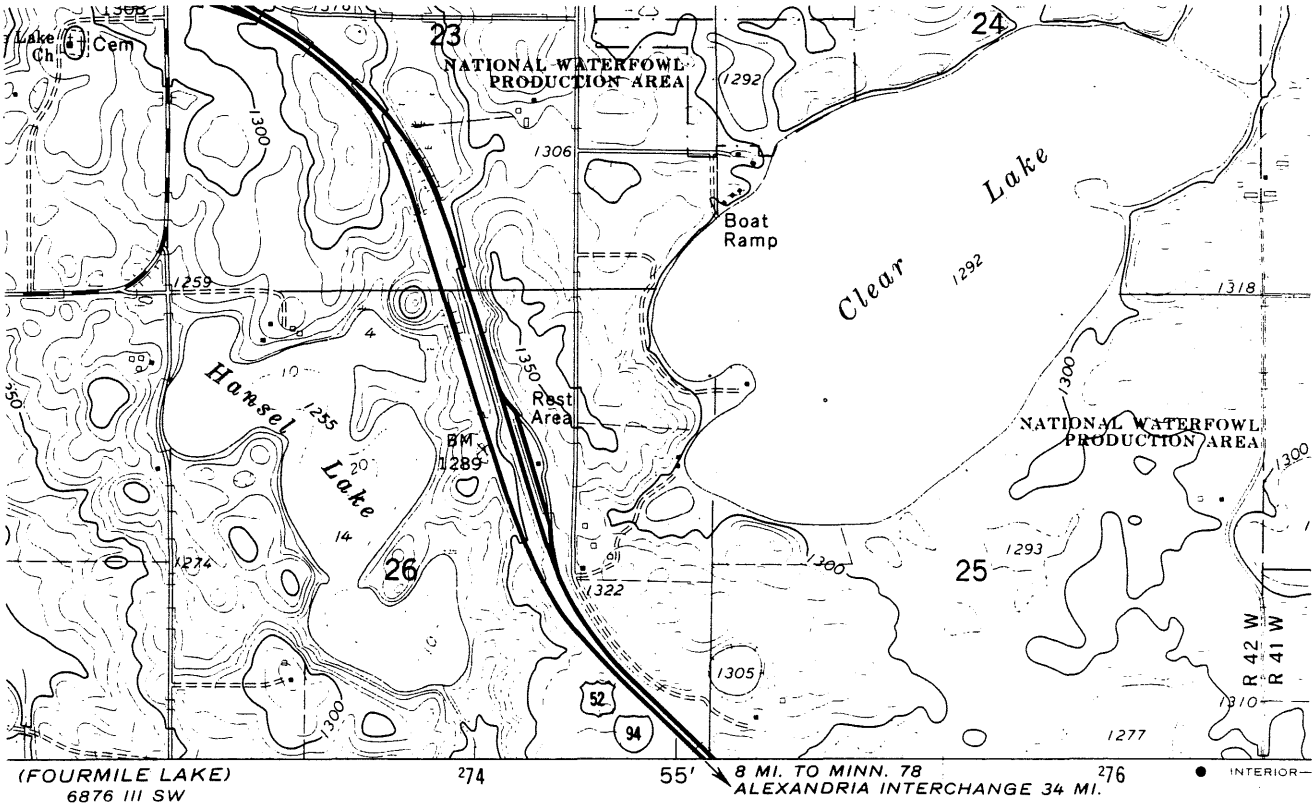


Figure 14. Typical Topography in RMU 2

RESOURCE MANAGEMENT UNIT 2 (ALEXANDRIA MORAINE COMPLEX)

The Alexandria moraine complex is a prominent end moraine formed by two ice advances. The core material was deposited at the terminus of the Wadena ice lobe and was later covered by a thin mantle from the Des Moines ice lobe (14,000-18,000 years ago). Decaying ice blocks resulted in the knob and kettle like topography and account for the numerous small potholes, marshes and lakes. Isolated sandy and gravelly areas can be found within this unit in pitted outwash or esker formations.

Topography is dominantly rolling to hilly knob and kettle like. It abounds in numerous small potholes and marshes and many good recreational lakes(See Fig. 14).

This moraine forms a transition between forest and prairie, tall grass prairie in the west with northern hardwood forests in the eastern portion.

Soils developed mainly from calcium rich loam and light clay loam glacial till. The dominant soil consists of 2-4 feet of clay loam and loam over loam till. North of Detroit Lakes, the loamy soil is intermixed with finer textured soils. The majority of soils in this unit are well drained. Glacial stones are common in this unit.

Approximately 15-25% of this unit is forested. An estimated 45-55% is tilled, 15-25% is pasture, and 5-15% is marshy. There is heavy recreation on its many lakes and includes two state parks. Main agricultural crops include: oats, barley, wheat, corn, alfalfa, and brome.

This moraine tends to be the border between prairie and forest. It is hypothesized that the topography of the moraine has affected the climate enough to encourage forest areas on the eastern side. This is more noticeable in the north than the southern portions. This unit differs from the Itasca moraine mainly in soil materials and stoniness. The Itasca moraine tends to be sandy loam materials with common sandy hilltops and common stones while this unit is predominantly loam and clay loam with fewer sand and gravel areas or stones. This results in greater percent of forested area than unit 6 and 7, and greater agriculture in this unit. Also, Unit 7 has much fewer lakes than this unit.

Unit 3 has similar topography, but materials consist of shallow sandy loam over sand and gravel and are very droughty. This affects both forestry and agricultural management. This unit is bordered by the nearly level rich agricultural land in Unit 1 and the nearly level sandy outwash of Unit 5.

The management emphasis in this unit is on private forest management. Typically, this includes management of hardwoods in scattered woodlots or planting conifers on sites where it is too steep, droughty or eroded for productive agricultural management. Generally, this unit is very productive for a variety of tree species. Hardwoods can be managed for saw timber in Otter Tail County and to the south. North of this line, frostcracking reduced hardwood quality. Hardwoods tend to be more productive and better quality on the east side of large lakes.

RESOURCE MANAGEMENT UNIT 3 (DETROIT LAKES PITTED OUTWASH)

The Detroit Lakes pitted outwash was formed by meltwaters from the Des Moines ice lobe as it receded to the northwest. Large blocks of stranded ice resulted in the occasionally steep "pitted" topography.

Topography over most of the plain varies from undulating to gently rolling with many lakes (See Fig. 15). Rolling to steep terrain occurs north of Star and Dead Lakes in northwestern Otter Tail County and in much of the Becker County plain. A nearly level area is located in the vicinity of Perham.

The original vegetation was dominantly prairie with scattered oak. Currently much of the area is forested. Forested areas are dominated by northern hardwoods, mainly near streams and lakes or on scattered farm woodlots.

Most soils consist of loamy sand to sandy loam less than 24 inches thick over sand and gravel. Consequently, with low water holding capacity, the soils are quite droughty. Water tables range from 2-3 feet in some low areas to 50 feet below the surface in higher elevations. Approximately 5-10% of this unit is poorly drained. The depth of glacial drift over bedrock near Perham is approximately 215 feet. Outwash sand and gravel in places range up to and over 100 feet thick. This unit is a good source of gravel and many large gravel pits are located in it.

An estimated 5-15% of this unit is forested, 15-25% is pasture and native meadow, and 60-70% is tilled. In pitted or steep terrain, common boulders and severe doughtiness has restricted agricultural use and is therefore in pastures or woodland. Main agricultural crops include: oats, soybeans, corn, rye, alfalfa and brome. This outwash is a very good source of gravel and many pits are located in it.

The major difference between this unit and surrounding units is in its soil materials. This unit consists of shallow sandy loam over sand and gravel vs. loamy or clay loam glacial till in Unit 2 or sandy loam till in Units 6, 7, and 4. These differences are reflected in both agricultural and forest management and productivity. Some very productive hardwoods can be found, mainly on the eastern sides of large lakes. The difference between Units 3 and 5 are mainly in topography and soils. Unit 5 is nearly level with much less sandy loam surface.

Forest management consists mainly of private forest management on scattered woodlots. Some saw timber quality hardwoods can be produced in this unit. Other management consists of coniferous plantings on sites too steep, droughty or eroded for agriculture. These sites are usually low site index and quite droughty.

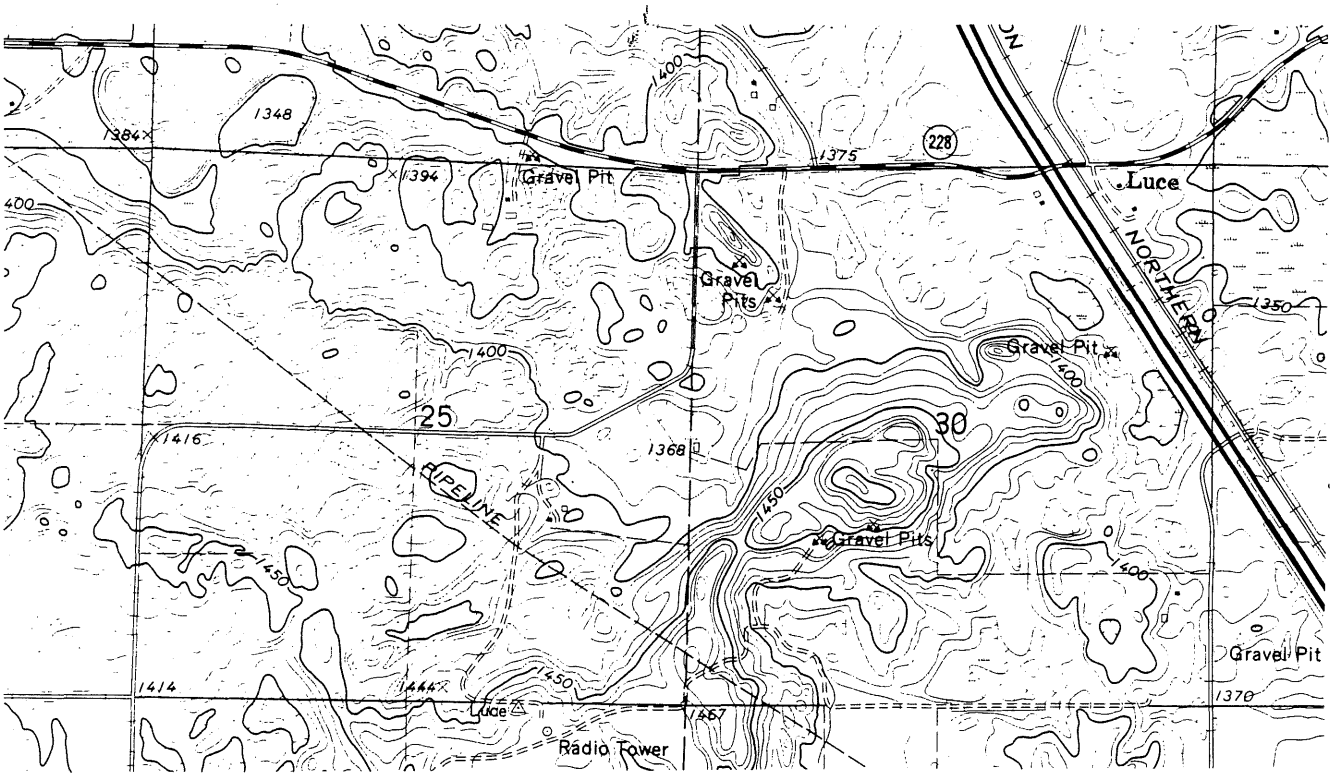


Figure 15. Typical Topography in RMU 3

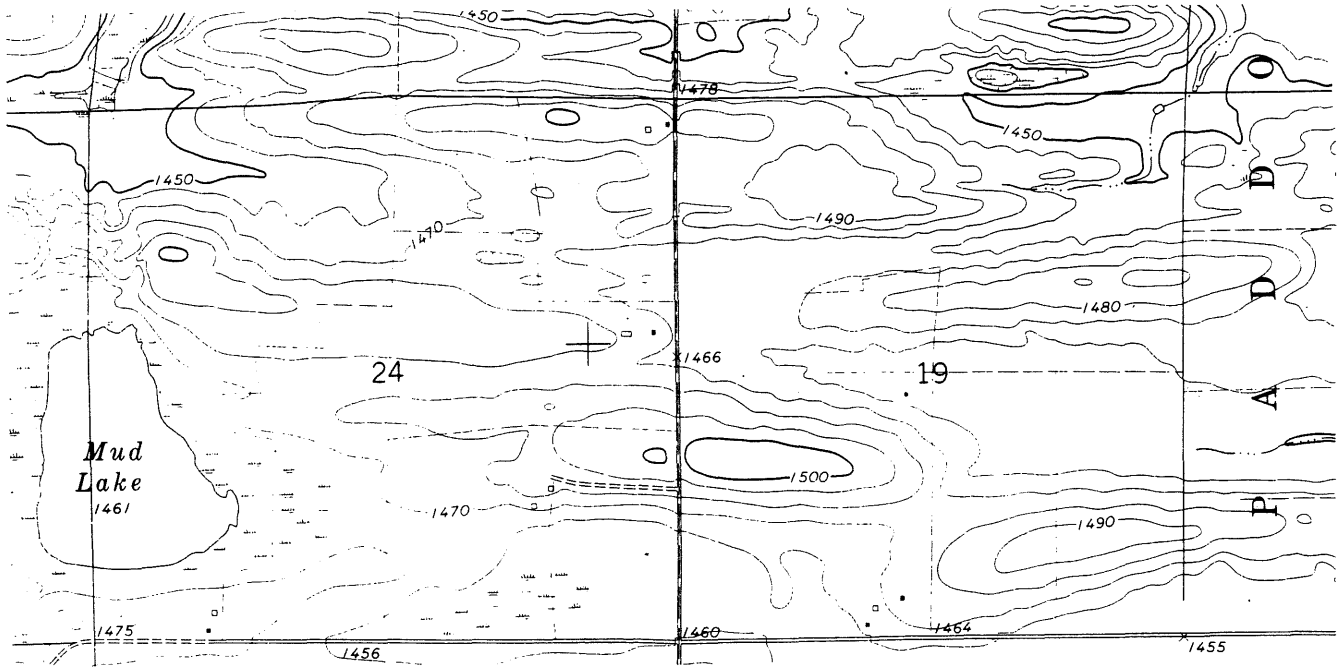


Figure 16. Typical Typography in RMU 4

RESOURCE MANAGEMENT UNIT 4

This unit formed from materials deposited by the Wadena ice lobe. This material consists of calcium rich sandy loam till originating from southern Manitoba.

The western portion of this unit is typified by undulating to rolling knob and kettle type topography, mixed with numerous wet depressions and small peat bogs. Several larger peat bogs from 1 to over 5 sections in size are located in this unit(See Fig. 17).

The eastern portion is characterized by relatively low drumlins with long gentle slopes oriented in a easterly direction. Drumlins are separated by wet marshy areas which in places are over a quarter mile wide. The drumlins range from 0.1 to 0.5 miles wide and 1 to 4 miles long.

Most of this unit was originally forested, consisting mainly of white and red pine. Northern hardwoods were common throughout the area. Lowland conifers are common between the drumlins in northeast Ottertail County.

Soils in this unit typically consist of 2-4 feet of sandy loam over calcareous sandy loam till. Approximately 60-80% of these soils are well drained. Occasionally, subsoils consist of sand and gravel but usable gravel sources are generally scarce. Glacial stones and cobbles are numerous on the surface and throughout the profile.

Approximately 20-25% of this unit remains in forests. About 15% is pastured, 10-30% marshy and 40-50% is under cultivation. Principal crops include: oats, corn, brome grass, alfalfa, and clover. Forested areas consist mainly of private woodlands.

This unit is similar in topography to Units 6, 7, 3 and 2, but with a greatly reduced number of lakes. Soil materials are sandy loam till vs. loam and clay loam in Unit 2 and sandy loam over sand and gravel in Unit 3. This unit is similar to 6 and 7, but with much less forested area, fewer lakes, reduced topography and few sandy droughty hilltops. The drumlins in this unit provide a unique feature of upland and lowland affecting agriculture, forestry and wildlife. Soils in these drumlins tend to dry out approximately 2 weeks later than surrounding areas.

RESOURCE MANAGEMENT UNIT 5 (PARK RAPIDS-STAPLES OUTWASH PLAIN)

This outwash plain formed from sediments deposited from meltwaters from the Wadena ice sheet which formed the Itasca moraine and Henning till plain (16,000-25,000 years ago). Meltwaters carried sediments through low areas to the south. This resulted in sand and gravel deposit of up to and over 100 feet thick in the north end with shallower deposits in the south.

The topography ranges from nearly level to gently rolling with 5-15 feet local relief(See Fig 18). There are a few strongly rolling areas in this unit, including the northern edge along the Itasca moraine. Many lakes exist throughout this unit.

Original vegetation over much of this unit was prairie grass and occasional oak openings. Some areas were forested with jack pine, white pine, and northern hardwoods.

Soils range from 1-3 feet of loams and loamy sands, underlain by sand and gravel up to 100 feet thick. Consequently with low water holding capacity, most of these soils are quite droughty. Approximately 20% of this unit is poorly drained. Most poorly drained soils occur in peat bogs prevalent in parts of this unit. The largest bog is in southeastern Otter Tail County and covers approximately 15 square miles. Much of the Badoura State Forest in southeastern Hubbard County is also poorly drained.

An estimated 25-35% of this unit is forested; most of this is in Becker County. Pasture accounts for 10-20%, marshes for 10-15%, and 40-50% is tilled. The Badoura State Forest and portions of Two Inlets and Smoky Hills State Forest are contained in this unit.

This unit is unique from surrounding areas in both topography and soil materials. This difference is reflected in both agricultural and forest management. This unit contains the major pine management in the Park Rapids area.

The combination of pine, agriculture, recreation and the droughty soils of this unit create a high fire hazard. Most fires in the Park Rapids Area occur in this unit. The major emphasis in forest management is on pine and aspen management. Large lowland areas in southeast Hubbard County provide opportunities for lowland conifer management.

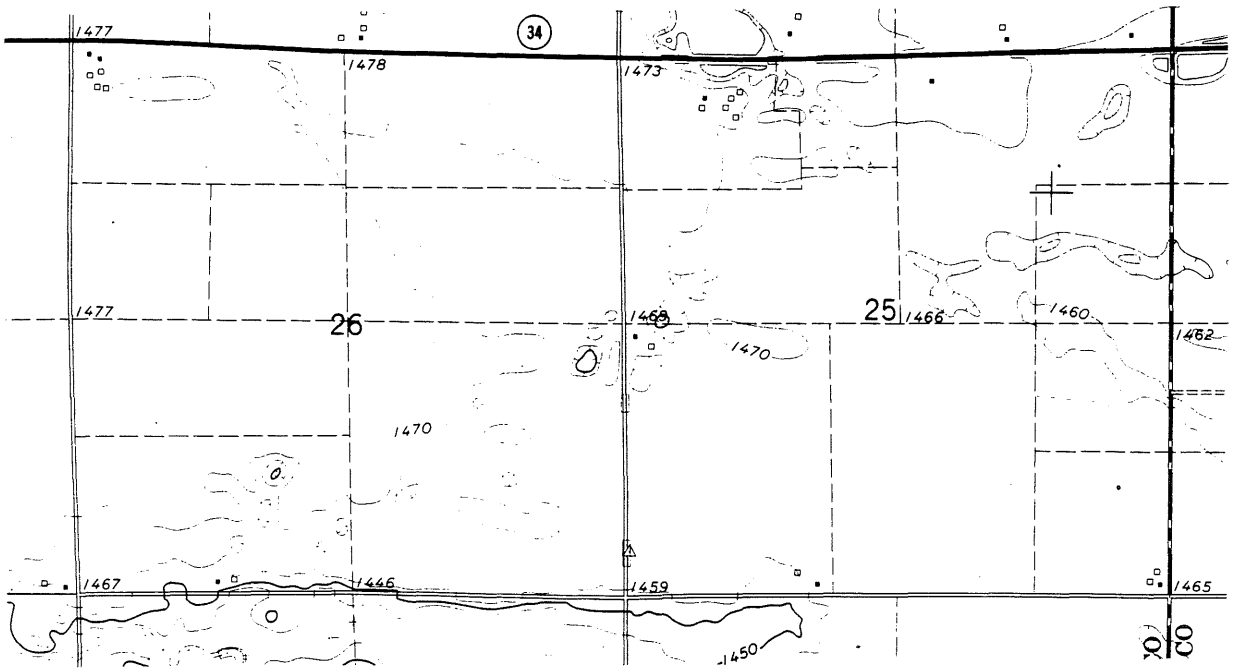


Figure 17. Typical Topography in RMU 5

RESOURCE MANAGEMENT UNIT 6 (ITASCA MORAINE)

The Itasca moraine is an end moraine formed by the advance of the Wadena ice lobe from the north and northeast. This moraine consists predominantly of calcareous sandy loam till with large areas of sandy outwash. This is one of the oldest landforms in the Park Rapids Area (16,000-25,000 years ago). Ice and meltwaters gouged several channels through the moraine now occupied by chains of small lakes. Stagnant ice formed many larger lakes and small potholes throughout this unit.

This unit consists of rolling to steep knob and kettle topography with common lakes, wet potholes and marshes throughout (See Fig.18). Several tunnel valleys exist throughout the moraine. Areas of less rolling outwash sands exist in this unit.

This unit contains many lakes both large and small. Small streams are common and typically connect lakes within old glacial meltwater channels.

Original vegetation was primarily white and red pine forests. Current vegetation is dominated by aspen and northern hardwood forests with areas of jack and red pine common throughout in occasional sandy outwash areas and on droughty hilltops.

Soils consist mainly of 2-4 feet of sandy loam (some loamy sand) over calcareous sandy loam. Pockets of sand and gravel are intermixed with the till in about 60% of this unit. Soils are dominantly well to excessively well drained. This unit includes a few large sandy and gravelly outwash areas.

This unit is unique in topography and soil materials from the surrounding units. This provides special opportunities in forest and wildlife management.

The primary species in forest management is aspen with hardwood management more common in the western portion and pine management scattered throughout. This unit typically has a low fire hazard with possible exceptions in the outwash areas. Road construction is challenging due to the terrain.Once constructed, roads hold up very well and side slopes have little caving.

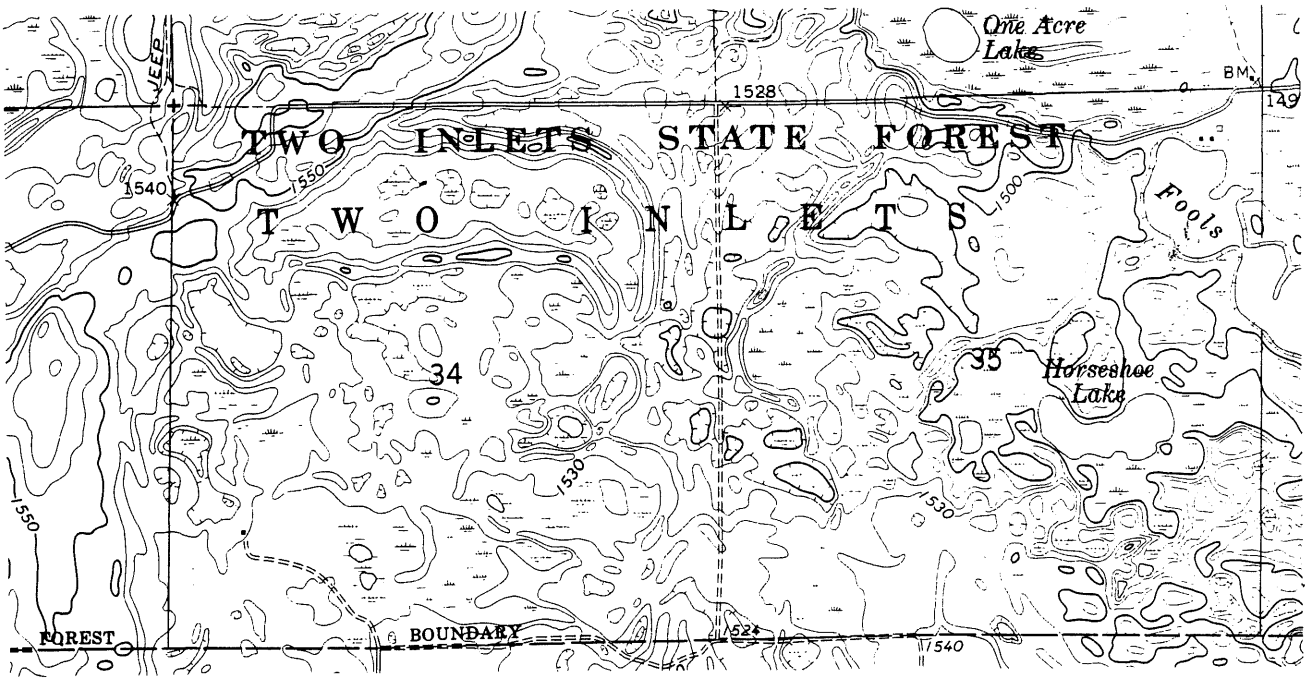


Figure 18. Typical Topography in RMU 6 & 7

RESOURCE MANAGEMENT UNIT 7 (EASTERN PORTION - ITASCA MORAINE)

This unit is the same landform as RMU 6 and therefore is identical to RMU 6 except that this RMU is predominately covered with aspen (See Fig.9).

Markets are such that this unit is able to sell its planned cut easily, while the western portion of the Itasca moraine (unit 6) has not harvested its planned cut in recent years.

LAND ADMINISTRATION ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The goal of the land administration program is to achieve the optimum pattern of forest land ownership for the management of forest resources to best serve the needs of Minnesota's citizens. Maximum long-term resource and economic benefits through efficient resource management, land acquisition, leasing, sales and exchange.

The Division of Forestry administers six state forests in the Park Rapids Area. The Division administers 102,243 acres, or 48% of the land within the statutory boundaries of the state forests.

The following is a brief review of the major types of state and county administered land in the Park Rapids Area.

Trust Fund Lands

Trust fund lands are those that were received by Minnesota from the federal government with the condition that receipts from them be used for specific education purposes. Most of these lands were granted to the state after it achieved statehood in 1858.

School Lands and Swamplands

The two major types of trust fund lands are the school lands and swamplands. School lands originally consisted of grants of sections 16 and 36 in each township (or in lieu selections made in the case of tracts that had been occupied or reserved prior to transfer of title to the state). These lands were granted to the state by the federal government for the purpose of establishing and developing a system of public schools. Almost 3 million acres were granted to the state for such purposes. The state, through legislation, directed how the lands should be managed and the manner in which they would be disposed of. Roughly two thirds of the original grant of school lands have been sold. Most of the remaining school trust fund lands are administered by the Division of Forestry.

The state also received a grant of 500,000 acres of Internal Improvement Lands for highway development and other similar public improvements.

Minnesota received about 4.7 million acres of swampland grants from the federal government in 1860 to encourage drainage and improvement of swamplands with money received from the sale of those lands. In reality, many of these lands were not swamplands, but higher quality lands. Over one half of these lands (about 2.9 million acres) were not used for swampland improvement, but were instead granted to railroads. In 1881 an amendment to the state constitution was passed which required that swamplands be sold in the same manner as school lands. From that time on the receipts from the sale of both swampland and school lands were deposited in a permanent fund and the interest allocated to educational institutions on a per pupil basis. About 1.6 million acres of swamplands are still in public ownership in Minnesota. About 1.1 million acres are within state forests.

Other Trust Fund Lands

There are about 33,000 acres of other types of trust fund lands administered by the Department of Natural Resources, including University Lands, and Territorial University Lands. Territorial University Lands consisted of 72 sections granted to Minnesota by the United States in 1851 to support a university in the territory. The State of Minnesota in 1863 accepted 120,000 acres of land from the Federal Government for the establishment of a College of Agriculture.

Acquired Lands

The state has acquired additional lands through a variety of means for different purposes. Lands may be acquired from private landowners or other governmental units through fee purchase, gift, land exchange, transfer, county board resolution (50-50 land, 50% of income goes to counties), condemnation, Land Utilization Project acquisition, and several other methods. About 1.1 million acres of land have been acquired by the state as natural resource lands. This accounts for about 20 percent of the total of 5.3 million acres owned and administered by the state. Almost one half of all acquired lands are administered by the Division of Forestry.

From about 1860 to the 1930's the basic land policy of the counties, as dictated by the state, was to avoid land ownership. Permanent public ownership of land acquired by tax forfeiture was neither anticipated nor desired. Instead, state policy had been to prevent tax forfeiture and, when necessary, encourage redemption of tax delinquent lands by the original owners or the purchase of tax titles by others who might wish to acquire them. Public land disposal was viewed as essential to establishing a viable tax base from which counties could secure much needed operating revenue.

Following the massive tax forfeitures of the 1930s; however, and despite repeated attempts to return these lands to private ownership, Minnesota county governments found themselves as continuing custodians of large amounts of tax-forfeited lands.

State Forests

The 1899 Minnesota Legislature passed a law permitting the establishment and management of public forest reserves. A 1913 law changed the official designation from "forest reserve" to "state forest." The legislatures of 1917, 1927, 1931, 1933, 1935, and 1937 established new forests or added lands to existing forests. All laws relating to the establishment of state forests were combined in Chapter 89 of the Minnesota Statutes in 1943. The legislature thereby reestablished 29 state forests.

Nearly all legislatures since 1943 have passed legislation pertaining to state forest boundaries. Minnesota now has 57 state forests with over 3 million acres of forestry administered lands inside their boundaries. There are also private, county, federal, and other state agency administered lands within the state forest boundaries. The Division also administers about 1.5 million acres outside of state forests.

The first state forests to be established in the Park Rapids Area were White Earth and Badoura in 1931. Paul Bunyan and Smoky Hills were next in 1935. The last to be established were Two Inlets and Huntersville in 1963.

White Earth State Forest

The portion of the White Earth State Forest which lies in the Park Rapids Area is located in Northern Becker County and covers approximately 3.5 townships. This part of the forest lies entirely within the White Earth Indian Reservation, with the Elbow Lake Indian Village being the only settlement. Access to the area is by State Highway #113 and county roads.

The landscape is characterized by rolling hills, potholes, and many lakes. The rough terrain and rocky soils are not suited to agriculture so there has been little development. Extensive pine acres were logged in the early 1900s. The present timber types are primarily aspen and northern hardwoods, along with numerous pine and spruce plantations and other natural conifers.

Of a total of 85,760 acres within this part of the White Earth State Forest, 20,224 acres are State owned (20,030 acres administered by the Division of Forestry), 27,220 acres are County owned, and the remainder are private or owned by the White Earth Indian Reservation.

Badoura State Forest

The Badoura State Forest is located in the southeast corner of Hubbard County, approximately 8 miles south of Akeley via State Highway #64. The forest was established in 1931 and contains 15,360 acres within its boundaries, 4,401 acres or 29% of which is State owned. Much of the area is either privately owned or lowland which is primarily of value for wildlife. The dominant timber type is jack pine. The area has an extensive fire history; the most recent major fire occurring in 1976.

The Badoura Nursery is located within the forest boundaries, at the junction of State Highways #64 and #87.

Paul Bunyan State Forest

Paul Bunyan State Forest is located in Hubbard County about six miles north of Nevis and Akeley. The forest was established by the legislature in 1935 after 26,365 acres were acquired from the Red River Land Co. as a result of a tax abatement deal in 1934. In that same year 32,800 acres were received as gift. The final major addition involved the acquisition of 12,942 acres of tax forfeited land from Hubbard County. The 9,280 acre Paul Bunyan Game Refuge is located within the forest boundary.

Smoky Hills State Forest

The Smoky Hills State Forest is located in eastern Becker County and is crossed by State Highway #34. It is 20 miles east of Detroit Lakes and 10 miles west of Park Rapids.

The forest was established in 1935 to facilitate forest management and fire protection. There was an acquisition of 1000 acres of tax forfeited land from Becker County in 1944, followed by another 3,866 acres in 1948 and a final 6,043 acres in 1967. There are presently 24,160 acres within the state forest boundaries of which 14,429 acres or 60% are State owned.

Two Inlets State Forest

The Two Inlets State Forest is located in Becker County, approximately four miles north of Osage and Highway #34. Of a total of 25,960 acres, 12,885 are State owned (50%), 160 acres are Becker County tax forfeited, and the remainder is private. The landscape is gently rolling to hilly with scattered lowlands. Much of the forest was once farmed but then abandoned because the soils were not productive for agricultural purposes.

Huntersville State Forest

The portion of the Huntersville State Forest which lies in the Park Rapids Area is comprised of a single section (640 acres) of Trust Fund land. The majority of the forest lies within the Backus Area.

A severe fire burned approximately one third of the section in 1976. Pine has been planted where natural regeneration did not occur following the fire, and is the dominant cover type in the area.

County Land Ownership Policies

The majority of "county land" is actually state-owned, tax-forfeited land administered by the counties. While basic policies for administration and management of tax-forfeited lands are determined by the state legislature, policy application through direct administration and management of these lands has been granted to the counties. In the absence of any grants from either the federal or state governments and with limited means to acquire lands by purchase, tax forfeiture became a primary means for counties to acquire lands. Over 99 percent of Minnesota's county administered land was originally acquired from private landowners who forfeited land to the state.

Tax-forfeited lands were forfeited to the state through non-payments of taxes and to which the state holds title and is impressed with a trust in favor of counties and local taxing districts. This means that proceeds from the management of these lands are returned to the local taxing districts. While title to the land is held by the state, administrative control and policy setting for these lands is shared by the state legislature and, most directly, by the counties. Table 9 shows the amount of land administered in the area by the counties.

Until recently, it was the general policy of this state to encourage return of tax-forfeited lands to private ownership through sale. State law sets forth guidelines for the classification and sale of tax-forfeited lands, provides for establishment of "memorial forests", and review of tax-forfeited land

sales by the Commissioner of Natural Resources. A new statement of tax-forfeited land policy was contained in the Forest Resource Management Act passed by the 1982 state legislature. This new legislation declares that: "It is the policy of this state to encourage the best use of tax-forfeited lands, recognizing that some lands in public ownership should be retained and managed for public benefits while other lands should be returned to private ownership."

Table 9. County Administered Lands in the Park Rapids Area.

County	Memorial Forest	Outside of Memorial Forest
Becker	46,856	14,294
Clay		80
Hubbard	6,095	30,396
Otter Tail		336

PROGRAM DIRECTION

Area-wide

The goal of the Division of Forestry's land administration program is to maintain a state forest land ownership pattern that will provide for efficient multiple-use management of forest resources. The achievement of this goal will require not only an integrated effort among all administrative units of the division, but a close working relationship with the DNR Land Bureau, other DNR divisions, the U.S. Forest Service, other public land agencies, the state legislature, and the private sector.

The Forest Resource Management Act of 1982 also called for an assessment of state forest boundaries to determine if lands currently in state forests were suited for long-term forest management, or if there were additional lands that might be given state forest status. Section 8 of the Forest Resource Management Act of 1982 (1982 Minn. Laws, Chapter 511) directed the Commissioner of Natural Resources to propose a realignment of the boundaries of state forest, including consolidation or creation of state forests and adjustments of boundaries of existing state forests, based on the long-term suitability of lands for use and management for forestry purposes.

In the process of developing this plan, all land administered by the Division of Forestry in the Park Rapids Area was evaluated for its resource management potential. Recommendations have been made for future management. Resources such as wildlife, recreation and wilderness were considered along with timber. Recommendations for land adjustments have received considerable review by members of the Interdisciplinary Planning Team as well as other resource specialists in the DNR.

The Park Rapids Area was evaluated for additional potential Scientific and Natural Areas but no additional sites were identified for designation at this time. Existing SNAs in the area have been listed in the Natural Heritage Appendix.

The Park Rapids Area is well developed and roaded and therefore not suitable for consideration for Wilderness Area Designations (see MINNESOTA STATE WILDERNESS AREAS WITHIN DNR ADMINISTERED LANDS, DNR Commissioners Guideline No. 2).

Smaller tracts of forest land can be designated as Administrative and Scattered State Forest land.

Much of the land is in consolidated blocks administered by a single agency, such as State Parks or Wildlife Management Areas. However, there are interruptions of ownership within statutory boundaries of State Forests, County Memorial Forests, State Parks, and Wildlife Management Areas, etc. Scattered parcels within these areas either privately owned or controlled by another agency often presents problems in managing the entire unit as desired.

It is much easier and more effective to maintain a presence that will protect state lands from encroachment, trespass and incompatible land uses when the length of boundary is minimized in relation to the acreage managed. As an example, four scattered 40 acre tracts in a single section of land have four miles of boundary. If that entire section (640 acres) were under one administrator, there would still be only four miles of boundary, but that boundary would encompass four times the acreage of the isolated 40 acre tracts. From a budget basis, this is important when considering engineering and administrative costs, as well as for providing access.

It is more cost effective to manage larger tracts in close proximity to one another. Professional time is better utilized in coordinating activities in such an area, and management costs are reduced because of economies of scale. For example, bids for project work are usually lower when a contractor can minimize travel distances by treating several sites within the same localized area. In addition, timber sale success and revenues are increased when larger tracts are available for harvesting in one place because of the increasingly mechanized nature of the timber harvesting operation.

In addition, many parcels of publicly administered lands are scattered small ownerships that are inefficient to manage or inaccessible (land-locked by private lands). Some lands could be more efficiently managed by another agency which controls the larger share of land in the area, or is closest to it.

Intermingled ownerships present problems of trespass, especially on public lands adjoining privately owned woodlands or agricultural lands. Some public lands although controlled by public land management agencies, may be better suited to private ownership for agriculture, commercial, or even residential use.

To achieve the goal of managing the public lands in the most efficient and effective manner, all public land administrators need to work together to develop a plan of action. Consolidation will be achieved through a program of land exchange, transfer of administrative control within DNR, land acquisition, and in some cases the sale of certain public lands. In addition, more effort should be directed toward the acquisition of desirable lands by gift. Many private landowners, properly approached, may wish to have a public agency carry on their work of good stewardship. Others are interested in the gift program for its tax advantages.

Where DNR-administered lands outside of designated management units have potential for management for specific resource purposes and could be established as management units or used to increase management units, internal transfers of administrative control may take place.

Internal transfers of administrative control involving trust fund lands require specific recognition of the purpose for which these lands are dedicated. The proceeds from the state school trust lands are dedicated to the permanent school fund. When a transfer is proposed which precludes the purposes for which these lands are dedicated, compensation and payment to the trust shall be required upon completion of the transfer of administrative control. (Procedures for the Internal Transfers of Administrative Control - DNR Commissioner's Guideline No 17.)

Where funding to satisfy the trust is a problem,the trust status may be transferred to lands that do not have trust status.

Land exchange is an important management tool available to the division. It is a mechanism by which state, federal, and private landowners may rearrange, through exchange, certain ownership interests in real estate for purposes not limited or prohibited by the Minnesota Constitution or statute. It has been used only on a limited basis because of statutory and other conflicts. However, a recent State Constitutional Amendment now may allow land exchanges between the State and the Counties.

All lands identified in this plan to be acquired by exchange are tentative recommendations that are dependent on the willingness of the exchange partner (mostly Counties) to proceed. Efforts will be made to identify lands that.County Land Departments think have some potential for exchange. All exchanges of land require a lengthy administrative and legal procedure (see LAND EXCHANGES, TITLE TRANSFERS... Commissioner's Guidelines No. 16). The requirement that the State receive a clear title to lands acquired in exchange will cause a delay and in some cases prevent exchanges with the counties.

Acquisition efforts will be selective and aimed primarily at consolidation of forest management units. It is expected that land acquisition will continue on a case by case basis for specific purposes such as consolidation, improvement of manage-management efficiency, protection of key forest resources, and maintenance of an adequate public forest resource base to provide for multiple-use forest requirements.

Over the past five years, there have been five excellent opportunities to acquire desirable lands from willing sellers, and to consolidate ownership within the State forests. Due to the lack of acquisition funds and ability to move quickly, these opportunities were lost. However, a special revolving account is now in place within the DNR for land acquisition. Receipts from the sale of other lands may be used to purchase desirable lands.

Sale of state forest land will be undertaken in some cases where a determination has been made that the land is not needed for forest management purposes and serves no other state purpose.

The Division has leased some lands, primarily for special purposes such as location of field offices, fire towers, air tanker bases, or other special facilities. The Division has also leased state forest land for agricultural, commercial, or other suitable purposes. The major leasing program involves lake shore leases. Lake shore lots on state forest lands are leased to private individuals for seasonal recreational use.

All lands lying outside state forest boundaries have been examined for their potential for non-ferrous minerals and sand or gravel. All mineral potential tracts are to be retained to enhance the exploration and extraction possibility on those minerals. The tracts that have sand or gravel potential need further study and/or exploration before they can be considered for exchange or sale.

Natural heritage elements have been identified on two tracts. They have also been identified as having potential for county exchange. Before proceeding with this exchange, the vegetation needs to be inventoried and evaluated to determine if it needs the special protection provided for heritage elements. Exchange of these tracts is possible, if Becker County would continue to protect the heritage elements.

The Division of Fish and Wildlife evaluated all tracts for sale and exchange for wildlife management considerations. Some adjustments have been made, and their concerns for protected wetlands and protected waters have been noted in the Appendix - Land Administration Proposals. No formal land exchanges with the counties will be initiated (on lands containing protected waters and wetlands) until a legal review of these exchanges is completed by the Attorney General.

Deer yarding areas have also been identified and the concern noted. These sites will be exchange for lands having an equal potential for deer yarding in order to ensure the concerns are addressed. Wildlife personnel will also work closely with the counties to ensure proper management of these deer yards.

Work has begun on a proposal to exchange lands with Potlatch Corporation. The lands proposed for exchange with private industry are included in this proposal.

The county lands proposed for exchange to the State are subject to county review and approval. The counties may wish to retain some lands for various reasons, and offer other tracts for exchange. All exchanges must be on a fairly equal basis and must also address wetlands, protected waters and wildlife needs. In order to accomplish this a large list is needed to have the flexibility to reach the objectives of all concerned parties.

Please refer to the Appendix - Land Administration Proposals for specific details.

PROGRAM OBJECTIVES AND TARGETS

Table 10. Land Administration - Park Rapids Area Staffing and Objectives, FY 85 and Projections for FY 87, 91 & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
Staffing					
1. Area	fte	0.2	0.4	0.7	0.2
Objectives					
Leases and Permits					
1. Administer leases	leases	216	216	182	182
2. Process special use permits	permits	2	3	5	6
Acquisition, Sale, Exchange					
1. Propose or review exchanges	acres	-	160	1163	800
2. Propose or review sales	acres	-	20	-	-
3. Acquire rights-of-way	miles	-	-	-	-
4. Other acquisitions	acres	-	200	400	-
5. Transfer admin. control	acres	-	0	1256	-
6. Transfer trust status	acres	-	200	273	-
7. State Forest boundary changes	proposals	-	-	5	1

Resource Management Units

RMU1

The total area of state land administered by DNR in this unit is 19,075 acres. The acres by administrator is as follows:

State Land by DNR Administrator

Administrator	Acres
Forestry	980
Wildlife	16786
Waters & Minerals	207
Fisheries	53
Trails & Waterways	20
Parks	1029

The Division of Forestry administered land is made up of scattered parcels that are all outside state forest boundaries. This land is mostly in the northern portion of the unit.

The Section of Wildlife administered lands are located primarily in small Wildlife Management Areas throughout this unit. These WMAs are managed primarily for waterfowl, upland game birds, and white tailed deer, with furbearers and nongame species receiving secondary benefits.

The land administered by the section of Fisheries is made up of administrative sites and fish rearing ponds. Fisheries also administers a number of public access sites which make up a significant portion of this acreage.

The lands administered by the Trails and Waterways Unit are mainly public access sites.

The largest portion of Division of Parks administered land is located in Buffalo River State Park located east of Glyndon, in the northern portion of the unit.

Management Strategy

The land management opportunities could be enhanced by transferring Forestry administered lands to, or, receiving land from other divisions. The goals of these transfers would be to consolidate ownership and to increase administrative efficiency for resource management.

Many isolated parcels of the Forestry administered lands are located adjacent to Wildlife Management Areas, and in many cases they are primarily covered with native grasses and shrubs. Where appropriate, these lands are very beneficial to wildlife needs and should be managed as such.

The lands that are not suitable for wildlife or other forest resource management should be sold. The proceeds of these sales should be used to acquire lands within state forests.

The State should continue to lease lands for agriculture, gravel removal, and utility crossings. All leases must consider impacts and benefits to wildlife, especially endangered species.

Specific Proposals

There are 22 tracts which have been identified as being most suitable for wildlife management that are adjacent to Wildlife Management Areas. These amount to 520 acres in Clay County, 319 acres in Becker County, and 40 acres in traverse.

One twenty acre tract in Otter Tail County has been recommended to be sold. One 40 acre parcel in Traverse County is recommended to be transferred to the section of wildlife.

RMU2

The total area of state land administered by DNR in this unit is 17,554 acres. The acres by administrator is as follows:

State Land by DNR Administrator

Administrator	Acres
Forestry	1648
Wildlife	6355
Fisheries	421
Parks	8996
Trails & Waterways	134

With the exception of land administered by the Division of Parks and Recreation, land administered by other DNR divisions are similar to those described in RMU1.

The largest portion of Division of Parks administered lands is in Maplewood State Park located north of Fergus Falls and in the center of this unit. Another smaller portion is located in Lake Carlos State Park on the north shore of Lake Carlos near Alexandria.

Management Strategy

Same as RMU1.

Specific Proposals

There have been 2 tracts recommended for exchange to Becker County. They cover 180 acres and lie in areas where the county is very active in their forest management.

Seventeen tracts have been recommended for transfer to the Section of Wildlife. These tracts encompass 523 acres in Becker County, 44 acres in Ottertail County, 78 acres in Clay County and 40 acres in Douglas County.

Thirteen tracts have been recommended for transfer of administrative control to the Section of Fisheries. These tracts encompass 360 acres in Otter Tail County, 80 in Douglas Co. and one acre in Becker Co. They are flooded tracts of land and present an excellent opportunity for development as a spawning areas for northern pike and pan fish.

One 9 acre tract is located adjacent to Maplewood State Park and could be used as an access to North Long Lake. The future status of this tract is uncertain at this time.

RMU3

The total area of state land administered by DNR in this unit is 7,244 acres. The acres by administrator is as follows:

State Land by DNR Administrator

Administrator	Acres
Forestry	1,162
Waters & Minerals	220
Wildlife	3,763
Fisheries	743
Trails & Waterways	91
Parks & Recreation	1,292

The Division of Forestry administers 1,162 acres. These lands are scattered and are outside state forest boundaries. Some are leased for agriculture with the rest managed for forestry purposes.

The Section of Wildlife administered lands are spread out in 142 different Wildlife Management Areas. These units are managed for waterfowl production with a secondary use for fur bearers and upland game.

Glacial Lakes State Park lies within this unit, located in central Pope County, four miles south of Starbuck. The park is characterized by the rolling prairie hills of the Alexandria moraine complex. The diversity of prairie, wetlands, and oak woods provide excellent habitat for a variety of wildlife species.

Section of Fisheries administered land is used mainly for spawning areas, rough fish traps, boat accesses, and administrative sites.

The remaining land is administered by the Trails and Waterways Unit, Division of Waters, and Division of Minerals. These parcels are used mainly for boat accesses, trails, ditches, and water control structures.

Management Strategy

Same as RMU1

Specific Proposals

Due to the numerous Wildlife Management Areas, many Forestry administered tracts lie inside or adjacent to WMAs. Sixteen tracts have been identified that should be transferred to the Section of Wildlife. The lands are located as follows: 40 acres in Becker County, 317.7 acres in Otter Tail County, and 200.2 acres in Pope County.

Glacial Lakes State Park has a tract of trust fund land within its boundary. The tract of 35.25 acres should be transferred to Parks administrative control.

Five small tracts have been identified for transfer to fisheries. All five are located in Ottertail County and amount to 9.13 acres.

RMU4

The total area of State land administered by the DNR in this Unit is 7,598 acres. The acres by administrator is as follows:

State Land by DNR Administrator

Administrator	Acres
Forestry	2725
Wildlife	4838
Fisheries	26
Trails & Waterways	9

The Division of Forestry administered land is made up of scattered parcels of land that are all outside state forest boundaries. Of this land, 54% is located in the northern one-fourth of the unit. The rest of the tracts are scattered throughout the southern three-fourths of the unit.

The Section of Fisheries administers two tracts for northern pike spawning areas and rearing ponds.

Lands administered by other DNR divisions are similar to those described in RMU1.

Management Strategy

The Division of Forestry land in the southern portion of this unit has been examined for transfer to the Section of Wildlife. Land exchange possibilities also exist with Becker County that could be mutually beneficial. A special effort has been made to identify tracts that would consolidate ownership for both the DNR and Becker County.

There are few leases in this unit. The leases in this unit should be examined individually to determine if the lease should be maintained or the land declared as surplus. Surplus lands should be disposed of through public auction.

Specific Proposals

This unit has good potential for land exchanges with Becker County. Two tracts have been identified for exchange to Becker County. These include 77.37 acres and are located in the south central part of the county. Twenty-eight tracts in the southeastern portion of the county have been identified as desirable for acquisition from Becker County through exchange, they include 1155 acres. There will be more Forestry administered tracts for exchange to Becker county proposed in RMU6.

Two tracts consisting of a total of 80.00 acres have been identified to transfer to the Section of Fisheries.

In Becker County, nine tracts have been identified to be declared as surplus lands. They account for 360 acres, and should be sold at public auction.

In Otter Tail County and Becker County, 24 tracts have been identified as having potential for transfer to the Section of Wildlife. They account for 966.86 acres.

RMU5

The total area of State land administered by the Department of Natural Resources in this Unit is 11,811 acres. The acres by administrator is as follows:

State Land by DNR Administrator

Administrator	Acres
Forestry	7764
Wildlife	3357
Fisheries	466
Trails & Waterways	224

The Division of Forestry administered land is located in the Badoura State Forest with 5,095 acres, and outside State forest with 2,669 acres. These lands are mostly forested and capable of producing forest products. There are also leases on some of these lands. There are 39 lakeshore homesites, 1 agricultural lease, 2 cartway leases, and a small number of powerline, road, pipeline leases and licenses which cross into other resource management units.

The Section of Wildlife administered lands are located on the Crow Wing Chain and the Lowe Wildlife Management Areas. The Crow Wing has 97% of the wildlife acreage in this unit. The primary management on these WMAs is for deer, bear, upland game and waterfowl production. Although not targeted, nongame species benefit greatly from the management of these areas.

The Section of Fisheries administered land is in small scattered parcels. Their primary purpose is for northern pike spawning areas, water retention for flood control, rearing ponds and administrative sites. The Fisheries Division has a fish hatchery on their administrative site with rearing ponds.

The Trails and Waterways administers 21 sites which are used primarily for public water accesses. They also administer 62 tracts of land that comprise the Heartland Trail. The maintenance is handled by the Trails and Waterways personnel at Nevis.

Management Strategy

The land management opportunities could be enhanced by transferring forestry administered lands to other divisions.

Land exchange possibilities also exist with Hubbard and Becker Counties that could benefit both the Counties and the Department. Specific parcels have been identified which will be evaluated by both parties before a land exchange proposal is made.

The State should continue to lease lands where the land use does not conflict with the management goals for that land. The lease should generate a fair return to the State, while practicing proper land use. The leasing of lakeshore should be examined on a lake by lake basis and retention or disposal of the lease determined due to the 1986 legislation allowing sale of lakeshore lease sites.

Efforts to consolidate land ownership is a continuing program. Many opportunities exist to consolidate ownership in the Badoura State Forest. Many parcels of land outside state forests in this unit have been examined for the potential of exchanging these lands for lands inside the Badoura State Forest. Two large land administrators with good potential for exchanges are Hubbard County and Potlatch Corporation.

Specific Proposals

This unit has many opportunities for land exchange. There are 6 tracts of 40 acres each have been identified to exchange to Potlatch Corporation. More exchanges with Potlatch can be possible if they identify more lands they wish to exchange.

In Hubbard County, 20 tracts have been identified to exchange with the County. They account for 800 acres and would assist in consolidating their ownership.

There is one 40 acre tract in Hubbard County that should be sold or exchanged if possible with private parties. The local farmers have land adjacent or control the access to this land, and some have expressed interest in purchasing the land in past years.

In southwestern Hubbard County 3 tracts have been examined and found to have benefit for wildlife management. These tracts which amount to 116 acres are near the Lowe Wildlife Management Area and should be transferred to the Section of Wildlife.

Two tracts should be transferred to the Section of Fisheries or to the Trails and Waterways Unit. One of these is on the Shell River and the other on Fifth Crow Wing Lake. Both could be used for public access sites for fishing and waterfowl hunting.

In southeastern Becker County, the Becker County Land Department administers numerous scattered parcels of land that have State land interspersed with them. An exchange of their lands closer to Park Rapids for Forestry administered lands closer to Detroit Lakes where they have a high percentage of ownership would be very beneficial for both land administrators. Forty-four tracts of County land have been identified to be acquired through exchange. These lands amount to 1729.53 acres.

RMU6

The total area of state land administered by the DNR in this unit is 45,575 acres. The acres by administrator is as follows:

State Land by DNR Administrator

Administrator	Acres
Forestry	41,776
Wildlife	2,720
Fisheries	263
Parks	775
Trails & Waterways	40

The Division of Forestry administered land is located primarily in three state forests. These are the White Earth, Smoky Hills, and the Two Inlets State Forests, the acreage of each indicated in the table below. The rest of the Forestry administered land is made up of 6,350 acres of scattered tracts that are outside the state forests.

State Forest	
White Earth	8112 ac.
Smoky Hills	14429 ac.
Two Inlets	12885 ac.
	35426 ac.

The Section of Wildlife administered lands are all located in Wildlife Management Areas. There are a few small WMAs but the largest and most significant is Hubbel Pond Wildlife Management Area. Hubbel Pond is a very large WMA located between Cotton and Height of Land lakes in Becker County. The WMAs are managed to benefit waterfowl, upland gamebirds, deer and fur bearers with nongame species receiving a secondary benefit.

The Section of Fisheries lands are used for rearing ponds and access to lakes.

The Trails and Waterways Unit administers public accesses and recreational trails. The 18 sites they administer are used for recreational purposes.

This Unit also contains the Tamarac National Wildlife Refuge, scattered U.S. Fish and Wildlife Service Wetlands, scattered BIA land, and both scattered and contiguous blocks of Becker County Tax Forfeit lands.

Management Strategy

The land management opportunities could be enhanced by transferring Forestry administered lands with other divisions. Exchanges with Becker County that would be mutually beneficial.

The lands that have low value for wildlife management or forest management should be sold.

The State should continue to lease suitable lands that are to be retained for agriculture, gravel removal, and utility crossings. These leases have a low administrative cost verses the return, and allow for the highest and best use of the land.

Specific Proposals

This unit provides the greatest opportunity for exchanging lands with Becker County. The following table shows the recommended exchanges, transfers, and acquisitions.

Table 11. Land Recommendations RMU 6.

Administrator	No. Tracts	No. Acres	Disposal Method to Agency
Forestry	27	1006	Exchange with Becker Co.
Forestry	5	172	Transfer to Section of Wildlife
Forestry	1	15	Transfer to Section of Fisheries
Becker County	62	2465	Acquire by Exchange

In implementing this plan each tract will have to be field evaluated, appraised and proposed for disposal. The recommendations are not static but will be finalized through negotiation.

RMU7

The total area of land in this unit is small with only 2% of the 5.7 million acres in the Park Rapids Area. Public ownership is high. Forty percent of the Park Rapids Area's Forestry administered land is located in this unit. Only 39% of the land is in private ownership (Table 2).

The total area of State land administered in this unit is 46,298 acres. Unlike other units, the Division of Forestry administers most of the land as the Paul Bunyan State Forest is in this unit. The acres by administrator is as follows:

State Land by DNR Administrator

Administrator	Acres
Forestry	46,188
Wildlife	None
Fisheries	None
Enforcement	5
Trails and Waterways	100
Public Access	4

Most of the Division of Forestry administered land is concentrated as a solid block inside the Paul Bunyan State Forest. Only 3% of the total State ownership is located outside the state forest. State forest lands are located in Steamboat and Thorpe Townships and the north areas of Mantrap and Akeley Townships. Hubbard County has a high concentration of ownership in Clay and Arago Townships. They also have a substantial ownership of scattered lands in the Paul Bunyan State Forest (1084 acres).

While there are no Wildlife Management Areas in this unit, wildlife management for deer, grouse and nongame species is a major activity on Forestry administered lands.

The Section of Fisheries uses ponds on Division of Forestry administered lands for raising walleye fry to a larger size for stocking in area lakes.

The lands administered by the Trails and Waterways Unit consist of 4 public accesses on 9 acres of land. The remaining 5 DNR public accesses are administered by the Division of Forestry. The 100 acres administered by Trails and Waterways is the Heartland Trail. One picnic and camping area is located in Akeley, this is also directly supervised by the Trails and Waterways Unit.

Management Strategy

The land management opportunities could be enhanced by exchanging Division of Forestry administered lands with Hubbard County that could benefit both the County and the DNR. Specific parcels have been identified that will be discussed as possible opportunities before the land exchange proposal is made.

As there are several isolated private parcels in the Paul Bunyan State Forest, efforts should be made to exchange these parcels for more accessible scattered State parcels outside the state forest. Scattered parcels are costly to manage and often difficult to identify boundaries and enforce against trespass. Travel time and costs are higher. Access to these isolated parcels is often difficult.

DNR should continue to lease lands for agriculture, gravel removal, utility crossings and lakeshore leases. They have a low administrative cost versus the return and are identified as the highest and best use of the land.

This unit has 2 active hunting cabin leases that should be eliminated as they expire. The hunting cabin leases have been in disrepair, and are becoming "eye sores" in the forest.

Of the 1,784 State lakeshore leases, 68 are located in this unit. Before 1975, lease rates ranged between $75.00 to $175.00 per year. In the next three years, lease rates will increase by 1/3 increments each year to annual rates ranging from of $224 to $570 per year.

Specific Proposals

There have been 15 tracts identified outside the Paul Bunyan State Forest that could be exchanged with Hubbard County. These 640 acres would be combined with land in RMU 5 to make approximately 1360 acres that would be useful to Hubbard County to consolidate their ownership. These tracts will be evaluated and prioritized in order to complete the land exchange.

Seven tracts of 280 acres have been identified to be exchanged with private industrial landowners. The principal party would be Potlatch Corporation.

Of the land administered by Hubbard County, 60 tracts lie inside or adjacent to the Paul Bunyan State forest. This land totals 2348 acres and is a highly desirable acquisition in order to consolidate ownerships. These tracts would also need to be prioritized by both State and County personnel to facilitate the exchange. This would be a continuing process, which may take many years to accomplish.

Of the 5,250 acres of private land inside the Paul Bunyan State Forest, only a small acreage would be desired and might be a mutual advantage to both State and private parties involved. There is only one 280 acre block of private land in Section 18 of Steamboat Township, that had an owner that wanted to sell to the State. It is possible that a future years some private owners of land in the Paul Bunyan State Forest may wish to sell or exchange their lands.

FOREST RECREATION ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

Introduction

There are 117,000 acres of Division of Forestry administered land in the Park Rapids Area. Most of these lands are located in the Paul Bunyan, Two Inlets, Smoky Hills, White Earth and Badoura state forests in Hubbard and Becker counties. Recreation is recognized as an appropriate use of state forest land under the definition of "forest resources" in the Forest Resource Management Act of 1982 (Laws of Minnesota, Chapter 511, subd. 8). The definition reads:

> Forest Resources means those 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, soils and educational, aesthetic and historical values.

The goal of the Division of Forestry Recreation Management Program is:

> To fulfill the outdoor recreation potential of Minnesota state forest lands by providing developed recreation areas and opportunities for dispersed recreation activities that are compatible with other forest uses and recreation facilities.

The goal, as stated above, is consistent with the forest management philosophy of multiple-use. When developed, facilities on state forest lands should provide opportunities for contact with nature and require a minimum level of development and management. These policies generally limit state forest recreation areas to primitive campgrounds, day use areas and recreational trails. In addition, recreational activities that do not require developed facilities, such as hunting, berry picking, bird watching, nature photography and other types of dispersed recreation, are quite popular and encouraged in state forests.

Tourism Planning and Development

Planning for recreational development on public lands is one of the first steps in increasing the long term development of the recreation/tourism sector. Much of the recreational land base in the major recreation destination areas, such as Park Rapids, is owned by different levels of government. Planning for the long term management and use of these public lands and waters is important to ensure continued growth and investment by the private tourism industry.

Conserving and Protecting Natural Resources for Recreation

Keeping existing recreation facilities in top condition with adequate funding and maintenance, ensures opportunities for future generations. Frequently recreation facilities lost to

disrepair can never be replaced or repaired. In extreme cases lands suitable for public recreation are sold or never purchased and are forever lost because they are often developed for other uses. To foster public understanding of conservation measures, the DNR should continue to develop interpretive materials and programs designed to engender a feeling of stewardship toward natural resources that used for recreation. Adequate maintenance and redevelopment budgets are a must.

Recreation Demand

Statewide Demand

Perhaps the most important factor to consider when assessing a facility or potential facility in Minnesota is the quality of the resource. The resource can be natural or man-made. However, most of the facilities in Minnesota have been developed around the State's outstanding natural resources. In addition to the quality of the resource, other factors such as the accessibility of the facility to the population and the numbers of people who participate in the activity should be considered when assessing a facility. The State Comprehensive Outdoor Recreation Plan (SCORP) participation surveys indicate that Minnesotans demand for summer recreation is greater than for winter recreation but participation in winter activities is growing at a faster rate. Swimming and bicycling are by far the most popular summer activities followed by fishing and boating. Other popular summer activities include picnicking, hiking and camping. Snowmobiling and ice skating are the most popular winter activities followed by ice fishing and cross country skiing. Statewide, participation in these activities ranged from about 3.5 to 13.5 million occasions per year except for swimming, 23 million, and bicycling, 54 million.

Participation in all the most popular activities is expected to increase between now and 1995. Large projected increases do not always mean that new facilities must be constructed. In many cases facilities go unused because of the lack of adequate knowledge of their availability for public use or the lack of adequate development or maintenance. Also, some adequate facilities are located in out of the way places, and use is limited by inadequate access or information. Therefore, there is a need to carefully document all the relevant factors affecting demand when assessing an existing or proposed facility.

Northwestern Minnesota Demand

Recreation activities or occurrences in northwestern Minnesota are concentrated in several areas. Recreational use statistics compiled by the DNR Office of Planning show that 65% of the recreational occasions occurring in the Bemidji DNR Region took place in the Park Rapids Forestry Area. The majority of this activity is located in the areas of concentrated lakes around Park Rapids, Detroit Lakes, Alexandria, and central Otter Tail County. Statistics for hunting were not broken down by forestry area but the demand areas maps included in the 1985 SCORP show that upland game and big game hunting is concentrated in the

forested areas around Park Rapids, Perham and Alexandria. Waterfowl hunting is concentrated in the west central prairie pothole region.

The most popular activities in the Park Rapids Area were water related. Swimming, fishing and boating all have weekly activity occasions of over 150,000. Camping, an activity frequently associated with water related recreation, is the next most popular activity with over 80,000 occasions occurring weekly. Snowmobiling is the only other activity with average weekly activity occasions of more than 50,000. Other activities would also have higher weekly averages during peak seasons.

Figures for popular activities like hunting and off road vehicle use cannot be calculated in a similar fashion at the current time. Figures for hunting were not calculated on an area basis. The region totals indicate that during the hunting season, hunting would be the major activity in the area with over 50,000 weekly activity occasions in some areas. Off road vehicle use has not been documented in such a fashion; however, sales of new vehicles and observation by resource managers indicate that their use is significant and will continue to increase in the near future.

All surveyed recreational activities in the Park Rapids Area are expected to increase between now and 1995. Increases of over 10% were noted for summer fishing, boating, camping, picnicking, hiking, canoeing and nature study. Nature study is expected to increase at the fastest rate, over 25%. All types of hunting are also expected to increase.

In general growth will occur in the areas in which activities are already taking place, barring the development of any new facilities with the capability of capturing a significant portion of the market. In most cases existing facilities will be able to accommodate most of the projected increase in use. These existing facilities need to be carefully analyzed to ensure that they will be capable of accommodating additional use and that they are desirable facilities that people will continue to use if use increases. The opportunity exists in some cases to increase utilization of a facility by increasing the publics awareness of the facility or by upgrading or simply repairing an outdated facility.

Supply Of Recreation Resources

Private Facilities

Private facilities play an important role in serving recreational needs in the Park Rapids Area. Compared to the public sector, the private sector provides more capital intensive, service oriented facilities ranging from overnight lodging in resorts to outfitting people for all types of outdoor experiences. Some facilities provide on site recreational experiences, using the north woods setting for a background, while others rely heavily on nearby public lands and facilities to attract users.

Private resorts, campgrounds, water accesses, outfitters, and other private facilities and services have a direct effect on Minnesota's public lands and waters by providing access and complimentary facilities. SCORP, 1985 Draft, shows one of the highest concentrations in the State for resorts and other recreation facilities to be around the public land and water areas in the Park Rapids Area. By far, the majority of other recreation facilities such as campgrounds, accesses, marinas and beaches, are privately owned and managed. In addition to the private recreation facilities, many local businesses rely heavily on tourist/travel expenditures.

DNR Managed Facilities

The Department of Natural Resources manages many types of recreation facilities ranging from state forests, which may contain several thousand acres of public land, to state trails which provide a variety of recreational opportunities. The several types of state managed areas include state forests, state parks, state trails, public water access sites, scientific and natural areas, canoe and boating routes, wild and scenic rivers, wildlife management areas and state trout lakes and streams.

Other Public Facilities

There are many other public recreation facilities in the Park Rapids Area that are managed by federal, county and local governments. Most of the federal facilities are wildlife related and are in the non forested part of the area. Most of the county managed facilities are public water accesses. Municipal facilities usually include a variety of facilities within city parks. In general, these types of public recreation facilities offer opportunities that compliment other facilities in the outdoor recreation system and increase attractiveness to tourists.

Conclusions

There is an abundance of outdoor recreation opportunities in the Park Rapids Area. This is primarily due to the abundance of natural resources that are suitable for recreation. With few exceptions these resources have already been developed as resorts or private lake shore homes or cabins. Over the years, state forest lands have proved to be very suitable for dispersed recreation activities, the most popular of which are hunting and snowmobiling. These activities attract many visitors to the area in the fall and winter but their numbers are small when compared to summer recreation activity in the area.

Opportunities for additional development in the area exist on both public and private land should the need arise. Opportunities for increased dispersed recreation opportunities exist through better promotion. Hunting and fishing opportunities can be expanded with increased habitat management and stocking.

PROGRAM DIRECTION

Area-wide

The Park Rapids Area recreation program maintains several high quality recreation facilities. In addition much of the 117,000 acres of state forest land is accessible for dispersed recreational use. These state lands and facilities in combination with the many lakes and other public and private recreation facilities in the area make Park Rapids area one of the most popular recreation destinations in the state. The Division of Forestry has the opportunity to improve the quality of the Park Rapids Area recreation experience by continuing to rehabilitate and properly maintain developed state forest recreation facilities, roads and trails. Forestry can also improve opportunities for dispersed recreation by increasing efforts to provide information and education on forest lands and maps that show location of and access to state forest lands. Cooperating with other public and private recreation providers for all these efforts will help to ensure that user needs are being met. Continuing these efforts on an ongoing basis will provide a diverse and well planned outdoor recreation system in the future.

Facilities which enhance dispersed recreation opportunities such as well maintained roads, trails, water accesses, signs, picnic areas and other points of interest should be emphasized. An informative user map of the area suitable for dispersed recreational use should be a high priority as well as an adequate maintenance and rehabilitation budget.

Expanding the amount of recreation facilities in the area is not recommended at this time because users are being adequately served by forestry facilities and the other public, grant-in-aid, and private facilities available in the area. Demand for additional facilities that could be developed in state forests is limited by the location of the lands and competition from other recreation facilities. The desire of the Division of Forestry to complement other providers of recreation facilities is also a factor in determining what type of recreation is appropriate. Should the need arise in the future for more facilities there are opportunities for additional public or leased private development. Table 12 is a summary of rehabilitation needs for existing developments.

Table 12. Recreation Capital Improvements, Year Funding Requested, and Estimated Costs by Funding Source.

Project	Year Funding Requested	Costs
FORESTRY FUNDED PROJECTS		
Hungry Man Campground		
water supply	1988	$ 2,000
vault toilets	1988	12,000
Cedar Lake		
vault toilets	1988	6,000
Mantrap Campground		
rehabilitate	1987	20,000
Subtotal		$40,000
TRAILS AND WATERWAYS FUNDED PROJECTS		
Indian Creek		
construct alternate trail	1989	$ 2,000
Mantrap Lake		
rehabilitate access	1987	3,000
Reroute trails off forest roads	1997	15,000
Little Sand Lake Access		
rehabilitate	1987	2,000
Middle Crooked Lake		
develop new access	1990	10,000
Subtotal		$32,000
		$72,000

- Staffing

At the present time the workload and staffing levels in the Park Rapids Forestry Area limit the Division's ability to manage for recreation. Limited staff for the recreation program is expected to continue to be a problem in the future. Future evaluation of Forestry's operations in Region I may indicate the need to shift personnel to areas such as Park Rapids, which have greater recreation workloads. Either way the Division of Forestry needs to concentrate its recreation efforts in targeted areas to best satisfy user needs.

PROGRAM OBJECTIVES AND TARGETS

Table 13. Forest Recreation - Park Rapids Area Staffing and Objectives, FY 85 and Projections for FY 87, 91 & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
Staffing					
1. Area	fte	0.7	0.9	0.9	0.5
Objectives					
Development/Rehabilitate.					
1. Development/rehabilitate as outlined in sub-area plan					
- campgrounds	campgrounds		1	1	
- day-use areas	areas			1	
- water accesses	water accesses		1	1	0
- trails	miles		6.7	6	-
Operations/Maintenance.	fte		0.5	0.5	0.5
1. Operate & maintain facilities					
- campgrounds	number		2	2	2
- day-use areas	number		2	2	2
- water accesses (Contract Maintenance)	number		3	6	6
- trails (Contract)	number		7	7	7
- canoe routes	number		0	0	0
- water accesses (Forestry Maintenance)	number		3	0	0
Interpretation/Info.					
1. Develop & distribute recreation user maps	maps		1		

- Off Road Vehicles

Use of off road vehicles on state forest roads and multi-purpose trails will continue to be permitted unless problems with their use occur. Forestry administered lands are open for use by recreational motor vehicles and may be temporarily posted closed for any or all such uses when they are causing or are likely to cause; significant damage to state property; conflict with other recreational users, adjacent landowners/communities, or unsafe operating conditions or levels of use.

A study of soil damage that may be occurring from off-road motorcycle events will be made by the Regional Soils Specialist.

- Campgrounds and Day Use Areas

At the present time both of the developed campgrounds and day use areas in the Park Rapids Area are in need of rehabilitation. Campgrounds and day use areas receive the highest concentrations of use and are in the greatest need of rehabilitation. Work at

these facilities includes redevelopment at Mantrap and Hungryman Lake campgrounds and minor site work at Cedar Lake Access and Day Use Area. Efforts to acquire adequate funding for needed work and maintenance should be continued. Continuing to explore alternative maintenance procedures like contracts or leasing is also recommended.

- Public Access Management

The Division of Forestry maintains nine public accesses in the Park Rapids Area. Three of the accesses have been developed in conjunction with the campgrounds and day use areas and can be routinely maintained along with the other facilities. The remaining accesses are scattered throughout the area, making them more difficult to routinely maintain. The area has received limited funds from the Trails and Waterways unit for maintenance and redevelopment of water accesses. The area should document the maintenance costs and redevelopment needs and submit the projects to Trails and Waterways for funding. It may be possible to maintain the scattered accesses on a contract basis, relieving Forestry of some workload. Forestry should continue to work in cooperation with Trails and Waterways to develop adequate maintenance and development proposals for the accesses in the area.

- State Forest Trails Management

The Division of Forestry currently maintains developed trails for snowmobiles in the winter and unrestricted use in the summer in all the state forests in the area except the Badoura State Forest. Additional types of trail opportunities are provided by other levels of government and the private sector. However, Forestry should seek to cooperate with these other recreation providers to ensure that trail needs are being met as demand and activities change. Opportunities for new trail development and designating new uses on old unused trails have been evaluated during this planning process. Major changes in use are not proposed at this time however, plans have been developed to reduce trail user conflicts. These changes are vital to the safety of the users:

Coordination/Planning - Prior to each winter season (around mid-October) there will be an annual meeting with representatives from the logging and snowmobile communities to plan the winter logging and snowmobile routes.

Safety/Education - Both loggers and snowmobilers need to be better educated on safety. State forest maps will be revised to show designated "truck routes". The Division of Forestry will also work closely with local Chambers of Commerce on the accuracy of their maps. Informational signs will be posted at trail intersections. Standardized signs will be used and the symbols identified on maps. More year around "caution trucks hauling" signs will be posted.

Timber Sales Regulations/Planning - More planning and care in developing regulations will be done in advance of timber sales. Loggers will be required to give notice in advance

of any plowing, road building, or landing construction. Some timber sales may need to be planned for summer logging only. When permits for winter logging are given, acceptable winter routes will be specified to loggers. In addition, the Division will develop harvesting plans that will attempt to minimize conflicts between recreational users and loggers.

A few state forest roads that are also trails have companion trails constructed to route the trail use off the state forest road system.

- Recreation User Information

The Park Rapids Area provide many opportunities for dispersed recreation. However, maps showing location of state land and many of these opportunities are not currently available to the public. The Division of Forestry should seek to secure adequate funding for the development and publication of an area recreation user map as well as individual forest trail maps. This information, when complemented by on the ground facilities and information such as signs, parking areas and trails, should increase recreation opportunities and recreational use in the area.

The Division of Forestry should continue its efforts to increase user awareness of state forest management. The Division should continue making personal contact with the public and publishing more information about forest management.

- Monitoring and Managing Recreation Use

Both developed and Dispersed use should be monitored. This information can be used to prevent conflicts that may develop between different types of users and to establish an accurate planning data base for the future. Surveying users of campgrounds using the existing registration system would be the easiest for the Division to implement and provide needed planning and management information. Forestry should continue to work with the DNR Office of Planning to develop methods of documenting other types of recreational use in state forests.

Rules and regulations for managing and controlling dispersed use are likely to be necessary in the future. If use increases, conflicting uses may have to be restricted to different parts of the forest. Forestry will continue to work with the rest of the department in developing policies on off road vehicle use and rules and regulations for use of state forest lands.

Resource Management Units

RMU1

Because of the limited amount of Division of Forestry land, and because of the dispersed ownership pattern, the state forest lands in this RMU are not actively managed for recreation. However, these lands are used for dispersed recreation and play a role in providing wildlife habitat and hunting and wildlife observation opportunities.

Management Strategy

The Division of Forestry should continue to manage its lands with consideration for dispersed recreational activity. Forestry should also continue to provide assistance to other forest landowners on multiple use management including recreation. In addition, the division should cooperate with other recreation providers when possible, by making state forest lands available for recreational development by lease or agreement when the proposed development is compatible with state forest land management.

Specific Proposals

Develop a recreation user map showing opportunities on state forest land.

RMU2

The DNR Division of Park and Recreation administers Lake Carlos and Maplewood state parks. Both parks receive heavy use. Both State Parks have woodland demonstration projects that are interpreted with self-guiding signs.

There are a large number of Federal and State Wildlife Management Areas available for public use.

This unit contains many privately owned recreation opportunities including skiing, resorts, and tourist attractions.

Forestry administers a few small parcels of woodland available for dispersed recreational activity.

Management Strategy

Same as RMU1.

Specific Proposals

Both demonstration forests within Lake Carlos and Maplewood state parks need maintenance and renovation. Consideration should be given for dispersed demonstrations throughout the Parks. Maplewood State Park especially presents the opportunity to do this, due to its large size and diversity of vegetative types. Further planning with Parks personnel is needed to provide better interpretation to the public of vegetation management practices.

Develop a recreation user map showing opportunities on state forest land.

RMU3

This unit is very popular as a recreational area. It contains many large high use lakes. The summer population quadruples in size with many landowners only spending the summer months in this area. Many of these seasonal residents are retired or work in the Fargo/Moorhead, or Minneapolis/St. Paul areas.

Currently there are no Division of Forestry recreation facilities within this unit. Forestry administered land can be found within this unit, but much of it is land locked and not accessible to the general public. Glacial Lakes State Park, located south of Starbuck, is the main recreational attraction DNR has to offer, other than the numerous lakes throughout the unit.

Forestry administered land is open for dispersed recreational use. Some forestry land is crossed by the Winter Wonderland Snowmobile Trail, a grant-in-aid trail system in Becker County.

Management Strategy

The role of Forestry in future recreation management should be to supply information and technical advice involving projects on non-Forestry administered lands.

Specific Proposals

Currently DNR, in cooperation with local groups, is developing a self guided interpretive trail just north of the DNR headquarters southwest of Detroit Lakes on Lake Sally. The trail runs through a pond area and into a wood lot. Trail signs will contain forestry, wildlife, and fisheries management information. The trail will be used for summer hiking, winter skiing and spring/fall outdoor education sessions. It could be developed into a handicapped accessible trail with a little effort if future demand dictates.

Develop a recreation user map showing opportunities on state forest lands.

RMU4

Currently there are no Forestry administered recreational facilities or designated trails within this unit. Forestry administered land is available for dispersed recreational use. Many developed recreation facilities are provided by the private sector.

DNR Forestry provides advice and technical information involving for recreational management on non-Forestry administered lands.

Management Strategy

Same as RMU1 and RMU2.

Specific Proposals

Same as RMU1.

RMU5

Forestry administered recreational facilities in this RMU are very limited and include public accesses at Nagel Lake, Little Sand Lake and Duck Lake. Other Department administered facilities include the Heartland Trail and numerous other public accesses.

The county parks and recreation program maintains a ski trail, several picnic areas, public accesses to several lakes and many miles of county Grant-In-Aid snowmobile trails.

There are 73 resorts and 8 private campgrounds with 482 campsites in this RMU.

Management Strategy

Forestry's role in recreation should be to provide the public with the opportunities for multiple use of our forest lands. Educational programs and public awareness of these lands and their availability to the public must be emphasized through media mapping, and personal contact. Trails on all State lands should be designated for uses such as hiking, skiing, horse back riding and hunting with undesignated areas available for motorized use. State forest and trail maps should be made available for these areas.

No new forestry administered development is being planned for this RMU, although signing and trail maintenance are needed. Assistance will be available and given to Trails and Waterways and county parks and recreation boards to help improve or expand their facilities as needed.

Specific Proposals

Crocus Hill Park located on a tract of Forestry administered land in Sec. 36-140-35W, adjacent to city limits and presently under lease to the City of Park Rapids should be evaluated for possible upgrading and development for greater use. The possibility of exchange with the County or annexation by the City of Park Rapids should be considered.

RMU6

Existing Forestry-administered recreational facilities:
- Hungry Man Lake Campground
- Cedar Lake Picnic Area

Trails:
- North Smoky Hills Trail
- Wolf Lake Trail
- Two Inlets Trail

Public Access:
- Cedar Lake
- Hungryman Lake
- Big Rat Lake
- Many Point Lake
- Round Lake

Other Facilities:
- Private Campgrounds
- Tamarac National Wildlife Refuge
- Grant-In-Aid Trails
- Long Pine Ski Trail
- Itascatur Ski Trail
- Shingobee Ski Trail

Management Strategy

Forestry's role in recreation should be to provide opportunities for increasing visitor awareness and appreciation of a multiple use forest. Forest recreational facilities should be developed or leased for development to be compatible with other forest management and complement private recreational facilities when possible. The Hungryman Campground should retain its primitive character to avoid changing its role and competing with other recreation facilities. Trails should be provided to serve the following uses, based upon public interest and compatibility with the forest: Hiking, skiing, horse, snowmobile, ATVs, hunting, and canoeing. Trails should be designated, maintained, and signed. Conflicting trail uses should be identified, and resolved. Alternate trail routes may be developed where conflict exists with logging, use of State forest roads and other recreation users. Self-guided trails should be developed to educate the public on multiple-use management.

Trails and public lake accesses will be developed in cooperation with the Trails and Waterways Unit, in accordance with Trails and Waterways policy and priorities for improvement.

Recreation user maps showing state forest lands and trails are needed to make these areas more usable by the public.

Specific Proposals

1. Renovate and rebuild Cedar Lake Public Access ramp and parking area.
2. Improve water supply at Hungryman Campground - iron filter or new well.
3. Construct new vault-type toilets at Hungryman Campground and at Cedar Lake Access and Picnic Area.
4. Abandon forestry administered public access on Round Lake. This access is not needed since there is a Trails and Waterways public access which serves Round Lake.
5. Redevelop and sign hiking/nature trail at Cedar Lake Day Use Area.
6. Construct alternate snowmobile trail on Sec. 17 & 18-141-36w to get snowmobiles off Indian Creek Trail.
7. Timber access roads that are needed for future access will be seeded with clover. Roads over 1/4 mile in length will be gated and used as Hunter Walking Trails. Erosion control structures will be built where needed.
8. Timber access roads that will not be needed for future management will be seeded down with clover and closed with earthen berm. Erosion control structures will be built where necessary.
9. Timber access roads will be built with cooperative Forestry/ Wildlife funds in Sec. 3-139-37W and in Sec. 17-139-37W. An addition will be put on the trail in Sec. 28/29-140-37W. Other roads may be built where needed for balanced management.

10. Develop a recreation user map showing opportunities on state forest lands (same as RMU1)

RMU7

The 20 lakes and 65,000 acres of State and County forest land makes this RMU (as well as adjoining RMU 5) one of the most popular forest recreation areas in the state.

The economic impact of forest recreation to the area is enormous. Fourteen resorts with 192 cabin units are located in this unit. The unit contains one private and two public campgrounds. Mantrap Campground, a primitive forestry administered campground with 38 units, is the only forestry campground in the RMU. The campground ranks 11th in camper nights and 9th in income, of the 35 state forest pay campgrounds in the state. In conjunction with the campground the division manages a water access, picnic area and a beach.

Fishing, big game hunting, camping, hiking, trail biking, ATVs, and snowmobiling are all dependent on the Forestry administered lands, forest roads, trails and public accesses.

The two major winter activities in RMU5 and RMU7 are snowmobiling and ice fishing. Over 20 resorts, motels and 37 restaurants remain open and depend on the winter recreationists. The Paul Bunyan State Forest, with 75 miles of snowmobile trail, is the focal point and destination for most of the snowmobilers in the region. The Heartland Trail and area Grant-in-Aid trails serve as "feeder trails" to the Paul Bunyan trail system.

Nine of the major lakes in the unit have adequate public accesses. Two major lakes, Middle Crooked and Benedict Lake do not have public accesses. Hubbard County has land on Crooked Lake and Benedict Lake which may offer opportunities for public accesses.

There are no signed public cross country trails in RMU7. Val Chatel, a private downhill and cross country ski area is a popular attraction in the northern part of the unit. A four mile nature trail, on state land, is being maintained by 3 resorts on Mantrap Lake. During the summer several three-wheeler clubs and trail bike clubs use the 115 miles of forest roads and trails in the Paul Bunyan State Forest. The 9,200 acre wildlife refuge in the Paul Bunyan State Forest is closed to firearms big game hunting, but is open to small game and a special black powder deer hunting season which attracts over 100 hunters each year. Recreational facilities for RMU7 are listed in table 14.

Table 14. Recreational Facilities in RMU7.

	Name	Units	Ownership	Location
Campgrounds:	Mantrap	38	Forestry	Mantrap Lake
	Akeley	10	City	11th Crow Wing Lake
	Jemstar	31	Private	
Picnic Areas:	Mantrap	5	Forestry	Mantrap Lake
	Akeley	5	Trails	Heartland Trail
	Akeley	5	City	11th Crow Wing

	Lake	Rp Type	Administrator
Public Access:	Big Bass	Earth	Forestry
	Pickerel	Earth	Forestry
	Waboose	Earth	Forestry
	Mantrap	Earth	Forestry
	Mantrap	Asphalt	Forestry
	11th Crow Wing	Concrete	City of Akeley
	10th Crow Wing	Earth	Trails & Waterways
	Upper Bottle	Earth	Trails & Waterways
	West Dead	Concrete	Trails & Waterways

Resorts:	14	192 Units	Private

Ski Areas: Val Chatel - Downhill Runs - Triple Chair, 2 Rope Tows

Trails	Mi.	Snow.	Bike	Hike	3-Wheel.	Horseback
Heartland Trail	6	x	x	x		x
Forest Roads	68	x	x		x	x
Misc. Forest Trails	12	x		x	x	x
Beaver Lakes Trail	5	x		x	x	x
Grant-In-Aid	25	x				
Norway Hills	4				x	
	120					

Swimming:	Mantrap Campground	Forestry Administered
	Akeley Campground	City Administered
Horseback Riding:	Paul Bunyan Pit Stop	Privately Owned

Management Strategy

Forestry's role in recreation should be to provide maximum outdoor recreational opportunities compatible with multiple uses of the forest. The Mantrap Campground should remain primitive to minimize competition with other recreation facilities and provide a natural forest setting.

Forest access-walking trails should designated and signed to reduce conflicts. Annually about 15 miles of new access roads are being developed by loggers for access to cutting operations. Some of the shorter spur roads that are seeded to clover should be gated or closed with earth mounds to prevent trail damage from vehicular traffic and provide more walking trails.

A master plan for a portion of the North County Natural Scenic Trail has been prepared for the Paul Bunyan State Forest. Forestry should cooperate with the National Park Service to provide connections across state land as needed. Volunteers could be used for development of part of this trail. Under consideration yet, is whether the North Country Trail in non-Federal lands will permit motorized uses.

Forestry recreational facilities in combination with other public and private facilities should be adequate to meet the predicted increases in recreational activity in the next ten years. Trail, public access, and campground signing, maintenance and trail developments should continue with cooperation from the Trails and Waterways Section, Hubbard County and private organizations.

Specific Proposals

1. Mantrap Campground has pit toilets dating back to 1961. In 1987, the existing toilets will be replaced with modern sealed vault toilet buildings.
2. Maintenance costs have mounted. Consideration should be given to utilizing Greenview Contracts and contract garbage hauling.
3. The Campground Host program should be continually encouraged, as well as scheduled weekend visits by the Forester to enforce regulations and allow more contact with the public.
4. The public access to Mantrap is heavily used, and should be rebuilt as a double-wide ramp, with a dock in between. The swimming area dock should be replaced. This work should be done in conjunction with the other campground work being done in 1987.
5. A vegetation management plan should be developed in the campground area, promoting planting of maple, oak, and long-lived conifers.
6. Timber access roads that are temporarily not needed will be seeded to clover and gated to provide forest access-walking trails. Timber access trails that are not to be used again will be closed with earthen berms and will have erosion control structures built as needed. This will reduce erosion and discourage destructive uses of these roads. Some of the timber access roads are used for poaching and the closure would assist Enforcement in controlling this activity.
7. The public accesses have been getting heavy use and need some upgrading. The public access on Little Sand Lake is in desperate need of additional parking space. This may require moving the access to a larger lot. Trails and Waterways is working on a project proposal to develop an access for Middle Crooked Lake.
8. WINTER "TRUCK ROUTES" - the following forest roads will be designated as winter "truck routes": Spur I, Parkway I, Refuge Road, Blue Trail, and Parkway II (a Thorpe township

road). These roads will not be designated as snowmobile trails. Use of these roads by snowmobiles can continue for now but, grooming will be on other forest roads, trails, and alternate routes yet to be constructed. They will be signed "caution - truck route". Some of these roads may have to be eventually closed (marked - closed to snowmobiling) due to safety considerations. If it is known for certain in October that any of the designated truck routes will not be plowed, they could be groomed as snowmobile trails for that season.

9. ALTERNATE ROUTES - The following alternate routes will be necessary in order to designate the above forest roads as "truck routes": SPUR I - The corner at Gulch Lakes Road will be reconstructed to allow winter route out to Highway #64. If this is not possible, then the Beaver Lakes Trail East of Spur I will be reconstructed to connect to Highway #64 at the Kabekona Trail. In addition, a short connection will have to be made with Spur II; PARKWAY I - An alternate route will be sought southwest of Lake Benedict to the Kabekona Trail; REFUGE ROAD - The Beaver Lakes Trail will be reconstructed. The west end will be changed to eliminate having to run on the Refuge Road.

10. The South end of Spur I provides an important link with County Road #2. Spur I is the main haul route through the Western part of the Paul Bunyan State Forest. The Division of Forestry will continue to work with Mantrap Township to take this road over and improve it. If these efforts fail, all signs (posted by the Division of Forestry) will be removed and any future complaints will be directed to the Mantrap Town Board.

11. Parkway II provides a link from Spur I West to County Road #91. Except for the west one-half mile, it serves State land exclusively. The Division of Forestry will continue to negotiate for a complete takeover. This road should be constructed to proper standards.

Until adequate alternate routes are constructed, loggers and snowmobilers will have to share the forest roads. Precautionary signing will be emphasized.

FOREST ROAD ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The goal of the state forest road program is to develop and maintain a state forest road system that will provide adequate access for the protection, management and utilization of Minnesota's forest resources. The Division of Forestry's strategy for attaining this goal is to continue to manage state forest roads in cooperation with other public and private land managers to ensure coordinated and responsible forest road use and development. In response to growing user demands, heavier logging equipment and trucks, and the need to provide consistent long range program direction, a comprehensive State Forest Road Plan Minnesota DNR Division of Forestry 1982) was developed. The information in the State Forest Road Plan was used in part in developing this proposed program for the Park Rapids Area.

Timber harvesting and transport is one of the main uses of the state forest road system. Each year some 2,500 loggers haul and 15 major wood based industries use timber hauled on state forest roads. State forests and other state owned lands provide over one half million cords of wood annually, or about 20 to 25 percent of Minnesota's timber harvest. The volume of timber harvested annually from state lands has more than doubled over the last 15 years and is expected to keep increasing in the future.

An estimated 600,000 to 800,000 Minnesotans who use the state forests for fishing, hunting and other types of recreation benefit directly from the availability of state forest roads. In addition to being used for ski touring, snowmobiling and hiking, forest roads provide access for many other forms of dispersed recreation. Use of the state forests and state forest road system has expanded in recent years and is likely to expand further in coming years.

State forest roads are assigned to a given class based on expected use and road design and safety requirements. Classification ensures that a range of alternatives is considered when selecting the appropriate road design. The classification system facilitates the development of alternatives for varying types and intensities of forest road use and provides engineering information appropriate to such uses.

Under the system of classification, a range of six classes is used to describe forest road use and development possibilities. This system was developed to ensure the continued safe use and operation of state forest roads, while at the same time responding to the increased need for roads to be both durable and cost-effective. The standards recognize recent advances in technology, expanded road use, safety needs and the desirability of conforming to generally accepted statewide road standards.

Roads designated as Class 1 are multi-purpose two lane roads for use in all types of weather. Class 1 roads, unlike other forest roads, are generally hard surfaced and include a two foot minimum shoulder width. They are developed only where heavy two-way traffic volumes are anticipated.

Class 2 and 3 roads are also multi purpose, two lane roads. Both are developed as all weather gravel surfaced forest roads. Because Class 2 roads are four feet wider than Class 3 roads, they can accommodate substantially higher vehicle speeds. Engineering design specifications for Class 2 roadways are also more exacting and uniformly applied. Class 2 and 3 roads serve a variety of purposes and may access moderately developed recreational sites.

Class 4 roads are multi purpose, one lane roads used to access timber areas where continued management is necessary. In addition, Class 4 roads provide access to primitive recreational facilities, fish and wildlife management areas or for hunting, fishing and other forms of dispersed recreation. The majority of longer, permanent state forest roads requiring routine maintenance are class 3 or 4 roads.

Class 5 roads are primarily timber harvest haul roads for use during dry periods or winter. Road design is the minimum necessary for intended use. Road maintenance is also minimal and may not be required on a regular basis. Class 5 roads may also serve as recreational trails.

Class 6 roads are logging spurs which primarily provide access to one or several timber tracts. These roads are generally short and constructed to minimum standards. They will have very limited or no maintenance. Class 6 roads will remain open for public use, unless erosion or rutting problems develop. They may be closed with boulders, earthen berms, or gates.

The Park Rapids Area contains 162.2 miles of Division of Forestry administered roads in the class 1 through 5 designation. There are also 145.4 miles of class 6 roads which are being added to the road inventory. Becker County is also maintaining an additional 17.7 miles of forestry roads which should be transferred to them.

The trunk forest road system in the Park Rapids Area is complete. Major upgrading of this system has been underway since 1980, with emphasis on improvements for safety and hauling heavy tree length loads. Maintenance of the forest road system is a continuing concern. Adequate road maintenance funding has only been available since 1980. Grading of the trunk forest road system is necessary four times a year to keep the road system in adequate condition. Heavily used roads will have to be graded more often.

PROGRAM DIRECTION

Area-wide

Some Division of Forestry administered lands in the Park Rapids Area are not currently accessible. Land adjustment plans will drive the decisions on whether or not to provide access to State land for management purposes.

In some situations where lack of road access has been a problem, cooperative road funding with the Section of Wildlife has worked well.

All timber access roads will be reviewed by the Division of Forestry and the Division of Fish and Wildlife to determine which roads will be regulated for limited use. These roads may be temporarily blocked by gates, large rocks or an earthen barricade for a variety of reasons. These trails will open to hunters and hikers and other non-motorized users. All such trails will be closed to motorized use except snowmobilers or other authorized users. Some additional funding and labor may be available from the Minnesota Deer Hunters Association or some other groups. A certain degree of remote hunting and hiking opportunities will be provided for the fairly significant segment of people who prefer to get away from the crowd.

Stronger emphasis will be placed on closing certain Class-6 roads and restricting vehicle traffic in other Class-6 and Class 5 roads.

Most forest roads will be closed during spring breakup, high fire danger or extremely wet conditions. These closures will be done to protect the road system and adjacent resources from excessive damage or fire.

A road identification system will also be developed and road signs installed as outlined in the State Forest Road Plan. Forest roads will then be mapped, signed, and identified on State forest maps for user safety and convenience.

Approximately 5 to 8 miles of logging spurs (class 6) will be built per year in the next ten years.

Table 15 shows a summary of reconstruction needs in the Park Rapids Area. For discussion of these and other maintenance needs see the discussion under RMUs.

Timber management and sales along roads and highways will take into consideration road right-of-ways. The following guidelines will be adopted for cutting on all lands along major roads or highways:

1. Cut existing mature aspen and jack pine at a rotation age of 60 years in highway ROWs, in cooperation with MnDOT.
2. Clear-cuts will be no more than 1/4 mile in length adjacent to the highway.

3. Timber adjacent to or across the highway from a clear-cut area will not be cut for a 10 year period.

4. Oak, maple, ash and other long lived species with colorful autumn foliage will be left in clumps within 100 feet of highway ROW. This includes Norway and white pine clumps.

5. When cutting along roadside edge, all debris and tree tops will be removed from the ROW.

6. White and Norway pine adjacent to or visible from the highway will be selectively cut using a longer rotation period to maintain a "big tree" concept.

7. When planting along major roads, species with long life spans and good fall color will be favored.

State Forest Road Program Objectives 1986 - 1996:

- Update and maintain the state forest road inventory for the Park Rapids Area.
- Upgrade primary hauling roads in the state forests from Class 4 to Class 3 roads.
- Locate and map out gravel deposits for future gravel pit sites.
- Select, evaluate, and rank forest road improvement projects.
- Develop a forest road and right-of-way maintenance schedule and budget as determined by the Timber Management Plan and recreational needs.
- Coordinate timber harvest and recreational use of state forest roads.
- Reconstruct existing state forest roads to meet safety and use requirements, particularly where growing demands for timber and recreation exist.
- Plan for relocating recreation trails off the state forest road system to provide for user safety.
- Develop priorities and an implementation schedule for accessing Division of Forestry lands across other ownerships and roadless areas.
- Clarify responsibility for the management, maintenance and construction of forest roads accessing areas of mixed forest ownership.Officially transfer 17.7 miles of road to the Becker County Land Department.
- Coordinate timer sales planning with road construction prior to timber harvest or forest development activity.
- Protect environmentally unique areas from road development.

Coordination with Other Divisions, Agencies, and Organizations

The Division of Forestry will continue to cooperate with townships, counties, and Department of Transportation road engineers on transportation issues. Cooperative agreements with other public and private road users will be pursued, especially where mixed land ownerships or shared road use makes this a priority.

Coordination with the DNR's trail program and fisheries and wildlife habitat improvement programs will be essential. This cooperation will be important in obtaining cooperative project funds and in developing forest access priorities.

Forest road projects will be reviewed by the Division of Waters, to ensure that all water permits and floodplain requirements are addressed.

Table 15. Summary of Park Rapids Area State Forest Road Reconstruction Proposals by priority.

Road Name	RMU	Year	Cost
Akeley Cutoff	7	1986	$35,000
Hungryman Campground Road	6	1987	4,000
North Smoky Hills	6	1987	15,000
East Steamboat	7	1987	35,000
Refuge Road	7	1987	10,000
East Steamboat	7	1987	55,000
Spur I		1988	15,000
Kabekona	7	1989	5,000
Steamboat	7	1990	3,000
North Smoky Hills & White Earth	6	1990	60,000
Two Inlets & South Smoky Hills	6	1994	70,000
South Two Inlets & Indian Creek	6	1990	10,000

ROAD PROGRAM OBJECTIVES AND TARGETS

Table 16. State Forest Roads - Park Rapids Area Staffing and Objectives, FY 85 and Projections for FY 87, 91 & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
Staffing					
1. Area	fte	0.9	2.0	2.0	2.0
Objectives					
1. Road construction	miles	2	4	4	4
2. Road reconstruction & turnouts	miles	11	5	5	0
3. Bridge repair/replacement	bridges	0	0	0	0
4. Maintain class 1-4 roads	miles	122	122	122	122
5. Culvert replacement	number	5	6	10	10
6. Roadside brushing/spraying	miles	35	20	20	20
7. Gravel crushed	M	40		40	50
8. Gravel spread	M	20	30	20	50

Resource Management Units

RMU1

This unit already has an excellent transportation network administered by MnDOT, the counties, and the townships. No DNR Forestry roads exist or are needed.

RMU2

There are no state forest roads in this Unit. Forestry administered land is scattered and outside of state forests. Primary access to this land is by County and Township roads. If the land parcel is not directly adjacent to a road, secondary access, if any, is by class 6 road across private, County, or Federal land.

Management Strategy

Most of the Forestry administered parcels have one public access. Access can generally be obtained through private lands also. If there are any forest development projects or timber sales, necessary easements will be obtained. Class 6 roads will become part of the roads inventory.

RMU3

There are no Division of Forestry maintained roads in this unit. There are approximately 5.3 miles of unmaintained roads which provide access for recreational use and fuelwood sales on the scattered State land located in this unit. An excellent transportation network administered by MN/DOT, Counties and townships already exists in this unit.

There are no plans to improve, maintain or expand these roads on lands administered by the Division in this unit.

RMU4

Same as RMU3. There are 3.1 miles of unmaintained roads in this RMU.

RMU5

While RMU5 is one of the largest units in the forested area, most of the state and county land is located in the southwest portion in Badoura and Crow Wing Townships. The road system is extensive. Ten of the 12 townships have gravel roads adjacent to almost every section in the township. The major road system (non-forestry administered) has over 200 miles of bituminous surface. There are five major north-south routes (State Highway #64 & #71, County Roads #4, 6 and 11). Four major east-west highways (State Highway #34 & #87, Co. Highway. #18, #40 and #4). Other bituminous connector roads are County Roads #33, 14, 7, 13, 2, 20 and 12. (SEE TABLE 17.)

Parts of these access roads cross county land. These trails are also used by hunters, berry pickers and sightseers. The location and miles of roads are shown on table 15.

Table 17. State Forest Roads in RMU 5.

Road Name	Class 3	4	5	6	Total
Duck Lake Access	.8				.8
Pickerel Lake Access	1.3				1.3
Little Sand Lake Access	.7				.7
Unnamed				10.5	10.5
Little Scenic		7.0			7.0
Sockeye		2.1			2.1
Anchor Mattson		.8			.8
Unnamed-to gravel pit			.5		.5
Unnamed-logger access				6.9	6.9
Total	2.8	9.9	.5	17.4	30.6

Management Strategy

As all of the logger access roads in RMU5 are on flat sandy terrain and are not rutted, even during spring breakup, very little maintenance is needed. Maintenance needs consists of removing down trees and filling in occasional holes with gravel. A budget of $500 per year will be needed to keep these roads in reasonable shape and provide some grading when necessary.

As most of these logger access roads cross County land, road closure is only recommended for weather and fire prevention purposes. Additional roads are not needed, and the roads crossing County land are brushed and maintained by the Grant-In-Aid trails program.

Specific Proposals

1. When the self-guided Badoura Demonstration Forest is developed in Section 9 of Badoura Township, 1/2 mile of road will need a few repairs with gravel and at least annual grading.
2. The 1/4 mile access road to Nagel Lake should be added to the forest road inventory and maintained.

RMU6

Access to Forestry administered land via State forest roads is generally good. All roads need routine grading and gravelling. Three miles of the Smoky Hills Road needs rebuilding. Additional rock crushing is needed for future gravelling of these roads. Increased use of forest roads by semi-type logging trucks has necessitated increased maintenance, graveling, and upgrading. (SEE TABLE 18.)

Several forest roads have been abandoned in the past because they primarily serve either county or private land. Becker County has continued maintenance on some roads that serve county land. Official road transfer should be made to Becker County, along with any easements involved.

Table 18. State Forest Roads in RMU 6.

Road Name	Class 3	4	5	6	Total
Wolf Lake		3.7			3.7
Wolf Lake Tower		.5			.5
Hanna Ore		3.8			3.8
Indian Creek		4.5			4.5
South Two Inlets		4.5			4.5
North Two Inlets		4.7			4.7
Smoky Hills		7.0	3.0		10.0
Hungryman Campground	.7	.7			1.4
Unnamed			42.0		42.0
Unnamed				40.3	40.3
Sawmill Lake		.2			.2
Height of Land		.3			.3
Strawberry Mountain		.1			.1
McKenzie		.8			.8
Total	.7	30.8	45.0	40.3	116.8

Management Strategy

New road construction would involve short access roads for specific timber tracts. Some of these spur roads will built using the Division of Wildlife D-5 cat, as a cooperative Forestry/Wildlife project. Gating will also be done on some access roads built by Wildlife or Forestry. These roads will be used for forest access-walking trails following timber harvest. Gates will be closed except for winter use or forest management purposes.

Some forest roads also serve as recreational trails, in particular as snowmobile trails in the winter. Roads which have conflicting uses have been identified and alternate trails are being developed (see recreation section).

In cases where a State forest road crosses private land, easements will be obtained to guarantee access. Presently only two easements are needed.

Specific Proposals

1. Hungryman campground road - contract to upgrade eroded area. 1987 - cost $4,000.
2. Gravel crushing on North Smoky Hills and White Earth 20,000 Cubic Yards. 1990 - cost $60,000.
3. Gravel crushing - Two Inlets and So. Smoky Hills. 20,000 Cubic Yards. 1994 - cost $70,000.
4. Roadside brushing - North Smoky hills, South Smoky Hills, Hanna Ore, and Wolf Lake Forest Road. 1987 - cost $10,000.
5. Rebuild and gravel North Smoky Hills Forest Road. 1987 - $15,000.
6. Roadside spraying of all forest roads. 1988 and 1994 - Cost each year $4,000.

7. Emergency repairs - graveling, grading, and culverts. 1987-1997. Cost each year $5,000.
8. Gravel Hanna Ore Forest Road - 1987 cost $4,000.
9. Continue to jointly fund with the Bemidji Area a grader operator to grade the Forestry roads 4 times per year. Supplemental grading to be done with emergency repairs.
10. Gravel South Two Inlets and Indian Creek forest roads. 1990 - cost $10,000.

RMU7

Access to Division of Forestry administered lands in this unit are quite good. There are two north-south bituminous highways (State Highway #64 and County Road #4) and one county gravel road (County Rd. #90). (SEE TABLE 19.)

This unit is rather small, encompassing slightly more than five townships. The state forest roads in this unit total 160.2 miles, about 33% of the total public road mileage in the unit. Major maintenance and upgrading of the forest roads in RMU7 was not undertaken until 1979. Prior to 1981, forest roads were not heavily used by logging trucks. Now, 40,000+ cords of wood are hauled over these roads each year and continuous maintenance and gravelling is needed.

A continued upgrading of these roads is planned. The East Steamboat reconstruction is planned in 1986. Roadside brushing with spraying and some gravelling will improve the Steamboat, Akeley Cut-off and Spur II to Class 3 roads.

Only a few areas of the Paul Bunyan State Forest have access problems. One area is south of Kabekona Lake. There is a 50 foot section of road across private land which could present access problems in the future. An alternate route through state land is being surveyed. Another alternative would be to improve access from the south so it would not be necessary to cross private land.

The north end of the Parkway Forest Road has approximately 1 1/4 miles of Steamboat River Township administered road. This section of road is not in as good condition as the Division of Forestry portion and has deteriorated from heavy logging truck traffic. Presently, the township is working cooperatively with Hubbard County and DNR-Forestry to upgrade the road. Steamboat River Township will continue to maintain it's portion of this road.

In the past five years, $196,000 has been invested in maintenance and upgrading the 54 trunk road system. Approximately forty thousand cubic yards of gravel is now stock piled at three separate locations for future use. Five thousand cubic yards will be used on the township portion of the Parkway Forest Road. Four thousand cubic yards will be used on the Akeley cutoff Forest Road. Six thousand cubic yards will be used for reconstruction of East Steamboat Forest Road.

Over the next 10 years the twenty five thousand cubic yards of stock piled gravel will be used for general maintenance. It will cost about $75,000 to spread this gravel under contract.

A major road right-of-way brushing and spraying program was undertaken in 1984 and 1985. A quarter of the forest road system has either been mechanically brushed or chemically treated. Mechanical brushing must still be done on Thorpe, Kabekona and Blue Trail. This is scheduled for 1987 and will cost $15,000. General widening and scheduled chemical treatment will be programmed for all the roads in the next 10 year management period.

Table 19. State Forest roads in RMU 7.

Road Name	Class 3	4	5	6	Total
Akeley Cut-off		4.3	1.2		5.5
Steamboat		8.3			8.3
Thorpe Tower		2.3			2.3
Spur I		7.4			7.4
Spur II		5.9	1.2		7.1
Blue Trail		1.0			1.0
Refuge		3.1			3.1
Waboose Access		.5			.5
Kabekona		2.2	.8		3.0
Mantrap Campground	1.0				1.0
Big Bass Lake	.3				.3
Parkway	7.0				7.0
East Steamboat		1.5	5.2		6.7
Unnamed-gated forestry/ wildlife			2.5		2.5
Unnamed-logger access				104.5	104.5
Total	8.3	36.5	10.9	104.5	160.2

Management Strategy

No major reconstruction will be done in this unit after the East Steamboat is completed. General maintenance gravelling and roadside right-of-way clearing will be the main projects. Almost all the roads need some right-of-way clearing. Once this clearing has been done, scheduled maintenance will have to be done. There are no areas where it would be necessary to obtain easements for access.

Road closure and gating will be done on an individual basis except for the closure of all roads during spring breakup. Individual roads may be closed by a variety of means including gating. Each closure will be decided upon with input from the Area, District and Wildlife managers. Closure orders issued by the Regional Forest Supervisor will be posted on the roads and published in local newspapers.

Recreational trails will continue to coexist on forest roads in the Paul Bunyan State Forest until alternate trails can be built. If timber operations are utilizing a road which is being groomed

for snowmobiling, either "Caution-Trucks Hauling" signs will be posted or that road will be closed for snowmobiling and alternate routes made available. Close coordination of trails/road use will be required between DNR Division of Forestry and the Regional Trails Coordinator.

Planning of timber access trails will be coordinated with Wildlife personnel. Fish and wildlife management needs will be considered when planning new access trails. Approximately 5 miles of class 6 logging access roads will be built per year and added to the road inventory.

The South end of Spur I provides an important link with County Road #2. Spur I is the main haul route through the Western part of the Paul Bunyan State Forest. The Division of Forestry will continue to work with Mantrap Township to take this road over and improve it. If these efforts fail, all signs (posted by the Division of Forestry) will be removed and any future complaints will be directed to the Mantrap Town Board.

Park way II provides a link from Spur I West to County Road #91. Except for the west one-half mile, it serves State land exclusively. The Division of Forestry will continue to negotiate for a complete takeover. This road should be constructed to proper standards.

Specific Proposals

1. Major reconstruction will be done on East Steamboat Forest Road in 1986-1987. Cost: $55,000.
2. Straighten 1/8 mile of Kabekona Forest Road in Section 16, which will eliminate a steep grade in 1989. Cost: $5,000.
3. Relocate part of the Steamboat Forest Road in Sec. 29 to eliminate a steep, narrow grade in 1990. Cost: $3,000.
4. Crush 10,000 cubic yards of gravel at the south end of East Steamboat Forest Road in F.Y. 1991. Cost: $35,000.
5. Crush 10,000 cubic yards of gravel at the north end of East Steamboat Forest Road in F.Y. 1991. Cost: $35,000.
6. Crush 30,000 cubic yards of gravel east of Highway 64 in F.Y. 1994. Site undetermined at the present. Cost will be $70,000.
7. Upgrade relocated road on hill and gravel Akeley Cut-off Forest Road in 1986. Cost: $15,000. Gravel needed - 4,000 yards.
8. Upgrade and gravel Refuge Road in 1987. Cost: $10,000. Gravel needed - 3,000 yards.
9. Roadside spraying Spur I, Spur II, Kabekona and Blue Trail in 1986. Cost: $2,000.
10. Emergency repairs, supplemental grading and yearly replacement of culverts. Cost: $5,000/year.
11. Funding of grader operator with Bemidji Area for regular maintenance of forest roads.

12. Roadside spraying (remaining miles - 50) in 1990. Cost: $3,500.

13. A continuous program of tree removal along roadside right-of-way. Cost: $2,000/year.

14. Upgrade, gravel and widen Spur I Forest Road in 1988. Cost: $15,000.

TIMBER MANAGEMENT ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

It is the Division of Forestry's goal to maintain state forest lands in the appropriate cover types, and with the proper degree of stocking and growth rate to secure maximum benefits according to multiple-use, sustained-yield principles. The appropriate cover types will be defined by Resource Management Unit. (Only DNR administered forest land is addressed in the Timber Management Program. For management on private lands, see PFM Program.)

The timber management program includes two major components: Timber stand regeneration and the regulation of timber harvest. The basic objective of the timber stand regeneration program is to coordinate timber harvest and regeneration plans to assure state lands are maintained in the appropriate cover types to meet future multiple-use demands. Timber harvest regulation is designed to promote sustained-yields of forest products. Both functions are accomplished by coordinating various aspects of timber scaling, sales, harvest, stand regeneration, and stand maintenance activities.

Table 20, Area of Forest Land by Cover Type, includes all unrestricted timber stands administered by the Division of Forestry (some of the timber stands are on lands administered by other DNR Divisions). Of the 115,803 acres identified, 98,446 acres are considered commercial forest land. In addition, there are 6,838 acres of non-stocked commercial forest land.

Table 20. Area of Forest Land by Cover Type - All DNR Lands.

Commercial Forest Land

Cover Type	Acres
Ash	337
Willow	0
Lowland Hardwoods	1087
Aspen	61417
Birch	3632
Balm of Gilead	66
Northern Hardwoods	6553
Walnut	0
Oak	4055
Central Hardwoods	0
White Pine	487
Norway Pine	6470
Jack Pine	6260
Scotch Pine	7
Ponderosa Pine	0
White Spruce	1183
Balsam Fir	1849
Black Spruce Lowland	1233
Tamarack	3489
No. White Cedar	173
Black Spruce Upland	148
Red Cedar	0
*****	
Total	98446

Non-Forest Lands

Cover Type	Acres
Agricultural	433
Industrial Dev.	178
Recreational Dev.	107
Roads	272
Rock Outcrop	0
Permanent Water	3446
Non-Permanent Water	84
Marsh	5778
Muskeg	15
*****	
Total	10313

Unproductive Forest Lands

Cover Type	Acres
Stagnant Spruce	0
Stagnant Tamarack	46
Stagnant Cedar	0
Offsite Aspen	0
Offsite Oak	160
*****	
Total	206

Non-Stocked Forest Lands

Cover Type	Acres
Cutover Area	593
Lowland Grass	1063
Upland Grass	723
Lowland Brush	3921
Duff	0
Moss	0
*****	
Total	6838

Total Unit Area = 115,803 Acres

Major Forest Timber Types

There are nine major timber types in the Park Rapids Area. These types are briefly described below along with nonstocked commercial forest land. Timber types will be managed in accordance with guidelines in the Managers Handbook, General Technical Reports.

Aspen is the largest timber type, growing on a variety of soil types. Some aspen is being converted to conifers to meet goals outlined in the Forestry/Wildlife Management Guidelines. Birch is commonly mixed with aspen and pine. Pulp and fuel wood are

the main products with some sawbolts. Natural regeneration has tended to favor aspen in the mixed stands. With better markets for aspen, proper harvest practices are implemented to insure natural regeneration to aspen.

Red and white pine were a major component of the forests at the turn of the century. Very little remains today from these extensive acreages. Small pockets of mature timber along with plantations from the 1930's to the present make up the present acreage. Clear-cutting followed by planting is the accepted method of management. (See Technical Report on White Pine In The Paul Bunyan State Forest.)

Many jack pine stands were established following the extensive wildfires of the early pine logging. Jack Pine is a short-lived shade intolerant species growing primarily on sandy soils. Regeneration is mostly done by planting but some seeding is being tried. Aspen is commonly found with jack pine. Some mixed stands are being lost to aspen regeneration.

The lowland conifer type contains tamarack with a small acreage of black spruce and northern white cedar.

The northern hardwood type is composed of several species, including basswood, oak, maple, elm and aspen. Elm as a major component is being eliminated by timber sales and Dutch elm disease.

The lowland hardwood type is found along river bottomlands and poorly drained sites. Elm and ash are the predominant species.

The spruce-fir type is predominantly planted white spruce and naturally seeded balsam fir in aspen stands.

Oaks are found both on the sandy soils and the heavier soils. Northern red, burr and white oaks are the most common species. Wildlife considerations, especially in the Paul Bunyan State Forest, affect the management strategy.

Non-stocked forest land consists mostly of lowland brush. Brushland is very important wildlife habitat and its wildlife value should be considered prior to conversion.

Timber Demand and Harvest

The waferboard and paper industries generate the major demand for wood harvested in the Park Rapids Area.

For the past two years, 95% of the timber that could have been harvested (allowable cut) was harvested due to the large amount of unsold aspen (backlog) from previous years (Tables 21 & 22). Once this backlog of aspen is sold, the percentage of annual allowable cut sold is expected to drop to approximately 80%. The waferboard industry should continue to utilize almost all of the aspen allowable cut.

Table 21. Allowable Cuts for State Land in the Park Rapids Area (acres).

	FY85	FY84	FY83
Aspen	1538	1538	1547
Birch	29	29	7
Bottomland Hardwoods	7	7	2
Northern Hardwoods	171	171	177
Oak	21	21	15
Spruce Balsam	56	56	52
Jack Pine	195	195	205
Norway & White Pine	36	36	26
Black Spruce	17	17	24
Tamarack	23	23	24
Cedar	1	1	1

Table 22. Percent of Annual Allowable Cut Sold.

	FY85	FY84	FY83
All Species	92%	97%	46%
Aspen Only	107%	128%	48%
Jack Pine Only	70%	28%	33%

The Timber Management Planning Information System is a program that has been developed to use Phase II inventory information to select stands for various management practices based on the following criteria: Site index, stocking damage, stand size, and distance from a road. The preliminary list of stands generated by the program will be reviewed to see if the proposed practice is consistent with timber management and wildlife objectives. The amended lists of stands for various practices will be included as an appendix to this plan and will form the basis for annual harvest, site preparation, regeneration, and timber stand improvement plans.

The forest land inventory (see forest inventory program section for discussion) was completed in 1982 with the other DNR-administered lands in the agricultural areas finished in 1984. Management decisions for state owned lands including timber regulations will be done using Phase II inventory information.

Recommended annual harvest levels are set from the inventory for the purpose of creating an equal distribution of timber among age classes within a forest type. This will assure a continuous annual yield of forest products. Annual harvest is based on the present distribution of age classes, the total present volume of timber, and the condition of this timber.

PROGRAM DIRECTION

Area-wide

Most of the timber types in the Park Rapids Area are now found in the older age classes due to the low levels of harvest in the 1960s and 1970s. The highest cutting priority will be given to the older age classes to correct this imbalance.

Timber Management Planning System

Area personnel used a computer model called (Timber Management Planning Information Planning System), to develop a ten year timber plan that will identify specific sites recommended for treatment. (See appendix - for details.) The timber regulation model is designed to assist in making timber management decisions by helping Area personnel handle the vast amount of data collected during the Area Phase II forest inventory. A key element used in implementation of the management plan for the Park Rapids Area, was the timber management program developed through use of the timber regulation model. The timber regulation model will provide the basis for the Area timber management plan. The following reports have been produced:

1. The acreage and list of stands with regeneration recommendations to be regenerated without harvest.
2. The acreage to be harvested by clear-cutting with specific regeneration recommendations for each stand.
3. The recommended regeneration treatments for the acreage to be regenerated that will provide the nursery with a 10-year plan on what to grow.
4. A regulation scheme for the rotation that, as far as practical, provides for a uniform flow of wood throughout the management period. Acreage will be delineated by 10-year age classes.
5. A list of stands to be selectively cut or thinned.

The results and documentation of the timber regulation model forms the Area timber management plan. Tables 22 thru 34 provide a brief summary of the plan.

Tables 23 thru 36 show more acres to be regenerated than are shown in the allowable cut. This is because more acres will be regenerated than what are harvested and not all acres evaluated by the model were selected for harvest. Table 37 summarizes the artificial regeneration needs (slight differences from other tables in lowland conifer due to adjustments based on low demand and lower returns on investment). Table 38 summarizes the stand prescriptions by cover type.

Aspen-Birch

There will be a slight decrease in the aspen acreage by converting aspen to conifers where soil and site conditions warrant it and where the conifer cover will be beneficial to wildlife.

Aspen is presently managed on a 40 year rotation age. Pulp production is the primary management objective. Reducing the amount of timber in the the older aspen age classes will be done by increasing harvest efforts in aspen and through innovative timber sales. Some recycling of aspen may be done if poor timber markets are a hindrance. The rotation age for birch is 50 years.

Table 23. Planned Regeneration Treatments - Aspen Cover Type.

TOTAL ACRES IN TYPE: 53128
10 YEAR ALLOWABLE CUT: 14211
ANNUAL ALLOWABLE CUT: 1421

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
ASPEN	12	0	0	0	15301	15313
NOR HW	0	0	80	0	0	80
N PINE	1036	0	67	0	9	1112
J PINE	389	0	0	0	0	389
WH SPR	426	0	28	0	0	454
TOTAL	1863	0	175	0	15310	17348

Table 24. Planned Regeneration Treatments - Paper Birch.

TOTAL ACRES IN TYPE: 3106
10 YEAR ALLOWABLE CUT: 602
ANNUAL ALLOWABLE CUT: 60

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
PBIRCH	0	0	0	0	117	117
J PINE	70	0	0	0	0	70
N PINE	406	0	0	0	0	406
ASPEN	0	0	0	0	283	283
WCEDAR	10	0	0	0	0	10
WH SPR	56	0	0	0	0	56
TOTAL	542	0	0	0	400	942

Norway and White Pine

A 3,000 to 4,000 acre increase of this type is planned. Added acreage will come from converted aspen, birch and other hardwoods plus jack pine acres that are planted to norway pine. The rotation age will generally be 100 years with periodic thinning at 10-15 years. Sawlog production is the primary objective. Some natural seeding of white pine beneath older aspen stands will also be managed as a white pine type.

Table 25. Planned Regeneration Treatments - Norway Pine.

TOTAL ACRES IN TYPE: 5916
10 YEAR ALLOWABLE CUT: 644
ANNUAL ALLOWABLE CUT: 64

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
N PINE	663	12	34	0	0	709
TOTAL	663	12	34	0	0	709

Table 26. Planned Regeneration Treatments - White Pine.

TOTAL ACRES IN TYPE: 453
10 YEAR ALLOWABLE CUT: 38
ANNUAL ALLOWABLE CUT: 3

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
N PINE	31	0	0	0	0	31
J PINE	26	0	0	0	0	26
TOTAL	57	0	0	0	0	57

Jack Pine

Jack Pine is generally considered the preferred upland conifer for wildlife. A special effort is being made to keep it a major component in our forests. It is generally clear-cut at 55 years.

Table 27. Planned Regeneration Treatments - Jack Pine.

TOTAL ACRES IN TYPE: 6403
10 YEAR ALLOWABLE CUT: 1187
ANNUAL ALLOWABLE CUT: 118

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
N PINE	392	10	0	0	0	402
J PINE	791	141	0	0	0	932
P PINE	0	7	0	0	0	7
WH SPR	46	0	0	0	0	46
TOTAL	1229	158	0	0	0	1387

Lowland Conifers

No change in acreage is foreseen in the next 10 years. Rotation ages vary but 100 years would be typical. Seeding by strip cutting or seeded tree method along with planting are the planned methods of regeneration. Pulpwood production is the primary management objective.

Table 28. Planned Regeneration Treatments - Black Spruce.

TOTAL ACRES IN TYPE: 955
10 YEAR ALLOWABLE CUT: 102
ANNUAL ALLOWABLE CUT: 10

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
BL SPR	163	13	0	0	0	176
TMRACK	43	0	0	0	0	43
TOTAL	206	13	0	0	0	219

Table 29. Planned Regeneration Treatments - Tamarack.

TOTAL ACRES IN TYPE: 3016
10 YEAR ALLOWABLE CUT: 298
ANNUAL ALLOWABLE CUT: 29

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
TMRACK	279	185	10	81	0	555
BL SPR	25	0	10	0	0	35
SPRUCE/CEDAR	84	0	0	0	0	84
ASPEN	0	0	0	0	31	31
TOTAL	388	185	20	81	31	705

Table 30. Planned Regeneration Treatments - White Cedar.

TOTAL ACRES IN TYPE: 134
10 YEAR ALLOWABLE CUT: 12
ANNUAL ALLOWABLE CUT: 1

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
WCEDAR	12	0	0	0	0	12
TOTAL	12	0	0	0	0	12

Northern Hardwoods

Natural regeneration along with some conversion of low quality northern hardwood sites by planting to conifers is being planned. This type is managed on an uneven age basis with saw logs as the main objective. Oak clumps will be retained for mast production for wildlife. Natural regeneration along with some conversion by planting to conifers is being planned. A clear-cut operation where aspen is present in sufficient numbers will convert the stand to low quality hardwoods to aspen.

Table 31. Planned Regeneration Treatments - Northern Hardwoods.

TOTAL ACRES IN TYPE: 1680
10 YEAR ALLOWABLE CUT: 196
ANNUAL ALLOWABLE CUT: 19

REGEN SPECIES	ARTIFICIAL PLANT	ARTIFICIAL SEED	NATURAL UNDER	NATURAL SEED	NATURAL SPROUT	TOTAL
NOR HW	0	0	13	0	199	212
ASPEN	0	0	0	0	126	126
W PINE	129	0	0	0	0	129
TOTAL	129	0	13	0	325	467

Ash and Lowland Hardwoods

Little or no change in acreage is planned for this type. Both uneven aged and clear-cutting will be done. Natural reproduction from seed and stump sprouting will regenerate the stand. Some conversion to conifers will be attempted.

Table 32. Planned Regeneration Treatments - Ash.

TOTAL ACRES IN TYPE: 309
10 YEAR ALLOWABLE CUT: 34
ANNUAL ALLOWABLE CUT: 3

REGEN SPECIES	ARTIFICIAL PLANT	ARTIFICIAL SEED	NATURAL UNDER	NATURAL SEED	NATURAL SPROUT	TOTAL
ASH	0	0	16	0	54	70
WCEDAR	13	0	0	0	0	13
TOTAL	13	0	16	0	54	83

Table 33. Planned Regeneration Treatments - Lowland Hardwoods.

TOTAL ACRES IN TYPE: 695
10 YEAR ALLOWABLE CUT: 78
ANNUAL ALLOWABLE CUT: 7

REGEN SPECIES	ARTIFICIAL PLANT	ARTIFICIAL SEED	NATURAL UNDER	NATURAL SEED	NATURAL SPROUT	TOTAL
WCEDAR	13	0	0	0	0	13
WH SPR	99	0	0	0	0	99
GR ASH	0	0	0	0	11	11
BL SPR	23	0	0	0	0	23
ASPEN	0	0	0	0	56	56
ASH	0	0	0	0	6	6
W PINE	9	0	0	0	0	9
TOTAL	144	0	0	0	73	217

Spruce-Fir

Since white spruce is a better upland deer winter yard species than Norway pine, an effort will be made to increase our planting in conversion areas of the Paul Bunyan State Forest. This type will be managed for both pulp and saw logs with a varying rotation age. An increase of this type is expected with natural succession and with an increase of white spruce planting.

Natural reproduction of balsam fir is occurring throughout the area, especially in the Paul Bunyan and Two Inlets State Forests. It is expected to increase substantially in the next ten years, especially in the overmature aspen forests. No balsam fir will be planted. Natural succession will increase the amount of balsam fir present in several timber types.

Table 34. Planned Regeneration Treatments - White Spruce.

TOTAL ACRES IN TYPE: 527
10 YEAR ALLOWABLE CUT: 35
ANNUAL ALLOWABLE CUT: 3

REGEN SPECIES	ARTIFICIAL PLANT	ARTIFICIAL SEED	NATURAL UNDER	NATURAL SEED	NATURAL SPROUT	TOTAL
WH SPR	9	0	0	0	0	9
TOTAL	9	0	0	0	0	9

Table 35. Planned Regeneration Treatment - Balsam Fir.

TOTAL ACRES IN TYPE: 1242
10 YEAR ALLOWABLE CUT: 238
ANNUAL ALLOWABLE CUT: 23

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
ASPEN	0	0	14	0	64	78
WH SPR	177	0	0	0	0	177
N PINE	302	0	0	0	0	302
WCEDAR	7	0	0	0	0	7
TMRACK	8	0	0	0	0	8
ASH	0	0	12	0	8	20
BL SPR	13	0	0	0	0	13
J PINE	68	0	0	0	0	68
TOTAL	575	0	26	0	72	673

Oak

Oak will be reserved in clumps when beneficial to wildlife. Scattered oak may be harvested where mixed with aspen or other hardwoods, relying on stump sprouting for regeneration. Some planting of oak may be attempted Oak acreage will not change significantly in the 10 year management period. Rotation age of 90 years is recommended. The objective will be to produce high quality saw logs. Wildlife considerations,especially in the Paul Bunyan State Forest will alter management recommendations.

Table 36. Planned Regeneration Treatments - Oak.

TOTAL ACRES IN TYPE: 3087
10 YEAR ALLOWABLE CUT: 315
ANNUAL ALLOWABLE CUT: 31

REGEN	ARTIFICIAL		NATURAL			
SPECIES	PLANT	SEED	UNDER	SEED	SPROUT	TOTAL
RD OAK	0	0	0	0	346	346
BR OAK	0	0	17	0	0	17
ASPEN	0	0	0	0	198	198
NOR HW	0	0	15	0	0	15
N PINE	17	0	0	0	0	17
J PINE	25	0	0	0	0	25
TOTAL	42	0	32	0	544	618

Non-Stocked

Areas around potholes, especially aspen areas killed by beaver will be left as is until surrounding aspen is cut. Since upland brush is very important wildlife habitat, some will be maintained in each forest management compartment. The larger upland brush types may be planted to conifers or maintained for wildlife.

Timber Stand Regeneration

All regeneration projects take into account forest pest management and wildlife considerations. Efforts will be made to promote species diversity within management blocks. Soils conditions are also important to ensure that species regenerated match site conditions. Pest management and soils are discussed in more detail in their respective narratives.

There are four forest regeneration objectives (listed in order of priority) in the Park Rapids Area. The first objective is to regenerate an equivalent amount of acreage as is harvested each year. The second objective is to regenerate the previously harvested areas that cannot adequately regenerate themselves or that are to be converted to a more suitable species for the site. This regeneration usually involves mechanical and/or chemical site preparation followed by planting. The third objective is to regenerate unstocked and understocked sites that are not needed for wildlife habitat or other purposes. A fourth objective, regeneration without harvest (aspen recycling), may have to be applied to overmature aspen. Wherever this is required, efforts will be made to utilize any merchantable wood if there is an opportunity to do so. An overall objective is to manage the forest in a way that will benefit wildlife populations while recognizing market conditions of the forest resource.

Table 37. Summary of Artificial Regeneration Needs for Next 10 Years.

SPECIES	PLANT(acres)	SEED(acres)
WCEDAR	139	0
WH SPR	813	0
BL SPR	116	121
W PINE	138	0
N PINE	2847	22
ASPEN	12	0
J PINE	1369	141
P PINE	0	7
TMRACK	217	298
TOTAL	5872	368

Timber Management Objectives 1986 - 1996:

- Prepare and maintain a regulated timber harvest management plan for the Area.
- Continue to supply the state market share of the timber harvested within the Area.
- Conduct an intensive timber sales and regeneration program to start correcting an imbalance in age -structure especially in the aspen type.
- Increase harvest of aspen in the western portions of the Area through innovative timber sales, salvage cuts and recycling if necessary.
- Conduct timber stand improvement activities to improve growth and stand quality.

Table 38. Report of Stand Prescriptions by Cover Type.

COVER TYPE	PRESCRIPTIONS											
	CLEAR CUT		THINNING		ALL-AGED		SALVAGE		REGEN		TOTAL	
	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES	STD	ACRES
ASH	6	70	0	0	0	0	0	0	1	13	7	83
LOW HW	9	152	0	0	0	0	1	14	2	51	12	217
ASPEN	344	17044	0	0	22	1208	8	257	2	47	376	18556
PBIRCH	33	874	0	0	1	6	4	68	0	0	38	948
BALM	4	21	0	0	0	0	0	0	0	0	4	21
NOR HW	13	308	0	0	17	314	5	159	0	0	35	781
OAK	15	387	6	198	3	61	5	231	0	0	29	877
W PINE	5	57	5	75	0	0	0	0	0	0	10	132
N PINE	38	680	110	1870	1	28	2	29	0	0	151	2607
J PINE	99	1311	0	0	0	0	2	50	2	26	103	1387
S PINE	0	0	0	0	0	0	0	0	0	0	0	0
WH SPR	1	9	2	56	0	0	0	0	0	0	3	65
BALSAM	22	332	0	0	1	5	10	273	3	68	36	678
BL SPR	10	219	0	0	0	0	0	0	0	0	10	219
TMRACK	23	383	0	0	2	28	6	97	5	225	36	733
WCEDAR	1	12	0	0	0	0	0	0	0	0	1	12
UPBSPR	0	0	0	0	0	0	0	0	0	0	0	0
CUT	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0
UPBRSH	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	623	21859	123	2199	47	1650	43	1178	15	430	851	27316

Coordination with Other Divisions

The timber management program requires coordination with several other DNR Divisions, especially with the Division of Fish and Wildlife. Forestry is responsible for habitat management on Forestry administered lands. Since wildlife management is a major concern, Forestry and Wildlife habitat guidelines have been developed to insure that forest management practices result in the achievement of the objectives of both divisions. (See Fish and Wildlife Habitat Management Program.)

The Park Rapids Area will assist other divisions in developing timber management plans for other DNR administered lands. Area staff will assist the Division of Parks and Recreation in determining a timber regulation scheme for State Parks in the Area upon request. This scheme should complement existing vegetative plans for State Park lands. Assistance will also be provided to manage timber resources on Division of Fisheries or Wildlife lands.

Objectives and Targets

Table 39. Timber Management - Park Rapids Area Staffing and Objectives, FY 85 and Projections for FY 87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
Staffing					
1. Area	fte	6.2	8.0	8.5	8.5
Objectives					
Timber Sales					
1. Conduct timber sales	M cords reoffer	28000	15000	30000	30000
on state land.	M cords offer	48000	45000	45000	45000
	M cords sold	9928	30000	30000	30000
2. Appraise & supervise	permits	170	60	60	60
special fuelwood sales	cords	1700	600	600	600
3. Timber scaling					
- Division scaled	M cords		2000	2000	2000
- Consumer scaled	M cords		25000	25000	25000
4. Administer consumer scale agreements	agreements	50	60	60	60
Silviculture					
1. Regeneration surveys	acres	2600	3000	3500	3500
2. Reforestation					
- site preparation	acres	521	500	400	400
- natural regeneration	acres	875	1200	1200	1200
- seeding	acres	5	0	50	50
- planting	acres	444	500	400	400
3. Release	acres	400	500	500	500
4. TSI	acres	350	400	400	200
5. aspen recycling	acres	30	200	400	100

Resource Management Units

RMU1

State land timber is found in small acreages and is mainly aspen and bur oak. These are either pioneer trees, springing up in the prairie due to infrequent fires or oak trees found on old undisturbed beach ridges within the prairie unit.

Trees are generally poorly formed and low in volume if found on beach ridges, due to the soil conditions.

Timber markets are generally poor, except for fuelwood, because of the small amount of state land and the quality or volumes present.

Management Strategy

Due to the extremely limited forest resources found in this resource management unit, all state land timber should be managed to benefit wildlife species by the Section of Wildlife.

Specific Proposals

Follow the Forestry/Wildlife Habitat Management Guidelines.

RMU2

There are 6,329 acres of state owned commercial forest land in this unit. Of these, 3,949 acres (62%) are in the northern hardwood forest type, which contains maple, basswood and oak. An additional 1,418 acres (22%) are in the aspen forest type. Other forest types contain relatively small acreages.

The northern hardwood types range from medium to good in timber quality, are predominantly from 40-70 years old, and 67% of the timber is in the 9"- 15" size class.

Eighty six percent of the aspen type is over age 40, and could be harvested. The majority of state land in this unit is administered by the Division of Parks and the Division of Fish and Wildlife.

Management Strategy

Timber management for Northern Hardwood types should be done primarily by selective thinning. An allowable partial cut should be developed for management on a sustained yield basis. Many factors would affect Northern Hardwood management, including:

1. Specific objectives of land administrator.
2. Access and location of specific land parcel.
3. Species composition, site index, and basal area of the type.
4. Timing of logging, because of heavier soils.
5. Wildlife considerations.

6. Insect and disease concerns, particularly Dutch Elm Disease.
7. Markets for products, both for saw timber and fuelwood.
8. Aesthetics.

TSI practices would also be needed in conjunction with commercial thinning.

The goal of aspen management in this Unit is to eventually distribute the age class structure. Many of the factors affecting Northern Hardwood management would also affect aspen management. Markets for pulpwood in particular play a critical role in the harvest of aspen, because of the Unit's location in relation to mills. consideration for shearing should be given to overmature stands in order to maintain the aspen type.

Specific Proposals

1. Use group selective cutting to maintaining red oak in northern hardwood and oak forest types.
2. Harvest all merchantable elm whenever feasible.
3. Help promote and develop markets for the aspen resource.
4. Remove trees of poor form and poor quality for fuelwood, to facilitate production of high quality hardwoods.
5. Monitor for gypsy moth incidence.
6. Any Forestry administered grass lands will be evaluated for retention by the Division of Forestry.

RMU3

There are 7,244 acres of State owned land in this unit. 1,567 acres (22%) is stocked with commercial growing stands of timber 3,071 acres (42%) is non-forest land; 1,904 acres of which is marsh. Lowland and upland grasses and brushlands account for 2,601 acres (36%) of the total State land in the unit.

Of the forest land, the major species are oak (54%) and northern hardwoods (24%). Aspen comprises only 9%, and tamarack 8% of the commercial forest land in the unit.

The oak and northern hardwood types range from medium to good in saw timber quality; are predominantly from 40-70 year old; and 81% of the timber is in the 9"- 15" size class. Eleven percent (11%) of the oak is greater than 15 inches in diameter.

Eighty-six percent of the aspen type is over age 40, and in need of harvest. The majority of state land in this unit is administered by the Division of Parks and Recreation and the Division of Fish and Wildlife.

Management Strategy

Same as RMU2.

Specific Proposals

Same as RMU2.

RMU4

There are 7,970 acres of state owned land in this unit. Three thousand three hundred ninety-four (3,394) acres (43%) is stocked with commercial growing stands of timber. One thousand seven hundred seventy-nine (1,779) acres (22%) is non-forest land; 1130 acres of which is marsh. There are 2,223 acres (28%) of lowland brush, and 456 acres (6%) lowland and upland grasses, mostly located in WMAs. Offsite oak comprises the remaining 1%.

Of the forest land, the major species are aspen (36%) and oak (33%). Northern hardwoods comprise 19% of the forested land. There is a sprinkling of tamarack swamps accounting for 8% of the total commercial forest land in the unit.

The northern hardwood types range from medium to good in timber quality; are predominantly from 40-70 years old; and 95% of the timber is in the 9"- 15" size class.

Seventy-eight percent (78%) of the aspen type is over age 40, and in need of harvest. However, the majority of state land in this unit is administered by the Division of Parks and Recreation and the Division of Fish and Wildlife. The strategy for timber management within parks will be for longer rotations, and in some cases preservation.

Management Strategy

Same as RMU2.

Specific Proposals

Same as RMU2.

RMU5

Most of the state timber land in RMU5 is located in the southeast corner of the unit in Crow Wing and Badoura Townships. Jack pine is the predominate species with 40% of the forest cover in this type (Table 38). Aspen is the next major species with 22% of the acreage. Tamarack, Norway pine and red oak are the other major species. Over 65% of the red oak is poor quality with site index of 50 or lower. Red oak and jack pine are important components in deer management decisions.

Marsh, lowland brush and upland grass accounts for 25% of the total State's ownership in this unit (Table 2). As this cover type is important for the sandhill crane and prairie chicken, attempts will be made to maintain this cover type.

Table 42 lists the age class distribution for all species on state lands in Unit 5. There is a critical imbalance in the age class distribution of jack pine. Forty-two percent of the jack pine is 50 years or older. Imbalanced age class distribution of

the other species are not as serious. The large acreage of jack pine in the 0-10 age class was due to natural seeding after the 1976 Huntersville-Badoura Fire.

Management Strategy

The jack pine type over 50 years old is deteriorating and subject to jack pine budworm infestation. It should be cut soon. The largest concentration of older jack pine is in Sections 36 of White Oak and Crow Wing Townships. Breaking up these large blocks of jack pine will reduce future outbreaks of the jack pine budworm. The allowable cut for jack pine is 75 acres per year and only about half of the planned cut has been sold in the last five years. If markets do not improve, reduction of stumpage prices or adjustments in cutting regulations may be needed to sell more of this overmature jack pine.

Most of the jack pine previously cut has been converted to Norway pine. About one third of the cut jack pine is being replanted to jack pine. This species is an important component in the forest and valuable for wintering deer.

The overall jack pine type in this unit will be greatly reduced in the future as the Potlatch Corporation is converting all of their jack pine lands to Norway pine.

A good share of the oak type is located in the Crow Wing WMA. Small patches are being cut for fuelwood to provide habitat diversity.

On the 271 acres of Norway pine 40 years or older, commercial selective cuts are made at 10 year intervals to keep the stands between a basal area of 90 to 130 square feet per acre. Aspen in this unit is difficult to sell as the timber is further than 50 miles from the primary market area. Price reductions and other incentives are made to encourage cutting to maintain the aspen type.

Specific Proposals

The jack pine acreage on State land will be reduced and Norway pine acreage increased. This will be done to break up the large extensive areas of jack pine. Even though Norway pine is susceptible to jack pine budworm, the damage done is not as severe and results in very little mortality. The economic returns are also substantially higher, and it can be managed for twice the rotation age of jack pine. This reduces the overall capital investment for a 100 year period.

Both natural and artificial seeding of jack pine will be tried to reduce the cost of regenerating jack pine. "Hot Cap" seeding with minimal site preparation is also an alternative to the high initial costs of regenerating a lower valued species.

Jack pine budworm is at an epidemic population level and innovative timber sales may be needed to harvest infested stands. Recycling of jack pine may be a necessity in heavily damaged stands.

Table 40. Commercial Forest Land--State Ownership in RMU 5.

Cover Type	Acres
Ash	13
Willow	0
Lowland Hardwoods	31
Aspen	1631
Birch	281
Balm of Gilead	0
Cottonwood	0
Northern Hardwoods	0
Walnut	0
Oak	780
Central Hardwoods	0
White Pine	9
Norway Pine	845
Jack Pine	2926
Scotch Pine	7
Ponderosa Pine	0
White Spruce	0
Balsam Fir	63
Black Spruce Lowland	154
Tamarack	588
Northern White Cedar	2
Black Spruce Upland	12
Red Cedar	0
TOTAL	7342

Table 41. State Ownership of Non-Forest, Non-Stocked and Unproductive Forest Lands in RMU5.

Cover Type	Acres
Agricultural	307
Industrial Development	126
Recreational Development	107
Roads	31
Rock Outcrop	0
Permanent Water	169
Non-Permanent Water	16
Marsh	1589
Muskeg	0
TOTAL	2345

Table 42. Non-Stocked Forest Lands in RMU 5.

Cover Type	Acres
Cutover Area	39
Lowland Grass	50
Upland Grass	335
Lowland Brush	1234
Upland Brush	66
Duff	0
Moss	0
TOTAL	1724

Table 43. Unproductive Forest Lands in RMU 5.

Cover Type	Acres
Stagnant Spruce	0
Stagnant Tamarack	0
Stagnant Cedar	0
Offsite Aspen	0
Offsite Oak	32
TOTAL	32

Table 44. Acres of Commercial Cover Type by Age Class in RMU 5.

Cover Type	00-10	11-20	21-30	31-40	41-50	51-60	61-70
Ash	0	0	0	0	0	6	0
Aspen	107	65	78	199	500	682	0
Balsam Fir	15	13	0	0	0	27	8
Birch	0	0	0	0	15	19	247
Black Spruce/Upland	0	0	5	0	0	7	0
Black Spruce/Lowland	0	7	0	0	30	0	0
Jack Pine	209	41	172	501	782	882	236
Lowland Hardwoods	0	0	0	0	0	0	10
Northern White Cedar	0	0	2	0	0	0	0
Norway Pine	407	91	30	42	97	0	73
Oak	140	16	0	8	25	61	403
Scotch Pine	0	0	7	0	0	0	0
Tamarack	0	31	13	0	77	30	204
White Pine	0	0	0	0	0	9	0
Total Acres	878	264	307	750	1526	1723	1181

Cover Type	71-80	81-90	91-100	101-120	121+	Total
Ash	7	0	0	0	0	13
Aspen	0	0	0	0	0	1631
Balsam Fir	0	0	0	0	0	63
Birch	0	0	0	0	0	281
Black Spruce/Upland	0	0	0	0	0	12
Black Spruce/Lowland	46	13	58	0	0	154
Jack Pine	78	25	0	0	0	2926
Lowland Hardwoods	21	0	0	0	0	31
Northern White Cedar	0	0	0	0	0	2
Norway Pine	91	10	4	0	0	845
Oak	0	127	0	0	0	780
Scotch Pine	0	0	0	0	0	7
Tamarack	25	62	115	31	0	588
White Pine	0	0	0	0	0	9
Total Acres	268	237	177	31	0	7342

RMU6

There are 37,976 acres of commercial forest land in RMU6. Aspen comprises 46% of the commercial forest acres in this unit, followed by 9% Norway pine and 9% jack pine, and lesser amounts of other types. Aspen and pine constitute the major part of timber management in the unit. Table 45 shows the breakdown of timber type acreage.

Table 45. Commercial Forest Land in RMU 6.

Cover Type	Acres
Ash	212
Willow	0
Lowland Hardwoods	711
Aspen	17452
Birch	2745
Balm of Gilead	30
Cottonwood	0
Northern Hardwoods	1972
Walnut	0
Oak	1805
Central Hardwoods	0
White Pine	184
Norway Pine	3507
Jack Pine	3404
Scotch Pine	0
Ponderosa Pine	0
White Spruce	360
Balsam Fir	1696
Black Spruce Lowland	916
Tamarack	2966
Northern White Cedar	16
Black Spruce Upland	0
Red Cedar	0
Total	37,976

Table 46. Non-Forest Lands in RMU 6.

Cover Type	Acres
Agricultural	36
Industrial Development	12
Recreational Development	62
Roads	130
Rock Outcrop	0
Permanent Water	1560
Non-Permanent Water	60
Marsh	2576
Muskeg	20
Total	4,456

Table 47. Non-Stocked Forest Lands in RMU 6.

Cover Type	Acres
Cutover Area	643
Lowland Grass	311
Upland Grass	302
Lowland Brush	1135
Upland Brush	187
Duff	0
Moss	0
Total	2,578

Table 48. Unproductive Forest Lands in RMU 6.

Cover Type	Acres
Stagnant Spruce	14
Stagnant Tamarack	8
Stagnant Cedar	0
Offsite Aspen	0
Offsite Oak	239
Total	261

Management Strategy

Numerous factors affect management of a timber type:

- Access and location of specific type.
- Markets.
- Species composition of the type, and age and site index.
- Reforestation plans.
- Insect and disease concerns.
- Timing of logging - affecting soils and regeneration.
- Utilization of non-merchantable trees.
- Wildlife considerations.
- Unique Species.
- Dispersion of Cutting to Diversify Habitat.
- Size and Shape of Sales.
- Wetlands and Upland Openings.
- Deer Concentration Areas.
- Aesthetics and Recreation.

All of these factors must be considered when timber harvest is planned.

Table 49 shows the age distribution for each timber type. Eighty-eight percent (88%) (15,358 acres) of the aspen type in this unit is over age 40. Increased harvest is necessary to eventually balance the age class structure to assure a stable future supply. Aspen shearing should be considered for over-mature types where timber harvest is not feasible or expected very soon.

Table 49. Acres of Commercial Cover Type by Update Age Class in RMU 6.

Cover Type	00-10	11-20	21-30	31-40	41-50	51-60	71-80
Ash	27	16	5	0	0	0	15
Aspen	1171	368	86	469	5179	6821	2925
Balm of Gilead	14	0	0	4	6	0	0
Balsam Fir	10	343	163	57	330	322	295
Birch	19	0	0	79	301	1050	1140
Black Spruce Lowland	0	58	113	8	35	36	53
Jack Pine	70	0	65	199	1314	1006	508
Lowland Hardwoods	0	0	0	0	27	13	84
Northern White Cedar	0	0	0	0	0	16	0
Northern Hardwoods	53	0	0	18	373	166	624
Norway Pine	894	599	123	25	251	53	429
Oak	11	15	0	4	6	991	440
Tamarack	29	200	230	316	137	222	134
White Pine	0	0	0	35	0	0	35
White Spruce	82	148	18	24	73	0	15
Total Acres	2380	1747	803	1238	8032	10696	6697

Cover Type	71-80	81-90	91-100	101-120	121+	Total
Ash	45	21	24	46	13	212
Aspen	419	14	0	0	0	17452
Balm of Gilead	6	0	0	0	0	30
Balsam Fir	117	36	23	0	0	1696
Birch	156	0	0	0	0	2745
Black Spruce Lowland	169	103	205	91	45	916
Jack Pine	229	13	0	0	0	3404
Lowland Hardwoods	55	156	36	327	13	711
Northern White Cedar	0	0	0	0	0	16
Northern Hardwoods	373	130	183	52	0	1972
Norway Pine	500	433	102	94	4	3507
Oak	126	202	4	6	0	1805
Tamarack	393	225	680	255	145	2966
White Pine	86	28	0	0	0	184
White Spruce	0	0	0	0	0	360
Total Acres	2674	1361	1257	871	220	37976

Thirty-nine percent (1,362 acres) of the Norway pine type are in the 60-90 year old category. Commercial thinning should be planned for these types.

Jack pine also shows an age imbalance, with 90% (3,070 acres) of the jack pine type over age 40. Increased harvest will be necessary to prevent serious tree mortality. The emphasis in jack pine management should be to successfully reforest clear-cut areas of site index 60+ back to jack pine, a more desirable conifer species from a wildlife standpoint.

Northern hardwood types in this unit produce poor to medium quality logs, with the main product being fuelwood. Commercial thinning and TSI should be done on high site index types. Clear-cutting is the only feasible method for medium and poor site index types. Possible conversion to conifers should be considered on poor hardwood sites.

Specific Proposals

1. When timber harvest occurs along a state highway, the following guidelines should be considered:
   a. Timber inside the designated right-of-way should be reserved from cutting unless it is susceptible to blowdown because of age or poor condition. If harvest is necessary, it must be coordinated with MN/DOT.
   b. The timber harvest area should not exceed 1/4 miles along one side of the highway at one given time.
   c. Timber sale shape and size shall be designed to minimize the visual impact of logging and to maintain an aesthetic appearance along the highway.
2. Implement aspen recycling projects for overmature aspen in areas where market demand for aspen is poor.
3. Develop ruffed grouse management areas which would involve shearing of overmature aspen to promote aspen regeneration.

RMU7

Of the 15 forest types, aspen is the predominant specie followed by the three conifer species Norway pine, jack pine and white pine (Table 50). Of the upland hardwoods, red oak is the major species and is an important component for deer management decisions. Lowland conifers consisting of black spruce, tamarack, balsam fir and white cedar cover less than 2% of the forest, and are of minor importance in forest management decisions. Most of this spruce fir type is concentrated south of Kabekona Lake and are important winter deer yarding areas.

Table 50. Commercial Forest Land in RMU 7.

Cover Type	Acres
Ash	112
Willow	0
Lowland Hardwoods	45
Aspen	38149
Birch	373
Balm of Gilead	0
Cottonwood	0
Northern Hardwoods	65
Walnut	0
Oak	1003
Central Hardwoods	0
White Pine	223
Norway Pine	1983
Jack Pine	1033
Scotch Pine	0
Ponderosa Pine	0
White Spruce	239
Balsam Fir	30
Black Spruce Lowland	235
Tamarack	28
Northern White Cedar	155
Black Spruce Upland	144
Red Cedar	0
Total	43817

Table 51. Non-Forest Lands in RMU 7.

Cover Type	Acres
Agricultural	2
Industrial Development	85
Recreational Development	24
Roads	81
Rock Outcrop	0
Permanent Water	970
Non-Permanent Water	14
Marsh	1028
Muskeg	0
Total	2204

Table 52. Non-Stocked Forest Lands in RMU 7.

Cover Type	Acres
Cutover Area	124
Lowland Grass	0
Upland Grass	149
Lowland Brush	169
Upland Brush	78
Duff	0
Moss	0
Total	520

Table 53. Unproductive Forest Lands in RMU 7.

Cover Type	Acres
Stagnant Spruce	0
Stagnant Tamarack	0
Stagnant Cedar	0
Offsite Aspen	0
Offsite Oak	0
Total	0

The predominant aspen forest cover shows the extreme uneven age class distribution of the species. Table 52 shows the age class distribution of all species in this unit.

Table 54. Acres of Commercial Cover Type by Age Class in RMU 7.

Cover Type	00-10	11-20	21-30	31-40	41-50	51-60	61-70
Ash	0	0	0	0	0	0	37
Aspen	3420	4938	555	313	4944	20503	3476
Balsam Fir	0	0	0	0	0	13	17
Birch	0	0	0	0	159	200	14
Black Spruce Upland	0	0	144	0	0	0	0
Black Spruce Lowland	0	0	0	0	3	49	22
Jack Pine	0	15	35	36	215	508	192
Lowland Hardwoods	0	0	0	0	9	0	36
Northern White Cedar	0	0	20	0	0	14	29
Northern Hardwoods	0	0	0	0	0	46	0
Norway Pine	366	540	223	16	112	6	20
Oak	0	0	0	0	66	484	132
Tamarack	0	0	0	0	13	0	0
White Pine	0	0	0	3	0	0	0
White Spruce	8	185	46	0	0	0	0
Total Acres	3794	5678	1023	368	5521	21823	3975

Cover Type	71-80	81-90	91-100	101-120	121+	Total
Ash	75	0	0	0	0	112
Aspen	0	0	0	0	0	38149
Balsam Fir	0	0	0	0	0	30
Birch	0	0	0	0	0	373
Black Spruce Upland	0	0	0	0	0	144
Black Spruce Lowland	32	0	8	30	91	235
Jack Pine	25	7	0	0	0	1033
Lowland Hardwoods	0	0	0	0	0	45
Northern White Cedar	30	7	43	0	12	155
Northern Hardwoods	0	0	0	19	0	65
Norway Pine	269	86	202	137	6	1983
Oak	321	0	0	0	0	1003
Tamarack	0	0	0	15	0	28
White Pine	20	64	69	67	0	223
White Spruce	0	0	0	0	0	239
Total Acres	772	164	322	268	109	43817

Management Strategies

This unit is unique because its cover type is 87% aspen with 63% (24,000 acres) of this timber overmature. When running the TIMPIS program, a rotation age of 40 years was used. This was done so there would be a higher allowable cut in aspen and the age imbalance would be corrected more quickly.

By offering 1,200 acres of aspen for sale per year in the first 10 year management period, there will be a large increase of timber in the 61-70 year class. (See table 53.) However, it is felt that it would be better to hold timber on the stump rather than offering a large amount of timber at one time. Because of RMU 7's close proximity to several large wood-using industries in the Bemidji area, aspen recycling will not be necessary on a large scale. However, recycling is a strategy that can be used if allowable cuts are not sold, or for shearing unmerchantable, diseased or storm damaged stands.

Oak is a component of the forest that is desirable to maintain. Oak clumps of a least six trees and up to 5 acres in size are being reserved for wildlife benefits on many of the timber sales. The smaller clumps are not expected to expand and will be type mapped as aspen. The oak generally has low site indexes. But for diversity and wildlife, oak clumps will be retained. Most of the regeneration will be from stump sprouts and will be managed for bolts and small saw logs.

A considerable amount of birch is cut along with the aspen and pine. It is usually mixed in with the aspen type. Only a small acreage is type mapped as pure birch. Birch will resprout as it is cut and will continue to be a component of the aspen type.

Upland conifers consist mainly of Norway and jack pine. Phase II inventory data indicates that 700 acres of Norway pine should be partial cut over the next 10 years. There are at least another 1500 acres of conifers planted or seeded under aspen types. These plantations as well as natural white pine regeneration stands should be released in the next 10 years. Because of the jack pine type's value to deer, an attempt will be made to expand the present jack pine acreage. Conversion sites will be considered for planting to jack pine.

Aspen/oak areas will be allowed to regenerate back to aspen/oak. Conversion will be considered depending on FHC (forest habitat compartment) needs. Winter thermal cover is lacking and reforestation to jack pine or other high wildlife value species would be beneficial.

Management, especially along roads, will consider both the short and long-term effects of logging or lack of logging. The immediate aesthetic impact from logging will be weighed against the long-term aesthetic loss due to the deterioration of the mature stand.

When it becomes necessary or desirable to cut along a road, advance preparations can minimize the short term visual damage. This may involve thinning or cuttings to allow reproduction to screen out the final cut. Enforcement of cutting regulations and good permit supervision will be critical to insure minimal aesthetic effects.

Herbicide spraying for site preparation, roadside right-of-way maintenance, and plantation release will continue to be a major forest management tool. Strict guidelines will be followed according to State policy and label directions. Ground application of approved chemicals will be encouraged as more contractors and equipment become available.

Herbicide spraying for the release of plantations should be planned to minimize interference with fruit production of lowland and upland brush species for that growing season. This can be accomplished by different methods such as date of spraying, type of herbicide used and by ground application and avoid treating areas such as windrows where a high portion of fruit bearing species are located.

Specific Proposals

The 10 year cover type composition goal is to increase the conifer type by approximately 150 acres per year. Norway pine, jack pine and white spruce will be the primary conifers planted. The recommended composition goal for this unit is 20% conifer cover, but will not be met in this management period. An increase of specific conifers such as jack pine, white spruce and cedar will be encouraged. By 1995 there will be 1500 acres of conifers from the aspen conversion types and another 1000 acres of white pine regeneration that will be released. This will increase the total conifer type in the unit to 15% of the total cover type. By the year 2000, the recommended 20% conifer cover type should be attained.

Rotation age recommendations for this unit are: aspen - 50 years, Norway - 100 years, oak - 90 years, and jack pine - 60 years. White pine rotation will be more variable; from 100 to 140 years, depending on the establishment of natural regeneration.

Most of the high risk timber within this management unit will be harvested as soon as possible in the 10 year management period 1986-1995. Aspen stands with 15-25% of the basal area infected with Hypoxylon canker will be given a high priority for harvesting. Stands with infection rates greater than 25% will be considered for conversion to conifers.

On September 5, 1985 a major storm blew down approximately 1000 acres of mature aspen timber and severely damaged several hundred acres of reproduction. Some of this blowdown may require shearing to regenerate the aspen type.

There are 184 acres of aspen forests with less than 8 cords per acre, too low a volume to be marketable. Some of this acreage will left for old growth timber.

Timber management and sales along State highways will take into consideration road right-of-ways. A special concern along Minnesota Highway #64 exists. There is a right-of-way easement of 125 to 130 feet from the highway centerline through the Paul Bunyan State Forest. No cutting is permitted in this corridor without prior approval by the Minnesota Department of Transportation. The following guidelines will be practiced when harvesting in proximity to State highways:

1. Cut existing mature aspen at a rotation age of 60 to 70 years adjacent to the highway.
2. No clear-cuts for more than 1/4 mile adjacent to the highway.
3. Do not cut adjacent timber or timber across the highway from clear-cut areas for a 5-year period (i.e., cuts will be staggered to allow for regrowth).
4. Leave oak, maple, and other long lived species with colorful autumn foliage in clumps within 100 feet of the highway ROW. This also includes Norway and white pine.
5. When cutting along the roadside edge, all debris and tree tops will be removed from the highway ROW.
6. White and Norway pine adjacent to or visible from the highway will be selectively cut using a longer rotation period to maintain a "big tree" concept.

FISH AND WILDLIFE ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The Park Rapids Area has a diverse assemblage of wildlife species due primarily to the variety of habitats (plant communities) present. Prairie, wetland, coniferous and deciduous forest types are all represented.

Plant communities form what collectively makes up wildlife habitat. Habitat provides cover, structure and food that wild animals need to survive. The interdependence of plants and animals is demonstrated by certain wildlife species being present in only one particular plant community.

Forest management practices have a great potential to significantly affect (decrease and/or improve) wildlife habitat in the forested portion of Minnesota. Due to the suppression of wildfire in the northern forest ecosystems, most changes in habitat presently result from planned management. This purposeful management determines the age, composition, size and distribution of timber stands in the forest. All of these attributes affect a stand's value as wildlife habitat. Diversity is the focus of wildlife management in relation to forest management.

The most extensive cover in the area occurs in Hubbard and eastern Becker counties where there are sizeable holdings of state and county land. Such large tracts of public ownership provide wildlife management opportunities not presently available on private land. In planning management activities on these lands some habitats will require special consideration.

The environmental impact of forest management practices has received increased attention in recent years. The link between forestry and water quality planning originates with the passage of the 1972 Federal Water Pollution Control Act which gave us legislatively mandated water quality goals. The objective is to restore and maintain the chemical, physical and biological integrity of the nations water. In 1980 the Governor signed the Minnesota Water Quality Plan called for in the Federal Act. The Plan identified several areas of concern: Construction of roads in forest lands; recreational activities; and certain site preparation activities such as root and rock raking and plowing. The plan went on to say "The study of the relationship of forestry activities to water quality in Minnesota indicates that water pollution is not generally severe in forested areas. However, in both the current and proposed revised water quality classifications, an extremely high proportion of highly classified waters are in forested areas. Therefore, whenever pollution does occur from forested lands, it is likely to harm a high-quality environment." Special attention needs to be given to forest management operations that have the potential to harm water quality and aquatic life.

Wildlife habitats requiring special consideration during forest management in the Park Rapids Area are deer wintering complexes, forest openings, riparian zones, extensive forest areas, old growth forests, northern hardwoods, oak, wetlands, brushlands and native prairies.

Deer Wintering Complexes

Good quality winter habitat is vital to the survival of deer populations. These areas need consideration in planning forest management activities as well as in making recommendations to private landowners in the transition and agricultural areas within the Park Rapids Area. A more complete inventory of deer wintering complexes is needed to provide a better guide for future management.

Forest Openings

A forest opening is an upland grass/herbaceous area 1/2 to 10 acres with less than 10% trees and shrubs. Natural succession, plantation development and fire suppression have reduced the number of forest openings. Examination of 91,000 acres of public and private land reveals only three fourths of one percent (0.75%) of the upland area is made up of forest openings. Within state forests three-tenths of one percent (0.3%) of the upland area is made up of permanent forest openings. Five percent of the upland forest area is the goal for forest openings.

Riparian Zones

Riparian zones can be defined by the presence of vegetation which requires free water or an environment which is more moist than dry. 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.

This complex interaction makes this zone extremely vulnerable to direct disturbance by various land management activities (i.e., prescribed burning, logging, road construction, chemical use and grazing). Forested riparian zones are prime candidates for permanent old growth designation. Wildlife species indicative of quality riparian zones are:

Barred Owl
Broad-winged Hawk
Great Blue Heron
Goldeneye
Spotted Sandpiper
Pileated Woodpecker
Belted Kingfisher
Green Frog
Beaver
Otter
Wood Turtle
Snapping Turtle
Fisher
Wood Duck
Mink
Black Bear
Numerous Crustaceans & Invertebrates

Extensive Forest Areas

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, highways, pipelines, transmission lines, surface mining, agriculture, and timber harvesting, many of these species are adversely affected, some of them significantly. Special emphasis should be made to identify tracts of unfragmented forest areas to manage for the associated nongame wildlife species.

Old Growth Forest

Old growth forests are characterized by abundant snags, cavity forming trees and large, decaying logs on the forest floor. Old growth is a stand that is past full maturity and showing decadence and containing unique plant and animal communities.

Northern Hardwoods and Oak

The northern hardwood type is characterized by self-perpetuating, shade tolerant vegetation. Species composition is typically 70-75% maple and basswood mixed with, oak, aspen, paper birch, elm and ash in varying combinations.

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. The following species commonly occur in northern hardwood forests:

Pileated Woodpecker	Black Bear
Flying Squirrel	Chipmunk
White-footed Mouse	American Redstart
Ovenbird	Chestnut-sided Warbler
Black and White Warbler	Rose-breasted Grosbeak
Wood Frog	Gray Tree Frog
Red-bellied Snake	Common Garter Snake

Northern hardwoods and/or 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 red oak and bur 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. Thirty-seven species of songbirds consume acorns. However, light seeded mast producers such as cherries, birch, elm and maple may be more important to nongame species as their production tends to be less variable.

Wetlands

Wetlands in forested areas are essential to waterfowl, furbearers and numerous nongame species. Wetlands need consideration in timber harvesting by utilizing buffer strips to provide cavity trees for wood ducks, goldeneyes and hooded mergansers. These strips also help reduce nutrient and silt loading.

Brushlands

Habitats of an open brushy nature are of tremendous importance to wildlife. This was quantified by a recent Chippewa National Forest study which ranked 20 habitats based on wildlife habitat diversity. Permanent openings ranked first, shrub-sapling ranked second, shrub-swamp ranked sixth and young deciduous upland was seventh. Open brushland is the main habitat for sharp-tailed grouse, moose (especially in Northwest Minnesota) and a host of nongame species like sandhill cranes, yellow rails and sharp-tailed sparrows. Brushlands are of prime importance to deer in the Spring and harbor a wealth of unique flora. With the exception of climax stages of vegetational succession, brushland is one of our most important habitats for species which utilize successional stages. Although brushland does not constitute a large acreage in the Park Rapids Area, it should be preserved for wildlife in all areas, especially southeastern Hubbard County.

Native Prairies

Native prairies are an increasingly rare plant community. The Park Rapids Area contains a large portion of Minnesota's remaining prairie tracts. However, many native prairies are privately owned. These areas need to be thoroughly identified by the Section of Wildlife. Once identified these tracts will be evaluated,preserved and managed. In many situations prairie tracts exhibiting poor quality have become so because they were used for agricultural purposes or neglected. Grazing and lack of fire are primary reasons they have deteriorated. These areas can be improved through prescribed burning and proper management.

Utilization

Wildlife provides diverse opportunities for hunting, trapping and nature observation in the Park Rapids Area. In 1983, 37,863 deer licenses, 21,630 small game licenses, 11,538 waterfowl stamps, 9,106 pheasant stamps and 1,662 trapping licenses were sold in the Park Rapids Area. The issuing fee revenue for these licenses has an immediate impact on the local economy. In 1983 this represented a $70,815 direct return to the economy of the counties in the Park Rapids Area.

The Park Rapids Area, especially the forested portions of eastern Becker and Hubbard counties, receives a considerable number of hunters from other areas of the state including the Twin Cities metropolitan area. During 1984, 22,000 deer were registered in the Park Rapids Area. From hunter questionnaires representing persons who hunted in the Park Rapids Area, the average number of days spent hunting to take a deer was about seven. Using this

information, it can be determined about 154,000 hunter days were spent hunting deer. This results in several million dollars a year expenditure.

The State Comprehensive Outdoor Recreation Plan study of recreational activities estimated the average weekly rate of citizen participation in bird watching/nature study in the Park Rapids Area as 15,318 occasions. This was an average over a 17 week period. The report also predicted a 26% increase to 19,325 average weekly occasions of bird watching and nature study in the area by 1995.

PROGRAM DIRECTION

Area-wide

The Fish and Wildlife Habitat Management Program goal of the Division of Forestry is to improve and maintain forest related habitat for fish and wildlife. DNR Commissioners Guidelines No. 8 states, "As state administered lands are to be managed for compatible multiple use benefits, unless otherwise dedicated by law, both Divisions of Forestry, and Fish and Wildlife are jointly charged with the responsibility of achieving the goal of integrating forest and wildlife management, while recognizing other multiple use purposes."

The Division of Forestry has two primary means of managing forest wildlife habitat: 1) management with the primary objective of producing timber, but with modifications that allow secondary fish or wildlife objectives to be attained. 2) management practices solely designed to improve fish or wildlife habitat or to provide access to habitat.

Increased inter-disciplinary interaction in developing guidelines for habitat management will be emphasized in the Park Rapids Area. Cooperative planning, implementation and training will also be emphasized. Sharing common data and inventory information will also help improve communications and coordination of multiple use management activities among foresters, wildlife and fisheries managers.

Forestry/Wildlife guidelines for habitat management have been developed to help integrate forest and wildlife management on all state administered lands as well as non-DNR lands. Implementation of the practices delineated in these guidelines will help meet wildlife management objectives through forest management practices.

Limited wildlife resource surveys have been conducted either recently or historically within the Park Rapids Area. Special inventories have been conducted on endangered, threatened and special concern plant and animal species, certain game species and natural communities in the area. Due to the diversity and extent of forest cover types and large acreages of public land, it is not possible to make definite statements about the well being of most wildlife populations which are not hunted. More

detailed information is necessary for future management of many wildlife species. To the extent possible wildlife inventories should be integrated into forest inventory activities conducted in the Park Rapids Area.

Timber and fish management objectives on public lands will be integrated to protect aquatic habitat. Cutting practices in proximity to unique fish habitats shall be modified to protect and enhance the fisheries and other aquatic resources. A 200 foot buffer strip shall be reserved from timber harvest along all designated trout lakes and streams. A 100 foot buffer strip will be left around other aquatic habitats (see area-wide guidelines). Partial cutting may be done if jointly planned by the Forester and Fisheries manager. State forestland will be managed in ways that benefit aquatic habitats.

Habitat Management Needs

The Forestry-Wildlife guidelines provide forest composition criteria that generally refer to benefits for deer and ruffed grouse. The Forest Wildlife Habitat Evaluation Procedures Manual provides guidelines on which to judge the quality of deer habitat based on a four-section habitat compartment.

The following compositional guidelines are for the forested zone, RMUs 5, 6, and 7:

1. Forty-five (45) to 65% intolerant species (aspen, birch, oak).
2. With no less than 35% being aspen.
3. No less than 5% in upland grass/herbaceous permanent forest openings.
4. Not more than 20% conifer winter cover.
5. Not more than 30% of the upland in conifer plantations, spruce-fir, or northern hardwoods or 45% in combination.
6. Ten percent (10%) of the upland in regeneration types (0 to 10 years).
7. No less than 25% of aspen type in 0 - 10 years.

Ruffed grouse are highly dependent upon aspen. They need three age classes consisting of saplings for brood rearing cover, young pole-sized stands for drumming sites and nest cover, and mature male aspen buds for winter food supplies. In designated areas specifically being managed for ruffed grouse, these age classes need to be well interspersed in small blocks of 1-10 acres. Generally large tracts are desirable for ruffed grouse management (1000-2000 acres); however, ruffed grouse can be managed on units as small as 40 acres.

Composition goals for species such as ruffed grouse, bear, beaver, woodcock, squirrels, furbearers and other species will not be restricted to the four square mile compartment analysis. Certain species will need larger areas for evaluation while others can be addressed on a smaller unit basis.

Deer Wintering Complexes

Traditional deer wintering areas require consideration in planning forest management activities. Deer habitat management should be given priority over timber management based on site specific goals. Jack pine stands that have been identified for harvesting should have harvesting delayed until alternate thermal cover is established within that compartment. Winter complex areas should be kept intact. Jack pine areas, once harvested, should be regenerated back to jack pine where they are providing high wildlife value. High deer populations may hinder Jack pine regeneration. In those situations white spruce should be chosen over pine species as replacement thermal cover.

In the transition and agricultural areas wooded river bottoms, brushlands and wetlands are the only remaining deer wintering areas. Maintenance of these areas is essential and will require close cooperation between forestry and wildlife personnel since many of these areas are on private land.

A more complete inventory of deer wintering complexes is needed to provide a better guide for future management. Cooperation between forestry and wildlife personnel in forest inventory review, aerial photo interpretation and field inspection will help identify these areas.

Forest Openings

Inventory, creation and maintenance of permanent forest openings should be given high priority in future forest management. Since these areas will be developed in conjunction with timber harvest, maintenance of landings on timber sales as permanent openings should be stressed. Existing forest openings should not be reforested. Frequent communication with wildlife personnel will be necessary for meeting forest opening composition goals. The goal is to create 150 acres annually. At this rate (depending on funding) in 10 years 2% of the forest should be in openings.

Riparian Zones

Timber resources in riparian zones provide wildlife habitat throughout intensive agricultural areas where little other habitat exists. The diversity of wildlife species present in these zones provides aesthetic and recreational benefits for visitors and residents. Wildlife guidelines should be utilized in formulating management practices to protect and enhance all associated wildlife resources. These areas provide high species diversity and should be considered for permanent old growth designation.

Extensive Forest Areas

Extensive forest areas (at least one square mile of unfragmented forest) should be identified and evaluated for their possible potential for habitat required by some migrant bird species (i.e., wood warblers).

Old Growth Forests

Establishment and maintenance of old growth forests will provide an element of habitat diversity which will contribute to the stability of wildlife populations. Some wildlife species are entirely dependent on old growth stands for their existence. To provide an adequate amount of old growth for each timber type will be reserved for management as old growth. This will be accomplished through the timber sales planning process. This topic is being addressed statewide by the Department. Interim agreements pertaining to the Park Rapids Area are in the Wildlife Appendix.

Northern Hardwoods and Oak

Northern hardwood and oak stands need to be managed for their associated wildlife benefits. Because northern hardwoods are long lived, self perpetuating, and in low demand for wood fiber they are prime candidate areas for old growth designation. No fuelwood cutting should be allowed in areas so designated, except for perpetuation of oak types. Northern hardwood or oak stands should not be considered for type conversion. Oak clumps should be maintained whenever possible for mast production in all timber types.

Wetlands

Wetlands are essential wildlife habitat that require preservation, improvement, restoration and creation. Buffer strips are required adjacent to wetlands to lessen impacts of forest management activities.

Use of wetland basins and associated fringes for winter log landing locations will be discouraged. Wetlands should not be used as slash disposal areas. Wetlands will be given special consideration in planning road construction.

Through proper planning, construction of impoundments both large and small will provide wetland habitat without jeopardizing other management activities. Identification of future impoundment sites is necessary in future management decisions.

Prescribed burning of designated wetland complexes will be required to prevent natural succession of sedge meadows to rank, dense shrub swamps. Maintaining these lowland complexes is necessary to maintain sandhill crane and prairie chicken populations in southeastern Hubbard County.

Brushlands

Brushlands constitute a small percentage of cover types in the Park Rapids Area, except in southern Hubbard County. They should be preserved and maintained for their high value for numerous wildlife species. Brushlands in the agricultural area also provide winter areas for deer and pheasants. Prescribed burning is the best treatment for maintaining brushlands.

Native Prairie

Native prairie is an increasingly rare plant community. Prairie sites should be identified, evaluated, preserved and managed. Under no circumstances should native prairie areas be proposed for planting or type conversion. The Prairie Tax Credit provides incentives to preserve native prairie on private lands. Forestry and Wildlife personnel will encourage and assist landowners in this program.

Special Species Habitat Management

Endangered, threatened and special concern species have specific habitat needs which include habitat identification, protection and management. Often, management considerations can be implemented by cooperative forestry-wildlife projects. Other indicator and sensitive species such as colonial birds must be given consideration in future forest management practices.

The Forestry/Wildlife Guidelines will have to be followed closely for bald eagle, red shouldered hawk, great gray owl, osprey and colonial birds. Prescribed burning and curtailment of reforestation practices on both public and private land will be required on designated areas for prairie chicken and sandhill crane. More census, survey and evaluation will be needed for development of management plans for prairie chickens, sandhill cranes, and red-shouldered hawks.

Area-wide Guidelines

The following guidelines have been discussed in detail by Wildlife and Forestry personnel in the Park Rapids Area:

A. Public Lands

1. Compartments are 4-section units with a land base of 2560 acres. Acceptable compartment composition goals for intolerant deciduous types are the following:
   a. 65-45% (1664-1152 acres) Aspen, birch, oak, Balm-of-Gilead, brushland.
   b. Aspen Type: 55-35% (1408-896 acres).
   c. Aspen 1-10 years: Not less than 25% - (640 acres).
   d. Winter Cover: Not more than 20% (512 acres). Jack pine, balsam fir, N. white cedar.
   *Compartments of traditional deer winter use that contain more than 20% winter cover should be managed at that higher level of quality conifer thermal cover.
   e. Forest Openings: Not less than 5% (128 acres) except in areas designated for extensive forest management.

2. Plantations:

   a. Reforestation of jack pine harvest areas should be done with jack pine to favor wildlife. Conversion to other species will be discouraged. However, some conversion to other conifer species will be necessary due to other silvicultural considerations (i.e., insect or disease problems, soil/site characteristics).
   b. Plantations larger than 20 acres will have buffer strips of hardwoods and/or brush running through them and around the edges. Conversion of oak areas will be considered in compartments where thermal cover is lacking and reforestation to jack pine or other high wildlife value species would be beneficial.
   c. Access trails will be designed to avoid areas of wildlife concentrations such as deer wintering complexes.
   d. Spot failures in plantations will be evaluated for retention as permanent forest openings.
   e. Plantations will not be considered in any designated sandhill crane and prairie chicken management compartments where grassland is required. On private lands in these compartments, landowners will be encouraged to cooperate in sandhill crane and prairie chicken management.
   f. Plantations will not be considered in native prairie and native brushland sites.
   g. On suitable plantation sites, preference should be given to the establishment of hardwoods tree species or shrubs valuable to wildlife, or to conifers valuable to wildlife.
   h. Herbicide spraying for release of plantations should be planned to minimize interference with fruit production of lowland and upland brush species for that growing season.
   i. Protection of prairie chicken booming grounds and sandhill crane nesting marshes will be encouraged by restricting conifer plantations within 1 mile.
   j. In RMUs 1-4 small plantations are preferred. Conifer plantations larger than 10 acres should have buffer strips of hardwoods and/or shrubs around the edges and running through them at spacing no more than 600 ft to provide travel lanes for wildlife.

3. Harvest:

   a. Oak clumps will be retained in timber sales for future mast production where possible. Oak clumps should consist of no less than 6 trees.
   b. In RMUs 5, 6, and 7 harvest sites over 20 acres in size will include travel lanes, meandering cutting edges, and/or standing timber islands. These sites will also have at least 5 years of growth before timber adjacent to that stand is harvested.

c. In RMUs 1-6 buffer zones of unharvested timber 100 feet wide will be left around all type 3, 4, and 5 wetlands (as defined in USFS CIR. 39) larger than 1 acre and around all lakes and streams.
d. In RMU 7, buffer zones of unharvested timber 200 feet wide will be left around all types 3, 4, and 5 wetlands larger than 5 acres and around all lakes and streams.
e. Buffer zones of 200 feet of unharvested timber will be left around all trout lakes and streams.
f. Logging slash shall neither be piled within 50 feet of wetlands, nor placed within the wetland basin.
g. Aspen-oak areas should be allowed to regenerate back to aspen-oak. Food sources such as clumps of oak mast trees, scattered aspen clones and ironwood trees should be retained.
h. Planning of timber access trails will be coordinated with wildlife personnel. Fish and wildlife needs will be considered when planning new access trails.
i. Harvest activities near bald eagle and osprey nest and heron colonies will adhere to Forestry/Wildlife guidelines for these species.
j. Permanent forest openings of one to two acres will be established in timber harvest areas to meet Forestry-Wildlife compartment goals.
k. In RMUs 1-4, clear-cut harvest areas should be no larger than 10 acres and follow timber type boundaries. Selective harvest areas may be larger if other wildlife consideration is given.
l. Standing dead trees shall be retained at rate of 1-6 acre.

B. Private Lands

1. Copies of all PFM applications shall be sent to the Area Wildlife office upon receipt from applicant.

2. Area wildlife personnel shall be given the opportunity to provide input into the development of PFM plans. On PFM applications where the landowner has indicated wildlife and recreation interests, the plan should be developed cooperatively by Forestry and Wildlife personnel. Copies of referrals from other agencies shall be sent to the Area Wildlife Office.

3. Wildlife management recommendations and/or alternatives developed by wildlife personnel shall be included in the PFM plan. Where wildlife and forestry recommendations differ, the PFM plan shall present these differences as management options for the landowner to consider.

4. Private landowners should be encouraged to retain native prairie and brushland habitats and not convert these habitats to other uses.

5. Information and education should be provided to private landowners concerning the ecological values of prairie habitats and how to manage these habitats; and on various management options or programs available.

6. Buffer strips of upland grassland nesting cover around wetlands type 3, 4, and 5 should be restricted from tree planting.

7. Private landowners should be encouraged to follow the Forestry/Wildlife Guidelines and specific guidelines under Section A., Public Lands.

C. Special Concerns on Public and Private Lands.

1. Deer wintering complexes will be inventoried cooperatively with Forestry-Wildlife personnel. Individual deer wintering complexes will be evaluated and may require changes in normal timber harvest activities. Special strategies will be incorporated to perpetuate these winter complexes. Replacement thermal cover will be established before all surrounding cover has been harvested.

2. Forest areas that incur natural disasters such as: Blowdown, tornadoes, etc., will receive special attention from the Forestry/Wildlife personnel in that area. Cooperative funding and/or equipment use from the Section of Wildlife could be implemented to achieve Forest Habitat Compartment (FHC) goals.

3. Specific habitat compartments will be considered for management to promote grassland, marsh and brushland for sandhill crane, prairie chicken, and sharp-tailed grouse. After habitat compartments have been identified, project proposals for habitat maintenance will be prepared and implemented.

4. Prescribed burns for wetlands, grasslands brushland management will be cooperatively planned and implemented with wildlife personnel.

5. Agricultural leases should consider, wildlife, fisheries and watershed values of lease sites and adjacent areas.

6. Identification and location of eagle, osprey, Red-shouldered hawk and Great gray owl nests and heron colonies will be closely coordinated in timber management activities on both public and private land.

7. Identification and management of areas as extensive forest and/or old growth habitat will be incorporated into timber management activities on public and/or private lands. Old growth as identified by Wildlife and Forestry personnel will be managed in accordance with longer rotation principles. A goal of 5% of the forested land should be considered for old growth management.

Program Objectives and Targets

Table 56. Fish and Wildlife Habitat Management Program Staffing and Objectives, FY 85 and Projections for FY 87, 91 & 96.

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
Staffing					
1. Area.	fte	.20	.20	.25	.30
Objectives					
1. Permanent Wildlife Openings.	acres	50	50	100	150
2. Forestry/Wildlife Coordinate Meetings.	meetings	2	2	3	3
3. Special Wildlife Management.	projects	2	4	4	6

Resource Management Units

RMU1

This RMU is geographically located in a portion of Minnesota which was once dominated by the prairie ecosystem. The tall grass prairie habitat type was the dominant feature of this ecosystem, except for floodplain forests and scattered prairie woodlots and brushlands along the eastern fringe of glacial beach ridges. Fire was the dominant factor in maintaining this ecosystem, which has been altered to the extent that only remnants of these habitat types remain.

Presently a variety of wildlife species utilize non-forested habitat. Species management is directed at waterfowl, pheasant, prairie chicken and deer. In addition to prairie chickens, the remnant prairie grassland habitats are important to various other endangered, threatened or wildlife species of special concern. These include sandhill crane, burrowing owl, marbled godwit, upland sandpiper, Baird's sparrow, Sprague's pipit, chestnut-collared longspur and loggerhead shrike, prairie-vole, and several species of butterfly. Many endangered species such as the white-fringed prairie orchard may be found here also. Also present are species such as moose, ruffed grouse and woodcock which traditionally utilize forest and/or brushland habitats.

Fisheries resources are limited to riverine habitats and a few small lakes located mainly in the southwestern portion of the unit. Management is directed at warm water fish species including walleye, northern pike, pan fish and catfish.

Management Strategies

The limited remaining native habitats are extremely important to wildlife. Management strategies should promote the retention and, if possible, enhancement (quality, quantity, distribution) of native habitat types and improvement of fishing opportunities.

A number of wildlife species have specific requirements for non-forested habitats, particularly the grassland and wetland types. The main emphasis is to retain these habitat types and prevent conversion to other uses, to implement various management techniques including the use of fire, and to encourage restoration of these habitats. Woodland and brushland habitats, particularly those within riparian and the glacial beach ridge areas, are critical to various local wildlife species.

Management strategies include silvicultural practices which will promote hardwood species and age class diversity on harvest areas and plantation sites, and retention and management of brushland habitats. Multiple resource considerations in woodlot and plantation plantings would enhance habitat conditions for a variety of wildlife species.

Fisheries management activities being promoted or implemented to improve this resource include erosion and sedimentation control, weed control, rough fish control, fish stocking and lake aeration. Watershed and water quality are important fisheries considerations in the planning and implementation of Forestry activities.

RMU 2

This unit contains a wide variety of wildlife species which inhabit the transition habitats from native prairie and agricultural lands to brushlands and forested areas. Active management is primarily for ruffed grouse, deer, pheasants and waterfowl. Management activities also benefit furbearers and other small game species and over 400 nongame species. Of special concern within this unit are those remnant areas of native prairie vegetation and those forested locations where colonial water birds nest. Recognizing and protecting these resources should be a concern shared by all land managers.

Native prairie acreages are important to all forms of wildlife from insects to big game because of the wide diversity of grasses and forbs which provide food and shelter. The western edge of this unit though Becker and Otter Tail counties borders the known prairie chicken range. With management and protection of this habitat type, prairie chickens, marbled godwits and other inhabitants of this vanishing habitat will be assured survival. In the southern half of this unit native prairie plant communities are known to be highly productive for pheasants, ducks and other ground nesting wildlife. With proper protection and management of this complex and varied ecosystem, wildlife and humans alike will benefit.

A small number of cold water lakes and streams managed for trout, and many warm water lakes managed for walleye, northern pike, largemouth bass and pan fish are present in RMU 2.

Management Strategies

Management strategies will include timber harvesting practices which promote species and age diversity, including that of brushland types, and regeneration of harvest areas back to hardwoods. Woodland and brushland habitats, particularly those within river bottoms and those in agricultural areas are critical for deer, ruffed grouse, pheasants and a wide variety of other wildlife species. Proper planning and implementation of shelterbelts, woodlots and plantations will also enhance habitat conditions for a variety of wildlife species.

Native prairie and the transitional brushlands require constant attention and thus are difficult to manage. The best known method of maintaining these cover types in proper density, height and vigor is with fire management. Prescribed burning will be cooperatively utilized to restore and maintain these cover types. Retention of native prairie and brushland areas will be encouraged on all public and private lands.

Many of the lakes, ponds, marshes, streams and rivers occurring throughout this unit, have been drained, channelled or otherwise affected by agricultural concerns. To safeguard the quality and natural resource benefits of all existing water resources, forest management activities will be formulated to prevent degradation and adverse impact upon all water basins and water courses.

Lakes and streams of this unit will be assessed for their waterfowl, fur bearer and fisheries management potential. Various waterfowl management practices for improving and creating habitat will be utilized. Areas with potential for impoundments, dugouts and artificial nesting structures will be identified, evaluated and developed through cooperation of federal, state, county and private landowners.

Fisheries activities include stocking of walleyes, trout and muskies; management of northern pike and muskie spawning areas; rough fish control; weed control and winter aeration. An important need in the management of the fisheries resources is the protection of the spawning habitats and rearing ponds used to grow walleyes for stocking the intensively utilized and managed lakes of this unit. Water quality and soil erosion potential are major consideration when planning timber management activities near marshes, lakes and streams.

RMU3

This unit consists of 2 separate subunits located within the forest-prairie transition zone. Land ownership is primarily private and agriculture is the dominant land use. Important habitat features are the variety and abundance of fish lakes, wetlands and woodlands interspersed with the agricultural developments.

Wildlife management activities are directed at waterfowl, deer, and pheasant (in the south portion of the unit).

Ruffed grouse and a variety of non-game species are also present. Primary fisheries management activities are directed at various warm-water game fish species such as walleye, northern pike, largemouth bass and pan fish.

Management Strategies

Current fish and wildlife species population levels within RMU 3 are mainly a result of habitat conditions. Except for deer, beaver and Canada geese in localized areas, present population levels of important game species are less than desirable. Maintaining and enhancing habitats in order to increase population levels of desirable species are major needs in this unit. Forestry management activities which positively influence habitats and species populations should be incorporated into management strategies.

RMU4

This unit contains a wide variety of wildlife species which inhabit one or more of the diverse habitat types found here. Native prairies of variable size and various wetlands ranging from temporary to permanent are scattered throughout this unit. The interspersion of woodlots, shelterbelts and brushy fence rows provide good habitat for farmland wildlife.

Primary wildlife management activities are directed toward waterfowl, deer and ruffed grouse throughout this unit and for waterfowl, deer and pheasants in the southern 2/3 of the unit. Furbearers, small game and nongame wildlife benefit indirectly from these efforts.

Remnant native prairie areas exist in nearly every part of this unit. They provide an unequalled natural history of plant and soil which must be protected and enhanced. These generally small areas need to be recognized and their protection and management encouraged by all natural resource personnel.

Another special concern within this unit are the forested locations where colonial water birds, eagles and ospreys are found to nest.

Fisheries resources of this unit include a small number of cold-water streams managed for trout and a few small warm-water lakes managed for walleye, northern pike, largemouth bass and pan fish. An important need in the management of this resource is the protection of spawning habitats of all species. This involves prevention of soil erosion and degradation of water quality in all tributary streams, flowages and marshes by all land managers.

Management Strategies

Current fish and wildlife population levels within this unit are mainly a result of existing habitat conditions. Present population levels of primary game species are lower than desired with some localized exceptions for deer, beaver and Canada geese.

Maintaining and enhancing habitats in order to increase population levels of desirable wildlife species are major needs in this unit. Forestry management activities which positively influence desired wildlife populations should be incorporated into management practices.

RMU5

This unit contains a wide variety of wildlife species that utilize forested as well as non-forested habitats including brushland and grassland. Management is primarily for deer, ruffed grouse and waterfowl. This unit also contains some special concern species that require management practices that are not commonly used for the primary species. In forested areas, bald eagle, osprey and heron colonies have special habitat needs that require important considerations during timber management. Sandhill cranes and prairie chickens require a proper balance of wetland, brushland and grassland.

In southeastern Hubbard County there is a unique interspersion of brushland, sedge meadow, wetland and open upland areas that are presently supporting populations of sandhill cranes, prairie chickens and other species associated with this brushland complex. This area has historically supported sharp-tailed grouse. Sharp-tails might exist in this area, but at such low numbers, that only an occasional individual bird is present.

Management of this complex and varied ecosystem will provide sandhill crane and prairie chicken habitat, and possibly increase their numbers. Maintaining this habitat in the early transitional brushland stage could possibly provide for sharp-tails to once again be present in larger numbers.

More census and survey work will be required by Wildlife personnel to determine distribution of these populations. With more thorough knowledge of these population distributions, specific management practices necessary for perpetuation of these species can be implemented. Transitional habitats like brushland require constant attention and thus are difficult to manage. Fire is the best method of maintaining the brushland in proper age, size, density and distribution. Prescribed burning can help maintain the delicate balance of open sedge meadow and brush that is required for these species. All prescribed burns must meet the safety standards and other criteria as established in the prescribed burning policy.

Fisheries resources include warm water lakes managed primarily for walleye, northern pike and pan fish, trout streams and trout lakes. Another important need for fisheries resources are spawning areas for northern pike and rearing ponds for walleye production for stocking into the larger heavily fished lakes.

Management Strategies

Timber harvest will be done to promote a diversity of forest related plant and animal species. Emphasis for deer habitat management will be to maintain deer wintering complexes on public lands. Maintaining existing winter cover and reforestation of quality additional thermal cover will be done to meet habitat compartment goals.

Timber harvest of 20 acre cuts or smaller are preferred. Retain mast and snag trees according to guideline recommendations. If 20 acre or larger stands will be cut, the sale will be designed with the most irregular shape practical, taking into consideration insect and disease problems. Travel lanes, clones and other guideline recommendations will be followed on cuts over 20 acres.

Permanent forest openings are valuable to many wildlife species and will continue to be established and maintained on public lands. Forest openings will also be promoted on private lands for their value as a needed component of wildlife habitat.

Communication and cooperation with other department personnel on resource management decisions that affect their management goals is important.

An extensive network of lakes, ponds, marshes, streams and rivers occur throughout this unit. The use of artificial nesting structures for waterfowl has been a very effective tool and will be continued. Lakes and ponds will be assessed for their waterfowl, fur bearer and fisheries management potential. Various waterfowl management practices for improving and creating waterfowl habitat will be utilized. Areas with potential for impoundments and dugouts will be identified, evaluated and developed through cooperation of state, county and private landowners.

Upon completion of census and survey work, habitat compartments in Southeastern Hubbard County will be identified and managed to promote the grassland-marsh-brushland complex for sandhill cranes, prairie chickens, and sharp tails. Reforestation of these areas will require special cooperative assessment.

Fisheries activities include walleye and trout stocking, management of northern pike spawning areas, weed control and aeration. Water quality and erosion potential are major consideration when planning timber management activities near lakes and streams.

Specific Proposals

SPECIAL COMPARTMENT: Prairie Chicken and Sandhill Crane

A special compartment has been targeted for intensive management for prairie chicken and sandhill crane in Badoura Township.

This special compartment is 16.5 square miles in size and is located in:

T.139N., R.32W., S 1/2 of Sections 13, 14 and 15;
Sections 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35 and 36

Management within this compartment will be to promote grassland and maintain the brushland in an early stage of growth (i.e., keep the brush from getting too tall and rank).

Specific recommendations to be followed:

1. Conduct intensive census and survey of prairie chicken and sandhill crane populations in the project area to monitor these populations and their response to management activities.
2. Mechanical and chemical treatments of some areas of present off-site aspen and controlled burns will be done to create grassland islands for use as display grounds and nesting areas.
3. Fire breaks will be made to facilitate conducting prescribed burns under controlled conditions.
4. Restrict conifer plantations within one mile of prairie chicken booming grounds and sandhill crane nesting marshes.
5. Private landowners will be encouraged to maintain grassland and other upland areas in an open condition.

RMU6

This unit contains a wide variety of wildlife species that utilize forested as well as non-forested habitats. The agricultural area is made up of small farms with a mixture of tilled and pasture land. The forest area is comprised of aspen, along with pine and northern hardwoods. Tamarac National Wildlife Refuge and Hubbel Pond WMA are located within the unit.

Fisheries resources include warm water lakes managed primarily for walleye, northern pike and pan fish, trout streams and trout lakes. Another important need for fisheries resources are spawning areas for northern pike, and rearing ponds for walleye production for stocking into the larger heavily fished lakes.

Some special concern species that require management practices that are not commonly used for the primary species are also in this unit. In forested areas, bald eagle, osprey, red-shouldered hawk and heron colonies have special habitat needs that require priority during timber management.

Management Strategy

Timber harvest will be done in such a way as to promote a diversity of forest age classes and species. Timber harvest adjacent to river and lake banks will be curtailed to prevent erosion problems and to retain valuable nesting and den trees. Permanent forest openings are valuable to many wildlife species and will continue to be established and maintained on public lands. Forest openings will also be promoted on private lands for their value as a needed component of wildlife habitat.

An extensive network of lakes, pond, marshes and streams, and rivers occur throughout this unit. The use of artificial nesting structures for waterfowl has been very effective and will be continued. Lakes and marshes will be assessed for their waterfowl, fur bearer and fisheries management potential. Various waterfowl management practices for improving and creating waterfowl habitat will be utilized. Areas with potential for impoundments will be identified, evaluated and developed through cooperation of federal, state, county and private landowners.

Fisheries activities include walleye and trout stocking, management of northern pike spawning areas, weed control and aeration of lakes. Water quality and erosion potential are major consideration when planning timber management projects near lakes and streams.

Specific Proposals

Harvest:

This unit contains areas where intensive ruffed grouse management can take place. Those areas will have special aspen harvest techniques implemented. Forestry and Wildlife personnel will work closely on all aspects of this special project.

Impoundments:

1. Proceed with development of Shell River Impoundment as funding permits. This project depends on availability of acquisition funds for section of Wildlife.
2. Evaluate and rebuild Gyles Lake Impoundment. This is a cooperative Forestry/Wildlife project.
3. Evaluate existing Indian Creek impoundment structure located on Becler C.R. 44 for water level management. Coordinate with wildlife personnel.
4. Evaluate other wetland impoundment possibilities (i.e., Two Inlets Township - Indian Creek) and promote their development once they have been determined feasible.
5. DNR-Forestry and Wildlife will cooperatively maintain these impoundments to provide stable water levels, and prevent undesirable damage to surrounding timber, roads, trails, and impoundment dikes.

SPECIAL COMPARTMENT: Red-Shouldered Hawk

A special compartment is identified in which coordination between Wildlife and Forestry will emphasize the red-shouldered hawk. The area identified is northern hardwoods, and in the past 3 years there have been 4 active red-shouldered hawk territories located in the area. This species is classified as "special concern" on the State Endangered Species list.

The special compartment is 9 square miles in size and in located in: T140N R37W Sections 33, 34 & 35.
T139N R37W Sections 2, 3, 4, 9, 10 & 11.

The following specific recommendations which enhance the habitat quality in the compartment have been formulated in order to create optimum nesting habitat for the red-shouldered hawk:

1. Timber management will encourage a longer rotation in hardwoods.
2. Timber harvest sizes of 20 acres will be encouraged. Larger cuts will have wildlife considerations.
3. Active nest trees shall be protected by a 5 chain radius from all harvest activities. An active radius is defined as occupied or for up to 5 years after occupancy.
4. New logging roads should be closed to traffic after harvest is completed.
5. Wildlife personnel will be responsible for nest site identification, monitoring and use.

SPECIAL COMPARTMENTS: Ruffed Grouse

Two special compartments have been targeted for intensive ruffed grouse management. Compartment A is located in the southwest portion of the Smoky Hills State Forest. Compartment B is located in the Two Inlets State Forest.

Compartment A

This special compartment is six square miles in size and located in:

T. 139N.,R.37W., Sections 15,16,17,20,21 and 22.

Compartment B

This special compartment is two square miles in size and located in:

T. 141N., R. 36W., Sections 17 and 18.

Specific recommendations to be followed:

1. Harvest will consist of staggered 5-10 acre cuts in aspen and northern hardwoods.
2. Grouse Management Guidelines will be followed closely (p. 102-107 of the Forestry - Wildlife Guidelines to Habitat Management, rev. 1985).

3. Forestry and Wildlife personnel will work jointly in cutting area design and layout of timber access trails that will be used as forest access-walking trails.

RMU7

This unit contains a wide variety of wildlife species that utilize forested as well as non-forested habitats. The majority of this unit is forested land in public ownership. The forest area is comprised of aspen, along with northern hardwoods and pine. Many of the wildlife species are associated with the aspen-hardwoods types. Management is primarily for deer and ruffed grouse with considerations for waterfowl utilization of the wetlands and adjacent woodlands. These species favor a young forest composed of differing age class stands of aspen with maximum distribution of cutting sites, preferable in small tracts.

Fisheries resources include warm water lakes managed primarily for walleye, northern pike, large and small mouth bass, muskellunge, pan fish and trout streams and stream trout lakes. Another important need for fisheries resources are spawning areas for northern pike and walleye, plus rearing ponds for walleye production for stocking into the larger heavily fished lakes.

Some special concern species are present that require management practices that are not commonly used for the primary species. Bald eagle, osprey and heron colonies have special habitat needs that require priority during timber management.

Management Strategies

Timber harvest will be done to promote a diversity of forest related plant and animal species. Timber harvest adjacent to river and lake banks will be curtailed to prevent erosion problems and retain valuable nesting and den trees. Timber harvest of 20 acres or smaller tracts is preferred. Retain mast and snag trees according to guideline recommendation. Cuts larger than 20 acres will be cut in the most irregular shape practical, taking into consideration insect and disease problems. Travel lanes, aspen clones and other guideline recommendations will be followed on these larger cuts. Maintaining existing winter cover and reforestation of good additional thermal cover to meet compartment needs will also be promoted.

Permanent forest openings are valuable to many wildlife species and will continue to be established and maintained on public lands, with a goal of 5% per compartment. Controlled burning of wildlife openings and old farm fields will be done on a rotational basis to improve nutrient recycling and maintain successional stages. Burning projects will be reviewed by both Forestry and Wildlife according to DNR prescribed burning policy.

Communication and cooperation with other department personnel on resource management decisions that affect their management goals is important.

Division of Fish and Wildlife, Section of Fisheries has the following sites as walleye rearing ponds in this RMU. These are located in the Paul Bunyan State Forest.

Table 57. Walleye rearing ponds in RMU 6.

TWP	RGE	SEC	FORTY	ACRES
141	33	3	SE 1/4	20
141	33	3	SE-SW	11
141	33	10 & 11	SE-NE SW-NW	25
141	33	4	W 1/2-SW	10
				66

These ponds are actively being used by Fisheries on a rotational basis. Fisheries will be notified whenever a timber harvest will take place adjacent to these valuable rearing ponds, and the sale designed in consideration of them.

Specific Proposals

SPECIAL COMPARTMENT: Ruffed Grouse

A special compartment has been targeted for intensive Ruffed Grouse management in the southern portion of the Paul Bunyan State Forest near Waboose Lake.

This special compartment is four square miles in size and located in:

T.142N., R.33W., Sections 25,26,35 and 36.

Specific recommendations to be followed:

1. Harvest will consist of staggered 5 to 10 acre cuts in aspen.
2. Grouse Management Guidelines will be followed closely (p.102-107 of Forestry - Wildlife Guidelines to Habitat Management, rev. 1985).
3. Forestry and Wildlife personnel will work jointly in design and layout of timber access trails that will be used as forest access-walking trails.

PRIVATE FOREST MANAGEMENT ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

Introduction

The goal of the Private Forest Management (P.F.M.) program is to provide for improved multiple use forest management on Non--Industrial Private Forest (N.I.P.F.) lands to benefit the land, the landowner, and the economy. The Division's strategy for achieving this goal is to first identify N.I.P.F. landowners interested in improving forest productivity, increased wildlife benefits, improved recreational benefits, and then to provide the necessary incentives and assistance. Landowner incentives include the desire to maximize profits, cost share assistance, tax reductions, and Tree Farm status.

Typical P.F.M. activities include:

1. Promoting proper forest management through personal contacts with forest landowners as well as many types of information and educational activities.
2. Developing multiple-use forest management plans for landowners.
3. Providing landowners with advice and assistance on forest activities such as:
   a. Tree planting
   b. Timber stand improvement
   c. Timber harvest and marketing
   d. Forest insect and disease control
   e. Wildlife habitat management
4. Providing information on financial incentives such as cost sharing and forest tax laws.
5. Promoting landowner recognition.
6. Assisting on urban forestry projects.
7. Cooperating with other agencies, vendors, industrial and consulting foresters to maximize landowner services and benefits.

Foresters utilize a variety of activities in order to make new landowner contacts and to educate the public. Educational activities include: 1) use of the mass media such as: Newspapers, magazines, radio, television; 2) speaking to school, civic and other local groups; 3) conducting educational workshops, clinics and field days; 4) promoting and assisting woodland owner organizations; 5) Arbor Day promotion through civic and school programs.

As of July 1, 1985, the Park Rapids Area had 1,280 detailed private forest management plans on file. Currently 836 plans are considered active. The average size of woodlands varies by district (Park Rapids - 102 acres, Alexandria District - 6 acres, Smoky Hills - 73 acres).

During Fiscal '85 an additional 170 management plans averaging 96 acres per plan were made up, involving 16,320 acres. This acreage is roughly equal to 2.7% of the total private commercial woodland in the Park Rapids Area.

Table 58 illustrates the potential that private ownership has for resource management. The majority of forest land (72% or 365,200 acres out of the total commercial ownership) is privately owned.

Table 58. Private Commercial Forest Land By County.
(Listed in multiples of 1,000 acres)

County	Forest Industry	Farmers Owner	Private Corporate	Individual Private	Total Com. Forest Land
Becker	1.3	11.3	0.0	1.3	34.0
Clay	0.0	12.8	0.0	0.7	13.4
Douglas	0.0	20.5	0.0	4.6	26.4
Grant	0.0	4.4	0.0	0.0	4.4
Hubbard	14.0	34.6	5.9	51.2	187.6
Otter Tail	0.0	142.1	0.0	38.3	183.5
Pope	0.0	0.0	0.0	3.1	3.1
Total	15.3	225.7	5.9	99.1	452.4

Source: Phase I Forest Inventory-MN DNR Forestry 1977.

The PFM plan can help the landowner and the forester size up a property for possible future forest development project.

Requests for plans offer the PFM forester the best opportunity to sell the program. Unfortunately a landowner must often wait several months for his request to be filled. Thus, the forester is forced to start out with some understandable negative feelings from the landowner being served. Landowners should not be left wondering when they will get assistance. Once they are served and plans are written, foresters must improve their efforts to make follow up contacts to initiate on-the-ground forest management projects. Experience has proven that the first and second year after initial interest are critical in achieving proper management on the land.

Forest Regeneration

The Park Rapids Area has almost 13,000 acres of private plantations. (See Table 59.) About 65% of these plantations are in southern Hubbard County. Total plantation area should exceed 20,000 acres by FY 1995. Norway pine currently comprises 65% of the N.I.P.F. plantation area while Scotch pine is second at 13%. The majority of Scotch pine is located in Otter Tail County.

White spruce ranks third with 11%, while hardwoods and other species take up the balance. Most of these plantations are over stocked and in need of thinning. A great marketing and silvicultural challenge exists to manage these plantations for optimum yields.

TABLE 59. NIPF Plantations in the Park Rapids Area.*

County	Norway Pine	White Spruce	Scotch Pine	Hardwoods	Other Species
Hubbard	6741	843	421	421	
Becker	982	452	353	176	
Otter Tail	501	90	966	232	
Douglas	219	110		55	163

SOURCE: DNR '84 Plantations Report plus ACP & FIP Records.

*Table 57 does not include acres of hardwood natural regeneration.

For the past several years foresters planted trees with the anticipation of a future market for the wood. In many cases this market has not materialized. In fact, the market for pine posts, pulp and poles has decreased. The bolt and saw timber market has been the only market that has remained fairly constant over the years. Without adequate markets, several thousand acres of pine plantation face possible stagnation. This problem helps bring into focus a very critical question in regards to conifer reforestation: Will a market develop to utilize this resource?

Tree spacing has widened over the past 20 years from 5'x 5' common in the early 1960's, to a normal 7'x 8' spacing today. The trend toward wider spacing may continue - especially if pine pulp, post and pole markets do not increase. The loss of markets is making it difficult, if not impossible, to commercially thin several thousand acres of pine plantations. Many have been non-commercially thinned once.

Regeneration efforts have encountered the following major problems: 1) limited availability of planting machines; 2) difficulty in supervision of users of planting machines rented from the DNR; 3) machine break downs or adjustment problems during the planting season.

Improving the Quality of Existing Timber Stands

Timber stand improvement covers a variety of work including thinning, release, and pruning. A major objective of private planting should be to plant trees in such a manner that they will not require release or pre-commercial thinning at a later date. The requirement for pre-commercial thinning can be eliminated by proper spacing.

Eliminating the need for plantation release is difficult. They are less likely to receive release, when needed, because: 1) there has been not been enough time for the forester to check the plantation; 2) the landowner lacks interest or funds to carry through the release project; or 3) the job is too big for the landowner and there is a shortage of contract vendors.

There have been more plantation trees lost to pocket gophers than any other type of pest. A vendor service is needed that can handle this problem. Currently this expense for the landowner cannot be cost shared. Some landowners will not be willing to put forth sufficient effort or money to control this problem. Simple cost effective methods of pocket gopher control need to be developed. A pocket gopher control machine might have to be purchased. This could be done possibly through a local landowners organization.

Thinning of hardwood stands is best accomplished by use of vendors. Encouraging vendors and identifying hardwood stands in need of thinning should increase accomplishments.

Harvesting and Marketing Assistance

Timber harvest with DNR assistance in the Park Rapids Area during FY '85 consisted of 10,717 cords on 935 acres. This could have been greater, but hardwood markets and pine pulp markets have declined. Individual sales assistance has proven to be most successful in the area. Improved markets or new markets are the best hope for expanding sales.

Markets needed most are for poor quality hardwoods, pine pulp, and aspen pulp. Ample timber resources are available to supply wood chips for energy if that market can be developed.

Financial Incentives

Financial incentives for good forest management include: (1) property tax breaks under the "3E" and "Tree Growth" tax classifications; (2) cost-share assistance for tree planting and T.S.I. projects and; (3) the desire to maximize profits from timber harvest operations.

As of July 1, 1985, there were 27,744 acres under the "3E" and 26,083 acres under the "Tree Growth" tax classification in the Park Rapids Area (see Tables 58 & 59). The problem is that the "Tree Growth" classification is limited mostly to large industrial type landowners while the "3E" classification is rarely an incentive because other classifications give similar tax relief. For instance, the "3E" rate is currently 18% plus 26% tax credits. The non-homestead farm rate is 18% with 26% credit. The homestead rate is also 18% with a 54% credit. Seasonal recreational taxes are a bit higher at 21% with a 15% credit. Vacant land taxes are 40% in the counties that choose to use this classification. Most lands fit into one of the classifications similar to "3E" in taxes. Only landowners under the "vacant land" classification have an incentive to change.

Table 60. County Private Commercial Forest Land Enrolled In Tax Law.

County	3E Timberland Classification	Auxiliary Forest Tax	Tree Growth Tax
Hubbard	6,114	2,038	22,418
Becker	20,130		3,665
Otter Tail	1,500		
Totals	27,744	2,038	26,083

Source: Minnesota's 1982-83 Forest Property Tax Structure.
By: Michael A. Kilgore, February 1984

Table 61. Average Minnesota Forest Property Tax Revenue Per Acre by Tax Law and County.

County	3E Tax	Auxiliary Forest Tax	Tree Growth Tax
Becker	2.01		1.41
Hubbard	3.44	.16	1.43
Otter Tail	2.80		

Source: Minnesota's 1982-83 Forest Property Tax Structure
By: Michael A. Kilgore, February 1984

Cost share incentives are a vital part of the PFM program. Average accomplishments under cost sharing projects in the Park Rapids Area over the last five years (1981-1985) were 634 acres of planting and 283 acres of T.S.I. per year (see table 60).

Table 62. Park Rapids Area ACP-FIP Accomplishments Five Year Average (FY 81-FY 85).

County	Planting (Acres)	T.S.I. (Acres)
Hubbard	293	132
Becker	172	41
Otter Tail	48	12
Douglas	69	79
Pope	49	17
Grant	1	2
Mahnomen	2	
TOTALS	634	283

Problems encountered with cost share programs include (1) lack of communication and understanding between some A.S.C.S. offices and the DNR, (2) landowners not following through with their projects signed up under cost share and, (3) money set aside for projects but never used.

The timber harvest profit incentive is the main reason landowners contact the DNR for harvest assistance. Even so, it is very common for landowners to try to sell timber on their own and then run into major problems. Foresters need to inform landowners that professional assistance is available.

Table 63. Tree Farms - Park Rapids (6-1-85).

County	# Tree Farms	Total Acres
Hubbard	128	15,029
Becker	49	7,107
Douglas	35	1,419
Otter Tail	25	2,380
Grant	1	12
TOTALS	238	25,947

Landowner Recognition

Landowners gain well deserved public recognition when: 1) they display the Tree Farm sign; 2) their property is visited on a forestry field trip; 3) they have a write up in the local paper; or 4) they receive some type of forest management award. Currently Park Rapids foresters are nominating an average of 20 new "tree farmers" per year. Only one Region Tree Farmer of the Year receives recognition annually.

As of June 1, 1985, there were 238 Tree Farms covering 25,947 acres in the Park Rapids Area (see table 61). This is about 15% of all tree farms in the state.

PROGRAM DIRECTION

Area-wide

The Division of Forestry's strategy for achieving the goal of the PFM program is to first identify landowners interested in improving forest productivity and then to provide the necessary technical assistance and incentives.

An additional 1,500 forest management plans totalling 120,000 acres will be completed over the next ten years. This will be accomplished while at the same time forester-landowner communications will be improved and follow up contacts increased. This will be accomplished by taking the following actions:

1. Computerize all forest management plan files so that harvest, planting and timber stand improvement recommendations are more readily accessible.

2. Increase vendor and consultant forester services (especially in the areas of planting, timber stand improvements, harvesting and marketing), so that PFM foresters have more time to devote to initial landowner training and motivation to manage their woodlands, as well as follow up contacts.

3. Increase manpower or focus attention on landowners in most need of immediate attention (i.e., mature timber or areas to be planted. Provide general information only to owners having intermediate age class timber).

The Park Rapids Area has one Area Staff Forester (PFM) and a PFM Specialist assigned almost full time to PFM. The four District Foresters and their technicians also conduct a substantial amount of PFM fieldwork. Total PFM assistance in the Park Rapids Area amounted to 3.82 person years in FY 1983, and 3.55 person years in FY 1984. The proposed program calls for increasing the Area's PFM effort from 3.55 person years in FY '84 to 6 person years by FY '95.

The quality and uniformity of management plans in the Park Rapids Area has improved with the addition of the new PFM management plan format and inserts. Additional inserts will be made up to cover wildlife and other aspects of the plan.

PFM plans could be improved with "TWIGS" (computer program) type information - especially on plantations and high value hardwoods. Foresters must be trained in the availability and implementation of these computer programs.

Information & Education

In order to better develop contacts with landowners potentially interested in forest management the following activities will be undertaken.

Goals for the PFM I&E program for the next ten year period include the following:

1. Develop one or more Area slide-tape programs on various PFM activities, including forest and wildlife management on private lands.

2. Develop a lighted display panel on PFM to use at fairs and other civic functions.

3. Promote landowner membership in woodland owner type organizations such as "Forest Tree Farmers of Minnesota, Inc. (F.F.M.). The goal is to have 200 woodland owner organization members in the Park Rapids Area by FY '95.

4. Continue the availability of field trips programs in the Area's most active PFM counties. Counties affected include Hubbard, Becker, Otter Tail, Douglas and Pope.

5. Make field trips available to groups such as 4-H, Boy Scouts, A.S.C.S., etc. Invite the public to attend.

6. Give more time and attention to promotion of field days, meetings, etc.

7. Develop an improved network of communications between Forester and landowner to improve rapport and landowner involvement.

The concept of multiple use and benefit to private landowners requires that plantation sites be selected with care and consideration for all natural resource values found on the property. The following general guidelines will be observed within the Park Rapids Area when preparing PFM plans:

1. Natural regeneration techniques will be recommended as preferential to artificial regeneration.

2. Plantation sites will be limited to forest developed soil types, disturbed soil sites and former agricultural lands. Under no circumstances will native prairie or native brushlands be recommended for plantation sites without obtaining an evaluation of the existing plant community by a qualified plant ecologist who states that the site is appropriate for establishment of a plantation.

3. Plantation species selection will give due consideration to the soils present and the species indigenous to that Resource Management Unit.

Over the next ten years more attention to will be given to species, selection, spacing decisions, and in market development for intermediate products from thinning.

The problems associated with planting machines can be solved by promoting and developing a good vendor program for tree planting. Vendors normally do better planting jobs because they are more experienced. They also are responsible for the maintenance of their equipment, which relieves the forester of supervision problems.

Vendors help simplify a forester's planting supervision tasks. Since they normally plant at a more even spacing than the untrained beginner it is more likely that all trees ordered will be used. The problem of too many or too few trees left at the end of the planting job is reduced.

Setting aside freezer stock may help solve the problem of late stock. The trees planted early in the planting season normally have better survival because of better soil moisture conditions and because the stock has not candled. Planting earlier in the season also has another advantage, in that the forester has more planting days available so that he is not so rushed to get his trees in the ground in a very short time.

A pocket gopher control machine might have to be purchased, possibly through a local landowners organization.

Timber Stand Improvement

Timber stand improvement in the Park Rapids Area consists of thinning of natural hardwood stands and pine plantations.

Hardwood stands in need of thinning should be identified Vendors should be used for this work.

Pine plantations have become a problem due to lack of a market for the thinned material. Planting pine at a greater spacing should eliminate at least one pre-commercial thinning.

Grazing has a detrimental impact on managing our forest resources. Substantial amounts of productive sites are heavily grazed. Landowners should be encouraged to keep animals from grazing in wood lots.

Marketing Problems

The following efforts may help alleviate some of the current marketing problems (see Marketing and Utilization Program for additional recommendations):

1. Develop "System 6" industry that utilizes low quality small diameter hardwoods. This is being accomplished with the cooperation of the Wes-Min RC&D.
2. A possible pine pulp consumer has been located in Otter Tail County in the form of a post plant. A business plan and marketing strategy are currently being worked on.
3. The expanding turkey industry, as well as schools and other businesses are good prospects for aspen chips as a source of fuel.

Forest Insect, Disease and Pest Control

Species selection, timing of harvest, and slash disposal are the best defense against potential insect, disease and pest problems.

Financial Incentives

Problems concerning cost-sharing can be addressed by the following actions:

1. Making more of an effort to inform A.S.C.S. personnel and County ASCS Committees of our projects and objectives.
2. Limiting landowners to smaller acreages when it appears that the project may not be finished, especially if the landowners intend to do the work themselves.
3. Making sure correct funding is set aside (preventing over funding.
4. Making sure projects are completed on time.

Landowner Recognition

Landowner recognition will be increased by sponsoring an annual "Forest Management Award" in each of the most active PFM counties. This award will be co-sponsored by the DNR and local woodland owners groups. Recognition is given for proper forest management. These awards should be also given to recognized proper forest management for the production of wildlife.

Each year a winner will be entered in the Region Tree Farm Contest. It can help keep people informed on forest management through the "American Tree Farmer" magazine. The Tree Farm program should be promoted and expanded in the Park Rapids Area at the rate of 30 new tree farms per year.

Coordination with Other Divisions, Agencies, and Organizations

Much of the PFM Program's effectiveness depends upon maintaining good working relationships with other agencies and organizations. Since cost-sharing assistance is available to landowners for activities such as site preparation, tree planting, release, and thinning from individual county ASCS offices, it is essential that the PFM Forester maintain rapport with the ASCS offices and handle all aspects of technical assistance and paperwork between the landowner and the ASCS offices. The ASCS has monthly meetings, in which the county committee approves or disapproves all forestry cost-sharing practices. Many times it is beneficial for the forester to attend the meetings to explain any of the particulars involved with various practices. Area staff will attend at least one county ASCS meeting per month.

The Soil Conservation Service often contacts landowners with woodlands that need management beyond the scope of SCS expertise. Many of these contacts are referred to the forester, so maintaining good rapport with the District Conservationist and District Board is desirable. A positive working relationship will be maintained with the SCS, the local Soil and Water Conservation Boards, and other governmental agencies such as the University of Minnesota, County Extension Offices, and the U.S. Forest Service. The University of Minnesota and the County Extension Offices provide up to date educational materials on forestry subjects and are partners with the Division of Forestry in conducting certain educational activities.

The PFM program promotes the educational aspects of forestry to the general public by handling forestry field tours, workshops, and seminars. Assistance from private landowner associations and the Minnesota Forestry Association is important in carrying out these activities, so rapport with these associations will also be maintained.

PFM recommendations often affect resources that are managed primarily by other DNR divisions. Commonly, the only contact a landowner has with the Department of Natural Resources is through the technical advice supplied by the PFM forester. PFM foresters incorporate the environmental and resource concerns of the

Department into management plans. Since a majority of PFM assistance requests involve a desire by the landowner to for improve wildlife habitat quality, a copy of each PFM application assistance will be sent to the appropriate Area Wildlife Manager. It will be the wildlife manager's responsibility to contact the forester for involvement with the landowner. In addition, open communications with all other divisions in the DNR must be maintained, to insure that all natural resource concerns are recognized and their protection is encouraged.

Program Objectives and Targets

Table 64. Private Forest Management - Park Rapids Area Staffing and Objectives, FY 85 and Projections for FY 87, 91, & 96

PROPOSED PROGRAM	UNIT OF MEASURE	FY85	FY87	FY91	FY96
Staffing					
1. Area	Fte	3.6	3.9	4.8	6.0
Objectives					
1. Total Assists	Assists	420	420	450	500
Field	Assists	420	400	450	500
2. Management Plans	Plans	170	130	165	185
Comprehensive Plans	Acres	16320	12000	15000	16300
Brief	Plans	61	90	110	130
3. Site Preparation	Acres	2550	1400	1550	1700
Natural	Acres	561	400	400	600
Artificial	Acres	1071	1000	1150	1100
4. Reforestation	Acres	1071	1300	1500	1400
Softwood	Acres	1071	1250	1400	1250
Hardwood	Acres	0	50	100	150
5. Timber Stand Improvement	Acres	283	310	340	380
Release	Acres	250	310	300	340
Other TSI	Acres	33	0	40	40
6. Habitat Improvement	Acres	560	400	450	540
7. Recreation Improvement	Acres	20	20	20	21
8. Timber Sales	Sales	37	40	50	60
Acres	Acres	935	600	750	900
MBF	MBF	526	300	420	500
Cords	Cords	9665	7000	8300	9000
9. Referrals to Consultants	Referrals	20	40	45	50
10. U&M Assists	Assists	18	15	16	20
11. PFM Articles/News Releases	Number	40	45	53	55
12. Forestry Field Days	Number	8	9	10	11
13. Displays & Exhibits	Number	12	11	12	14
14. Tree Farms					
Inspections	Number	45	50	65	85
New Certifications	Number	31	30	30	30

Resource Management Units

RMU1

The private forest land in this RMU is mainly found within the floodplain of the Red River and Buffalo River systems or in small farmstead woodlots and shelterbelts. Typical stand composition along the floodplains include box-elder, American elm, green ash and hackberry on the lower areas. Basswood and bur oak can be found on upland areas.

Stands of oak, ash, elm, basswood, box-elder, cottonwood and some poor quality walnut typify the farmstead woodlots within this area. These stands occur as shelterbelts and lowland woodlands that are not conducive to agriculture.

PFM opportunities are good, because of the landowners' increasing awareness of their woodlot due to losses from Dutch elm disease and financial opportunities in timber sales.

Management Strategy

1. Work closely with County Extension, SWCD, SCS, and ASCS offices in educating landowners about proper woodland management.
2. Assist landowners and the general public in marketing and locating sources of fuelwood.
3. Improve existing good quality hardwood stands.
4. Encourage through management plans, news articles, presentations and other contacts, the planting of desirable hardwood trees.
5. Follow up on Red River Elm Inventory Project, with individual marketing and forest land management assistance.

Specific Proposals

1. Maintaining hardwood forests within this unit should be encouraged as much as possible. This is important because much of the river timber is presently dying due to Dutch elm disease, or rotting away due to heart rot in other species.
2. The recommended rotation age for ash is 80 years; hackberry - 80 years; oak - 80-100 years; and elm, salvage immediately. These rotation ages are based on regeneration potential and may have to be modified as site conditions dictate. All cutting must be done with natural regeneration in mind. No cutting should be done if the area is not intended to be reforested.
3. The forest resources within this unit are extremely important to local wildlife populations. For this reason, the forest must be managed for wildlife as well as timber production. (See Area-wide Guidelines of the Fish and Wildlife section and refer to Forestry/Wildlife Habitat Guidelines.)

4. The timber in this unit presents unique problems in forest management. Dutch elm disease is currently killing most of the elm. Cutting in the floodplain has resulted in slash being disposed of in the rivers causing problems. For this reason, these guidelines must be followed whenever possible:

   a. Selective cutting is preferred over clear-cutting.
   b. Stand density should be maintained at 90 sq. ft. of basal area per acre.
   c. Box-elder should be retained when no other tree species is present.
   d. When cutting, all slash should be removed from the floodway.
   e. Underplanting of high quality hardwood trees should be encouraged to promote better future forest stands.

RMU2, RMU3, RMU4

Private landowners own most of the forest land within these RMU's (88% of RMU2, 99% of RMU3, 96% of RMU4). The forest land consists of small scattered woodlots mixed with agricultural land. In general, the past forest management has only affected a small percentage of the land.

Professional forestry assistance is available through the Forestry offices at Park Rapids, Elbow Lake, Detroit lakes and Alexandria. A consultant forester is available for the southern portion of these units, and is based out of Garfield.

Timber management on private forest lands depends on the desires of the individual landowners. Primary interests or concerns vary from timber production, wildlife habitat, or aesthetics, to name a few.

Management Strategy

Following are a number of concerns and needs both from the standpoint of the landowners and the resource:

1. In many cases, landowners are unaware of the services available to them. Educational efforts are constantly accomplished to enlighten the general public. The forest products industry is not a major economic factor in this Unit.
2. Marginal markets for certain species and products has caused high-grading of both hardwood and aspen stands. Encouraging private landowners to manage their timber is difficult where no markets exist.
3. Grazing greatly depreciates the quality and value of woodlands. Regeneration is eliminated by continuous grazing. Grazing of woodlands has been a traditional farming practice in this Unit. Changing local attitudes about grazing of woodlots is a difficult challenge.

4. A lack of quantity and quality of hardwood planting stock has hampered efforts to regenerate harvested stands. Planting of open sites to hardwoods is minimal due to the lack of adequate planting stock.

5. Insect and disease problems have also had an effect on timber management. Dutch elm disease greatly increased timber sales on private land, because of salvage harvests. Due to the tourist business, there is considerable recreational traffic through the area. Gypsy moth is a definite threat to the oak and other hardwood resource, as there is a strong possibility of it being brought into the Unit on tourist vehicles.

Specific Proposals

1. Use of the media is essential to promote improved timber management on private lands. Proven techniques include newspaper articles, group presentations, field tours, and most important, individual contacts. The opportunities are limited only by the time available for the field foresters.

2. Improved markets can be encouraged in several ways. An accurate inventory of private forested lands is crucial. Before industry will make any commitments it is imperative that they have accurate information. Efforts are currently underway to develop markets for lower quality hardwoods, through development of a "System 6" industry. Fiber fuel use is being promoted to utilize surplus aspen and poor quality hardwoods. The Wes-Min Resource Conservation and Development organization is playing a major role in this effort.

3. Reducing the amount of timber land that suffers from the effects of grazing is important. This can be accomplished by several means including education of landowners. Other means include the state cost share programs to assist the landowner with cost of fencing woodland, to protect if from destructive grazing. Giving priority assistance to people who currently protect their woodland is also effective. Adequate planting stock will increase the opportunities for regeneration of our hardwood stands. Private nurseries are a good source of a variety of hardwoods, but the stock is expensive. Improved quality and quantity of hardwood stock from State nurseries is desirable.

4. Taking into account the current and future insect and disease problems when working with private landowners is important. Elm trees are high priority for harvesting, due to Dutch elm disease. Annually gypsy moth traps will continue to be placed throughout the district to detect possible problem areas. Continued awareness of insect and disease problems will facilitate better long term management of our forest resources.

RMU5

Timber is predominantly overmature aspen with pockets of jack pine, Norway pine and white pine.

Table 65, based on Phase I inventory data, shows species distribution on N.I.P.F. lands in RMU 5.

Table 65. Acres by Commercial Cover Type - NIPF Lands.

Species	Acres
Aspen	35,000
Balsam Fir	1,000
Jack Pine	16,000
Oak	7,000
Birch	9,000
Red Pine	11,000
Tamarack	1,000

Phase 1 inventory data also shows that approximately 55% of the jack pine is above the recommended rotation age of 55 years. By 1990, 86% of the total jack pine cover type will be overmature. This data also shows that 40% of the aspen in this unit is on poor sites (site index under 60), and 52% is over the ideal rotation age of 40. Also, 87% of the oak and 88% of the birch in RMU 5 are on poor sites.

As noted in the introduction, there are approximately 9,500 acres of conifer plantations and 1500 acres of Christmas tree plantations in RMU 5. 200+ acres per year are being planted to conifers by private landowners.

The private forest plantation survey conducted by DNR-Forestry from 1976 through 1980 gives the species breakdown as follows:

Species	% of Total
Red Pine	77.0
Jack Pine	8.0
Scotch Pine	4.0
White Spruce	4.0
Mixed Pine	6.5
White Pine	.5

Major problems have been the poor markets for low quality hardwoods and pine pulp products. A large majority of N.I.P.F. pine plantations will require thinning soon. Many are overstocked already. Pine plantations with basal areas of 200+ sq. ft. per acre are not uncommon.

About seventy percent of the current pine plantations in RMU 5 will need thinning during the next ten year period. This will be a major challenge, since markets are not available to utilize the post and pole production in conifer plantations.

As of 11-07-85 there are 385 private forest management plans covering 36,805 acres in RMU5. About 40% of these plans are more than 15 years old.

Arbor Day programs are regularly held at the Park Rapids, Nevis and Akeley schools. There are three school forests in RMU5. All could use work. The Nevis School Forest recently had a harvest and is scheduled for planting and T.S.I. in the near future.

A local woodland owners group "Forest tree Farmers of Minnesota, Inc." keeps many of the more active woodland owners well informed on forestry topics. N.I.P.F.-oriented forestry articles are frequently published under the "Timberlines" logo in the local newspaper.

Management Plans

1. Management plans and calendars of events will be computerized. Plans over 15 years old will be updated as time allows. Follow up contacts based on computerized information will be made.
2. Harvest is to be promoted through education and direct contacts.
3. Utilize recommended wildlife benefiting practices as outlined in the Forestry/Wildlife Guidelines manual.
4. Promote a greater diversification of species. Aspen and other hardwoods should be maintained to break up large conifer types.
5. Locate or develop markets for underutilized species in conifer plantations. Continue to promote non-commercial thinning under cost share and plantation release where needed. Possibly row thin, utilizing chips for wood energy.
6. Improve the data base and access to data on private forest lands within management plans.
7. Increase public education through the development of visual aids.

Specific Proposals

1. All important management plan data will be computerized.
2. Private plantations larger than 20 acres will incorporate buffer strips of hardwoods, grass, or brushy areas which will improve wildlife habitat.
3. Plantations will be checked every ten years for T.S.I. needs. Maps showing all plantation areas and corresponding data will be developed and computerized.
4. Diversification of tree species in plantations will be promoted. Medium and better aspen sites will be managed for aspen production.
5. Develop a timber harvest assistance package, which would be made available to landowners to better inform them on all phases of harvest including harvest procedures, terms, tax incentives and other considerations.

6. Develop parts of the Badoura State Forest as a self guided tour of an area to be called the "Badoura Demonstration Forest".

7. Assemble two P.F.M. display boards to be used at fairs and exhibits.

8. Develop P.F.M. slide shows on timber harvest, tree planting, the conservation reserve program, and T.S.I.

9. Copies of the PFM "Application for Assistance" will be sent to the Area Wildlife Manager for his input into the management plan.

RMU6

Private landowners own approximately 60% of the commercial forest land in RMU 6. Farmers are the largest group of private owners (74%), followed by private individuals (22%). Opportunities exist for diverse timber and wildlife management in this unit. Aspen comprises nearly half of the commercial forest acreage. Other forest types include pine, more common in the eastern part of the unit, and Northern Hardwoods, more common in the western part of the unit. Professional forestry services to private landowners in this unit are provided predominantly by the Division of Forestry.

Management Strategy

Timber sales and tree planting are the high priority PFM activities for this unit, along with some TSI.

Timber harvesting involves aspen and jack pine clear-cuts, Norway and white pine partial cuts, and northern hardwood partial cuts and some clear-cuts. Sixty-three percent (63%) of the aspen type is over age 40. There are high density Norway and white pine types and hardwood types in need of thinning. Dutch Elm Disease has necessitated elm removal. Markets are the critical factor in increasing private timber sales. Wildlife management concerns should be incorporated into private sales.

Tree planting should be primarily conifer reforestation. Planting should be done on old fields, erodible or unproductive cropland, conversion of poor hardwood and aspen sites, and on pine cutover areas. Underplanting and planting for wildlife cover should also be considered.

TSI should be done primarily on better hardwood sites, on both existing and regeneration stands.

Public education on proper multiple-use forest management is an integral part of private forest management. This involves the news media, field days, school forests, tree farm program, woodland owners associations, and other educational presentations.

Specific Proposals

1. Computerize management plan information and schedules.

RMU7

Timber is predominately overmature aspen with pockets of jack pine, Norway pine and white pine.

There are 35 private forest management plans covering 5,850 acres in RMU7. This includes a plan for Camp Wilderness (Northern Lights Council B.S.A. out of Fargo), covering 2,477 acres. Wonewok Conference Center and other 3M (Minnesota Mining & Manufacturing Corp.) holdings in RMU7 totaling 2,982 acres. Wonewok has contracted with a Consulting Forester for forest management assistance, while the balance of 3M forest lands are being harvested through an agreement with Potlatch Corporation.

Management Strategies

1. Aspen will be harvested as markets allow. Aspen sites with medium or better site indexes will be allowed to regenerate to aspen. Off-site aspen areas will be converted to pine or spruce. Off-site hardwoods sites should be converted to aspen, pine or spruce. Bur oak and red oak clumps and snag trees will be reserved during harvest.

2. Private pine plantations consisting of an estimated 550 acres should be maintained at a basal area of 90-130 square feet per acre. Non-commercial thinning should be promoted through the State cost share program. About 65% of these plantations are more than 20 years old and most will require some type of thinning during the next 10 years.

3. Management plans and private forest development schedules will be computerized. Harvesting will be promoted through forest management plans and through follow up contacts based on plan recommendations.

COUNTY ASSISTANCE ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

Minnesota counties are responsible for the management of about 2.3 million acres of tax forfeited commercial forest land (see discussion in land administration assessment). County forestry programs are financed by county appropriations, state payments in-lieu-of taxes, the federal BWCAW Forestry Intensification Program, and the state's County Assistance Program. Fifteen counties have County Land Commissioners. The County Land Departments have the responsibility to manage forestry programs, some also have responsibility for recreation programs for parks, wildlife, soil and water, and surveying.

The goal of the Division of Forestry is to encourage and support county efforts to intensify the multiple-use, sustained-yield management of county forest lands.

The counties in the Park Rapids area are Becker, Clay, Douglas, Grant, Hubbard, Otter Tail, Pope, Stevens, Traverse and Wilkin. Table 66. shows information about those counties that have county administered lands.

Table 66. County Forest Resource Information

County	Other Tax For. Acres	Mem. For. Acres	Total Tax. Ac. Acres	Land Dept.
Becker	16,572	58,999	75,571	Y
Hubbard	108,000	28,858	136,859	Y
Otter Tail	336	0	336	N

Minnesota Public Lands, 1983

The Division of Forestry's strategy is to support the continuing improvement in county land management programs by providing counties with technical data, advice, and training in various specialized areas of resource management. DNR assistance will be tailored to complement, but not duplicate county needs and potentials. The Division of Forestry promotes a stable county tax-forfeited land ownership and encourage greater cooperation between the state and counties in the multiple-use, sustained management of forest lands.

The working relationship with all the counties is very good. The counties with forested lands (Becker and Hubbard) are particularly interested in promoting sound forest management along with the Division of Forestry.

PROGRAM DIRECTION

There are many opportunities for State and County land exchanges that would be beneficial to both parties, by increased efficiency in land management through consolidation. There are barriers to these exchanges but many can be overcome. More effort should be directed toward this end.

Roads

There is a need to define jurisdiction on some roads in a written form. This would require some joint meetings to reach agreement. This agreement would improve the efficiency of maintenance, improve roads for public use, and resolve any legal liabilities in question. There is also a need for some standardization of construction and maintenance standards. This would minimize problems that occur where the road jurisdiction changes.

Recreational Trails

There are some issues resulting from conflicting uses that need to be addressed and resolved. A cooperative agreement or memorandum of understanding can resolve some many of these issues.

Coordination of Harvest

Planned timber harvest lists should be developed by the counties and coordinated with the appropriate District Forester's plans for harvest of state lands. The Area Wildlife manager should also have input in this important planning process. This would eliminate the problem of conflicting sales, or sales using the same access. It would result in better coordination of wildlife habitat management. The Park Rapids Area would also furnish a planned cut list for the county to improve communications between the counties and the state, and possible agency referrals in servicing timber requests.

Wildlife Management

Timber management is one of the primary ways of manipulating wildlife habitat. The County land departments manage many acres of timberland that benefit wildlife. The County Land Managers have been doing a good job of land management for wildlife needs. State and County foresters can improve wildlife management through the use of the Forestry/Wildlife Habitat Management guidelines. The guidelines are a good reference and are especially helpful for non-game wildlife needs. The Area Wildlife Manager will be invited to work with the foresters in this process.

Forest Inventory

Better understanding and confidence in Phase II information is needed. In order to increase the use of this information, county input is necessary toward the development of a joint project to interpret the data, and make any corrections or alterations.

A joint annual Area meeting with all counties and DNR Foresters should be scheduled to bring out issues, concerns and solutions. The best time would be at the time our input toward stumpage prices is requested.

URBAN FORESTRY ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

Urban forestry is the term used to describe those forest management practices applied in areas where trees and associated plants grow individually, in small groups, and under forest conditions within cities, towns, and their suburbs.

The goal of the Division's urban forestry program is to help cities, towns, and suburbs maintain and improve their community forests and to assist private homeowners, no matter where they are located (on a farm, near a lake shore, in a small town or large metropolitan area), with the management of any trees or associated plants they are growing for ornamental, aesthetic, or conservation purposes.

The Area Staff Forester (PFM) coordinates all urban forestry activities occurring in the Park Rapids Area. The urban forestry program provides help to all communities, regardless of their size, to plan their overall forestry program, including the development of tree inventories, management plans, city tree ordinances, and budgets. Advice and assistance is given to community officials and private homeowners in the selection of plant materials, planting techniques, spacing and location of trees, in urban and residential areas. This aid helps these community officials and private homeowners develop wildlife habitat, improve watershed areas, minimize soil erosion, establish windbreaks, and manage trees and associated plants for the aesthetic pleasure they bring. Identifying the many insect and disease problems that affect municipal and residential trees is a particularly important urban forestry responsibility of the Area. Any work involved with school and municipal forests is also considered urban forestry.

PROGRAM DIRECTION

The Area's urban forestry effort in F.Y. 1984 was 0.39 person years. This figure will increase in the years to come as communities become more aware of the deteriorating condition of their trees. There will be some new initiatives made. The Area will focus on assisting each major municipality within its jurisdiction in developing a tree planting program and on promoting Arbor Day activities with as many schools and communities as possible. If the Division's proposed grant program for urban forestry is accepted and additional funds become available to communities, the Area's urban forestry workload will increase.

Urban Forestry Program Priorities for 1985-1994

- Maintain or increase the number of Arbor Day activities occurring in schools and municipalities.
- Assist communities with the development of tree planting programs, tree management plans, city tree ordinances, forestry budgets, and the utilization or disposal of urban forest resource wastes.

- Identify for homeowners and communities the insect and disease problems affecting residential and public trees.
- Increase the number of school and municipal forests.
- Distribute news releases concerning local urban forestry activities to the media and provide urban forestry information (pamphlets, books, etc.) to interested individuals.
- Nominate and confirm candidates for the Division's Native Big Tree Registry.
- Acquaint community developers with the benefits of urban forest management and encourage them to protect existing vegetation at construction sites.

Coordination with Other Divisions, Agencies and Organizations

The Area will be working primarily with the city councils and town boards of surrounding communities. The Soil Conservation Service and the County Extension Service could become involved in the Area's urban forestry activities. The Division of Fish and Wildlife, with its nongame wildlife program, might also be a participant in some urban forestry efforts. The Area will certainly assist schools with Arbor Day projects and school forest management. To protect building sites from ongoing construction damage, the Area will work with community developers. Organizations like the Minnesota Forestry Association will be contacted regarding tree distribution programs.

Objectives and Targets

Table 67. Urban and Community Forestry - Park Rapids Area Staffing and Objectives, FY 85 and Projections for FY 87, 91 & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
Staffing					
1. Area	Fte	.40	.45	.55	.60
Objectives					
1. Homeowner Assists	Number	150	160	180	210
2. Community Assists	Number	10	10	12	14
3. Community Arbor Day Celebrations	Number	3	3	3	3

FOREST PEST MANAGEMENT ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

Insects and diseases are the major cause of growth loss and mortality in Minnesota forests. The activities of pests such as the spruce and jack pine budworms, white pine blister rust, dwarf mistletoe, oak wilt, Dutch elm disease, and wood decayers result in loss of about one-half of the annual forest growth in the state.

Insects and diseases have caused and continually are capable of causing heavy losses. Losses have occurred from tree mortality, a reduction in tree quality and volume, and from an alteration or abandonment of a forestry practice. Insects and diseases will always be a part of the forest ecosystem and may potentially become more common under intensified forestry practices. Conditions contributing to a build up of damaging population levels can be managed so that losses can be reduced. Insect and disease management, then, should be an objective when planning and carrying out any forestry activity.

The Division of Forestry is charged by state law with controlling forest pests on public and private lands within Minnesota. The division provides forest protection assistance to nursery, Christmas tree, non-industrial, industrial, urban, municipal, county, and state forest managers or landowners.

The goal of the forest pest management program is to reduce resource losses and constraints on productivity to acceptable levels. The efficient and economical accomplishment of this goal will require the integration of forest pest management techniques into forest nursery production and forest management practices from site preparation to harvest. Integrated pest management requires a pest management program with strong training, evaluation, and research components. The role of the division's forest pest management program is to provide management guidelines, standards, examples, and risk evaluation systems for addressing forest pest management on public and private lands in the state.

The jack pine budworm is the major historic insect problem in the Park Rapids Area. Population numbers great enough to cause top kill and tree mortality probably will occur on the average of once every 10 years. An outbreak occurred between 1977 and 1979, and at the height of the outbreak in 1978, defoliated jack pine in the Park Rapids Area amounted to approximately 25,000 acres. In 1984 budworm populations once again began to build, and defoliated 6700 acres in 1985. Approximately 3,800 acres of this area was heavily defoliated, and some top kill in the heavier defoliated areas is expected. Both the 1977 and the 1984 outbreaks appeared to begin in the Wadena-Hubbard County line. Townships include Badoura, 139N, 32W; White Oak, 140N, 32W; and Crow Wing Lake, 139N, 33W.

Mature and overmature jack pine stands on state, county, and private lands, open grown and overstocked stands, large contiguous jack pine stands, and droughty soil provide conditions for the budworm to carry over during population lows and provide conditions for populations to build up to epidemic proportions. Young red pine plantations mixed in among the older jack pine stands are particularly vulnerable to the budworm.

The most destructive hardwood insect pest is the gypsy moth which is established in Minnesota but not in the Park Rapids Area. The hardwood stands in the southern portion of the Area will be particularly vulnerable to gypsy moth since these hardwood stands are dominated by oak, which is the favored food for gypsy moth. The southern portion of the Area is a popular vacation area for people from outside the Area making gypsy moth introduction a very real possibility.

The forest tent caterpillar has been the major hardwood defoliator in the Park Rapids Area. Historic outbreak areas include the aspen types in Hubbard and Becker counties and the mixed hardwood types, particularly basswood, in central Otter Tail and southern Pope counties. The fall defoliator complex also causes periodic heavy hardwood defoliation throughout the Area. Defoliation has been widespread and heavy enough to adversely impact the tourist industry by forcing people away from outdoor activities. This complex of defoliators includes the variable oakleaf caterpillar, and the red-humped oakworm.

An oak decline complex within this geographic area is triggered by drought stress. The stressed oaks are then invaded by the two-lined chestnut borer and shoestring root rot. Areas of dying red oak were found after both the 1976-1977 and 1980 droughts. Pockets of dead and dying oak were common in the timber demonstration area in Maplewood State Park in Otter Tail County after the 1980 drought.

Hypoxylon canker is the most destructive disease of aspen, and it has been estimated that 112 million board feet of aspen is killed annually in the Lake States. Cankers tend to be more common on quaking aspen, in open grown stands, on the edges of stands, on trees with persistent branches, and disease incidence can be related to genetically susceptible clones.

Diplodia tip blight on red and jack pines is common in the Park Rapids Area. This disease was particularly prevalent in 1977 causing branch and top mortality to young trees. In 1984 and 1985, young red pine planted under larger, residual pine or close to jack pine edges also showed signs of infection. The fungus can be found infecting the cones of the overstory trees, and spores from these infections rain down on the younger understory. Normally, Diplodia tip blight infects and kills elongating shoots. This kind of infection results in setting back growth and causing tree deformities. Under stress, drought and hail damage, this disease invades the stem tissue beyond the current year shoot causing branch, top and/or tree mortality.

Insect and disease management should start before plantations are established and be part of the planning process. It is more costly to address insect and disease problems after plantation establishment. Insect and disease problems should never result from decisions or omissions made before establishment. Many insect and disease problems can be minimized by providing conditions for keeping the tree vigorously growing.

Since a sizable investment has been made in establishing plantations, priority should be given to maintaining the vigor, health, density and quality of the plantation.

PROGRAM DIRECTION

To manage insects and diseases, the Park Rapids Area personnel and the Division's forest pest personnel will work together to integrate forest pest management techniques into silvicultural practices. The forest pest program provides management guidelines, basic biological information for the insect and disease pests, and risk rating systems for the major forest types and pests. Park Rapids Area personnel conduct surveys, implement risk rating systems, and carry out management strategies. Regularly scheduled workshops will be conducted to keep Area personnel aware and informed of insect and disease identification, life cycles, and management principles and techniques.

For each of the following forest pests specific actions to be take are listed:

Jack Pine Budworm

1. Evaluate the risk to pine stands using phase II inventory data and on field observations. Include all ownerships in risk rating.
2. Prioritize stands for harvesting and conversion based on risk rating results.
3. Break up large, contiguous pine types by planting spruce or larch, or by taking advantage of natural hardwood types.
4. Encourage more mixed pine-aspen stands. When regenerating pine, accept some aspen competition.

Gypsy Moth

1. Designate the Alexandria District Forester as the gypsy moth specialist in the Area.
2. Evaluate the risk to the central hardwood type in the Alexandria District, and in Otter Tail and Becker Counties.
3. Prepare a gypsy moth action plan to address gypsy moth management, and public reaction, and relations.
4. Continue trapping for gypsy moth under the supervision of the Area gypsy moth specialist coordinating with the region I & D specialist.

Hardwood Defoliators

1. Conduct forest tent caterpillar egg mass surveys in conjunction with aspen timber sale inspections that are carried out during winter.
2. Prepare a plan to deal with public reactions to defoliation.
3. Assist landowners in developing and coordinating management and control activities.

Oak Decline Complex

1. Identify oak stands growing on drought-susceptible soils.
2. During seasons of drought and for 2 years immediately following the cessation of a drought, aerial and/or ground check these drought-susceptible areas.
3. Prevent the buildup of the two lined chestnut borer by harvesting oak with top dieback.

Hypoxlyon Canker of Aspen

1. Identify stands which have at least 10% of the basal area infected with Hypoxylon. These stands should be the priority stands for shearing and harvesting.
2. Stands with Hypoxylon canker should be scheduled strictly for dormant season logging to promote a more uniform, well-stocked stand.
3. Stand with 15-25% of the basal area infected should be given priority for immediate harvest.
4. Stands with infection rates greater than 25% should be converted to a species other than quaking aspen.
5. Favor regenerating big tooth aspen, especially when Hypoxylon is present.

Diplodia Tip Blight

1. Timber sale specifications should call for removal of all pine when the area will be regenerated to pine.
2. In plantations where overstory pine exist, the overstory should be removed or killed.

Plantation Establishment

1. Match the intended tree species to the soil type and drainage by doing a field soil check before determining species to plant.
2. Emphasize intensive site preparation using a combination of mechanical and chemical means to provide a healthy, vigorous start for seedlings.
3. Remove all live overstory residual conifers when establishing a conifer of the same genus as the overstory.

4. Plan for buffer strips by not planting areas or by planting species of different genera. Buffer strips should also be used against adjacent stands when those stands show signs of insect and disease problems.

5. Any old field plantings should be surveyed for white grub populations the summer before establishment.

6. Confine mid-summer containerized seedling planting to sites which have been harvested or sheared within 2 years of planting to reduce the potential for grasshopper damage.

Plantation Management

1. The regeneration surveys conducted at 1, 3, 5 and 10 years after establishment should incorporate insect and disease surveys which record incidence, amount of damage, and cause of mortality.

2. All red pine plantations without crown closure should be hazard rated for Saratoga Spittlebug.

3. All red pine plantations from 3 feet tall until crown closure should be included in a spittlebug scar survey conducted so that each plantation is checked at least once every 3 years.

4. Thin stagnant and dense stands of jack pine.

FOREST SOILS ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The forest soil resource is perhaps the most important element of the forest site to be considered in intensive forest management. Accurate characterization, interpretation and understanding of this resource is essential to effective and efficient planning and management. Soil/site conditions effect: Site productivity, species suitability, equipment operability, stand vigor and longevity, herbicide effectiveness and vegetative composition. They also effect site preparation and release activities (nearly all aspects of site management). Therefore a thorough understanding of soil/site properties is necessary for efficient forest management. Ignorance of these properties has resulted in costly mistakes, lost productivity and reduced environmental quality.

It is the mission of the forest soils program to:

- Enhance forest resource management and productivity through the application of technical forest soils information.
- Disseminate new and existing forest soils information to field forest managers and encourage implementation of new concepts.
- Improve the utility of existing forest soils data
- Assist forest managers in focusing resource management efforts and targeting investments to the most productive sites.
- Facilitate land use planning and decision making.

In the past, the forest soil resource has not been given due consideration in many forest management decisions. This is partly due to the limited amount of soils information available and partly due to the lack of soils education and training of forest managers. In recent years forest managers have become increasingly aware of the importance of the soil resource in considering forest management options. Soils data is still lacking, and education of foresters in soil properties and processes is needed.

Increased soil data availability and training of managers will improve forest management, increase efficiency of management dollars, and maintain or improve site productivity. Park Rapids Area personnel and the forest soil specialist will work together to integrate soil management principles into forest management practices. The forest soil specialist provides soil resource information and interpretations on both a broad base and site specific level. The Area personnel indicate sites needing intensive soil investigation and implement soil interpretations into development of management strategies.

PROGRAM DIRECTION

The overall strategy of the forest soils program is to develop field applications of forest soil information on state administered forest lands.

The forest soils program can be split into five major program areas of which to assess needs and activities. These areas are: Soil interpretations and management assistance; information, education and training; management planning assistance; forest roads; and soil resource inventory.

Soil interpretations and management assistance.

Because of the lack of soils information in the Area, there is a need for soil investigation and interpretations to be developed on both site specific and area wide levels. Soil interpretations applicable to intensive management include: Operability, productivity, species suitability, and suitable site preparation methods. It is most useful if these interpretations are made prior to any initiation of management activities. Ignoring site properties may result in site degradation, poor return on investments, seedling mortality, or other costly mistakes.

The overall strategy of onsite investigations is to place primary emphasis on state administered lands and to emphasize site specific analyses prior to the initiation of any management activities. The following actions will be taken:

1. Standardize data collection, reporting and request procedure.
2. Identify and interpret geographic land forms and soil types occurring on state forest lands (i.e., Itasca moraine).
3. Collect base line soil and site data.

Information, Education and Training

To effectively use forest soils information, the forest manager should understand soil properties and the intricate relationship between soil and forest management. There is a need to improve the level of this understanding among most foresters through formal and informal training. There is also a need to disseminate current forest soils research to Area and District personnel. The following actions will be taken:

1. Continue training of Area and District personnel.
2. Disseminate forest soils research findings and current literature to Area and District personnel.
3. Complete forest soils manual series.

Forest Planning Assistance

Forest soils information should play an integral part in long and short range management planning and decision making. Specific soil information on resource management units and soil landscape units should be used to develop manageable planning units with similar goals.The following actions will be taken:

1. Utilize forest soils data in the development of resource management units, management strategies and guidelines.
2. Integrate forest soils information into the MFRP planning process.

Forest Roads

The forest roads system in the Park Rapids Area is in constant need of maintenance and occasional repair or construction. Road design and routes may vary due to local soil conditions. Gravel sources for road work are often times difficult to locate close to roads. The forest soil specialist should provide insight into soil conditions and gravel deposits through careful evaluation of the landscape.

The following actions will be taken:

1. Work with the forest roads specialist to identify future needs for soil interpretation and gravel resource location.
2. Work with forest managers to prevent erosion of sites due to logging or other activities.
3. Recommend solutions to road and trail erosion problems.

Forest Soil Resource Inventory

An intensive inventory of the soil resource is an important step in the incorporation of soil information into management practices. Intensive soil survey information is very limited in the forested portions of the Park Rapids area. Counties with completed soil surveys include: Clay, '80; Douglas, '75; Grant, '75; Pope, '72 and Stevens, '71. Counties with partially completed surveys include: Wilkin,'86; Traverse,'86 and Becker,'92. Clearwater and Ottertail counties have signed agreements but have not yet started fieldwork. Hubbard county has not signed an agreement as of 1985.

As soil surveys move into forested counties there is need to improve the utility of the surveys for use by Foresters. Most outstanding are the needs of communication between soil scientists and foresters, and the need for forestry related interpretations of soil resource map units.The following actions will be taken:

1. Increase communication between foresters and soil survey personnel, especially in forested counties.

2. Provide Hubbard County with a clear statement of the Division's position on soil surveys and what Forestry needs in survey design and interpretations.

3. Improve interpretations specifically for forestry in those forested counties with existing soil surveys, with emphasis on land forms with large blocks of state ownership.

4. Work with ongoing soil surveys to improve the surveys for use by forest managers.

5. Provide Area personnel with advanced copies of soil maps as they are produced by a county survey.

FOREST RESOURCE INVENTORY ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The goal of the Division's Forest Inventory program is to collect, process, maintain and distribute reliable information on the present status and dynamics of the state's forest resources to a variety of user groups. Information regarding the location, character and current condition of the state's forest resources is essential for effective management planning and decision making.

A forest inventory is a sampling method used to determine the forest resource of a particular area or unit. The sampling system measures some or all of the resource component on a plot which is a proportional representation of the total forest. The forest inventories developed to inventory Minnesota's forest resources are called Phase I and Phase II.

Phase I inventory can be compared to the surveys conducted by pollsters where they randomly contact 1,000 people in the country to determine a trend, or a position, or an attitude. The people interviewed represent all the people in the country. In Phase I, information is obtained from forested plots instead of people. This information then represents the forest resources of Minnesota.

Phase II inventory is a much more intensive survey. Every vegetative cover type is identified through photo interpretation. All merchantable types and most of the non-merchantable types are field checked. Data is collected by plot sampling, which describes the composition and condition of each forest stand at the time of the examination. A vegetative cover type map is made for each township. The boundaries of the individual forest types are outlined and each forest type described on the map. Individual stand data is put into the computer data bank.

The Division's objective is to integrate the inventory with advances in remote sensing and geographic mapping in order to produce a comprehensive forest resource assessment.

This data has been extremely useful in overall resource planning, research, and in promoting new or expanded forest industries in Minnesota.

Phase I inventory plots will be measured every 10 years. For the next 4 years, the Forest Inventory Unit and the North Central Forest Experiment Station will be measured 9,000 commercial forest land plots statewide. Phase I plots in the Park Rapids Area will be re-measured by North Central Forest Experiment Station personnel in 1989.

Phase II inventory was also done in the Park Rapids Area. It was started in 1977 and field work was completed in 1984. This inventory included all DNR and County administered lands.

Private lands were not included, although some private land was inventoried as it was crossed by inventory crews proceeding to inventory public lands. Field sheets, type maps, computer printouts and stand information summaries are used and maintained in Area and District DNR Forestry Offices, DNR Wildlife Offices, and the County Land Department Offices.

PROGRAM DIRECTION

The stand information inventory (Phase II) needs to be accurate and up to date. An alteration procedure was initiated in 1981 to incorporate changes in an area's vegetative cover brought about by natural and artificial manipulations such as logging, shearing or flooding. These alterations are extremely important in maintaining the integrity and accuracy of the inventory data. Improved alterations procedures are being developed to assure the inventory system is kept current. In addition, steps are being taken to utilize computers to more rapidly access forest inventory information for field office use. The capabilities of the Geographic Information System in Grand Rapids, allows for all stand management data to be linked with updated stand maps.

Phase II forest inventory will be updated and kept current through several techniques. Models developed by the North Central Forest Experiment Station (and adjusted by the analysis of Phase I data) will be used to update the records of undisturbed stands. Remote sensing (35 mm photography) will also be used to locate disturbed stands, verify non-commercial stands and reduce the need for field checks. The third method of updating will require field checking stands.

Area personnel, based on experience working with existing Phase II data, will identify stands needing field re-inventory using the following criteria:

- Stands at high risk of loss that are beyond rotation age.
- Stands with high risk of loss due to insects or disease.
- Stands or minor types that don't "model" well.
- Stands in error in original survey.

Area personnel will start soon to identify stands needing field re-measurement. During the period December 1986, to March 1988, Area personnel, trained and under the direction of an Inventory Project Leader, will complete Phase II re-measurement. New aerial photos or 35 mm photos of State land areas where site disturbances have occurred will be needed. An Inventory Project Leader position needs to be be established in the area.

The Park Rapids Area vegetative stand analysis inventory could be completely updated and on a firm timber regulation scheme by July 1, 1988.

Objectives and Targets

Table 68. Forest Resource Inventory - Park Rapids Area Staffing and Objectives, FY 85 and Projections for FY 87, 91, & 96

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
Staffing					
1. Area	fte	0.6	0.8	2.0	2.0
Objectives					
Phase II					
1. Maintain inventory	alterations	80	200	200	200
2. Reinventory	acres	0	3200	1280	1280
3. Private lands	acres	0	12000	15000	16300
Phase I					
1. Plot measurements	plots	0	10	25	25
Aerial Photography					
1. 9x9 photos	acres	0	Hubbard	0	Becker
2. 35 mm photos	acres	979	1500	2000	2000

UTILIZATION & MARKETING ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The mission of the Forest Products Utilization & Marketing Program is to: 1) Expand the use of Minnesota's wood resources, 2) Increase the value of forest products produced in Minnesota, and 3) Increase the wood-using efficiency of Minnesota's forest products industry, so that the resources of the state's forest lands are utilized to best meet the needs of Minnesota's citizens. Markets provide the stimulus for most forest management activities; without markets for forest products, TSI and harvest are futile.

The diverse forest resources in the Park Rapids Area, at the junction of northern pine, central hardwoods, and prairie regions, require a diverse forest products industry to realize the full potential for utilization. Emphasis up to this point has primarily been in conifers. Post, pole and pulp markets have diminished in recent years, and efforts should be made to restore these uses for pine thinnings. Major aspen consumers in Bemidji affect only the extreme northeast portion, leaving a large aspen surplus throughout the rest of the area. Older age classes will not properly regenerate if harvesting is delayed. Currently, there are under-utilized species in every county, and a general lack of markets and value-added industry throughout the area.

Within the Park Rapids Area, then, there is a need for additional forest products industrial development, especially in the utilization of low-quality hardwood species and small-sized pine. High quality timber, both hardwoods and conifers, will always have a market, although a major portion of logs harvested have been exported out of the area for processing due to a lack of local markets. Development of secondary processing facilities would add to the value of local resources, as well as provide further economic support to local communities.

Increased pressure has been placed on the hardwood resource in recent years; through selective harvesting of high-grade trees,, without a professional forester's assistance, and through cutting of young, potentially valuable crop trees for firewood. Landowner education, training of loggers and forest vendors, and general promotion of proper hardwood forest management should be increased. Since agriculture is the primary industry in the area, additional emphasis must be placed on the potential economic importance of the hardwood forest resource.

Pressure on the aspen resource has also been increasing. The three major aspen consumers in Bemidji, currently using a combined volume of approximately 500,000 cords per year, are purchasing aspen from portions of the Area at this time. However, proposed expansion plans of Bemidji's largest consumer, currently in the feasibility study stages, will most likely increase the consumption around Bemidji by about 25%. Technological changes, such as the conversion to faster setting isocyanate resins, are expected to increase consumption by another 30% within the next

5 years, bringing the total consumption by these three plants up to approximately 800,000 cords/year. This increasing pressure on the resource will force the companies to purchase wood further and further from their plants, and will push their procurement further into the Park Rapids Area.

Development of other industries around the state will also impact the Area. The recently announced expansion of a major mill in Grand Rapids will force the procurement zones of the Bemidji plants westward, as will the construction of a new waferboard plant in Deerwood. Even plans to increase the consumption of softwoods at the International Falls paper mill can be expected to have an affect on the Park Rapids Area, because improved markets for pine pulpwood and clean chips, currently unmarketable by-products of saw logs, will result in more saw timber being harvested.

Proposed conversion of a coal-burning NSP power plant in Granite Falls to wood fuel may effect the southern portions of the Area. Promotion of fast growing hybrid poplar plantations, currently underway, is expected to provide most of the fuel needed for this prairie region plant, but it may be necessary to reach up into more wooded areas for additional wood supply.

PROGRAM DIRECTION

Responsibilities for implementation of the U & M Program lie mainly with the Region U & M Specialist and St. Paul staff. Many activities of the U & M Staff will benefit the Park Rapids Area as part of the Region or State as a whole. However, Area personnel do have the responsibility to identify specific situations where U & M assistance is needed and to request specialized help. The Area staff also assists in various localized aspects of the U & M Program.

The six major program categories that the U & M staff are involved in, listed by priority, include:

a) Forest Products Industrial Development
b) Wood Energy
c) Forest Products Marketing
d) Forest Products Secondary Processing
e) Forest Products Primary Processing
f) Forest Products Harvesting

<u>Park Rapids Area Utilization & Marketing Program Objectives for 1985 - 1995</u>

- Analyze the Area's forest resources to identify potential wood products industrial development opportunities.
- Collaborate with other agencies (RC&D, SWCDs, Extension, etc.) to promote awareness of underutilized timber resources and gain support for development of these resources.

- Promote the development of new forest products industries, such as "System 6", a laminated panel product designed to use low quality hardwoods; medium density fiberboard, a construction board made from aspen, balsam, or almost any other species; pine pulp, post, or pole using industries; shavings mills, using aspen for livestock bedding; or other unforeseen industrial uses of the under-utilized forest resource in the Park Rapids Area, especially the prairie hardwoods portions.
- Solicit legislative and congressional support of forest management and development of forest products industries and marketing.
- Increase marketing assistance to local processors, bringing together suppliers and consumers of their products.
- Promote the best use of area timber resources, to minimize waste and encourage highest value uses of the resource.
- Identify timber and residue surpluses so that the wood energy program will result from proper log merchandising, and lead the effort in promoting conversion of potential wood energy conversion sites (i.e., schools, hospitals, government offices, central municipal heating plants, ag-industry, etc.) from primary dependence on fossil fuels to use of renewable wood energy.
- Expand efforts to market the Area's timber resource.
- Improve timber sale marketing techniques to maintain a competitive position, increase the number of completed sales, and make sales more attractive to potential buyers, without compromising proper forest management.
- Assist primary processing industry with specific requests, especially in sawing for grade and marketing the products.

Park Rapids Area personnel are involved in the following U & M activities:

- Conducting programs to salvage wood lost through fire, wind, flood, and insects and diseases.
- Merchandising raw materials for the highest value products.
- Proper scaling and grading of products sold through timber sales.
- Bringing together producers and consumers of wood products.
- Serving as local contacts for loggers and industry.
- Serving as local advisors to Region and St. Paul U & M staff with regard to quantity and quality of the local timber resource.
- Harvesting and marketing assistance to private landowners.

A major portion of the U & M workload for Area Personnel is in providing assistance to landowners through the Private Forest Management Program. PFM has a high priority in the Park Rapids Area, and U & M assistance (harvesting, marketing) is second only to regeneration in the number of requests. Through PFM, the U & M program becomes visible and meaningful to the general public. Increased emphasis on Utilization & Marketing of privately-owned wood resources will be encouraged.

Coordination with other Divisions, Agencies, and Organizations

The primary coordination the Area has with other DNR divisions (Parks, Wildlife, etc.) is to assist in marking and selling timber on their lands. As on Forestry administered land, the timber is identified and sold for its highest value product. Park Rapids Area staff has also worked with Counties in the Area by marketing of County-owned timber lands, and coordinating State sales with County timber sales programs, as well as providing information and assistance to County Extension agents as needed. Similar assistance is provided to the U.S. Fish and Wildlife Service on their lands. Cooperation with other agencies, i.e., SCS, SWCD, RC&D, should be continued, as a means of promoting under-utilized species and potential development, with the resulting economic and job security benefits to surrounding communities.

FIRE MANAGEMENT ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The goal of the fire management program is to provide effective wildfire control while promoting the safe and effective use of fire as a resource management tool. The major components of wildfire control are fire prevention, presuppression, and suppression. Prevention involves efforts to inform the public of the dangers and potential losses that can result from uncontrolled wildfires. Presuppression focuses on the need to adequately prepare and maintain fire suppression forces for the eventuality of fire outbreak. Presuppression is done through extensive planning, training, rural fire department assistance, fire detection, and interagency cooperation. Suppression activities involve controlling and extinguishing wildfires with a minimum of damage to property, natural resources, or people.

The Division of Forestry is responsible for providing expertise and assistance for prescribed fire by other DNR disciplines in the Park Rapids Area. In addition, the Division provides assistance and final approval for all uses of fire as a management tool by other agencies and organizations, such as The Nature Conservancy, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, Prairie Chicken Society, etc.

The Park Rapids Area also administers the Rural Community Fire Protection program locally. This program is designed to assist 85 rural fire departments in the Area. Title VI, a Federal matching fund program, is utilized to reimburse fire departments for approved projects, up to 50% of their cost. Federal excess equipment is also distributed to rural fire departments, based on need, and priority. The Park Rapids Area is quite diversified, ranging from heavily forested high risk fire areas in the northeast, to sparsely wooded agricultural areas in the west and south. The Park Rapids Area office is the center of fire protection activities. Twelve full-time employees and a ready complement of fire fighting equipment provide the main fire fighting force for 80% of the Area's fires.

In the high risk area of southern Hubbard and eastern Becker Counties, DNR Forestry works closely with all fire departments, County Sheriff's departments, Tamarac National Wildlife Refuge, County land departments, other DNR Divisions, Township Fire Wardens, and the general public to assure quick and effective fire action.

In the scattered hardwood and agricultural areas in western Becker County, from Ottertail County and south, DNR Forestry personnel play a lesser role in fire protection. With only 3 foresters in this 8 county area (one in Detroit Lakes and 2 in Alexandria) we have found it to a mutual advantage to enter into a cooperative fire fighter agreement with many of the local fire departments. The primary function of DNR Forestry in these areas is to assist the rural fire departments in coordinating, training, and securing equipment and funding. The rural fire departments are employed as the initial attack fire fighting force.

DNR Forestry assists with specialized equipment such as bulldozers, ATVs, fire plows, helicopters, air tankers, and additional fire fighters if needed. Long term fire fighting situations such as peat or ground fire mop-up are often times taken over by DNR Forestry or worked cooperatively with a few members of the fire department and contracted equipment as needed. In addition, DNR Forestry personnel investigate wildfire causes and take necessary enforcement action. Another primary DNR Forestry responsibility in this area is fire prevention activities such as school or group visits, parades, poster contests, and information provided to the news media.

PROGRAM DIRECTION

Area-wide

The Area Fire Analysis (1971-78) indicates an average of 84 fires,burning 1884 acres per year. Average size of fires when the forester makes the initial attack is 5 acres. The average size of when controlled is 22 acres.

The peak fire season is generally from April 1 to about May 23. Most [65%] of the Area's fires occur during this period. An additional short season sometimes occurs in late July and early August. Fall fire seasons are unpredictable. Fall is generally wet and cool, but fires can occur generally between September 15 to October 31. Historically, the large disastrous fires have occurred in the fall, usually preceded by summer drought conditions.

The two main causes of the Area's fires are incendiary (35%) and debris burning (27%). Again, the Spring season is the most active, with 74% of the debris burning and 67% of the incendiary fires occurring then.

The Park Rapids Area Fire Plan, 1983, contains a detailed analysis of fire information for the period 1971-1978. The fire plan presents information such as: Description of the Area, major cover types, type of fires and fire seasons, fire history, purpose and goals of the fire protection program, fire prevention, presuppression, detection systems, manning guides, resources and equipment available or needed, and costs of operations.

The Area Fire Plan provides overall direction for the Area's fire protection program. In addition, an Area Dispatch Plan is maintained and kept current at the Area office for use in daily fire protection operations. These plans are revised as necessary to reflect changing conditions or program direction. The Area Fire Plan and Dispatch Plan are used by field and supervisory personnel to coordinate the Park Rapids Area fire protection efforts with the Statewide program.

Fire Management Objectives for 1986-1995

- Increase wildfire prevention efforts.
- Establish adequate equipment upgrading and replacement schedules.

- Continue to work closely with rural fire departments - cooperative fire agreements, excess equipment, Title VI funding, and training.
- Improve wildfire training programs.
- Increase fire investigation, cost collection, and law enforcement efforts.
- Assure that Area personnel are trained in the needed fire suppression courses, National Interagency Incident Management System (NIIMS), and the Incident Command System (ICS).
- Encourage other emergency service agencies and fire departments to continue to train in the above courses.
- Train and develop dependable Area fire crews, smokechasers, and FFA Students for fire fighter.
- Revise the Area Fire Plan in 1986, and keep the Dispatch Plan current at all times.
- Increase dependence on aircraft for fire detection, and identify towers for disposal.
- Upgrade fire prediction system.
- Increase accuracy of fire reporting.
- Improve overall cost effectiveness of fire program.
- Continue to support and implement prescribed burn management with other DNR disciplines, public agencies and private organizations (see Operation Order #47).

Objectives and Targets

Table 69. Fire Management - Park Rapids Area Staffing and Objectives, FY 85 and Projections for FY 87, 91, & 96.

Proposed Program	Unit of Measure	FY85	FY87	FY91	FY96
Staffing					
1. Area	fte	1.5	1.5	1.7	1.7
Objectives					
Training					
1. Meet training requirements for:					
- Overhead team members	people	1	1	2	2
- Basic Firefighter	people	0	0	1	1
- Rural Fire Departments	departments	4	6	6	6
Prevention	fte	0.1	0.1	0.2	0.3
Presuppression					
1. Issue and inspect burning permits	permits inspected	1200	1400	1800	2400
2. Recruit and train township fire wardens	wardens	40	50	90	120
Fire Management					
1. Use prescribed fire as a resource management tool	acres	2000	2000	2000	2000
Suppression	fte	.4	.3	.3	.3

Resource Management Units

RMU1

The main type of wildfire danger within this unit is uncontrolled spring and fall burning of marshes, prairies or road ditches. Fire danger resulting from this type of burning is greatly reduced by the high percentage of agricultural cropping of the area. Grasslands are generally surrounded by tilled fields, providing barriers to spreading wildfires. The many rural volunteer fire departments in the area provide initial attack when fires occur. DNR Forestry does not have personnel or equipment located within the unit.

Management Strategy

1. The fire prevention, presuppression and suppression program should continue to be carried out by rural fire departments.
2. The main effort of the fire program should be directed at educating landowners toward the proper use of fire as a management tool, in accordance with State and local regulations.

3. Forestry will cooperate with all agencies or fire departments in fire prevention education.

4. The MPCA is active within this area and permits are required before burning. No DNR Township Fire Wardens are located within this unit.

Specific Proposals

1. Forestry will cooperatively plan and implement prescribe burns for prairie grass management with DNR Wildlife, DNR Parks, The Nature Conservancy, Prairie Chicken Society and the U.S. Fish and Wildlife Service, in accordance with DNR Operational Order No. 47.

2. Excess forestry fire equipment will be loaned to respective agencies, when available for prescribed burning.

3. Forestry will cooperate with Wildlife, Parks, MPCA and the U.S. Fish and Wildlife Service in educating the public in the proper use of fire as a management tool.

4. Forestry should continue to assist local fire departments with aid and surplus equipment in an effort to improve their effectiveness.

5. Forestry will provide fire fighting assistance to rural fire departments if needed.

RMU2

This area has traditionally been a low fire hazard area. It is typically hardwood forests, agriculture land and swamps. Swamps burning are the most prevalent fire but rarely do any major damage. Most fires within this type are handled by landowners or local fire departments.

Many landowners burn out ditches or swamps in the fall trying to stimulate new growth and clean up the dead grass.

Management Strategies

DNR Forestry should undertake with DNR Wildlife for a more intensive information campaign to discourage landowners from doing indiscriminate burning.

The MPCA is active within this area and permits are required before burning. Only in the extreme north end of this type can DNR Fire Wardens be found and burning permits required.

Specific Proposals

1. DNR Forestry's role in this Unit is in prevention mainly.

2. We should educate and inform landowners of the proper uses of fire.

3. We should continue to assist local fire departments with aid and surplus equipment in an effort to make them better able to respond effectively.

4. When the fire departments can no longer handle the fire, then we should provide assistance and administration.

RMU3

The main type of fire problem in this RMU is spring and fall grass burning of swamps and road ditches. This unit consists primarily of farmlands interspersed with hardwood woodlots, swamps and lowland or non-productive grasslands. Marginal grasslands are managed by fire. These low marginal lands are hayed in dryer years.

Wildfire suppression is handled by local volunteer fire departments with assistance upon request from the Department of Natural Resources at Park Rapids and Nimrod. These fire departments are well equipped and are very familiar with their local areas.

Management Strategy

Rural fire departments will continue to be the initial attack fire-fighting force. DNR Forestry will assist, as requested, with specialized equipment such as bulldozers, ATVs, fire plows, helicopters, air tankers, and additional firefighters if needed. Long term fires, peat or ground fire mop-up will be worked cooperatively with DNR Forestry and RFDs. Fire law enforcement will be done by DNR Forestry with cooperation from fire departments and local law enforcement officers.

Most rural fire departments are fairly well equipped. With DNR Forestry's ability to obtain surplus equipment and Title IV matching fund grants, upgrading of the rural fire departments should continue.

Fire pre-suppression and prevention activities should continue to augment the efforts of the rural fire departments. Education of school children and adults is a continuing responsibility. The network of Township Fire Wardens will be maintained at its present level. Burning regulations will be set and enforced by Park Rapids Area and Nimrod personnel.

The detection of wildfires will be primarily from reports by the public. Under high fire danger conditions, railroad patrols and aerial fire detection will be initiated by the Area Forest Supervisor.

Specific Proposals

1. Annually, prior to spring fire season, contact each fire department in the unit, and review fire problems, training and/or equipment needs, and renew cooperative fire agreements.
2. Assist the fire departments in obtaining excess equipment and Title VI funding.
3. Conduct an annual Township Fire Warden meeting and training session.
4. Continue fire prevention activities in the unit.

RMU4

The main type of fire problem in this RMU is spring and fall grass burning of swamps and road ditches. This unit consists primarily of farmlands interspersed with hardwood woodlots, swamps and lowland or non-productive grasslands. Marginal grasslands are managed by fire. These low marginal lands are hayed in dryer years.

Wildfire suppression is handled by local volunteer fire departments with assistance upon request from the Department of Natural Resources at Park Rapids and Nimrod. These fire departments are well equipped and are very familiar with their local areas.

Management Strategy

Rural fire departments will continue to be the initial attack fire-fighting force. DNR Forestry will assist, as requested, with specialized equipment such as bulldozers, ATVs, fire plows, helicopters, air tankers, and additional firefighters if needed. Long term fires, peat or ground fire mop-up will be worked cooperatively with DNR Forestry and RFDs. Fire law enforcement will be done by DNR Forestry with cooperation from fire departments and local law enforcement officers.

Most rural fire departments are fairly well equipped. With DNR Forestry's ability to obtain surplus equipment and Title IV matching fund grants, upgrading of the rural fire departments should continue.

Fire pre-suppression and prevention activities should continue to augment the efforts of the rural fire departments. Education of school children and adults is a continuing responsibility. The network of Township Fire Wardens will be maintained at its present level. Burning regulations will be set and enforced by Park Rapids Area and Nimrod personnel.

The detection of wildfires will be primarily from reports by the public. Under high fire danger conditions, railroad patrols and aerial fire detection will be initiated by the Area Forest Supervisor.

Specific Proposals

1. Annually, prior to spring fire season, contact each fire department in the unit, and review fire problems, training and/or equipment needs, and renew cooperative fire agreements.
2. Assist the fire departments in obtaining excess equipment and Title VI funding.
3. Conduct an annual Township Fire Warden meeting and training session.
4. Continue fire prevention activities in the unit.

RMU5

The Division of Forestry is responsible for wildfire protection in this unit. this is the most hazardous unit in the Park Rapids Area. Thirty (30) fires per year occur in the unit, based on a 10 year average. It is an extremely high hazard unit, as the vegetation consists of extensive pine lands, grasslands, marshes, conifer plantations with grass, pine slash areas, agricultural lands, unmowed grassy roadsides, recreation areas, and tourists and rural residents.

People cause 98.4% of the fires in the unit! Debris burning 23% and incendiarism 44% are the major causes. Children cause 13% of the fires, primarily, in the Pine Point area of the White Earth Indian Reservation. In fact, 27% of the fires in RMU5 occur around Pine Point. Farm equipment fires account for 8% of the fires within the unit.

Critical fire hazard areas that deserve mention are the Badoura area of extensive bog and pine lands; the conifer plantations and mature jack pine along the west side of Lone lake; and other resorts or homesites nestled under the pine throughout the unit. These areas present a very difficult task for the Forester to protect. Risk and potential for serious wildfires is prevalent throughout the unit.

Management Strategy

Since RMU5 is such a critical fire protection area, the maximum level of effort in fire prevention and pre-suppression activities should be directed toward this area. Fire prevention activities should reach all ages of the population, by use of all forms of public media. Announcement of the fire danger level and information about current fire actions on a regular basis should continue. Visits to schools and youth group visits to the Forestry Station should be continued. Teachers, Township Fire Wardens and other group leaders can also assist in spreading the fire prevention message. Parades, fairs, and other community events are good opportunities. There is a need for more and better audio/visual aids - films, slide-tape programs, radio and TV public service announcements, portable displays, etc.

Another aspect of fire prevention needs emphasis - fire law enforcement. A stronger fire enforcement program will result in fewer fires. Arson investigation teams and individual fire enforcement action by trained Forest Officers should reduce the number of careless debris burning and intentionally set fires, which now account for 67% of all fires in the unit. Closer coordination with other law enforcement agencies is needed.

The fire suppression strategy is to continue to operate in accordance with the Area Fire Plan and Dispatch Plan. Area fire personnel and crews will be continuously trained in the latest fire-fighting techniques. Equipment should be continually up-graded and fire-ready.

Property that is fire prone should be identified and an effort will be made to work with landowners and county zoning to take preventative measures such as breaking up area of conifers.

The main fire detection strategy will be aerial detection with a local contracted commercial pilot, based at Park Rapids airport. Towers will supplement detection in accordance with the Area Fire Plan detection guide.

Specific Proposals

A helicopter with bucket and 2-man crew should be located at Park Rapids during the spring fire season. A helicopter's presence would have tremendous fire prevention value. In addition, it would provide a rapid initial attack capability in a high hazard area where a few minutes can make the difference between a routine fire and disaster.

Selected Badoura Nursery personnel should be continuously trained, equipped, and ready to assist when needed for fire in that area. A trailer is needed there, to haul the bulldozer. A fully-equipped high pressure pumper is also needed.

Annually, an FFA crew should be trained at the Park Rapids High School, and utilized as firefighters. Annual training of cooperating rural fire departments is also essential.

Prescribed burning will be employed as a practice for disposal of logging slash, site preparation for planting, maintenance of wildlife openings, and prairie chicken management projects. DNR Operational Order No. 47 will be the basic policy for planning and implementation of prescribed burning projects. They will also serve as training opportunities for cooperating fire departments and other agencies.

RMU6

The Division of Forestry has the primary responsibility for wildfire suppression in this unit. All of this unit lies within the intensive fire protection area. Forestry personnel and equipment generally take initial attack action on most fires in the unit. However, on the more distant western and southern edges of the Unit, more reliance if placed on assistance from rural fire departments and Tamarac Refuge. Cooperative agreements exist with the Tamarac National Wildlife Refuge, U.S. Fish and Wildlife Service, and 8 rural fire departments.

Management Strategy

The main thrust of fire prevention should be public education on the dangers of wildfires. Presuppression activities will be done according to the Area Fire Plan, including use of towers and aircraft for detection, agreements with equipment operators and RFDs, and maintaining the Township Fire Warden network. Fire suppression activities will be according to the Fire Plan Manning Guide. They include increased use of helicopters and updating of fire fighting equipment.

Prescribed burning is used by Forestry mainly as form of site preparation on cutover pine areas, and by Wildlife for maintaining upland grass areas. All prescribed burning will be conducted in accordance with Operational Order No. 47.

RMU7

The Division of Forestry is responsible for wildfire protection in this unit. This unit has a low fire incidence that averages only about 2 fires per year. Reasons for this are: The aspen-hardwoods timber types; primarily public land with very sparse population settlement; and low incidence of man-caused, equipment-caused, or lightning-caused fires. The Akeley and Nevis Volunteer fire departments provide a quick response to fires in this unit, whenever needed. DNR Forestry equipment is dispatched from Park Rapids, with assistance available from Guthrie, Cass Lake, or the U.S. Forest Service at Walker.

Management Strategy

The main thrust of fire prevention should be public education of the dangers of wildfires. Informing trail users and resort owners within the unit during high fire danger, could prevent fires. Pre-suppression activities will be done in accordance with the Area Fire Plan, including aerial detection; agreements with equipment operators and RFDs; and maintaining the Township Fire Warden network. Fire suppression will be done according to the Area Fire Plan. The plan calls for increased use of helicopters and RFDs; favoring aerial detection over tower detection; and continuous updating of fire fighting equipment and personnel training.

Specific Proposals

Prescribed burning will be a continuing practice, when appropriate, for disposal of logging slash, site preparation for planting, and for maintenance of wildlife openings in upland grass areas.

MAINTENANCE AND ADMINISTRATION ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The goal of this program is to provide the administrative support needed to achieve the goals of the other Division programs. Major functions include personnel management, Area organization, building administration, and equipment administration.

Personnel Management

The Park Rapids Area has 15 full time employees and one 90% Clerk Typist position. In addition, there are Mn-CEP workers, MCC crewmen, student interns, forester trainees, smokechasers, and various other laborers that account for the overall work force. Most of the forest development project work is done under contract rather than labor hire, as it has proven more efficient.

Area Organization

The Area is in the process of reorganization as part of the Division of Forestry Realignment Plan of 1984. This reorganization plan was directed by the Forest Resource Management Act of 1982, to improve the effectiveness of the Division of Forestry. The present organization is illustrated in Figure 19.

Consolidation Plan - Reorganization

The Park Rapids Area reorganization is underway. On August 1, 1985, the Perham District closed, with the position transferred to Alexandria as Assistant Forester. The south four-sevenths of Otter Tail County (Townships 131, 132, 133 & 134) transferred to the Alexandria District.

Some temporary assignments were made until the consolidation plan could be completed. The Smoky Hills District assumed the workload in northeastern Otter Tail County. The Detroit Lakes office, currently under the supervision of the Smoky Hills Forester, took over the remainder of northwestern Otter Tail County, as well as Wilkin County. The Detroit Lakes office also presently administers Clay County and the west half of Becker County.

Future plans are to close the Elbow Lake Station by July 1, 1987. The Forester and Technician positions will be transferred to Detroit Lakes. This district will then include all of western Becker County (from Range 38 west), the north three-sevenths of Otter Tail County (Townships 135, 136, and 137), and all of Clay and Wilkin Counties.

Upon closing the Elbow Lake Station, all townships in Mahnomen and Clearwater counties will transfer to the Bemidji Area. In turn, all of Becker County will be administered by the Park Rapids Area with the transfer of Townships 142-36 and 142-37 from Itasca District.

Also, by July 1, 1987, the Park Rapids and Smoky Hills Districts will be combined. This district will include the south one-half of Hubbard County, and the eastern part of Becker County (Ranges 36 and 37). This District will then administer the Paul Bunyan, Badoura, Smoky Hills, Two Inlets, and part of the White Earth State Forests. Personnel will consist of a Forester, Assistant Forester and 3 Technicians (including the present Area Technician position).

Administrative and support services will come from the Park Rapids Area Office, staffed by the following personnel: Area Forest Supervisor, Assistant Area Forest Supervisor, Area Silviculturist, Area PFM Specialist, Area Office Assistant, Office Assistant (90%), and the Area Repairman. Refer to the new Area organization chart (upon completion of consolidation) on (figure 20).

Position Descriptions are on file in the Area Office for all personnel employed in the Area. These have been developed jointly by the employee and his/her immediate supervisor. They accurately define the employee's role, authorities, responsibilities, job tasks, and expected performance standards.

Personnel Development plans are also on file in the Area Office. These are also developed annually with the employee and the Area Forest Supervisor. An average of 60 hours per employee is dedicated each year to training and employee development. It is extremely important for all personnel to keep current in their fields and expand their knowledge into other areas to broaden their career and benefit the organization. There are many in-service training opportunities as well as Department of Employee Relations courses, professional seminars, AVTI courses, tours, etc., which round out the employee training program. Often times, Area personnel are also involved in training other personnel, rural fire departments, or other groups.

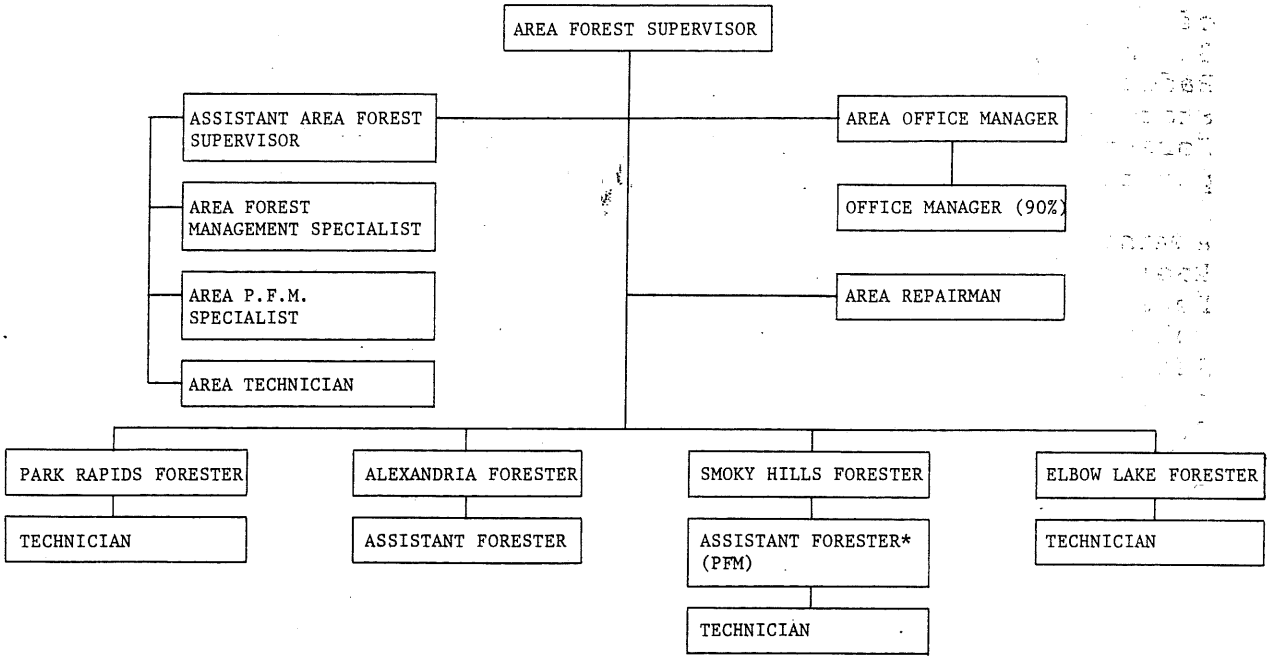
Building Administration

Currently the Park Rapids Area has State-owned buildings at three administrative sites - Park Rapids, Elbow Lake, and Detroit Lakes. The Alexandria office is a rental facility co-located with the Douglas County ASCS office. The Area Forest Supervisor is responsible for providing adequate facilities to serve the public and house the personnel and equipment necessary to accomplish the program objectives. Following are descriptions of buildings and improvements needed, listed by location:

Figure 19

PERMANENT PERSONNEL

ORGANIZATION CHART - PARK RAPIDS AREA
(as of June, 1986)

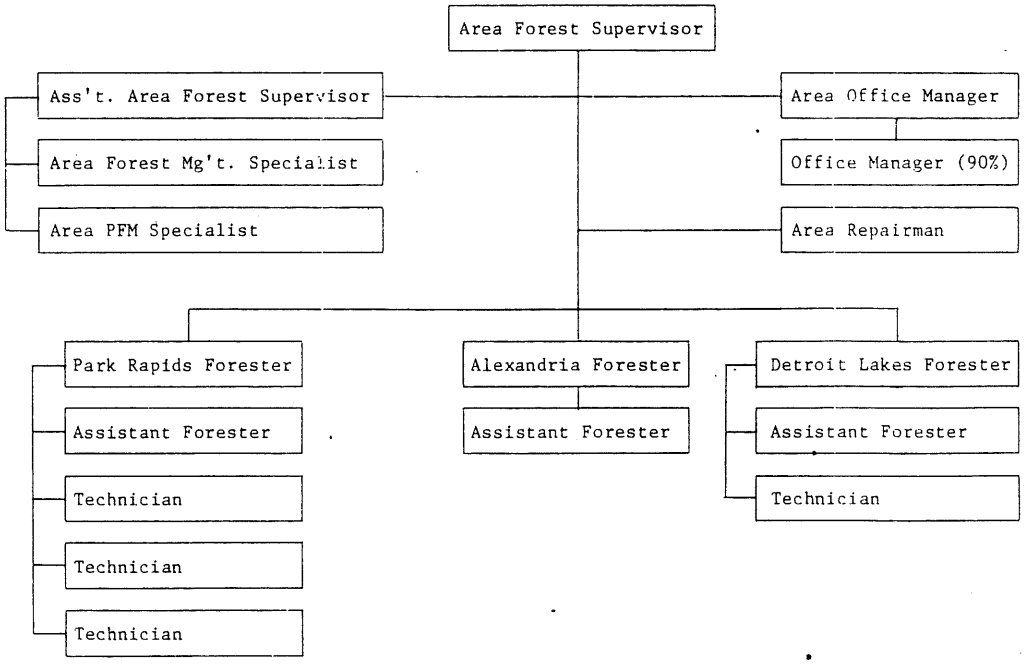


*located at Detroit Lakes

Figure 20

ORGANIZATION CHART - PARK RAPIDS AREA

(as of July, 1987)*



*upon completion of consolidation plan

Park Rapids Area Headquarters

1. The 15 acre Park Rapids Area headquarters site is well arranged and adequate to handle future needs (Table 68).

Table 70. Park Rapids Area Headquarters Buildings.

Type	Inv. #	Size	Year	Condition
Office	1626-424	28x40	1937	Improvement Needed
Shop-Warehouse	1626-1916	36x82	1970	Good
S.H. Warehouse	1626-425	26x40	1937	Good
P.R. Warehouse	1626-426	26x40	1937	Good
"Ice House"	1626-427	26x40	1937	Good
Oil House	1626-428	14x14	1938	Good
Residence	1626-429	26x40	1939	Improvement Needed
Garage	1626-566	12x24	1939	Good

2. The Area Office is a 28'x40' frame structure built by the Works Progress Administration (WPA) in 1937. It currently houses the Area administrative staff, Park Rapids District, and Smoky Hills District; a total of 11 full-time personnel. In addition, there are generally additional personnel stationed there, such as: Student interns, forester trainees, MCC crew, smokechasers, MnCEP workers, etc.

   Repairs or Improvement Needs:

   This office is very overcrowded due to consolidation of the Smoky Hills District in 1974 and addition of a PFM Specialist and Silviculturist to the Area Staff. A major remodeling is needed to accommodate existing personnel, as well as expand into an Area DNR Headquarters, including Division of Fish and Wildlife and Enforcement personnel.

   A capital improvement request has been submitted to the Minnesota Legislature to remodel the present office space and add 3 new offices and additional reception and secretarial staff area. Upon completion of this project the Area headquarters would include Wildlife and Fisheries offices to provide efficient "one-stop" DNR services to the public. The new improvements should be handicapped accessible. Consideration should also be given for paving the entrance and parking area at the Area DNR headquarters. Engineering will be needed to layout for proper drainage.

3. The park Rapids residence was built in 1939, by the Civilian Conservation Corps. It was intended for occupation by the Forester to provide security for the Area complex, and to provide prompt fire emergency response and service to the public.

The residence has many maintenance requirements. The wiring is barely adequate. The wall insulation is 1½" balsa wood. The exterior needs painting. The roof should be re-shingled. Cost of needed improvements is estimated at $12,000 - $15,000.

Since Park Rapids is now a town of about 3,000 population, there is adequate housing available in the community. The residence should not be improved. Rather, it should be sold and removed from the site.

4. Additional warehouse space is needed now, and even more so if the headquarters becomes a DNR complex. A warehouse approximately 40'x80' would be needed at an estimated cost of $30,000.

Elbow Lake District Headquarters

As stated earlier, the Elbow Lake District is scheduled to close by July 1, 1987. To ensure local fire protection, the Division has agreed to lease the buildings to the Tulaby-Elbow Lake Fire Department. They presently occupy one building there, and have a need for more warehouse space. The lease will specify certain conditions for use and maintenance of the buildings and grounds. The Detroit Lakes Highway Maintenance District, Mn-DOT will continue to use the site to store salted sand and keep a loader in a warehouse during the winter season (Table 69).

Table 71. Elbow Lake District Office Buildings.

Type	Inv. #	Size	Year	Condition
Office	1626-309	14x18	1935	Fair
Shop-Warehouse	1626-444	24x36	1935	Good
Warehouse	1626-600	20x50	1935	Poor
Oil House	1626-446	10x14	1935	Good
Residence	1626-308	24x38	1935	Fair

If at some time the fire department vacates the premises, then the site including land and buildings should be offered for surplus sale.

Detroit Lakes DNR Headquarters

The Detroit Lakes headquarters is a multi-discipline DNR complex. Originally, it was the fish hatchery. Now, it includes office space for Fisheries, Wildlife, Forestry, and Waters personnel. Forestry, Wildlife a Wildlife Biologist, and a Hydrologist are located upstairs, above the shop. Although attempts have been made to remodel, these are still less than desirable offices. They're inaccessible to elderly or handicapped people, and energy inefficient.

The Forestry office is 12'x 13'. Upon establishment of the Detroit Lakes District, on July 1, 1987, two additional Forestry employees will move in. This office will be very overcrowded with three people working there. Another room will be needed. Possibly the upstairs laboratory could be converted into office space if a new lab is constructed.

Warehouse space is also very much in demand at this complex. Plans are to move the Hubbel Pond warehouse sometime in 1986. It is expected that DNR equipment now standing outside will fill this up immediately.

With the additional Forestry equipment and vehicles, more warehouse space will be needed. A cost estimate of office needs is $8,000, and additional warehouse needs is $10,000.

Alexandria District Office

The Alexandria District office is a rental office co-located with the Douglas County ASCS office. This office is 12'x24' in size, and must be accessed through the ASCS office. The size is adequate, and generally serves the public well. There is a small storage area for tools and supplies. There is no garage for the State vehicles. No building improvements are needed.

However, there is no full-time clerical position, so the public does not always get served well. The ASCS office personnel will take a message, but generally cannot answer the public's requests when the Foresters are not in. The telephone system is presently being improved to at least catch all calls and respond to them. Two lines and two phone sets will be installed, as well as a telephone answering system. One of the weaknesses in this office is the fact it is often unstaffed when personnel are in the field. Attempts will be made to co-locate with other government offices that have full-time receptionists who can be trained to assist the public or refer them to the proper agencies for assistance.

It would be desirable to explore the possibility of 50-50 funding of a clerical position with ASCS or any other government agency that might be co-located at this building.

Table 72. Summary of Park Rapids Building Projects

Building	Project Description	Estimated Cost
Area Office	Remodel	$64,000
Park Rapids Residence	Remodel	9,000
Park Rapids Warehouse	Build	30,000
Detroit Lakes Office	Add Room	8,000
Detroit Lakes Warehouse	Build	10,000

Building & Grounds Maintenance

The present cleaning service contract at Park Rapids is satisfactory and is preferred. The grounds maintenance is presently done by the General Repair Worker and MnCEP or summer student. A MnCEP contract or contract with mentally handicapped from the Hubbard County D.A.C. will be pursued. Another option would be working with the County Sheriff on Community Service programs utilizing people serving a jail sentence. Grounds maintenance includes the lawn and the windbreak area around the 15 acre DNR complex. To maintain an effective windbreak and a neat appearance, annual upkeep is needed. The windbreak is in need of a commercial thinning. However, the logging should be done in the winter season, tree length logged, and all slash burned.

Cleaning of single offices at Detroit Lakes and Alexandria will continue to be done by Forestry personnel.

Other Administrative Sites - Towers

In recent years, fire lookout towers have been used sparingly. Most fire detection is done with contracted aircraft. However, on high fire danger days, or in periods of extreme fire or drought conditions, some towers will still be used. Table 73 lists the Park Rapids Area towers and recommended disposition.

Table 73. Park Rapids Area Fire Lookout Towers.

Name	Location	Type	Height	Year	Recommended Disposition
Badoura	NENE 16-139-32	Stairway	100'	1934	Retain
Dorset	NESE 9-140-34	Stairway	86'	1966	Sell
Smoky Hills	SENW 15-140-37	Ladder	80'	1926	Sell
Wolf Lake	SENE 16-139-37	Ladder	81'	1929	Retain
Tulaby	SWSW 28-143-39	Stairway	86'	1935	Retain
Egg Lake	NWSW 16-141-39	Ladder	81'	1935	Sell

Dorset, Smoky Hills, and Egg Lake Towers should be offered for surplus sale and removed from the sites. The Dorset site, 1.5 acres of the NESE, Sec. 9-140-34 should be sold on a public land sale, as there is no other reason to own this land. Also, 1.0 acres in the NWNE, Sec. 14-137-36 should be sold. This was the old Hillview Tower site. The tower was destroyed by vandals in 1976, and was disposed of by surplus sale. This is an isolated tract and serves no other purpose.

Equipment Administration

The Park Rapids Area has a large complement of equipment necessary to accomplish the wide range of work programs in the Area. All equipment is accounted for in a computerized inventory system of non-expendable, semi-expendable, and expendable equipment.

Because of it's condition and age, much of the current equipment in the Area has been in service beyond its normal life expectancy. In recent years, funding has been inadequate, allowing for replacement of pickups and cars, but little else. This tends to inflate the normal annual maintenance cost. Since there has never been a standardized equipment replacement schedule and funding has been limited, major upgrading of equipment is needed now. Also, specialized fire fighting equipment is needed to upgrade to an acceptable standard.

The Park Rapids Area annual budget does not include an allocation for major equipment purchases. Items costing over $300 must be requisitioned through DNR Field Services, which are prioritized at the Regional level, among all DNR disciplines. With limited funding Department wide, needed items cannot be purchased on schedule.

Maintenance is done by the Area Repairman, or in local garages. Major maintenance or repair work is done either at the Bemidji Region shop or at the DNR Northern Service Center.

The equipment administration appendix lists the current Park Rapids Area major equipment, annual maintenance cost, and replacement schedule and cost. The average annual maintenance cost is estimated at $7,635.

Because there is no balanced schedule for replacement, there are "peaks and valleys" in equipment budget needs. As stated earlier, Park Rapids Area is behind in needed replacements. Initially, $183,250 should be spent in 1987 to come up to standard (according to the Equipment Replacement Schedule in the appendix). However, this is unreasonable to expect. If the goal would be to achieve this standard by the year 2000, then the average annual expenditure for major equipment replacement should be about $35,000 per year. An additional $5,000 per year should be budgeted for miscellaneous equipment replacement such as: Hand tools, pump tanks, safety equipment, picnic tables, shop equipment, professional equipment, culverts, etc.

LAW ENFORCEMENT ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The Division of Forestry is charged with the enforcement of certain Minnesota Statutes, as well as various DNR administrative rules and regulations.

Enforcement activities on forestry administered lands are conducted in cooperation with DNR Conservation Officers and may also involve state or local law enforcement officials.

All of the Conservation Officers are licensed peace officers in accordance with State statutes. Within the Park Rapids Area, Conservation Officers are stationed at Park Rapids, Detroit Lakes, Lake George, Alexandria, Henning, Moorhead, Twin Valley, Osage, Breckenridge, Elbow Lake, Evansville, Fergus Falls, Glenwood, Morris, Pelican Rapids and Perham. The Area Supervisors are located in Thief River Falls, Bemidji and Glenwood.

The Division of Forestry Law Enforcement Manual outlines coordination procedures for the two divisions.

The Division of Enforcement is primarily responsible for the following major areas:

1. Game and Fish Laws
2. Watercraft Safety
3. Snowmobile and O.R.V. Enforcement
4. Public Access Enforcement
5. Water Regulations
6. Trail Regulations
7. State Park Rules
8. Federal Statutes (when appropriate)
9. Assist Pollution Control Agency in enforcing Environmental Protection Standards
10. Assist other law enforcement agencies

Additional responsibilities include firearm, ATV, boat & water, and snowmobile safety, nuisance animal complaints, removal of animals killed by vehicles, public access maintenance, and public relations.

In general, enforcement of forest laws in the Park Rapids Area has been very good. As with other programs, there is room for improvement and growth. The training all forest officers have received has been excellent. New training schedules are being developed to reflect the needs of forest officers. Periodic refresher courses are planned to update personnel on law changes and review procedures.

Forest Fire Laws (Minn. Stat. Chapter 88.03 - 88.22)

The enforcement of fire laws focuses primarily on burning permit regulations, wildland arson and railroad caused fires. Forest Officers and DNR Conservation Officers work together on arson investigation teams. The statutes also outline the authority of Forest Officers to arrest and prosecute fire law violators, close forest roads and trails, regulate certain public and private dumping areas and enlist suitable persons and commandeer private property to fight forest fires.

Forest Officers work closely with DNR Conservation Officers, State Fire Marshall, and Township Fire Wardens in efforts to reduce the number of wildfires, loss of property and resources, and fire suppression costs.

Timber Sales and Trespass (Minn. Stat. Chapter 90)

Field enforcement of state timber sale regulations and timber trespass laws is the responsibility of the Division of Forestry. DNR Conservation Officers assist the division by conducting in depth investigations designed to establish basic facts and liability. Minnesota Statutes, Chapter 90, sets forth timber sale permitting procedures, timber appraisal and scaling regulations, and timber trespass provision. Additional regulations are established in division policy manuals.

Christmas Tree Laws (Minn. Stat. Chapter 88.641 - 88.648)

The enforcement of Christmas tree laws by the Division of Forestry pertains to the cutting, removal and transport of decorative trees. Enforcement provisions and permitting procedures are specified.

Recreation Regulations (NR-1)

Five Forest Officers at Park Rapids have been delegated specific authority by the Commissioner of Natural Resources to enforce NR-1 Rules in State Forest Campgrounds and forest day use areas and public accesses. Forest Officers handle most of this work with some help from the Conservation Officers and the Sheriff. These are basically peace keeping rules which specify appropriate personal conduct, public safety measures, environmental protection guidelines, motor vehicle use regulations and other standards for those areas under the control of or operated by the Commissioner of Natural Resources.

Land, Leases and Permits (Minn. Stat. Chapters 89, 90.311 and 282)

These laws pertain to the acquisition, use, management and control of state lands, and to some extent, tax-forfeited lands. Forest Officers carry out inspections, enforce rules and regulations, and oversee provisions of these statutes with the assistance of DNR Conservation Officers or Land Bureau specialists, if needed.

The Division of Enforcement cooperates with the Division of Forestry in the enforcement of certain forestry regulations. The Enforcement responsibilities may be grouped into five key areas. These are: 1) forest fire laws, 2) timber sales and timber trespass, 3) Christmas tree laws, 4) forest recreation regulations (NR-1), and 5) enforcement of permit regulations. A brief description of each follows.

PROGRAM DIRECTION

The Division of Forestry has recently completed a manual designed to assist forest officers in their duties in forest law enforcement. The manual includes the statutes and policies pertaining to forestry laws. The manual also provides recommendations, guidelines and helpful examples relating to training needs, officer conduct, issuing citations, civil billing and claims against the State. Refer to the Law Enforcement Manual for more detailed information.

The Park Rapids Area has two DNR-Forestry arson investigators which should allow each more involvement in the initial investigation with the Incident Commander. Both investigators should keep their training up to date in order to participate in more cases and assist adjoining areas. In addition, the DNR-Conservation Officer at Osage is also a trained arson investigator, and works closely with DNR Foresters as a team. This trend will continue. The goal is to investigate the origin of every fire, and where evidence is found, it will be followed up until a conviction is obtained, a warning ticket is issued, or the case is closed due to lack of sufficient evidence. Civil collections for fire fighting costs will be made from responsible parties.

Enforcement of the timber laws has been excellent. We will continue to follow up on all trespass cases, following the established procedures.

There has been little need for enforcement of Christmas tree laws in recent years, as very little theft of natural trees occurs. We will keep all forest officers informed of changes to the Christmas tree laws, watch for violations, and take appropriate action where necessary. Continued close working relationships will be maintained with County Sheriffs who are primarily responsible for enforcement of theft of private property.

The Park Rapids Area has been increasing campground patrols every weekend. With the increased use of off road vehicles our enforcement efforts on trail and forest road use will also increase. We must work more closely with the Conservation Officers and County enforcement officers in this area of enforcement.

All reported instances of trespass will be investigated. In addition, forest officers will regularly inspect leases and permits to ensure the State's interests are protected, and lease regulations are followed.

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

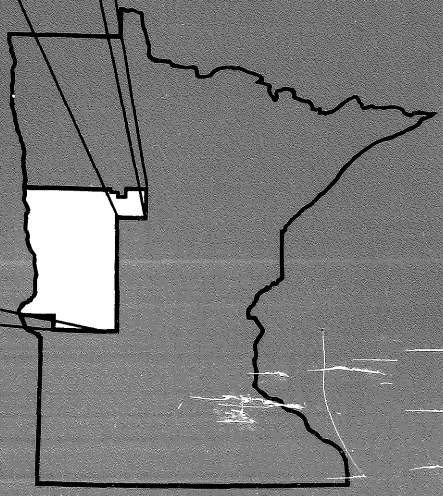
The Park Rapids Area Plan is meant to provide guidance to the Area for a period of ten years. An overall rewrite of the plan will be completed no later than 1996. The rewrite will include a reassessment of the area's land base and program direction.

Revision of the Park Rapis 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.

WORK PLANS AND ACCOMPLISHMENT REPORTS

(To be developed and appended to Area Plan each year)

Park Rapids Area
Forest Resource Management Plan
Summary



Minnesota
DEPARTMENT OF NATURAL RESOURCES

Division of Forestry

EXECUTIVE SUMMARY

All land administered by the DNR, Division of Forestry in the Park Rapids Area was evaluated for its resource management potential. Recommendations are made for land exchanges, transfers of administrative control within DNR, and the sale of one parcel of land.

The quality of forest recreation will be improved by continuing to rehabilitate and properly maintain developed state forest recreational facilities, roads and trails.

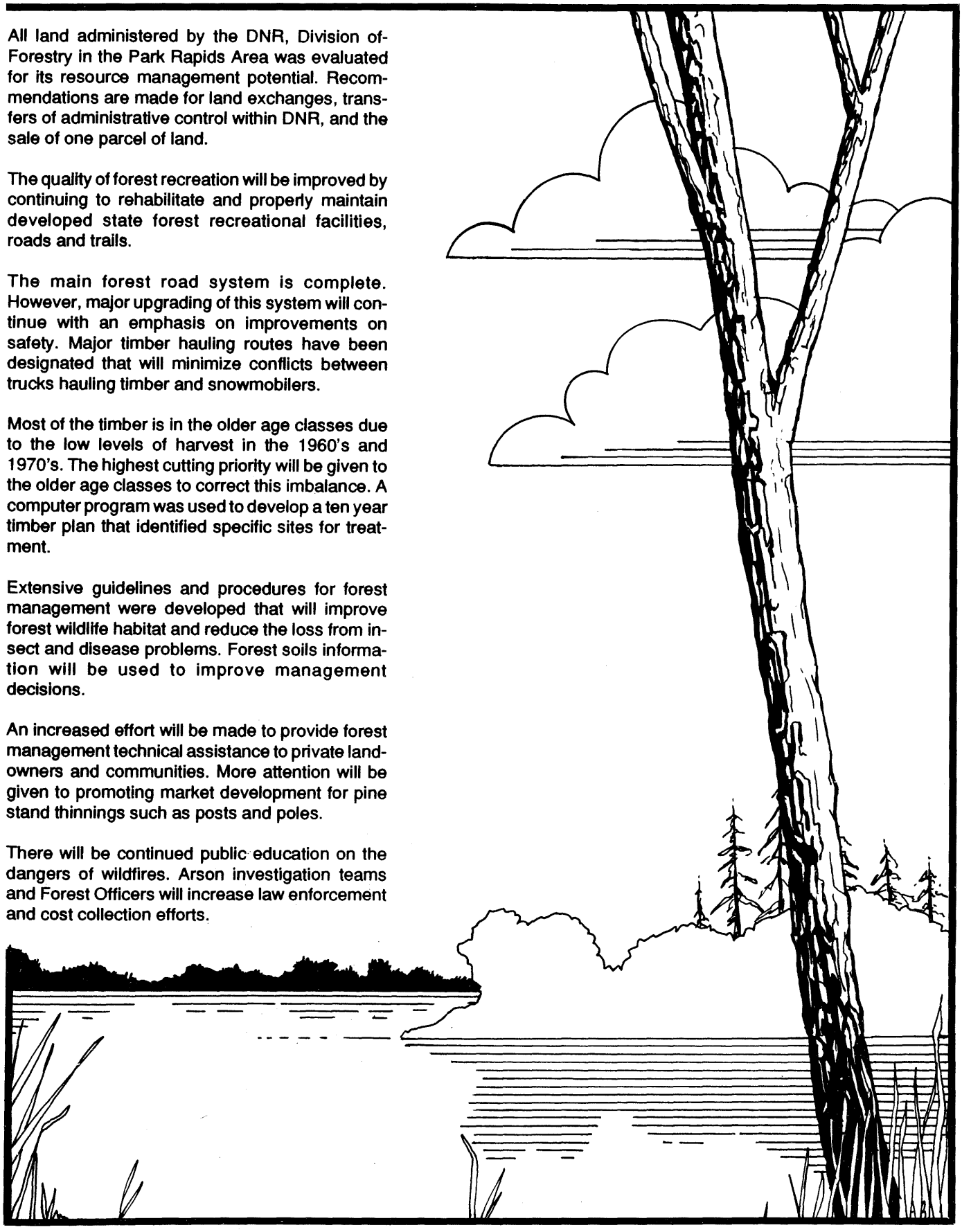
The main forest road system is complete. However, major upgrading of this system will continue with an emphasis on improvements on safety. Major timber hauling routes have been designated that will minimize conflicts between trucks hauling timber and snowmobilers.

Most of the timber is in the older age classes due to the low levels of harvest in the 1960's and 1970's. The highest cutting priority will be given to the older age classes to correct this imbalance. A computer program was used to develop a ten year timber plan that identified specific sites for treatment.

Extensive guidelines and procedures for forest management were developed that will improve forest wildlife habitat and reduce the loss from insect and disease problems. Forest soils information will be used to improve management decisions.

An increased effort will be made to provide forest management technical assistance to private landowners and communities. More attention will be given to promoting market development for pine stand thinnings such as posts and poles.

There will be continued public education on the dangers of wildfires. Arson investigation teams and Forest Officers will increase law enforcement and cost collection efforts.



SUMMARY OF THE

PARK RAPIDS AREA FOREST RESOURCE MANAGEMENT PLAN

December 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

TABLE OF CONTENTS

INTRODUCTION

PLANNING PURPOSE AND PROCESS

Planning is being conducted in response to recent legislative direction which requires the DNR to complete both statewide and "unit forest resource plans" for each geographic administrative unit of the Division of Forestry (Minnesota Laws 192, Chapter 511). The Division has selected its administrative areas as the appropriate planning unit.

The statewide Minnesota Forest Resources Plan (MFRP) was originally completed in 1983 and last updated in 1987. It provides the statewide framework of policy and direction within which the area plans function.

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 area. Area plans provide guidance for area forestry programs and management activities. The plans are also designed to help coordinate the Division of Forestry's activities in an area with those of other DNR units, other agencies, local governments and the private sector. Area plans are developed by an interdisciplinary planning team consisting of DNR natural resource specialists including foresters, wildlife managers, fisheries managers, hydrologists, recreation and minerals specialists, enforcement officers and others. Several portions of this plan were developed by these resource specialists as part of the planning process.

MEMBERS OF THE INTERDISCIPLINARY TEAM

Ken Baumgartner * **	Area Forest Supervisor
Mark Carlstrom *	Ass't Area For.
David Johnson *	Area Staff PFM
Allen Wickman *	Area Staff-PFM
Jack Bugge *	Area Staff-Silviculture
Howard Warrington *	Repair Worker
Kern Ridlington *	Forester
Rick Pierce *	Forester
Chuck Cornelius *	Forester
Ron Norenberg *	Forester
Howard Mooney *	Forester
John Rodewald	Reg. Forest Supervisor
Dale Peterson	Ass't. Reg. Forest Sup.
George Miller *	Reg. Staff-Forester
Jeff Edmonds *	Reg. Staff-Util. & Mkt.
Alan Jones *	Reg. Staff-Forest Pests
Dick Rossman *	Reg. Staff-Soils
Rob Naplin * **	Area Wildlife Manager
Katie Haws *	Nongame Specialist
Earl Johnson *	Area Wildlife Manager
Tom Stursa *	Ass't. Area Wildl. Mgr.
Jack Backer **	Reg. Enforcement Sup.
Arden Belcher **	Trails Coordinator
Ted Wilde **	Reg. Lands Spec.
Leon Gladen * **	Supervisor,Geoscience
Gerald Paul **	Hydrologist
John Hellquist	Forest Recreation Spec.
Bob Tomlinson	Coop. Forest Mgmt.
Eric Giesler	Forest Roads Specialist
Olin Phillips	Sup., Coop. Programs
Tom Polasik *	Forest Resource Planner
Dorian Grilley *	Forest Rec. Planner
Lloyd Wagner *	Planning Team Leader

* Contributing Author

** DNR Division Representative

PLAN FORMAT AND CONTENT

Section I, Introduction, includes explanations of legal requirements for unit planning, the relationship of unit plans to the statewide MFRP and the interdisciplinary planning team.

Section II, Area Overview, describes the social, physical and natural character of the area. Descriptions of Resource Management Units are also included.

Section III, Assessment and Program Direction for the Division of Forestry, presents an analysis of the resource situation and outlook for each of the programs administered by the Division of Forestry. Based on this analysis and the Minnesota Forest Resources Plan, a general management direction or strategy is established for the area. Although the plan is organized by program it should be understood that there is considerable overlap in some programs.

Direction or strategy established at the area level is further refined for sub-divisions of the area for appropriate Division of Forestry programs. These sub-divisions are called resource management units (RMU's).

PUBLIC INVOLVEMENT

The goal of public involvement in the Park Rapids Area Plan was to involve interested and knowledgeable publics in the project so that the best possible resource management program is developed and maintained. Efforts were made in developing this plan to promote an understanding of natural resource management, to obtain advice and public opinions, and to gain public support for DNR resource management programs.

AREA OVERVIEW

LAND BASE

The Park Rapids Area includes approximately 5.8 million acres in portions of 10 counties in west-central Minnesota (Figure 1). The area covers approximately 10% of the State of Minnesota.

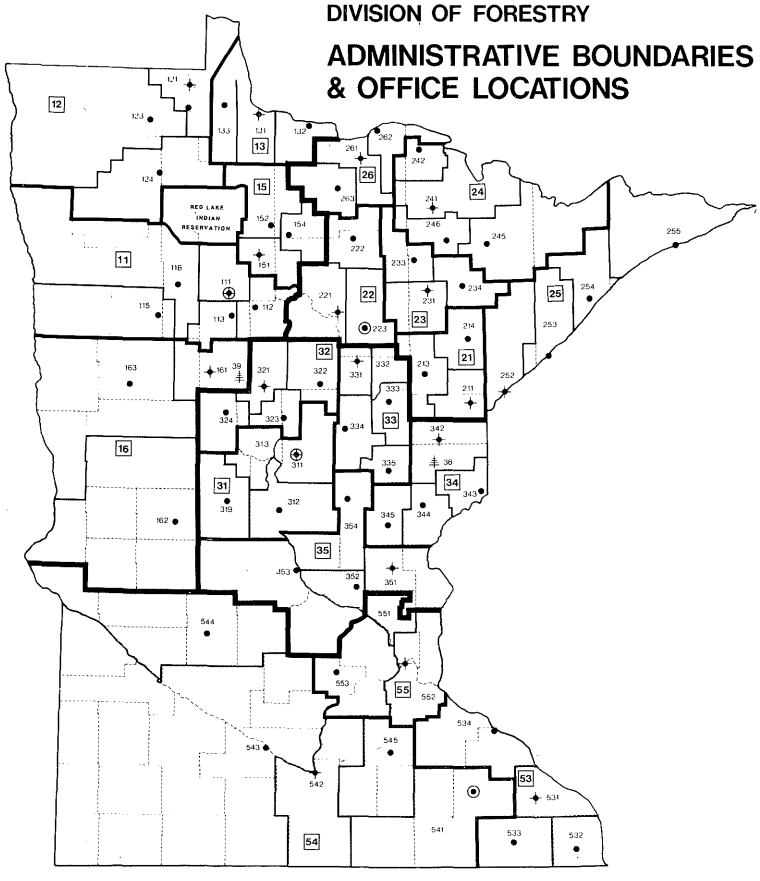
The landscape is characterized in the western third by the Red River Valley, a nearly flat plain covered by rich clay and silty soils deposited on the bottom of glacial Lake Agassiz. In the northeast, the northern pine moraine forms ranges of hills containing primarily sandy or coarse soils and pockmarked with countless lakes, ponds and bogs. This area is predominantly forested with pine, aspen and birch. Encompassing the east-central portion of the area is the northern Alexandria moraine complex and outwash plain. This area has sandy textured soils and is characterized by rolling terrain and maple-basswood and aspen-oak forest vegetation. The southeast portion consists of rolling hills on the prairie fringe created by repeated glaciation. The southcentral portion of the area, a part of the Minnesota River Valley, originally supported prairie vegetation, most of which has been cleared for agriculture.

There are about 102,243 acres of division administered land in the area, most of which (85,154 acres) is located in six state forests: the Paul Bunyan, Two Inlets, Smoky Hills, Badoura, White Earth, and Huntersville state forests. Division of Forestry offices are located at Park Rapids, Alexandria and Detroit Lakes.

Figure 1

DIVISION OF FORESTRY

ADMINISTRATIVE BOUNDARIES & OFFICE LOCATIONS



REGION 1 BEMIDJI

AREA 11 BEMIDJI
DISTRICT 111 BEMIDJI
113 CASS LAKE
115 GUTHRIE
116 NOY LAKE
118 BAGLEY

AREA 12 WARROAD
DISTRICT 121 WARROAD
123 WANNASKA
124 GRYGLA

AREA 13 BAUDETTE
DISTRICT 131 BAUDETTE
132 BIRCHDALE
133 WILLIAMS

AREA 15 BLACKDUCK
DISTRICT 151 BLACKDUCK
152 KELLIHER
154 NORTHOME

AREA 16 PARK RAPIDS
DISTRICT 161 PARK RAPIDS
162 ALEXANDRIA
163 DETROIT LAKES (PFM)

REGION 2 GRAND RAPIDS

AREA 21 CLOQUET
DISTRICT 211 CLOQUET
213 FLOODWOOD
214 COTTON

AREA 22 DEER RIVER
DISTRICT 221 DEER RIVER
222 EFFIE
223 GRAND RAPIDS

AREA 23 HIBBING
DISTRICT 231 HIBBING
232 SIDE LAKE
234 VIRGINIA

AREA 24 ORR
DISTRICT 241 ORR
242 KABETOGAMA
245 TOWER
246 COOK

AREA 25 DULUTH
DISTRICT 251 CLOQUET VALLEY
253 TWO HARBORS
254 FINLAND
255 GRAND MARAIS

AREA 26 LITTLEFORK
DISTRICT 261 LITTLEFORK
262 INTERNATIONAL FALLS
263 BIG FALLS

REGION 3 BRAINERD

AREA 31 BRAINERD
DISTRICT 311 BRAINERD
312 LITTLE FALLS
313 PILLAGER
319 LONG PRAIRIE

AREA 32 BACKUS
DISTRICT 321 BACKUS
322 WASHBURN LAKE
323 PEQUOT LAKES
324 NIMROD

AREA 33 HILL CITY
DISTRICT 331 HILL CITY
332 JACOBSON
333 SANDY LAKE
334 AITKIN
335 McGRATH

AREA 34 MOOSE LAKE
DISTRICT 342 MOOSE LAKE
343 EAGLEHEAD
344 HINCKLEY
345 MORA

AREA 35 CAMBRIDGE
DISTRICT 351 CAMBRIDGE
352 ZIMMERMAN
353 ST CLOUD
354 ONAMIA

NURSERY 38 GENERAL ANDREWS

NURSERY 39 BADOURA

REGION 5 ROCHESTER

AREA 53 LEWISTON
DISTRICT 531 LEWISTON
532 CALEDONIA
533 PRESTON
534 LAKE CITY

AREA 54 MANKATO
DISTRICT 541 ROCHESTER
542 MANKATO
543 NEW ULM
544 WILLMAR
545 FAIRMAULT

AREA 55 METRO
DISTRICT 551 N METRO
552 E METRO
553 W METRO

HEADQUARTERS SYMBOLS
REGION
AREA
FIELD STATION
NURSERY

BOUNDARY LINES
REGION BOUNDARY
AREA BOUNDARY
DISTRICT BOUNDARY
COUNTY BOUNDARY

NOVEMBER 1987

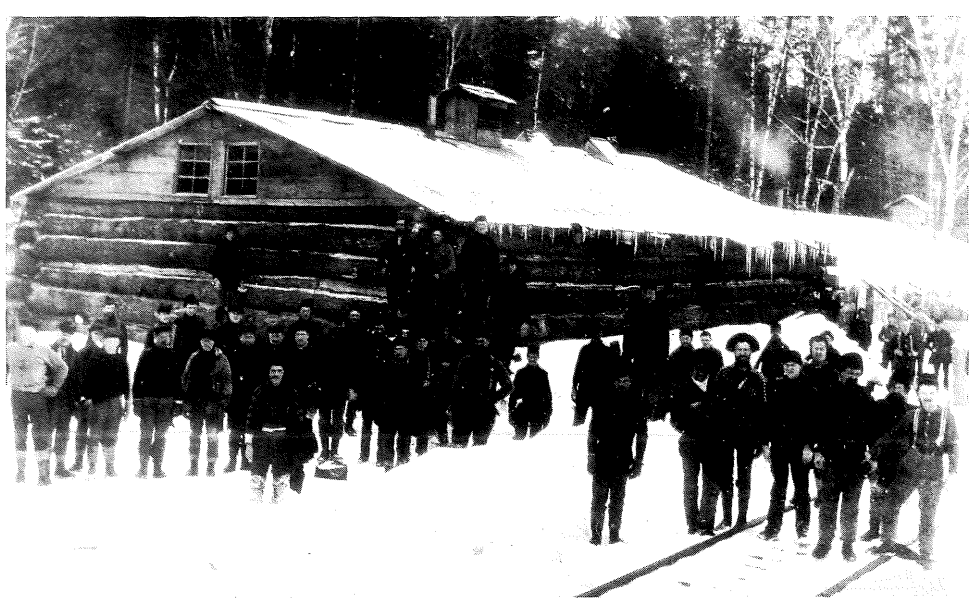
HISTORY

The Park Rapids Area is quite diversified in character ranging from unpopulated, publicly owned forest areas in the north; scattered lakes and privately owned tracts in the central and southern areas; to very small farm woodlots and extensive agricultural land in the western areas. Lakes, rivers, and wetlands are common over most of the area. The abundance of natural resources in the Park Rapids Area has contributed significantly to its development. However, due to man's intervention, some natural resources have been depleted.

The first white settlement began in the southern and western parts of the Park Rapids Area and spread slowly north and east. Agriculture became the dominant use of the rich, loamy soils of the western and southern parts of the area. Woodlands were rapidly cleared and native prairies plowed to develop agricultural lands. In much of the area only a few remnants remain of the original prairies and hardwood forests.

The heavily forested areas were settled in the late 1800's. In 1879 the first settlers reached southern Hubbard County. Many tried to log and convert the land to agricultural use. However, the light, sandy soils and short growing seasons were not conducive to successful agricultural ventures.

But timber was the big attraction! In the 1880's much settlement occurred as the villages of Hubbard, Park Rapids, Nevis, and Akeley were established. By 1891 rail transportation had reached all but the village of Hubbard, and the boom had begun. Although logging and



agriculture were the initial attraction, the large number of pristine northern lakes began to attract tourists to the area. Tourism also became an important early industry in the Detroit Lakes, Fergus Falls and Alexandria areas.

As settlement moved north and east, small sawmills sprang up in the 1890's to manufacture building materials. In 1899 the giant Red River Lumber Company became established at Akeley, in the heart of virgin stands of white pine and Norway pine.

Starting about 1890, the general direction of public forest land use in Minnesota was toward reservation of large areas for management purposes and the gradual adoption of scientific forest management practices. During this same period, new demands for all forest resources evolved, and the forests were expected to meet the needs of an increasingly varied group of users.

Public appreciation for fire prevention and protection of natural resources increased with each year. The late 1800's and early 1900's was considered a time of changing attitudes toward the use of natural resources in Minnesota and in the nation as a whole. The concept of conservation gained popularity among lawmakers as well as the general public. Much of this concern was generated because of abuses of the past, which resulted in scarred, eroded hillsides and catastrophic fires.

By 1902 a logging railroad with an extensive system of spurs was being pushed into the area that is now the Paul Bunyan State Forest. Once the system was completed, the railroad allowed for even more rapid movement of large quantities of logs and lumber.

New laws enacted by the legislature in 1911 provided for preservation of forest land, reforestation and the prevention of forest fires throughout the state. This enabled the State Forestry Board to take responsibility and action against forest fires. Thus the Minnesota Forest Service was established as an organization. In 1914 an amendment to the constitution of the state providing for authorization to set aside state trust fund lands as state forests was passed.

By 1915 much of the extensive cutting was done, mills were dismantled, and companies moved west. Since much of the land was cleared, settlers then tried to convert some of the land to agricultural production. Promiscuous slash burning destroyed most of the small remnants of good timber.

These lands were not as productive for agriculture as people thought they would be. Drought, fires, and crop failures of the 1930's forced many to abandon their farms.Much of the land was forfeited to the counties for tax-delinquency.

The Park Rapids Area Forestry office was established in 1911 to fight fires and administer state lands in the area.

RESOURCE MANAGEMENT UNITS

The Park Rapids Area has been sub-divided into seven units for the purpose of developing resource management strategy. Resource Management Units (RMU's) were developed by the Regional Soil Specialist working with Area Forestry personnel. RMU's were delineated by using differences in landforms (surficial geology) and other resources. They first developed a map showing the natural boundaries (Figure 2). Due to the fact that all computerized data on timber, land and other resources are described on a legal basis, the natural boundaries were modified to ones that follow legal boundaries (Figure 3). Considering the scale of the units, the deviation is not significant.

The resource management strategy is quite distinct between some RMU's and similar in others depending on the particular program. For example the differences between the Red River Valley and the heavily wooded, rolling terrain of Paul Bunyan State Forest have a significant impact on what can be accomplished from a forestry standpoint. The distinctions between some other RMU's are based on less dramatic soil, timber, and land ownership pattern differences. Figure 4 shows the comparative amounts of timber on state administered land in the different RMU's. These distinctions have, in most cases, a definite influence on the type and amount of forest management that can be accomplished.

Detailed descriptions of resource management units can be found in the full plan.

Figure 2

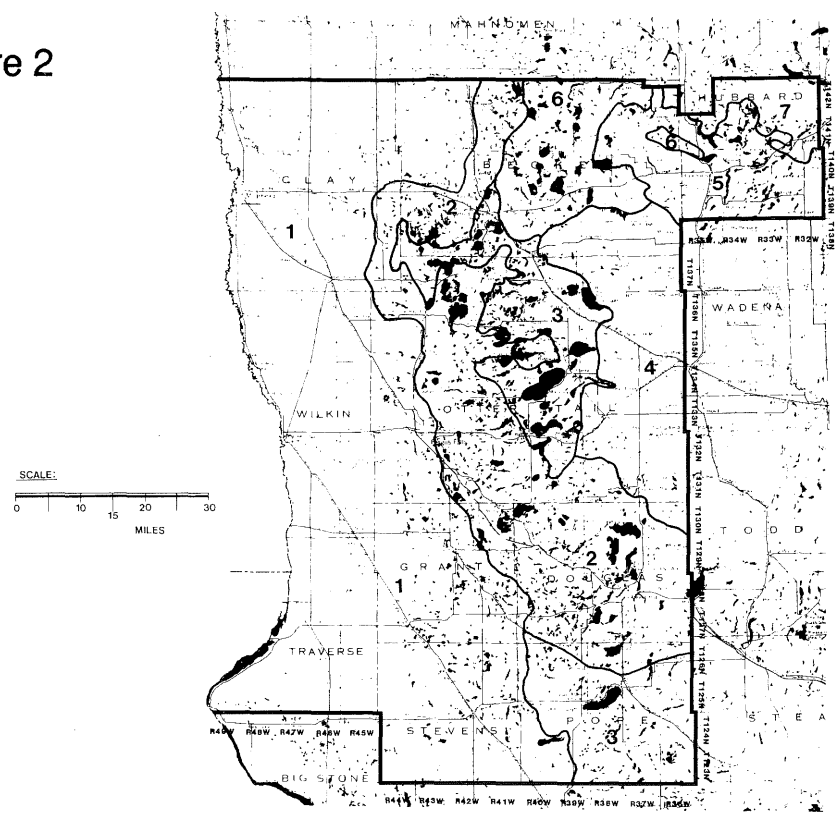


Figure 3

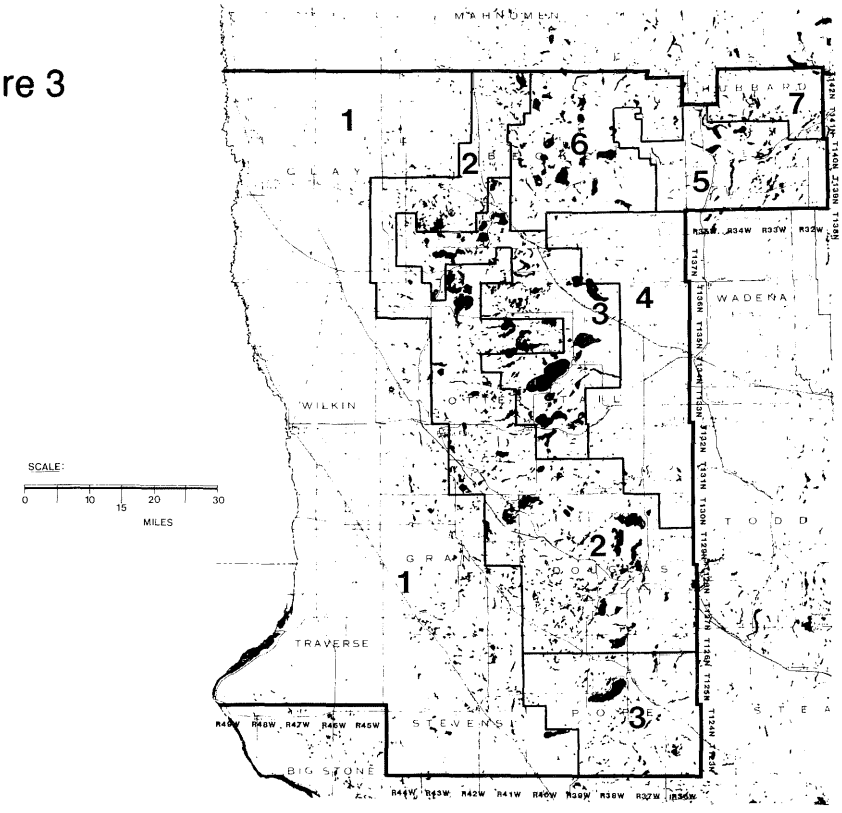
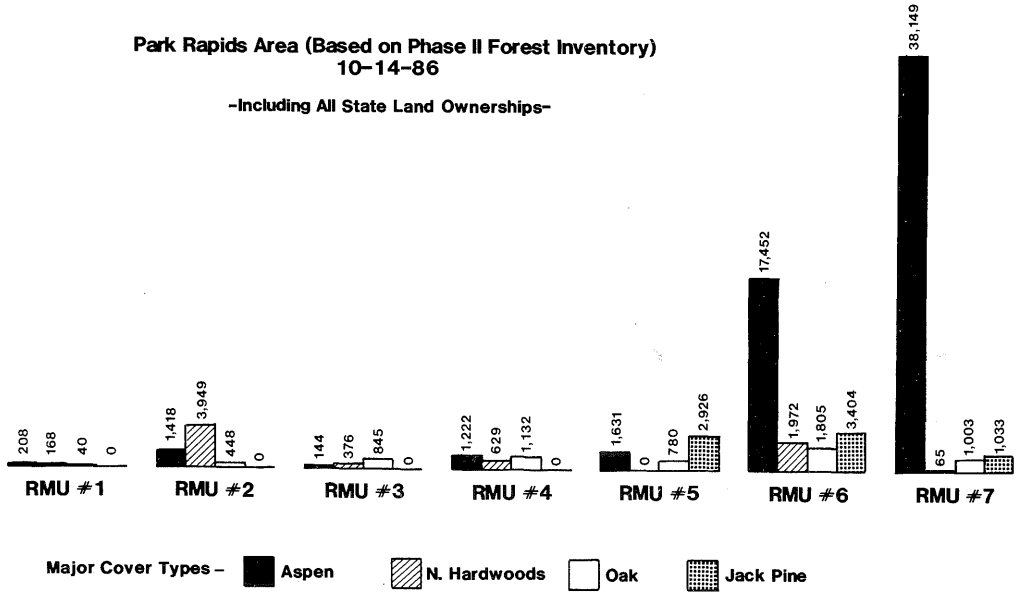


Figure 4

ACRES of MAJOR COVER TYPES by RESOURCE MANAGEMENT UNIT

Park Rapids Area (Based on Phase II Forest Inventory)
10-14-86

-Including All State Land Ownerships-



ASSESSMENT AND PROGRAM DIRECTION FOR THE DIVISION OF FORESTRY

STATE FOREST LAND MANAGEMENT

State Land Administration Program

The goal of the Division of Forestry's land administration program is to achieve the optimum pattern of forest land ownership for the management of forest resources to best serve the needs of Minnesota's citizens, and to maximize long-term resource and economic benefits through efficient resource management, land acquisition, leasing, sales and exchange.

The achievement of this goal will require not only an integrated effort among all administrative units of the division, but a close working relationship with the DNR Land Bureau, other DNR divisions, other public land agencies, the state legislature, and the private sector.

Much of the State owned land in the Park Rapids Area is trust fund land. Trust fund lands are those that were received by Minnesota from the federal government with the condition that receipts from them be used for specific education purposes. Most of these lands were granted to the state after it achieved statehood in 1858.

The state has acquired additional lands through a variety of means for different purposes. Lands may be acquired from private landowners or other governmental units through fee purchase, gift, land exchange, transfer, county board resolution (50-50 land, 50% of income goes to counties), condemnation, and several other methods.

The first state forests to be established in the Park Rapids Area were White Earth and Badoura in 1931. Paul Bunyan and Smoky Hills were next in 1935. The last to be established were Two Inlets and Huntersville in 1963.

In the process of developing this plan, all land administered by the Division of Forestry in the Park Rapids Area was evaluated for its resource management potential. Recommendations have been made for future management. Resources such as wildlife, recreation and wilderness were considered along with timber. Recommendations for land adjustments have received considerable review by members of the Interdisciplinary Planning Team as well as other resource specialists in the DNR.

Scientific and Natural Areas

Scientific and Natural Areas currently exist in the Park Rapids Area. The Area was evaluated for additional potential Scientific and Natural Areas, but no additional sites were identified for designation at this time. Existing SNA's in the area have been listed in the Natural Heritage Appendix.

Wilderness

The Park Rapids Area is well developed and roaded and therefore not suitable for consideration for Wilderness area designations.

Scattered Lands

To achieve the goal of managing the public lands in the most efficient and effective manner, all public land administrators need to work together to develop a plan of action. Partial land consolidation will be achieved through a program of land exchange, transfer of administrative control within DNR,Smaller tracts of forest land can be designated as **Administrative and Scattered State Forest land**. This designation represents a decision by the state to manage these lands permanently for forestry.

- 10,758 acres of of scattered tracts for this designation.

In addition, more effort should be directed toward the acquisition of desirable lands by gift. Many private landowners, properly approached, may wish to have a public agency carry on their work of good stewardship. Others are interested in the gift program for its tax advantages.

Transfer of Administrative Control

Where DNR-administered lands outside of designated management units have potential for management for specific resource purposes and could be established as management units or used to consolidate or expand management units, internal transfers of administrative control may take place. The following transfers of administrative control have been proposed for lands administered by the Division of Forestry:

Transfer to:

- DNR Section of Wildlife - 3336 acres
- DNR Section of Fisheries - 664 acres
- DNR Division of Parks and Recreation - 44 acres.

Land Exchange

Land exchange is an important management tool available to the division. It is a mechanism by which state, federal, and private landowners may rearrange, through exchange, certain ownership interests in real estate for purposes not limited or prohibited by the Minnesota Constitution or statute. Land exchange has been used only on a limited basis because of statutory and other conflicts. However, a recent State Constitutional Amendment allows land exchanges between the State and the Counties.

- Lands proposed for exchange with counties total 1963 acres.

All lands identified in this plan to be acquired by exchange are tentative recommendations that are dependent on the willingness of the exchange partner (mostly Counties) to proceed. Efforts will be made to identify lands that County Land Departments think have some potential for exchange. All exchanges of land require a lengthy administrative and legal procedure.

- There were 10,760 acres of land identified to be acquired by exchange from the counties.

Acquisition

Acquisition efforts will be selective and aimed primarily at consolidation of forest management units. It is expected that land acquisition will continue on a case by case basis for specific purposes such as consolidation, improvement of management efficiency, protection of key forest resources, and maintenance of an adequate public forest resource base to provide for multiple-use forest requirements.

- No specific land acquisitions were identified at this time.

Sales

Sale of state forest land will be undertaken in some cases where a determination has been made that the land is not needed for forest management purposes and serves no other state purpose.

- One 20 acre parcel was identified for sale. Forest Recreation Program

Forest Recreation Program

The goal of the Division of Forestry Recreation Management Program is to fulfill the outdoor recreation potential of Minnesota state forest lands by providing developed recreation areas and opportunities for dispersed recreation activities that are compatible with other forest uses and recreation facilities.

The goal, as stated above, is consistent with the forest management philosophy of multipleuse. When developed, facilities on state forest lands should provide opportunities for contact with nature and require a minimum level of development and management. These policies generally limit state forest recreation areas to primitive campgrounds, day use areas and recreational trails. In addition, recreational activities that do not require developed facilities, such as hunting, berry picking, bird watching, nature photography and other types of dispersed recreation, are quite popular and encouraged in state forests.

The Park Rapids Area includes a wide variety of recreation resources. The prairie lands of western Becker, Clay, Wilkin, Traverse and Stevens counties offer excellent open land and waterfowl hunting as well as a variety of other recreational opportunities. The forested, lake regions of eastern Becker, southern Hubbard, Otter Tail, Grant, Douglas and Pope counties have a wider variety of recreational opportunities. Abundant resources exist for almost all types of fishing and hunting as well as other types of summer and winter activities. The majority of the developed facilities are operated by the private sector. These private facilities rely heavily on the recreation lands and waters managed by the public sector to provide a base for recreational activities.

Most of the state forest lands in the Park Rapids Area are located in eastern Becker and Hubbard counties. The majority of these lands are located in the Paul Bunyan, Two Inlets, White Earth, Smoky Hills and Badoura state forests. In general, the public recreational facilities are primitive.

Private facilities play an important role in serving recreational needs in the Park Rapids Area. Compared to the public sector, the private sector provides more capital intensive, service oriented facilities ranging from overnight lodging in resorts to outfitting recreationists for several types of outdoor experiences.

DNR Managed Facilities

The Department of Natural Resources manages many types of recreation facilities ranging from state forests which may contain several thousand acres of public land, to state trails which provide a variety of recreational opportunities.

Division of Forestry campgrounds, water accesses and trails include:

- Hungryman Lake Campground
- Cedar Lake Picnic Area and Public Access
- Mantrap Lake Campground, Picnic Area and Public Access
- Paul Bunyan State Forest Trails
- Two Inlets State Forest Trails
- Smoky Hills State Forest Trails
- 9 Public Accesses maintained by the Division of Forestry

Expanding the amount of recreation facilities in the area is not recommended because of the amount of other public, grant-in-aid, and private facilities available in the area. Should

the need arise in the future for more facilities there are opportunities for additional development.The Division of Forestry has the opportunity to improve the quality of the Park Rapids Area recreation experience by continuing to rehabilitate and properly maintain developed state forest recreation facilities, roads and trails. Use of off road vehicles on state forest roads and trails will continue to be permitted unless posted otherwise, their use will be permitted unless damage to the resource occurs or they are conflicting with other established users. In this case closure of certain roads and trails to motorized use may be necessary. Cases such as this will be reviewed on an individual basis. Special events by organized groups will require special use permits from the Department.

At the present time all three of the developed campgrounds and day use areas in the Park Rapids Area are in need of some rehabilitation or additional development. The following proposals for rehabilitation have been made:

- Improve water supply at Hungryman Campground Construct new vault-type toilets at Hungryman Campground and at Cedar Lake Access and Picnic Area.

- Mantrap Campground has pit toilets dating back to 1961. In 1987, the existing toilets will be replaced with modern sealed vault toilet buildings.

- Redevelop and sign hiking/nature trail at Cedar Lake Day Use Area. The Division of Forestry maintains nine public accesses in the Park Rapids Area. The following proposals concern public accesses:

- The public access to Mantrap is heavily used, and should be rebuilt as a double-wide ramp, with a dock in between. The swimming area dock should be replaced. This work should be done in conjunction with the other campground work being done in 1987.

- The public accesses have been getting heavy use and need some upgrading. The public access on Little Sand Lake is in desperate need of additional parking space. The DNR's Trails and Waterways Unit is working on a project proposal to develop an access for Middle Crooked Lake.

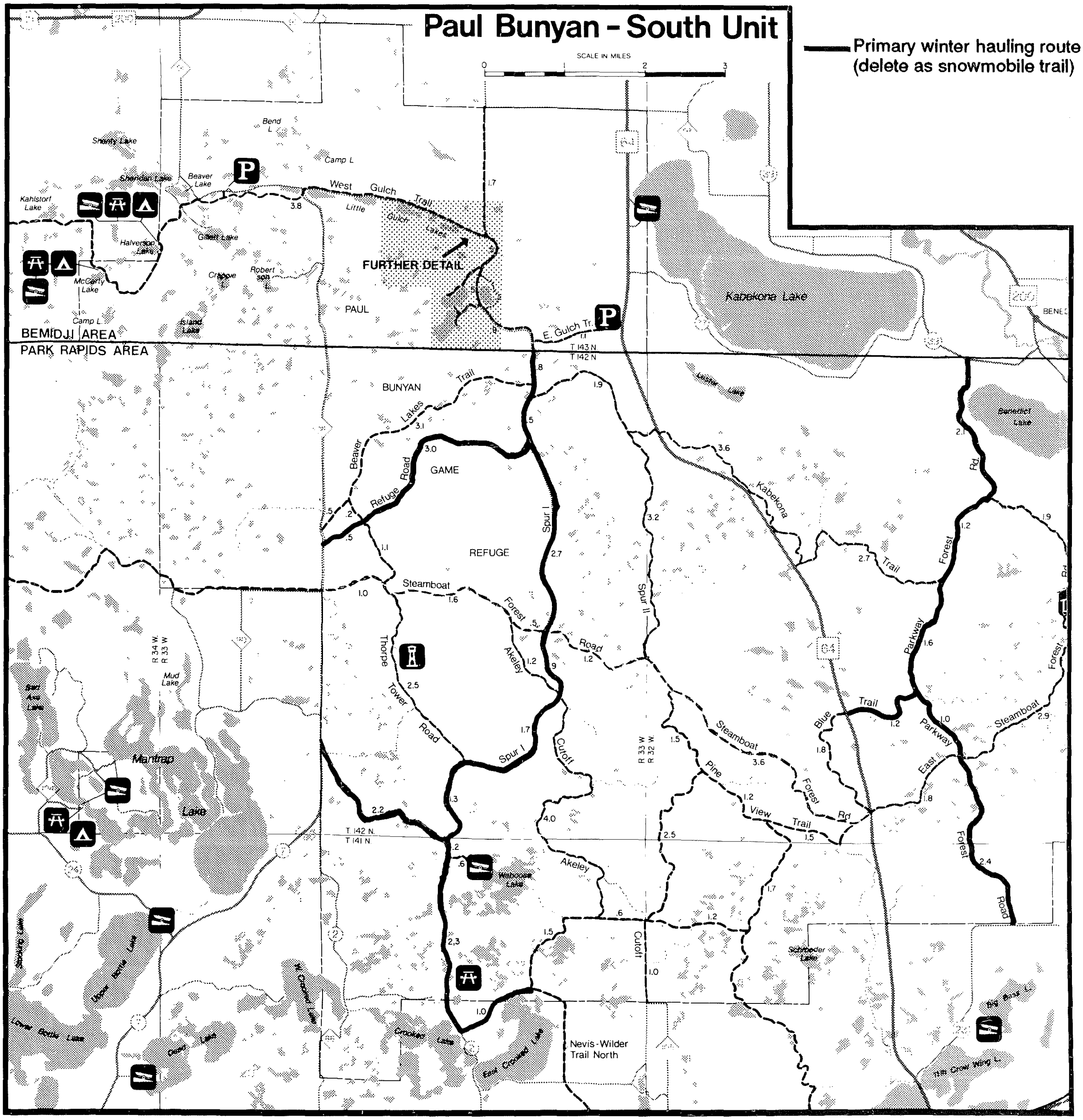
- Abandon forestry administered public access on Round Lake. This access is not needed since there is a Trails and Waterways public access which serves Round Lake.

- Renovate and rebuild Cedar Lake Public Access ramp and parking area.

Snowmobiling on Forest Roads

The Division of Forestry currently maintains developed trails for snowmobiles in all the state forests in the area except the Badoura State Forest. Additional types of trail opportunities are provided by other levels of government and the private sector. However, Forestry should seek to cooperate with these other recreation providers to ensure that trail needs are being met as demand and activities change. Opportunities for new trail development and designating new uses on old unused trails have been evaluated during this planning process. Plans have been developed to reduce trail user conflicts. This has been done by minimizing recreation trail use of busy forest roads and conflicting uses on the same trail. The following changes (Fig. 5) are proposed:

Figure 5


Paul Bunyan - South Unit
SCALE IN MILES
Primary winter hauling route
(delete as snowmobile trail)
FURTHER DETAIL
BEMIDJI AREA
PARK RAPIDS AREA
West Gulch Trail
E. Gulch Tr.
PAUL
BUNYAN
GAME
REFUGE
Kabekona Lake
Mantrap
Lake
Beaver Lakes Trail
Refuge Road
Spur I
Spur II
Steamboat Forest Road
Thorpe Tower Road
Akeley Cutoff
Pine View Trail
Blue Trail
Parkway
East Forest Road
Nevis-Wilder
Trail North
T 143 N
T 142 N
T 141 N

WINTER "TRUCK ROUTES"

The following forest roads will be designated as winter "truck routes": Spur I, Parkway I, Refuge Road, Blue Trail, and Parkway II (a Thorpe township road). These roads will not be designated as snowmobile trails. Use of these roads by snowmobiles can continue for now but, grooming will be on other forest roads,trails, and alternate routes yet to be constructed. They will be signed "caution - truck route". Some of these roads may have to be eventually closed (marked - closed to snowmobiling) due to safety considerations. If it is known for certain in October that any of the designated truck routes will not be plowed, they could be groomed as snowmobile trails for that season.

ALTERNATE ROUTES

The following alternate routes will be necessary in order to designate the above forest roads as "truck routes":

- SPUR I - The corner at Gulch Lakes Road will be reconstructed to allow winter route out to HWY. #64.
- PARKWAY I - An alternate route will be sought southwest of Lake Benedict to the Kabekona Trail.
- REFUGE ROAD - The Beaver Lakes Trail will be reconstructed . The west end will be changed to eliminate having to run on the Refuge Road.

Until adequate alternate routes are constructed, loggers and snowmobilers will have to share the forest roads. Precautionary signing will be emphasized.

TIMBER SALES REGULATIONS/PLANNING

More planning and care in developing regulations will be done in advance of timber sales. Loggers will be required to give notice in advance of any plowing, road building, or landing construction. Some timber sales may need to be planned for summer logging only. When permits for winter logging are given, acceptable winter routes will be specified to loggers. In addition, the Division will develop harvesting plans that will attempt to minimize conflicts between recreational users and loggers.

COORDINATION/PLANNING

Prior to each winter season (around mid-October) there will be an annual meeting with representatives from the logging and snowmobile communities to plan the winter logging and snowmobile routes.

SAFETY/EDUCATION

Both loggers and snowmobilers need to be better educated. More properly located signs are needed. State forest maps will be revised to show designated "truck routes". The Division of Forestry will also work closely with the local Chambers of Commerce on the accuracy of their maps. Informational signs will be posted at trail intersections. Standardized signs will be used and the symbols identified on maps. More year around "caution trucks hauling" signs will be posted.The state land in the Park Rapids Area provides many opportunities for dispersed recreation. However, maps showing many of these opportunities are not currently available to the public or are in short supply. The Division of Forestry will seek to secure adequate funding for the development and publication of an area recreation user map and individual forest trail maps. Dispersed use should be monitored to prevent conflicts that may develop between different types of users. Rules and regulations for controlling dispersed use will be necessary in the future. If use increases, conflicting uses may have to be separated.

Forest Road Program

The goal of the state forest road program is to develop and maintain a state forest road system that will provide adequate access for the protection, management and utilization of Minnesota's forest resources.

The Division of Forestry's strategy for attaining this goal is to continue to manage state forest roads in cooperation with other public and private land managers to ensure coordinated and responsible forest road use and development. In response to growing user demands, heavier logging equipment and trucks, and the need to provide consistent long range program direction, a comprehensive State Forest Road Plan (Minnesota DNR Division of Forestry 1982) was developed. The information in the State Forest Road Plan was used in part in developing this proposed program for the Park Rapids Area.

All timber access roads will be reviewed by the Division of Forestry and the Division of Fish and Wildlife to determine which roads will be regulated for limited use. These roads may be temporarily blocked by gates, large rocks or an earthen barricade for a variety of reasons. These trails will open to hunters and hikers and other non-motorized users. All such trails will be signed "Forest Access- walking trails" and closed to motorized use except snowmobilers or other authorized users. A certain degree of remote hunting and hiking opportunities will be provided for the people who prefer to get away from the crowd. Most forest roads will be closed during spring breakup, high fire danger or extremely wet conditions. Closures will protect the road system and adjacent resources from excessive damage or fire.

A road identification system will also be developed and road signs installed as outlined in the State Forest Road Plan. Forest roads will then be mapped, signed, and identified on State forest maps for user safety and convenience.

Approximately five to eight miles of logging spurs (class 6) will be built per year in the next 10 years.

Timber harvest guidelines will be adopted for cutting on all lands along major roads or highways.

Table 1. Summary of road reconstruction needs in the Park Rapids Area by priority (depending on funding).

ROAD NAME	YEAR	COST
Akeley Cutoff	1986	$35,000
Hungryman Campground Road	1987	$4,000
North Smoky Hills	1987	$15,000
East Steamboat	1987	$35,000
Refuge Road	1987	$10,000
Spur I	1988	$15,000
Kabekona	1989	$5,000
Steamboat	1990	$3,000
North Smoky Hills & White Earth	1990	$60,000
Two Inlets & So. Smoky Hills	1994	$70,000
So. Two Inlets & Indian Creek	1990	$10,000
Total		$262,000

Timber Management Program

It is the Division of Forestry's goal to maintain state forest lands in the appropriate cover types, and with the proper degree of stocking and growth rate to secure maximum benefits according to multiple-use, sustained-yield principles.

The timber management program includes two major components: timber stand regeneration and the regulation of timber harvest. The basic objective of the timber stand regeneration program is to coordinate timber harvest and regeneration plans to assure state lands are maintained in the appropriate cover types to meet future multiple-use demands. Timber harvest regulation is designed to promote sustained-yields of forest products. Both functions are accomplished by coordinating various aspects of timber scaling, sales, harvest, stand regeneration, and stand maintenance activities. (Only DNR administered forest land is addressed in the Timber Management Program.(For management on private lands, see PFM Program).

Major Timber Types

There are nine major timber types in the Park Rapids Area. These types are briefly described below along with nonstocked commercial forest land. Timber types will be managed in accordance with guidelines in the Managers Handbook, General Technical Reports.

Aspen

Aspen is the largest timber type, growing on a variety of soil types. Some aspen is being converted to conifers to meet wildlife management goals. Birch is commonly mixed with aspen and pine.

Pulp, fuel wood, and sawbolts are the main products from aspen. Natural regeneration has tended to favor aspen in the mixed stands. With better markets for aspen, proper harvest practices are implemented to insure natural regeneration of aspen.

Red and White Pine

Red and white pine were a major component of the forests at the turn of the century. Very little remains today of these extensive acreages. Small pockets of mature timber along with plantations from the 1930's to the present make up the present acreage. Clearcutting followed by planting is the accepted method of management.

Jack Pine

Many jack pine stands were established following the extensive wildfires of the early pine logging. Jack Pine is a short-lived species growing primarily on sandy soils. Regeneration is mostly done by planting but some seeding is being tried. Aspen is commonly found with jack pine. Some mixed stands are being lost to aspen regeneration.

Lowland Conifer

The lowland conifer type contains tamarack with a small acreage of black spruce and northern white cedar.

Northern Hardwood

The northern hardwood type is composed of several species, including basswood, oak, maple, elm and aspen. Elm as a major component is being eliminated by timber sales and Dutch elm disease.

Lowland Hardwood

The lowland hardwood type is found along river bottomlands and poorly drained sites. Elm and ash are the predominant species.

Spruce-Fir

The spruce-fir type is predominantly planted white spruce and naturally seeded balsam fir in aspen stands.

Oak

Oaks are found both on the sandy soils and the heavier soils. Northern red, burr and white oaks are the most common species.

Non-Stocked Forest Land

Non-stocked forest land consists mostly of lowland brush. Brushland is very important wildlife habitat and its wildlife value should be considered prior to conversion.

Demand For Wood

The waferboard and paper industries generate the major demand for wood harvested in the Park Rapids Area.

For the past two years, 95% of the timber that could have been harvested (allowable cut) was harvested. This was due to the large amount of unsold aspen (backlog) from previous years. Once this backlog of aspen is sold, the percentage of annual allowable cut sold is expected to drop to approximately 80%, unless additional markets are developed.

Timber Management Planning System

The Timber Management Planning Information System is a computer program that has been developed to use forest inventory information to select stands for various management practices based on the following criteria: site index, stocking damage, stand size, and distance from a road. The preliminary list of stands generated by the program was reviewed to see if the proposed practice is consistent with timber management and wildlife objectives. The amended lists of

stands for various practices have been included as an appendix to the plan and form the basis for annual harvest, site preparation, regeneration, and timber stand improvement plans.

The following reports have been produced:

- The acreage and list of stands with regeneration recommendations to be regenerated without harvest.
- The acreage to be harvested by clear cutting with specific regeneration recommendations for each stand.
- The recommended regeneration treatments for the acreage to be regenerated that will provide the nursery with a 10 year plan on what to grow.
- A regulation scheme for the rotation that, as far as practical, provides for a uniform flow of wood throughout the management period. Acreage will be delineated by 10 year age classes.
- A list of stands to be selectively cut or thinned. Recommended annual harvest levels are set from the forest land inventory (see forest land inventory section for discussion) for the purpose of creating an equal distribution of timber among age classes within a forest type. This will assure a continuous annual yield of forest products. Annual harvest is based on the present distribution of age classes, the total present volume of timber, and the condition of this timber. Table 2 is a summary of the annual harvest.

Most of the timber types in the Park Rapids Area are now found in the older age classes due to the low levels of harvest in the 1960's and 1970's. The highest cutting priority will be given to the older age classes to correct this imbalance. However, some old growth stands will be identified by Foresters and Wildlife Managers to be postponed from harvest in order to provide habitat for certain wildlife species.

Table 2. Summary of Annual Allowable Harvest Level.

Annual Timber Harvest Types	(acres)
Aspen	1421
Paper Birch	60
Norway Pine	64
White Pine	3
Jack Pine	118
Black Spruce	10
Tamarack	29
White Cedar	1
Northern Hardwoods	19
Ash	34
Lowland Hardwoods	7
White Spruce	35
Balsam Fir	23
Oak	31

Timber Stand Regeneration

There are four forest regeneration objectives (listed in order of priority) in the Park Rapids Area. The first objective is to regenerate an equivalent amount of acreage as is harvested each year. The second objective is to regenerate the previously harvested areas that cannot adequately regenerate themselves or that are to be converted to a more suitable species for the site. This regeneration usually involves mechanical and/or chemical site preparation followed by planting. The third objective is to regenerate unstocked and understocked sites that are not needed for wildlife habitat or other purposes. A fourth objective, regeneration without harvest (aspen recycling), applies in some cases. Wherever this is required, efforts will be made to utilize any merchantable wood if there is an opportunity to do so. An overall objective is to manage the forest in a way that will benefit wildlife populations while recognizing market conditions of the forest resource.

Table 3. Summary of Artificial Regeneration Needs for Next 10 Years.

Species	Plant(acres)	Seed(acres)
White Cedar	139	0
White Spruce	813	0
Black Spruce	116	121
White Pine	138	0
Norway Pine	2847	22
Aspen	12	0
Jack Pine	1369	141
Pondorosa Pine	0	7
Tamarack	217	298
TOTAL	5651	589

Fish and Wildlife Management Program

The Fish and Wildlife Habitat Management Program goal of the Division of Forestry is to provide forest habitats conducive to managing and protecting a variety of fish, wildlife and native plant resources compatible with forestry and fish and wildlife management objectives, site capabilities and adjacent land uses.

The Division of Forestry has two primary means of managing forest wildlife habitat: 1) management with the primary objective of producing timber, but with modifications that allow secondary fish or wildlife objectives to be attained. 2) management practices solely designed to improve fish or wildlife habitat or to provide access to habitat. The Park Rapids Area has a wide variety of wildlife species due primarily to the variety of habitats (plant communities) present. Prairie, wetland, coniferous and deciduous forest types are all represented.

Forest Management Practices

Forest management practices have a great potential to significantly affect (decrease and/or improve) wildlife habitat in the forested portion of Minnesota. Due to the suppression of wildfire in the northern forest ecosystems, most changes in habitat presently result from planned management. This management determines the age, composition, size and distribution of timber stands in the forest. All of these attributes affect a stand's value as wildlife habitat. Diversity is the focus of wildlife management in relation to forest management.Increased interdisciplinary interaction in developing guidelines for habitat management will be emphasized in the Park Rapids Area. Cooperative planning, implementation and training will also be emphasized. Sharing common data and inventory information will also help improve communications and coordination of multiple use management activities among foresters, wildlife managers and fisheries managers.

Forestry/Wildlife guidelines for habitat management have been developed to help integrate forest and wildlife management on all state administered lands as well as non-DNR lands. Implementation of the practices delineated in these guidelines will help meet wildlife management objectives through forest management practices

Deer Wintering Areas

Traditional deer wintering areas require consideration in planning forest management activities. Deer habitat management should be given priority over timber management based on site specific goals. Jack pine stands that have been identified for harvesting should have harvesting delayed until alternate thermal cover is established within that compartment. Jack pine areas, once harvested, should be regenerated back to jack pine where they are providing high wildlife value. High deer populations may hinder jack pine regeneration. In those situations white spruce should be chosen over pine species as replacement thermal cover.

In the transition and agricultural areas, wooded river bottoms, brushlands and wetlands are the only remaining deer wintering areas. Maintenance of these areas is essential and will require close cooperation between forestry and wildlife personnel since many of these areas are on private land.

A more complete inventory of deer wintering complexes is needed to provide a better guide for future management. Cooperation between forestry and wildlife personnel in forest inventory review, aerial photo interpretation and field inspection will help identify these areas.

Forest Openings

Inventory, creation and maintenance of permanent forest openings (in central and eastern part of the Area) should be given high priority in future forest management. Since these areas will be developed in conjunction with timber harvest, maintenance of landings on timber sales as permanent openings should be stressed. Existing forest openings should not be reforested. Frequent communication with wildlife personnel will be necessary for meeting forest opening composition goals. The goal is to create 150 acres annually.

At this rate (depending on funding) in 10 years 2% of the forest should be in openings. Timber resources in riparian zones provide wildlife habitat throughout intensive agricultural areas where little other habitat exists. The diversity of wildlife species present in these zones provides aesthetic and recreational benefits for visitors and residents. Wildlife guidelines should be utilized in formulating management practices to protect and enhance all associated wildlife resources. These areas provide high species diversity and should be considered for permanent old growth designation.

Extensive Forest Areas

Extensive forest areas (at least one square mile of unfragmented forest) should be identified and evaluated for their possible potential for habitat required by some migrant bird species (e.g. wood warblers).

Old Growth Forests

Establishment and maintenance of old growth forests (parts of the forest that are not harvested as soon as possible) will provide an element of habitat diversity that will contribute to the stability of wildlife populations. Some wildlife species are entirely dependent on old growth stands for their existence. Stands for each timber covertype will have harvest postponed to meet goals agreed to by the Divisions of Forestry and Fish and Wildlife.

Northern Hardwoods and Oak

Northern hardwood and oak stands need to be managed for their associated wildlife benefits. Because northern hardwoods are long lived, self perpetuating, and in low demand for wood fiber they are prime candidate areas for old growth designation. No fuelwood cutting should be allowed in areas so designated, except for perpetuation of oak types. Northern hardwood or oak stands should not be considered for type conversion. Oak clumps should be maintained whenever possible for mast production in all timber types.

Wetlands

Wetlands are essential wildlife habitat that require preservation, improvement, restoration and creation. Buffer strips are required adjacent to wetlands to lessen impacts of forest management activities. Use of wetland basins and associated fringes for winter log landing locations will be discouraged. Wetlands should not be used as slash disposal areas. Wetlands will be given special consideration in planning road construction. Through proper planning, construction of impoundments both large and small will provide wetland habitat without jeopardizing other management activities. Identification of future impoundment sites is necessary in future management decisions.

Prescribed burning of designated wetland complexes will be required to prevent natural succession of sedge meadows to rank, dense shrub swamps. Maintaining these lowland complexes is necessary to maintain sandhill crane and prairie chicken populations in southeastern Hubbard County.

Brushlands

Brushlands constitute a small percentage of cover types in the Park Rapids Area, except in southern Hubbard County. They should be

preserved and maintained for their high value for numerous wildlife species. Brushlands in the agricultural area also provide winter areas for deer and pheasants. Prescribed burning is the best treatment for maintaining brushlands.

Native Prairie

Native prairie is an increasingly rare plant community. Prairie sites should be identified, evaluated, preserved and managed. Under no circumstances should native prairie areas be proposed for planting or type conversion. The Prairie Tax Credit provides incentives to preserve native prairie on private lands. Forestry and Wildlife personnel will encourage and assist landowners in this program.

Special Species Habitat Management

Endangered, threatened, and special concern species have specific habitat needs which can be met through habitat identification, protection and management. Often, management considerations can be implemented by cooperative forestry-wildlife projects. Other indicator and sensitive species such as colonial birds must be given consideration in future forest management practices.

Areawide Guidelines

The following guidelines have been discussed in detail by Wildlife and Forestry personnel in the Park Rapids Area.

Public Lands

1.Compartments are 4-section units with a land base of 2560 acres. Acceptable compartment composition goals for intolerant deciduous types are the following:

a.65-45% (1664-1152 acres) Aspen, birch, oak, Balm-of-Gilead, brushland.

b.Aspen Type: 55-35% (1408-896 acres).

c.Aspen 1-10 yrs: Not less than 25% - (640 acres).

d.Winter Cover: Not more than 20% (512 acres). Jack pine, balsam fir, N. white cedar.

*Compartments of traditional deer winter use that contain more than 20% winter cover should be managed at that higher level of quality conifer thermal cover.

e.Forest Openings: Not less than 5% (128 acres) except in areas designated for extensive forest management.

2.Plantations:

a.Reforestation of jack pine harvest areas should be done with jack pine to favor wildlife. Conversion to other species will be discouraged. However, some conversion to other conifer species will be necessary due to other silvicultural considerations (e.g. insect or disease problems, soil/site characteristics).

b.Plantations larger than 20 acres will have buffer strips of hardwoods and/or brush running through them and around the edges. Conversion of oak areas will be considered in compartments where thermal cover is lacking and reforestation to jack pine or other high wildlife value species would be beneficial.

c.Access trails will be designed to avoid areas of wildlife concentrations such as deer wintering complexes.

d.Spot failures in plantations will be evaluated for retention as permanent forest openings.

e.Plantations will not be considered in any designated sandhill crane and prairie chicken management compartments where grassland is required. On private lands in these compartments, landowners

will be encouraged to cooperate in sandhill crane and prairie chicken management.

f.Plantations will not be considered in native prairie and native brushland sites.

g.On suitable plantation sites, preference should be given to the establishment of hardwoods tree species or shrubs valuable to wildlife, or to conifers valuable to wildlife.

h.Herbicide spraying for release of plantations should be planned to minimize interference with fruit production of lowland and upland brush species for that growing season.

i.Protection of prairie chicken booming grounds and sandhill crane nesting marshes will be encouraged by restricting conifer plantations within 1 mile.

j.In RMU's 1-4 small plantations are preferred. Conifer plantations larger than 10 acres should have buffer strips of hardwoods and/or shrubs around the edges and running through them at spacing no more than 600 feet to provide travel lanes for wildlife.

3.Harvest:

a.Oak clumps will be retained in timber sales for future mast production where possible. Oak clumps should consist of no less than 6 trees.

b.In RMU's 5,6,and 7 harvest sites over 20 acres in size will include travel lanes, meandering cutting edges, and/or standing timber islands. These sites will also have at least 5 years of growth before timber adjacent to that stand is harvested.

c.In RMU's 1-6 buffer zones of unharvested timber 100 feet wide will be left around all type 3,4,and 5 wetlands (as defined in USFS CIR.39) larger than 1 acre and around all lakes and streams. In RMU 7, buffer zones of unharvested timber 200 feet wide will be left around all types 3,4,and 5 wetlands larger than 5 acres and around all lakes and streams.

e.Buffer zones of 200 feet of unharvested timber will be left around all trout lakes and streams.

f.Logging slash shall neither be piled within 50 feet of wetlands, nor placed within the wetland basin.

g.Aspen-oak areas should be allowed to regenerate back to aspen-oak. Food sources such as clumps of oak mast trees, scattered aspen clones and ironwood trees should be retained.

h.Planning of timber access trails will be coordinated with wildlife personnel. Fish and wildlife needs will be considered when planning new access trails.

i.Harvest activities near bald eagle and osprey nest and heron colonies will adhere to Forestry-Wildlife guidelines for these species.

j. Permanent forest openings of one to two acres will be established in timber harvest areas to meet Forestry-Wildlife compartment goals.

k.In RMU's 1-4, clearcut harvest areas should be no larger than 10 acres and follow timber type boundaries. Selective harvest areas may be larger if other wildlife consideration is given.

l.Standing dead trees shall be retained at rate of 1-6 per acre.

Private Lands

1.Copies of all PFM applications shall be sent to the Area Wildlife office upon receipt from the applicant.

2.Area wildlife personnel shall be given the opportunity to provide input into the development of PFM plans. On PFM applications where the landowner has indicated wildlife and recreation interests, the plan should be developed cooperatively by Forestry and Wildlife personnel. Copies of referrals from other agencies shall be sent to the Area Wildlife Office.

3.Wildlife management recommendations and/or alternatives developed by wildlife personnel shall be included in the PFM plan. Where wildlife and forestry recommendations differ, the PFM plan shall present these differences as management options for the landowner to consider.

4.Private landowners should be encouraged to retain native prairie and brushland habitats and not convert these habitats to other uses.

5.Information and education should be provided to private landowners concerning the ecological values of prairie habitats and how to manage these habitats; and on various management options or programs available.

6.Buffer strips of upland grassland nesting cover around wetlands type 3,4,and 5 should be restricted from tree planting.

7.Private landowners should be encouraged to follow the Forestry-Wildlife Guidelines and specific guidelines under section A) Public Lands.

Special Concerns on Public and Private Lands

1.Deer wintering complexes will be inventoried cooperatively with Forestry-Wildlife personnel. Individual deer wintering complexes will be evaluated and may require changes in normal timber harvest activities. Special strategies will be incorporated to perpetuate these winter complexes. Replacement of thermal cover will be established before all surrounding cover has been harvested.

2.Forest areas that incur natural disasters such as blowdown or tornadoes, will receive special attention from the Forestry and Wildlife personnel in that area. Cooperative funding and/or equipment use from the Section of Wildlife could be used to achieve Forest Habitat Compartment (FHC) goals.

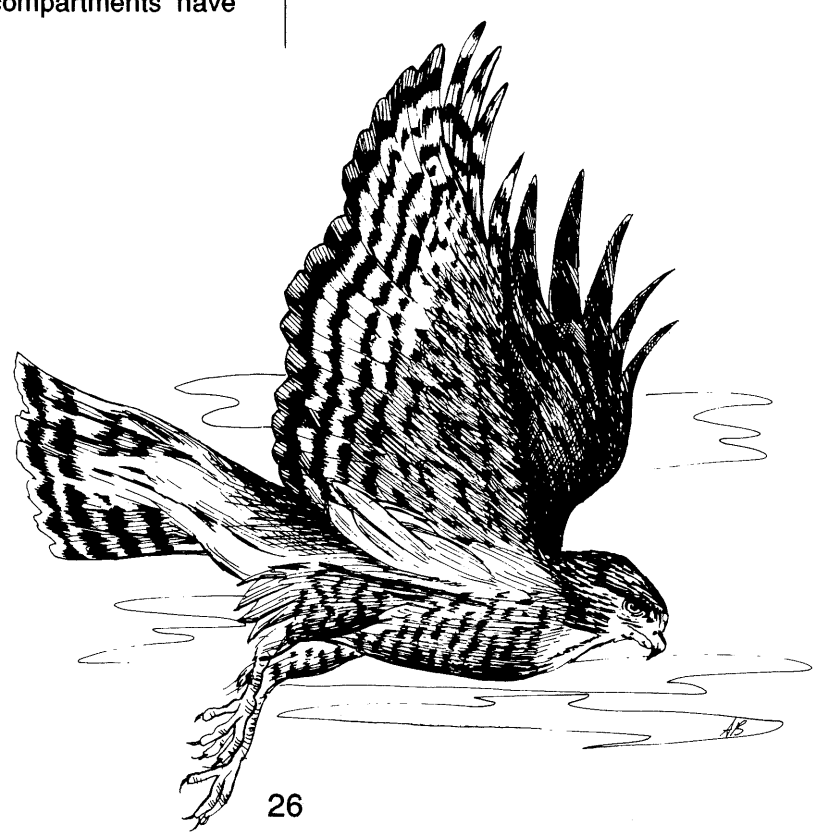
3.Specific habitat compartments will be considered for management to promote grassland, marsh and brushland for sandhill crane, prairie chicken, and sharp-tailed grouse. After habitat compartments have been identified, project proposals for habitat maintenance will be prepared and implemented.

4.Prescribed burns for wetlands, grasslands, and brushland management will be cooperatively planned and implemented with wildlife personnel.

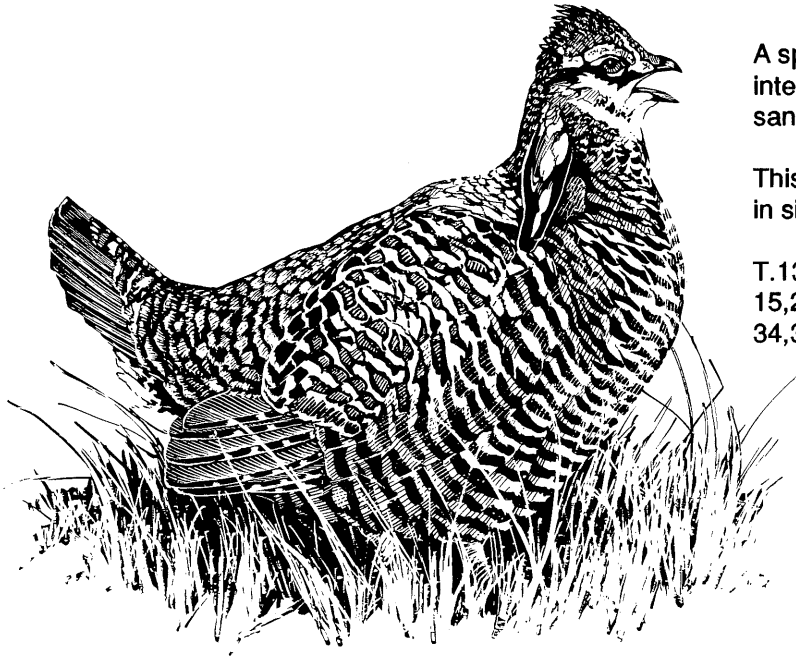
5.Agricultural leases should consider wildlife, fisheries and watershed values of lease sites and adjacent areas.

6.Identification and location of eagle, osprey, red-shouldered hawk and Great gray owl nests and heron colonies will be closely coordinated in timber management activities on both public and private land.

7.Identification and management of areas as extensive forest and/or old growth habitat will be incorporated into timber management activities on public and/or private lands. Old growth goals as identified by Wildlife and Forestry personnel will be managed in accordance with longer rotation principles.



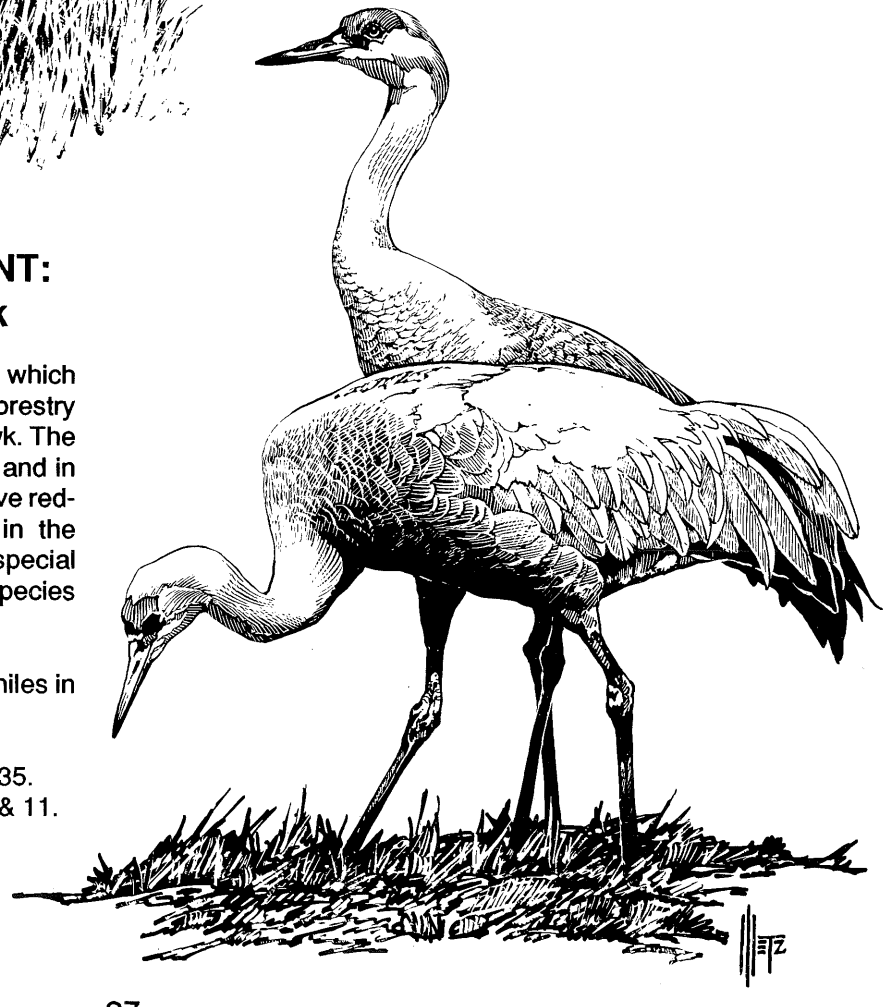
SPECIAL COMPARTMENT: Prairie Chicken and Sandhill Crane



A special compartment has been targeted for intensive management for prairie chicken and sandhill crane in Badoura Township.

This special compartment is 16.5 square miles in size and is located in:

T.139N., R.32W., S 1/2 of Sections 13,14 15,20,21,22,23,24,25,26,27,28,29,32,33, 34,35 and 36.



SPECIAL COMPARTMENT: Red Shouldered Hawk

A special compartment is identified in which coordination between Wildlife and Forestry will emphasize the red-shouldered hawk. The area identified is northern hardwoods, and in the past 3 years there have been 4 active red-shouldered hawk territories located in the area. This species is classified as "special concern" on the State Endangered Species list.

The special compartment is 9 square miles in size and is located in:

T140N R37W Sections 33,34 and 35.
T139N R37W Sections 2,3,4,9,10 & 11.

SPECIAL COMPARTMENTS: Ruffed Grouse

Three special compartments have been targeted for intensive ruffed grouse management. Compartment A is located in the southwest portion of the Smoky Hills State Forest. Compartment B is located in the Two Inlets State Forest.

Compartment A

This special compartment is six square miles in size and located in:

T 139N.,R.37W.,Sections 15,16,17,20,21 and 22

Compartment B

This special compartment is two square miles in size and located in:

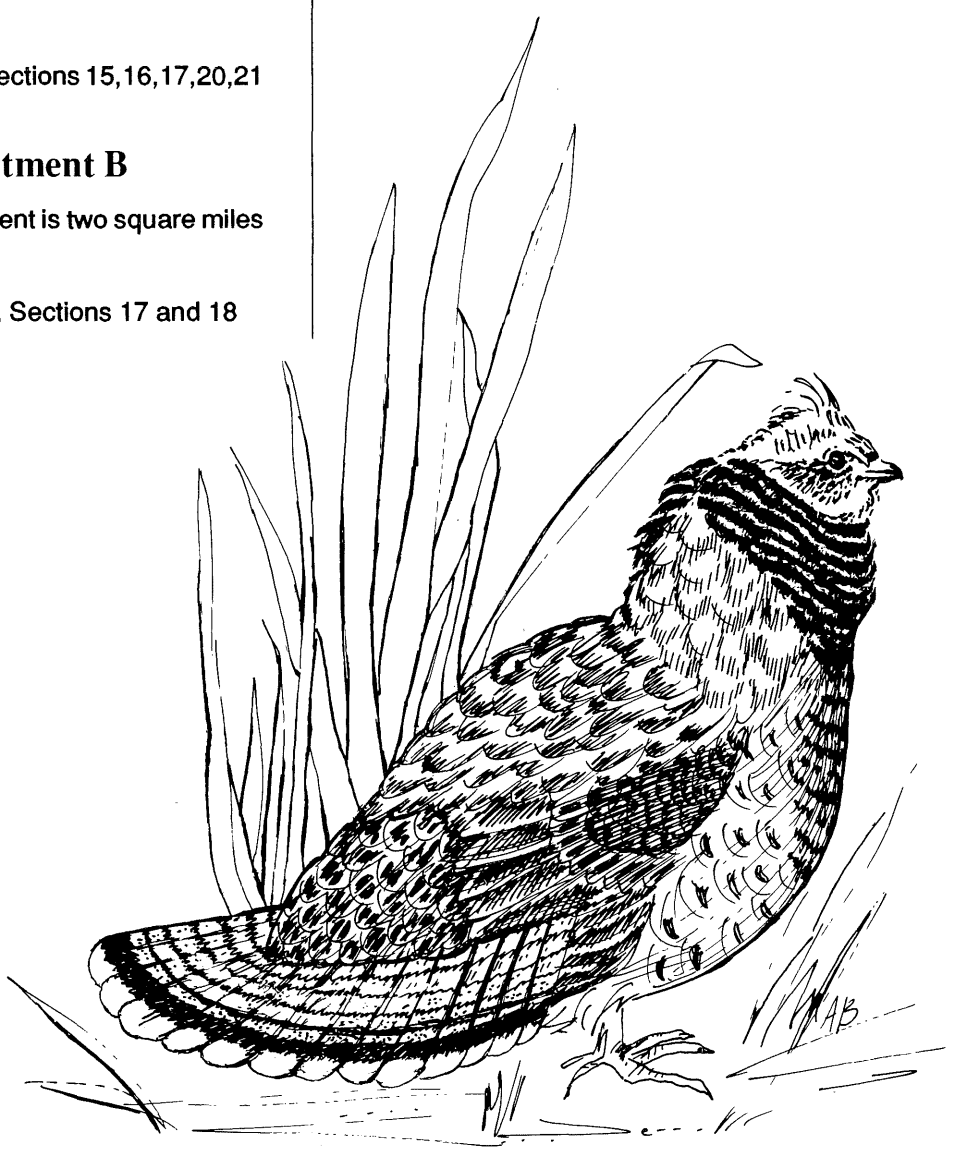
T. 141N., R. 36W., Sections 17 and 18

Compartment C

A special compartment has been targeted for intensive Ruffed Grouse management in the southern portion of the Paul Bunyan State Forest near Waboose Lake.

This special compartment is four square miles in size and located in:

T.142N., R.33W., Sections 25,26,35 and 36



Cooperative Forest Management

Private Forest Management Program

The goal of the Private Forest Management (PFM) program is to improve the multiple-use management of non-industrial private forest lands in a way that is cost-effective to the Division, consistent with departmental policies, and complementary to other public and private efforts.

The Division's strategy for achieving this goal is to first identify N.I.P.F. landowners interested in: improving forest productivity, increasing wildlife benefits, improving recreational benefits, and then to provide the necessary incentives and assistance. Landowner incentives include the desire to maximize profits, cost share assistance, tax reductions, and Tree Farm status.

Services Available to Landowners

1.Promoting proper forest management through personal contacts with forest landowners as well as many types of information and educational activities.

2.Developing multiple-use forest management plans for landowners.

3.Providing landowners with advice and assistance on forest activities such as:

- Tree planting
- Timber stand improvement
- Timber harvest and marketing
- Forest insect and disease control
- Wildlife habitat management

4.Providing information on financial incentives such as cost sharing and forest tax laws.

5.Promoting landowner recognition.

6.Assisting on urban forestry projects.

7.Cooperating with other agencies, vendors, industrial and consulting foresters to maximize landowner services and benefits.

Educational Activities

Foresters utilize a variety of activities in order to make new landowner contacts and to educate the public. Educational activities include:

1)Use of the mass media such as: newspapers, magazines, radio, television.

2) Speaking to school, civic and other local groups.

3) Conducting educational workshops, clinics and field days.

4) Promoting and assisting woodland owner organizations.

5) Arbor Day promotion through civic and school programs.

Over the next ten years:

- 1,500 forest management plans totalling 120,000 acres will be completed.
- Forester-landowner communications will be improved and follow up contacts increased. In order to accomplish this it will be necessary to computerize all forest management plan files.
- There will be an increased use of vendor and consultant forester services.

Program Objectives

1.Develop one or more Area slide-tape programs on various PFM activities, including forest and wildlife management on private lands.

2.Develop a lighted display panel on PFM to use at fairs and other civic functions.

3.Develop an improved network of communications between forester and landowner to improve rapport and landowner involvement.

4.Natural regeneration techniques will be recommended as preferential to artificial regeneration.

5.A good vendor program for tree planting will be promoted.

6.Hardwood stands in need of thinning should be identified and vendors should be used for this work.

7.Pine plantations must be monitored for thinning and release needs.

8.Pine plantations have become a problem due to lack of a market for the thinned material. Planting pine at a greater spacing should eliminate at least one pre-commercial thinning. Increased use of pine post and poles and low quality hardwoods will be promoted.

9.Good quality hardwood stands will be improved through thinning.

10.A positive working relationship will be developed and maintained with the SCS, the local Soil and Water Conservation Boards, and other governmental agencies.

11.An accurate inventory of private forest lands will be promoted because it is is necessary to attract forest industry investments.

County Assistance Program

The goal of the Division of Forestry is to provide professional forest management support to counties to complement their efforts to intensify the multiple-use, sustained yield management of county forest lands

The Division of Forestry's strategy is to support the continuing improvement in county land management programs by providing counties with technical data, advice, and training in various specialized areas of resource management. DNR assistance will be tailored to complement, but not duplicate county needs and potentials. The Division of Forestry promotes a stable county tax forfeited land ownership and encourage greater cooperation between the state and counties in the multiple-use, sustained management of forest lands.

Minnesota counties are responsible for the management of about 2.3 million acres of tax forfeited commercial forest land. (see discussion in land administration assessment) County forestry programs are financed by county appropriations, state payments in-lieu of taxes, the federal BWCAW Forestry Intensification Program, and the state's County Assistance Program. Fifteen counties have County Land Commissioners. The County Land Departments have the responsibility to manage forestry programs, some also have responsibility for recreation programs for parks, wildlife, soil and water, and surveying.

Land Exchange

There are many opportunities for State and County land exchanges that would be beneficial to both parties, by increased efficiency in land management through consolidation. There are barriers to these exchanges but many can be overcome. More effort will be directed toward this end.

Roads

There is a need to define jurisdiction on some roads in a written form. This would require some joint meetings to reach agreement. This agreement would improve the efficiency of maintenance, improve roads for public use, and resolve any legal liabilities in question. There is also a need for some standardization of construction and maintenance standards. This would minimize problems that occur where the road jurisdiction changes.

Recreational Trails

There are some issues resulting from conflicting uses that need to be addressed and resolved. A cooperative agreement or memorandum of understanding can resolve many of these issues.

Coordination of Harvest

Planned timber harvest lists should be developed by the counties and coordinated with the appropriate District Forester's plans for harvest of state lands. The Area Wildlife manager should also have input in this important planning process. This would eliminate the problem of conflicting sales, or sales using the same access. It would result in better coordination of wildlife habitat management. The Park Rapids Area would also furnish a planned cut list for the county to improve communications between the counties and the state, and possible agency referrals in servicing timber requests.

Wildlife Management

Timber management is one of the primary ways of manipulating wildlife habitat. The County land departments manage many acres of timberland that benefit wildlife. The County Land Managers have been doing a good job of land management for wildlife

needs. State and County foresters can improve wildlife management through the use of the Forestry-Wildlife Habitat Management guidelines. The guidelines are a good reference and are especially helpful for non-game wildlife needs. The Area Wildlife Manager will be invited to work with the foresters in this process.

Forest Inventory

Better understanding and confidence in Phase II information is needed. In order to increase the use of this information, county input is necessary toward the development of a joint project to interpret the data, and make any corrections or alterations.

Coordination

A joint annual Area meeting with all counties and DNR Foresters should be scheduled to bring out issues, concerns and solutions. The best time would be at the time our input toward stumpage prices is requested.

Urban Forestry Program

The goal of the Division's urban forestry program is to assist Minnesota's communities in managing their urban vegetation through cooperation with governmental agencies and private citizens, so that the physical, social and economic well being of these communities is enhanced.

Urban forestry is the term used to describe those forest management practices applied in areas where trees and associated plants grow individually, in small groups, and under forest conditions within cities, towns, and their suburbs.

Assistance To Communities

The urban forestry program provides help to all communities, regardless of their size, to plan their overall forestry program, including the development of tree inventories, management plans, city tree ordinances, and budgets. Advice and assistance is given to community officials and private homeowners in the selection of plant materials, planting techniques, spacing and location of trees, in urban and residential areas. This aid helps these community officials and private homeowners develop wildlife habitat, improve watershed areas, minimize soil erosion, establish windbreaks, and manage trees and associated plants for the aesthetic pleasure they bring. Identifying the many insect and disease problems that affect municipal and residential trees is a particularly important urban forestry responsibility of the Area. Any work involved with school and municipal forests is also considered urban forestry.

The Area's urban forestry effort in F.Y. 1984 was 0.4 person years. This figure will increase in the years to come as communities become more aware of the deteriorating condition of their trees. There will be some new initiatives made. The Area will focus on assisting each major municipality within its jurisdiction in developing a tree planting program and on promoting Arbor Day activities with as many schools and communities as possible. If the Division's proposed grant program for urban forestry is accepted and additional funds become available to communities, the Area's urban forestry workload will increase.

Coordination with Other Divisions, Agencies and Organizations

The Area will be working primarily with the city councils and town boards of surrounding communities. The Soil Conservation Service and the County Extension Service could become involved in the Area's urban forestry activities. The Division of Fish and Wildlife, with its nongame wildlife program, might also be a participant in some urban forestry efforts. The Area will certainly assist schools with Arbor Day projects and school forest management. To protect building sites from ongoing construction damage, the Area will work with community developers. Organizations like the Minnesota Forestry Association will be contacted regarding tree distribution programs.

Forest Pest Management Program

The goal of the forest pest management program is to provide efficient forest resource protection from insects, diseases and competing vegetation to increase productivity and reduce pest losses.

The efficient and economical accomplishment of this goal will require the integration of forest pest management techniques into forest nursery production and forest management practices from site preparation to harvest. Integrated pest management requires a pest management program with strong training, evaluation, and research components. The role of the division's forest pest management program is to provide management guidelines, standards, examples, and risk evaluation systems for addressing forest pest management on public and private lands in the state.

The Division of Forestry is charged by state law with controlling forest pests on public and private lands within Minnesota. The division provides forest protection assistance to nursery, Christmas tree, non-industrial, industrial, urban, municipal, county, and state forest managers or landowners.

Insect and Disease Problems

Jack Pine Budworm

The jack pine budworm is the major historic insect problem in the Park Rapids Area. Population numbers great enough to cause top kill and tree mortality probably will occur on the average of once every 10 years. An outbreak occurred between 1977 and 1979, and at the height of the outbreak in 1978, defoliated jack pine in the Park Rapids Area amounted to approximately 25,000 acres. In 1984 budworm populations once again began to build, and defoliated 6700 acres in 1985. Approximately 3,800 acres of this area was heavily defoliated, and some top kill in the heavier defoliated areas is expected.

Mature and overmature jack pine stands on state, county, and private lands, open grown and overstocked stands, large contiguous jack pine stands, and droughty soil provide conditions for the budworm to carry over during population lows and provide conditions for populations to build up to epidemic proportions. Young red pine plantations mixed in among the older jack pine stands are particularly vulnerable to the budworm.

Gypsy Moth

The most destructive hardwood insect pest is the gypsy moth which is established in Minnesota but not in the Park Rapids Area. The hardwood stands in the southern portion of the Area will be particularly vulnerable to gypsy moth since these hardwood stands are dominated by oak, which is the favored food for gypsy moth. The southern portion of the Area is a popular vacation area for people from outside the Area making gypsy moth introduction a very real possibility.

Forest Tent Caterpillar

The forest tent caterpillar has been the major hardwood defoliator in the Park Rapids Area. Historic outbreak areas include the aspen types in Hubbard and Becker counties and the mixed hardwood types, particularly basswood, in central Otter Tail and southern Pope counties. The fall defoliator complex also causes periodic heavy hardwood defoliation throughout the Area. Defoliation has been widespread and heavy enough to adversely impact the tourist industry by forcing people away from outdoor activities. This complex of defoliators includes the variable oakleaf caterpillar, and the redhumped oakworm.

Oak Decline

An oak decline complex within this geographic area is triggered by drought stress. The

stressed oaks are then invaded by the two-lined chestnut borer and shoestring root rot. Areas of dying red oak were found after both the 1976-1977 and 1980 droughts. Pockets of dead and dying oak were common in the timber demonstration area in Maplewood State Park in Otter Tail County after the 1980 drought.

Hypoxylon Canker

Hypoxylon canker is the most destructive disease of aspen, and it has been estimated that 112 million board feet of aspen is killed annually in the Lake States. Cankers tend to be more common on quaking aspen, in open grown stands, on the edges of stands, and on trees with persistent branches. Disease incidence can be related to genetically susceptible clones.

Diplodia Tip Blight

Diplodia tip blight on red and jack pines is common in the Park Rapids Area. This disease was particularly prevalent in 1977, when it caused top mortality to young trees. In 1984 and 1985, young red pine planted under larger, residual pine or close to jack pine edges also showed signs of infection. The fungus can be found infecting the cones of the overstory trees, and spores from these infections rain down on the younger understory. Normally, Diplodia tip blight infects and kills elongating shoots. This kind of infection results in setting back growth and causing tree deformities. Under stress, drought and hail damage, this disease invades the stem tissue beyond the current year shoot causing branch, top and/or tree mortality.

Plantation Management

Insect and disease management should start before plantations are established and be part of the planning process. It is more costly to address insect and disease problems after plantation establishment. Insect and disease problems should never result from decisions or omissions made before establishment. Many insect and disease problems can be minimized by providing conditions for keeping the tree vigorously growing.

Since a sizable investment has been made in establishing plantations, priority should be given to maintaining the vigor, health, density and quality of the plantation.

Coordination

To manage insects and diseases, the Park Rapids Area personnel and the Division's forest pest personnel will work together to integrate forest pest management techniques into silvicultural practices. The forest pest program provides management guidelines, basic biological information for the insect and disease pests, and risk rating systems for the major forest types and pests. Park Rapids Area personnel conduct surveys, implement risk rating systems, and carry out management strategies. Regularly scheduled workshops will be conducted to keep Area personnel aware and informed of insect and disease identification, life cycles, and management principles and techniques.

Management Strategies

For each of the forest pests and diseases specific actions to be take are listed in the full plan.

Forest Soils Program

It is the goal of the Forest Soils Program to enhance forest resource management and maintain site productivity through the application of technical landform, soil and vegetation information.

The overall strategy of the forest soils program is to develop field applications of forest soil information on state administered forest lands.

The forest soil resource is perhaps the most important element of the forest site to be considered in intensive forest management. Accurate characterization, interpretation and understanding of this resource is essential to effective and efficient planning and management. Soil/site conditions effect: site productivity, species suitability, equipment operability, stand vigor and longevity, herbicide effectiveness and vegetative composition. They also effect site preparation and release activities (nearly all aspects of site management). Therefore a thorough understanding of soil/site properties is necessary for efficient forest management. Ignorance of these properties has in the past resulted in costly mistakes, lost productivity and reduced environmental quality.

In the past, the forest soil resource has not been given due consideration in many forest management decisions. This is partly due to the limited amount of soils information available and partly due to the lack of soils education and training of forest managers. In recent years forest managers have become increasingly aware of the importance of the soil resource in considering forest management options. Soils data is still lacking, and education of foresters in soil properties and processes is needed.

Soil Interpretations and Management Assistance

Increased soil data availability and training of managers will improve forest management, increase efficiency of management dollars, and maintain or improve site productivity. Park Rapids Area personnel and the forest soil specialist will work together to integrate soil management principles into forest management practices. The forest soil specialist provides soil resource information and interpretations on both a broad base and site specific level. The Area personnel indicate

sites needing intensive soil investigation and implement soil interpretations into development of management strategies.

Forest Roads

The forest roads system in the Park Rapids Area is in constant need of maintenance and occasional repair or construction. Road design and routes may vary due to local soil conditions. Gravel sources for road work are often difficult to locate close to roads. The forest soil specialist should provide insight into soil conditions and gravel deposits through careful evaluation of the landscape.

Forest Soil Resource Inventory

An intensive inventory of the soil resource is an important step in the incorporation of soil information into management practices. Intensive soil survey information is very limited in the forested portions of the Park Rapids area. Counties with completed soil surveys to date include: Clay '80; Douglas '75; Grant '75; Pope '72 and Stevens '71.

As soil surveys move into forested counties there is a need to improve the utility of the surveys for use by foresters. Most outstanding are the needs of communication between soil scientists and foresters, and the need for forestry related interpretations of soil resource map units.

FOREST RESOURCES ASSESSMENT

Forest Resource Inventory Program

The goal of the Division's Forest Inventory program is to intregrate all inventory activities into a comprehensive assessment program that provides accurate information in response to changing user needs and expanded applications.

A forest inventory is a sampling method used to determine the forest resource of a particular area or unit. The sampling system measures some or all of the resource component on a plot which is a proportional representation of the total forest. The forest inventories developed to inventory Minnesota's forest resources are called Phase I and Phase II.

Phase I inventory can be compared to the surveys conducted by pollsters where they randomly contact 1,000 people in the country to determine a trend, a position, or an attitude. The people interviewed represent all the people in the country. In phase I, information is obtained from forested plots instead of people. This information then represents the forest resources of Minnesota.

Phase II inventory is a much more intensive survey. Every vegetative cover type is identified through photo interpretation. All merchantable types and most of the non-merchantable types are field checked. Data is collected by plot sampling, which describes the composition and condition of each forest stand at the time of the examination. A vegetative cover type map is made for each township. The boundaries of the individual forest types are outlined and each forest type described on the map. Individual stand data is put into the computer data bank.

The Division's objective is to integrate the inventory with advances in remote sensing and geographic mapping in order to produce a comprehensive forest resource assessment.

This data has been extremely useful in overall resource planning, research, and in promoting new or expanded forest industries in Minnesota.

Phase I inventory plots will be measured every 10 years. For the next four years, the Forest Inventory Unit and the North Central Forest Experiment Station will be measured 9,000 commercial forest land plots statewide. Phase I plots in the Park Rapids Area will be remeasured by North Central Forest Experiment Station personnel in 1989.

Phase II inventory in the Park Rapids Area was started in 1977 and field work was completed in 1984. This inventory included all DNR and county administered lands. Private lands were not included, although some private land was inventoried as it was crossed by inventory crews proceeding to inventory public lands. Field sheets, type maps, computer printouts and stand information summaries are used and maintained in Area and District DNR Forestry Offices, DNR Wildlife Offices, and the County Land Department Offices.

The stand information inventory (Phase II) needs to be accurate and up to date. An alteration procedure was initiated in 1981 to incorporate changes in an area's vegetative cover brought about by natural and artificial manipulations such as logging, shearing or flooding. These alterations are extremely important in maintaining the integrity and accuracy of the inventory data. Improved alterations procedures are being developed to assure the inventory system is kept current. In addition, steps are being taken to utilize computers to more rapidly access forest inventory information for field office use. The capabilities of the Geographic Information System in Grand Rapids allows for all stand manage-

ment data to be linked with updated stand maps.

Phase II forest inventory will be updated and kept current through several techniques. Models developed by the North Central Forest Experiment Station (and adjusted by the analysis of Phase I data) will be used to update the records of undisturbed stands. Remote sensing (35 mm photography) will also be used to locate disturbed stands, verify non-commercial stands and reduce the need for field checks. The third method of updating will require field checking stands.

Area personnel, based on experience working with existing Phase II data, will identify stands needing field re-inventory using the following criteria:

- Stands at high risk of loss that are beyond rotation age.
- Stands with high risk of loss due to insects or disease.
- Stands or minor types that don't "model" well.
- Stands in error in original survey.

Area personnel will soon start to identify stands needing field re-measurement. From December, 1986 to July, 1989, Area personnel, trained and under the direction of an Inventory Project Leader, will complete Phase II re-measurement. New aerial photos or 35 mm photos of State land areas where site disturbances have occurred will be needed. An Inventory Project Leader position needs to be established in the area.

The Park Rapids Area vegetative stand analysis inventory could be completely updated and on a firm timber regulation scheme by July 1, 1988.

Utilization and Marketing Program

The goal of the Forest Products Utilization & Marketing Program is to increase the use of Minnesota's wood resources; increase the economic benefits derived from the production of forest products within the state; and increase the wood using efficiency of Minnesota's forest products industry.

Markets provide the stimulus for most forest management activities; without markets for forest products, timber stand improvement projects and harvest are futile.

The diverse forest resources in the Park Rapids Area, at the junction of northern pine, central hardwoods, and prairie regions, require a diverse forest products industry to realize the full potential for utilization. Emphasis up to this point has primarily been in conifers. Post, pole and pulp markets have diminished in recent years, and efforts should be made to restore these uses for pine thinnings. Major aspen consumers in Bemidji affect only the extreme northeast portion, leaving a large aspen surplus throughout the rest of the area. Older age classes will not properly regenerate if harvesting is delayed. Currently, there are underutilized species in every county, and a general lack of markets and value-added industry throughout the area.

Need For Industrial Development

Within the Park Rapids Area, there is a need for additional forest products industrial development, especially in the utilization of low-quality hardwood species and small-sized pine. High quality timber, both hardwoods and conifers, will always have a market, although a major portion of logs harvested have been exported out of the area for processing due to a lack of local markets. Development of secondary processing facilities would add to the value of local resources, as well as provide further economic support to local communities.

Hardwood

Increased pressure has been placed on the hardwood resource in recent years; through selective harvesting of high-grade trees without a professional forester's assistance, and through cutting of young, potentially valuable crop trees for firewood. Landowner education, training of loggers and forest vendors, and general promotion of proper hardwood forest management should be increased. Since agriculture is the primary industry in the area, additional emphasis must be placed on the potential economic importance of the hardwood forest resource

Aspen

Pressure on the aspen resource has also been increasing. The three major aspen consumers in Bemidji, currently using a combined volume of approximately 500,000 cords per year, are purchasing aspen from portions of the Area at this time. However, proposed expansion plans of Bemidji's largest consumer, currently in the feasibility study stages, will most likely increase the consumption around Bemidji by about 25%. Technological changes, such as the conversion to faster setting isocyanate resins, are expected to increase consumption by another 30% within the next 5 years, bringing the total consumption by these three plants up to approximately 800,000 cords/year. This increasing pressure on the resource will force the companies to purchase wood further and further from their plants, and will push their procurement further into the Park Rapids Area. As more aspen is harvested, a considerable volume of underutilized species will be available. Fuelwood, green chip, medium-denisity fiberboard or other markets need to be constantly pursued.

Development of other wood using industries around the state will also impact the Area. The recently announced expansion of a major mill in Grand Rapids will force the procurement zones of the Bemidji plants westward, as will the construction of a new waferboard plant in Deerwood. Even plans to increase the consumption of softwoods at the International Falls paper mill can be expected to have an affect on the Park Rapids Area, because improved markets for pine pulpwood and clean chips, currently unmarketable by-products of sawlogs, will result in more sawtimber being harvested.

Proposed conversion of a coal-burning NSP power plant in Granite Falls to wood fuel may effect the southern portions of the Area. Promotion of fast growing hybrid poplar plantations, currently underway, is expected to provide most of the fuel needed for this prairie region plant, but it may be necessary to reach up into more wooded areas for additional wood supply.

Park Rapids Area Utilization & Marketing Program Objectives for 1987 - 1997

- Analyze the Area's forest resources to identify potential wood products industrial development opportunities.
- Collaborate with other agencies (RC&D, SWCD's, Extension, etc.) to promote awareness of underutilized timber

resources and gain support for development of these resources.

- Promote the development of new forest products industries, such as "System 6," a laminated panel product designed to use low quality hardwoods; medium density fiberboard, a construction board made from aspen, balsam, or almost any other species; pine pulp, post, or pole using industries; shavings mills, using aspen for livestock bedding; or other unforeseen industrial uses of the under utilized forest resource in the Park Rapids Area, especially the prairie hardwoods portions.

- Solicit legislative and congressional support of forest management and development of forest products industries and marketing.

- Increase marketing assistance to local processors, bringing together suppliers and consumers of their products.

- Promote the best use of area timber resources, to minimize waste and encourage highest value uses of the resource.

- Identify timber and residue surpluses so that the wood energy program will result from proper log merchandising, and lead the effort in promoting conversion of potential wood energy conversion sites (ie: schools, hospitals, government offices, central municipal heating plants, ag-industry, etc.) from primary dependence on fossil fuels to use of renewable wood energy.

- Expand efforts to market the Area's timber resource.

- Improve timber sale marketing techniques to maintain a competitive position, increase the number of completed sales, and make sales more attractive to potential buyers, without compromising proper forest management.

- Assist primary processing industry with specific requests, especially in sawing for grade and marketing the products.

FIRE MANAGEMENT PROGRAM

The goal of the fire management program is to provide wildfire protection to the level necesary to avoid loss of life and, considering values at risk, minimize the potential for loss of property and natural resources on public and pivate land. Improve the Department's ability to use controlled fire as a safe and effective vegetative management technique.

The major components of wildfire control are fire prevention, presuppression, and suppression. Prevention efforts inform the public of the dangers and potential losses that can result from uncontrolled wildfires. Presuppression focuses on the need to adequately prepare and maintain fire suppression forces for the eventuality of fire outbreak. Presuppression is done through extensive planning, training, rural fire department assistance, fire detection, and interagency cooperation. Suppression activities involve controlling and extinguishing wildfires with a minimum of damage to property, natural resources, or people.

The Division of Forestry is responsible for providing expertise and assistance for prescribed fire by other DNR disciplines in the Park Rapids Area. In addition, the Division provides assistance and final approval for all uses of fire as a management tool by other agencies and organizations, such as The Nature Conservancy, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, Prairie Chicken Society, etc.

The Park Rapids Area also administers the Rural Community Fire Protection program locally. This program is designed to assist 85 rural fire departments in the Area. Title VI, a Federal matching fund program, is utilized to reimburse fire departments for approved projects, up to 50% of their cost. Federal excess equipment is also distributed to rural fire departments, based on need, and priority. The Park Rapids Area is very diversified, ranging from heavily forested high risk fire areas in the northeast, to sparsely wooded agricultural areas in the west and south. The Park Rapids Area office is the center of fire protection activities. Twelve full-time employees and a ready complement of fire fighting equipment provide the main fire fighting force for 80% of the Area's fires.

In the high risk area of southern Hubbard and eastern Becker Counties, DNR Forestry works closely with all fire departments, County Sheriff's departments, Tamarac National Wildlife Refuge, County land departments, other DNR Divisions, Township Fire Wardens, and the general public to assure quick and effective fire action.

In the scattered hardwood and agricultural areas in western Becker County, from Ottertail County and south, DNR Forestry personnel play a lesser role in fire protection. With only five foresters in this eight county area (three in Detroit Lakes and two in Alexandria) we have found it a mutual advantage to enter into a cooperative fire fighter agreement with many of the local fire departments. The primary function of DNR Forestry in these areas is to assist the rural fire departments in coordinating, training, and securing equipment and funding. The rural fire departments are employed as the initial attack fire fighting force. DNR Forestry assists with specialized equipment such as bull dozers, ATV's, fire plows, helicopters, air tankers, and additional fire fighters if needed. Long term fire fighting situations such as peat or ground fire mop-up are often taken over by DNR Forestry or worked cooperatively with a few members of the fire department and contracted equipment as needed. In addition, DNR Forestry personnel investigate wildfire causes and take necessary enforcement action. Another primary DNR Forestry responsibility in this area is fire prevention activities such as school or group visits, parades, poster contests, and information provided to the news media.

The two main causes of the Area's fires are incendiary (35%) and debris burning (27%). Again, the Spring season is the most active, with 74% of the debris burning and 67% of the incendiary fires occurring then.

The Area Fire Plan provides overall direction for the Area's fire protection program. In addition, an Area Dispatch Plan is maintained and kept current at the Area office for use in daily fire protection operations. These plans are revised as necessary to reflect changing conditions or program direction. The Area Fire Plan and Dispatch Plan are used by field and supervisory personnel to coordinate the Park Rapids Area fire protection efforts with the Statewide program.

Resource Management Units

RMU1

The main type of wildfire danger within this unit is uncontrolled spring and fall burning of marshes, prairies or road ditches. Fire danger resulting from this type of burning is greatly reduced by the high percentage of agricultural cropping of the area. Grasslands are generally surrounded by tilled fields, providing barriers to spreading wildfires. The many rural volunteer fire departments in the area provide initial attack when fires occur. DNR Forestry does not have personnel or equipment located within the unit.

Management Strategy

1.The fire prevention, presuppression and suppression program should continue to be carried out by rural fire departments.

2.The main effort of the fire program should be directed at educating landowners toward the proper use of fire as a management tool, in accordance with State and local regulations.

3.Forestry will cooperate with all agencies or fire departments in fire prevention education.

4.The PCA is active within this area and permits are required before burning. No DNR Township Fire Wardens are located within this unit.

RMU2

This area has traditionally been a low fire hazard area. It is typically hardwood forests, agriculture land and swamps. Swamps burning are the most prevalent fire but rarely do any major damage. Most fires within this type are handled by landowners or local fire departments.

Many landowners burn out ditches or swamps in the fall trying to stimulate new growth and clean up the dead grass.

Management Strategy

DNR Forestry should undertake with DNR Wildlife for a more intensive information campaign to discourage landowners from doing indiscriminate burning.

The PCA is active within this area and permits are required before burning. Only in the extreme north end of this type can DNR Fire Wardens be found and burning permits required.

RMU3 & 4

The main type of fire problem in this RMU is spring and fall grass burning of swamps and road ditches. This unit consists primarily of farmlands interspersed with hardwood woodlots, swamps and lowland or nonproductive grasslands. Marginal grasslands are managed by fire. These low marginal lands are hayed in dryer years.

Wildfire suppression is handled by local volunteer fire departments with assistance upon request from the Department of Natural Resources at Park Rapids and Nimrod. These fire departments are well equipped and are very familiar with their local areas.

Management Strategy

Rural fire departments will continue to be the initial attack fire-fighting force. DNR Forestry will assist, as requested, with specialized equipment such as bulldozers, ATV's, fire plows, helicopters, air tankers, and additional firefighters if needed. Long term fires, peat or ground fire mop-up will be worked cooperatively with DNR Forestry and RFD's. Fire law enforcement will be done by DNR Forestry with cooperation from fire departments and local law enforcement officers.

Most rural fire departments are fairly well equipped. With DNR Forestry's ability to obtain surplus equipment and Title IV matching fund grants, upgrading of the rural fire departments should continue.

Fire pre-suppression and prevention activities should continue to augment the efforts of the rural fire departments. Education of school children and adults is a continuing responsibility. The network of Township Fire Wardens will be maintained at its present level. Burning regulations will be set and enforced by Park Rapids Area and Nimrod personnel.

The detection of wildfires will be primarily from reports by the public. Under high fire danger conditions, railroad patrols and aerial fire detection will be initiated by the Area Forest Supervisor.

RMU5

The Division of Forestry is responsible for wildfire protection in this unit. this is the most hazardous unit in the Park Rapids Area. Thirty fires per year occur in the unit, based on a 10 year average. It is an extremely high

hazard unit, as the vegetation consists of extensive pine lands, grasslands, marshes, conifer plantations with grass, pine slash areas, agricultural lands, and unmowed grassy roadsides. Recreation areas, tourists and rural residents,interspersed among high hazard fuel types add to the hazards.

People cause 98.4% of the fires in the unit! Debris burning, 23%, and incendiarism, 44%, are the major causes. Children cause 13% of the fires - primarily in the Pine Point area of the White Earth Indian Reservation. In fact, 27% of the fires in RMU5 occur around Pine Point. Farm equipment fires account for 8% of the fires within the unit.

Critical fire hazard areas that deserve mention are the Badoura area of extensive bog and pine lands; the conifer plantations and mature jack pine along the west side of Lone lake; and other resorts or homesites nestled under the pine throughout the unit. These areas present a very difficult task for the Forester to protect. Risk and potential for serious wildfires is prevalent throughout the unit.

Management Strategy

Since RMU5 is such a critical fire protection area, the maximum level of effort in fire prevention and pre-suppression activities should be directed toward this area. Fire prevention activities should reach all ages of the population, by use of all forms of public media. Announcement of the fire danger level and information about current fire actions on a regular basis should continue. Visits to schools and youth group visits to the Forestry Station should be continued. Teachers, Township Fire Wardens and other group leaders can also assist in spreading the fire prevention message. Parades, fairs, and other community events are good opportunities. There is a need for more and better audio/visual aids - films, slide-tape programs, radio and TV public service announcements and portable displays.

Another aspect of fire prevention needs emphasis - fire law enforcement. A stronger fire enforcement program will result in fewer fires. Arson investigation teams and individual fire enforcement action by trained Forest Officers should reduce the number of careless debris burning and intentionally set fires, which now account for 67% of all fires in the unit. Closer coordination with other law enforcement agencies is needed.

The fire suppression strategy is to continue to operate in accordance with the Area Fire Plan and Dispatch Plan. Area fire personnel and crews will be continuously trained in the latest fire-fighting techniques. Equipment should be continually upgraded and ready.

Property that is fire prone should be identified and an effort will be made to work with landowners and county zoning officials to take preventative measures such as breaking up extensive areas of conifers.

The main fire detection strategy will be aerial detection with a local contracted commercial pilot, based at Park Rapids airport. Towers will supplement detection in accordance with the Area Fire Plan detection guide.

RMU6

The Division of Forestry has the primary responsibility for wildfire suppression in this unit. All of this unit lies within the intensive fire protection area. Forestry personnel and equipment generally take initial attack action on most fires in the unit. However, on the more distant western and southern edges of the Unit, more reliance if placed on assistance from rural fire departments and Tamarac Refuge. Cooperative agreements exist with the Tamarac National Wildlife Refuge, U.S. Fish and Wildlife Service, and eight rural fire departments.

Management Strategy

The main thrust of fire prevention should be public education on the dangers of wildfires. Presuppresssion activities will be done according to the Area Fire Plan, including use of towers and aircraft for detection, agreements with equipment operators and RFD's, and maintaining the Township Fire Warden network. Fire suppression activities will be according to the Fire Plan Manning Guide. They include increased use of helicopters and updating of fire fighting equipment.

Prescribed burning is used by Forestry mainly as form of site preparation on cutover pine areas, and by Wildlife for maintaining upland grass areas. All prescribed burning will be conducted in accordance with Operational Order No. 47.

RMU7

The Division of Forestry is responsible for wildfire protection in this unit. This unit has a low fire incidence that averages only about 2 fires per year. Reasons for this are: the aspen-hardwoods timber types; primarily public land with very sparse population and low incidence of human-caused, equipment-caused, or lightning-caused fires. The Akeley and Nevis Volunteer fire departments provide a quick response to fires in this unit, whenever needed. DNR Forestry equipment is dispatched from Park Rapids, with assistance available from Guthrie, Cass Lake, or the U.S. Forest Service at Walker.

Management Strategy

The main thrust of fire prevention should be public education of the dangers of wildfires. Informing trail users and resort owners within the unit during high fire danger, could prevent fires. Pre-suppression activities will be done in accordance with the Area Fire Plan, including aerial detection; agreements with equipment operators and RFD's; and maintaining the Township Fire Warden network. Fire suppression will be done according to the Area Fire Plan. The plan calls for increased use of helicopters and RFD's; favoring aerial detection over tower detection; and continuous updating of fire fighting equipment and personnel training.

TECHNICAL AND ADMINISTRATIVE SUPPORT SERVICES

Maintenance and Administration Program

The goal of this program is to provide the administrative support needed to achieve the goals of the other Division programs and to provide direction, and bear responsibility for processing of the Division of Forestry's information.

Personnel Management

The Park Rapids Area has 15 full time employees and one 90% Clerk Typist position. In addition, there are Mn-CEP workers, MCC crewmen, student interns, forester trainees, smokechasers, and various other laborers that account for the overall work force. Most of the forest development project work is done under contract rather than labor hire, as it has proven more efficient.

Area Organization

The Area is in the process of reorganization as part of the Division of Forestry Realignment Plan of 1984. This reorganization plan was directed by the Forest Resource Management Act of 1982, to improve the effectiveness of the Division of Forestry.

Consolidation Plan-Reorganization

On August I, 1985, the Perham District closed, with the position transferred to Alexandria as Assistant Forester. The south four-sevenths of Otter Tail County (Twp. 131, 132, 133 & 134) became part of the Alexandria District.

The Elbow Lake Station closed July 1, 1987. The Forester and Technician positions were be transferred to Detroit Lakes. This district now includes all of western Becker County (from Range 38 west), the north three-sevenths of Otter Tail County (Twp. 135, 136, and 137), and all of Clay and Wilkin Counties.

All townships in Mahnomen and Clearwater counties were transferred to the Bemidji Area. All of Becker County is now administered by the Park Rapids Area with the transfer of Townships 142-36 and 142-37 from Itasca District.

The Park Rapids and Smoky Hills Districts are now combined. This district will includes the south one-half of Hubbard County, and the eastern part of Becker County (Ranges 36 and 37). This District administers the Paul Bunyan, Badoura, Smoky Hills, Two Inlets, and part of the White Earth State Forests. Personnel consists of a Forester, Assistant Forester and 3 Technicians (including the present Area Technician position).

Other Administrative Sites - Towers

In recent years, fire lookout towers have been used sparingly. Most fire detection is done with contracted aircraft. However, on high fire danger days, or in periods of extreme fire or drought conditions, some towers will still be used. Table 4 lists the Park Rapids Area towers and recommended disposition.

Dorset, Smoky Hills, and Egg Lake Towers should be offered for surplus sale and removed from the sites. The Dorset site, 1.5 acres of the NESE, Sec. 9-140-34 should be sold on a public land sale, as there is no other reason to own this land. Also, 1.0 acres in the NWNE, Sec. 14-137-36 should be sold. This was the old Hillview Tower site. The tower was destroyed by vandals in 1976, and was disposed of by surplus sale. This is an isolated tract and serves no other purpose.

Table 3. Summary of Park Rapids Building Projects

Building	Project Description	Estimated Cost
Area Office	Remodel	$100,000
Park Rapids Warehouse	Build	$30,000
Detroit Lakes Office	Add Room	$8,000
Detroit Lakes Wharehouse	Build	$10,000

Equipment

The Park Rapids Area has a large complement of equipment necessary to accomplish the wide range of work programs in the Area.

All equipment is accounted for in a computerized inventory system of non-expendable, semi-expendable, and expendable equipment.

Because of it's condition and age, much of the current equipment in the Area has been in service beyond its normal life expectancy. In recent years, funding has been inadequate, allowing for replacement of pickups and cars, but little else. This tends to inflate the normal annual maintenance cost. Recently, the Department has changed to a " fleet management" method to correct this situation.

The Park Rapids Area annual budget does not include an allocation for major equipment purchases. Items costing over $300 must be requisitioned through DNR Field Services, which are prioritized at the Regional level, among all DNR disciplines. With limited funding Department wide, needed items cannot be purchased on schedule.

The equipment administration appendix lists the current Park Rapids Area major equipment, annual maintenance cost, and replacement schedule and cost. The average annual maintenance cost is estimated at $7,635.

Table 4. Park Rapids Area Fire Lookout Towers.

Name	Location	Type	Height	Year	Disposition
Badoura	NENE 16-139-32	Stairway	100'	1934	Retain
Dorset	NESE 9-140-34	Stairway	86'	1966	Sell
Smoky Hills	SENW 15-140-37	Ladder	80'	1926	Sell
Wolf Lake	SENE 16-139-37	Ladder	81'	1929	Retain
Tulaby	SWSW 28-143-39	Stairway	86'	1935	Retain
Egg Lake	NWSW 16-141-39	Ladder	81'	1935	Sell

Law Enforcement Program

The goal of the law enforcement program is to provide compliance with state statutes to prevent wildfires, to protect the public's interest in state land and its assets and to ensure that the public can safely enjoy the Division's recreational facilities.

The Division of Forestry is charged with the enforcement of certain Minnesota Statutes, as well as various DNR administrative rules and regulations.

Enforcement activities on forestry administered lands are conducted in cooperation with DNR Conservation Officers and may also involve state or local law enforcement officials.

All of the Conservation Officers are licensed peace officers in accordance with State statutes. Within the Park Rapids Area, Conservation Officers are stationed at Park Rapids, Detroit Lakes, Lake George, Alexandria, Henning, Moorhead, Twin Valley, Osage, Breckenridge, Elbow Lake, Evansville, Fergus Falls, Glenwood, Morris, Pelican Rapids and Perham. The Area Supervisors are located in Thief River Falls, Glenwood and, Bemidji .

The Division of Forestry Law Enforcement Manual outlines coordination procedures for the two divisions.

The Division of Enforcement is primarily responsible for the following major areas:

1.Game and Fish Laws

2.Watercraft Safety

3.Snowmobile and O.R.V. Enforcement

4.Public Access Enforcement

5.Water Regulations

6.Trail Regulations

7.State Park Rules

8.Federal Statutes (when appropriate)

9.Assist Pollution Control Agency in enforcing Environmental Protection Standards

10. Assist other law enforcement agencies

Additional responsibilities include firearm, ATV, boat & water, and snowmobile safety, nuisance animal complaints, removal of animals killed by vehicles, public access maintenance, and public relations.

In general, enforcement of forest laws in the Park Rapids Area has been very good. As with other programs, there is room for improvement and growth. The training all forest officers have received has been excellent. New training schedules are being developed to reflect the needs of forest officers. Periodic refresher courses are planned to update personnel on law changes and review procedures.

Investigators

The Park Rapids Area has two DNR-Forestry arson investigators which should allow each more involvement in the initial investigation with the Incident Commander. Both investigators should keep their training up to date in order to participate in more cases and assist adjoining areas. In addition, the DNR-Conservation Officer at Osage is also a trained arson investigator, and works closely with DNR Foresters as a team. This trend will continue. The goal is to investigate the origin of every fire, and where evidence is found, it will be followed up until a conviction is obtained, a warning ticket is issued, or the case is closed due to lack of sufficient evidence. Civil collections for fire fighting costs will be made from responsible parties.

Timber and Christmas Tree Laws

Enforcement of the timber laws has been excellent. Forestry will continue to follow up on all trespass cases.

There has been little need for enforcement of Christmas tree laws in recent years, as very little theft of natural trees occurs. We will keep all forest officers informed of changes to the Christmas tree laws, watch for violations, and take appropriate action where necessary. Continued close working relationships will be maintained with County Sheriffs who are primarily responsible for enforcement of theft of private property.

Recreation Law Enforcement

The Park Rapids Area has been increasing campground patrols every weekend. With the increased use of off road vehicles our enforcement efforts on trail and forest road use will also increase. We must work more closely with the Conservation Officers and County enforcement officers in this area of enforcement.

PARK RAPIDS NORTH

Ownership Classification Map

Minnesota
DEPARTMENT OF NATURAL RESOURCES

1 0 1 2 3 4 5 miles
1 0 1 2 3 4 5 kilometers
1 inch : 2 miles

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

- - - Special Compartment Boundary

LAND DISPOSITIONS

A Parcels to RETAIN in State Forest status

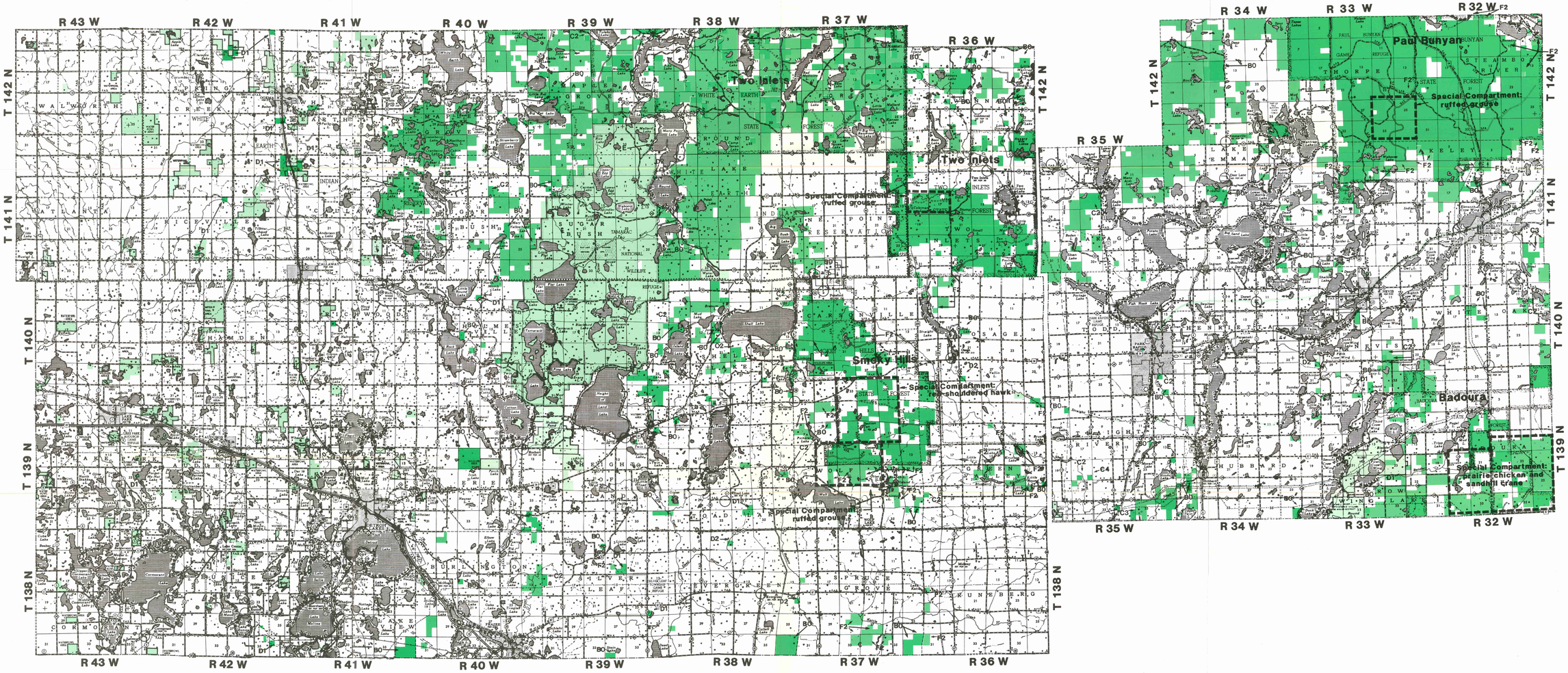
B Parcels to ADD to State Forest status
0-Administrative and Scattered State Forest Land

C Parcels to EXCHANGE
2-With County
3-With Private Industry
4-With Private

D Parcels to TRANSFER administrative control
1-To Wildlife
2-To Fisheries
3-To Parks
4-To Trails and Waterways
5-To Forestry

E Parcels to SELL at public auction

F Parcels to ACQUIRE
1-From Federal
2-From County
3-From Private



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Minnesota Department of Natural Resources
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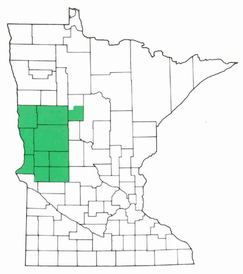
Minnesota
DEPARTMENT OF NATURAL RESOURCES

PARK RAPIDS
Ownership Classification Map



2 0 2 4 6 8 10 miles
2 0 2 4 6 8 10 kilometers
1 inch = 4 miles

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

- Unit Boundary

LAND DISPOSITIONS

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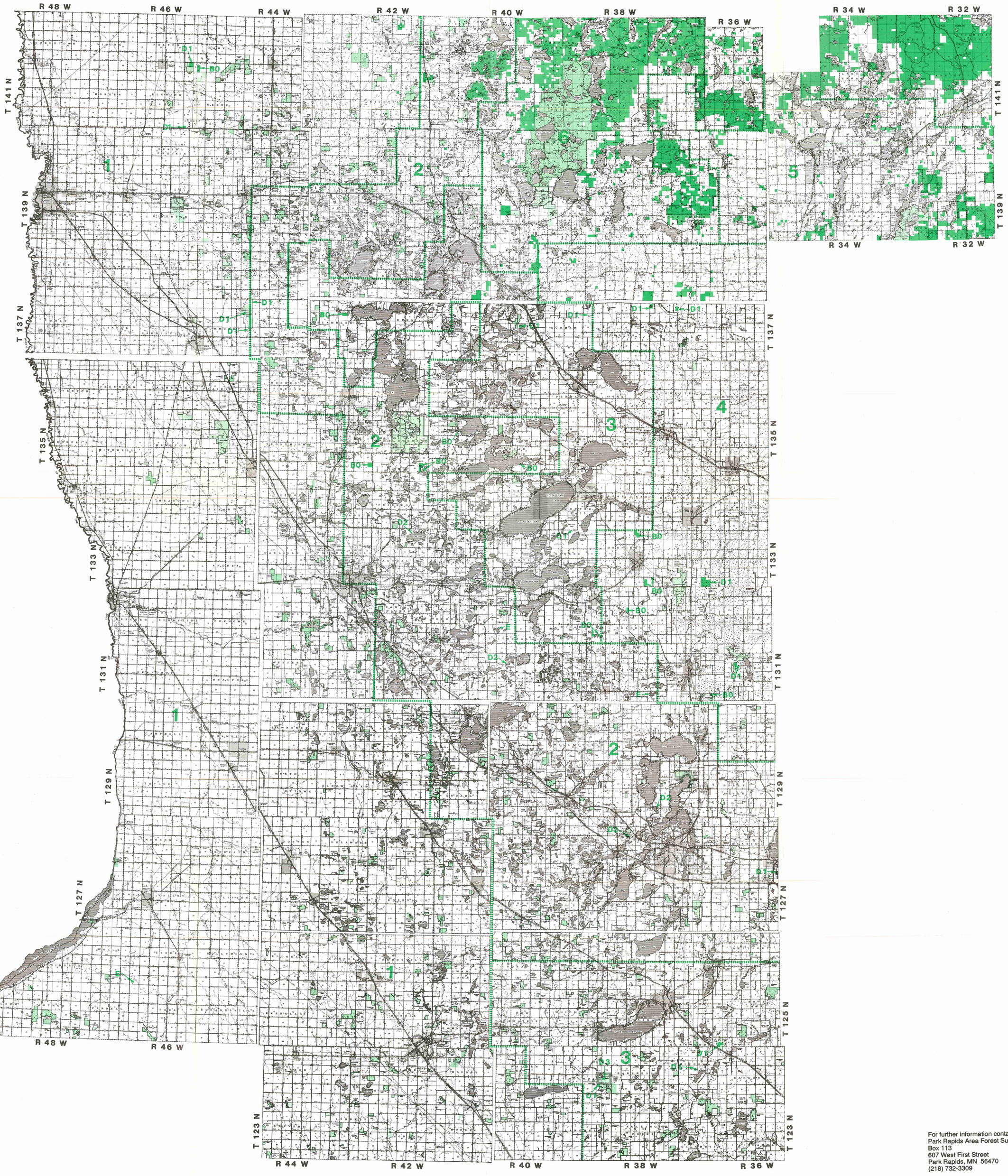

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