BAUDETTE AREA FOREST RESOURCE MANAGEMENT PLAN

October 1990

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

Minnesota Department of Natural Resources
Division of Forestry
500 Lafayette Road
St.Paul, MN 55155-4044

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I. INTRODUCTION

Chapter Contents — Page

DESCRIPTION OF THE BAUDETTE AREA

The Baudette Area is one of nineteen Division of Forestry administrative areas. Forestry offices are located at Baudette, Williams and Birchdale. It includes all of Lake of the Woods County and part of Koochiching County (Figure 1-1).

PLANNING PURPOSE AND PROCESS

Planning is being conducted in response to 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 Management 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, recreation and minerals specialists, enforcement officers and others. Portions of the plan were developed by these resource specialists as part of the planning process.

PLAN FORM 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 and analysis of the resource situation and outlook for each of the programs administered by the division of Forestry. Based on this analysis general management direction or strategy is established for he area. Although the plan is organized by program it should be understood that there is considerable overlap in some programs.

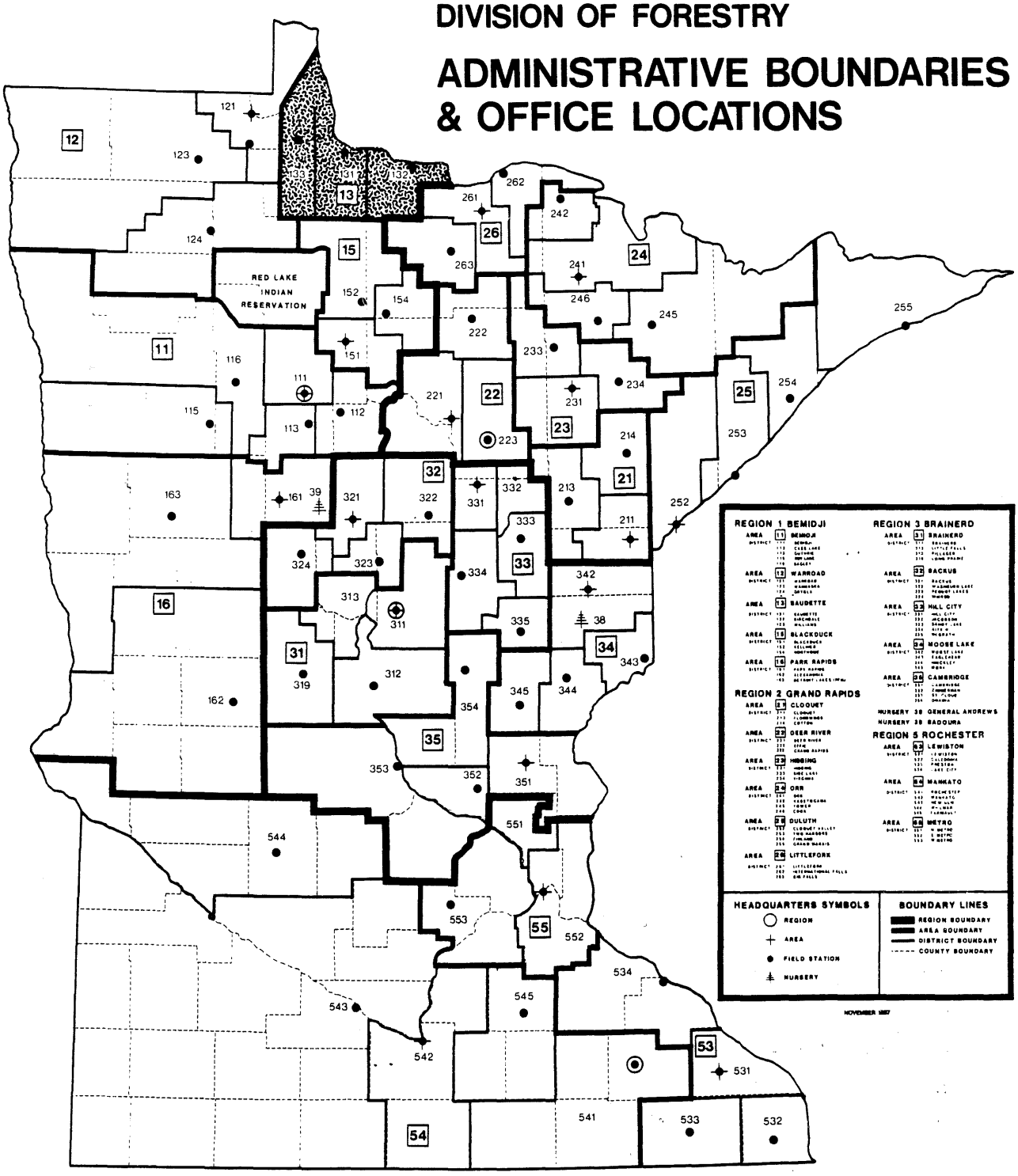
Direction or strategy established at the area level is further refined for subdivisions of the area for appropriate Division of forestry programs. These subdivisions are called resource management units (RMUs).

PUBLIC INVOLVEMENT

The goal of public involvement in the Baudette Area Plan is to involve interested and knowledgeable publics in the project so that the best possible resource management program is developed and maintained. This involvement will help to promote an understanding of natural resource management, to obtain advice and public opinions, and to gain public support for DNR resource management programs.

DIVISION OF FORESTRY

ADMINISTRATIVE BOUNDARIES & OFFICE LOCATIONS



Baudette Area

BAUDETTE AREA FOREST RESOURCE MANAGEMENT PLAN

2. AREA OVERVIEW

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LAND USE AND OWNERSHIP AND ADMINISTRATION

The dominant land use of the area is multiple-use forest resource management. This main category is further broken into commercial and unproductive forest on Figure 2-1.

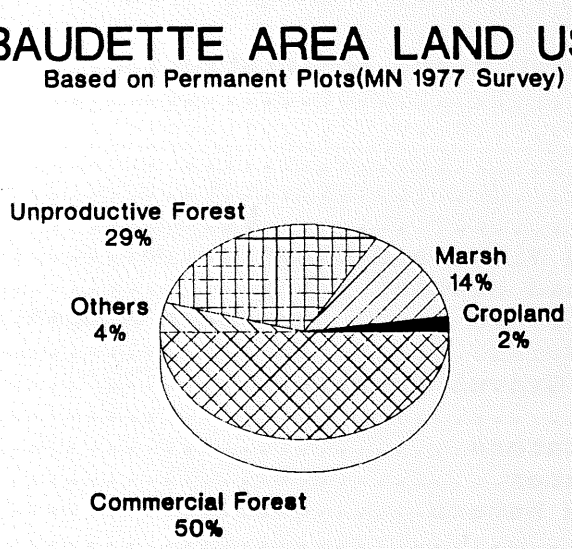


Figure 2-1: Baudette Area Land Use

The State of Minnesota owns almost half of the of land in the area. Private land ownership is the next largest category followed by land owned by American Indians (see Table 2-1).

TABLE 2-1 TOTAL AREA OF LAND USE BY OWNERSHIP CLASS
2/27/87 DATA

LAND USE	BUREAU LAND MGT	INDIAN LAND	MISC. FEDERAL	STATE LAND	COUNTY +MUNIC	FOREST INDUSTRY	OTHER PRIVATE	NOT IN SAMPLE	TOTAL (1,000 ACRES)
COMMERCIAL FOREST	31.6	40.6	2.9	209.8	5.4	17.3	101.6	0.0	409.2
CROPLAND (NO TREES)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106.5	106.5
CROPLAND (WITH TREES)	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	1.6
FARM (FARMSTEAD, ETC.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4
MARSH	1.6	1.4	0.0	23.4	0.0	0.0	18.2	71.3	115.8
RANGE LAND (NO TREES)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8	16.8
UNPRODUCTIVE F. LAND	14.1	21.7	1.2	187.5	0.0	2.7	14.5	0.0	241.7
URBAN AND OTHERS	0.0	0.0	0.0	1.4	0.0	0.0	1.3	11.2	13.9
WATER (40 ACRES +)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
WINDBREAKS (120 FT -)	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.5	3.7
TOTAL	47.3	63.7	4.2	421.9	5.4	20.0	138.4	212.3	913.2

*BASED ON PERMANENT PLOT SYSTEM. These figures are estimates based on statistical samples. INCLUDES NON STOCKED PLOTS IN THE COMM. FOREST

DNR-ADMINISTERED LAND

The Division of Forestry is the major administrator of State land in the area. Figure 2-2 illustrates the relative amounts of land administered by the DNR.

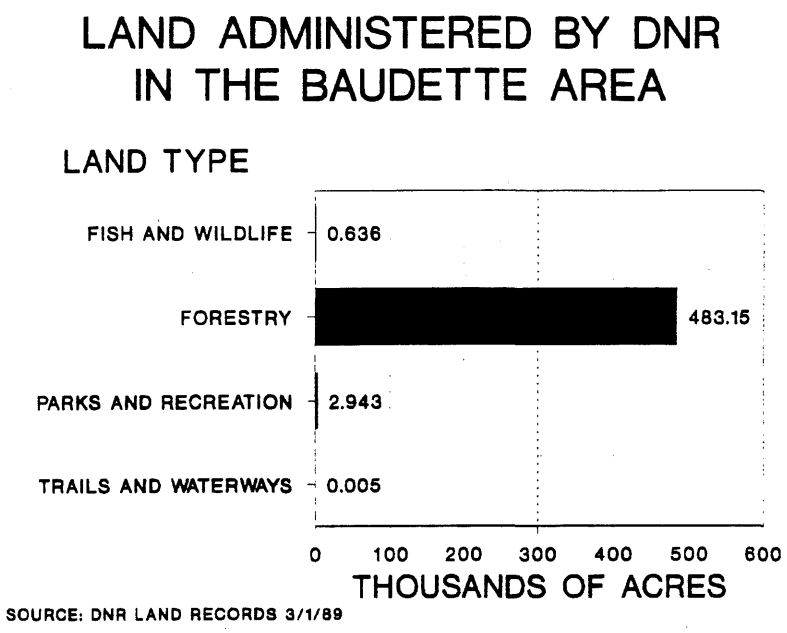


Figure 2-2

Parks and Recreation

The Division of Parks and Recreation has 2,943 acres of land in the two state parks - Zippel Bay and Franz Jevne.

Fish and Wildlife

The Division of Fish and Wildlife administers 636 acres of land in three wildlife management areas: Red Lake, Bernhoft and Rako The division also administers one 95-acre Scientific Natural Area: Pine and Curry Island. In addition, 33,951 acres of L.U.P. land are leased from the federal government by the DNR. This land is administered by the Division of Fish and Wildlife, but is managed by the Division of Forestry.

Beltrami Island State Forest

In 1933, the Minnesota Legislature established the Beltrami Island State Forest in Beltrami, Lake of the Woods, and Roseau Counties. Figure 2-3 shows the Beltrami Island State Forest and the overlapping Red Lake Wildlife Management Area along with the Pine Island State Forest and other DNR Management Units.

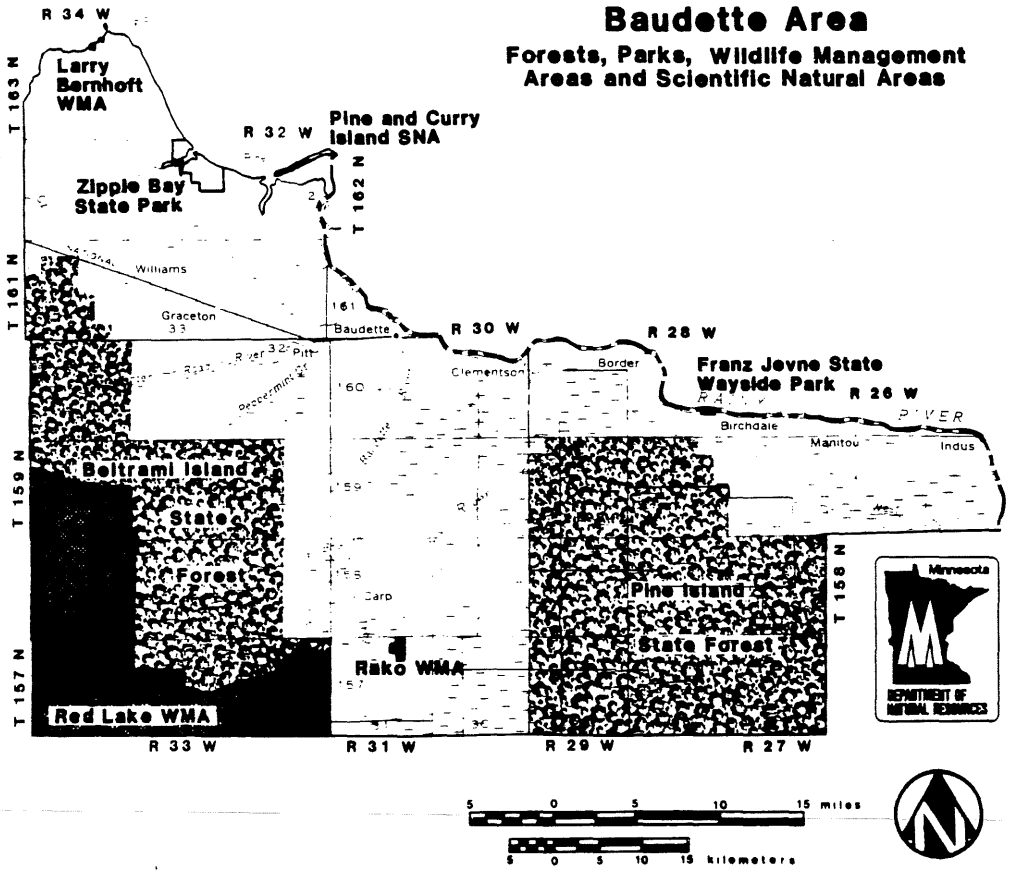


Figure 2-3: Major DNR Management Units

The total forest encompasses approximately 669,030 acres within the statutory boundaries, of which 505,954 acres are administered by the Division of Forestry. There are 142,454 acres of forestry-administered land inside the Beltrami Island State Forest within the Baudette Area.

Pine Island State Forest

In 1933, the legislature also established the Pine Island State Forest. Pine Island is the largest state forest with 878,040 acres of which 641,951 acres are state owned. There are 142,015 acres of forestry administered land inside the Pine Island State Forest within the Baudette Area.

Land Outside State Forests

The Division of Forestry administers 198,680 acres of land outside state forests in the Baudette Area.

COUNTY ADMINISTRATION

There are 9,017 acres of land administered by counties in the area.

HISTORY

The first residents to leave an extensive archaeological record in the Baudette area were from the Laurel Culture. They dominated the period from 200 B.C. to 800 A.D. They were mound builders and built the Grand Mound, the largest burial mound in Minnesota and now the site of a Minnesota Historical Society Interpretive Center, 50 miles east of Baudette along the Rainy River.

The Blackduck Culture succeeded the Laurel in about 800 A.D. Their remains have been found across from Wheelers Point and on islands in Lake of the Woods. This culture disappeared around 1400 A.D.

In 1732 Pierre La Verendrye found northern Minnesota populated by Cree, Monsonis, Assiniboine and Sioux Indians.

British possession of the land west of Lake Superior began the age of the voyagers who became important in this region for the fur trade. Lake of the Woods was a major link in the voyagers route. All trade returning from the north and west had to cross the lake. In the 1840s fur trading gradually subsided.

The coming of the Canadian Railroad brought Canadian loggers who came for American timber for the lumber mills at Kenora.

In 1885, the area got its first permanent settler when Wilhelm Zippel settled on the south shore of the lake at Zippel Bay. In the 1890s more settlers followed. Most of the earliest arrivals chose to make their homes on the shore of the lake and fish for a living.

Baudette and Spooner became incorporated villages in 1906. Spooner is now East Baudette. Figure 2-4 shows the level of development in the early 1900s.

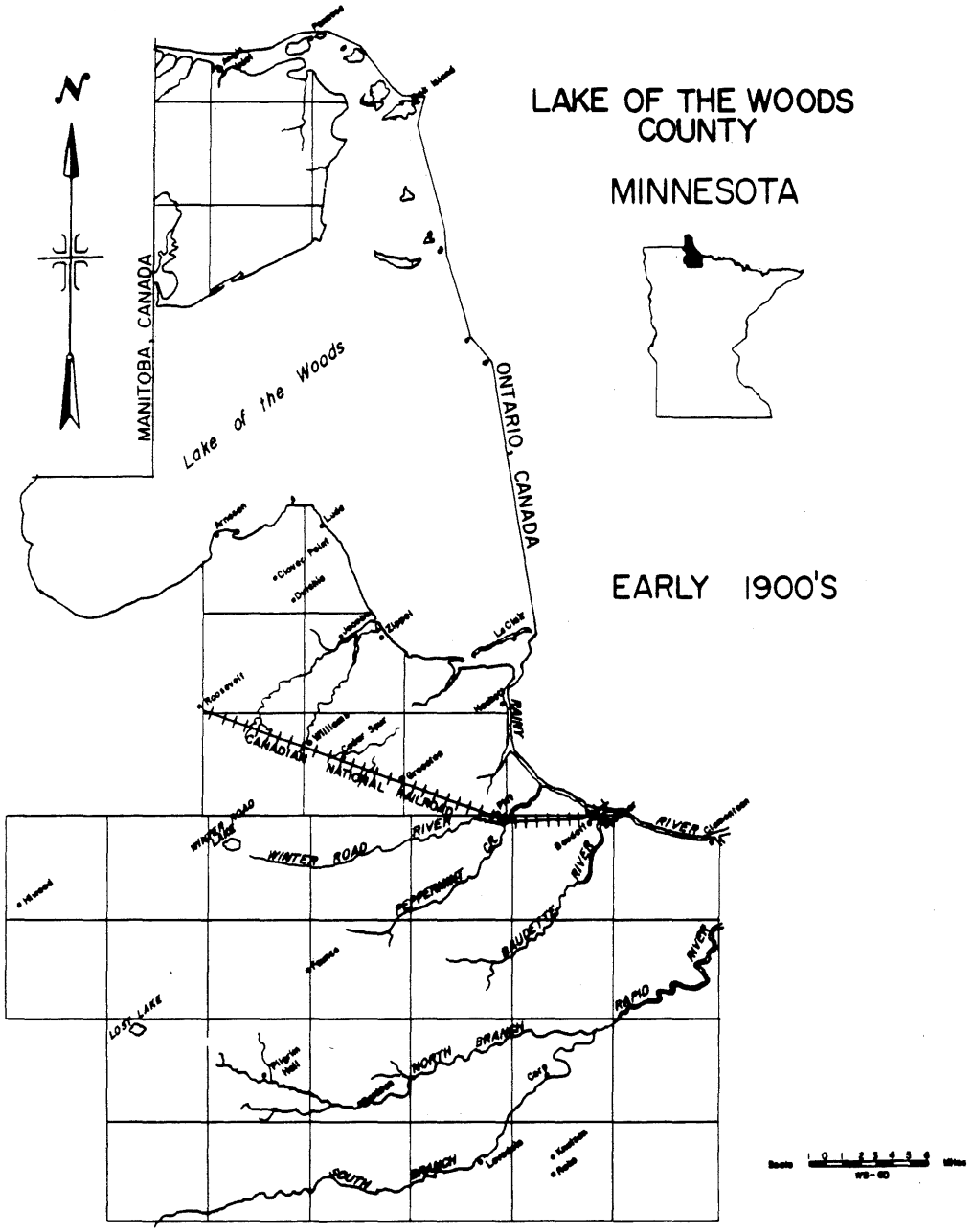


Figure 2-4: Lake of the Woods County - Early 1900s

Source: A Brief History Of Lake of the Woods County. Lake of the Woods County Historical Society.

By this time the area was dependent on the lumbering business for their existence. Agriculture had not yet gained a substantial foothold in the area. Two sawmills, the Shevlin and the Engler had the capacity to saw 40 million board feet of lumber a year. These mills did not always reach capacity, but did produce many millions of board feet timber.

The mills had just started operation in 1910, when a disastrous forest fire struck. On October 7, the towns of Graceton, Pitt, Baudette, Spooner and the entire northern half of Lake of the Woods County were reduced to ashes (see fire program for more information). Fortunately, the lumber mills were spared and there was some reason for optimism.

One of the effects of the fire was to improve the land for agriculture, but agriculture would not replace lumbering as the mainstay of the local economy until the 1920s.

After recovering from the fire there was a settlement boom and nearly every 160 acre plot which was available for homesteading was claimed.

Much of the land was low and wet. In order to alleviate the problem a plan was made to drain the bogs. Beginning in 1912, dredges started to excavate Judicial Ditches. The ditches were suppose to leave the land suitable for farming but despite much expense this goal was not achieved. Settlers then abandoned the land. With the taxes on the abandoned land delinquent, the county was forced to default on the loan that it had received to pay for the ditching work. The State of Minnesota made the payments on these loans and acquired title to large amount of land.

For some, the problems of farming poor agricultural lands continued. In 1935 the state and federal governments decided that it would be more economical to move settlers off marginal land and onto land with better soils that was more suited for agriculture.

These settlers had been able to adequately feed and cloth themselves but were unable to pay for the schools and other government services. Faunce, Bankton, Hiwood, Norris and neighboring communities went out of existence as a result of this government program.

Despite the setbacks to agriculture, enough good land existed so that farming became an increasingly important segment of the economy. By 1940 there were 1200 farms in Lake of the Woods County. Agriculture suffered again in the 1950s and 1960s, and there was a drastic reduction in the number of farms. Today it is a very important segment of the economy.

The following quote is from A Brief History of Lake Of The Woods County, Lake of the Woods Historical Society, 1980:

> "The attractions of Lake of the Woods County are much as they were when the pioneers came to settle. Fishing, hunting, forests, water, clean air, relatively inexpensive land and space to live and play...that pioneer spirit which enabled people to overcome the hardships of a wilderness survives in a population which is determined to bring Lake of the Woods County to its full potential. May we be wise enough to recognize those factors which make for the quality of life...and prudent enough to preserve and expand them."

CLIMATE

The climate in Lake of the Woods county is classified humid continental. Summers are mild to warm and winters are cold with considerable snow. The average temperature in July for Baudette is 65 degrees Fahrenheit and the average temperature in January is about 3 degrees Fahrenheit. Temperature ranges are broad, from -45 degrees Fahrenheit in winter to 95 degrees Fahrenheit in summer. Length of daylight also varies greatly from less than nine hours in winter up to 19 hours in the summer.

Average annual precipitation is 21 inches, with nearly 50 percent of the total occurring during the summer. Snow lies on the ground a minimum of one inch deep for an average of 140 days per year and reaches an average maximum depth of 30 inches. Frost normally occurs from September 10 to June 1. Damaging hail, thunderstorms, strong winds, tornadoes and droughts seldom occur in the area. The local climate is suitable for agriculture and favorable for tourism.

GEOLOGY

The largest contiguous areas of peatland are located in the northern part of the state, where glacial erosion and deposition formed topography favorable for peat accumulation. These peat-lands were formed primarily by in the beds of Glacial Lakes Agassiz, Aitkin, And Upham (see Figure 2-5). As a result todays topography is a flat plain interrupted by extinct glacial lake beaches, exposed outcrops of the Canadian Shield, and large expanses of poorly drained peat bogs overlaying thin clay soils. Underlying the clay is highly sorted ground moraine which is as deep as two hundred feet in places. This overlays metamorphic and volcanic bedrock. Potential deposits of nickel and copper as well as other minerals exist. Exploration has been done by numerous companies in recent years.

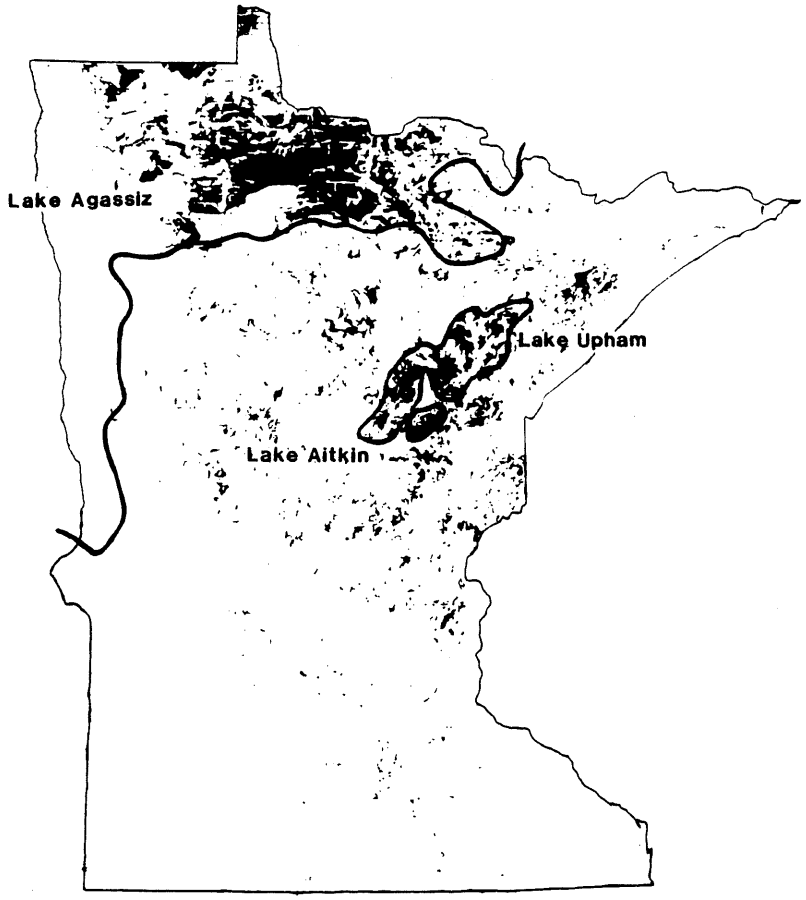


Figure 2-5: Peatlands in Glacial Lake Beds

Peat deposits have numerous possible uses including natural habitat, recreation, forestry, horticulture, agriculture, and energy.

SOILS

The soils and landscape of the Baudette Area have developed from materials originally deposited during the late Wisconsin glacial age. These deposits have since been modified by glacial Lake Agassiz and later by the organic material of the Agassiz peatlands.

The original parent material from which most of these soils formed originated from South Manitoba and is referred to as calcareous gray drift. This material was deposited in a

nearly level to gently rolling configuration. After the drift was deposited two events occurred. The first event was the formation of glacial Lake Agassiz which covered all of the Baudette area at one time or another. This lake modified the drift by washing sands, silts, and clays into suspension and later depositing them over the landscape. Silts and clays were generally deposited in deeper calmer water and sands and coarser material were deposited in more active zones such as sand bars or beaches. The second event was the accumulation of organic matter forming the vast peat deposits of the Agassiz peatlands. Cool wet conditions resulted in organic matter production exceeding the rate of decomposition; therefore, accumulating and spreading in a process known as paludification. Organic matter continued to accumulate filling in the depressions and covering low areas of the landscape.

These events resulted in the variety of soils found in the Baudette Area today. Generally, these soils can be lumped into 4 general groups and associations as follows:

1. LAKE LAID SILTS AND CLAY

   This group of soils consists of nearly level and gently sloping, poorly to moderately well drained soils formed in lake laid silts and clays. Typical soil series found in this group include: Spooner vfSL, Baudette L, Indus Cl, Taylor SiCL, and Clearwater C. These soils occur primarily in RMU 1. They are quite productive and many have been developed for agriculture. These soils are also very productive forest soils. Forested areas typically consist of aspen, Balm of Gilead, or balsam FIR, black ash, elm, etc.

2. LAKE WASHED GLACIAL TILLS

These soils consist of nearly level and gently sloping, poorly to moderately well drained soils formed in glacial till. Typical soils series found in this association consist of: Chilgren fSL, Garnes L, and Percy FSL. These soils occur throughout the Area but primarily in RMU 1(see RMU section). These soils are fairly productive and many areas have been cleared for agriculture. Aspen is the dominant forest cover type found on these soils.

3. LAKE DEPOSITED SANDS AND BEACH RIDGES

These soils consist of nearly level to sloping, poorly to somewhat excessively well drained soils formed in lake laid sands, and sands and gravels of beach ridges. Typical soils series of these associations include: Redby LfS, Hiwood fS and Cormant LfS. on sand bars, etc.; and Marquette fS & gr, Karlstad Ls and Faunce Ls on Beach ridges. These soils are fingered throughout the Baudette Area in all RMUs, but occur primarily in the western half of RMU 2. These soils are, typically, poor agricultural soils and most have remained forested. Typical forest cover consists primarily of Jack and/or red pine on well drained areas, and jack pine, aspen, balsam or lowland brush on lower, less well drained areas.

4. ORGANIC SOILS

These soils consist of nearly level, very poorly drained soils, formed in deep organic deposits and organic deposits over calcareous till or sand. Typical soil series consist of Seeleyeville mucky peat, Cathro muck, Haug muck (organic over mineral soil), Rifle mucky peat, Greenwood peat, and Lobo peat (deep organics). These soils occur throughout the Area in large irregular shapes. RMU 3 is primarily deep organic deposits and raised bogs. Most of these soils remain

in their natural state with a vegetative cover of lowland brush, coniferous bogs or grassy fens. They are, typically, low productive soils in their natural state, but some can be drained and worked successfully. Development of these soils for agriculture has occurred primarily in RMU 1. Forest productivity is relatively low but some sites (especially shallow peats) can be quite productive for lowland conifers.

SAND AND GRAVEL DEPOSITS

Gravel deposits in the Baudette Area are generally scarce. Deposits are limited to remote shoreline beaches and offshore bars formed by currents and wave action related to former levels of Lake Agassiz. (Some ice contact deposits may occur in S.W. Lake of the Woods County.)

These deposits are the result of the sorting of materials in selected areas by surf action and offshore currents. Typically, only certain stretches of the shore may contain gravel. These Shoreline deposits may have quality problems with shale and, typically, have a narrow range of particle sizes due to the selective sorting of the lake currents. Beach deposits of glacial Lake Agassiz are, characteristically, long, narrow and shallow, usually ranging from 5-15 feet deep.

WATERS

SURFACE WATERS

All surface drainage in the Baudette Area empties into the Red River of the North and eventually into Hudson Bay. The watershed unit that covers the Baudette Area (Figure 2-6) occupies an area of 2,903 square miles in north-central Minnesota and includes nearly all of Lake of the Woods.

Locally, surface drainage flows to the Rainy River, Warroad River, Roseau River or directly into Lake of the Woods. Numerous tributaries flow into the Rainy River; generally, from the southwest to the northeast. The tributaries include: Zippel Creek, Bostic Creek, Wabanica Creek, Winter Road River, Baudette River, Silver Creek and the Rapid River. Most of the tributaries are navigable by boat for some distance upstream. Sometimes small creeks drain from bog to bog disappearing within the bogs and reappearing downstream.

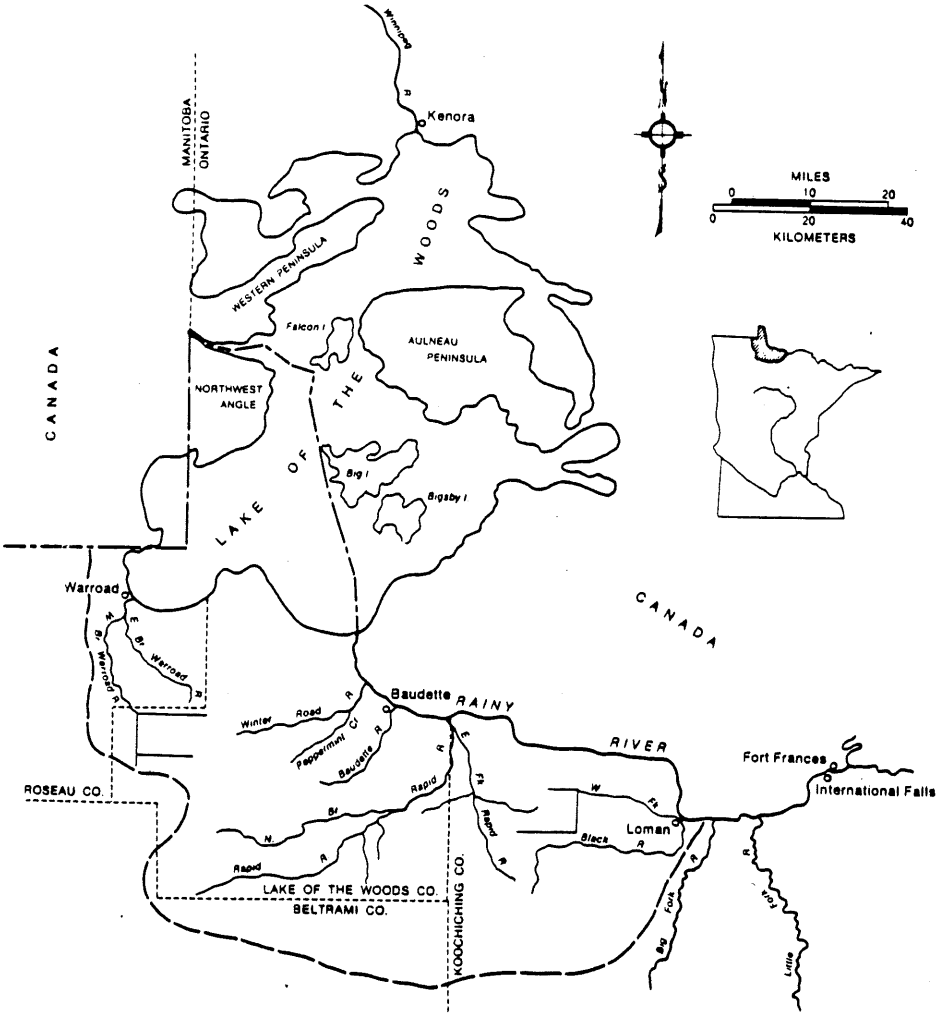


Figure 2-6: Surface Drainage in Baudette Area

More than two-thirds of the watershed consists of poorly drained land covered with muskeg swamps. Altitudes on the swampy lake plain range from about 1,100 to 1,200 feet.

Most of the Area's land is in a very youthful stage of the erosion cycle. Permanently water saturated soil conditions often exist only a few hundred feet away from major rivers. Large portions of the county are poorly drained. Some areas of the county have been made more useful for agriculture through artificial drainage.

A dam and hydropower facility, at Kenora Ontario, regulates the level of Lake of the Woods.

GROUND WATER

Significant quantities of ground water are available from the glacial drift in the Lake of the Woods watershed. Aquifers are lenses and glacial lake beaches of sand and gravel enclosed in or on top of the glacial till. Aquifers may be many different shapes and sizes. Essentially, all ground water recharge is derived from precipitation within the boundaries of the watershed. Water levels in wells generally range from just below the surface to about 25 feet below. In the vicinity of Williams and Graceton Aquifers beneath the stream valleys are under sufficient pressure to bring the water levels above the land surface and produce flowing wells.

PROTECTED WATERS

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 water basins and watercourses. The waters are identified either as "protected" or "unprotected" depending on their size, physical characteristics, and ownership of surrounding lands. Protected waters include: a) water basins assigned a shoreland management classification, b) waters that have been declared public or navigable by a court, c) meandered lakes that have not been legally drained, d) designated trout and

game lakes, e) water basins in Scientific and Natural Areas, f) water basins surrounded by public land, g) water basins where the state or federal government owns any of the beds or shores, and h) water basins with public water accesses. 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. Protected wetlands are Type 3, 4, and 5 wetlands as defined in US Fish and Wildlife Service Circular No. 39, not included in the definition of protected waters, which are 10 acres or larger in unincorporated areas or 2.5 acres or larger in incorporated areas.

The DNR has completed an inventory of protected waters and wetlands consisting of descriptive lists and maps. Copies of the Protected Waters Inventory have been distributed to Area and District forestry offices.

Any person or agency proposing to alter the course, current or cross-section of protected waters or wetlands must first obtain a permit from the Department of Natural Resources - Division of Waters and the U.S. Army Corps of Engineers.

Most lakes over 25 acres in size are also subject to shoreland development regulations covering lot sizes, building setbacks, sanitary facility placement, vegetation removal, and grading and filling. These standards are administered by county zoning officials, subject to DNR monitoring. Shoreland districts include all lands within 1,000 feet of lakes and within 300 feet of streams.

The shoreland management program currently classifies lakes as Natural Environment (NE), Recreational Development (RD), or General Development (GD) and streams as NE or GD. Structure setback standards for the three classifications are 200, 100, and 75 feet, respectively. Listings of the classification of lakes in the Baudette Area are available from the Regional Hydrologist.

The statewide standards and criteria for managing shoreland areas have recently been revised. The standards and criteria list uses and activities that are permitted, conditional, or prohibited under the various shoreland classifications. The revised rules prohibit intensive vegetation cutting within the shore impact zone which is defined as land located between the ordinary high water level and a line parallel to it at a setback of 50 percent of the structure setback. The revised rules also address other impact zones along shorelines which may have additional effects on forest activities.

VEGETATION

Postglacial plant succession in northwest Minnesota has been reconstructed from analysis of pollen and plant fossils in peat samples. Approximately 11,000 years ago, spruce forests developed along the receding shoreline of glacial Lake Agassiz. By 9,000 years ago, a boreal conifer forest covered most of the former lake bed. As the climate turned warmer and drier, between 8,000 and 4,000 years ago, prairie and oak savanna dominated the lake plain; marshes occupied the poorly drained sites.

With the onset of wetter and cooler conditions vegetation similar to the present type emerged. Reed-sedge communities dominated the lowlands; black spruce, tamarack, white cedar, and sphagnum moss became established on portions of the bog. Aspen parklands covered the surrounding uplands. These stands developed into mixed coniferous-deciduous forests with the reinvasion of white pine, red pine, and jack pine.

The presettlement vegetation of the area was altered by logging, land clearing, drainage, and fires early in the 1900s. Most of the mature pine was harvested for sawtimber. Other timber stands were logged for posts, ties, or for pulpwood. Many tracts of land were cleared for farming. Fires originating from logging, land clearing and drainage were prevalent throughout the area.

Major disturbances lessened as settlement pressure decreased and existing settlers abandoned their homesteads during the 1930s. Additional discussion on existing vegetation is in the section on resource management units.

TIMBER RESOURCES

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

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

FOREST COVER TYPES

Aspen covers 134,000 acres or 34% of the total commercial forest (see Figure 2-7). The other major cover types are black spruce (17%) and Balm of Gilead (15%).

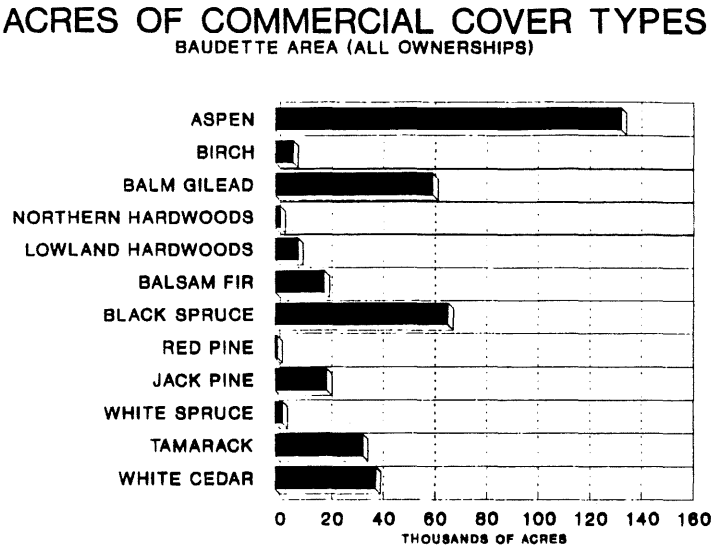


Figure 2-7

COMMERCIAL FOREST OWNERSHIP

The State of Minnesota is the largest owner of commercial forest land in the Baudette area with 200,000 acres or about 50% of the total. Private landowners hold 100,000 acres or about 25% of the total. The remainder is owned by Native Americans, the federal government, forest industry and the counties. Table 2-2 shows the distribution of commercial timber for each land ownership category.

Table 2-2: TOTAL AREA BY COMMERCIAL COVER TYPE BY OWNERSHIP
.....(IN 1,000 ACRES).....
2/24/1987

NOTES: BASED ON PERMANENT PLOT SYSTEM DOES NOT INCLUDE NONSTOCKED PLOTS

COMMERCIAL COVER TYPE	BUREAU OF LAND MGT.	INDIAN LAND	MISC. FEDERAL	STATE LAND	COUNTY LAND	FOREST INDUSTRY	OTHER PRIVATE	TOTAL AREAS (1,000 ACRES)
ASPEN	9	4	0	64	0	4	53	134
BALSAM FIR	0	5	2	10	0	2	0	19
BALSAM POPLAR	3	0	0	26	1	1	30	61
BLACK SPRUCE	6	17	0	34	4	1	5	67
JACK PINE	7	0	0	9	0	0	4	20
LOWLAND HDWDS.	2	3	0	1	0	0	3	9
N. WHITE-CEDAR	3	9	0	18	0	6	3	39
NORTHERN HDWDS.	0	0	0	0	0	0	2	2
PAPER BIRCH	0	0	0	7	0	0	0	7
RED PINE	1	0	0	0	0	0	0	1
TAMARACK	0	3	1	28	0	2	0	34
WHITE SPRUCE	0	0	0	3	0	0	0	3
TOTAL	30	41	3	200	5	17	100	396

The total net volume for the major commercial cover types is shown in Figure 2-8. Aspen has the largest volume in the area followed by Balm-of-Gilead and then white-cedar.

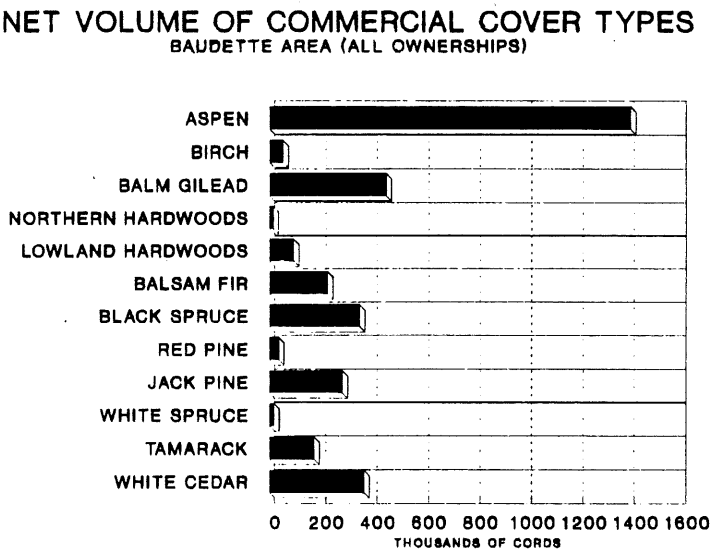


Figure 2-8

The volume of commercial timber for each land ownership class is shown in Table 2-3.

Table 2-3: TOTAL NET VOLUME BY COMMERCIAL COVER TYPE BY OWNERSHIP
.....(IN 1,000 CORDS).....
FOR BAUDETTE AREA

2/24/1987

NOTES: BASED ON PERMANENT PLOT SYSTEM DOES NOT INCLUDE NONSTOCKED PLOTS

COMMERCIAL COVER TYPE	BUREAU OF LAND MGT.	INDIAN LAND	MISC. FEDERAL	STATE LAND	COUNTY LAND	FOREST INDUSTRY	OTHER PRIVATE	TOTAL VOLUME (1,000 CORDS)
ASPEN	76	80	0	773	0	71	406	1,406
BALSAM FIR	0	90	4	126	0	8	0	228
BALSAM POPLAR	28	0	0	210	8	44	166	455
BLACK SPRUCE	46	86	0	198	10	1	11	352
JACK PINE	104	0	0	149	0	0	32	285
LOWLAND HDWDS.	24	41	0	22	0	0	9	96
N. WHITE-CEDAR	52	83	0	150	0	66	18	369
NORTHERN HDWDS.	0	0	0	0	0	0	15	15
PAPER BIRCH	0	0	0	53	0	0	0	53
RED PINE	37	0	0	0	0	0	0	37
TAMARACK	0	15	7	153	0	0	0	175
WHITE SPRUCE	0	0	0	18	0	0	0	18
TOTAL	366	396	11	1,851	18	189	657	3,488

Size Class Distribution

Forest stands are separated into three size classes: Sawtimber, pole timber, and seedling/sapling. 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. Of the 396,000 acres of commercial forest in the Baudette Area, 16 percent is in the sawtimber size classes, 40 percent is in the pole size timber class and 43 percent is in the sapling/seedling class. Table 2-4 summarizes size class distribution by acreage and volume for each cover type.

Table 2-4: TOTAL NET VOLUME AND AREA BY COMM.COVER TYPE AND SIZE CLASS
...(AREA IN 1,000 ACRES AND VOLUME IN 1,000 CORDS)...
FOR BAUDETTE AREA 2/24/1987

NOTES: BASED ON PERMANENT PLOT SYSTEM IT DOES NOT INCLUDE NONSTOCKED PLOTS

COMMERCIAL	SAPLING/SEEDLING		POLE TIMBER		SAWTIMBER		-------- TOTAL --------	
COVER TYPE	AREA	VOLUME	AREA	VOLUME	AREA	VOLUME	1000 ACRES	1000 CORDS
ASPEN	53	186	64	947	17	273	134	1,406
BALSAM FIR	9	41	9	133	1	54	19	228
BALSAM POPLAR	30	80	22	227	8	148	61	455
BLACK SPRUCE	44	106	20	203	3	43	67	352
JACK PINE	3	10	7	117	9	158	20	285
LOWLAND HDWDS.	5	18	2	24	3	53	9	96
N. WHITE-CEDAR	6	13	16	122	17	233	39	369
NORTHERN HDWDS.	0	0	0	0	2	15	2	15
PAPER BIRCH	1	0	6	53	0	0	7	53
RED PINE	0	0	1	37	0	0	1	37
TAMARACK	20	40	12	112	2	23	34	175
WHITE SPRUCE	1	2	2	16	0	0	3	18
TOTAL	173	496	161	1,991	62	1,001	396	3,488

RECREATION

STATEWIDE DEMAND

The State Comprehensive Outdoor Recreation Plan (SCORP) participation surveys indicate that Minnesotan's 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 county skiing. Berry picking, bird watching, and the use of off road vehicles are recreational activities that were not included in the 1985 SCORP surveys. 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.

DEMAND IN THE AREA

The majority of the recreational activity is concentrated along the Rainy River and Lake of the Woods. The most popular activities in the Baudette Area were resource related including hunting, fishing, and boating. Camping, an activity frequently associated with hunting and water based recreation is a popular activity. Fishing creel census documents (1986 figures) 1,000,000 hours of fishing on Lake of the Woods and Rainy River establishing it as the leading activity in all seasons. Recreational motor vehicle use has increased over the last ten years, and is expected to continue to increase. In a recent survey of Tourism in North Central Minnesota by the Headwaters Regional Development Commission, over three-fourths of the survey respondents mentioned the environment as an important attraction of the region. In Lake of the Woods County, fishing was the major attraction (57.7 percent) followed by the environment (53.6

percent) and then peace and quiet (28.5 percent). When asked for suggestions on ways to improve existing attractions, amenities, or develop new attractions, only one-fourth of those sampled had any ideas. Of those that did respond, campgrounds improvements, better fishing facilities, and road improvements led the list of improvements seen as a need.

SUPPLY OF RECREATION RESOURCES

Private Facilities

Private facilities play an important role in serving recreational needs in the Baudette 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.

Most facilities provide on site recreational experiences, using the north woods setting for a background. These facilities rely heavily on nearby public lands to attract users.

Public lands and waters provide additional recreation opportunities to users of private resorts, campgrounds, water accesses, and outfitters.

The majority of campgrounds, accesses, marinas, beaches, and all resorts are privately owned and managed. In addition to the private recreation facilities, local businesses rely heavily on tourist/travel expenditures.

Public Facilities

The Department of Natural Resources manages many types of recreation units in the area including two state forests, two snowmobile trails, one ski touring trail, three WMAs, two state parks, public water access sites, and a scientific and natural area. Recreational experience opportunities and objectives are detailed in individual facility plans. These units, all part of the State Outdoor Recreation system, are managed by several different DNR offices. This makes it necessary to coordinate efforts among these offices.

Other public recreation facilities in the Baudette Area are managed by county and local governments. County facilities are generally water recreation public accesses and grant-in-aid snowmobile trails (see Table 2-5). Municipal facilities include a variety of facilities within city parks and waysides. In general these types of public recreation facilities offer opportunities that compliment other facilities in the outdoor recreation system and increase attractiveness to tourists.

Table 2-5: Recreational Trails *

Administrator/Trail	Trail Miles By Use			
	Hike	Ski	Snow mobile	Total
DNR Forestry				
Baudette-Norris			52.5	52.5
Blueberry Hill		3		
DNR Parks & Recreation				
Zippel Bay	6	2	15.0	15.0
County-Administered				
Lake of the Woods Border Trail			90.0	90.0

* If a trail has more than one use on a segment it is listed for each use.

Table 2-6 is a summary of the public and private outdoor recreation facilities in the Baudette Area.

Table 2-6: Public and Private Recreation Facilities

Facility Type	Number
Parks	4
Resorts	35
Campgrounds	24
Marinas	34
Water Accesses	19
Swimming Beaches	13

RESOURCE MANAGEMENT UNITS

PURPOSE AND DELINEATION

Resource management units (RMUs) are intended to promote an ecosystem perspective in natural resource management. Different ecosystems (i.e., combinations of biological communities and their physical environments) present differing opportunities for management.

The Baudette Area has been subdivided into three RMUs (see Figure 2-9) based on differences in surficial geology, soils, and other resources. In most instances RMUs are comprised of similar geomorphic regions which are mapped and described in the Minnesota Soil Atlas (University of Minnesota Agricultural Experiment, Station, 1975-80).

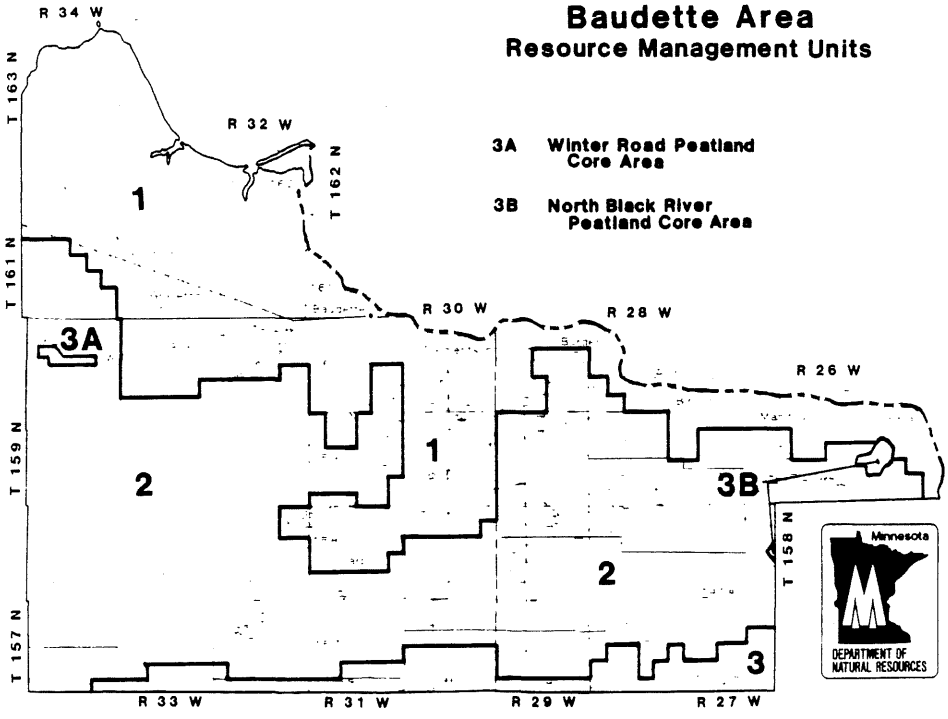


Figure 2-9

Physiographic Units (RMUs)

The Baudette Area contains 2 broad physiographic units: The Agassiz lacustrine plain-Bigfork Valley (RMU 1) and the Agassiz Peatlands (RMU 2 and 3). RMU 3, 3A, and 3B splits out the vast patterned peatlands in the Southern part of the Aggassiz peatlands.

RMU 1: Agassiz lacustrine plain

The soils in this RMU are predominantly lake washed tills and lake deposited silt and clays. Narrow distinct beach ridges are common in this RMU but well drained sandy soils make up less than 5 percent of the total land base. Landuse is as follows: 38 percent is forested; 30 percent is cultivated; 15 percent is pasture and 11 percent is classed as marsh.

Approximately, 50 percent of the state administered land in this RMU is on shallow to deep organic soils, 22 percent is on loamy poorly drained soils (LLPL), 3 percent is on well drained sandy soils (SSWL), and the remainder (25 percent) on various mineral soils mostly poorly drained.

RMU 2: Agassiz Peatlands/Interbeach Unit

This portion of the Area was covered by a relatively shallow part of Lake Agassiz. Wave action smoothed the lake bed and shores by eroding, transporting, and redepositing material to form sand bars, spits, and beach ridges. As peatlands developed they invaded low areas forming large peat deposits between areas of mineral soils. Sandy soils are generally located in the Western half of this unit. The Eastern half is dominated by peatlands, with areas of mineral soils that are predominantly loamy or clayey. Topography is level to gently undulating. Short steep slopes occur adjacent to perennial streams and rivers. Landuse is as follows: 74 percent is forested, 3 percent is pasture or open, 1 percent is cultivated and 22 percent is marsh.

RMU 3, 3A and 3B: Agassiz-Patterned Peatlands

This unit consists almost entirely of vast patterned bogs and fens. These deposits are a result of ideal conditions of climate and landscape that produced organic material faster than could be decomposed. This area represents a unique ecological landscape that is world renown and is currently under management restrictions due to its unique features. Most soils in this unit have low productivity due to low nutrient levels and excessive moisture and/or acidity.

Landuse is as follows: Approximately 56 percent is marsh or sedge bog, 44 percent is forested, less than 1 percent is cultivated or pasture.

For more information on soil landscape units see Soils Appendix.

WILDLIFE HABITAT AND TRENDS

Presettlement Habitat

The original vegetation of the Baudette Area was a mosaic of lowland and upland habitat that was about 72 percent lowland. Conifer forest made up most of the lowland vegetation, but a significant proportion was also open bog or peatland, characterized by saturated organic soils and stagnant timber. The upland habitat was about 93 percent aspen-birch, pine and spruce-fir mix; and about seven percent jack pine barrens.

The presettlement vegetation was primarily undisturbed, but some areas were constantly changing due to natural forces. Disturbance occurred from fire, insects and disease outbreaks, and wind storms. This disturbance created young forest vegetation in both upland and lowland habitat. At the same time, natural plant succession was changing the composition and age of a larger proportion of the forest vegetation. Some stands of mature spruce-fir, but including white and red pine, developed on areas with the proper topography, soils and seed sources.

This interplay of geology, soils, and natural disturbance created a mosaic of forest habitat that supported a variety of wildlife species, but primarily those associated with boreal habitats. Presettlement wildlife included moose, woodland caribou, fisher, pine marten, gray wolf, raven, boreal woodpeckers and warblers. Species associated with young hardwood-dominated forest and brushland-grassland habitat, such as white-tailed deer, ruffed grouse, and sharp-tailed grouse, were uncommon in the Baudette Area prior to 1850.

Changes in Vegetation (Wildlife Habitat Trends)

Major changes in the vegetation in what is now the Baudette Area occurred during the early 1900s. Most of these habitat changes were caused by man. Logging for red and white pine started during the late 1890s and peaked between 1910 and 1920. Also, catastrophic fire occurred from 1910 to the mid1930s causing large changes in the area's vegetation. During the logging era, settlers immigrated to this area to homestead farms in the logged and burned over areas.

This growing demand for agricultural lands prompted large scale drainage projects. Laws enacted in 1908 and 1909 authorized Judicial drainage ditch projects in the Baudette Area. Sterile soils, short growing seasons, poor drainage and transportation, as well as other problems contributed to repeated crop failures. As a result, by 1931, 60 percent of Lake of the Woods County lands were tax forfeited due to nonpayment of taxes and ditch liens.

Wildlife habitat during the early 1900s was dominated by grass, brushlands, and young hardwood and conifer forest. This habitat supported a different wildlife community. Boreal forest wildlife was replaced by wildlife species adapted to young forest, open bog, and grassland-brushland habitats. Populations of white-tailed deer, ruffed grouse and sharp-tailed grouse erupted during this time. Other species such as snowshoe hare, woodcock, black bear, and mourning dove also became abundant during this period. High populations of these wildlife species persisted through the 1940s and 50s.

By the 1960s most of the forest habitat, bogs, grass-brushlands, and abandoned farm fields had changed again. Plant succession had been slowly changing these habitat types. Brush and trees invaded abandoned farmland and other open habitat, and cutover forests were growing older. Succession and aging of habitat was aided by increasing demand for effective fire suppression. This

reduced the prominence of fire as a disturbance factor. Also, many abandoned fields on DNR administered lands were planted to pine and spruce during this thirty year period.

Due to minimal disturbance since their establishment, large age class imbalance exists in important forest types such as aspen and Jack pine. For example, in 1986, fifty percent of the aspen type in the Baudette Area was 40 years or older. Logging has replaced fire as the major disturbance factor and is the primary means of creating disturbance in forest habitat. However, a history of weak timber markets in the Baudette Area has suppressed logging's ability to address these age class imbalances.

Two recent major developments will improve the ability to address these problems. Projected increased demand for wood products (especially aspen) will allow commercial timber harvest to play a greater role in producing young age classes in commercial timber types. In addition, expanded funding for noncommercial management of low quality aspen stands will help increase disturbance in the aspen type. Both of these developments will have an immediate positive effect on wildlife populations associated with young forests, such as deer and ruffed grouse.

Much of the open habitats created during the early logging, fire, and settlement era have succeeded to timber and decadent brush, or have been converted to farmland. Unchecked succession and intensive farming has contributed to long-term population declines of wildlife species, such as sharp-tailed grouse, that are associated with this transition habitat.

Wildlife Resources

Today the Baudette Area supports wildlife populations representing diverse habitats: Coniferous forest, hardwood forests, lakeshore and wetlands, and transition habitat.

At least eleven species of amphibians and reptiles, 47 species of mammals, and 251 species of birds occur in the Baudette Area. One hundred and sixty-eight of the birds are resident breeders, while 83 species are migrants. A complete wildlife species list is included in the wildlife appendix. This list includes species' habitat associations, as well as any special population status and critical habitat requirements.

Game wildlife species occurring in the Baudette Area include 21 game mammals and 37 game birds, of which 28 are waterfowl species. Important game species include: white-tailed deer, ruffed grouse, sharp-tailed grouse, black bear, beaver, fisher, otter, mink, red fox, mallard, common goldeneye, and lesser scaup (see Table 2-7).

Nongame wildlife is representative of the diverse vegetative communities, or habitats present. Nongame species include: 11 reptiles and amphibians, 26 mammals, and 214 birds. The few reptiles and amphibians occurring are typical of extreme northern climates and vegetation.

At least 28 shorebirds use the shore of Lake of the Woods. These include: piping plovers, greater yellowlegs, dunlin, and marbled godwits.

In forest habitats, common species include: great horned owl, downy and hairy woodpeckers, common flicker, gray jay, chickadee, white-throated sparrow, red squirrel, northern flying squirrel, porcupine, and deer mouse.

In grassland/brushland habitats, common nongame species include: bluebird, purple martin, tree and bank swallows, sharp-tailed sparrow, Franklin's ground squirrel, and woodchuck.

Twenty-four wildlife species occurring in the Baudette Area require specific attention because they are "endangered", "threatened" nationally or statewide or are of "special concern" in Minnesota.

Two species (piping plover and peregrine falcon) are endangered, three (bald eagle, loggerhead shrike, gray wolf) are threatened, and 29, including 7 peatland-associated butterflies, are of special concern.

Natural Heritage Elements (Natural Communities)
The Section of Wildlife's Natural Heritage Program gathers data statewide on natural vegetative communities. The remnants of these communities, which have received little impact from man's activities, are important because they have been nearly eliminated since settlement and make up only a small fraction of Minnesota's landscape today.

The Natural Heritage Program's (NHP) information on natural communities in the Baudette Area is limited primarily to lowland communities. The lack of information on upland communities is due partly to a lack of NHP sponsored survey work in this part of the state.

The following four peatland communities, which lie partly within the Baudette Area, have been identified as ecologically significant (DNR Peatland Task Force):

1. Red Lake Peatland
2. Winter Road Lake Peatland
3. North Black River Peatland
4. South Black River Peatland

Rare Plants
The Baudette Area contains eight rare plant species; two are "State Threatened" plant species and four "State Special Concern" plant species are found on DNR-administered lands. In addition, two special concern plant species have been recorded on private land and may be present on DNR lands (see Wildlife Appendix). Where rare plants occur on DNR administered land, special land management techniques may be required to protect them.

Scientific and Natural Areas

There is one Scientific and Natural Area in the Baudette Area. It includes Pine and Curry Island and adjacent Morris Point on Lake of the Woods. Two "core areas" of the four peatland communities described above have been previously recommended for SNA status.

Resource Management Units

Differences between wildlife habitat and wildlife resources in the Baudette Area Resource Management Units are explained below.

RMU 1

A wide variety of wildlife species are supported by the transition, agricultural, forest, and lake habitats of RMU 1. Some species are found throughout the RMU, such as the white-tailed deer. Other less adaptable species such as the transition habitat dependent sharp-tailed grouse, short-eared owl, and sandhill crane have more limited distributions. These wildlife species can be negatively impacted by land clearing, natural succession and artificial reforestation. Species associated specifically with forest habitat in RMU 1, include ruffed grouse, great gray owl, gray wolf, fisher, and black bear. Land clearing for agriculture has had the largest impact in reducing the transition habitat base in RMU 1, and has been compounded by succession.

The Lake of the Woods shoreline is a habitat unique to RMU 1. Mallards, common goldeneyes, blue winged teal, and hooded and common mergansers nest along the lake shoreline. Waterfowl and shorebirds use the lake and shoreline during migration for feeding and resting. There is one known active bald eagle nesting territory. Piping plovers breed on Pine and Curry Island SNA and two other locations on the shore of Lake of the Woods. Two colonies of common terns also nest on Pine and Curry Island SNA, and at Rocky Point. Endangered peregrine falcons are occasional visitors to the lake's shoreline during migration. One great blue heron colony is located within RMU 1.

RMU 2

A wide variety of forest wildlife species occur in RMU 2. Deer, bear, ruffed grouse, snowshoe hare, and woodcock are the most common game species. Spruce grouse and various waterfowl are also present. The most abundant furbearers are beaver, otter, mink, red fox, and fisher. Muskrat, weasel, raccoon, bobcat, and lynx also occur. The threatened gray wolf is common in RMU 2. Birds characteristic of forest habitats include common flicker, gray jay, downy and hairy woodpeckers, and white-throated sparrow. Less common species that occur in RMU 2 include the Connecticut warbler, black-backed woodpecker, pileated woodpecker, and the great gray owl. There are also two known great blue heron nesting colonies in this RMU. Wildlife associated with transition habitat, such as sandhill crane, sharp-tailed grouse, and moose, occur in RMU 2 in low numbers and scattered locations due to the limited occurrence of this habitat.

RMU 3, 3A, and 3B

Many plant species in RMU 3, 3A, and 3B are uniquely adapted to the poor growing conditions typified by peatlands. Some trees such as black spruce, white cedar, and tamarack occur here but grow slowly and often are considered "stagnant". As a result, wildlife species diversity and abundance is lower in these RMUs. Examples of animals well adapted to living in peatland bog habitats include northern and southern bog lemmings (both rare in Minnesota).

Game species in RMU 3 and 3A include the sharp-tailed grouse, spruce grouse, and snowshoe hare. Moose are found in low densities along the willow brush edges of these bogs. Other wildlife occurring in these RMUs include: Beaver, muskrat, mink, white-tailed deer, ruffed grouse, sandhill crane, great gray owl, yellow-bellied flycatcher, boreal chickadee, golden crowned kinglet, sharp-tailed sparrow, Lincoln's sparrow, short-eared owl, and Connecticut warbler.

Table 2-7: List of Game Species in the Baudette Area

Migratory Game Birds	White-winged scoter	Big Game Mammals
White-fronted goose	Common goldeneye	Black bear
Snow goose	Bufflehead	White-tailed deer
Canada goose	Hooded merganser	Moose
Brant	Common merganser	
Wood duck	Red-breasted merganser	Furbearers
Green-winged teal	Ruddy duck	Beaver
American black duck	Virginia rail	Muskrat
Mallard	Sora	Coyote B
Northern pintail	American coot	Red fox
Blue-winged teal	Common snipe	Gray fox
Northern shoveler	American woodcock	Raccoon
Gadwall		Pine marten
American widgeon	Resident Small Game Birds	Fisher
Canvasback A	Gray partridge	Ermine B
Redhead	Spruce grouse	Long-tailed weasel B
Ring-necked duck	Ruffed grouse	Mink
Greater scaup	Sharp-tailed grouse	Badger
Lesser scaup		Striped skunk B
Harlequin duck	Small Game Mammals	River otter
Old squaw	Snowshoe hare	Lynx A
Black scoter	Gray squirrel	Bobcat

A - Season currently closed.
B - Unprotected species.

Table 2-8: Rare Plants Recorded in the Baudette Area

Species	Status (state list)
1. English sundew (*Drosera anglica*)	Threatened
2. Small white water lily (*Nymphaea tetragona*)	Threatened
3. Rock sandwort (*Arenaria dawsonensis*)	Special concern
4. Dragon's mouth (*Arethusa bulbosa*)	Special concern
5. Northern comandra (*Geocaulon lividum*)	Special concern
6. White malaxis A (*Malaxis brachypoda*)	(No Legal Status)
7. Moonwort A (*Botrychium lunaria*)	Special Concern
8. Felwort (*Gentianella amarella*)	Special Concern

A - Not recorded on DNR administered lands.

Table 2-9: Endangered, Threatened, and Special Concern Wildlife Species in the Baudette Area.

Species	Status	
	State	Federal
Peregrine falcon	Endangered	Endangered
Piping plover	Endangered	Threatened
Bald Eagle	Threatened	Threatened
Loggerhead shrike	Threatened	
Gray wolf	Threatened	Threatened
American white pelican	Special concern	
American bittern	Special concern	
Osprey	Special concern	
Yellow rail	Special concern	
Sandhill crane	Special concern	
Upland sandpiper	Special concern	
Marbled godwit	Special concern	
Wilson's phalarope	Special concern	
Common tern	Special concern	
Short-eared owl	Special concern	
Sharp-tailed sparrow	Special concern	
Northern bog lemmings	Special concern	
Pine marten	Special concern	
Snapping turtle	Special concern	
Lake Sturgeon	Special concern	
Red-disced alpine butterfly	Special concern	
Freija fritillary butterfly A	Special concern	
Frigga fritillary butterfly A	Special concern	
Dorcas copper butterfly	Special concern	
Bog copper butterfly	Special concern	
Jutta arctic butterfly A	Special concern	
Bog fritillary butterfly A	Special concern	

A - Probably occurs, but not documented.

BAUDETTE AREA FOREST RESOURCE MANAGEMENT PLAN

3. PROGRAM GUIDELINES

Chapter Contents — Section

AREA PROGRAMS

INTRODUCTION

This chapter includes proposed objectives and staffing levels for each Division of Forestry program in the Baudette Area. The proposed programs follow the framework provided by the Minnesota

Forest Resources Plan (MFRP). Statewide direction set in the MFRP was updated and modified for the Baudette Area when appropriate.

The next section of this chapter is a proposed level of effort for various programs. The remainder of the chapter consists of specific program proposals. Each program write-up includes a program description, a list of accomplishments for fiscal and proposed accomplishments for fiscal year 1989 and 1992. The projections for 1992 show the trend in accomplishments and staffing. For programs that have major capital requirements (e.g., roads, recreation, buildings) a prioritized list of projects and estimated costs are also included.

The accomplishments projected are dependent on adequate budget and staffing levels. Events such as severe fire seasons or significant changes in resource demands could alter the projections.

AREA PROGRAM HIGHLIGHTS

Table 4.1 shows past and projected staffing levels for Division of Forestry programs in the Baudette Area. This information provides only a rough indication of the relative emphasis placed on each program. Certain programs are sensitive to outside factors such as weather (e.g., fire), or economic conditions (e.g., timber sales). Other programs rely heavily on contracted labor which the time summaries do not reflect.

Table 3-1-1: Staffing in Hours Spent on Division Programs by Baudette Area Personnel in Fiscal Years 1984-88. Includes projections for Fiscal Years 1992 and 1997.

Program	FY84	FY88	FY92	FY97
Land Administration	616	398	777	500
Forest Recreation	274	234	114	250
Forest Roads	1357	767	1268	1000
Timber Management	11298	11099	12000	12000
Fish & Wildlife Habitat	309	324	350	400
Nursery & Tree Improvement	147	116	24	100
Private Forest Management	375	416	590	700
County Assistance	15	5	3	10
Urban & Community Forestry	2	0	5	20
Pest Management	55	93	19	40
Forest Resource Inventory	919	1545	655	500
Utilization & Marketing	24	13	24	20
Fire Management	1835	3122	1880	2000
Planning & Environmenal Review	71	82	93	100
Maintenance & Administration	3425	3684	4011	3500
Information & Education	147	160	163	200
Training	456	858	659	700
Total	21,325	22,916	22,635	22,040
Full Time Equivalents*	12.3	13.2	13.1	12.7

* A full time equivalent (FTE) is 1,730 hours per year and is based on an average division employee. Source: MN DNR Division of Forestry time summaries (unpublished) for Fiscal Years 1984-86. Area staff and program managers projections for FY 88, 92, and 97.

LAND ADMINISTRATION ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

The land administration program involves real estate activities such as land acquisition, exchange, leasing, sales, and classification. This program requires foresters to be familiar with the state land ownership base including the various land types and accounting requirements.

State Land Ownership

The state has experienced three major processes by which land entered state ownership. The first was through various federal land grants. Most of these grants occurred during the nineteenth century, although additional acreage was granted by the federal government as late as the 1950s. The Federal government granted about 16.5 million acres to the state of Minnesota. Figure 3-2-1 shows the general methods of state land acquisition of forestry-administered land in the Baudette Area.

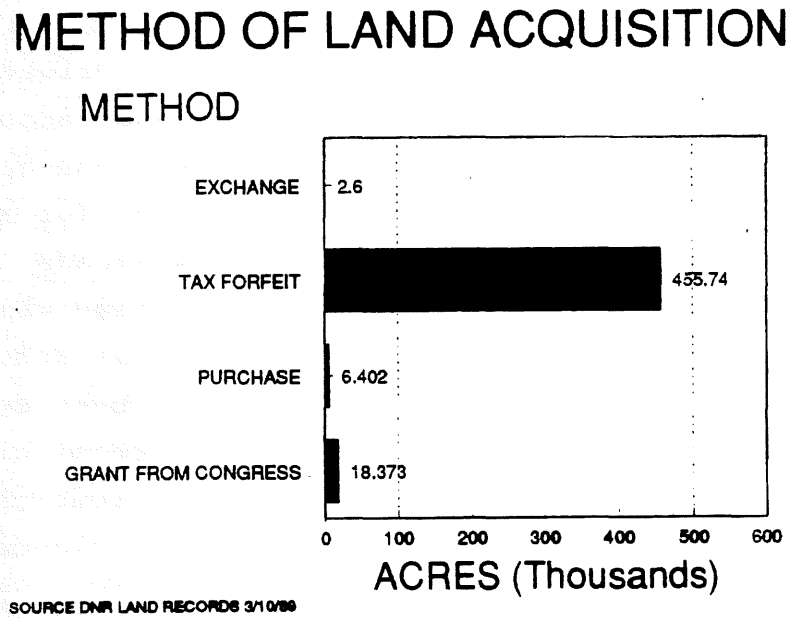


Figure 3-2-1

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 DNR is charged with the responsibility of land management as directed by the state's constitution and legislation. 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.

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 school trust 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. There are 18,373 acres of trust land in the Baudette Area.

Tax Forfeiture

Tax forfeiture is the second major process by which land has entered state ownership. State laws provide for the transfer of title to land that is tax delinquent for more than three years. Most titles to tax-delinquent land are held in trust by the state for the taxing districts.

The decline of logging in the area during the early 1900s brought a growing demand for agricultural lands. Pressures mounted for the development of drainage projects to reclaim the swamplands for agricultural use.

State legislation (1887) had already authorized the organization of county drainage districts to be financed by bonds issued by the county. The Volstead Act of 1908 subjected federal lands in drainage projects to ditch assessments. Later legislation (1909) subjected state lands in drainage projects to assessments the same as privately owned lands. Prior to 1925, legislation also authorized drainage construction at the initiation of only a small minority of the property owners who would have to pay for the project. With this encouragement, over 1500 miles of ditches costing approximately $3 million were dug in Beltrami and Lake of the Woods Counties between 1909 and 1917.

The drainage program was largely unsuccessful. Much of the drained land was never settled; other areas were abandoned soon after settlement. Poor soils, severe climate, inefficiency of drainage ditches, and distance from markets made farming impossible.

From about 1860 to the 1930s 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.

Beginning in the 1920s depression and drought caused large scale tax forfeiture of privately owned land. In many counties, agriculture had been encouraged through public bond supported drainage projects. Many of these efforts were ill-advised since the soils were amenable to neither drainage nor cultivation. When land in these areas was abandoned and tax payments ceased, drainage bonds were forfeited and certain counties faced bankruptcy.

Diminishing tax revenues forced many northern counties into such extreme financial difficulty that the state was forced to intervene. Beginning in 1925, a series of laws were passed in an attempt to get tax-delinquent lands back on the tax rolls or to reimburse the counties for all or part of the delinquent taxes and principal and interest on drainage bonds assessed on these lands.

In 1929, the Red Lake Game Preserve was established (Laws of Minnesota, 1929, Chapter 258) in Beltrami, Lake of the Woods, and Koochiching Counties. It was created " for the purpose of preserving, protecting, propagating, and breeding wildlife of...including all species of game and fish and furbearing animals amd birds of rare and useful species, ...and the preservation and development of rare and distinctive plant species native to the area." (From the original law)

In 1933, the Minnesota Legislature established the Beltrami Island and Pine Island State Forests for the purpose of growing, managing, and harvesting timber and other forest crops.

In 1980, the Divisions of Forestry and Fish and Wildlife signed a cooperative agreement that covers the joint administration of overlapped sections of the Red Lake WMA and the Beltrami Island

State Forest. This agreement was made during the development of the Red Lake Wildlife Management Area Master Plan, 1980-1989.

In three separate legislative acts (Laws of Minnesota, 1929, Chapter 258; Laws of Minnesota, 1931, Chapter 407; Laws of Minnesota, 1933, Chapter 402), the state assumed debts of certain drainage projects in seven counties in exchange for clear title to the tax-forfeited land within the project areas. A number of conservation areas were formed from these drainage project areas. Receipts from the management of land within these separate conservation areas were combined by the legislature in 1949 to form the Consolidated Conservation Areas Fund, and the areas became known as Consolidated Conservation areas and the land within as Con-Con land.

The state received title to more than 1.6 million acres of Con-Con land in the original transfer of titles. In return, the state assumed about $4,750,000 in county drainage debts. Subsequent tax forfeiture within the conservation areas transferred additional acreage into Con-Con status. Recent legislation, however, states that future tax forfeiture within Con-Con areas will not result in more Con-Con land. (Laws of Minnesota, 1984, Chapter 654, Article 2, Section 84, Minnesota Statutes, Section 84A.57). Over the years much of the Con-Con acreage has been sold back to the private sector.

The existence of substantial acreage of tax-forfeited land in these counties is a measure of the quality of much Con-Con land for private use and development. Most of the tax-forfeited land has relatively low use and development. Most of the tax-forfeited land has relatively low suitability for cultivation and low potential for other economic uses. The fact that so much of this land went tax forfeit at least once indicates that development efforts have been attempted and failed. Return of this land to private control posed the prospect that future development efforts may fail and the land will again go tax forfeit.

Currently Lake of the Woods County administers 9,017 acres of tax-forfeited land.

Acquired Lands

The third method of land entering state ownership was through acquisitions. 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 percent 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.

Minnesota In-Lieu-Of-Tax Payments and Con-Con Payments

The impact of public land ownership on the local tax base has long been a concern to local governments. In 1949 the legislature passed a law that gives 50 percent of the proceeds from management of Con-Con lands to counties. In 1979 the legislature passed a a law that makes payments to the counties based primarily on the acreage of land in various categories.

Determination of payments to the counties is determined by five separate statutes that prescribe general rates to be paid for different land classes, alternative rates for certain types of land, and special rates for some counties. The statutes are:

> M.S. 477A,11-14 (In-lieu Payments Per Acre): Established amounts to be paid to counties per acre of state land in the county, by type of land ($3/acre acquired land, $.75/acre county-administered tax-forfeit land and $.375/acre of other land, including trust land and Consolidated Conservation land).

M.S. 84A.51 (Con-Con Fund): Established Consolidated Conservation Areas fund, for proceeds from management of state land in Con-Con areas. Apportions half (50 percent) of such proceeds back to counties and proscribes allocation of funds.

M.S. 89.036 (State Forest Fund): Apportions half (50 percent) of state forest fund gross receipts to county, to be received and distributed by the county treasurer as if ordinary property tax revenue.

M.S. 97A.061, Subd. 1 (Public Hunting Grounds): Prescribes three alternate formulas for "Public Hunting" payments to counties, with payment to be based on the formula that yields the largest amount.

M.S. 272.68, Subd. 3 (Rent Receipts): Provides for 30 percent (or other percentages as provided by other laws) of rent receipts from acquired land to be paid to counties as property taxes.

Except for Con-Con payments made according to M.S. 84A.51, the the other payments required by these statutes are deducted from the gross in-lieu payments that the counties would otherwise receive.

The net in-lieu of taxes payable in 1988 for Lake of the Woods County was $165,152. An additional $82,608 was paid to Lake of the Woods County for Con-Con payments (50 percent of the proceeds from management of state land).

Federal Resettlement Program

By the early 1930s, much of the land settled during the drainage period had been abandoned or tax-forfeited. A few scattered settlers, however, still lived in the area. The combination of unproductive lands and the economic depression of the 1930s,

forced many settlers into an extreme financial crisis. In 1933, the federal government responded by initiating the Land Utilization Project (L.U.P.) under the National Industrial Recovery Act. The L.U.P. authorized the Federal Government to purchase submarginal lands from isolated and distressed settlers and to relocate these people on more accessible and productive lands.

The Beltrami Island Development Project in Beltrami, Lake of the Woods, and Roseau Counties was initiated in 1935 at the request of the Minnesota Department of Conservation and the Minnesota Rural Rehabilitation Corporation. By 1936, over 300 families had been relocated on more productive lands within these counties.

In 1940 the 80,781 acres of scattered Beltrami Island L.U.P. lands were leased to the State of Minnesota 33,951 acres are in the Baudette Area (administered by the Division of Wildlife but cooperatively managed with the assistance of the Division of Forestry). The term of the lease was for a period of 50 years with provisions for automatic renewal for three successive terms of 15 years each. This lease will be up for renewal in 1990.

In the Baudette Area, the Division of Forestry administers 5,177 acres that were acquired through the Land Utilization Project.

The Volstead Act provided for the patent of federal lands in drainage systems upon payment of the drainage taxes accruing to the land; all other provisions of homesteading were waived. Many of the Volstead lands were quickly patented by settlers and absentee owners, regardless of the suitability of the land for agriculture.

The federal government refused to pay the taxes assessed against the unsold Volstead lands adjoining drainage ditches, and, as a result, the state included these tracts in their list of tax-forfeited lands. The legality of these actions was disputed until 1963, when the state purchased these lands from the federal government.

Figures 3-2-2, 3-2-3, and 3-2-4 show the different categories of land acquisition in both the state forests and the land currently outside state forests in the Baudette Area.

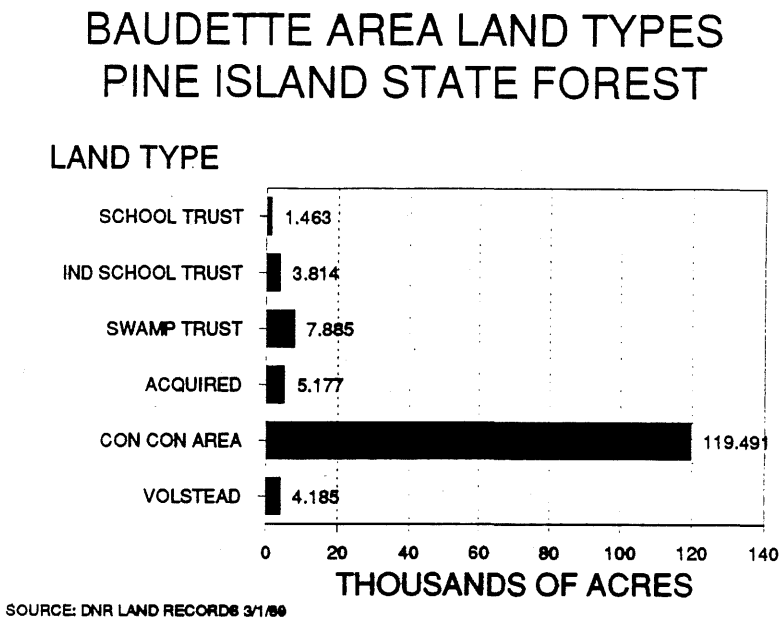


Figure 3-2-2

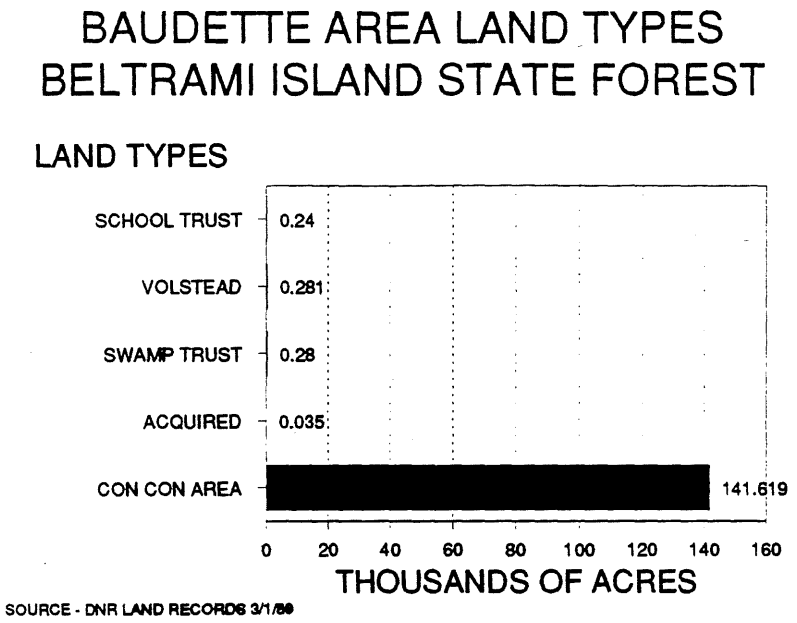


Figure 3-2-3

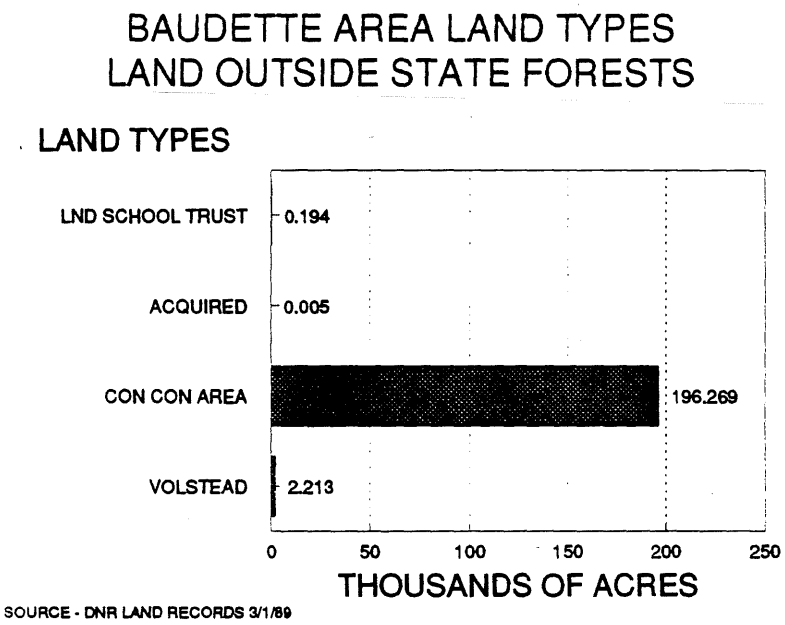


Figure 3-2-4

Leasing

The Division of Forestry is responsible for the approval of requests for surface leases, licenses and easements on all forestry administered lands in the Baudette Area; based on the compatibility of the proposed use with natural resource management objectives. The Bureau of Real Estate Management issues required surface leases, licenses or easements and upon approval of rates issues these contracts and the records and accounts. The Division of Forestry is responsible for monitoring the use of state land to assure compliance to contract terms. Con-Con, tax-forfeited, and other state owned mineral rights are leased and managed by the DNR Division of Minerals.

The leasing is beneficial to the people of the state. It provides a service to the public, both directly, as in the case of an agricultural lease, and indirectly, as in the case of a utility license. Also, the leasing provides income to the state and county, and can have a positive impact on other resources. The types and amounts of leases are shown in table 3-2-1.

Currently, problems exist in 1) the ability of existing numbers of staff to monitor all outside use of the nearly one half million acres of state leasing and 2) timely processing of requested leases and 3) in maintaining consistent lease rates which reflect current market trends. Land use trespasses are another recognized problem.

Table 3-2-1: Summary of surface use leases, leases, easements, metallic mineral leases, and licenses (land use) in the Baudette Area as of October 1989.

Contract Type	Number Issued	Miles or acres
Leases		
Earth Removal	32	564.84
Agriculture	19	1,034.78
Commercial	3	296.31
Miscellaneous	6	15.12
Hunting Cabin Site	18	6.32
Governmental	4	52.45
*Metallic Mineral	33	14,499.63
Utility Licenses	15	104.37
Right of Way Easements	22	30 miles

*As of 1/11/90.

DIRECTION

Optimal land ownership patterns and land use patterns vary by management objective. Scattered parcels have significant value in terms of wildlife, recreation, and minerals, whereas more contiguous blocks are desired for wood fiber production.

In order to achieve the goals of this program, there will be proposals for land exchange, land classification efforts with the counties, sales, transfers of administrative control to other DNR Divisions, management unit designations such as State Forests and Wildlife Management Areas, leases, and easements.

Land Classification

The land classification system used in Lake of the Woods County utilized the classifications completed in the early 1970s as a starting base. A classification committee consisting of three members appointed by the Lake of the Woods County Board and representatives of the DNR Divisions of Forestry, Fish and Wildlife, Minerals and the Bureau of Lands first met in January of 1984. The purpose of this committee was to identify lands to be retained or disposed of by sale or exchange. A third classification category called provisional is used to identify lands where no agreement upon the disposition could be reached. Provisional land will be reviewed periodically.

Land classification proposals were also made for Koochiching County during the development of this plan.

Specific Proposals for Consolidated Conservation Land

1. A total of 2,883.32 acres of surplus lands identified to be sold (Figure 3-2-5) will be disposed of on a schedule to be determined by the Lake of the Woods County Board. (Refer to the land administration appendix and the large map of the Baudette Area for details.)
2. Transfer of administrative control of 28,338.32 acres in six tracts from the Division of Forestry to the Division of Fish and Wildlife.

3. 133,035.16 acres will be added to administrative and scattered state forest status in Lake of the Woods County. 24,925 acres in Koochiching County will be considered for addition in the Region II Forest Management Plan.
4. A total of 8987.90 acres will be classified as provisional. These lands will be reviewed in 1999 or sooner if significant land use patterns develop (see Figure 3-2-5).

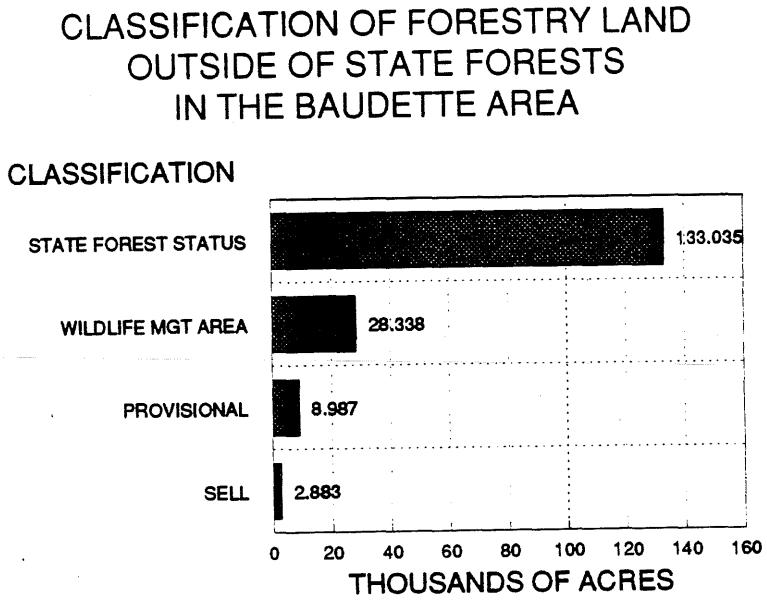


Figure 3-2-5

Peatland in RMU 3

All land in RMU 3 is classified retain in order to protect the ecological integrity of the peatland and therefore no sales, exchanges, or transfers of administrative control are proposed. (See Section 3-6, Page 48, for specific protection proposal.)

Beltrami Island Lease

The current 50-year lease ends on the second day of August 1990, and shall be automatically renewed for three successive terms of fifteen years each, unless written notice to the contrary is given by either party to the other not less than ninety days prior to the expiration of this instrument...and each renewal shall be subject to all the terms and conditions of this lease. All LUP lands are within RMU 2.

Specific Proposals for Beltrami Island Lease

The DNR supports the renewal of the lease with the Division of Fish and Wildlife continuing to act as the administrator of the lands with cooperative management by the Division of Forestry.

Leasing of State Lands

The goal for leasing will be to improve service, identify lease opportunity, and improve the fee setting methods so that lease rates reflect fair market value and are consistent.

Specific Proposals for Leasing

1. Inventory resources to determine leasing opportunities
   a. Gravel - Review available soils maps and field check soil types with gravel potential.
   b. Agricultural - Forestry and Wildlife personnel should inventory existing fields and sites with agricultural potential and identify fields which should or should not be farmed.
   c. Wild rice - Use system developed by Blackduck Area and inventory State land suitable.
   d. Minerals - Cooperate with Minerals Division for inventory.
2. Agricultural lease proposals (RMUs 1 and 2)
   a. Area to conduct annual inspections to assure compliance to lease terms.
   b. Annually meet with Regional Realty Manager, County Assessor, County Extension Agent, and Warroad Supervisor to set agricultural lease fees.

c. Involve Area Wildlife Manager in establishing food plots.

d. Remove highly erodable soils from lease program by not renewing.

e. Phase out woodlot pasture leases by 1995.

3. Gravel lease proposals (RMUs 1 and 2)

a. Area to inspect gravel leases annually to insure compliance to lease terms.

b. Identify (post) boundary limits of pit.

c. Provide over-the-counter gravel lease system.

d. Base lease rate to be based on 10 percent of land value or annual requested volume (this will be coordinated with BREM.

e. Identify special use and reserve gravel sites.

4. Land use trespasses

a. Will be pursued, as they occur or are discovered, using existing regulations.

Table 3-2-2: Objectives and Targets for FY 1989 and 1992
Land Administration

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't. AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
Leases and Permits								
1. Administer leases	leases	X		44	14	49	107	105
2. Process special use permits	permits							
Acquisition, Sale, or Exchange								
3. Acquire rights-of-way	miles easements							
4. Other acquisitions	acres							
5. Transfer admin. control	acres	X (1)					28M	
6. Exchange land	acres	X (2)		10			10	0
Classification								
7. Transfer trust status	acres							
8. Propose or review land classifications	acres	X (3)		167 M		173 M	340 M	0
9. Review ditch assessments	acres projects	X (4)		10 M	10 M	10 M	30 M	5 M

Specific Details

(1) Transfer administration control of designated con con land (north of Hwy 11) from Forestry to Wildlife.
(2) State with County - Boy Scout Camp.
(3) Complete reclassification of all state land in Lake of the Woods County.
(4) When ditch assessment rules are finalized, the work will began. Forestry's role is unclear at this time.

FOREST RECREATION ASSESSMENT AND PROGRAM DIRECTION

ASSESSMENT

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

> To cultivate 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 consistent with user demands.

Recreation is recognized as consistent with the forest management philosophy of multiple use. It is defined 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.

DNR policy (Recreational Use of Minnesota State Forests, DNR Policy #9) is to generally limit development of state forest recreation areas to primitive campgrounds, day use areas, and recreational trails. 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 on forestry administered lands.

Tourism Planning and Development

Planning for recreational development on public lands is one of the first steps in increasing long term development of recreation

and tourism. The majority of the recreational land base in the Baudette Area is publicly owned. Developed accesses to water based recreation are generally in private ownership and intensively managed. Planning for the long term management and use of public lands and waters is important to continued growth and investment by the private tourism industry.

WILDLIFE-RELATED RECREATION

Recreation provided by wildlife resources in the Baudette Area is significant economic activity. Hunting, trapping, bird-watching and other wildlife-related activities contribute to tourism in Minnesota as well as the Baudette Area.

Big Game Hunting

White-tailed deer hunting in the Baudette Area provides recreation for about 5000 firearms hunters annually. Historically deer hunting in the Baudette Area has been popular. In the mid-1960s, 3 percent of Minnesota's firearms deer harvest occurred here. However this proportion declined beginning in the early 1970s to 2.2 percent in 1976 and to between 1.5 and 1.7 percent in the 1980s. This decline reflects adjustments in antlerless permits and harvests (see Table 3-3-2). Primary factors affecting the year-to-year fluctuations in deer populations are: hunter harvest, the previous year's winter severity, and general habitat quality. Deer harvest is controlled by adjusting antlerless permit quotas, which are set based on pre-season deer population estimates. Currently (1987), deer hunting provides approximately 24,000 hunter-days of recreation annually. Deer harvests and recreation days will continue to fluctuate, but overall, are expected to increase slightly.

Black bear hunting provides about 1200 recreation days annually in the Baudette Area. Pre-season scouting and baiting provides 700 additional recreation days. Since 1980, an average of 54 bears have been harvested in the Baudette Area (Table 3-3-4). Harvests have ranged from 38 in 1982 to 73 in 1981, with harvests since 1983 at 48-59 bears. The percent of statewide harvest has

ranged from 3.3 percent in 1987, to 9.7 percent in 1982. More restrictive hunting seasons since 1982 and annual differences in bear response to baiting accounts for most harvest variation.

Small Game Hunting

Ruffed grouse provide the most hunter recreation (average of 8,000 hunter-days in 1982-86) in the Baudette Area. Between 1982 and 1986, ruffed grouse hunters harvested an average of 7000 ruffed grouse annually. In 1985 and 1986, about 800 spruce grouse were harvested each year. Ruffed and spruce grouse harvests have provided 3-4 percent of the statewide harvests during the last several years.

Sharp-tailed grouse hunting provides significant hunting recreation in the Baudette Area. Between 1982 and 1986, sharptail hunters averaged 2300 hunter-days afield and harvested approximately 1400 birds, annually.

Ruffed grouse harvests and hunter-days of recreation will increase for the next few years as these birds reach an expected ten-year population peak. Sharp-tailed grouse harvests will increase slightly over the next ten years, in response to more intensive management of transition habitat.

Trapping

Trapping license sales remained stable since the early 1980s. Species providing the majority of Baudette Area trapping harvest include: mink, muskrat, beaver, fox, coyote, and fisher. Future license sales will fluctuate with changes in pelt values.

Non-Consumptive Recreation

Observing wildlife is popular recreation in Minnesota. In the Baudette Area, substantial amounts of time are spent viewing and photographing wildlife. Big game species such as deer, bear, and moose provide the largest proportion of this recreation.

Unique bird-watching opportunities exist in the Baudette Area. Relatively inaccessible bog areas offer possibilities to observe and document nesting birds such as yellow rail, sandhill crane, and sharp-tailed sparrow. Excellent opportunities to view raptors, such as the rough-legged hawk, red-tailed hawk, snowy owl, short-eared owl, and marsh hawk, are seasonally available along Highway 72. Observing shorebirds, waterfowl, and colonial nesting birds on Lake of the Woods is another unique recreational opportunity.

Resource Values

Popular small and big game animals provide significant economic impact in Minnesota as well as the Baudette Area (MN DNR Fish & Wildlife Long Range Plan). For example, deer hunting provides approximately $165 of economic contribution from each hunter. This is based on deer hunter expenditures on arms, ammunition, equipment, food, lodging, and transportation. In 1987 deer hunting in the Baudette Area provided over $825,000 to the economy. Popular small game, such as ruffed grouse, provide economic value of $20 per grouse harvested. In 1987 Baudette Area ruffed grouse hunters returned over $160,000 to the economy.

Table 3-3-1: Registered Firearm Deer Harvest in the Baudette Area by Kill Block, 1980-87.

	Total Registered Harvest (All Deer)							
Block No.	1980	1981	1982	1983	1984	1985	1986	1987
211(101)[a]	1209(604)[b]	2044(1022)[b]	1841(920)[b]	2177(1088)[b]	2548(1274)[b]	1806(903)[b]	684(342)[b]	1442(721)[b]
104	244	299	264	356	290	222	215	295
205(305)[a]	325(163)	642(321)	601(301)	1150(575)	1226(613)	1259(630)	886(443)	1187(593)
214	44	50	14	20	13	16	15	48
Total[b]	1055[b]	1692[b]	1499[b]	2039[b]	2190[b]	1771[b]	1015[b]	1657[b]

a Approximately 1/2 of deer harvest occurs in the Baudette Area.
b Baudette Area proportion.

Table 3-3-2: Registered Firearm Deer Harvest (Bucks and Antlerless) in the Baudette Area, 1980-87, by Kill Block.

	1980[b]		1981		1982		1983		1984		1985		1986		1987	
Block No.	Bucks	Al	Bucks	Al	Bucks	Al	Bucks	Al	Bucks	Al	Bucks	Al	Bucks	Al	Bucks	Al
211(101)	442	162	536	485	472	449	498	590	409	864	385	518	254	84	529	192
104	177	67	242	57	222	42	238	118	158	132	155	67	147	68	243	52
205(305)	107	56	255	67	224	77	262	313	244	370	313	317	229	214	366	227
214	25	19	28	22	14	0	20	0	13	0	16	0	15	0	48	0
Totals	751	304	1061	631	932	568	1018	1021	824	1366	869	902	645	366	1186	471

a Proportion of Baudette Area harvest
b. Antlerless deer

Table 3-3-3: Lake of the Woods and Koochiching County and Statewide Firearm Registered Deer Harvest 1965-1987.

Year	Lake of the Woods Co.	Koochiching Co.[a]	Minnesota
1965	2868	8110	127,000
1966	1504	5810	115,000
1967	2079	5379	107,000
1968	2240	5296	403,000
1969	1581	3833	68,000
1970	866	1354	50,000
1971	Season Closed		
1972	1723	2934	73,448
1973	1540	2426	67,106
1974	1431	2255	64,997
1975	1345	2064	62,469
1976	503	933	28,613
1977	760	1387	45,918
1978	520	1386	47,253
1979	559	1429	44,069
1980	No data		68,330
1981	1524	2894	93,027
1982	1275	2074	93,045
1983	1805	3098	132,457
1984	1939	2450	132,042
1985	1692	2242	138,065
1986	952	2408	129,770
1987	1630	3090	135,635

a Approximately 15% of the Koochiching Co. harvest occurs in the Baudette Area

Table 3-3-4: Registered Black Bear Harvest in Koochiching and Lake of the Woods Counties, 1980-87.

Year	Koochiching Co.[a]	Lake of the Woods Co.	Total	
1980	137(27)[b]	30	167(57)[b]	(4.6)[c]
1981	149(30)	43	192(73)	(5.4)
1982	66(13)	25	91(38)	(9.7)
1983	105(21)	32	137(53)	(5.1)
1984	89(18)	41	130(59)	(6.4)
1985	95(19)	29	124(48)	(3.9)
1986	113(23)	32	145(55)	(3.9)
1987	126(25)	27	153(52)	(3.3)

a Approximately 20 percent of Koochiching County bear harvest occurs in the Baudette Area.
b Baudette Area proportion.
c Percentage of statewide total.

Conserving and Protecting Natural Resources for Recreation

Resources lost are difficult to restore or replace. Lands suitable for public recreation are in demand for private speculation and development. Land sales, of DNR administered lands, exchanges, and road abandonments must be reviewed for long-term impact on resource and recreation management.

There is an abundance of outdoor recreation opportunities in the Baudette Area (see overview section for discussion on supply and demand). With few exceptions, water based resources have been privately developed at the most favorable access points. State-administered lands have proved to be very suitable for dispersed recreation activities including hunting, snowmobiling, ATV use, trapping, nature study, and berry picking.

Opportunities for expansion or development of existing facilities are present on both public and private land. Dispersed recreation opportunities may be increased through better public information, maps, promotion, and an improved network of forest and county roads.

DIRECTION

Expanding the amount of forestry administered facilities is not recommended at the present time. Development of new facilities with the capabilities of changing the focus of recreational offerings is unlikely in this ten-year period. Privately owned facilities will expand their services as demand develops. The Division of Forestry in cooperation with the Trails and Waterways Unit have the opportunity to improve the Baudette Area recreation experience by continuing to rehabilitate, properly maintain, and develop the forest road and trails system, and existing recreation facilities. Facilities administered by the Division of Forestry will be analyzed to ensure they can accommodate additional use, and complement services supplied by private enterprise. The Division of Forestry will avoid new construction of recreation facilities that compete with the private sector or duplicate existing opportunities. Efforts will be made to cooperate with both public and private recreation providers in this planning.

Recreational opportunities will benefit from timber and wildlife management practices that improve habitat.

Dispersed Recreation

Dispersed recreation opportunities will increase with the expansion of the forest road system and development of a map showing land ownerships and accesses. Dispersed use should be informally monitored to prevent conflicts that may develop between different types of users. Rules and regulations for controlling dispersed use may be necessary in the future.

Information and Education

Public awareness of state facilities will be increased through Information and Education programs and by producing maps that show dispersed recreation opportunities and accesses. The Division of Forestry and the of Lake of the Woods Chamber of Commerce should cooperate on publication of a recreation user map that will include public lands and facilities.

Franz Jevne State Park

The Franz Jevne State Park is presently administered by the Division of Forestry for the Division of Parks and Recreation due to its small size relative to other state parks and its close proximity to the Birchdale Field Station. Adequate funding to develop, maintain, and enhance its qualities will be obtained by the Division of Parks and Recreation. Existing facilities will be upgraded by proposed additions of a fish cleaning house, trail development, new picnic tables, road graveling, I & E programs, and construction of a small fishing dock.

Forestry Campgrounds

Increasing the maintenance level of existing facilities at Blueberry Hill and Faunce Campgrounds is recommended to enhance user enjoyment and safety. These two state forest campgrounds have occasionally been maintained by a volunteer group. Adequate funding for supplies, and recognition of the volunteers is necessary to ensure continued support of this volunteer program. Existing toilets should be replaced with the standard DNR vault toilet. One toilet should be sufficient at each facility.

Snowmobile Trails

The Division of Forestry currently maintains 52.5 miles of snowmobile trails in the Baudette Area. Maintenance of the four snowmobile shelters will be continued through snowmobile trail funding. Additional trail use opportunities are provided by 90 miles of grant-in-aid trail administered by Lake of the Woods County. Snowmobiling on state forest trails has increased in recent years. Grooming has been contracted at a level that provides for the highest use periods such as Christmas vacation and the Bemidji to Baudette annual expedition. Conflicts between logging traffic and snowmobile use will be kept to a minimum by use of trails designated (before the season starts) for logging or snowmobiling. Conflicting trail uses between snowmobilers and logging traffic will be solved by temporarily rerouting where possible. Maps will be made and revised yearly showing changes. Traditional snowmobile use of portions of the Aichele and Nelson

forest roads will continue. Traffic regulations and user education is vital to the safety of all users. These precautions are vital to the safety of the users. An updated version of the current snowmobile map will be made to include changes in the grant-in-aid system.

Canoe Route

The Rapid River will be assessed for the feasibility of developing a canoe route.

Ski Trail

There is a three mile cross country ski trail at Blueberry Hill Forest Campground. This trail is cleared of obstructions annually but not groomed.

Trails Policies

The Department of Natural Resources has developed policies for State, Unit, and Grants-in-Aid trails (DNR Policies #10, #11, and #12). Division of Forestry Circular Letter 3501 sets forth guidelines concerning timber cutting and extractive operations adjacent to recreational trails on state land, and Operational Order #85 governs Recreational Motor Vehicle Use on DNR Administered Lands.

Recreational motor vehicle use has increased during the last ten years and this trend is expected to continue. There is concern that in some situations RMV caused disturbance negatively impacts wildlife, vegetative resources, soils and other types of recreation. Division of Forestry administered lands in the Baudette Area are generally open for use by recreational motor vehicles. A recreational motor vehicle is defined as:

> Any self-propelled vehicle and any vehicle propelled or drawn by a self-propelled vehicle used for recreational purposes, including, but not limited to, trail bike or other all-terain vehicle, hover-craft, or motor vehicle licensed for highway operation, which is being used for off-road recreational purposes, but not including snowmobiles.

In the Baudette Area, recreational motor vehicles are currently prohibited in all State Parks, Non-ATV Grant-in-Aid Trails, Scientific and Natural Areas, State Forest Campgrounds and Day Use Areas, Designated Walking Trails, State Wildlife Management Areas, State Water Access Sites, State Historic Sites, and State Rest Areas (exceptions must be posted or established in management plans that include opportunity for the public to comment on the exceptions). Areas normally open to recreational motor vehicle use can be closed on a temporary or permanent basis when such use is causing or is likely to cause:

1) significant damage to state property
2) conflict with other users
3) damage to environmentally sensitive areas, or
4) unsafe operation conditions or levels of use.

The Division of Forestry does not intend to develop any trails specifically for RMV use. The Division will, however, consider proposals for grant-in-aid ATV trails should clubs in the area be interested in developing a trail in the future.

Walking Trails

Designated "Walking Trails" will be posted closed to motor vehicles, recreational motor vehicles, and snowmobiles from March 15, to December 15, each year permits to use motorized vehicles may be granted. The primary objective of regulating these trails is to provide opportunity for trail associated recreation in a setting undisturbed by vehicles. The locations of these trails are shown on the large map in the appendix. Motorized vehicles may be used on these trails for designated management purposes by DNR authorization.

RMU 1

Division of Forestry administered land is open to the public in scattered blocks for hunting, trapping, cross county skiing, berry picking, and other dispersed recreation uses. Recreation facilities adjacent to state highways receive heavy seasonal use. This unit contains major concentrations of privately owned

recreation facilities that utilize water based resources. This RMU contains two state parks - Zippel Bay (administered by Parks) and Franz Jevne (administered by Forestry). Blueberry Hill State Forest Campground provides a frequented wayside rest due to its proximity to Highway #11. Visitors include many day-use picnickers and an occasional overnight camper. The Bernhoft WMA and, and the Pine and Curry SNA are in this RMU.

Management Strategy

The primary management focus will be to enhance wildlife habitat which will in turn provide increased recreational opportunities for hunting and for observation. Most forest access trails will remain open to provide dispersed recreational opportunities.

Assistance will be provided to other forest landowners and administrators regarding multiple use forest management. The Division will cooperate with other recreation providers, when possible by making state administered lands available for trail development thru leases and agreements when compatible with state forest land management practices.

Specific Proposals

1) The Division of Parks and Recreation will request funding for rehabilitation and maintenance of Franz Jevne State Park through its budget process.
2) A formal signed trail easement in NE 1/4 of section 7-161-34 should be obtained from the private landowners to route the snowmobile trail through the existing power line corridor.
3) Snowmobile trail maps will be updated to show changes in the grant-in-aid trail system.
4) A recreation user map will be developed with access to state-administered lands and land ownership designation clearly defined.
5) Secure funding for maintenance materials used at Blueberry Hill Campground.
6) Publicly acknowledge (annually) volunteer work performed to maintain Blueberry Hill Campground.

7) Provide forestry demonstration projects and interpretation of vegetative management practices in and around Zippel Bay State Park as a cooperative effort with the Division of Parks and Recreation.

8) Coordinate use of sentence to serve labor from Lake of the Woods County Sheriffs office for Blueberry Hill Ski Trail Maintenance.

9) Selected trails will be designated as "walking trails."

Table 3-3-5: Rehabilitation of Facilities in RMU 1

Facility	Cost
Franz Jevne Campground	
Fish Cleaning House	$ 8,000
Trail Development	2,000
Picnic Area Tables	1,500
Campsite Tables & Rings	4,500
Toilet Replacement	8,000
Gravel Road, campsites	10,000
Signing & I&E	2,000
Roll In Dock	2,000
Total	$37,000
Blueberry Hill Campground	
Toilet Replacement	$ 4,000
Gravel Road 4	2,000
Signing 4	500
Campsite Tables & Rings	3,500
Total	$10,000

Table 3-3-6: Annual Maintenance Costs of Facilities in RMU 1

Facility	Cost
Franz Jevne	$1,280
Blueberry Hill	100
Total	$1,380

RMU 2

This RMU is popular for recreational activities. Due to the extensive acreage of continuous DNR administered land, it receives the most recreational use from activities such as hunting, trapping, berry picking, and snowmobiling. Faunce State Forest

Campground is used mostly by hunters and berry pickers. During the season, there are scattered traditional hunting camps along all forest roads.

Management Strategies

Forestry's role in recreation will be to provide maps and information that show opportunities for dispersed recreation while increasing visitor awareness and appreciation for multiple use management of the forest. Campgrounds will remain primitive in a natural forest setting. Forest recreational facilities will be maintained so they continue to be complementary to private resort facilities in RMU 1.

Recreational access will be developed in conjunction with forest management activities and as designated recreation trails.

Alternate trail routes or cautionary signs will be used where trail use conflicts exist. Walking trails will be designated.

Detailed land ownership and road access maps will aid the public in use of the forest for dispersed recreation.

Specific Proposals

1) Secure funding for maintenance supplies used at Faunce Campground.
2) Annually acknowledge volunteer labor who maintain Faunce Campground.
3) Perform annual clearing and signing of the state forest snowmobile trail and associated shelters. Grooming will be limited to high use periods.
4) An effective forest road maintenance and development program will be employed to provide public access on forest roads.
5) An area map with public land ownership, state forest roads and county road accesses will be developed and distributed.
6) Selected trails will be designated as "walking trails."

7) Operational trials of Hexazinone as a site prep herbicide to promote blueberry culture in combination with timber production will be implemented.
8) The DNR will strive to renew the lease for LUP (see land administration section) lands to maintain recreational opportunities.
9) Maps of snowmobile trails will be revised to ensure forest roads are not mistaken for groomed snowmobile trails.
10) Assess the physical attributes of the Rapid River for the development of a canoe route.

Table 3-3-7: Rehabilitation of Facilities in RMU 2

Facility	Cost
Faunce Campground	
New Toilet	$4,000
Tables & Rings	1,500
Total Cost	$5,500

Table 3-3-8: Maintenance Costs of Facilities in RMU 2

Facility	Annual Cost
Faunce Campground	$ 100
Snowmobile Trails	1,600
(Funding by Trails & Waterways)	
Total Cost	$1,700

RMU 3

This RMU provides the least amount of recreational use due its nature and inaccessibility. It contains part of one of the largest and unique ecosystems in the nation; known as the "Big Bog" or Red Lake Peatland. To protect this unique ecosystem, summer access roads will not be built.

Management Strategies

Recreational use includes hunting, trapping and nature study. Unique plants, wildlife and geology are features of the peatlands that attract some recreation.

Specific Proposals

Continue to monitor recreational use while performing routine management activities to insure that only those recreational activities compatible with the area occur.

Table 3-3-9: Objectives and Targets for FY 1989 and 1992
State Forest Recreation

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
Development/Rehabilitation								
1. Develop/rehab. facilities								
a. campgrounds	campgrounds						2	
	campsites							8
b. day-use areas	areas							1
c. water accesses	accesses							
d. trails	miles		X	0	1	3	4	6
Operations/Maintenance								
2. Operate & maintain facilities								
a. campgrounds	campgrounds		X		1	2	3	3
	campsites		X		13	14	27	30
b. day-use areas	areas		X	2	2	2	6	6
c. water accesses	accesses		X					1
d. trails	miles		X				55	55
e. canoe routes	miles		X					
Interpretation/Information								
3. Develop recreation user maps	maps	X (1)	X (2)			X (3)	3	

Specific Details

(1) Area user map - Forestry will supply the base map and the Chamber of Commerce will detail and print.
(2) Snowmobile trail map update
(3) Ski trail map

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.

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. Recreational use of the state forests and state forest road system exceeds timber management traffic during peak hunting and berry picking seasons 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 multipurpose 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 roads are multi-purpose, all weather, two-lane gravel roads. Their design allows for relatively rapid movement of a wide variety of vehicles. Class 2 roads serve the most heavily used recreational and forest areas.

Class 3 roads are multi-purpose, all weather, one and a half lane gravel roads. These are designed for moderate speed in one direction with passage of two vehicles, but at reduced speeds. Class 3 roads serve as main system roads for forest management and a variety of recreational opportunities.

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 closed for resource management purposes. They may be closed with boulders, earthen berms, gates or signs restricting use of motorized vehicles.

The Baudette Area contains 177.05 miles of Division of Forestry-administered roads in the Class 2-5 designation (see Table 3-4-1). Class 6 roads are detailed on the area maps and total miles will be calculated when digitization of all township covertype maps have been completed. There are no Class 1 forest roads and plans do not include upgrading existing roads to Class 1 or construction to this level. The trunk forest road system in the Baudette Area is not complete. A total of 3.5 miles of new haul roads in Class 3 will be constructed to access timber management and forest development work on sites identified by the TMPIS program.

Upgrading of the trunk system has been underway since 1980. Bridge redecking, culvert replacements, road class upgrading, new bridge construction, roadside vegetation control, and surfacing has been emphasized for safety and summer hauling of full highway loads.

Maintenance of the forest road system and bridges is a continuing concern. Road maintenance funding has increased since 1980. Use of the division owned GSA cat-12 motor grader, using a hired intermittent labor, has allowed maintenance grading and minor reconstruction at a significant savings over contracting costs. Contract grading will continue to be done wherever the cost and scheduling appears to be beneficial. Winter maintenance on forest roads is restricted to snow removal on limited portions of roads for specific management objectives.

TABLE 3-4-1: Miles of Existing Forest Roads

	RMU 1	RMU 2	RMU 3	TOTALS
Fierro		6.90	1.00	7.90
Frontier		7.20		7.20
Sandsmark		4.20		4.20
Rapid River		26.00		26.00
Indian Pines		18.80		18.80
Faunce		15.00		15.00
Stoney Corners		13.25		13.25
Nelson		12.70		12.70
Krull		9.00		9.00
Faunce-Butterfield		7.00		7.00
Bankton		15.00		15.00
Firebreak (no regular maintenance)		6.00		6.00
Spina		3.90		3.90
Hogsback		7.10		7.10
Farmer (no regular maintenance)		1.00		1.00
Aichele	1.50	5.00		6.50
Pitt Grade		16.50		16.50
Franz Jevne	.30			.30
	1.80	174.55	1.00	177.35

For the present time, maintenance levels of forest roads are acceptable. However, there is a concern about obtaining sufficient funding for adequate future maintenance.

The topography of the Baudette Area requires many water crossings. The majority of these are culverts which require continual maintenance due to beavers and structural damage. There are a number of large "tank car" culverts and nine bridges which serve the road network in crossing the major drainages. These major crossings will be evaluated by Engineering and replaced in order of need as funding is available. At least five will be replaced by 1996.

DIRECTION

Some Division of Forestry administered lands in the Baudette Area do not have road access. Planned timber management and forest development work will determine whether to provide access. Cooperative road funding with the Division of Fish and Wildlife and others will be explored where there are multiple benefits.

Timber access roads will be reviewed by Division of Forestry and the Section of Wildlife for designation as "walking trails." The nature of the topography, soils, and enforcement of posted restrictions will generally preclude the need for gates or obstructions to close these roads to vehicle traffic.

Area road committees have been organized with local participants as mandated by the Forest Road Act of 1988, and have held initial meetings for Koochiching and Lake of the Woods Counties. Coordination of road management efforts with other road authorities will continue through annual road committee meetings. County road projects eligible for funding by the State Park or Township Road Accounts will be annually referred to the State Screening Committee.

All forest roads will be restricted by seasonal weight limits during spring breakup. This weight restriction will usually run concurrent with county weight restrictions. Individual roads will be closed for additional periods to protect them during wet conditions, or to protect resources during periods of high fire danger.

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

Approximately, 35.8 miles of road reconstruction will be performed during the next ten years. Approximately 100 miles of road will be resurfaced during the next ten years. Approximately six miles of new Class 6 logging spurs will be built per year in the next ten years.

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 lands adjacent to major roads or highways:

1. Regeneration of clear cut areas adjacent to major state or county highways will be clearly visible to motorists prior to cutting adjacent stands, if this delay is silviculturally sound.
2. Clear cuts will be no more than 1/4 mile in length adjacent to roads.
3. When harvesting along roadside edge, cutting and slash disposal regulations will produce an aesthetically acceptable cutover designed to promote rapid regeneration.
4. Regeneration of timber harvest areas adjacent to major roads by artificial means will be identified to the public by plantation establishment signs, upon successful establishment.

State Forest Road Program Objectives 1986 - 1996

- Update and maintain the state forest road inventory for the Baudette 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.
- Develop a forest road and right-of-way maintenance and construction schedule and budget as determined by the Timber Management Plan and recreational needs.
- Reconstruct existing state forest roads to meet safety and use requirements, particularly when growing demand for timber and recreation exists.
- Relocate recreation trails off the state forest road system to provide for user safety.
- Clarify responsibility for the management, maintenance and construction of forest roads accessing areas of mixed forest ownership.
- Establish a list of official county roads providing access to state land.
- Challenge county abandonment of specific ditch grade roads..
- Protect archeologically unique areas from road development.

Coordination With Other Divisions, Agencies, and Organizations

The Division of Forestry will continue to cooperate with counties and MnDOT engineers on transportation issues.

A road committee has been established and meetings scheduled as directed by the Minnesota legislature. This committee will assist in transportation planning.

Cooperative funding agreements with the Section of Wildlife to construct roads to previously inaccessible timber and habitat will be pursued. Preliminary review of the wolf management road densities policy indicate that road construction projects proposed in this ten-year plan will not be in conflict with that document. New road construction will avoid private ownership, or seek easements from landowners. New road construction will avoid private ownership, or when this is not possible formal easements will be sought from landowners.

The Division of Minerals has an ongoing program in industrial minerals (sand & gravel inventory, mapping). All activites concerning sand and gravel will be coordinated with staff from the Division of Minerals.

Forest road projects will be reviewed by the Division of Waters and Army Corp of Engineers, where appropriate, to ensure that all water permits and flood plain requirements are addressed. The Division of Forestry will comply with Minnesota Statute 471.99 requiring notice to local county officials 30 days prior to new road construction projects exceeding $15,000.

A gravel deposit inventory will be conducted by contract, to identify volumes and locations of gravel deposits. Strategic deposits for forest road maintenance and construction will be reserved for division use. Deposits of interest to MnDOT, county, and private contractors will be considered for lease.

RMU 1

This unit has an excellent transportation network administered by the Department of Transportation and the counties. There are 1.8 miles of forest roads existing in this RMU. Franz Jevne Park Road - .3; Aichele - 1.5 (of 6.5).

Management Strategy RMU 1

No new roads above Class 6 will be built. The main emphasis of the forest road management program in this RMU is to provide access to DNR-administered lands. Gravel deposits are in demand to be leased by county and private contractors in this RMU.

Retaining existing public access to state administered lands will be a high priority. Incidental brush clearing by mechanical shears that are accessing resource management projects will clear encroaching vegetation from judicial ditch grades which serve as public access. Existing forest roads will be maintained at their current level, or upgraded as response to TMPIS planned management activities. Contract grading of existing forest roads will be performed as needed.

Specific Proposals

1. A map of county roads (officially recognized) will be obtained from county engineers.
2. New gravel deposits will be scrutinized for lease auction suitability.
3. Challenge closure of County Road #64. This road provides needed access to DNR administered land.
4. Conduct archeological investigation of proposed road improvements in Franz Jevne State Park.
5. Upgrade the Aichele Forest Road to an all season access for the first 1.5 miles at a cost of $8,000.00
6. Contract grade the Franz Jevne State Park Road at a cost of $100.00, annually.
7. Realign portions of the Franz Jevne Road (conform to archaeological investigation report recommendations). Utilize dozer and motor grader at a cost of $2,000.00.

RMU 2

This unit contains 174.55 miles of forest roads Class 2-5, in addition to identified Class 6 roads, which are accessed by state and county roads. Existing forest roads are built on sandy beach ridges or ditch grades. Maintenance requirements include spot graveling, culvert replacement, roadside vegetation control, removal of blowdown trees, beaver control, culvert cleaning, and turnout construction.

In the past five years, $828,100 was invested in maintenance and reconstruction of the trunk road system. Major reconstruction projects upgraded 42.94 miles of forest road including portions of the Rapid River, Stoney Corners, Hogsback, Indian Pines, Pitt Grade, Frontier, and the Canning Forest Roads. An average of 541 hours of DNR-owned grader time and 65 hours of contracted grader time has been applied to the road system each year.

A major road right-of-way maintenance program was undertaken in 1985 and will continue through 1988. Heavily encroached upon right-of-ways were mechanically brushed in 1985 and 1986. A

60-mile project of mechanically treated right-of-way which had sprouted back was chemically treated in 1987.

Approximately 64M cubic yards of stockpiled gravel are distributed as follows:

- Frontier Forest Road 18.0M
- Faunce Pit 0.5M
- Spina Pit 20.0M
- Indian Pines Pit 17.0M
- Stoney Corners Pit 8.0M
- Rako Pit 0.5M

Total 64.0M cubic yards

Management Strategy

Three and one-half (3.5) miles of Class 3 new construction, 19 miles of Class 6 winter road improvements, and 16.8 miles of reconstruction of Class 3 roads will be performed during this plan. Location of these projects will be driven by management activities identified through TMPIS and recreation and other resource needs and demands.

Maintenance activites are road specific. They will be coordinated on the basis of timber hauling and recreational use with consideration also being given to weather and road conditions. The objective is to maintain the drainage of water from the road surface and along the ditches. The surface of Class 2-4 roads should be maintained regularly to provide a condition that is at least passable for high clearance vehicles. Soft spots will be repaired as part of the ongoing maintenance activities. Class 5 and 6 roads will be maintained as needed to provide a stable road surface.

Seasonal weight restrictions by specific forest road will be utilized to prevent damage to forest roads during spring breakup.

Snowmobile recreational trails will be moved from the Nelson forest road to a parallel or alternate course where feasible. Timber management traffic will be separated from snowmobile traffic corridors.

Vegetation will be maintained to provide for safe sight distances and road drying. Future chemical vegetation control on right-of-ways will be implemented at intervals determined by vegetation growth rates. It is anticipated that 50 to 90 miles will require treatment each year.

Beaver activity will be monitored to prevent damage to forest roads.

New gravel pits will be pioneered to provide for specific projects and emergency maintenance. Approximately 70,000 cubic yards of gravel will need to be stockpiled to maintain reserves.

Specific Proposals

1. In FY 1989, 91 miles of road right-of-way will be chemically treated at a cost of $7,142.
2. Future chemical or mechanical treatments will be performed as broad leafed sprouts exceed 3′ heights within 12′ of the travel way edge, create a safety hazard, or block drainage.
3. Use of the experienced road grader operator (intermittent laborer) will continue as funding is available.
4. Contract grading of the Indian Pines, Fierro, and Sandsmark Forest Roads will be performed at an annual cost of $3,200.
5. Snow removal for forest management will be limited to the Faunce Butterfield Road, and the Faunce Road from the north end to the Bankton, if funding and labor allow.
6. The Indian Pines reconstruction of 2.8 miles will be performed as needed.
7. Diamond Ridge Road construction addresses the access problem in the Birchdale Field Station. This Class 6 winter road will bisect the northern one-half of the Birchdale District in an east-west direction.

8. Approximately, six miles per year of Class 6 logging spurs will be created by loggers accessing timber sales.
9. An existing easement through section 33-160-29 will be researched and reviewed by the Attorney General's Office in preparation for future construction of a north-south oriented forest road.
10. New construction of 3.5 miles will connect the Frontier and Farmer Forest Roads and will reduce maintenance costs on the Frontier Road by absorbing loaded truck traffic.
11. Beaver damage will be controlled with assistance from the Section of Wildlife and the Division of Enforcement.

TABLE 3-4-2: New Road Construction in RMU 2 by Priority

ROAD NAME	MILES
Frontier-Farmer Loop	3.5

TABLE 3-4-3: Road Reconstruction in RMU 2 by Priority

ROAD NAME	MILES
Rapid River	9 of 26
Aichele	5 of 6.5
Indian Pines (Boise Boulevard)	2.8
Diamond Ridge Winter Road	19

TABLE 3-4-4: Road Graveling - Maintenance and Reconstruction in RMU 2

Road		Yards
Bankton	6"x 14'x 3 miles	4,110
Hogsback	6"x 14'x 4 miles*	5,480
East Rapid River	6"x 14'x 9 miles*	12,330
Pitt Grade	6"x 14'x 9 miles	12,330
Fierro	6"x 14'x 6.75 miles	9,248
Frontier	6"x 14'x 6 miles	8,220
Sandsmark	4"x 14'x 4.25 miles*	3,880
		55,598

* Will require new pit construction.

TABLE 3-4-5: Forest Road Bridge Replacement Schedule

Bridge Identification	Bridge Type	Replacement Date	Forest Road
L 9751	2 steel tank cars	2000	Fierro
11-157-28	2 steel tank cars	2000	Fierro
12-157-32(NWNE)	steel tank car	1990	Rapid River
12-157-32(NENE)	steel tank car	1995	Rapid River
24-157-34	galvanized steel pipe	1999	Rapid River
L 9258	flat car	1999	Rapid River
10-157-32	laminated wood	2031	Rapid River
L 9260	flat car	2005	Rapid River
L 9307	flat car	2015	Indian Pines
26-158-29	laminated wood	2038	Indian Pines
L 9257	flat car	2014	Pitt Grade
L 9256	flat car	2014	Pitt Grade
24-158-33	laminated wood	2035	Bankton
27-158-33	galvanized steel pipe	2030	Bankton
30-158-33	steel tank car	1995	Faunce
31-158-33	steel tank car	2005	Faunce
24-157-34	steel tank car	2015	Rapid River

RMU 3

This unit has limited access consisting of ditch grades and Christmas tree cutting roads. State land ownership is in a contiguous block. No deposits of gravel are presently leased and no gravel exploration is anticipated.

Management Strategy

The forest road system is connected to this RMU by ditch grades and winter logging trails. No roads above Class 6 will be constructed in this unit. The only maintenance to be performed will be on the one-mile segment of the Fierro Trail which bisects RMU 3 to connect to the Pine Island Forest Road. Access will continue to be by helicopter or snowmobile for management purposes.

Specific Proposals

1. One mile of the Fierro trail is within this RMU. A gravel lift and construction of two turnouts will be performed at a cost of $1400.
2. Chemical or mechanical control of encroaching vegetation will be performed when broad leafed sprouts exceed 3' height within 12' of the road way, impede safety, or obstruct drainage.
3. Chemical right-of-way treatment is scheduled for 1988 at a cost of $120.

TABLE 3-4-6: Objectives and Targets for FY 1989 and 1992
State Forest Roads

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
1. Construction	miles				4.8 (3)	4.8	3.5 (6)	
2. Reconstruction	miles		X	3 (2)	6.5 (1)	9.5	16.0 (5)	
3. Bridges repaired/replaced	bridges					1 (4)	1	
4. Culverts repaired/replaced	culverts		X	2	3	3	8	8
5. Class 1-4 roads maintained	miles		X				1500	1500

Specific Detail

(1) Rapid River west reconstruction
Aichele Reconstruction
(2) Bankton Gravel Project
(3) Boise Boulevard Construction
(4) Repair railing on Peet's Bridge
(5) Turnouts on Fierro Trail
(6) Frontier Farmer Loop
2.5 miles new
1 mile reconstruction

Special Emphasis

1. Roadside spraying will be used to control encroaching vegetation. Approximately 91 miles will be herbicided.

TIMBER MANAGEMENT

INTRODUCTION

Statewide Goal of the Timber Program

Efficiently apply sound silvicultural practices to regenerate and improve productivity of state-owned forest lands while providing a sustained yield of forest resources for Minnesota citizens.

The goal of the timber management program is met primarily by regulating timber harvests and by regeneration of areas harvested. The basic function of regulating harvests is to promote sustained yields of forest products. The basic function of stand regeneration is to assure that state lands are maintained in appropriate cover types to meet future multiple use demands.

The Forest Resource Management Act of 1982 requires the Division of Forestry to assure that reforestation activities will occur in three areas: Regenerate timber on an equivalent amount of acreage as is harvested each year; regenerate previously harvested areas that have not been reforested adequately; and regenerate poorly stocked forest stands to return them to a state of greater productivity.

ASSESSMENT

Summary of Major Cover Types

Table 3-5-1 is a summary of acres in each cover type. The lands included are all DNR-administered lands except for State Park Lands. Cover type acres are separated by RMU.

TABLE 3-5-1

Area of Forest Land by Cover Type and RMU
All DNR administered land except Park.

COMMERCIAL FOREST LAND

	RMU 1	RMU 2	RMU 3	TOTALS
Ash	427	5,618	77	6,122
Willow Species	8			8
Lowland Hardwoods	52	2,719	31	2,802
Aspen	13,831	70,941	394	85,166
Paper Birch	265	3,030	65	3,360
Balm of Gilead	2,647	6,184	200	9,031
Northern Hardwoods	7			7
Oak		234		234
White Pine		47	8	55
Norway Pine	161	3,054		3,215
Jack Pine	1,134	9,819		10,953
White Spruce	68	1,829		1,897
Balsam Fir	513	5,146	74	5,733
Black Spruce	2,406	46,446	2,158	51,010
Tamarack	2,937	39,630	5,400	47,967
White Cedar	1,130	12,502	609	14,241
Upland Black Spruce	30	435		465
TOTALS	25,616	207,634	9,016	242,266

NON-COMMERCIAL FOREST LAND

	RMU 1	RMU 2	RMU 3	TOTALS
Stagnant Spruce	8,776	59,095	9,452	77,323
Stagnant Tamarack	34	12,608	6,508	19,150
Stagnant Cedar	1,872	13,485	2,800	18,157
Offsite Aspen	291	1,544		1,835
TOTALS	10,973	86,732	18,760	116,465

DEFORESTED FOREST LAND

	RMU 1	RMU 2	RMU 3	TOTALS
Cutover Area	104	3,200	13	3,337
Lowland Grass	517	3,246	79	3,842
Upland Grass	896	2,044	2	2,942
Lowland Brush	15,065	59,460	7,490	82,015
Upland Brush	128	483		611
Moss	78			78
TOTALS	16,788	68,453	7,584	92,825

The lowland hardwood and ash types are the primary riparian types in the area. These two types are of very similar species composition. The lowland hardwood type is mostly ash with some American elm. Much of the elm is dead or dying due to Dutch elm disease. Lowland hardwood stands located on river bottoms are usually of higher quality.

The aspen type covers more acres than any other forest type in the area. A large age class imbalance occurs in this type. Most of the aspen acreage is mature to overmature with few acres in the intermediate age bracket. Stand quality and productivity ranges from poor offsite aspen to excellent pulp and bolt material. Management activities in the aspen type have a strong impact on wildlife habitat. A large percentage of the aspen available for the next ten years will be accessible only in the winter.

The birch type in the Area is very limited. Many townships have only one or two stands. Birch is commonly mixed with other species. Pure stands of birch exist only in small acreages. Birch is generally a valued species for fuelwood. In a few locations it meets sawtimber standards. The birch type is similar to aspen in terms of its value as wildlife habitat.

The oak type occupies few acres in the area. Most oak is growing on poor sites and is not considered to be a merchantable timber type. Oak is present as a component of lowland hardwood, ash and some aspen types, and is often found in stream corridors. Oak has little commercial value in the Area but has considerable value to a wide variety of wildlife species.

The white pine type is declining in the Area. Once a major component of the upland pine forest, it has been all but eliminated due to logging in the early part of the century, land clearing, and disease. Scattered trees can be found in many pine and aspen stands on loamy soils. It continues to be a high value sawtimber species, but is generally found as scattered trees.

The Norway pine type has been increasing in acreage since the late 1930s due to extensive planting on upland pine sites. Most of the sites suitable for this species are found in RMU II and have already been planted. Norway pine growing stock is reaching sawtimber size, the highest value timber product in the area.

The jack pine type is one of the larger upland types in the area. It is very valuable in terms of wildlife habitat and blueberry production, as well as wood production. There is a large age class imbalance in this type, with 50 percent of the jackpine acreage at or beyond a 50 year rotation age. There is a significant gap in the growing stock that will be available for harvest in twenty to thirty years. There is a large area known as the Stoney jackpine, which was established after a fire in the 1930s by natural seeding. The area is characterized by a large monotypic block of overstocked, small diameter, low site index jackpine. Insect and disease hazards are of major concern in this area.

The white spruce type is a rapidly increasing type with most of the stands as new plantations in the 0-10 age class. The limited number of older stands are of high value pulpwood and sawtimber trees, often mixed with other species.

Balsam fir is rare in pure stands within the area, but is typically found as a component of aspen, lowland hardwood and cedar types. It is valued as wildlife habitat, especially as winter cover for deer. At the present time the demand for this species is low, but in the future it has potential for pulpwood and sawtimber.

The tamarack type is one of the largest lowland types in the area. It is one of the most rapidly expanding types in the area due partly to delayed natural conversion of lowland types, and to the accelerated containerized tamarack planting program of the past few years, both on upland and lowland sites. Regeneration

on tamarack cutovers has been variable, generally better in the western portion of the area, and poor to nonexistent to the east. The demand for tamarack has increased in recent years.

Black spruce is prevalent throughout the area. It is a valuable lowland conifer which is fairly easy to regenerate. This species is valuable for pulpwood used to make high quality paper, but at the present time, the demand is low.

The brush and grass types cover a significant amount of lowlands in the area and a small percent of uplands. These types are important as wildlife habitat, and some have great potential for timber production.

The northern white cedar type has declined in both acreage and quality and presently more timber exists in the older age classes which creates an age class imbalance. Reductions in acreage are due to land clearing and poor natural regeneration of disturbed sites. Most existing cedar is losing its value for certain types of wildlife and timber production because of its poor condition. Establishment of new stands or reestablishment of existing stands is difficult. The demand for wildlife species, which are dependent on the cedar type, is increasing. At the same time demand for quality cedar wood products is also increasing.

Timber Management History

Harvest

Area records (Table 3-5-2) show that for all species, except jack pine and tamarack, the timber supply has exceeded the demand in the Baudette Area. A once strong black spruce market no longer exists and the percent of allowable cut sold has dropped from 70 percent to 5 percent. Currently the demand for aspen bolts is strong and is responsible for most aspen sold in the Baudette Area. (See the utilization and marketing section of this plan for a more detailed discussion of current and forecasted markets.)

TABLE 3-5-2

Timber sales drain record in acres and expressed as a percent of timber available which was sold.

	F.Y. 81			F.Y. 82			F.Y. 83			F.Y. 84			F.Y. 85			F.Y. 86		
	For Sale	Drain	% Sold	For Sale	Drain	% Sold	For Sale	Drain	% Sold	For Sale	Drain	% Sold	For Sale	Drain	% Sold	For Sale	Drain	% Sold
Aspen	769	339	44%	777	336	43%	621	326	52%	604	328	54%	630	507	80%	652	458	70%
Northern Hardwood	26	4	15%	48	22	45.8%	39	8	20.5%	37	2	5%	45	37	82%	33	6	18%
Balsam Spruce	185	27	14.5%	196	119	60.7%	206	64	31%	270	28	10%	65	42	64.6%	180	32	17.7%
Jack Pine	267	253	94.7%	260	275	106%	271	295	108.8%	232	290	125%	251	297	118%	238	173	72.6%
Norway & White Pine	4	5	125%	4	4	100%	3	0	0%	4	3	75%	3	14	466%	0	0	0%
Black Spruce	653	473	72%	623	490	78.6%	560	344	61%	520	251	49%	499	164	32.8%	533	26	4.8%
Tamarack	249	239	96%	239	175	73%	239	204	85%	197	176	89%	215	259	120%	218	210	96%
Cedar	145	15	10%	158	57	36%	96	46	48%	96	32	33%	96	28	29%	96	3	3%
TOTAL	2298	1355	59%	2305	1478	64%	2035	1287	63%	1960	1110	56.6%	1804	1348	74.7%	1950	908	46.5%

TABLE 3-5-3

Plantations artificially established in acres by species by decade.

Decade	Norway Pine	White Pine	White Spruce	Jack Pine	Black Spruce (Plant/Seed)	White Cedar	Tamarack	Aspen	Balsam Fir	Misc.	Total Planted by Decade
40-49	539	23		10	8/						580
50-59	352	44	440	284	63/	2			15	4	1204
60-69	1091		875	112	137/ 27						2242
70-79	1041	9	147	161	87/ 435	37			4	3	1924
80-Present	1025	17	755	1379	418/3191	50	713				7548
TOTALS	4048	93	2217	1946	713/3653	89	713		19	7	

GRAND TOTAL 13,498

Regeneration

Forest regeneration has evolved from reliance on natural regeneration of all species following logging, through pine plantations established on unused agricultural fields left by the early settlers, to planting multiple species. Today's plantations are established and maintained by silvicultural methods tailored to the most appropriate species for the site. Table 3-5-3 traces the progress of plantation establishment in the area.

The majority of forest development projects have been completed in RMU 2. The first recorded plantation establishment began with the Work Progress Administration (W.P.A.) in the early 1940s with the planting of abandoned homestead fields to Norway Pine. Very small volumes of other upland conifers and black spruce were planted at this time. These Norway pine plantations have been thinned twice and are a prominent feature of the Beltrami Island State Forest as they are all planted adjacent to forest roads. Most of these plantations were established using furrowing for site preparation followed by hand planting.

Planting of old fields continued in the 1950s. Plantations were established throughout the area using a variety of conifers. Pine plantation sizes were small, averaging less than 11 acres, due to the settlers' small fields. The first plantings of White Spruce were established during the 1950s. Very limited site preparation was used during this decade. Plantations typically were planted with mixed species including several plantations with small volumes of balsam fir, green ash, and Siberian elm. Natural regeneration was used to try to maintain cover types of jack pine, black spruce, aspen and tamarack after logging.

Technological advances in plantation establishment became evident during the 1960s. Machine planting, and the use of disking, wind-rowing, and furrowing as site preparation techniques were used. Also during this decade, coordination between the Section of Wildlife and Division of Forestry resulted in establishment of

wildlife openings and travel lanes in plantations. During the 1960's the Birchdale Field Station established most of the Baudette Area's white spruce plantations. The Williams Field Station planted predominantly Norway pine in sites averaging 25 acres utilizing disking and furrowing as the main site preparation methods. Artificial seeding of black spruce on cut over areas was initiated during this period. Natural regeneration was utilized to maintain cover type acres of all species that were not planted.

In the 1970s, the Baudette Field Station began planting trees again. The volume of trees planted out of the Birchdale Field Station decreased while the Williams Field Station maintained the level of the previous decade. Aerial seeding of black spruce came into heavy use as did the use of prescribed burning to prepare black spruce and pine sites. A small number of acres of jack pine were established by disking followed by seeding. Seedings of white spruce, and jack pine were tried but the practice was dropped due to failures. Norway pine plantations were commercially thinned during this period, a practice that continues today. Natural regeneration was encouraged where possible and the first plantations were established in RMU 1.

Plantation establishment in the 1980s increased dramatically. Forest development accomplishments reflect increases in funding, technology, training and staff, including designating area level forest management responsibilities and regional staff specialists in silviculture, soils and integrated pest management. Access for timber harvest and forest development has been improved by upgrading forest roads.

A seed collection program utilizing local high site index trees has been established. This seed is used in greenhouse production of containerized trees which extend the planting season and provide planting stock which has been used to establish operational trials of lowland conifers including white-cedar and tamarack. Plantation establishment costs have been reduced

through use of contracted professional planting crews, site specific site preparation and use of timber sale regulations that reduce the need for site preparation.

Plantation survival has been increased through improved site preparation, stock handling and storage methods. Mechanical site preparation may be by means of shearing, furrowing or patch scarification. Chemical site preparation alone or in combination with mechanical treatment is tailored to specific target vegetation and soil type. The need to use mechanical or chemical release to free plantations of vegetative competition has been all but eliminated by use of thorough site preparation.

Aspen recycling began in 1985 under BWCAW funding as a pilot program in several areas, including the Baudette Area. In 1986 monies from the Reinvest in Minnesota (RIM) program provided an opportunity to accelerate wildlife habitat improvement. Aspen recycling will also help reduce the age imbalance of the aspen timber.

DIRECTION

Statewide

Authorized by the U.S. Congress in 1978, the Boundary Waters Canoe Area Wilderness Act (PL 95-495) provides $3 million annually in federal funds for forestry intensification projects on state and county lands from 1979-1990. With the loss of this funding in 1990, a very large reduction in timber program accomplishments can be expected. Efforts are underway to secure a stable long-term source of state funding.

Regional

Budget reductions will be associated with the phasing out of the federal funds from the BWCA, requiring greater emphasis on economic priorities to determine which projects will be funded. Timber management activities will encourage natural regeneration, including stands which have been identified through TMPIS for natural regeneration to understory where acceptable levels of advance regeneration of suitable species exist.

Cutting regulations on timber sales will protect or improve seed beds, take advantage of silvicultural characteristics of species capable of natural regeneration by sprouts, seeding or advance reproduction, and eliminate or reduce site preparation costs. Lower cost site preparation prescriptions including burning lowland sites and full tree skidding for upland, species will be emphasized. Herbicides and heavy mechanical site preparation will continue to be used where appropriate.

Area

The Timber Management Planning Information System (TMPIS) 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, age, stand size, and distance from a road. (Table 3-5-4 shows rotation ages used during the TMPIS run by species, by RMU.) The preliminary list of stands generated by the program are 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.

This plan indicates the timber management activities that could or should be done if there were no constraints on budget and staff and if all timber recommended for harvest could be sold.

It is also based on the assumptions that the mix of products (i.e., pulpwood, sawtimber) to be provided and silvicultural techniques used will remain relatively constant.

The Phase II inventory information used in developing this plan was current as of 1986. The data was edited and sorted by Resource Management Unit (RMU). Summary tables were prepared for each RMU to characterize the timber resource. An initial meeting of members of the Inter-Disciplinary review team (ID Team) was held to discuss market conditions, insect and disease problems, wildlife concerns, and soils limitations that would affect timber management in the Baudette Area. General cover type management guidelines and future cover type composition goals were also discussed. Based on the inventory information and discussions, Area Forestry and Wildlife personnel developed rotation ages and TMPIS selection criteria for each cover type in each RMU.

Station foresters and Area Wildlife personnel ran the TMPIS for each RMU. They used inventory information, their knowledge of access and market conditions, management guidelines, and wildlife habitat compartment evaluations to determine which stands selected by TMPIS should be listed for various management practices. If stands selected for harvest were larger than the recommended maximum acreage for clear-cuts, or if it was important to maintain a portion of a stand for wildlife, aesthetics, or other management purposes the entire stand was listed for treatment but a tally of the acreage to be reserved from treatment was maintained. Portions of stands were reserved only if it was likely that the reserved timber would survive until the next management period and that it would be economical to manage the deferred acreage. Stands listed for various management activities were color coded on Phase II township inventory maps to provide a spatial illustration of areas to receive timber management treatments.

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.

Many of the timber types in the Baudette Area occur primarily in the older age classes. The highest cutting priority will be given to the older age classes to correct this imbalance.

General Timber Direction By RMU

RMU 1

The management emphasis in RMU 1 will be on the improvement of wildlife habitat particularly transition habitat, for such species as deer, moose, sharptailed grouse and sandhill cranes. Forest cover types will be maintained to enhance winter cover, provide habitat diversity, and an even distribution of timber type age classes. Intensive forest management for pulp and sawtimber will occur in some locations such as the school forest.

RMU 2

The timber in RMU 2 will to be managed with an emphasis on fiber production, with concerns for wildlife habitat addressed by coordination with the Section of Wildlife (Forestry/Wildlife Coordination Policy #8, revised 1982; Wildlife-Forestry Guidelines to Habitat Management, revised 1985; and Specific Procedural Policy, revised 1988, for Baudette Area). The forest road system will be upgraded and maintained to ensure access for timber management. Timber will be protected from wildfire, insect and disease and all other types of damage. This RMU will receive the greatest forest management intensity of the three RMUs.

RMU 3 and 3A and 3B

In RMU 3 forest management activities will be limited to a few productive conifer stands. Management activities will center around the protection of the unique qualities of the Red Lake, Winter Road Lake, North Black River and South Black River Peatlands. If any forest management activity is considered in a peatland watershed protection area, scientific protection area, or core area, then the procedure in Section 3-6, page 48, should be followed.

Table 3-5-4: Rotation Ages Used During the TMPIS Run, by Species, by RMU

SPECIES	RMU 1	RMU 2	RMU 3
Ash	80	80	100
Lowland Hardwoods		80	
Aspen	40	45	45
Birch	45	45	
Balm of Gilead	45	45	
Oak		100	
White Pine		120	
Red Pine		80	
Jack Pine	50	50	
White Spruce	90	80	
Balsam Fir	50	50	
Black Spruce	90	90	120
Tamarack	90	90	90
White Cedar	160	120	160

Timber Management By Forest Type

Ash

RMU 1 and 3 - Ash will be managed primarily for fuelwood, and wildlife. Ash acreage will remain relatively unchanged.

RMU 2 - Ash will be managed primarily for fuelwood and sawtimber as quality and access dictate. This relatively small type will

show moderate expansion due to natural conversion from other types (mostly aspen), where site quality of the converting species is poor.

Lowland Hardwoods

RMUs 1, 2 and 3 - Lowland hardwoods will be managed primarily for wildlife, fuelwood and sawtimber where applicable. This type will show a steady decline in acres due to Dutch elm disease removing the elm component, resulting in a natural conversion to the ash type. The management goal will be to maintain stands through harvest for fuelwood and sawtimber and to regenerate by sprouting.

Aspen

The management objective will be to achieve an evenly distributed amount of aspen in each age class. This will provide for future sustained yields for forest industries and will provide quality wildlife habitat for deer, grouse and other species. This distribution will be accomplished through: Innovative timber sales in currently depressed local markets; the aspen recycling program; and a shift in the procurement areas of new, or existing forest industries. During FY 1993 harvest records will be reviewed to determine if a surplus is developing. If there is a surplus, new criteria should be developed to identify additional stands for recycling.

RMU 1 - Aspen is the largest forest covertype in this RMU, covering over 13,000 acres. A decrease in acreage is projected for the next ten years due to natural conversion to other types on overmature sites. Emphasis on harvesting and recycling productive aspen stands and regenerating by root sprouting will be a high priority. Some artificial conversion of poorly-stocked and poor quality stands will occur in the next ten years. Maintaining and improving wildlife habitat will be a high priority. Planting jack pine, cedar, and white spruce, on some sites will improve winter cover for wildlife.

RMU 2 - Aspen is the largest forest covertype in RMU 2, covering over 70,000 acres. Many stands within this type have reached maturity or are overmature. A large age class imbalance exists which will make type regulation difficult.

The ten-year trend for the aspen type is a decrease in size due to artificial conversion of poor quality aspen to other species. As a result, tamarack, white spruce, white-cedar, jack pine, and black spruce types will increase.

Conversion is a management option when stands have low site index, high incidence of hypoxylon canker and rot, and low volume.

RMU 3 - Aspen is a minor component in RMU 3. Due to inaccessibility, little or no type management is planned for the next ten years.

Paper Birch

In most cases birch stands are of such poor quality that the products are limited to fuelwood. Managed stands will regenerate through stump sprouting. Wildlife considerations are very important in birch management.

RMU 1 - Paper birch is a minor component (265 acres) in RMU 1. Wildlife considerations for this intolerant type are a high priority. Management plans for the next ten years will be to maintain the birch type by harvest and salvage with regeneration by stump sprouting. Little change in type acreage should occur.

RMU 2 - Paper birch is a small component in RMU 2. The type provides fuelwood for local residents and serves as an intolerant species for wildlife habitat. Changes for the next ten years include artificial conversion of poor quality birch stands to white spruce, black spruce, and cedar by planting and conversion to aspen by sprouting. Most productive stands will be maintained by stump sprouting after harvest.

RMU 3 - Paper birch is a minor component in RMU 3 with only 65 acres. Due to inaccessibility no type management is planned for the next ten years.

Balm of Gilead

RMU 1 - Balm is a small component in RMU 1. Emphasis for maintaining productive balm sites for wildlife will be a priority. A decrease in type acreage is projected for the next ten years. A small amount of artificial conversion by planting cedar and tamarack is planned. Natural conversion to an Ash understory will be allowed to occur where appropriate for wildlife needs.

RMU 2 - Balm will generally be managed as a natural conversion type to other species for wood production, except in the cases where intolerant deciduous species are significantly lacking for wildlife. This management is expected to reduce the acreage of this type in the next ten years. Higher quality sites will be harvested or salvaged and regenerated, or naturally converted to aspen by root sprouting. Present balm markets are poor to nonexistent. Maintenance of these intolerant deciduous stands will benefit wildlife. Some conversion of nonstocked and poor quality balm stands to white spruce, cedar, jack pine, and tamarack will occur in the next ten years. Approximately 25 percent will be reserved or managed on an all age basis due to very poor access, site quality, or because stands are too small to manage.

RMU 3 - Balm is a minor component in RMU 3. Due to inaccessibility no type management is planned for the next ten years.

Oak

RMUs 1 and 3 - There is insufficient oak in these RMUs to manage.

RMU 2 - Oak will be established on all suitable sites. The amount of oak that is part of other timber types will be expanded whenever possible. This effort will provide benefits to wildlife. Funding to accomplish projects will be provided by the

Divisions of Forestry and Section of Wildlife. A special sorting of current forest inventory data was done to identify other timber types which have oak as a component or as an understory. This sorting will provide a list of sites where there is an opportunity to expand the oak type and oak component. A further attempt will be made to increase this type by managing oak that is present in the understory in some lowland hardwood types. Oak will be reserved in aspen types that are clearcut if it will persist through the next rotation.

White Pine

RMUs 1, 2 and 3 - There are very few acres of white pine in the area. During the next ten years, the white pine type will be maintained for wood production and old growth purposes. Although reforestation of white pine is expected to increase in the future, no additional acres will be added to the type due to lack of a blister-rust resistant planting stock. Establishment of new stands will be limited to small experimental plantings until sufficient quantities of blister-rust resistant planting stock are developed. Some increase in the acreage of the type may be noticed as aspen stands with high percentages of white pine are thinned and the white pine becomes predominant. Individual old growth white pine will be retained on sites where retention will not put new stands at risk.

Norway Pine

The management emphasis will be to maintain established stands by commercial thinning. Harvesting will be done on only a few acres because the stands are very young.

RMUs 1 and 3 - There are only a few acres of Norway pine in RMU 1 and none in RMU 3. The type will remain essentially unchanged.

RMU 2 - Norway pine is a significant component of this RMU. It is located primarily in the western one-third of the area and exists in plantations from 1 to 50 years in age. Because most of the Norway pine is in the younger age classes, only intermediate

harvests will occur in the next ten years. A slight increase in the type will occur from artificial conversion of a few jack pine sites to Norway pine.

Jack Pine

Due to the uneven age distribution of jack pine, and the significant value of well stocked stands for both wildlife and timber purposes, high site index, healthy stands will be held past rotation to mitigate the effects of poor age class distributions. Recently there has been an increase in the establishment of jack pine plantations. This planting increase will continue with added emphasis toward natural regeneration.

RMU 1 - The management strategy is to maintain the jack pine type where it exists and to convert poor site upland species to jack pine where possible if wildlife cover is needed. There has been an increase of this type due to the artificial conversion of mostly low site index aspen types to provide for winter cover and diversity for wildlife. To provide for a greater age balance in the future some jack pine is being retained in areas such as Blueberry Hill and the Baudette School Forest.

RMU 2 - The general management strategy will be for wood fiber production, planned so as to create the maximum benefit for wildlife purposes. The type will increase slightly over the next ten years because of artificial conversions of poor quality upland sites (mostly aspen). These conversions are expected to benefit wildlife by providing winter cover. The Stoney Corners Jack Pine Complex will be harvested above and beyond what is shown in the timber plan because of the high potential for insect and disease problems. Most of the jack pine type in this area will be regenerated back to jack pine after harvest. Some diversity will be achieved through artificial conversion to Norway pine, black spruce, tamarack, aspen, and intolerant hardwoods.

RMU 3 - Jack Pine is not a component of this RMU.

White Spruce

There will be little harvesting of white spruce in the next ten years because very little of it is mature. The number of plantations is expected to increase due to artificial conversion of nonstocked and poor quality stands.

RMU 1 - White spruce is a minor component in RMU 1. No harvest is planned for the next ten years. The number of white spruce plantations will increase due to artificial conversion of nonstocked and poor quality aspen stands.

RMU 2 - The trend for the next ten years will be for a significant increase in White Spruce acres due to conversion of other types. Conversion will come primarily from the aspen type.

RMU 3 - There is no White Spruce in this RMU.

Balsam Fir

RMU 1 - This type will be maintained through some natural conversion of aspen to balsam by advanced reproduction. Balsam is a common aspen understory component and can be valuable wildlife habitat.

RMU 2 - The balsam type is significantly smaller than indicated by previous inventories and the recommended cut has been greatly reduced. The future trend for this type is a reduction in size because of natural conversions to Aspen. Where this species is important for wildlife habitat it will be maintained. Special cutting regulations to preserve the balsam understory should be employed in areas where wildlife cover is needed.

RMU 3 - There is no Balsam in this unit.

Black Spruce (lowland)

RMU 1 - This type will be smaller due to conversion to white-cedar and shrub types for wildlife habitat. Currently poor markets are expected to improve.

RMU 2 - The Black Spruce in this RMU will be managed for pulpwood. Although some decrease is planned by conversion to white-cedar, many more acres will be added to the black spruce type through conversion. Most of the stands will be regenerated by aerial seeding immediately following harvest or site preparation.

RMU 3 - The Black Spruce which is harvested will be regenerated by seeding to maintain present acreage.

Tamarack

RMUs 1, 2 and 3 - It is expected that the acreage will increase by natural and artificial means. There will be conversion of other timber types to tamarack of both upland and lowland sites. Experimental cutting areas should be established to determine cutting methods that promote natural regeneration. Aerial seeding of tamarack should become a major method of regenerating future cutovers. Hand planting may be done in some sites that have good access. There is a major gap in the age distribution of this type. There are large amounts of timber in both the young and old classes with little in between. Conversion of some upland sites may fill this gap because this timber would be ready for harvest sooner.

Cedar

RMUs 1 and 2 - This type will be managed to provide winter deer habitat and wood products through systematic cuts designed to regenerate cedar. The use of advanced reproduction, natural and artificial seeding, and bareroot and containerized planting stock in conjunction with a variety of site preparation techniques will lead to a increase in the number of acres in this timber type. This increase will mostly come from conversion of low site index aspen and balm stands.

RMU 3 - No management activity is feasible at this time.

Black Spruce (upland)

RMUs 1 and 3 - There is no Upland Black Spruce component in this RMU.

RMU 2 - Upland black spruce will be managed primarily for pulpwood production. Acreage in this type is expected to remain approximately the same throughout the ten year period. Regeneration will take place by aerial seeding and planting.

Cutover Areas (COA)

RMUs 1 and 2 - The majority of the acres shown as COA are now plantations. Only a few acres are left to plant and seed. Alterations are needed to correct the Phase II inventory. The list of stands to be regenerated without harvest (by understory) is a list of plantations needing alteration.

RMU 3 - There are no Cut Over Areas in this RMU.

Stagnant Types (Ax - Offsite Aspen, Tx - Stagnant Tamarack, Sx - Stagnant Spruce, Cx - Stagnant Cedar)

RMUs 1 and 2 - Of the four stagnant types, Cx and Ax have the greatest potential to be converted to productive types for forest production and improved wildlife habitat. The size of the CX and Ax types will be reduced over the ten year period by conversions. Selected Cx stands which have site indexes that would support medium or higher quality Black Spruce will be converted to Black Spruce. Other Cx stands which are valuable for wildlife cover will be managed for wildlife. When Cx stands are converted they will be salvaged then burned and seeded to Black Spruce. The Christmas tree market for black spruce on Sx sites is increasing.

RMU 3 - No work will be performed on these types

Lowland Brush (LB), Upland Brush (UB), Upland Grass (UG), Lowland Grass (LG)

There are significant amounts of land covered with brush and grass in lowlands and limited amounts in the uplands. These areas will be managed for wildlife habitat and/or timber.

RMU 1 - Appropriately located UB and UG types will be used to achieve a minimum 5 percent wildlife opening goal. UB and UG types will be used for agricultural leases and crop share where this practice benefits wildlife. Some increase in the UB and UG types will occur through conversion.

LB and LG will be managed to improve wildlife habitat quality. If appropriate, some Cx, Sx, and Tx may be converted to LB or LG.

RMU 2 - Portions of large LB and LG types, along with cutover areas will, be converted to tree species best suited for the site. Small UB and UB types will be created and maintained to help meet the minimum 5 percent wildlife opening goal.

RMU 3 - UB, UG, LB & LG will be managed extensively.

TIMBER HARVEST ACTIVITIES

The timber harvest for the next ten years will be planned to meet the following objectives: Provide wood for the forest industry up to the limits of the resource; improve or maintain wildlife habitat by following the Forestry/Wildlife habitat management guidelines; follow sound silvicultural practices; protect other resource values including recreation and water quality; and, protect the timber resource from excessive insect or disease damage.

The harvest activities identified by this planning process for the next ten-year period are shown in the clear cutting budget, and the ten-year precommercial and commercial thinning plan. These plans are summarized in tables 3-5-5 and 3-5-6.

Table 3-5-6: A summary of the ten-year precommercial and commercial thinning plan for Norway Pine in the Baudette Area, by Field Station and size class.

	Precommercial Size Class				Commercial Size Class		
Field Station	I	II	III	Total	IV	IV	Total
Baudette	0	0	0	0	4		4
Birchdale	0	0	18	18	32		32
Williams	27	0	72	99	357	92	449
Total	27	0	90	117	393	92	485

TABLE 3-5-6

Baudette Area Annual Cutting Budget F.Y. 88 - 97
By Field Station and RMU
Based on TMPIS using Phase II Data

Field Station	RMU	#01 Ash	#09 Lowland Hardwoods	#12 Aspen	#13 Birch	#14 Balm of Gilead	#30 Oak	#52 Norway Pine	#53 Jack Pine	#61 White Spruce	#62 Balsam Fir	#71, #74 Black Spruce	#72 Tamarack	#73 White Cedar	Totals
	1	1		74		5			5		4	1	2		92
Baudette	2	21	18	465	4	19			7	1	5	22	16	2	580
1	3			2								5	4		11
	Totals	22	18	541	4	24			12	1	9	28	22	2	683
	1			11								2		2	15
Birchdale	2	25	7	325	26	33		6		1	11	120	152	52	758
2	3			3								7	10	2	22
	Totals	25	7	339	26	33		6		1	11	129	162	56	795
	1	1		115	3	26			9		2	11	12	2	181
Williams	2	3		389	8	26	2	4	150	3	24	180	90	28	907
3	3														0
	Totals	4		504	11	52	2	4	159	3	26	191	102	30	1088
	1	2		200	3	31			14		6	14	14	4	288
Area	2	49	25	1179	38	78	2	10	157	5	40	322	258	82	2245
Totals	3			5								12	14	2	33
	Totals	51	25	1384	41	109	2	10	171	5	46	348	286	88	2566

TIMBER REGENERATION ACTIVITIES

Regeneration accomplishments over this planning period will be limited by available manpower and budgets. For these reasons, sites will be selected based on the following criteria:

The first priority will be to regenerate acreage as it is harvested each year. Aggressive development of harvested acres takes advantage of lower plantation establishment costs due to minimal vegetative competition existing following harvest. Silvicultural characteristics and harvest regulations encourage natural regeneration of significant acreages of hardwoods, black spruce, and some site specific tamarack each year.

The second priority will be to regenerate previously harvested areas that have not regenerated adequately by themselves, or are to be converted to a more suitable specie for the site. These sites are identified through a system of regeneration checks performed 3 years after harvest on sites targeted for natural regeneration, or plantation survival checks at regularly scheduled intervals. Regeneration of these sites usually involves the use of mechanical and/or chemical site preparation, followed by planting.

The third priority will be to regenerate unstocked and understocked sites that are not needed in their present form for wildlife habitat or other purposes. Regeneration of these sites involves heavy use of mechanical and/or chemical site preparation, followed by planting.

Aspen recycling is a special forest regeneration effort and will be addressed separately from other development projects. Unmerchantable aspen stands which are over mature and in danger of being lost as aspen stands will be recycled by cutting or shearing. Over the next ten years approximately 1000 acres of non-merchantable sands will be recycled for wildlife management purposes.

Another aspect of forest regeneration is the management of established plantations. The two objectives in the plantation management portion of the forest development program are to maximize fiber production and protect the plantation from injury or disease.

Stocking, competition, growth, and insect and disease effects are surveyed on approximately 2,000 acres of plantations annually (scheduled at 1-3-5-10 years) and 800 acres of seedings (scheduled at 5-10 year intervals).

Norway pine stands in the Baudette Area are being thinned as basal area exceeds management guidelines. Use of special cutting regulations and slash disposal regulations as prescribed in the insect and disease unit are employed on all thinnings to protect the residual stand.

Integrated pest management is used in establishment of plantations. Selection of the best tree specie for each site is based on soils, silvicultural characteristics, and insect and disease considerations. These factors, combined with control of competing vegetation, ensure establishment of a successful, vigorous stand. The use of small stands, mixed species planting and plantation design will provide natural plant diversity. The use of site preparation has all but eliminated the need for release of Baudette Area plantations.

Limited hand and chemical release of Norway pine plantations has been employed in the past to control volunteer jack pine competition to the Norway pine. Use of release will be limited during this plan. Mixed stands of pine species are acceptable within normal stocking limits, in contrast to the earlier practice of removing all jack pines in a Norway pine plantation.

Regeneration activities identified by this planning process for the next ten year period are shown in the ten year forest regeneration plan. This plan is summarized in the following tables:

Table 3-5-7: Summary of the ten-year artificial seeding and planting plans by species, by Field Station, and by RMU.

Table 3-5-8: Summary of the ten-year natural regeneration plan by type of regeneration, by species, by Field Station, and by RMU.

Table 3-5-9: Summary of the numbers of bushels of cones, bare root planting stock, containerized planting stock, and seed for direct seeding needs.

TABLE 3-5-7

Artificial Regeneration Plans F.Y. 88-97
Broken Down by Species, by Field Station, by RMU, by Method of Regeneration

		SEEDING				PLANTING				TOTAL ARTIFICIAL REGENERATION			
Field Station	Species	RMU I	RMU II	RMU III	Total	RMU I	RMU II	RMU III	Total	RMU I	RMU II	RMU III	Total
Baudette						76	473		549	76	473		549
Birchdale	Jack						20		20		20		20
Williams	Pine					754	2689		3443	754	2689		3443
Area Totals						830	3182		4012	830	3182		4012
Baudette							82		82		82		82
Birchdale	Norway						19		19		19		19
Williams	Pine						75		75		75		75
Area Totals							176		176		176		176
Baudette						310	620		930	310	620		930
Birchdale	White		35		35	32	303		335	32	338		370
Williams	Spruce					205	1257		1462	205	1257		1462
Area Totals			35		35	547	2180		2727	547	2215		2762
Baudette		57	367	102	526	125	555		680	182	922	102	1206
Birchdale	Black	24	4166	230	4420	17	299		316	41	4465	230	4736
Williams	Spruce	8	2846		2854	16	370		386	24	3216		3240
Area Totals		89	7379	332	7800	158	1224		1382	247	8603	332	9182
Baudette		18	512		530	147	708		855	165	1220		1385
Birchdale	Tamarack	24	2723		2747	42	256		298	66	2979		3045
Williams		4	311		315	351	1419		1770	355	1730		2085
Area Totals		46	3546		3592	540	2383		2923	586	5929		6515
Baudette			85		85	90	637		727	90	722		812
Birchdale	White		86		86		571		571		657		657
Williams	Cedar					603	727		1330	603	727		1330
Area Totals			171		171	693	1935		2628	693	2106		2799
Baudette		75	964	102	1141	748	3075		3823	823	4039	102	4964
Birchdale	All	48	7010	230	7288	91	1468		1559	139	8478	230	8847
Williams	Species	12	3157		3169	1929	6537		8466	1941	9694		11,635
Area Totals		135	11,131	332	11,598	2768	11,080		13,848	2903	22,211	332	25,446

TABLE 3-5-8

NATURAL REGENERATION F.Y.'88-97

Broken Down by species by Field Station, by RMU, by Method of Regeneration

		SEEDING				SPROUTING				UNDERSTORY				ALL NATURAL REGENERATION			
FIELD STATION	SPECIES	RMU I	RMU II	RMU III	TOTAL	RMU I	RMU II	RMU III	TOTAL	RMU I	RMU II	RMU III	TOTAL	RMU I	RMU II	RMU III	TOTAL
Baudette	Ash									83	727		810	83	727		810
Birchdale											1209		1209		1209		1209
Williams							8		8	174	483		657	174	491		665
Area Totals							8		8	257	2419		2676	257	2427		2684
Baudette	Aspen					1065	7840		8905		38		38	1065	7878		8943
Birchdale						125	5406		5531		167		167	125	5573		5698
Williams						2526	6056		8582		72		72	2526	6128		8654
Area Totals						3716	19,302		23,018		277		277	3716	19,579		23,295
Baudette	Balsam Fir									25	87		112	25	87		112
Birchdale			104		104						672	29	701		776	29	805
Williams										19	502		521	19	502		521
Area Totals			104		104					44	1261	29	1334	44	1365	29	1438
Baudette	White Cedar										18		18		18		18
Birchdale			213	44	257					56	100	270	426	56	313	314	683
Williams			225		225					251	293		544	251	518		769
Area Totals			438	44	482					307	411	270	988	307	849	314	1470
Baudette	Birch						76		76						76		76
Birchdale						119	337		456					119	337		456
Williams							283		283						283		283
Area Totals						119	696		815					119	696		815
Baudette	Black Spruce	7	50	8	65					8	108	72	188	15	158	80	253
Birchdale			42		42						776		776		818		818
Williams		62	62		124						414		414	62	476		538
Area Totals		69	154	8	231					8	1298	72	1378	77	1452	80	1609
Baudette	Tamarack			16	16					33	80	25	138	33	80	41	154
Birchdale											239	36	275		239	36	275
Williams		143	296		439					12	100		112	155	396		551
Area Totals		143	296	16	455					45	419	61	525	188	715	77	980
Baudette	Jack Pine	4	10		14									4	10		14
Birchdale																	
Williams			106		106						188		188		294		294
Area Totals		4	116		120						188		188	4	304		308
Baudette	White Spruce										17		17		17		17
Birchdale											20		20		20		20
Williams											104		104		104		104
Area Totals											141		141		141		141
Baudette	Norway Pine										2		2		2		2
Birchdale											139		139		139		139
Williams											161		161		161		161
Area Totals											302		302		302		302
Baudette	All Species	11	60	24	95	1065	7916		8981	149	1077	97	1323	1225	9053	121	10,399
Birchdale			359	44	403	244	5743		5987	56	3322	335	3713	300	9424	379	10,103
Williams		205	689		894	2526	6347		8873	456	2317		2773	3187	9353		12,540
Area Totals		216	1108	68	1392	3835	20,006		23,841	661	6716	432	7809	4712	27,830	500	33,042

Table 3-5-9: Bushels of cones needed for artificial regeneration for the 10-year period FY 88 and 97 by spp. Required bareroot stock, containerized stock and seed for seeding is listed by spp.

	Bushels of Cones	Bareroot M or Trees	Containerized M or Trees	Seeding Lbs. of Seed
Jack Pine	60	2,264	946	0
Norway Pine	10	141	0	0
White Spruce	52	1,580	602	4
Black Spruce	3,966	640	465	975
Tamarack	1,247	0	1,987	25
White Cedar	20	0	2,670	171
TOTAL	5,355	4,625	6,670	1,175

Table 3-5-10: Objectives and Targets for FY 1989 and 1992
Timber Sales/Timber Management

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
Timber Sales								
1. Conduct timber sales on state land								
a. timber offered	M cords	X		10	15	11	36	36
b. timber reoffered	M cords	X		3	8	7	18	22
c. timber sold	M cords	X		6	12	8	26	29
2. Appraise & supervise sales								
a. regular auction	permits	X		3	5	3	11	15
	acres	X		70	150	80	300	500
b. intermediate auction	permits	X		6	5	7	18	26
	acres	X		100	100	100	300	500
c. informal	permits	X		14	25	25	64	90
	acres	X		180	305	175	660	925
d. fuelwood	permits	X		8	6	30	44	44
	cords	X		50	60	200	310	310
3. Timber scaling								
a. Division scaled	M cords	X		1.5	.4	1.0	2.9	3
b. Consumer scaled	M cords	X		7.0	4.0	6.0	17.0	24
c. Check scaled	M cords	X		.1	.1	.3	.3	
Silviculture								
4. Regeneration surveys								
a. plantations	acres		X	195	550	1689	2434	4000
b. natural	acres		X	118	350	125	593	1300
5. Reforestation								
a. site preparation			X (1)					
-chemical	ground acres	X	X	60	0	25	85	170
	air acres	X	X	140	100	109	349	440
-mechanical	acres		X	220	100	230	550	600
b. natural regeneration	acres		X	300	350	200	850	1100
c. seeding	acres		X	50	200	23	273	550
d. planting	acres		X	220	150	800	1170	950
6. Release								
a. ground	acres		X	0	0	0	0	20
b. air	acres	X	X	20	0	0	20	10
7. TSI	acres		X	0	0	150 (2)	150	70
8. Cones purchased	bushels		X	25	5	60	90	165
Forest Development								
9. Well Capping	wells							
10. Surveying	projects					2	2	4
11. Signing	miles				3	5	8	8
12. Fencing	miles							
13. Erosion control structures	structures							

Specific Detail

(1) Additional 50 acres of prescribed burning for site preparation will be completed in Area 13.

(2) TSI will be thinnings of Norway pine plantations by timber sales.

Special Emphasis

1. Train and establish a cadre of local vendors to pick cones to supply area seed needs.

FISH & WILDLIFE HABITAT MANAGEMENT PROGRAM

ASSESSMENT

The Baudette Area's vegetative communities provide habitat for a variety of fish and wildlife species. Lakes, rivers, wetlands, coniferous forest, deciduous forest, transition habitat, and agricultural habitat are all represented.

Wildlife habitat includes the food, water, cover, and structure that wildlife needs to survive. Plant communities, the most important components of wildlife habitat, largely determine wildlife species distribution and abundance.

Forest management practices affect plant communities and consequently wildlife habitat. Generally, this management influences the distribution, size, age, structure, and composition of habitat types. All of these attributes affect the quality of wildlife habitat.

The environmental and social impacts of public land management practices have received increasing attention since the early 1970s. Various federal and state laws were enacted during this decade relating to environment and natural resources protection. In Minnesota, the Forest Resource Management Act of 1982 includes a multiple use mandate that requires integrated management of fish, wildlife, timber, and other resources on DNR administered forest lands. The Wildlife/Forestry Coordination Policy (DNR Policy #8, revised 5/3/82) and the Forestry-Wildlife Guidelines to Habitat Management (MN DNR, revised 1985) were developed to further improve integration of forestry practices and wildlife management.

In addition to previously referenced policy and guidelines, Baudette Area and Section of Wildlife personnel have developed a "Forestry/Wildlife Specific Procedural Policy" (revised 2/17/88). This procedural policy is specified in DNR Policy #8 (Wildlife/

Forestry Coordination, revised 1982). This Area procedural policy will promote coordination of habitat management between Forestry and Wildlife (see Appendix).

The DNR's habitat management efforts are designed to promote habitat diversity and maintain or improve habitat through integration of forestry and wildlife management. Practices used to achieve these goals include: Timber management designed to promote diversity of cover types and age classes; creation and protection of critical habitats (e.g., forest openings, deer wintering complexes, old growth); protection of significant natural features; prescribed burning; and reforestation. Regular communication between Division of Forestry and Section of Wildlife personnel is necessary to maintain coordinated management efforts.

Habitat of Special Concern

Some habitat types are of special importance and concern. Important habitat types in the Baudette Area are described and discussed below. This is not a complete or comprehensive analysis. Specific management guidelines are included in the Forestry Wildlife Guidelines (revised 1985).

Upland Intolerant Forest Types

The shade-intolerant or sun-loving forest types include aspen, Balm-of-Gilead, birch, jack pine, oak, and upland brush. These early forest successional types are an important habitat component in the Baudette Area and make up 24 percent of all cover types on DNR-administered lands. Most forest game species are dependent on these types. Maintaining intolerant types at appropriate levels and improving the distribution--in time and space--of these types is important to many wildlife species.

Transition Habitat

This habitat type is composed of a variety of non-forest and forest cover types. These include upland and lowland brush, upland and lowland grass, open muskeg and bog, and low productivity hardwoods, black spruce and tamarack.

Transition habitat has been maintained in the Baudette Area by fire and hydrology. Absence of fire has resulted in woody vegetation encroachment on both upland and lowland sites. Much transition habitat on private lands has been cleared and converted to agriculture.

In the Baudette Area, grass and brush comprise 20 percent of all cover types on DNR-administered land. An additional 22 percent consists of noncommercial forest types. Most non-commercial forest types are, or have, the potential to be managed as transition habitat. Protection and management of transition habitat on public and private land is critical to wildlife species such as sharp-tailed grouse, sandhill cranes, and moose which depend on this dwindling habitat.

Deer Wintering Complexes

Quality winter habitat contributes to the maintenance of productive white-tailed deer populations in northern forest areas. Wintering complexes provide deer thermal protection and food sources. During severe winters, deer often migrate several miles to traditional wintering areas or deer yards. In the Baudette Area, white-cedar, jack pine, and balsam fir are cover types that provide deer with high quality thermal protection. Protecting the integrity of deer wintering complexes and winter deer habitat is essential when planning management activities.

Currently, jack pine provides much of the winter deer habitat, especially in the western portion of the Area. Most jack pine is currently at or near maturity. As these stands are harvested, there will be a significant loss of thermal cover in many areas.

White-cedar is found throughout the Area and has the potential to provide the best winter cover. In the eastern half of the Area, balsam fir is important winter cover. This is especially true where it is found in association with aspen and other hardwoods. As balsam fir understories in these stands mature, their cover value to deer will improve.

Forest Openings

Forest openings are defined as upland herbaceous areas, 1/2 acre or larger, dominated by grasses and forbs. At least 36 bird species and 15 mammals are associated with forest openings. Openings provide important spring and fall forage for deer. They are used extensively by bear as sources of forage, and are important courtship areas for woodcock.

Historically, forest openings resulted from natural forces and human activity. Logging camps, pastures, abandoned homesteads, and frost pocket meadows, are examples of forest openings. During the last 50 to 60 years many relic forest openings have been lost to plant succession and conifer planting. Additional forest openings have been created during the last ten years from log landings in timber sales and plantations. In the Baudette Area, forest openings comprise 1.6 percent (2,497 acres) of deer habitat on DNR administered land.

Old Growth

The DNR has established an inter-disciplinary task force to define and locate old-growth forest in Minnesota and to develop guidelines for its identification and management on DNR administered lands.

Old-growth forest stands develop characteristic features including: 1) large old trees of long-lived species, 2) relatively high occurrence of snags, and 3) relatively large number of downed logs, in various stages of decay. These three features reflect a history of growth, decay, and regeneration.

Natural communities found within the Baudette Area that may possess old-growth characteristics include:

1) Spruce-Fir Forest
2) Upland Cedar Forest
3) Floodplain Forest
4) Forested Bog
5) Conifer Swamp
6) Red Pine Forest
7) Hardwood Swamp
8) White Pine Forest

Forest Age Class Diversity

Diversity of forest cover type age classes, stand size, and geographic arrangement of successional stages are important habitat considerations in managing forest wildlife. Many species such as ruffed grouse and white-tailed deer utilize a variety of plant communities, of different successional stages, at different times of the year. A significant number of other species require specific sizes, age classes, and arrangements of cover types as a part of their habitat.

Young sapling age classes provide important habitat for wildlife species such as woodcock, ruby-crowned kinglet, and Swainson's thrush. Absence of pole-sized forest types limit the occurrence of species such as spruce grouse, chestnut-sided warbler, and broad-winged hawk.

Wildlife species such as wood duck, bald eagle, great grey owl, turkey vulture, pine warbler, and pine marten are excluded from otherwise suitable habitat if large, old individual trees are not available for nesting, denning, or roosting. Pileated woodpecker, black-backed woodpecker, brown creeper, golden-crowned kinglet, black-burnian warbler, solitary vireo, and barred owl are species dependent on mature or over-mature second-growth forest types for part of their life requirements. The proper

distribution and size of these forest stands are critical to maintaining viable and well distributed populations of these species.

In the Baudette Area, there are at least 85 birds and 27 mammals associated with over-mature forest cover types (see appendix). Logging, land clearing for agriculture, and catastrophic fires have eliminated most of the original old growth forest. Absence of fire and poor timber markets have resulted in an abundance of mature second-growth forest area-wide, particularly short-lived early successional species such as aspen, birch, and jack pine. However, sapling and pole-sized stands of these cover types are deficient and poorly distributed. Although individual trees still exist, stands of mature and over-mature long-lived species such as white and red pine, and white and black spruce are rare on upland sites. Mature stands of lowland conifer such as black spruce, tamarack, and white-cedar are common, but well stocked sapling and pole-sized stands of cedar are lacking.

Riparian Habitat

Riparian habitat includes areas of standing and flowing water such as lakes, ponds, streams, shrub and forested swamps, and marshes. A riparian zone includes wetland habitats and associated adjacent habitat. Numerous wildlife species make disproportionately high use of riparian zones because many of their life needs are met by the highly productive and diverse riparian plant communities.

In the Baudette Area, the most productive riparian zones are located along the Rainy River and its tributaries. Lowland hardwoods, black ash, and aspen are common riparian timber types. Much of the burr oak, a species of great value to wildlife, occurs in riparian zones. White pine, silver maple, Balm-of-Gilead, and American elm are also important components of forested riparian zones.

Peatlands

The Baudette Area is part of a peatland complex that formed in the bed of Glacial Lake Agassiz. The Minnesota Soil Atlas indicates that there are approximately 360,000 acres of deep peat soil within the area. A unique feature of some Minnesota peatlands, that sets it apart from other boreal areas, is its southerly climactic setting and associated lack of permafrost. Also, boreal peatlands have a characteristic landform feature, referred to as "patterned" peatlands. This patterning results from the intricate relationship between vegetation, hydrology, topography and climate. Minnesota peatlands are a forested raised bog type of patterned peatlands. This type of patterned peatlands exhibits a diversity of surface patterns not found in comparable size or complexity anywhere in the world except the Hudson Bay Lowlands and possibly Siberia.

For these reasons, these peatlands offer an opportunity to protect nationally significant peatland ecosystems. These peatland ecosystems are extremely valuable for the study of ecological and developmental processes, and regional hydrology.

Although peatlands lack the vertebrate species diversity and richness present in upland habitats, they are unique habitats. Twenty-five vascular plants and wildlife species that occur in Minnesota peatlands are endangered, threatened, or of special concern.

Peatlands provide habitat for numerous plants which possess unusual adaptations to the harsh environment. These include the insectivorous pitcher plants, sundews, bladderworts, and many orchids and ericaceous plant species.

Wildlife species associated with peatlands in the Baudette Area include: sharp-tailed grouse, spruce grouse, yellow rail, sandhill crane, northern hawk owl, great gray owl, short-eared owl, yellow-bellied flycatcher, boreal chickadee, golden crowned kinglet, Connecticut warbler, and sharp-tailed and Lincoln's

sparrow, masked, arctic and short-tailed shrews, red-backed vole, deer mouse, and snowshoe hare. A woodland caribou herd wintered in the Red Lake Peatland prior to its extirpation in the late 1930s.

The previous section adapted from: "Recommendations for the Protection of Ecologically Significant Peatlands in Minnesota" (MDNR, 1984).

Featured Wildlife Species

Featured species in the Baudette Area are:

- White-tailed Deer
- Ruffed Grouse
- Sharp-tailed Grouse
- Moose
- Black Bear
- Gray Wolf
- Rare Northern Owls
- Sandhill Crane

White-tailed Deer

Deer were rare in the Baudette Area prior to settlement. Habitat alterations associated with settlement activities created ideal habitat for deer. By the 1920s deer were common throughout the Area. Good deer habitat persisted through the mid-1950s, and deer populations remained relatively stable through the 1960s. Natural succession and aging forests, aided by a lack of fire, weak timber markets, planting old fields to conifers, and little direct habitat management, caused the quality of deer habitat to deteriorate. By the early 1970s, deer populations declined to modern lows, as high hunter harvests, back-to-back severe winters, and decreasing habitat quality combined to take their toll. As a result of more conservative hunting seasons, moderate winters, and active habitat management, populations increased and have remained relatively stable since the early 1970s.

Deer pellet group surveys provide an index to deer population trends in the northern forest. This index, combined with population modeling, provides an estimate of deer densities (pre-fawning). Portions of two forest Deer Management Units occur in the Area (see Figure 6-1). Deer densities in these DMUs are estimated to be 10-13 per square mile of habitat. Portions of nine townships north of Highway 11 are part of a farmland deer management Unit (AGASSIZ DMU, Figure 6-1). The current estimate of deer densities in this DMU is 5.5 deer per square mile of land (habitat and non-habitat included).

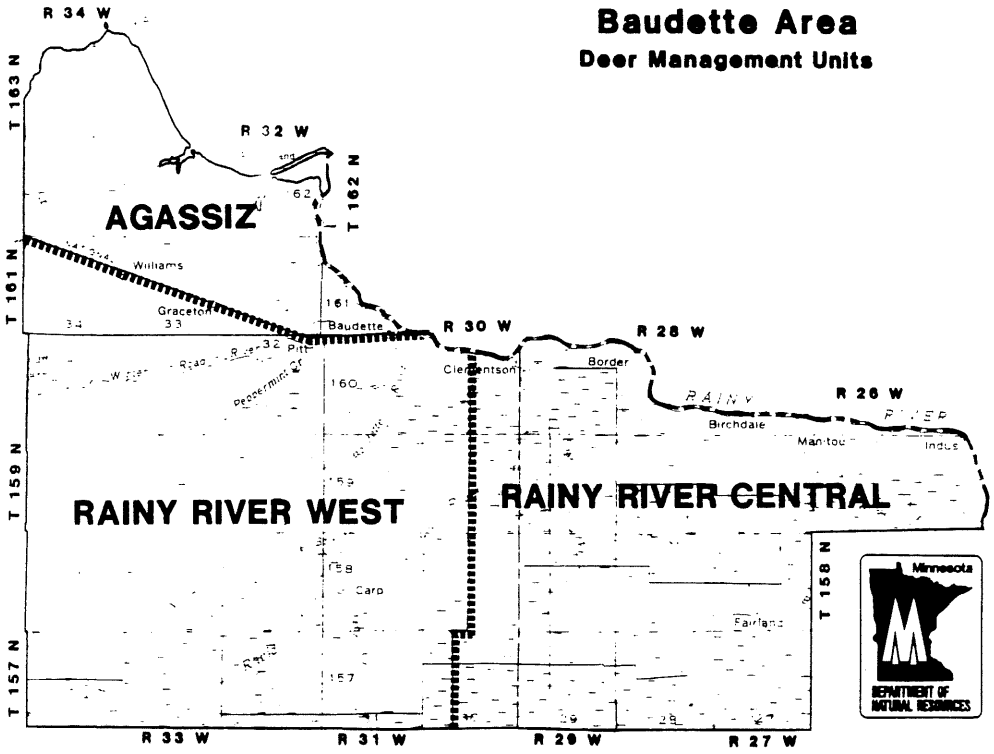


Figure 6-1

Ruffed Grouse

Ruffed grouse are the most popular small game species in Minnesota. They are the most abundant and sought after small game bird in the Baudette Area. Ruffed grouse are strongly associated with aspen dominated forests and also with cover types that contain at least 20 percent aspen. In addition to aspen, birch, oak, upland brush, and alder are valu able cover types to ruffed grouse. Research has revealed that conifer dominated forests limit ruffed grouse population densities.

Ruffed grouse populations are cyclic. Periods of peak abundance occur about every ten years. In Minnesota, marked ruffed grouse population peaks occurred in: 1880-81, 1901, 1907, 1912, 1923, 1933, 1942, 1950-51, 1960-61, 1971-72, and 1980. Populations are expected to peak again in the early 1990s.

Ruffed grouse respond positively to forest disturbance, especially in the aspen type. Three age classes in aspen are critical habitat requirements for ruffed grouse. Sapling and young pole-sized stands provide cover from predators during all four seasons, and pole stands 25-30 feet tall are used extensively by drumming males. Mature aspen stands provide grouse highly nutritious food in the form of buds in winter, catkins in spring, and leaves in summer. Male flower buds are used almost exclusively during most winters. Ruffed grouse population abundance in the Baudette Area is currently limited by lack of aspen age class diversity (i.e., 1-10 and 11-30 year age classes).

Sharp-tailed Grouse

Sharp-tailed grouse became very abundant in the Baudette Area following settlement activity. The transition habitat they are associated with was improved and expanded as a result of logging, fire, and farming. High sharptail numbers persisted through the 1940s and 1950s. Long-term habitat loss to natural succession, aided by the absence of fire, and conversion of transition habitat to cropland, has caused a severe population decline. Statewide, sharptail harvests have decreased by 85 percent since

the early 1960s. A sharptail dancing (breeding) ground survey conducted in Lake of the Woods County documents a 52 percent decline in dancing grounds from 1976 to 1988.

Moose

Prior to European settlement, moose and woodland caribou were common in the Baudette Area. Uncontrolled harvest by settlers and extensive habitat alterations during the early 1900s were largely responsible for extirpating caribou and almost eliminating moose. White-tailed deer proliferated in the early successional habitats created during that era.

Deer are benignly infected by a parasitic meningeal brain worm. This parasite also infects moose and caribou with fatal results. The parasite's effect on moose and caribou population dynamics is not well understood. However, it is a factor suspected in early population declines and may continue to play a significant role.

Concern for the moose population prompted a closed hunting season in Minnesota beginning in 1922. The season remained closed through the 1960s resulting in a gradual population recovery. An aerial census conducted from the 1950s to present documents this population increase.

The 1978-79 aerial moose census revealed the population in a portion of RMU 1 was sufficient to allow a limited hunter harvest. The hunt area (see Figure 6-2) is referred to as moose hunt zone 11. Five hunting permits were issued during the 1979, 1981, 1983, and 1985 moose seasons. Hunting permits were not issued for the 1987 season, because the 1986-87 aerial census indicated that the moose population had declined below goal.

Moose hunt zone 11 is a combination of transition, agricultural, and forested habitats. Land clearing for agriculture and natural succession, aided by a lack of fire, have caused long-term loss and deterioration of moose habitat.

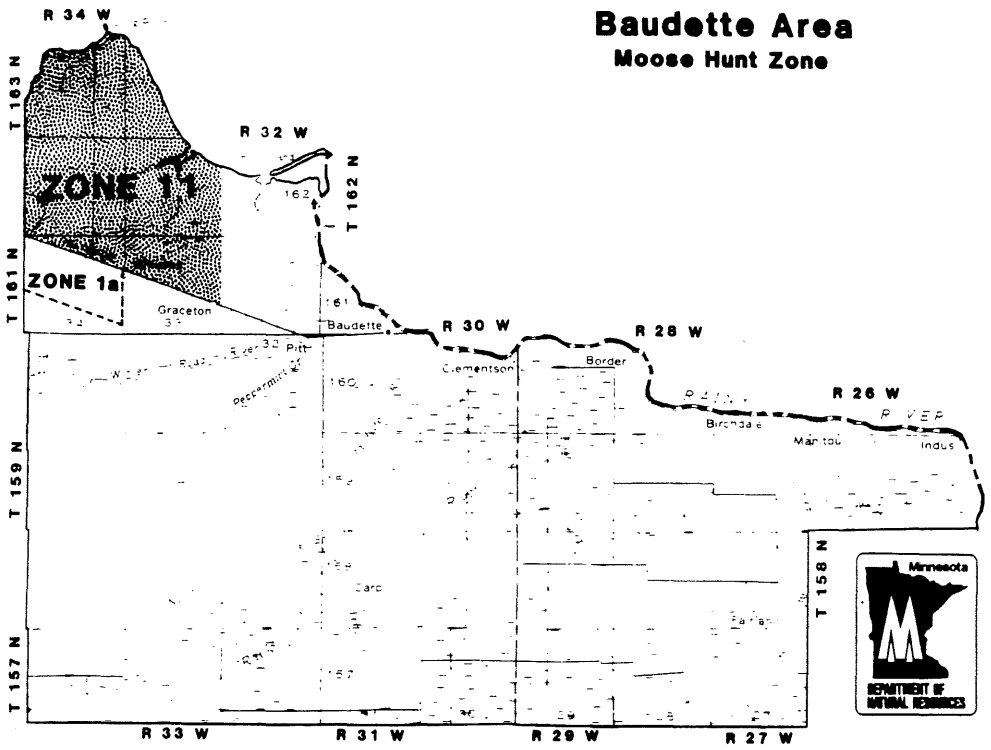


Figure 6-2

Black Bear

Black bear are popular big game animals in Minnesota. They occur throughout the Baudette Area. During times of natural food shortages, individual bears are often attracted to human-related food sources. These nuisance bear may damage crops, apiaries, dwellings, and other human property. Consequently, bear population goals are based on both carrying capacity and human tolerance. Goals have been established for Bear Management Units (BMUs) throughout the bear range (see Figure 6-3).

Bear population estimates, derived from radio-telemetry research and harvest statistics, provide information for setting hunting seasons and harvest quotas. The two BMUs which are in part located in the Baudette Area are near population goals.

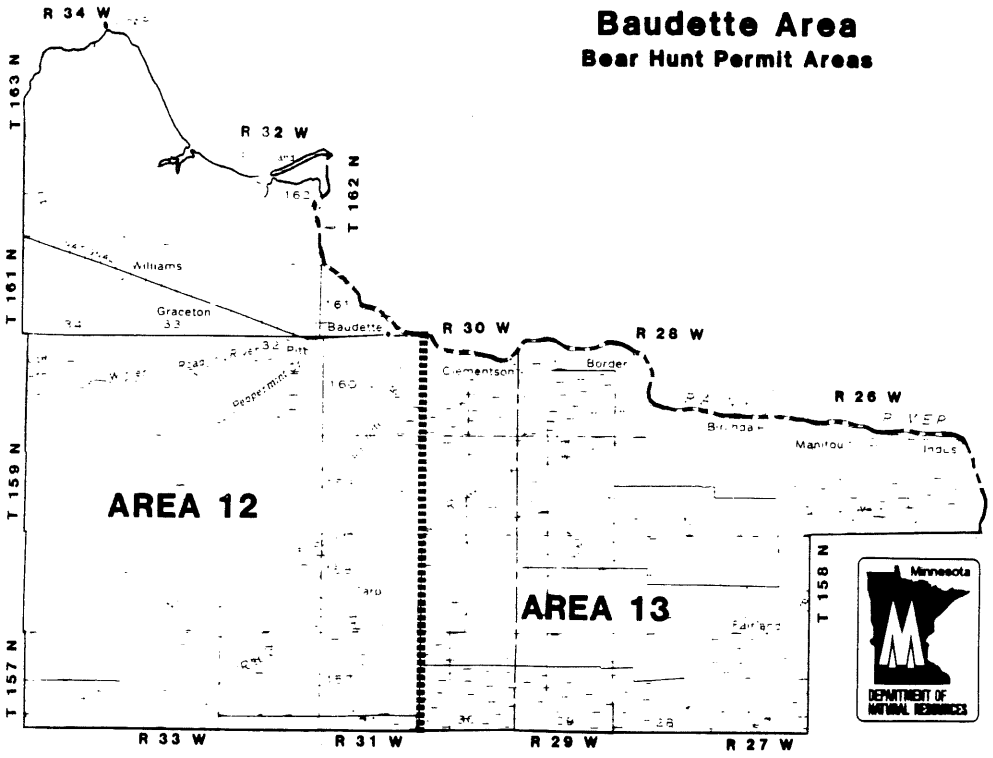


Figure 6-3

Gray Wolf

Gray or timber wolves were legally hunted and trapped in Minnesota until 1974. The wolf population in northern Minnesota has expanded south and west since the mid-1970s. The Baudette Area, is part of the gray wolf's primary range in Minnesota. The Area's wolf population has remained relatively stable during the last five years due to:

1. Protection resulting from enactment of endangered species legislation in 1973 and 1974.
2. More than adequate white-tailed deer populations.

Wolves are common in the Area and occupy all forested habitat where their primary prey, white-tailed deer, occur. Wolf population goals were established for "Wolf Management Zones" in Minnesota, as a part of the Eastern Timber Wolf Recovery Plan (U.S. Fish & Wildlife Service, 1978). The Baudette Area lies within two zones: 3 and 4 (Figure 6-4). Zone 3 includes approximately one-third of the Area, almost all in RMUs 2, 3, and 3B. The Zone 3 wolf population goal is 1 wolf/10 square miles. Zone 4 which encompasses RMU 1 and the NE portion of RMU 2, has a wolf population goal of 1 wolf/50 square miles.

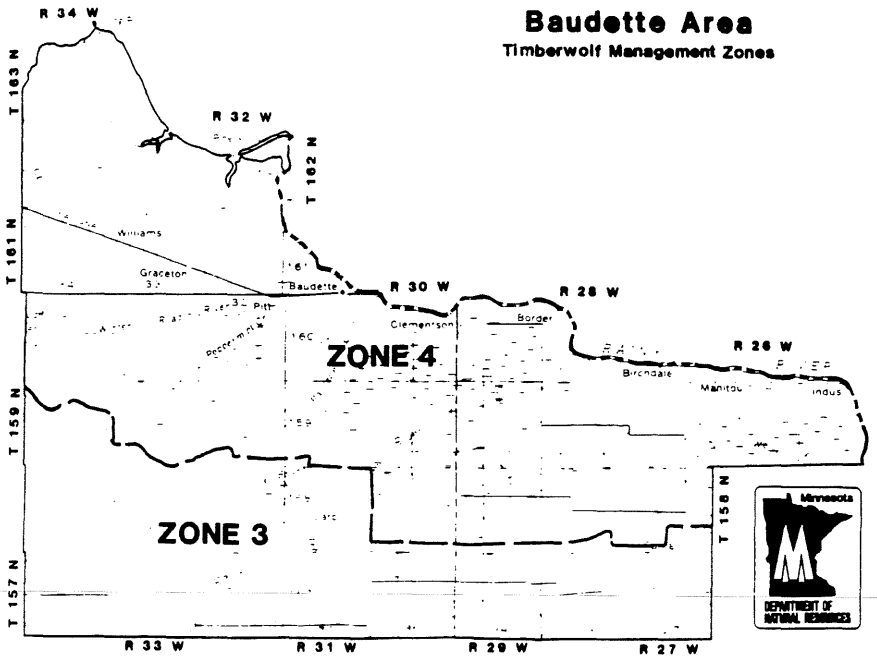


Figure 6-4

Rare Northern Owls

The Baudette Area provides habitat for several species of owls typical of boreal ecosystems. Three rare owls occurring in the area are the great gray owl, the northern hawk owl, and the boreal owl. Nesting habitat requirements, although not completely understood, can be described as follows. Great gray owls nest in stick nests made by large birds such as crows, ravens or hawks. Nests are typically located in mature tamarack and black spruce types. Northern hawk owls nest in tree cavities. They

generally select open areas adjacent to lowland conifer types. Boreal owls seem to prefer to nest in mixed forest types or fully stocked mature aspen stands with a balsam fir understory. Their nests are often adjacent to lowland black spruce bogs. Nesting by great gray owls and northern hawk owls is documented in the Baudette Area. Nesting by boreal owls probably occurs, but has not been documented.

Sandhill Crane

Extensive habitat alteration and uncontrolled harvest during the nineteenth and early twentieth centuries greatly reduced sandhill crane populations in Minnesota. Sandhill cranes received protection in 1916 under the Migratory Bird Treaty Act. Sandhill cranes are also listed as a "Special Concern" species under Minnesota's "State Endangered Species Act." During the last ten years, sandhill crane observations have increased statewide. Their range in Minnesota includes northwest and east-central counties of the state. The largest population occurs in northwest Minnesota, including the Baudette Area.

Sandhill crane breeding territories are a minimum of 200 acres, and generally consist of a combination of transition habitat and wetland habitat, often associated with cropland. Conversion of transition and wetland habitat to other land uses, and human disturbance of breeding territories can negatively affect cranes.

Snag/Cavity Associated Wildlife

Many forest wildlife species require snags and cavities for nests, dens, perching and feeding sites. Waterfowl such as common goldeneyes, wood ducks, and hooded and common mergansers nest in natural and artificial cavities. Other wildlife such as pileated woodpeckers, barred owls, northern flying squirrels, raccoons, three-toed woodpeckers, and chickadees also use snags and tree cavities. Approximately 93 species occurring in the Baudette Area require snags and/or cavities during part of their life cycle.

Forest management activities may eliminate large trees and snags from forest types, if efforts are not made to reserve them.

Endangered, Threatened and Special Concern Wildlife Species

Twenty-seven wildlife species occurring in the Baudette Area require special attention because they are "endangered," "threatened," or of "special concern" nationally or statewide.

Table 3-6-1: Endangered, Threatened, and Special Concern Wildlife Species in the Baudette Area.

Species	Special Status
Piping Plover (Charadrius melodius)	Endangered (State) Threatened (Federal)
Peregrine Falcon (Falco peregrinus)	Endangered (State & Federal)
Bald Eagle (Haliaeetus Leucocephalus)	Threatened (State & Federal)
Loggerhead Shrike (Lanium ludovicianus)	Threatened
Gray Wolf (Canis lupus)	Threatened (State & Federal)
American White Pelican (Pelecanus erythrorhynchos)	Special Concern (State)
American Bittern (Botaurus lentiginous)	Special Concern (State)
Osprey (Pandion haliaetus)	Special Concern (State)
Yellow Rail (Coturnicops noveboracensis)	Special Concern (State
Sandhill Crane (Grus canadensis)	Special Concern (State)
Upland Sandpiper (Bartramia longicauda)	Special Concern (State)
Marbled Godwit (Limosa fedoa)	Special Concern
Wilson's Phalarope (Phalaropus tricolor)	Special Concern
Common Tern (Sterna hirundo)	Special Concern (State)
Short-Eared Owl (Asio flammeus)	Special Concern (State)
Sharp-tailed Sparrow (Ammospiza caudacuta)	Special Concern (State)
Northern Bog Lemming (Synaptomys borealis)	Special Concern (State)
Pine Marten (Martes americana)	Special Concern (State)
Snapping Turtle (Chelydra serpentina)	Special Concern

Lake Sturgeon (Acipenser fulvescens)	Special Concern (State)
Bog Copper Butterfly (Epidemia epixanthe michiganensis)	Special Concern (State)
Dorcas Copper Butterfly (Epidemia dorcas dorcas)	Special Concern (State)
Bog Fritillary Butterfly (Proclossiana eunomia dawsoni)	Special Concern (State)
Frigga Fritillary Butterfly (Clossiana frigga saga)	Special Concern (State)
Freija Fritillary Butterfly (Clossiana freija)	Special Concern (State)
Red-disced Alpine Butterfly (Erebia discoidalis)	Special Concern (State)
Jutta Arctic Butterfly (Oeneis jutta ascerta)	Special Concern (State)

Piping plovers nest in only two localities in the state: the Duluth harbor on Lake Superior and Lake of the Woods. Of these two, Pine and Curry Island SNA on Lake of the Woods is the plover's main stronghold. Rocky Point is proposed as a WMA (see Land Administration chapter). The Minnesota piping plover breeding population was 14 pairs in 1988, all in the Baudette Area. Piping plovers nest in association with common terns (special concern species) on Pine and Curry Island SNA and Rocky Point.

Bald eagles are directly impacted by human disturbance and forest management activities. In the Baudette Area, there is one known active nest territory, located on private land. No known territories exist on DNR-administered lands. There is evidence of eagle nesting attempts on Pine and Curry Island SNA during the last few years. The bald eagle population is expanding and it is likely eagles will establish new territories in the area. Riparian areas in the Baudette Area provide important habitat for migrating eagles. Timber management that preserves super canopy trees and roost trees is critical for this species well being.

Peregrine falcons are occasional spring and fall migrants along the South Shore of Lake of the Woods. Nesting in the Baudette Area probably never occurred because of absence of cliff nesting sites.

Sandhill cranes, yellow rails, American bitterns, short-eared owls, and sharp-tailed sparrows are species of special concern found in nonforested habitat. They are negatively impacted by uncontrolled plant succession, land clearing for agriculture, and conifer reforestation.

DIRECTION

Areawide

The Wildlife Habitat Management goal of the Department of Natural Resources is to provide wildlife habitats conducive to managing and protecting a variety of wildlife and native plant resources compatible with forestry and wildlife management objectives and other multiple use goals.

The Division of Forestry has three primary means of managing wildlife habitat:

1. Timber management practices with modifications to meet specific habitat objectives.
2. Direct habitat management activities usually in cooperation with the Section of Wildlife.
3. Private Forest Management Program

Habitats and wildlife of special emphasis in the Baudette Area have been identified. Actual habitat enhancement will be accomplished, in part, through timber management activities (harvest and reforestation). These activities have been planned cooperatively by Baudette Area and Section of Wildlife personnel using the Timber Management Planning Information System (TMPIS), a computerized timber planning model.

Area Wildlife personnel were active participants in TMPIS. Input was also provided by Nongame, Natural Heritage, and Scientific and Natural Areas staff. Wildlife personnel also reviewed proposed road and recreation development and maintenance projects to identify management opportunities and potential conflicts between these planned activities and wildlife habitat and ecological considerations.

Areawide Objectives

To help achieve the goals of the Wildlife Habitat Management Program, the following are objectives for the Baudette Area:

1) Improve coordination and implementation of management programs.

Strategies

A. Initiate annual training session for both forestry and wildlife personnel.

B. Include joint field trip as part of one Area Forestry/Wildlife meeting.

C. Exchange research information, inventory data alterations, and habitat evaluation updates as part of standard coordination.

D. Coordination should be through personal contact as much as possible.

E. Increase the number of cooperative field projects between Forestry and Wildlife.

F. Coordination conflicts should be resolved through "review meetings" as outlined in Wildlife/Forestry Policy #8, specific procedural policy on Page D.

G. Personnel new to the Baudette Area (both disciplines) will be required to become familiar with the "Wildlife/Forestry Coordination Policy", the "Forestry/Wildlife Guidelines to Habitat Management" manual, and the Baudette Area Forest Resource Management Plan.

H. Where weaknesses in Forestry/Wildlife Guidelines (DNR rev. 1985) are apparent, Section of Wildlife personnel will meet with the Baudette Area Supervisor to initiate modifications.

2) Work toward improving forest habitat composition goals, by improving integration of Forest Habitat Compartment (FHC) evaluation with the Timber Management Plan.

Strategies

A. Field staff will meet with Area Wildlife staff at least twice a year to review FHC evaluation updates.

B. Area Wildlife staff will annually provide Field Stations with habitat improvement needs through FHC evaluation, that can be achieved through timber management.

C. During review of planned cuts, Area Wildlife personnel will indicate to Baudette Area staff which timber sales wildlife personnel would like additional input on (i.e., field involvement).

D. Baudette Area field staff will contact Area Wildlife staff as early as possible for review of plantation development proposals that have not been previously indicated on timber sale appraisals (L & F 121).

3) Continue cooperation with the Section of Wildlife's Natural Heritage, Nongame, and Scientific and Natural Areas programs.

Strategies

A. Baudette Area staff will contact the Regional Nongame Wildlife Specialist when a significant nongame feature or rare wildlife species is discovered (e.g., eagle nests, heron rookeries).

B. Baudette Area staff will contact the Natural Heritage Program when rare plants or unique natural communities are discovered.

C. SNA program will be contacted prior to management activities in ecologically significant and/or sensitive natural communities identified by SNA or NHP.

D. Proposed Scientific and Natural Areas and Heritage Registry Sites. Specific occurrences of natural communities, rare plants, and habitat of statewide significance will be established as Heritage Registry Sites or SNAs following Operational Order 29. (See 3-6, page 46, also.)

4) Improve coordination between Area PFM program and Section of Wildlife.

Strategies

A. Baudette Area staff will contact Area Wildlife staff for input when developing management plans.

B. Area Wildlife staff will identify those individual management plans and specific practices they will provide cost sharing for.

C. Management options will be presented to private landowners where wildlife and forestry recommendations differ.

5) Improve cooperation and participation in developing and conducting prescribed burns directed at maintaining and improving wildlife habitat.

Strategy

Pursue training opportunities that will enable Section of Wildlife personnel to assume Prescribed Burn Boss and Prescribed Burn Crew Boss assignments.

6) Obtain DNR unit designation (Wildlife Management Area, State Forest, SNA) of DNR administered lands classified "retain."

Strategy

Identify specific land unit designation during the Forest Unit Planning process, and work with local counties and other DNR disciplines to achieve objective.

7) Upgrade the two existing Wildlife Habitat Specialists from 90 percent to full-time employment (Baudette and International Falls), and add one full-time Wildlife Specialist to the Baudette Area Wildlife staff so that sufficient manpower exists to accomplish the above objectives and other wildlife management goals.

Habitat Management Needs

The Wildlife-Forestry Coordination Policy (DNR, revised 1982) and Forestry/Wildlife Guidelines (revised 1985) have been developed to address wildlife habitat needs by integrating forest management practices and habitat management objectives. Specific items referenced include: Habitat composition goals, Forest Habitat Compartment evaluation, forestry practices modifications, and special wildlife considerations. The Forest Wildlife Habitat Evaluation Procedures Manual (December 1980) provides guidelines for assessing the quality of forest deer habitat within four square mile (4 section) Forest Habitat Compartments (FHC) of 2560 acres. These habitat composition guidelines generally benefit deer and ruffed grouse. The Forestry/Wildlife Guidelines address other wildlife habitat considerations and special species habitat management.

The following habitat composition goals will apply to appropriate forested FHCs of the Baudette Area:

(percent Based on cover types assigned as "forest deer habitat")

Primary "Deer Habitat" Cover Types: aspen, birch, Balm-of-Gilead, oak, Ax, Ox, UB, jack pine, balsam fir, white-cedar, Cx, upland grass, IDEV (powerline ROW), Agr (field edges).

Secondary "Deer Habitat" Cover Types: black spruce upland, white spruce, red pine, white pine, ash, lowland hardwoods, northern hardwoods, Agr, IDEV, RO.

"Non-deer Habitat" Cover Types: willow, black spruce lowland, tamarack, REC, road, permanent water, nonpermanent water, marsh, muskeg, Sx, Tx, lowland grass, and lowland brush.

Goal	Habitat Type
1. 45-65%	Intolerant deciduous cover types (aspen, birch, Balm-of-Gilead, oak, upland brush)
2. 35-55%	Aspen (Disturbance in this type is the highest priority for habitat improvement, to provide well distributed stands in the 1-10 year age class)
3. 5% (minimum)	Permanent Upland Forest Openings (grass/forb dominated)
4. (Even Age Class Distribution)	All Timber Cover Types
5. 5-10%	Winter Conifer Cover (white-cedar, jack pine, balsam fir, and spruce) that currently provides cover (proper size, volume, crown closure)

Other Compartments

Habitat composition goals for other wildlife species in the Baudette Area will not be restricted to the four square mile FHC. Habitat for species such as ruffed grouse can be evaluated on smaller units, while species such as moose need larger areas for evaluation.

Conifer Plantations

Coordination of conifer plantation development and habitat considerations is an important forestry/wildlife concern (The Forestry/Wildlife Guidelines, revised 1985; pages 21 & 22, 36-39, 48, 62 and 63).

The following preferred practices benefit most early successional forest associated wildlife. These practices should be considered throughout the area, and particularly in FHCs where the intolerant deciduous and/or aspen component is below goal:

1) Expand intolerant deciduous acreage where the opportunity exists.
2) Favor regeneration of jack pine instead of red pine or white spruce.
3) Favor plantation establishment stocking levels and rotation age alternatives where a specific need exists (e.g., decrease levels where FHC deer winter cover component meets goal; increase levels to provide special habitat requirements) (e.g., dense jack pine for spruce grouse).
4) Use thinning to bring pole-size red pine plantations down to 80-90 basal area and saw-timber size plantations down to 110 basal area.
5) Favor plantation establishment techniques that do not utilize herbicide.
6) When herbicide use is necessary for establishment or release, favor selective rather than broadcast application techniques.
7) When considering plantation development to provide future deer winter cover, coordinate closely with Area Wildlife staff.

Deer Winter Cover

The importance of deer wintering complexes and winter cover to deer has been discussed. Wintering complexes have been and will continue to be identified by Wildlife personnel. The management direction for this habitat component will involve two aspects: protection of important winter cover and identifying potential future cover.

In those wintering complexes where harvest occurs, efforts should be made to maintain winter cover. Where white-cedar provides winter cover, it should be retained to biological maturity.

In FHCs that have a deficiency of winter cover, or in FHCs where white-cedar or balsam fir provide winter cover, adequately stocked white-cedar or balsam fir understories should be allowed to succeed to the understory component.

When establishing conifer as future winter cover, the priority species should be: White-cedar, jack pine, and balsam fir.

Old-Growth Forest

Identification and management of old-growth forest in the Baudette Area will follow DNR Old-Growth Task Force guidelines, when they are approved by DNR.

Forest Age Class Diversity

- Overmature Forest Types

To maintain stable populations of a variety of wildlife species, well distributed overmature forest habitat will be emphasized. Wildlife species such as white-tailed deer, black bear, sharp-tailed grouse, and sandhill crane have been discussed in other sections of this chapter. Other species require older forest habitat. Species that require overmature forests include: pileated woodpecker, barred owl, brown creeper, pine grosbeak, red-eyed vireo, pine warbler, northern flying squirrel, and pine marten.

The TMPIS process included an attempt to distribute timber sales and other management geographically. Because the Baudette Area's forest types are heavily skewed toward old age classes, maintaining mature and overmature forest habitat will generally not be a problem during the next 10 years. However, in some FHCs, there has been and will be extensive harvest and other disturbance.

The Forestry/Wildlife Guidelines (revised 1985) outline habitat considerations for timber harvest that create age class diversity by harvesting in smaller units. The need for large cuts is recognized and is mitigated by retention of uncut reserve strips and clumps. This does not adequately address the habitat needs of the wildlife species discussed above.

The following guidelines will apply:

Ten percent of each timber type's acreage will be managed beyond normal rotation to accommodate the needs of wildlife species which require overmature forest habitat.

When wildlife or forest staff recognize deficiencies in age class distribution in an FHC, they will work together to achieve a desirable spatial distribution of age classes.

Decisions to manage specific parcels beyond commercial rotation age will be made jointly by wildlife and forestry staff. Forest insect and disease considerations will enter into the decision-making process. The Section of Wildlife will develop a procedure to monitor FHCs for quantity and distribution of overmature forest types.

Snag/Cavity-Associated Wildlife

A priority will be to emphasize habitat considerations for snag and cavity associated wildlife species. Implementation of snag/cavity guidelines will be accomplished through coordination with Baudette Area staff (F/W Guidelines, rev. 1985, pages 78-80). This effort will help ensure that individual trees or groups of trees are reserved on timber sales and plantation development sites. Another goal will be to identify buffer areas in riparian zones, and cooperatively implement management of them. This will help protect critical habitat for wildlife species that utilize snags and cavities. In addition, wildlife personnel will continue placing waterfowl and songbird nesting structures.

Riparian Habitat

Special emphasis will be placed on riparian habitat management (Forestry/Wildlife Guidelines, pages 73-74). The preferred management strategy will be to identify and manage 100-foot wide buffer zones along wetland edges. This zone generally includes upland timber types. Also, management of specific stands in riparian zones will require coordination between Area Forestry, Wildlife and Fisheries personnel.

Resource Management Units

RMU 1

RMU 1 encompasses most of the Baudette Area's agriculturally suited soils, private land and active farms. Most DNR-administered land in RMU 1 lacks DNR management unit designation. Four areas are designated: Bernhoft Wildlife Management Area (WMA), Pine and Curry Island Scientific and Natural Area (SNA), and Zipple Bay and Franz Jevne State Parks. Several other areas are being considered for designation as State Forest and WMA.

A wide variety of wildlife species are supported by the forest, transition, agricultural, and lake habitats of RMU 1. Species such as white-tailed deer are found throughout the RMU. Other species such as sharp-tailed grouse, sandhill crane, and short-eared owl are found only in transition habitat. These transition habitat dependent wildlife populations can be negatively impacted by land clearing for agriculture, natural succession, and artificial reforestation. Intensive management of transition habitat will be required to maintain and increase these wildlife populations.

Management Strategies

Management strategies include retention of most public land and enhancement of the quality of wildlife habitat on DNR administered and private land. Unit designation of DNR administered land in this RMU is important to management of numerous wildlife species and associated habitats.

Primary emphasis for habitat management in RMU 1 will be enhancing the transition habitats which have deteriorated in quantity and quality on both public and private lands. Improving existing transition habitat and converting poor quality forest to brushland will receive special emphasis. Wildlife such as sharp-tailed grouse, sandhill crane, yellow rail, sharp-tailed sparrow, moose and deer will benefit from this management. The federal

Conservation Reserve Program (CRP) and state Reinvest in Minnesota (RIM) Reserve and Forest WHIP (FWHIP) programs have the potential to increase the amount of transition habitat on the private land in RMU 1.

Prescribed fire will be the primary tool used to manage transition habitat in RMU 1. Burning will improve the quality of brushland/grassland habitat. Fire, used under prescribed conditions, is an effective and cost efficient way to improve and create transition habitat. Alternatives to burning, such as shearing, brush disking, and herbiciding will also be used.

A second priority in RMU 1 will be forest habitat management. This will involve cooperative planning of timber sales, forest development projects, and Section of Wildlife funded habitat improvement projects. Habitat projects will include: Maintenance and improvement of deer wintering complexes, shearing and burning of noncommercial aspen and other intolerant deciduous types, management of forest openings, and establishing food plots.

Management of deer wintering complexes will be emphasized. This will include management of conifer types to provide thermal cover, and adjacent deciduous types for browse.

Management for endangered, threatened, and special concern wildlife species will continue to be directed at protection of important breeding areas for piping plovers, bald eagles, common terns, and sandhill cranes. Known bald eagle nests will continue to be monitored annually to assess territory occupancy and reproductive success. Riparian areas associated with Lake of the Woods and the Rainy River and its tributaries will be monitored to locate newly established and unknown eagle nesting territories. Detailed management plans for individual eagle nests will continue to be written, updated, and distributed by Nongame Wildlife staff. The extent and frequency of nongame wildlife

surveys in this RMU will be improved. Intensive bird observations and small mammal trapping will attempt to document the occurrence of wildlife such as northern and southern bog lemmings, marbled godwits, colonial water birds, and reptiles and amphibians.

Featured Wildlife Species

Featured species in RMU 1 are:

Sharp-tailed Grouse	Ruffed Grouse
Sandhill Crane	Piping Plover
Moose	Eastern Bluebird
White-tailed Deer	

Sharp-tailed Grouse and Sandhill Crane

SPECIFIC PROPOSAL: Sharp-tailed Grouse and Sandhill Cranes Management Areas

Specific areas in RMU 1 will receive special emphasis for these species (F-W Guidelines, pp. 92-93 and pp. 108-113). Both DNR administered lands and private lands will be involved. Portions of the following Townships will be selected:

T.164-34	T.161-33	T.158-31
T.163-34	T.160-31	T.158-30
T.163-33	T.160-30	
T.162-34	T.159-31	
T.162-33	T.159-30	

Specific Sections and Cover Types boundaries will be jointly developed by Baudette Area staff and Section of Wildlife personnel by April 1990.

Management within these compartments will be directed at improving the quality of existing transition habitat.

Specific Strategies:

1) Manage transition habitat using fire, shearing, and brush disking to maintain young successional stages.
2) Restrict conifer planting on DNR administered land within one half mile of known sharp-tailed grouse dancing grounds.
3) Encourage private landowners within project area to maintain transition habitat by providing specific management recommendations (e.g., discourage conifer planting especially within one-half mile of known sharp-tailed grouse dancing grounds) and cost-sharing to implement the recommendations.
4) Coordinate management practices on private land between Division of Forestry's PFM Program and Section of Wildlife's Forest WHIP and WHIP Programs.
5) Conduct and expand surveys of these two species to locate unknown breeding areas, document migratory patterns, and monitor response to habitat management activities.

Moose

Within moose hunt Zone 11, the population goal is the maintenance of a minimum of 50-65 moose. This population level enables issuing at least 5 permits per season, which is the minimum number of permits required to open a hunt zone. Habitat improvement projects such as shearing shrubs and intolerant hardwoods, prescribed burning, and brush disking will be implemented in an effort to increase this moose population to a huntable level. Some projects will be directed specifically at moose habitat improvement. However, most of the projects will be directed at transition habitat improvement, which a wide variety of wildlife species, including moose, are associated with. Since the general public is very interested in viewing moose, forest management and habitat management activities in RMU 1 should consider moose where they occur.

White-tailed Deer

The strategy for white-tailed deer management in the farmland DMU is to increase the population to 6.8 per square mile (non-habitat included). In the two forest DMUs of RMU 1, the population goal is to increase deer density to 15 per square mile of habitat. Strategies to accomplish this goal will involve:

1) Controlling antlerless deer harvests.
2) Using forest habitat compartment evaluation to prioritize habitat alterations.
3) Coordinating timber sales and plantation development on both public and private lands with Baudette Area staff.
4) Initiating direct habitat improvement with Section of Wildlife funds (i.e., DHIP, RIM, WHIP, FWHIP) on public and private lands. The following practices will be used: Prescribed burning, brush shearing, and shearing of intolerant timber types.
5) Establishing thermal cover (i.e., white-cedar, jack pine, balsam fir) by coordinating winter cover needs with Baudette Area's forest management and private forest management programs.

SPECIAL COMPARTMENTS: Deer Wintering Complexes

Specific forest habitat compartments have been selected for intensive deer habitat management because they contain important winter deer habitat (Figure 6-5). Management will emphasize maintaining existing conifer types that provide thermal cover, and where cover is needed, establishing additional conifer types to augment existing cover or to replace cover lost to harvest or succession. Additional management will be directed at providing adequate deer food sources within and near thermal cover.

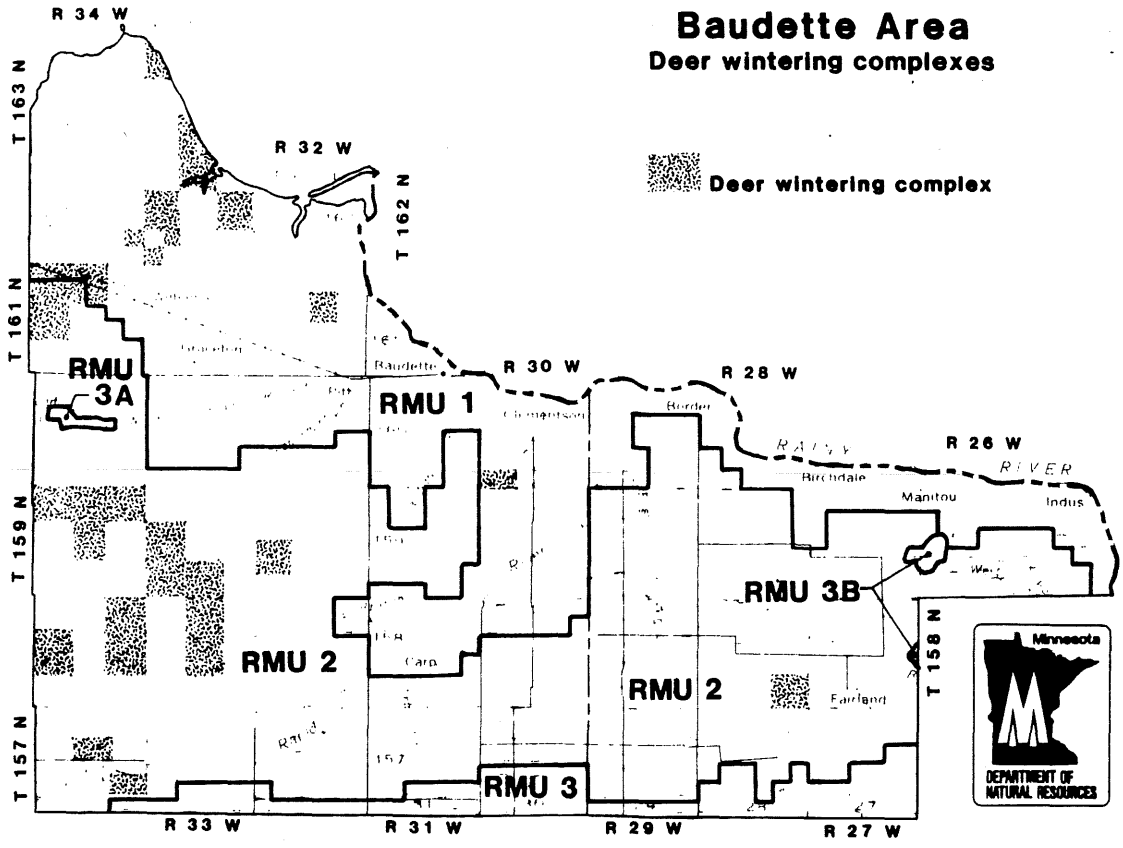


Figure 6-5: RMU 1 and 2

Compartments:

1) R.30-T.160, SW-FHC
2) R.32-T.161, C-FHC
3) R.33-T.163, SC-FHC
4) R.33-T.163, NW-FHC
5) R.33-T.162, NC-FHC
6) R.33-T.162, EC-FHC
7) R.33-T.162, WC,SW-FHCs
8) R.34-T.162, SE-FHC

Specific strategies:

1) Reevaluate FHC habitat composition and reclassify cover type designation to fit specific FHC situation.

2) Aspen stands selected for management by TMPIS will receive priority for harvest and recycling during the first part of this planning period.

3) Forest openings development and browse regeneration projects will be emphasized in these areas.

4) Harvest of conifer types, that are providing winter cover on DNR administered lands, will be closely coordinated to maintain thermal cover.

5) Priority will be given to developing TMPIS prescribed plantations when the location and species type (e.g., white-cedar) addresses a winter cover need.

Ruffed Grouse

Ruffed grouse management will emphasize aspen sale design that provides the proper interspersion of grouse food and cover. Ruffed grouse research has identified habitat management techniques that increase grouse populations by diversifying age classes within aspen communities. Ruffed grouse habitat requirements are best met by providing three age classes of aspen within the 6-10 acre "activity center" required by each breeding male. Timber harvest or disturbance on this scale provides the best opportunity for habitat improvement.

Maximum breeding densities of ruffed grouse result from harvesting in a patch-work or series of 1- to 2-1/2-acre cuts. Cutting units up to 10 acres with uncut clumps or strips of mature aspen reserved, also provide excellent ruffed grouse habitat. Cuts over 10 acres result in ruffed grouse densities less than those resulting from optimum habitat treatments.

Sale design, number of sale entries, and number of years between sale entries strongly influences habitat quality and, consequently, grouse population response.

Because of the Baudette Area's aspen age class imbalance, extensive management of mature and overmature stands is necessary during the next 20 years. Therefore, implementing ruffed grouse habitat management through small timber sales on an area-wide scale is not realistic. Harvesting in larger units, with modifications in sale design, can still provide habitat benefits.

Guidelines for ruffed grouse habitat improvement:

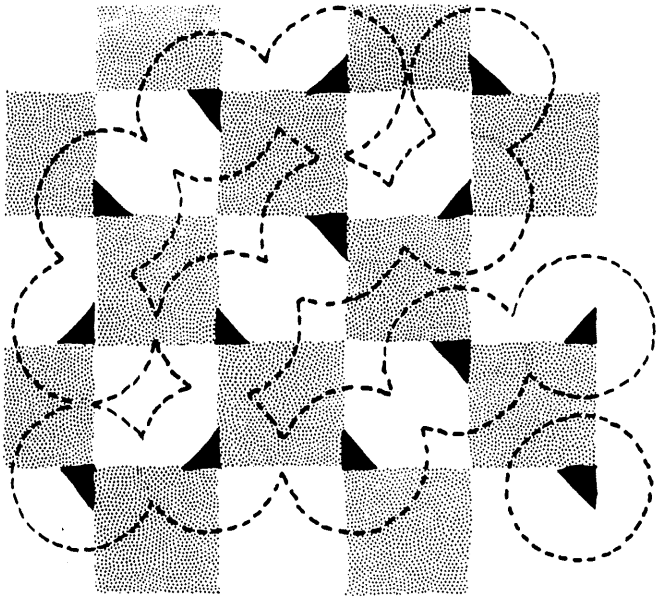
Preferred aspen harvest is a checkerboard pattern of cuts in 4 or 3 sale entries. Because aspen stands selected for harvest during this planning period are all overmature, the following guidelines will be used. It is recognized that certain stand characteristics {e.g., size, age, condition, access} and manpower limitations may curtail guideline implementation however, the Section of Wildlife will assist in the field work that is necessary:

1) Harvest aspen in small cuts (5-20 acres).

2) Plan harvest in aspen types in 2 sale entries at least 5 years and preferably 10 years apart (Figure 6-6).

3) In large stands, where stand management is not desirable and more than one sale entry is practical, design cuts so that the long axis is oriented north-south.

4) Design sales to provide mature aspen (25+ years) no further than 330 feet (five chains) from any part of the cutting unit.



Two Entry Aspen Sale In Mature Stand With Ruffed Grouse Habitat Consideration

1st cut - 10 or 20 acre blocks (preferably the smaller)

2nd cut - 5-10 years later

"Leave Corners" - old forest dedicated to wildlife (1/5 acre)

Potential "Activity Center"

Figure 6-6

Options to #4: (Figures 6-7, 6-8, 6-9).

a) Reserve clumps of 50-60 mature aspen trees (male clones preferred).

b) Reserve mature aspen in 1-2 chain-wide strips along upland/lowland edges of cuts, and/or reserve 1-2 chain-wide north/south strips between cutting blocks.

5) Harvest should be planned to ensure good stocking of regeneration (5000+ stems per acre).

6) Plan access so that trails and roads transect edges rather than center of the cutting areas.

7) Utilize small cuts (10 acres) in aspen stands which are outside of or not adjacent to cutting areas listed in the planned cut.

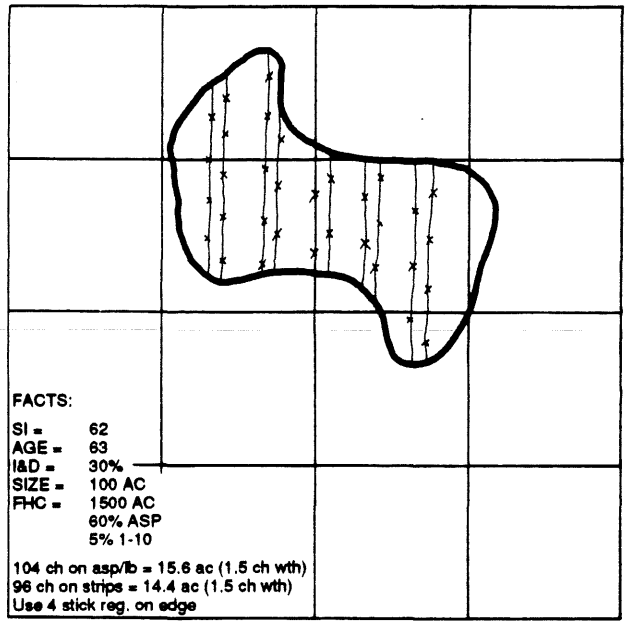


Figure 6-7: Option A

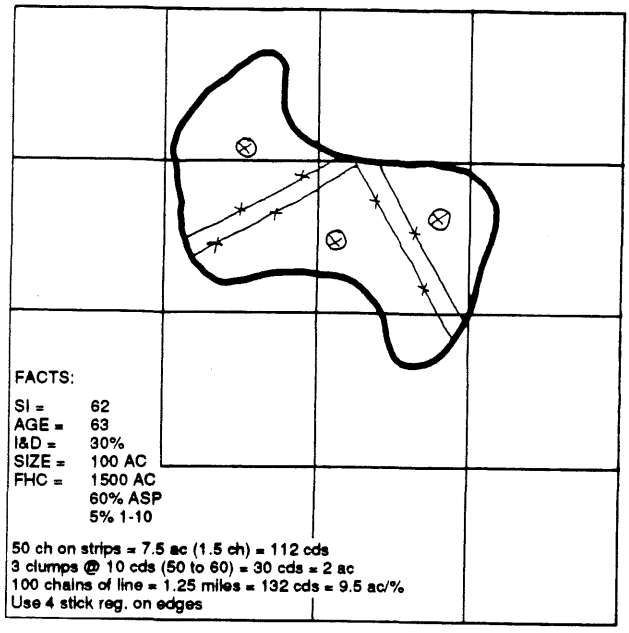


Figure 6-8: Option B

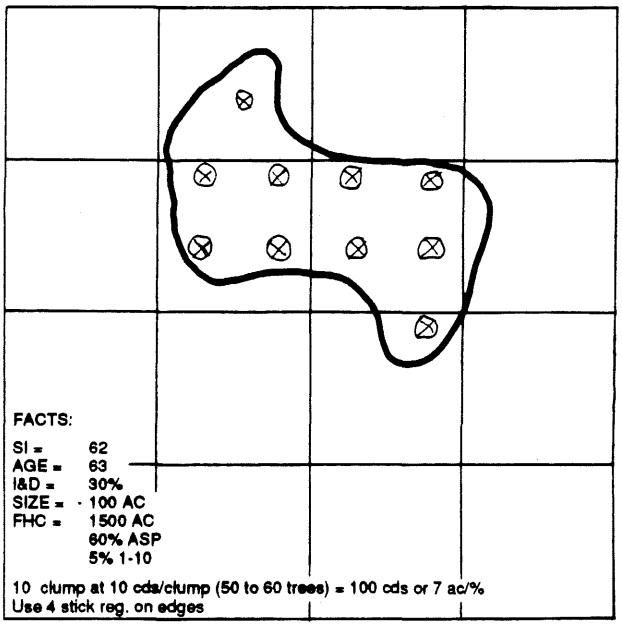


Figure 6-9: Option C

Piping Plover

The Piping Plover management goal is to increase the breeding population to 25 pairs (Great Lakes and Northern Great Plains Piping Plover Recovery Plan, 1988, and Pine and Curry Island SNA Plan). Strategies to accomplish this goal will include:

1) Continue to monitor the Lake of the Woods piping plover population. This will include: population estimation, monitoring reproductive success, and plover banding.
2) Continue to monitor effect of predation on the plover population, and initiate predator control as needed.
3) Continue efforts to designate Lake of the Woods shoreline as Harbor and South Shore WMAs to protect the piping plover population and habitat.
4) Search for additional undocumented piping plover nesting areas.

Eastern Bluebird

SPECIFIC PROPOSAL: Bluebird Management Areas

The eastern bluebird has suffered a widespread population decline, apparently due to a lack of nesting cavities. Forest management practices that provide snags and natural cavities are the best way to provide bluebird nesting sites. In addition, man-made nest boxes are accepted by bluebirds.

Currently, bluebird management corridors or trails (Figure 6-10) have been established in RMU 1 to increase the local bluebird population. A bluebird trail is a series of bluebird nest boxes placed in suitable habitat. Boxes are monitored and maintained to document use and nesting success. The nest box effort will be expanded. Specific areas within RMU 1 have been selected for establishment of additional bluebird trails (Figure 6-10). The goal is to construct and place 1,000 bluebird boxes in the area during this planning period.

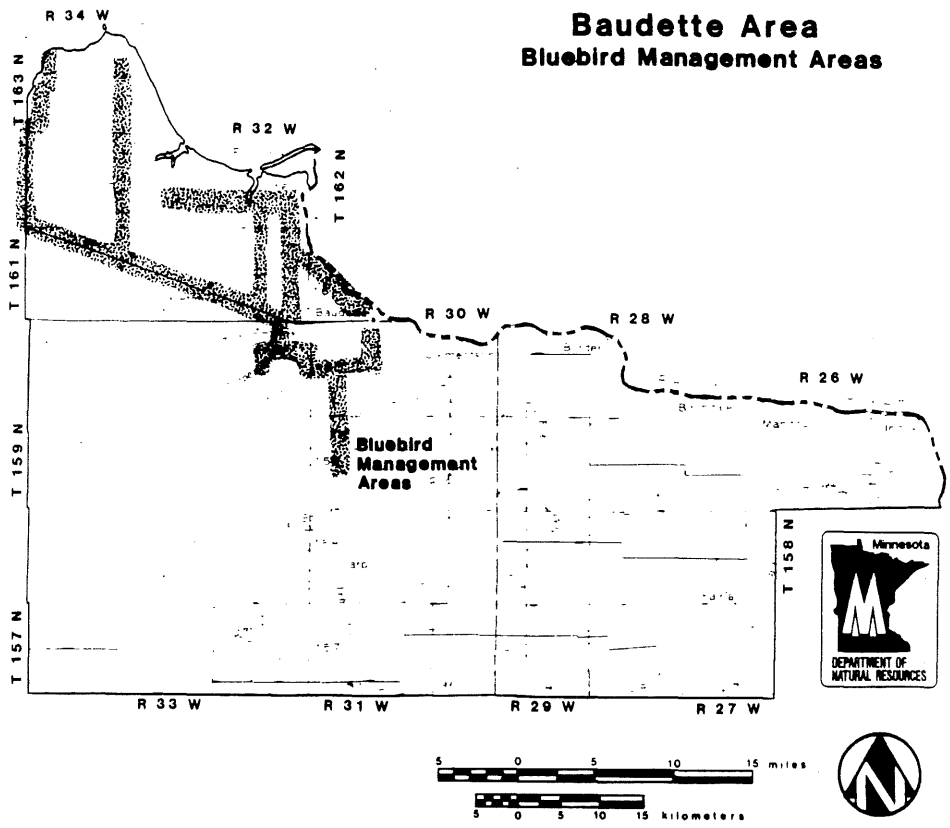


Figure 6-10

Specific Strategies:

1) Purchase nest box materials with Section of Wildlife's Nongame program funding.
2) Construct nest boxes by continuing to utilize MCC and standby firefighting labor. Construction of boxes by other programs (e.g., Sentence to Serve) and contract labor will also be pursued.
3) Coordinate with the PFM program to provide input into management plans to enhance bluebird habitat.
4) Promote bluebird trails as a management option to landowners contacted through the PFM and Forest WHIP programs.
5) Promote bluebirds and bluebird trails at the Lake of the Woods County Fair and other events.

SPECIFIC PROPOSAL: Protection of Ladyslippers

Spectacular stands of orchids including large yellow, small yellow, and showy ladyslippers occur in portions of Trunk Highway 11 right-of-ways. Cooperation between DNR, Minnesota Department of Transportation, and Canadian National Railways is being sought to promote preservation of these orchids. To enhance viewing opportunities and appreciation of this unique resource, construction of a rest area is planned. An effort will also be made to locate, protect, and promote viewing of additional unique floral assemblages--particularly orchids.

RMU 2

Presettlement vegetation and disturbances associated with human settlement were similar to RMU 1. However, the extent and duration of vegetation changes was on a smaller scale and of shorter duration. Farming attempts failed with greater frequency than in RMU 1 because of the poor quality and limited availability of agricultural soils. These abandonments culminated with the federal Land Utilization Project (LUP) from 1935 to 1939, which moved settlers to areas with better agricultural potential. In the Baudette Area, many families were moved to lands in RMU 1.

Portions of three major DNR management units are located in this RMU, including Pine Island State Forest, Beltrami Island State Forest, and Red Lake Wildlife Management Area. One small unit, Rako WMA, is located in RMU 2.

The existing quantity and quality of the forest habitat in this RMU, on DNR administered lands, has been evaluated by wildlife managers. Thirty-two percent (124,900 ac.) of all forest types is deer habitat. Of this deer habitat, 65 percent is intolerant deciduous types, 57 percent is aspen, and 1.1 percent (1,473 ac.) is forest openings. The largest habitat deficiency is the sapling age class in aspen (1-10 years). FHC evaluations show that only 5 percent (4,238 ac.) in this age class. The goal is 20-25 percent (14,188-17,735 ac.), a deficiency of 9,950-13,497 acres. The minimum long term goal for openings in RMU 2 is 5 percent or 6,250 acres, a deficiency of almost 4,800 acres.

Management Strategies

Wildlife habitat management in RMU 2 will involve integration of timber management activities with habitat management activities.

Opportunities to improve forest wildlife habitat in this RMU through Section of Wildlife funded habitat projects include: browse regeneration through shearing and prescribed burning, development and maintenance of forest openings, and cooperative development of timber access. By increasing forest habitat diversity, species such as deer and ruffed grouse will be benefited, as will many wildlife species associated with young hardwood forest habitats.

Management to protect unique plant communities and habitat of Endangered, Threatened, and Special Concern species such as gray wolf, short-eared owl, yellow rail, sandhill crane, and American bittern will be pursued. The Section of Wildlife Regional Nongame Specialist will recommend that the NHP Systematic County Biological Survey be conducted within this RMU. This is a comprehensive program designed to identify the occurrence of natural communities, plant and wildlife species.

Forest Openings

A long-term goal in RMU 2 is to attain a five percent minimum of deer habitat in forest openings. Additional openings construction in this RMU will be prioritized by Forest Habitat Compartment (FHC) evaluation. Construction in conjunction with maintaining existing openings will help achieve the desired quantity and distribution of this important habitat type.

Featured Wildlife Species

Featured species in RMU 2 are:

White-tailed Deer	Gray Wolf
Ruffed Grouse	Rare Northern Owls
Black Bear	Snag/Cavity Associated Wildlife

White-tailed Deer

RMU 2 includes portions of two forest deer management units (DMUs). These DMUs have a pre-fawning deer population goal of 10-15 deer per square mile of habitat. The goal during the next ten years is to increase the deer density to 15 per square mile of habitat. Specific strategies to accomplish this goal will involve:

1) Controlling antlerless deer harvests.
2) Prioritizing deer habitat improvement through Forest Habitat Compartment (FHC) evaluation.
3) Improving habitat by coordinating:
   - timber sale planning
   - aspen recycling
   - deer wintering complex management
4) Initiating habitat projects such as:
   - shearing intolerant timber types
   - creating forest openings
   - maintaining forest openings

Conservative antlerless deer harvests and moderate winter weather, together with habitat improvement, should result in stable or increasing deer populations in RMU 2.

SPECIFIC PROPOSAL: Deer Wintering Complexes

Specific forest habitat compartments (FHCs) in RMU 2 have been selected for intensive deer habitat management because they contain important winter deer habitat (See Figure 6-5 in RMU 1 discussion). Management will emphasize maintaining existing conifer types that provide thermal cover, and where cover is needed, establishing additional conifer types to augment existing cover or to replace cover lost to harvest or succession. Additional management will be directed toward providing adequate deer food sources within and near thermal cover.

Compartment:

1) R.28-T.158, SE-FHC
2) R.32-T.159, WC,SW-FHCs

3) R.33-T.159, WC,SC,SW-FHCs
4) R.33-T.158, NC,C-FHCs
5) R.34-T.161, NC,NW,WC-FHCs
6) R.34-T.159, NE,NC,NW,C-FHCs
7) R.34-T.158, NE,EC,WC-FHCs
8) R.34-T.157, C,SE-FHCs

Specific strategies:

1) Reevaluate FHC habitat composition and reclassify cover type designation to fit specific FHC situation.
2) Aspen stands selected for management by TMPIS will receive priority for harvest and recycling during the first part of this planning period.
3) Forest openings development and browse regeneration projects will be emphasized in these areas.
4) Harvest of conifer types on DNR administered lands will be closely coordinated to insure protection of thermal cover.
5) Priority will be given to developing TMPIS prescribed plantations when the location and species type (e.g., white-cedar) addresses a winter cover need.

Ruffed Grouse

The guidelines for ruffed grouse habitat improvement will be the same as for RMU 1 (Section 3-6, Pages 34-37).

Specific Proposal

SPECIAL COMPARTMENT: Ruffed Grouse

Specific habitat compartments in the Baudette Area have been targeted for intensive ruffed grouse management (Figure 6-11). This will be done by cooperatively designing small block cuts in the aspen type.

Compartments:

Range-Township	Section
1) 31-159	19
	20
	29
	30
2) 32-159	24
3) 27-158	23
	24
	N 1/2 25
	N 1/3 26
4) 34-157	21
	22
	23
	29

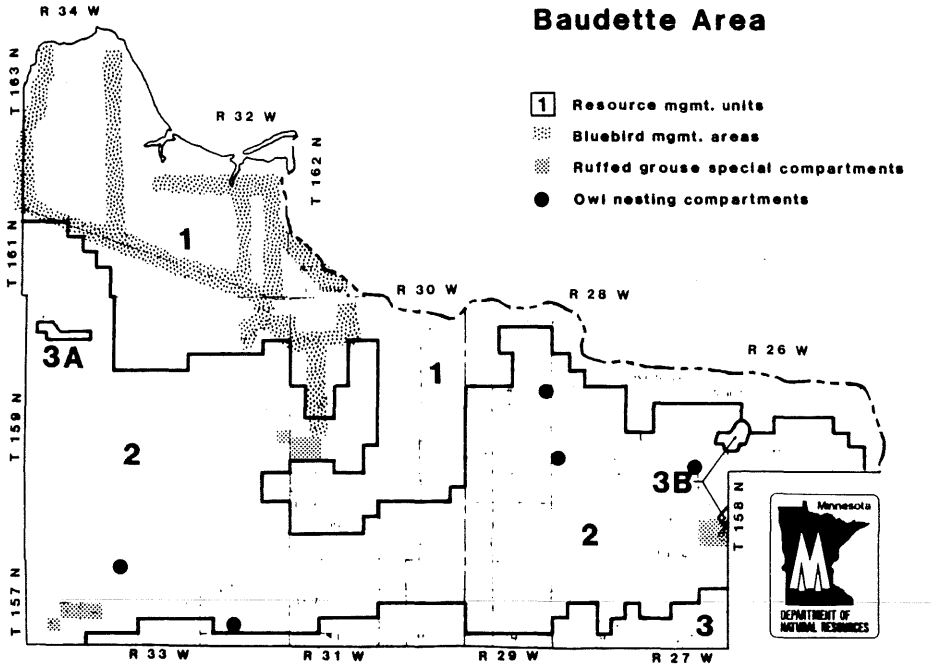


Figure 6-11

Specific Strategies:

1) Harvest pattern will follow ruffed grouse habitat recommendations in "Managing Northern Forests for Wildlife" by G. W. Gullion (pages 19-27) to provide optimum habitat improvement.
2) Cooperatively construct access to stands to be harvested.

3) Cooperative efforts between Forestry and Wildlife in deciding the timing and pattern of harvest and other treatment, and joint effort between disciplines in timber sale design and layout.

Black bear

The priority for bear habitat management will be to emphasize riparian habitat and forest management that provides habitat diversity. This will feature soft mast production, expansion of oaks to produce acorns for mast, and hardwood type management to provide young forest and forest openings for food sources.

The bear population goal is one bear per four square miles west of Highway 72 and one bear per five square miles east of Highway 72. Hunting permit quotas will be regulated during the next ten years to maintain the desired bear population.

Gray Wolf

Minnesota gray wolf populations are most affected by prey availability (i.e., deer population densities and alternate prey sources) and human-caused mortality. Recent research suggests there is a road density (1 mile of road / square mile of wolf habitat) above which wolf populations (i.e., reproducing packs) can be negatively impacted. High road densities provide increased human access, which can result in illegal and accidental human-caused wolf mortality.

Therefore, to help protect the Baudette Area's gray wolf population strategies will include:

1) Manage the wolf's primary prey (white-tailed deer) as previously described. Deer density goals for the Area's three DMUs exceed the level required to maintain the existing gray wolf population.
2) Implement the "Wolf Management-Road Densities" guidelines (F-W Guidelines, rev. 6/10/88).
3) Promptly refer wolf damage complaints to the appropriate wildlife manager.

SPECIFIC PROPOSAL: Rare Northern Owls

The Section of Wildlife's Nongame program will emphasize research and management for great gray, northern hawk, and boreal owls. Documentation of other rare northern owls, such as snowy owls, will also be sought.

To further document and encourage more nesting by great gray and northern hawk owls and to document nesting by boreal owls, specific compartments have been selected in RMU 2 for intensive habitat management (Figure 6-11).

Compartments:

Species	Location	Stand Numbers
A. Great gray owl	R.33-T.157, S.6	3, 4, 14
B. Hawk owl and	R.28-T.159, S.30	1, 3, 4
Boreal owl	R.27-T.159, S.34	9, 10
	R.32-T.157, S.28	2, 3
	R.29-T.159, S.1	6, 8

Strategies:

A. Great gray owl

1. Recommend increasing rotation (harvest) age of selected tamarack stands within this compartment.
2. Baudette Area staff and Nongame Wildlife staff will cooperatively design cutting patterns of tamarack stands selected in #1.
3. Nongame Wildlife staff will select and mark snags to reserve from harvest.
4. Five nesting structures will be constructed and placed by Nongame Wildlife staff.

B. Northern hawk owl and Boreal owl

1. Emphasize mixed stand management in these compartments.
2. Baudette Area staff and Nongame Wildlife staff will cooperatively design cutting patterns in selected cover types in these compartments.
3. Nongame Wildlife staff will mark snags including dead or dying trees and healthy live spruce and hardwood trees, to reserve from harvest.
4. Forty nest boxes will be placed by Nongame Wildlife staff.

SPECIFIC PROPOSAL: Proposed Scientific and Natural Area or Heritage Registry Site

The Section of Wildlife has identified an area where a Scientific and Natural Area or a Natural Heritage Registry Site should be considered for establishment. The site, commonly called "Gustafson's Camp" contains three sub-areas of high quality old growth white pine and red pine, within in an aspen type.

Specific Location:

Portions of Section 3, 4, 9, 10, Township 158, Range 33

Based on DNR information, virtually no old growth white pine and red pine remain in this part of the state. Field evaluation of this site by NHP staff, to be conducted by Fall, 1991, will determine whether it should be designated as a SNA or NHP Registry site. Also, exact boundary locations can then be coordinated and determined.

RMU 3, 3A, and 3B

This is the smallest RMU of the Baudette Area. It includes the north edge of the Red Lake peatland (RMU 3), the east side of the Winter Road Lake peatland (RMU 3A), and the west edge of the South Black River and North Black River peatlands (RMU 3B). With the exception of ditches constructed in the early 1900s, these peatlands differ little from their pre-settlement condition. All are recognized as ecologically significant and have been recommended for protection by the DNR Peatland Protection Task Force. Peatlands are fragile, poorly understood ecosystems that are not renewable if altered or destroyed.

Historically, fire has periodically retarded plant succession in parts of these RMUs. Because peatland soils are very unproductive vegetative changes occur very slowly. Successional stages are often maintained with very infrequent disturbance. Some habitat types within peatlands persist (in the human time frame) without disturbance.

Many plant species in RMU 3, 3A, and 3B are uniquely adapted to the poor growing conditions typified by peatlands. Trees species such as black spruce, white-cedar, and tamarack occur in peatlands but grow slowly and often are considered "stagnant". Wildlife species diversity is low in these RMUs.

The majority of land in RMU 3, 3A, and 3B is DNR administered. Portions are contained in Beltrami Island and Pine Island State Forests, and Red Lake WMA. The only DNR administered land lacking DNR management unit status in these RMUs occurs in Township 157, Range 30, and Township 157, Range 31. In these townships, there are substantial land holdings of the Red Lake Band of Chippewa Indians. There is very little other private land in RMU 3, 3A, and 3B.

Management Strategy

Management in RMU 3, 3A, and 3B will be broad or extensive rather than intensive and will be primarily habitat preservation. Little effort will be directed at improving wildlife habitat and wildlife-related recreational opportunities. Protection of peatland core areas will be emphasized. With the exception of State Highway 72 and the Fierro Forest Road, access into these RMUs is limited to ditch grades and winter trails. These RMUs offer unique wilderness recreational opportunities such as hunting sharp-tailed and spruce grouse and snowshoe hare, and observing rare plants, butterflies and birds. They also provide the opportunity for scientific study of these poorly understood communities. Wildlife habitat management activities may involve large-scale prescribed burning directed at controlling plant succession.

SPECIFIC PROPOSAL: Special Protection of Peatland Core Areas and Watershed Protection Areas.

Peatlands have been previously recommended for protection by the DNR to the Legislature as: SNAs, Peatland Scientific Protection Areas, and Watershed Protection Areas; however, this legislation was not passed. The core areas of the Red Lake Peatland and

North Black River Peatland were proposed as Scientific and Natural Areas. All four peatlands were proposed as "Peatland Watershed Protection Areas."

Management of these peatlands will be consistent with the recommendations in the report: Recommendations for the Protection of Ecologically Significant Peatlands in Minnesota, Minnesota DNR, November 1987.

The DNR is committed to the protection of these peatlands. In the absence of legislation, the following procedure will be used: Prior to initiation of any development proposal or management activity within these peatland core areas, or watershed protection areas, the Section of Wildlife's Scientific and Natural Area (SNA) program will be contacted. This coordination will ensure that the peatland's significant features receive adequate consideration for protection, relative to any management activity.

The locations of Peatland Core Areas and watershed protection areas are shown in Figure 6-12. More detailed maps are included in the appendix.

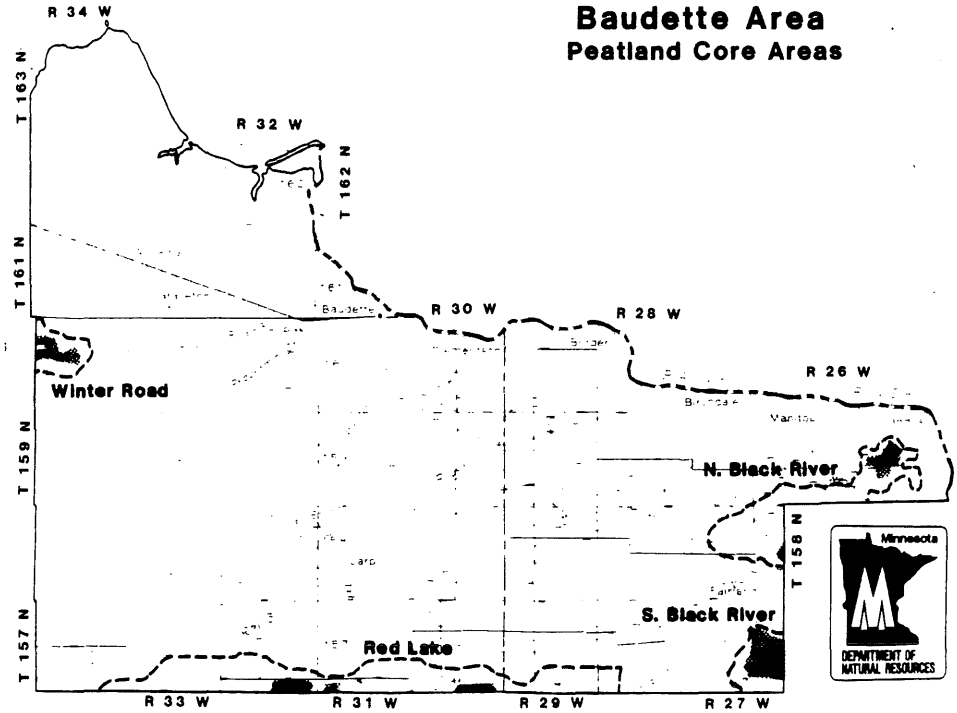


Figure 6-12

Table 3-6-2: Objectives and Targets for FY 1989 and 1992 (Forestry to accomplish.)
Fish and Wildlife Habitat Management

Proposed Program Objectives	Unit of Measure (#'s of)	1 ASF	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
1. Aspen recycling	acres	X	X (1)	500	200	400	1100	300
2. Schrub management	acres	X	X (2)	100	50	100	250	300
3. Permanent wildlife openings	acres		X (3)	30	20	60	110	150
4. Special nongame projects	projects							
5. Forestry/Wildlife coordinate meetings	meetings	2	X (4)	X	X	X		
6. Use prescribed fire as a resource management tool								
a. Forestry burns	acres		X (5)	30		100	130	100
b. Forestry assists	acres		X	800	20	100	920	920

Specific Detail
(1) Includes acres funded by wildlife but field work done by forestry.
(2) Sharptail/moose habitat improvement projects.
(3) Associated with recycling, sales, and development.
(4) These are special meetings and does not include unit planning, project coordination, or area meetings.
(5) None planned by wildlife.

Special Emphasis
1. Aspen recycling will take approximately 1000 hours during this FY89.

Table 3-6-3: Program Objectives Targets (Wildlife to accomplish.)
Habitat Management Program

Proposed Program Objectives	Unit of Measure (#'s of)	1 Reg	2 Bau	3 (1) IntF	4 RedL
1. Forestry/Wildlife Coordination (2)	fte	3.0	3.0	2.0	2.0
2. Permanent Forest Openings					
a. Creation	acres		500	150	150
b. Maintenance	acres		1500	150	650
3. Noncommercial Hardwood Regeneration (4)	acres		2000	500	800
4. Brushland Management					
a. Prescribed Fire	acres		8000	200	1000
b. Other (3)			1000	200	0
5. Forest Access	miles		20	20	10
6. Waterfowl Nest Boxes	structures		400	200	300
7. Bluebird Nest Boxes	structures	1000			
8. Owl Nest Structures	structures	45			

Specific Detail

(1) Ten-year goals on both DNR and private lands.
(2) Includes habitat evaluation, coordination meetings, review of forestry management practices on DNR and private lands.
(3) Includes shearing, disking, and herbicide.
(4) Includes browse management for deer yard management.

NURSERY AND TREE IMPROVEMENT PROGRAM

DESCRIPTION

The nursery program provides seed and planting stock for public and private lands. Nursery stock can be used for afforestation, reforestation, soil and water conservation, wildlife habitat, and environmental education. The tree improvement program seeks to increase the productivity of forest lands by providing genetically improved stock.

Nursery and tree improvement specialists at the General Andrews and Badoura nurseries are responsible for most program activities. Area staff assist in selecting seed sources and purchasing seeds and cones.

DIRECTION

The Baudette Area will continue to acquire seeds and cones as directed by the nursery staff. Emphasis will be placed on purchasing seed during good crop years. Seed collected will continue to be identified by its source.

The Area will provide the nursery with estimates of regeneration material needs on a timely basis. The accuracy of these projections should increase now that the TMPIS program is being used to summarize regeneration plans. The Area wants to increase paper birch regeneration and may consider limited hybrid aspen planting. Birch and aspen regeneration materials will be requested on a special order basis as projects are planned.

There will be continued efforts to improve the handling of seedlings from the time they leave the nursery until they are planted. Improvements in the tree storage bunker, use of refrigerated vans, and development of portable cold storage boxes for use at planting sites should improve seedling survival.

There will be an effort to establish seed production areas; especially for tamarack and northern white cedar.

Program Priorities for 1987-96

- Purchase adequate seed to meet Area needs. Acquire surplus seed in bumper crop years.
- Provide nurseries with estimates of regeneration material needs.
- Assist Nursery and Tree Improvement Specialists in the selection, development, and maintenance of seed production areas, seed orchards, and progeny tests.
- Improve cold storage facilities for seedlings.
- Return stock quality reports to nursery and attempt to relate stock quality to plantation survival rates.

PRIVATE FOREST MANAGEMENT

ASSESSMENT

In 1947, Minnesota Statute #88.79 implemented the PFM program by legislation providing assistance to private landowners who own less than 1,000 acres of commercial forest land. Reasons for landowner incentives participating in the private forest management program include: the desire to manage natural resources, improve recreation opportunities, and become involved in the tree farm program and local woodland owner's council. Program efforts are targeted to benefit forest and wildlife resources, the landowner, and the economy.

Typical PFM assistance activities include:

1. Promoting natural resource management through personal contacts with forest landowners, as well as information and education activities.
2. Developing multiple-use forest management plans for landowners.
3. Review and assessment of wildlife species/habitat concerns by area wildlife personnel and private landowners.
4. Providing landowners with advice and assistance on managed activities, such as:
   a. Timber harvest and marketing
   b. Wildlife habitat management
   c. Timber stand improvement
   d. Forest insect and disease control
   e. Tree planting
5. Providing information on financial incentives, such as cost sharing and forest tax laws.
6. Promoting landowner recognition for implementing forest management practices.
7. Assisting on urban forestry projects.
8. Cooperating with other agencies, vendors, industrial and consulting foresters to maximize landowner services and benefits.

Management Plans

As of April 1, 1989, the Baudette Area had 93 detailed Private Forest Management Plans on file, servicing 10,294 acres. There ar 41 landowners, and 7,413 acres involved in the Tree Farm Program. The PFM plan provides a professional Forester and Wildlife Manager valuation of a property's characteristics and potential for forest management. There is no charge for this service, but a limit of four days of professional assistance time per year is allowed to a landowner. Requests for plans offer the best opportunity to explain the program, as landowners receive immediate attention.

Artificial Forest Regeneration

The BAudette Area has approximately 4,800 acres of private plantations. Tree spacing has widened over the past 20 years, from 4' x 4' common in the early 1960s to 7' x 8' spacing today. Several closely spaced plantations have been noncommercially thinned under cost sharing program.s Several private conifer plantations will reach merchantable size for commercial thinning near the end of this ten-year management plan. Markets have traditionally been available to utilize these products and are anticipated to be periodically available in the future.

Artificial regeneration efforts have encountered several problems:

1. Private stock may be shipped late in the spring, after State orders. Stock has been received in poor condition for planting.
2. Late requests for tree sales and PFM plans are prompted by the annual media blitz for last minute tree sales. Plans are difficult to develop when property characteristics are obscured by snow. Foresters give special attention to these plans during implementation to make sure the correct assessment was developed.
3. Local labor supply for hand planting trees is not available. Landowners cannot rely on any local experienced planting contractors, and transient professional planting crews may not have time or interest in doing small acreage.

4. Storage conditions by private individuals are mediocre, at best. Storage under warm conditions, compounded by #1 and #2, does not provide optimum stock condition for establishment.
5. Improper planting techniques, i.e., not following spacing guidelines, planting too deep, too shallow, wrong species selection for the site.
6. Vendors for site preparation are difficult for individual landowners to identify and contract.

Improving and Protecting the Quality of Existing Timber Stands

Timber stand maintenance covers a variety of work, including thinning, release, and pruning. A major objective of private tree planting should be to develop well stocked stands which will not require release from competition, or pre-commercial thinning at a later date. Spacing requirements for cost share programs can control the need for pre-commercial thinning. Proper site preparation prescriptions have been proven to eliminate the need for release. Integrated forest pest management principles can reduce the impact of insects and disease on existing stands and those in the process of regeneration.

Timber Harvest and Marketing

Increasing market demands are promoting interest in forest products from private ownerships. Advice and assistance regarding timber sale design, scaling of cut products, and potential markets is available. The imbalance of age structure of the aspen timber type exists on all ownerships. Timber sales can provide financial returns and assist fulfillment of wildlife management objectives.

American Tree Farm System

The American Tree Farm system is a nationwide program which gives public recognition to private forest owners who are doing an effective job of growing trees as a crop. The Tree Farm organization encourages private forest landowners to manage their

forest lands for increased production of tree crops with the benefits of improved wildlife habitat, watershed protection, and outdoor recreation.

Benefits of belonging to the organization include:

1. Subscriptions to The American Tree Farmer and Green America magazines.
2. Newsletters and mailing from State Tree Farm Committees.
3. The opportunity to compete in local, state, and national outstanding tree farmer contests.

Financial Incentives

Currently, there are six federal and state cost-sharing programs as incentives for forest management:

1. Forestry Incentives Program (FIP):
   - Federally funded program
   - Wood production oriented
   - Landowner is limited to receiving a $10,000 maximum per year in program payments.
2. Agricultural Conservation Program (ACP):
   - Federally funded program
   - Conservation oriented
   - No minimum acreage
   - $3,500 yearly maximum allowed program payments for each landowner
3. Long Term Agreement (LTA):
   - Federally funded under the ACP program
   - 3- to 10-year forest management practice
   - conservation oriented
   - 40 acre minimum
   - Total reimbursement limited to $35,000
4. Conservation Reserve Program (CRP):
   - Federally funded program
   - Participants receive an annual rental payment in addition to 50 percent cost share for conservation practices.
   - 10-year contract

- Minimum 3 acres
- Can establish and maintain either trees or grass as a cover crop

5. Re-Invest in Minnesota (RIM):
   - State funded program
   - Aimed at retiring marginal agricultural land for a 10-year period
   - Landowner may establish and maintain either trees or grass as a cover crop
6. Forest Wildlife Habitat Improvement Program (FWHIP):
   - Funds are derived from (Reinvest in Minnesota) RIM legislation
   - Provides cost-share assistance to private landowners to perform wildlife habitat management practices
7. Deer Habitat Improvement Program (DHIP):
   - Funds are derived from (Reinvest in Minnesota) RIM legislation
   - Provides cost-share assistance to private landowners to perform wildlife habitat management practices

Cost-share incentives are a vital part of the PFM Program. More federal money is annually available than is used. Some of these federal and state cost-sharing programs involve cooperation with both the ASCS and SCS Offices. It is critical to have good working relationships with these agencies in order to provide land management information and assistance to the landowners.

Landowner Recognition

Landowner 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 are featured in a write-up in the local paper.
4. They receive a forest management award.

Norman and Joyce Olson were given the "Regional and State Tree Farmer of the Year" award in 1976.

To provide a smooth organized flow between the cooperating agencies and the landowners, the Baudette Area, the ASCS and SCS have developed a flow chart. It outlines the PFM project procedures, from initial contact through the final compliance check for a completed practice.

PROCEDURE FOR PFM WORK

Step 1. Interested landowner contacts the Field Station Forestry Office.
- Initial contact will cover:
A. Filling out the application for forestry assistance.
B. Setting up an appointment for a field check.
C. Determination of wildlife management interests of landowner and involvement of wildlife manager.

Step 2. Forester and wildlife managers, if applicable, field check property with landowner to inventory resources and assess landowner management objectives.
- Field check will cover:
A. Discussion of land management alternatives.
B. Completion of a rough management plan.
C. Completion of a rough 862 referral form.
D. Filling out a state tree order form.

Step 3. Landowner signs up at the ASCS or DNR Office, if interested in cost-share programs.

Step 4. Send in the state tree order form with payment before March 1.

Step 5. Field Station will complete a management plan and send a copy to the landowner.

Step 6. Landowner will complete practices as outlined in the management plan.

Step 7. After the practices have been completed, the landowner notifies the Field Station person and submits associated costs to the ASCS Office or wildlife office.

Step 8. Forester or wildlife manager will do field check of work completed (compliance check) and fill out the 862 referral form.

Program Direction

The Baudette Area intends to increase the number of landowners served in this 10-year management period. A goal for the next 10 years will be to complete an additional 60 plans that cover 6,400 acres. Present staffing will continue to serve requests for plans and advice, but the Area has requested funding for a technical contract to provide labor for tree planting coordination.

Management Strategy

To achieve the goals of the PFM program, the strategy will be to focus on those activities that produce the greatest benefit to landowners, the economy, and the natural resources of the Baudette Area.

The PFM program operates primarily in RMU 1 where wildlife management focuses on transition habitat, which may be negatively affected by conifer planting. The PFM program will promote transition habitat where possible, recognizing that the landowner's goals may emphasize forest management.

Specific Proposals

1. Wildlife management recommendations will be incorporated into PFM plans to meet the landowners particular interest.
2. Use of freezer stock and containerized stock will reduce dependance on late season delivery of bare root stock.
3. Additional mechanical and hand tree planting tools will be available for use by PFM participants to reduce seedling storage time and planting season length.
4. Early delivery of large volume individual tree orders will be requested annually.

5. Lists of local vendors interested in hand planting, wildlife habitat improvement, site preparation, and release work will be developed and maintained.
6. PFM will be promoted annually at the Lake of the Woods County Fair by personal contacts.
7. Foresters will annually promote Arbor Day in the schools and with area civic groups.
8. Management plans will encourage timber harvest as one of the practices of forest management.
9. Availability of cost share programs will be advertised in mid-July annually, to encourage requests for management plans during the summer field season.
10. News releases will be distributed as changes in programs occur, or woodland owners conferences are scheduled.
11. One candidate for Region Tree Farmer will be nominated annually.
12. Continuation of referral system with ASCS, SCS, and Section of Wildlife will be pursued.
13. Hold one PFM workshop per year to generate interest.
14. DNR will closely assist the Headwaters RC&D with formation of a Lake of the Woods Woodland Owner's Council.
15. Review and modify TEMPIS prescriptions in RMU I to mitigate the unanticipated, accelerated PFM program's impaction on brushland communities.

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.

Urban forestry activities in the Baudette Area are limited by the small population of the area. Advice and assistance is provided to city councils and private home owners in selection of trees, planting techniques, spacing, location of plantings. This assistance helps 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. Identified insect and disease problems that affect municipal and residential trees is an important urban forestry responsibility of the area.

DIRECTION

The urban forestry effort will continue to increase slightly as a response to expanding populations. Arbor day activities will be promoted, and the area will distribute information and education through the media on insects and diseases, and tree maintenance.

Urban Forestry Program Priorities for 1988-98

1. Continue to advise individuals and communities on forestry activities in the urban setting.
2. Promote DNR sponsored arbor day activities and encourage individual and civic group observances of arbor day.
3. Educate the public of symptoms and controls for insect and disease problems of local concern.
4. Promote urban forestry and distribute individual seedlings to the public at the annual county fair.
5. Continue to manage school forest land for multiple use.

Coordination With Other Divisions, Agencies, and Organizations

The Division of Forestry will work with many interest groups and service agencies in promoting urban forestry. Personnel from the non-game program of the Division of Fish and Wildlife will be used for urban forestry consultations. The county extension office and the Soil Conservation Service will be utilized to distribute information and education on urban forestry programs. The area will assist schools with arbor day activities and school forest management.

Table 3-9-1: Objectives and Targets for FY 1989 and 1992
Urban Forestry

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
1. Individual assists	assists		X	10	5	5	20	20
2. Community assists	assists			1	1	1	3	3
3. Arbor Day celebrations	communities		X	1	1		2	2

COOPERATIVE COUNTY FOREST MANAGEMENT PROGRAM

ASSESSMENT

The statewide goal for the cooperative county forest management program is to support and assist efforts to intensify the multiple use, sustained yield management of county tax forfeited forest lands.

The Division's cooperative county forest management activities include providing requested assistance on land transactions, administrative issues, forest inventory, ownership mapping, and aerial photo interpretation. Financial support is also made available to carry out reforestation, timber development, and forest road projects. Division efforts concentrate on channeling financial support and/or technical services through ongoing Division programs rather than through direct staff support.

Demand for assistance to the Counties in the Baudette Area has been minimal. There is little county administered land in the area.

DIRECTION

The historical role of the Division in providing forest fire protection, seed and seedling production, insect and disease control, and forest inventory for county programs will be maintained. Where statutory responsibilities allow flexibility, the regulatory role of the Division in relation to county programs will be de-emphasized in favor of an advisory role.

Cooperative efforts will continue to be pursued on the management of roads and trails the Area.

Table 3-10-1: Objectives and Targets for 1989 and 1992
Cooperative County Forest Management

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
1. Coordinate timber harvest plans.	plans							
2. Meetings with counties	meetings							
3. Cooperative projects with county land departments	projects							
4. Assistance to other counties:	projects	X		X (1)		X	1	1

Specific Detail

(1) Assist county in obtaining grant-in-aid snowmobile trail lease across 132 forties of state land. Process started 1/20/8

Special Emphasis

FOREST PEST MANAGEMENT PROGRAM

ASSESSMENT

Insects and diseases are the major causes 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. In addition to volume losses, losses occur from a reduction in tree quality and from an alteration of a forestry practice.

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. Assistance is provided to reduce resource losses and limits on productivity. Management guidelines, standards, examples, and risk evaluation systems for managing pests are examples of the types of assistances that are provided.

Insects and diseases are a part of the forest ecosystem and will always have the potential of causing catastrophic losses. Under intensified forest management practices, their potential impact is greater than under an extensive management system since intensified forestry practices tend to develop more monocultures and tree values increase because more money is spent on each tree. Losses can be managed only through the integration of forest pest management techniques into forest management activities. Insect and disease management should be an objective when planning and carrying out any forestry activity. Integrated pest management can reduce losses directly by affecting the pest and indirectly by altering conditions contributing to a pest popula-

tion build up. An integrated approach requires a pest management program with strong training, evaluation, and research components so that the resource managers are continually appraised of changing pest levels and are aware of pest management principles and strategies.

Softwoods

Jack Pine Budworm (*Choristoneura pinus*):

This defoliating insect has historically occurred in the Baudette Area and has the potential to cause top kill and tree mortality. The extensive acreage of mature and overmature jack pine in the Williams District is particularly vulnerable. Historical records of outbreaks do not quantify losses, but records show a budworm outbreak from 1965 through 1967. In 1965 while the population was building, scattered light defoliation was observed. In 1966 populations were "especially high," and top kill and mortality were predicted for "a few small locations...that were severely defoliated." (Forest Pest Newsletter-No. 3, May 12, 1966) During 1966, 100 acres of jack pine around the state forest campground at Blueberry Hill between Williams and Roosevelt were aerially sprayed with one pound per acre of Malathion in fuel oil.

In 1976 budworm caused moderate to heavy defoliation in the Warroad Area, but no noticeable defoliation was recorded in the Baudette Area. Since the jack pine type in the Baudette Area is part of a large, contiguous type which runs into the Warroad Area, budworm populations building up in one Area should affect the other Area. In 1986 budworm was found in both Areas, but defoliation was only noticed in the Warroad Area. Early larval and egg mass survey results in 1986 are indicative of an established population in the Baudette Area; noticeable defoliation may occur in 1987.

Bark Beetles (Ips spp. and Dendroctonus simplex):
Bark beetles in both pine (Ips) and tamarack (Dendroctonus) continuously pose a threat particularly in pine plantation management and in tamarack stands which are regenerated by the seed tree method or have experienced changes in water levels. Bark beetles need brood material to buildup their population, and then they need stress on the trees being attacked. Thinning pine plantations during the period of March through July or storing winter cut tamarack sticks on sale permits through the growing season can provide brood material. Drought and changes in water levels can provide the stress necessary for a successful bark beetle attack.

Saratoga Spittlebug (Aphrophora saratogensis):
This is a potentially devastating insect in plantations with trees ranging in height between 2 feet and 15 feet. Good records have not been kept on historic occurrences of this insect because the damage is often attributed to other factors. However, a heavy infestation on jack pine in the Faunce area was noted on June 24, 1965, by Dr. Harold Batzer of the North Central Forest Experiment Station, and jack pine plantations on Minnesota and Ontario Paper Co. (Boise Cascade) land in Koochiching County were "quite serious(ly)" infested with spittlebug. (Forest Pest Newsletter-No. 2. July 1, 1965)

Spittlebug feeding can cause tree deformity, dieback, and tree death. Both jack pine and red pine can become infested with this insect. The Saratoga spittleburg does need an alterate host to complete its life cycle. The alternate host can be any shrub species such as raspberry, willow, hazel and sweetfern; therefore, young pine plantations with brush competition are particularly susceptible to a buildup of this sucking insect.

Dwarf Mistletoe (Arceuthobium pusillum):

This parasitic seed plant is the most serious pest problem of black spruce. It causes a proliferation of growth at the point of infection which is commonly known as witch's broom. The natural control of this disease is through fire, but prescribed burning is no longer a major management tool for black spruce. In the past, black spruce was harvested by piece cutters who cut only the merchantable trees. This practice led to an increase in dwarf mistletoe since unmerchantable infected trees left after harvesting infected the newly regen- erating black spruce stands. Phase II inventory shows that 25,718 cords or 6.5 percent of the total black spruce volume are infected, and 6,918 cords or 1.7 percent are lost to this disease. Also, 15,241 acres or 52.9 percent of the black spruce cover type in the Baudette Area are affected to some degree. Mortality from dwarf mistletoe can be found on 9,521 acres or 60 percent of the black spruce type.

Diplodia Tip Blight (Sphaeropsis elliottii):

This disease can cause stunting and tree death particularly to young trees less than ten feet tall. Both jack and red pines are infected. Infections are more likely to occur in plantations established under larger residual pine or along edges adjacent to older, uncut pine. Damage is commonly confined to the current year shoots, but under stress conditions such as drought or hail damage, this fungus can move beyond the current year shoots and kill branches, tops or entire trees. Diplodia tip blight is found in the Norris Camp area but no significant damage has been observed. Because of the large contiguous pine type in the Williams District, this disease has the potential to adversely affect regeneration efforts. Control measures should be followed when establishing plantations.

WHITE PINE BLISTER RUST (Cronartium ribicola):

White pine is not a major cover type in the Baudette Area, but where white pine is found, blister rust occurrence is significant. Mortality can be found on 100 percent of the cover type acres. Phase II inventory found 5,392 cords of white pine or 64.5 percent of the total volume affected. Mortality accounted for 1,448 cords or 17.3 percent of the volume. Because the Baudette Area lies totally in the high and severe hazard zones for blister rust occurrence, any planting of blister rust during the next 10 years must be done as an understory crop, and a commitment must be made prior to planting to do periodic pathological pruning.

There is a small open grown plantation in the Williams District planted in 1983 with 3,000 "improved" white pine from the USFS and 3,500 regular white pine from our nursery. The "improved" stock came from seed produced by open pollination of one resistant parent, and the susceptibility of this stock should range between 10 percent and 80 percent. This planting was established to evaluate susceptibility and not to serve as a future source of seed.

Plantation Management:

Insect and disease management should start before plantations are established and be part of the planning process. It is more costly and difficult to address insect and disease problems after plantation establishment. Pest 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 sizeable investment has been made in establishing plantations, regeneration plans must be structured to improve pest management capabilities, and priority should be given to maintaining the vigor, health, density and quality of all plantations.

Hardwoods

Forest Tent Caterpillar (Malacosoma disstria) and Large Aspen Tortrix (Choristoneura conflictana):

Both of these defoliators have been historically important in the Baudette Area. The tortrix has been most evident in Koochiching County with the last major recorded outbreak occurring during the period of 1969-1971. In 1971, two million acres in northern Minnesota were 40-100 percent defoliated by this insect. During 1985 and 1986, tortrix was evident once again in Koochiching County, but causing thin crowns rather than noticeable defoliation. The forest tent caterpillar defoliation occurred during 1952 and 1953, 1969-1971, and 1977-1980. In 1978 and 1979, almost all hardwood stands in the Baudette Area were completely defoliated after the flush of new leaves in the spring. The population drastically collapsed at the end of the 1980 season, and no FTC populations were evident in 1981. Historically, both defoliators appear to spread into the Baudette Area from the International Falls area with the FTC spreading westward to the North Dakota border while the tortrix causes little notice west of Koochiching County.

Hypoxylon Canker (Hypoxylon mammatum):

This disease is the most destructive disease of aspen, and in Minnesota is responsible for an annual mortality of 700,000 cords of aspen. This loss more than equals the capacity of 3 average size Minnesota waferboard plants. Because of the large acreage of aspen in the Baudette Area, Hypoxylon canker has the potential of causing a significant impact on aspen management. Its management impacts must be considered in regeneration plans.

DIRECTION

To manage insects and diseases, the Baudette 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. Baudette Area personnel will 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 taken are as follows:

Jack Pine Budworm

1. Risk and hazard rate the pine stands in the Baudette Area using Phase II inventory data and field observations. Include all ownerships when possible.
2. Stands on the planned cut list should be prioritized for harvesting based on risk and hazard rating results.
3. Break up large, contiguous pine types by planting some non-pine species within the jack pine type and by not converting hardwood types to pine within these large contiguous pine types.
4. When planting or regenerating pine, accept some aspen ingrowth within pine plantations, and allow plantation edges to regenerate to hardwoods where hardwoods had previously occurred.
5. If an infestation occurs and causes top kill or tree mortality, give top priority to regenerating these stands either through salvaging or shearing if no markets exist.

Bark Beetles

1. Strictly follow the Division's bark beetle guidelines when clearcutting pine stands and thinning pine plantations.
2. Do not allow the stockpiling of tamarack products on sale areas during the growing season when standing tamarack is still left on the sales.
3. Assign a high priority for harvesting water-stressed tamarack stands.
4. During the period of May 1 - September 1, all stockpiled pine products should be inspected bi-weekly for bark beetle activity. If bark beetle activity is found, consult with the Regional I&D Specialist to discuss management options.
5. Conduct an aerial reconnaissance flight each July of all the pine and tamarack areas to detect bark beetle damage. Inspection flights should be increased during periods of drought or after catastrophic fires and storms.

Saratoga Spittlebug

1. Hazard rate all pine plantations under 15 feet in height.
2. Use herbicides or hand crews to remove brush from plantations which are hazard rated high and have evidences of a spittlebug population.
3. Accept grass in pine plantation rather than brush by using herbicide such as Roundup for site preparation. Plan on patch scarifying the site or spot spraying around the trees if the grass is a potentially serious competitor.
4. In all pine regeneration areas, conduct spittlebug scar surveys during the 5-year regeneration check; if the plantation has not closed and brush is present, conduct the scar count survey also during the 10-year check.

Dwarf Mistletoe

1. When regenerating black spruce all live black spruce 5 feet and taller must be cut or knocked down during the timber sale, or commit resources to conduct post-sale shearing before regenerating the site.
2. Live black spruce and tamarack should not be left for snag trees when regenerating black spruce.
3. Plan on landings to be located in pockets of mistletoe.
4. Preplan sale boundaries so that infected areas and a 2-chain noninfected buffer area are included on the sale.
5. Shear unmerchantable, infected stands before regenerating to black spruce.
6. Establish and maintain non-regenerated buffers at least 2 chains wide against infected stagnant black spruce stands. Inspect these buffers for retreatment after 10 years.

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.
3. During regeneration surveys, plantation edges against uncut pine should be inspected for Diplodia infections.
4. Harvest infected, uncut pine edges.
5. If harvesting is not possible, establish a buffer against the infected, uncut pine. The buffer should be at least as wide as two times the height of the uncut pine and consist of hardwoods, spruce, tamarack or larch, or left unplanted.

White Pine Blister Rust

1. White pine will only be planted as an understory tree until resistant planting stock is available.
2. Each white pine planting site will be evaluated for microclimatic factors to determine infection hazard before planting. Planting sites with microclimatic factors favorable for disease occurrence will be eliminated from consideration for planting white pine.
3. White pine plantings will be pathological pruned starting at ages 5 to 7 until the live crown is at least 9 feet above the ground.
4. Do not release white pine until the trees attain a height of at least 33 feet.
5. Remnant old growth white pine can be left for aesthetic or wildlife considerations providing white pine will not be regenerated within one half mile of the old growth trees.
6. Infected white pine should not be left for snag trees unless no white pine is to be regenerated within one-half mile of the snag trees.

Forest Tent Caterpillar and/or Large Aspen Tortrix

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.

Hypoxylon Canker

1. Identify stands which have at least 10 percent of the basal area infected with Hypoxylon. These stands should be the priority stands for shearing and harvesting.
2. Stands with 15-25 percent of the basal area infected should be given priority for immediate harvest.
3. Stands with infection rates greater than 25 percent should not be regenerated to produce a commercial crop of aspen. Regenerating these highly infected stands should be for meeting of wildlife objectives only.
4. Stands with Hypoxylon canker should be scheduled strictly for dormant season logging to promote a more uniform, well-stocked stand.
5. Work toward managing aspen by clone selection. Select Hypoxylon-free clones in the spring and regenerate those. Convert Hypoxylon-susceptible clones rather than converting an entire stand.

Plantation Establishment and Management

1. Conduct a field check of soil texture and drainage for each planting site so that the proper species is planted.
2. Use mechanical and chemical site prep techniques rather than rely on release techniques to establish and maintain plantations.
3. Establish buffer strips at least twice the height of the surrounding trees when insect and disease problems occur in adjacent stands. Buffer strips can be established by planting species of different genera than the plantation or by not planting the buffer area.
4. Grasshopper damage may occur to containerized seedlings planted during the summer on sites which have established, non-woody vegetation. Plant containerized seedlings during the summer only on sites which have been sheared, harvested, or sprayed within 2 years of planting.

5. Remove all live overstory residual spruce and pine when establishing the same genus as the overstory. If snags of the same genus must be left, use dead trees or girdle the trees before planting.
6. Document plantation insect and disease incidence and damage by conducting insect and disease surveys when doing the required regeneration surveys. Provide to the Regional Insect and Disease Specialist an annual summary of the survey results and consult with the Specialist if damage cause cannot be determined and/or if the damage is significant.
7. Release plantations only if crop tree vigor is poor as determined by foliage color and leader growth, and poor vigor cannot be attributed to site factors, insects and disease, or any other factors not associated with the competition.
8. Delay complete release of white spruce until the plantation height averages 15 feet if yellowheaded spruce-sawfly feeding is evident in adjacent stands.
9. When using a seed tree silvicultural system for regeneration, seed trees should be selected by the forester, not the logger.

Table 3-11-1: Objectives and Targets for FY 1989 and 1992
Pest Management

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
1. Insect and disease field inspections	inspections		X	10	5	5	20	20
2. Insect and disease surveys	surveys			1	1	1 (1)	3	3
3. Insect and disease information articles	articles		1				1	1
4. Insect and disease training sessions planned	sessions							

Specific Detail
(1) Gypsy moth traps.

Special Emphasis
1. Region pest specialist will train area personnel to rate insect and disease risk during survival checks.

SOILS PROGRAM

ASSESSMENT

The forest soils resource is the basic core of the forest site and is a very important element to be considered in intensive multiple use forest management. Soil conditions on a given site effect nearly every aspect of management including: timing of harvest, equipment operability, site productivity, stand vigor and longevity, herbicide effectiveness, site preparation techniques, etc. A good understanding of soil/site conditions is necessary for effective multiple use forest management.

Mission

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.
- Develop and refine forest soils information in the Baudette Area.
- Assist forest managers in focusing resource management efforts and targeting investments to the most appropriate sites.
- Facilitate land use planning and multiple use management decision making.

Relationships

The Region I Forest Soil Specialist serves the Baudette Area. Baudette Area personnel and the forest soil specialist should work together to integrate soil management principles into forest management practices. The forest soil specialist provides soil resource information and interpretation on both a broad base and site specific level.

General Soils

The soils and landscapes of the Baudette Area have developed from materials originally deposited during the late Wisconsin glacial age. These deposits have since been covered or modified by glacial lake Agassiz and later much of the area was covered by organic material of the Agassiz peatlands.

The original parent material from which most of these soils formed originated from South Manitoba and is referred to as calcareous gray drift. This material was deposited in a gently rolling till plain. After the drift was deposited two events occurred. First was the formation of glacial lake Agassiz which covered all of the Baudette area at on time or another. This lake modified the drift by washing sands, silts, and clays into suspension and later depositing them over the landscape. Silts and clays were generally deposited in deeper calmer water and sands and coarser material were deposited in more active zones such as sand bars, spits or beaches. Some areas have very shallow deposits and result in soils only slightly modified from the original till.

The second event was the accumulation of organic matter forming the vast peat deposits of the Agassiz peatlands. Cool wet conditions resulted in organic matter production exceeding the rate of decomposition, therefore accumulating and spreading in a process known as paludification. Organic matter continued to accumulate filling in depressions and covering low areas of the landscape. Currently approximately 360,000 acres of deep peat exists in the Baudette area.

Physiographic Units (RMUs)

The Baudette Area contains 2 broad physiographic units: The Agassiz lacuztrine plain-Bigfork Valley (RMU 1) and the Agassiz Peatlands (RMUs 2 and 3). RMU 3 splits out the vast patterned peatlands in the Southern part of the Agassiz peatlands.

RMU 1: Agassiz Lacustrine Plain

The soils in this RMU are predominantly lake washed tills and lake deposited silt and clays. Narrow distinct beach ridges are common in this RMU but well drained sandy soils make up less than 5 percent of the total land base. Landuse is as follows: 38 percent is forested, 30 percent is cultivated, 15 percent is pasture, and 11 percent is classed as marsh.

Fifty percent of the state-administered land in this RMU is on shallow to deep organic soils, 22 percent is on loamy poorly drained soils (LLPL), 3 percent is on well drained sandy soils (SSWL), and the remainder (25 percent) on various mineral soils mostly poorly drained (see below).

Major soils landscape units are as follows: (The first percentage is for all ownerships and the second is for Forestry-administered lands only.

Soil Landscape Units consist of:

SLU	% Total	% DNR	Description
LLPL	28%	(22%)	Somewhat poorly and poorly drained, silty and clayey soils
CCPD	14%	(6%)	Poorly and very poorly drained, clayey
LLWL	13%	(4.5%)	Moderately well drained, loamy soils
CCPL	7%	(<1%)	SWP to poorly drained, clayey
LP	8%	(18%)	Very poorly drained, 1-4 feet of peat and muck over loam and sandy loam
NP	7%	(26%)	Very poorly drained deep peat

Minor soil units: LSPD, SSPD, SSWL, LSWL,

RMU 2: Agassiz Peatlands/Interbeach Unit

This portion of the Area was covered by a relatively shallow part of Lake Agassiz. Wave action smoothed the lake bed and shores by eroding, transporting, and redepositing material to form sand bars, spits, and beach ridges. As peatlands developed they invaded low areas forming large peat deposits between areas of mineral soils. Sandy soils are generally located in the Western half of this unit. The Eastern half is dominated by peatlands, with areas of mineral soils that are predominantly loamy or clayey. Topography is level to gently undulating. Short steep slopes occur adjacent to perennial streams and rivers. Landuse is as follows: 74 percent is forested, 3 percent is pasture or open, 1 percent is cultivated, and 22 percent is marsh.

Fifty-two percent of state-administered land is on deep organic soils (NP, AP, BP), 19 percent is on shallow organic over mineral soils (LP, SP), 8 percent on well drained sandy soils (SSWL), and the remainder is wet mineral soils.

Soil Landscape Units consist of:

SLU	% Total	% DNR	Description
NP	33%	(35%)	Very poorly drained deep non-acid peat
SP	19%	(8%)	Very poorly drained peat and muck over sands
AP	14%	(15%)	Very poorly drained deep acid peat
LP	10%	(12%)	1'- 4' of very poorly drained peat over loamy soils
SSWL	9%	(7%)	Well to somewhat poorly drained sands
LSPD	8%	(6%)	Poorly drained, sandy over loamy soils
SSPD	5%	(4%)	Poorly drained sands

Minor soils consist of: BP LLWL CCPL LLPL, CCPL, CCPD, LSPL, LSWL, AA

RMU 3: Agassiz Patterned Peatlands

This unit consists almost entirely of vast patterned bogs and fens. These deposits are a result of ideal conditions of climate and landscape that produced organic material faster than could be decomposed. This area represents a unique ecological landscape that is world renown and is currently under management restrictions due to its unique features. Most soils in this unit have low productivity due to low nutrient levels and excessive moisture and/or acidity. Landuse is as follows: 56 percent is marsh or sedge bog, 44 percent is forested, less than 1 percent is cultivated or pasture.

Forty-five percent of state administered land is on deep acid peat (AP), 38 percent is on non-acid deep peat (NP), 13 percent is on acidic raised bogs (BP), and 2.5 percent is on well drained sandy soils (SSWL).

Soil Landscape Units consist of:

SLU	% Total	% DNR	Description
AP	44%	(45%)	Very poorly drained deep acid peat
NP	40%	(38%)	Very poorly drained deep non-acid peat
BP	11%	(13%)	Very poorly drained deep acid peat developed on raised bogs.

* General soils information and percentages taken from Minnesota Soil Atlas Project and MLMIS 40 acre data files of: The 1969 Landuse Project, 1977 Phase I Forest Inventory Data and the Minnesota Soil Atlas Project.

For more information on soil landscape units see Soils Appendix.

Soil Resource Information Assessment

1. **Maps and Surveys**

General level maps:

The "Minnesota Soils Atlas Project" provides soils and landform information at a 1:250.00 scale. "Surficial Geology of Minnesota" by Hobbs and Goebell provides surficial glacial feature information at a scale of 1:500.000.

The "Minnesota Peat Lands Inventory" provides intensively sampled peat lands information and surficial geology at a scale of 1/2 inch per mile. These are all good sources of information for general level planning and research.

Intensive soil surveys:

The field work has been completed for the Lake of the Woods County Soil Survey at a scale of 1:24,000. The maps are available as blue line copies with brief legends. Publication of the survey is estimated at 1990. Soil maps in parts of the county will be digitized in 1988, through the University of Minnesota. A large portion of the county will not be digitized, this includes primarily forested lands.

Koochiching County has shown great interest in a soil survey, but as of 1988 has not signed a contract with the MCSS.

DIRECTION

Forest Soils Program Direction

The overall strategy of the forest soils program is enhance the availability of forest soils information and interpretations to forest managers. To continue to refine our understanding of soil/forest relationships in order to manage at the level of intensity required to satisfy tomorrows resource needs and concerns. Collection of soils information is a long-term process, therefore information developed should be at such a level as to satisfy future needs as well as todays.

In ten years:

The accelerated soil survey should be completed in the Baudette area with soils mapped at 1:24,000 or better scale. Each Field Station should have these maps in hand. A forestry supplement should be completed with interpretations

made specifically for forest management including: Equipment operability, timber harvesting, tree productivity, regeneration and silviculture, chemical site preparation, and release.

Foresters should understand soil characteristics well enough to make limited onsite investigations and to apply the above inventory and interpretive data to determine management prescriptions. Onsite investigation and interpretation by the Region Forest Soils Specialist will continue.

The forest soils program can be split into six major program areas of which to assess needs and activities. These areas are: **Soil interpretation and management assistance; information, education and training; management planning assistance: forest roads; and soil resource inventory and land exchange/sale assessment.**

Soil Interpretations and Management Assistance

The overall strategy of onsite investigations is to provide timely site specific information to forest managers that will assist them in making management decisions throughout the intensive management of a given site.

Investigations should provide an inventory of soils and appropriate interpretations for management. Onsite investigations should be done where significant investment is made or where soil inventory does not adequately describe the site for the proposed management practice. Requests should be made to the FSS and be accompanied with a map of the area and description of project. The Forest Manager should accompany the FSS on investigations. The FSS will also make unsolicited visits to sites especially those proposing soil active herbicide application. It is most useful if interpretations are made prior to harvest or initiation of management activities so.

The following actions will be taken:

1. Area personnel should request site investigations for sites where soil information is lacking or where investment warrants it.
2. The FSS should service all requests in a timely manner.
3. The FSS Identify and interpret geographic land forms and soil types occurring on state forest lands.
4. The FSS and Area personnel should collect baseline soil and site data to support soil interpretations.

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. Most foresters have a basic knowledge of soils either through formal training or field experiences; however, understanding these relationships is a constant process. There will continue to be a need for soils training. It is the role of the FSS to provide specific information and training and to disseminate current forest soils research to Area personnel.

The following actions will be taken:

1. Continue training of Area and District personnel. Training should shift from general concepts to specific forest soil relationships.
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 and interpretations of resource management units should be developed in conjunction with the supplementary soil survey manual:

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.
3. Provide forest soils information for specific or short range planning projects such as the Stoney Pines Jack Pine Management Plan.

Forest Roads

The forest roads system in the Baudette Area is in constant need of maintenance and occasional repair or construction. Road design and routes may vary due to local soil condition. Gravel sources for road work are often times difficult to locate close to roads in the Baudette Area.

The Forest Soil Specialist should provide interpretation of soil conditions on projects and identify gravel deposits where needed. Area personnel and Road Specialist are responsible for requesting soils assistance in a timely manner so that field work can be done during the frost free season.

The following action will be taken:

1. Work with the forest roads specialist to identify future needs for soil interpretation and gravel resource location.
2. Work with Area personnel or with summer interns to identify potential gravel deposits throughout the Baudette Area.

Soil Resource Inventory (Soil Survey)

An intensive inventory of the soil resource is an important step in the incorporation of soil information into management practices. The mapping phase of an Intensive soil survey is complete in Lake of the Woods County. Publication of the survey is scheduled for 1990. Koochiching County has expressed interest in the survey program but has not signed an agreement of April 1989.

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 to develop forestry related interpretations of soil resource map units.

Action

1. Continue soil investigations to develop interpretations of soil survey units specifically for forestry.
2. Develop a forest management supplement to the Lake of the Woods County soil survey with specific interpretations for forest management.
3. Promote a contract for digitizing soil survey maps that will complement the digital Phase II data.
4. Provide Koochiching County with a clear statement of the Division's position on soil surveys and what the DOF needs in survey design and interpretations.

Land Exchange/Sale Assessment

The soil resource is a significant factor in the evaluation of land parcels for sale or exchange. The FSS should provide soil information on parcels proposed for sale or exchange to help determine the Divisions favor/disfavor of the action. Information should include: Inventory map of soils, woodland suitability and agricultural suitability of soils on the proposed parcel. Presence of gravel or other known valuable surface minerals.

FOREST RESOURCES INVENTORY PROGRAM

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 Forest Inventory and Analysis (FIA) and Cooperative Stand Assessment (CSA).

FIA inventory can be compared to the surveys conducted by polsters 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 FIA, information is obtained from forested plots instead of people. This information then represents the forest resources of Minnesota.

CSA 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.

FIA inventory will be measured every 10 years. During the next 4 years the forest inventory unit and the north central forest experiment station will measure 9000 commercial forest land plots statewide. FIA plots in Koochiching and Lake of the Woods Counties are being remeasured by independent contractors. Completion of Koochiching County Plots will be in 1988. Lake of the Woods County plots remeasurement will be contracted with a starting date of September 1988, with completion projected to be September 1989.

The initial CSA survey has been completed in the Baudette Area. It was started in 1978 and finished in 1986. This inventory included all DNR administered lands. Private lands were not included though some private land was type-mapped but not sampled by field crews. Field sheets, type maps, computer printouts, and stand information summaries are used and maintained in area, field station, and wildlife offices.

DIRECTION

The CSA 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.

The CSA will be updated and kept current through several techniques. Models developed by the North Central Forest Experiment Station (and adjusted by the analysis of FIA data) will be used to update the records of undisturbed stands. Remote sensing (35mm photography) will also be used to locate disturbed stands, verify noncommercial 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 CSA data will identify stands needing field reinventory. Criteria prescribed by the area management team as stands requiring field reinventory include:

- stands at high risk of loss that are beyond rotation age
- stands with high risk
- stands in error on original survey
- all stands acquired through land trade or purchases
- stands inventoried with white sheets
- plantations greater than 20 years, but less than 30 years
- stands with unique characteristics

All stands to be reinventoried must be manageable as determined by timber management criteria or identified as unique by department programs. Cooperative procedures need to be standardized to maintain ties to biological surveys for special values, reduce duplication of survey effort and share data. New aerial photo coverage of Koochiching County and 35mm photography of disturbances in both counties will be needed. Complete 9" x 9" aerial photography of the area must be obtained on a five-year cycle. Field reinventory of stands as identified will be performed by a mix of field staff and contracts. Contracting will be handled by the Grand Rapids forest inventory unit in cooperation with the

area office. Quality control of contractors will also be handled by Grand Rapids unit. Over the ten-year planning cycle, all stands selected to be reinventoried will be checked by a combination of area/region field projects and contracts. Ideally, 10 percent of the forest will be reinventoried each year.

Alteration of original CSA data are the means to maintain an accurate, current, data base and cover type map. An alteration is initiated by a resource manager (wildlife, forestry, parks) when a cover type is significantly changed through natural or man caused disturbance.

Alterations follow the flow chart established by the Grand Rapids inventory unit to maintain security and integrity of the data. The inventory unit will run a computer data check on alterations to identify obvious errors, and will establish a quality control procedure. Annual time periods (windows) will be established for each area so updates can be handled in a timely fashion.

Table 3-13-1: Objectives and Targets for FY 1989 and 1992
Forest Resource Assessment and Analysis

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
Phase II								
1. Maintain inventory	alterations		X	100	100	150	350	400
2. Reinventory	acres		X					25 M
3. Private lands inventory	acres							
Phase I								
4. Plot measurements	plots (1)							
Aerial Photography								
5. 9x9 photos	acres							
6. 35mm photos	acres		X (2)	500	200	1000	1700	1500

Specific Detail
(1) Portions of Koochiching County have been contracted out.
(2) Aspen recycling acres regeneration survey.

Special Emphasis
1. Phase II re-inventory will need to be started by 1992. Method and procedures will be needed.

UTILIZATION AND MARKETING PROGRAM

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, 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.

ASSESSMENT

Current markets for forest products vary throughout the state, based on available tree species and location. Markets are not static, thay are constantly changing. Conditions may be completely different a year from now, depending on the needs of the forest products industry.

Some species in the Baudette Area, jack pine, red and white pine, and tamarack, are well balanced in supply vs. demand. Aspen, birch, Balm-of-Gilead, balsam fir, and spruce are in oversupply. Cedar has more demand than supply.

No major pulpwood-using industries are within Area boundaries. Boise Cascade, in International Falls, has abundant resources nearby, but purchases some wood (chips and tree-length pine) from within the Area, at this time. A major expansion at Boise Cascade, currently under construction, is beginning to change the outlook for wood purchased from the Baudette Area. The mill will employ 190 additional people and consume an additional 350,000 cords of wood, mostly aspen. A portion of this wood will come from Lake of the Woods, Roseau, and surrounding counties, providing a much-needed aspen pulpwood market. Recent timber sales are already reflecting this increased consumption. The planned expansion and modernization will cost over $500 million.

The Boise Canada plant in Fort Francis buys little raw wood directly from Minnesota producers. Most Minnesota pulpwood destined for Boise Cascade is purchased through the International Falls mill as part of a cooperative agreement. International Biltrite manufactures aspen and Balm-of-Gilead sheathing board in International Falls, but consumes little wood from the Baudette Area. Potlatch, Northwood Panelboard, Blandin, and other mills to the south, purchase relatively small quantities from within the area.

There are a few large and many small sawmills in the Baudette Area; sawbolts of most species can be sold. Many mills are having trouble obtaining logs. There is little profit margin in sawmills and the cost of wood (logs and sawbolts) is a major proportion of the cost of the finished product, whereas papermills have a high profit margin and wood costs are only a minor portion of finished product costs. Sawmill owners can little afford to pay higher prices for logs and loggers cannot afford to sort sawbolts from pulpwood without an increase. Therefore the spiral continues. As competition for the wood resource increases, sawmills will have greater difficulty competing for logs with the larger mills. Another impact of increasing competition for wood resources, primarily affecting the logger, is rising stumpage costs.

Forest resource data is derived for all ownerships and all site classes, calculated from the 1977 "Phase I" inventory base. It is used as a broad-based planning tool, not for specific forest management recommendations. Unfortunately, we are badly in need of updated inventory data. Phase I data is being re-evaluated at this time. Current data will be incorporated into the Baudette Area plan as it becomes available. These figures would be of use to primary (roundwood-using) industries that may be interested in development or expansion.

Secondary or "value-added" industries would be interested in sawmill production in the local area, as they would purchase lumber and add value by further processing. In 1988, the following volumes of major species were sawed in mills in counties around Baudette.

Volumes of Sawtimber Processed in 1988
- volume in thousand board feet -

County	Aspen	Pine	Cedar	Birch
Lake of the Woods	2,100	1,700	20	---
Beltrami	7,300	5,200	1,100	600
Roseau	100	90	20	10
Koochiching	10,500	10,500	1,600	60
Totals	20,000	17,490	2,740	670

About 20 million board feet of aspen and almost as much pine is sawed per year in the area, presenting another opportunity for an entrepreneur to establish some sort of value-added facility. Value-added processing, such as making cut parts for pallets, is already done at some mill sites. Even low-grade lumber can be further processed to add value, as clear wood can be cut from between the defects. Value-added industries are particularly desirable as they provide employment and create higher-value products, thus more profits. Value-added processing, such as kiln-drying and surfacing, can reduce transportation costs by allowing more product and value per load.

Transportation of timber is a major cost in the Baudette Area. Long hauling distances to major markets make transportation costs critical. Railroads are not being used as in the past because of the limited rail network available for use. As a result, highways have become increasingly important. Primary roads are Trunk Highways 11 and 72, running east and west from Warroad to International Falls and south to Bemidji, respectively. Both are 10-ton routes, although seasonal restrictions are applied roughly from Baudette to Highway 71. Secondary haul roads are county and township roads or forest roads.

DIRECTION

The primary goal for utilization and marketing in the Area is to increase the use of surplus wood resources, thus increasing the benefits derived from that use. Social and economic benefits, as well as timber, wildlife, and recreational benefits are derived from a managed forest.

Strategy

The obvious first step is to identify any surplus forest resources based on the new forest inventory data. Surplus species and potential products will determine various economic development opportunities. These opportunities will then be developed and promoted to entrepreneurs. Recruiting new industries is the most difficult form of economic development, with the poorest cost/benefit and success ratios. Because of the long hauling distance from major markets, the Baudette Area is not currently under consideration for immediate industrial development plans by a major industry. A local economic development group is active and, considering additional surplus resources available from surrounding counties, they may succeed in attracting a new wood using industry to the area.

A major emphasis of the Utilization & Marketing program is business retention. While new wood industry is desirable, existing wood industries are crucial to the economic well-being of the area, and every effort must be made to maintain them. Wood products manufacturers will be provided with technical and business management assistance, in an effort to keep them operating productively.

Wood energy will be promoted in feasible commercial and institutional applications. Sawmill waste is accumulating throughout the area. Burning in commercial or institutional facilities presents a viable option for disposal of these wastes. Potential conflict between energy and industrial resource users will be monitored and managed.

Although their wood energy program has been delayed at this time, Northern States Power had been considering converting several existing power plants in Minnesota to wood fuel within the next decade. If these conversions are successful, NSP may have considered constructing new wood-fired power generation plants at various locations along their existing power transmission grid (which bisects Roseau and Lake of the Woods Counties). A plant of this sort would be a major wood consumer, and would have a substantial impact on the wood resource. Preliminary estimates of available resources indicate that the construction of such a plant in the Baudette area is feasible. The local development group has already discussed this possibility with NSP and they are expected to continue to pursue it.

The flow of market information within the forest products community will be increased, to assist the development of existing companies, particularly in value-added processing.

Value-added or secondary processing industries add value to lumber or other raw materials by processing it in some way. They are particularly desirable because the value of relatively low-value raw material is increased while still in the local area, increasing economic benefits.

Certain secondary industries could reduce the net transportation costs by increasing value per load. The resultant savings in transportation costs could justify the investment of establishing a drying and planing facility locally.

Christmas trees, cut from stagnant spruce swamps in the area, have recently been test marketed. If the market tests are successful, this industry might see some increased activity.

Specific Proposals

1. Complete a detailed analysis of forest resources in the vicinity of the Baudette Area, to clarify actual surplusses and to identify opportunities for increased use of surplus resources.
2. Identify opportunities for developing value-added industry.
3. Research treated wood market and supply relationships to identify expansion opportunities.
4. Continue to provide marketing, technical, and business management assistance to key wood products companies, in an effort to retain existing industries.
5. Identify resources and residues available for energy use, promote feasible applications of wood energy, and manage potential conflicts between commercial and energy wood users.

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. The aim of the prevention program is to reduce the number of wildfires by informing the public of the dangers and potential losses that can result from careless use of fire. Presuppression focuses on the need to adequately prepare and maintain fire suppression forces so that wildfires can be suppressed. Presuppression is done through extensive planning, training, rural fire department assistance, fire detection, and interagency cooperation. Suppression activities involve the efficient control and extinguishment of wildfires without loss of life, and minimal property and natural resource damage.

The use of prescribed fire in meeting specific management objectives is recognized as an important management tool. The wildlife and timber management sections of this plan deal with the planned use of fire. Operational order #47 outlines the mechanics and responsibilities involved in the prescribed fire program.

Baudette Area Fire History

Minnesota has a history of large and destructive forest fires. The Baudette and surrounding communities will not forget about the many destructive forest fires which occurred in the early 1900s. In the fall of 1910, a terrible fire wiped out the towns of Baudette and Spooner (see Figure 3-15-1). The following description of the fire is based on Carrington Phelps' A Great Fire And Its Heroes published in January 1911 edition of the The Metropolitan Magazine.

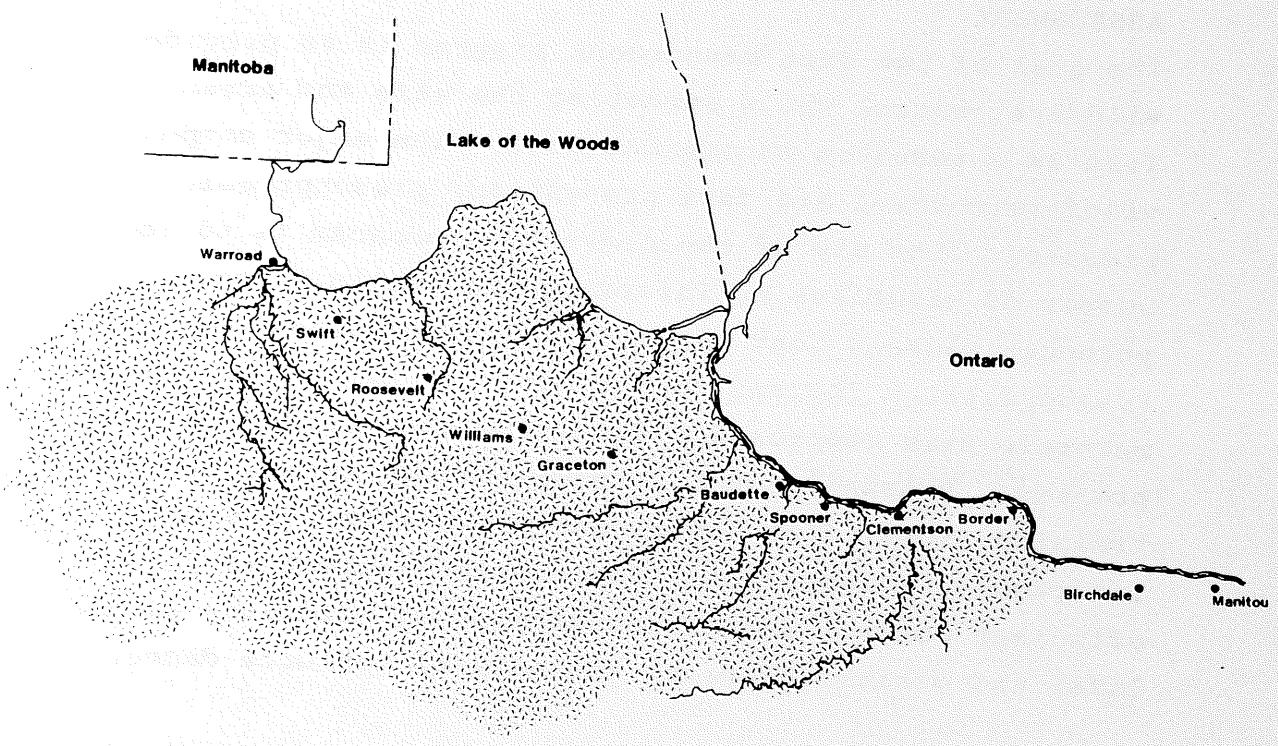


Figure 3-15-1: Extent of Baudette Fire of 1910

It had been a windy afternoon, and when clouds came scurrying up from the east the settlers watched them eagerly. "Rain at last" they said. Afternoon faded into twilight and with it came higher wind. Twilight grew into darkness, and with it came a veritable gale. "Thunder!" they cried, "And rain!" It was not rain. The rumble grew to an even, thunderous roar, which was deafening and horrible; for the entire sky, from horizon to horizon, became a burning red. The great fire almost instantly swept upon them, an enormous wall of wild flames, shrieking and crackling, and racing with the speed of an express train.

For those directly in the path of this fire avalanche there was no escape--none. In Baudette a locomotive was coupled to a train of cars. The train was soon jammed; people stood

in the aisles, packed the steps and platforms, clung to the roof, the tender, the engine. The train pulled out, over the river, to Canada and safety. Both towns caught fire and burned like so much kindling wood. Some who delayed too long were caught in the streets, suffocated and burned to death.

Following this fire, public sentiment demanded a better fire control system and as a result, the legislature of 1911 appropriated funds and passed laws setting up a system of rangers and ranger districts throughout the forested area of the state.

Even with the changes in land use and development which occurred over the last century, the potential for losses of life and property from wildfire exists.

The Baudette Area Fire Plan (1985) contains a detailed analysis of fire information for the period from 1976-1985. Baudette averages about 35 fires each year during spring and fall fire seasons. About 42 percent of the wild fires are incendiary and another 40 percent are caused by residents burning debris. Most fires are running grass fires. Historically, the large catastrophic fires in Baudette have been in late summer or early fall. Peat and crown fires are fewer in number but are more difficult to control, contain and extinguish.

RMU 1 is a critical fire protection area. Most residents and agricultural areas are located in this RMU. Volunteer township fire wardens serve an important role by issuing burning permits.

Cooperation and assistance from volunteer rural fire departments are used when structure are involved and where large volumes of water are required for short periods of time. Distinct areas of fire hazard occur along highways 11 and 72 and near the communities of Carp, Pitt, Graceton, Williams, and the resort area along Highway 172.

Although the causes of wild fires in RMU 2 are similar to RMU 1, including debris burning and incendiarism, the occurrence is much less. A high hazard area in this unit is in the large pine types south of Williams where fire occurrence is low but a possibility of large uncontrollable crown fires exist.

RMU 3 is traditionally a low fire occurrence area due to its inaccessibility. Nearly all fire occurrences are along Highway 72, south of Baudette.

DIRECTION

The Baudette Area Fire Plan (1985) outlines in detail the program direction. Since all three RMUs are in the fire protection area, action directed in that plan will apply to all three RMUs.

The major effort for this planning period will be in the area of fire prevention. A more intensive program of education and the continued enforcement of burning laws will reduce the number of fires and the potential for loss.

Presuppression activities will include equipment upgrading, fine tuning the manning guide, and continued training of pertinent and casual fire fighters. The use of towers versus aircraft detection will also be evaluated in terms of cost effective detection.

When fire weather conditions exist, manpower and equipment readiness will follow the manning guide.

General Program Strategy

1. Reduce the number of wildfires occurring in the Baudette Area thru prevention activities.
2. Improve fire fighting readiness thru training, improved equipment and cooperative agreements.
3. Safely extinguish wildfire without loss of life and with minimal losses to property and natural resources.

Specific Objectives for 1987-1996

Prevention

1. Request annual funding to purchase supplies, materials and displays on fire prevention.
2. Improve training courses available to area personnel for public relations.
3. Emphasize public education through increased visits to local schools to present programs on prevention.
4. Rebuild and make improvements to the DNR county fair building which serves as a prevention tool during the Lake of the Woods county fair.
5. Increase use of media with public service announcements to keep the public informed on burning regulations, laws, and seasonal fire dangers.
6. Continue use of long term burning permits for land clearing permit fires.
7. Request and secure funding through Region/St.Paul for an annual township fire warden training and recognition dinner.
8. Improve enforcement activities through increased fire investigation and law enforcement training.

Presuppression

1. Annual update of all equipment agreements and cooperative agreements.
2. Update the Area fire dispatch plan and district dispatch plans annually.
3. Continue to work closely with rural fire departments on the Title IV funding and excess property programs.
4. Assure that Area personnel receive specialized training in Division fire suppression courses.
5. The efficiency of various detection methods will be studied. Four fire towers will be used for detection, and supplemental air detection during high fire danger periods until the study is completed.
6. Continue use of station manning and specific action guides during fire season as found in the area fire plan.

7. Train and develop dependable fire crews and smokechasers for fire suppression.
8. Secure funding to acquire portable bridges for ditch and river crossings.
9. Assess area equipment needs for specialized suppression equipment and implement replacement schedules.
10. Evaluate fuel model predicted indexes.

Suppression

1. Improve efficiency of wildfire suppression actions to reduce associated costs thru training.
2. Increase accuracy of fire reporting and record keeping.
3. Continue to request additional resources so as to maintain initial attack during extended fire suppression activities.
4. Improve weather data collection capabilities.
5. Set up an area version of a large fire dispatch package which would be consistent with the ICS overhead team system.

Table 3-15-1: Objectives and Targets for FY 1989 and 1992
Fire Management

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
Prevention	fte	.05	.05	.10	.05	.05	.30	.40
Presuppression	fte	.10	.10	.20	.20	.20	.80	.80
1. Issue & inspect burning permits	permits	X		1000	300	800	2100	2100
2. Recruit township fire wardens	wardens	X		1	0	0	1	3
3. Train township fire wardens	wardens	X		20	17	21	58	60
Suppression	fte	.10	.10	.20	.20	.20	.80	.80
4. Suppress wildfires (1)	acres	X		1500	100	500	2100	1800
	fires	X		15	5	10	30	20
Training								
5. Meet training requirements for:								
a. Level II Enforcement	people		X					
b. Overhead Team Members	people	X		1			1	1
c. Basic Firefighter	people	X						1
d. Rural Fire Departments	Departments	X		1	1	1	3	
Prescribed Burning (2)								

Specific Details

(1) Estimates are higher than normal because of droughty conditions.

(2) See Table 3-2-1, item 6 (p. 50, Section 3-6), Fish & Wildlife Habitat Management Program.

MAINTENANCE AND ADMINISTRATION

ASSESSMENT

This program provides the administrative support needed to achieve the goals of other Division of Forestry programs. The major activities are fiscal and personnel management, equipment maintenance, and building maintenance.

Fiscal and Personnel Management

Fiscal management includes developing annual spending plans, bill processing, contract administration, and related activities. Temporary laborers or contractors and volunteers are used for projects such as tree planting, fire detection, recreation facility maintenance, and timber management. Personnel management activities include recruitment, selection, supervision, evaluation, and payroll and records processing.

Equipment Maintenance

Equipment maintenance includes repair and ongoing maintenance of the Area's equipment. The bulk of the equipment maintenance is provided at local service garages. Reductions in administrative budgets and loss of personnel have had a serious impact on levels of preventive maintenance. Several pieces of equipment currently in use in the Area are well beyond acceptable replacement age and some are obsolete. Staffing increases to the present complement will necessitate the acquisition of additional equipment.

Building Maintenance

Building maintenance includes minor maintenance and cleanup of Division of Forestry facilities in the Baudette Area. Major facility repair, remodeling, or construction is handled by the Bureau of Field Services located at the Bemidji Regional Office.

DIRECTION

Equipment Maintenance

The Maintenance and Administration Appendix lists the current and proposed inventory of major equipment for the Baudette Area at current staffing levels.

Any increase in personnel will require additional equipment. The table also includes estimated maintenance costs and replacement schedules.

Building Maintenance

Table 3-16-1 is a summary list of building improvement and construction needs for the Baudette Area. The Maintenance and Administration Appendix contains a complete inventory of the buildings in the Baudette Area along with detailed proposals for repairs, improvements and new construction. Funding for major building improvement and construction projects will be requested through the DNR Capital Improvement Budget.

Table 3-16-1: Baudette Area Building Projects by Priority

Priority	Location	Project Description	Estimated Cost
1.	Baudette Area Office	Major remodeling, electrical work	
2.	Baudette Small Warehouse	Replace door and frame	
3.	Fair Grounds Cabin	Remove and rebuild	
4.	Williams - Office Warehouse	Expansion, bathroom remodeling and sewer work	
5.	Williams Residence	Replace windows and doors	
6.	Williams Residence Garage	Drainage	
7.	Williams Oil House	Remove and Rebuild	
8.	Williams Additional	Storage expansion - Purchase adjacent lot	
9.	Birchdale Office - Warehouse	Correct frost heave problem, add hot water and check water quality - New well possible	
10.	Birchdale Residence	Replace one window and nine shades	
11.	Birchdale Residence Garage	Construct one car garage	
12.	Birchdale Oil House	Remove and replace	
13.	Prosper Fire Tower	Replace floor	
14.	Faunce Fire Tower	Replace floor, door and steps	

Program Priorities for 1987-96

Carry out fiscal and personnel management responsibilities:

1. Obtain the equipment necessary to carry out area workloads.
2. Upgrade, repair, or construct facilities necessary for staff to carry out their jobs.
3. Convert 90% funded positions to permanent classified status.
4. Hire additional personnel to cover projected staffing needs for all programs.

Table 3-16-2: Objectives and Targets for FY 1989 and 1992
Maintenance and Administration

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
1. Close stations	stations							
2. Consolidate offices	consolidations							
3. Rewrite position descriptions	PDs	1					1	3
4. Building projects	projects						0	1

Specific Detail

(1) Remodel area/field station office including meeting room, reception area, field office, siding, and make building handicap accessible.

Special Emphasis

HUMAN RESOURCES DEVELOPMENT PROGRAM

ASSESSMENT

Training and continuing education are necessary if Division of Forestry employees are to acquire and maintain the up-to-date knowledge and skills needed to effectively manage natural resources. The training program goal is to have each employee spend approximately five percent of their work time on training and continuing education. The type and amount of training each individual receives will vary as to their stage of career development, specialized program involvement, availability of training courses, Division needs, individual career objectives and Division budget.

Training plans are developed for each employee as part of the annual performance evaluation. Training plans will address both short-term and long-term goals. In the past most training was coded to the program or subject being taught. Therefore, the amount of time coded to training has been considerably less than the five percent goal. In the future, all time spent giving or receiving training (except for fire related training) will be coded to training to allow evaluation of training and continuing education efforts.

DIRECTION

The Area will increase the time spent on training and continuing education so that it meets the Division goal of five percent of employee time. Emphasis will be on ensuring that all employees meet the recommended minimum qualifications for training and experience for their position as outlined in the Personnel Development Manual (MN DNR - Forestry, 1985).

Program Priorities for 1987-1996

1. Annual development of individual training plans based on identified career objectives for all classified Division of Forestry personnel, plus any other personnel designated by an individual's supervisor.

2. Outline the training needs of all Area personnel on a priority basis and advise the Division Training Officer for inclusion in the development of the Division annual training needs.

Table 3-17-1: Objectives and Targets for FY 1989 and 1992
Human Resources Development

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
1. In-service training	training days	10	12	10	10	16	58	60
2. Continuing education	training days							
3. Sponsor training sessions	sessions							

Specific Details

Special Emphasis

PUBLIC AFFAIRS

ASSESSMENT

Typical activities include preparing news releases and feature articles for local media, presenting audiovisual programs, developing and distributing maps, brochures, and other documents, organizing field days and other events, and providing displays at fairs.

In the Baudette Area the effort must be one that stresses both the importance and the overall mission of the Division and the importance that each of the individual programs has in achieving that mission. In addition, it must be as "localized" as possible.

This type of information and education effort means that each of the Division's programs will have information and education as an integral part of its total accomplishment. It also means that the overall information & education effort will spotlight each of the division programs both collectively and individually. To insure a successful Information and Education Program it is important all actions advertised are carried out in a timely and effective manner.

DIRECTION

Information and education activities in the area should be increased over the ten-year planning period to make the public more aware of the Division of Forestry's activities and to build support for its programs.

The time commitment and quality of existing I&E efforts should be raised. Professional advice and services may be necessary to develop some information and education materials to make the more effective. Sources of this material may include other DNR Divisions and Bureaus, other governmental agencies, or private

interests. Area staff must keep abreast and use more state of the art communication techniques. They should also develop a rapport with media people both on a local and extra local level.

A partial list of potential information and education projects for the area follows:

1. Develop a number of slide presentations on the common subjects that area staff are most often asked to speak on. These presentation should use slides which show local examples.
2. Establish permanent photo points from which pictures will be taken at intervals to show the changes that are continually occurring on forestry lands.
3. Increase involvement in the conservation education effort of all area school districts by participating in the development of conservation curricula including Project Learning Tree. The increased effort should be designed to lessen the number of calls received from individual school teachers asking a forester to speak to their individual classes.
4. Use special events to tell the Forestry's story in the media.
5. To improve interpretation of land uses visible from existing trails.

Program Priorities for 1987-96

- Use Information and Education to increase public understanding and support of area forestry programs.
- Develop calendar listing annual and several Information and Education activities and assign personnel to assume effort is completed.
- Develop "intimate" contacts with area news media and local television and radio stations.
- Develop "canned" talks for most frequently requested topics (forestry careers, TSI, planting, etc.) on an area basis.

- Develop a general forestry talk for each office with slides that show local sites.
- Improve distribution of recreation site maps.
- Develop localized displays.

Table 3-18-1: Objectives and Targets for FY 1989 and 1992
Public Affairs

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms FY89	6 Total FY92	7 Total
Promotion and Publicity								
1. Promote existing Division of Forestry recreational opportunities and facilities.								
a. Advertise state forest lands and station locations.	articles	1				1	1	1
b. Coordinate preparation of interpretive maps, brochures and other user information.	items		1	1	1	1	4	4
2. Coordinate Arbor Day and Tree City USA efforts.	celebrations							
3. Initiate media contacts.	contacts	2	2			2	6	6
Training and Public Education								
4. Design public education materials for forest users.	items							
5. Strengthen public affairs skills and abilities.	training hours	X 8					1 8	2 16
6. Participate in Project Learning Tree.	sessions							

Specific Details

Special Emphasis

FOREST RESOURCE PLANNING

ASSESSMENT

The primary role of the planning program in the Baudette Area is to maintain a comprehensive plan to guide the protection, management, and use of the Area's forest resources. Other planning and environmental review activities include planning for management of specific state land units, management planning on private forest land and planning with other agencies and units of government.

DIRECTION

The major activities during the life of this plan will be preparing annual work plans and accomplishment reports as part of the implementation and monitoring process (see Chapter 4). Meetings will be held to review the past year's accomplishments and to discuss the new annual work plan.

Program Priorities for 1988-1997

1. Develop annual area work plans and accomplishment reports.
2. Help prepare management plans on PFM lands.
3. Participate in updates of the Minnesota Forest Resources Plan.
4. Update the Baudette Area Forest Resource Plan by 1997.

Table 3-19-1: Objectives and Targets for FY 1989 and 1992
Forest Resources Planning

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
1. Develop draft area plan	plan	X	X	X	X	X		
2. Develop base map	map	X	X	X	X	X		
3. Hold public meeting	meetings	X						
4. Publish final plan	plan	X						
	fte	.20	.10	.05	.05	.05	.45	.10

Specific Details

Special Emphasis
Unit Plan - Base information has been gathered and plans are roughed in by area and have been sent to St. Paul for drafting.

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. Conservation officers with patrol areas in the Baudette Area are stationed at Baudette, International Falls and Littlefork. The Area Supervisors are located in Bagley, Eveleth and Grand Rapids.

The Division of Forestry Law Enforcement Manual outlines coordination procedures for the two division. The Division of Enforcement is also 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 and water, and snowmobile safety, nuisance animal complaints, public access maintenance, and public relations.

In general, enforcement of forest laws in the Baudette 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 (Minnesota Statutes, Chapter 88.03 - 88.22) The enforcement of fire laws focuses primarily on burning permit regulations and wildland arson. Forest Officers and DNR Conservation Officers work together on an arson investigation team. 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 private property to fight forest fires.

The Division of Enforcement cooperates with the Division of Forestry in the enforcement of 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:

Forest Officers work closely with DNR Conservation Officers, State Fire Marshall, and Township Fire Wardens in efforts to reduce the number of wildfires, and loss of property and resources. Cost of suppression of fires will be collected as prescribed by division policy. Collection of costs will be referred to the Attorney General's Office or collected in conciliation court.

Timber Sales and Trespass (Minnesota Statutes Chapter 90)
Field enforcement of state timber sale regulations and timber trespass laws is the responsibility of the Division of Forestry and the Division of Enforcement. DNR Conservation Officers are responsible for 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. All delinquent timber sale accounts and timber trespasses will be reviewed by the Attorney General's Office. Accounts referred back to the area for collection in conciliation court will be filed by the appropriate area forestry personnel following policies established in the law enforcement manual. Additional regulations are established in division policy manuals.

Christmas Tree Laws (Minnesota Statutes Chapter 88.641-88.648)
The enforcement of Christmas tree laws by the Division of Forestry and the Division of Enforcement pertains to the cutting, removal and transport of decorative trees. Enforcement provisions and permitting procedures are specified.

Recreation Regulations (NR-1)
Baudette Area has requested specific authority by the Commissioner of Natural Resources, for three forest officers (with level II enforcement training) , to enforce NR-1 rules in state forest campgrounds, the Franz Jevne State Park administered by Forestry, and Public accesses. 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, Lease and Permits (Minnesota Statutes, 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 specialist, if needed.

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 Baudette Area has one arson investigation team composed of one forest officer and one conservation officer. Both investigators will keep their training up to date in order to participate in all major cases and assist adjoining areas.

Initial attack units will identify and protect all fire origin areas. District personnel or conservation officers will initiate investigation of all fires. CO's should initiate investigations on large fires or on smaller fires if forestry personnel are not available. The arson investigation team will review preliminary investigations and pursue any evidence found which will result in a citation, cost collection, or warning ticket.

Enforcement of timber laws has followed department policy. The Baudette management team has addressed measures which reduce delinquent timber accounts by emphasizing timber sales manual policies. Trespass billings and over due accounts are pursued aggressively through the court system.

There has been little need for enforcement of Christmas tree laws in recent years, as very little theft of natural trees occurs. The Division of Forestry will keep all forest officers informed on 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 or private property.

The Baudette Area has had few incidents requiring forest officer enforcement of NR-1 rules. State and county law enforcement officers perform random patrols of forest recreation sites adjacent to major state highways. Continued close working relationships will be maintained with these officers.

All reported instances of trespass will be investigated. Lease and permit inspections, and aerial observances of land use during fire detection flights ensure the State's interests are protected, and prescribed regulations are followed.

The primary tool of enforcement is to inform and educate the public of the law and the need to follow the law. Fire warden training, news releases, information and education programs with the schools and youth organizations, and the county fair displays will be used in addition to aggressive enforcement of regulations, to promote the understanding of forest laws.

Specific Proposals

1. All fire billings will be assembled for local billing or for approval and collection by the Attorney General as soon as possible after occurance.
2. Overdue timber accounts will be collected through the Attorney General's referral or court action as dictated by state policy.
3. A list of delinquent accounts docketed as judgements in court will be forwarded to St. Paul by July 15, each year, for collection by the revenue recapture act system.

4. Reports of suspected land or timber trespass will be immediately investigated.
5. High arson incidence areas will be under surveillance by outside investigation teams yearly, or until convictions reverse the occurrence trend.
6. The issuance of citation and warning tickets will emphasize the responsibility accepted by any individual who ignites a fire.

Table 3-20-1: Objectives and Targets for FY 1989 and 1992
Law Enforcement

Proposed Program Objectives	Unit of Measure (#'s of)	1 AFS	2 Ass't AFS	3 Bau	4 Bi	5 Wms	6 Total FY89	7 Total FY92
Fire Laws								
1. Fires investigated	investigations	X	6 (1)	15	5	10	30	30
2. Warnings written	warnings	X	X	4	1	2	7	6
3. Citations	citations	X	X	2	0	1	3	3
4. Cost collections (2)	$'s	X	X	56,000	25,700	13,000	94,700	6,000
Timber Laws								
5. Written warnings	warnings	X		0	0	0	0	1
6. Theft citations	citations			0	0	0	0	0
7. Timber trespass, civil	cases	X	X	0	0	1	1	1
8. Land trespass, civil	cases	X	X	1	0	2	3	1
Recreation Areas								
9. Written warnings	warnings	X	X			1	1	0
10. Citations	citations						0	0
11. Vehicle warnings	warnings						0	0
Court Cases	hours	40	100	20	20	40	220	50

Specific Details
(1) Conservation Officers, with assistance from forestry, will investigate fires which will require legal action (citations or court to collect costs).
(2) Suppression cost figures detail billings which are outstanding. Court collections will be required on most.

Special Emphasis
1. Court case hours are projected.

4. IMPLEMENTATION AND MONITORING

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IMPLEMENTATION AND MONITORING

IMPLEMENTATION

The Baudette 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 Baudette 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.

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 Baudette Area Plan is meant to provide guidance to the Area for a period of ten years. An overall rewrite of the plan will be initiated in 1999. The rewrite will include a reassessment of the area's land base and program direction.

Revision of the Baudette 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)