

**MINNESOTA'S PRIVATE FORESTRY
EXTENSION AND TECHNICAL ASSISTANCE PROGRAMS
- WITH SOME COMPARISONS TO NORWAY¹**

by

Gaute Walberg²

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²District Forester in the Forest Service, District of Moss, Østfold County, Norway.

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I. INTRODUCTION

In Norway, as in the United States, nonindustrial private forests play a key role in the timber producing economy. Educational and technical assistance programs on forest resource management are therefore important means of implementing forest policy.

The conditions of the organizations carrying out information and service programs—the public agencies in particular—have in both countries been altered through the 1980s. Changes in the economic and social structure of society have forced new directions in forest policies and new and greater demands on the agencies. The new situation is characterized by factors such as budget cuts, critical review and questioning about the utilitarian value of services, changes in programs or issues, higher demands on professional skills, more *market-orientation* of programs, etc. This has resulted in planning activities and organizational changes.

The objective of this report is primarily to describe the public forestry extension and assistance services in the United States, and how they approach the challenges of society today. The report is using the State of Minnesota as a case study, emphasizing the two most important agencies, the Minnesota Extension Service (MES) and the Division of Forestry, Minnesota Department of Natural Resources (DNR). Private organizations play a less significant role in providing extension or assistance services, and are accordingly given less attention. However, private organizations and other public agencies are described in a more summarized manner.

Though the study is not designed as a comparative study between the *service systems* in Minnesota and Norway, some comments are given on similarities and differences in a separate chapter.

To have a better understanding of the challenges that the agencies face today, the following chapter gives an introduction to Minnesota's forest resources.

II. MINNESOTA FOREST RESOURCES CHARACTERISTICS

a. Area and forest types

Minnesota has an area of 21.8 million hectares (53.8 million acres), of which 6.7 million hectares (16.6 million acres) or 31 percent is forested land (Hahn and Smith 1987) (see figure 1). Of the forest land, 5.5 million hectares (13.6 million acres) is classified as commercial forest land (= timberland), capable of producing wood suitable for industrial consumption and not withdrawn from timber utilization. Four-fifths of the state's commercial forest lands are located in north central and northeastern Minnesota. Of the state's remaining noncommercial forests (18 percent of total), two-thirds are not suited to timber production, while the rest are withdrawn by statute or administrative regulation for wilderness, parks, wildlife refuges, and so on (Lewis 1985). The geographic distribution of Minnesota's forest resources is shown in figure 2.

Total of 21.8 Million Hectares

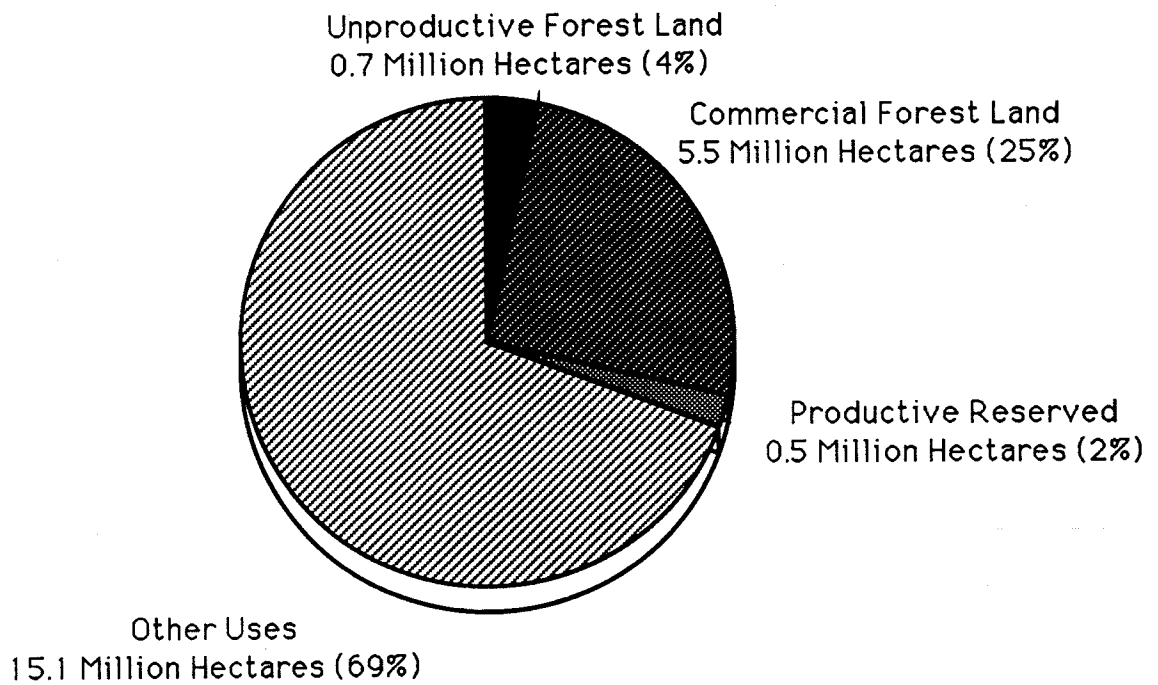


Figure 1. Minnesota land use (total land & water)
(Source: Hahn and Smith 1987).

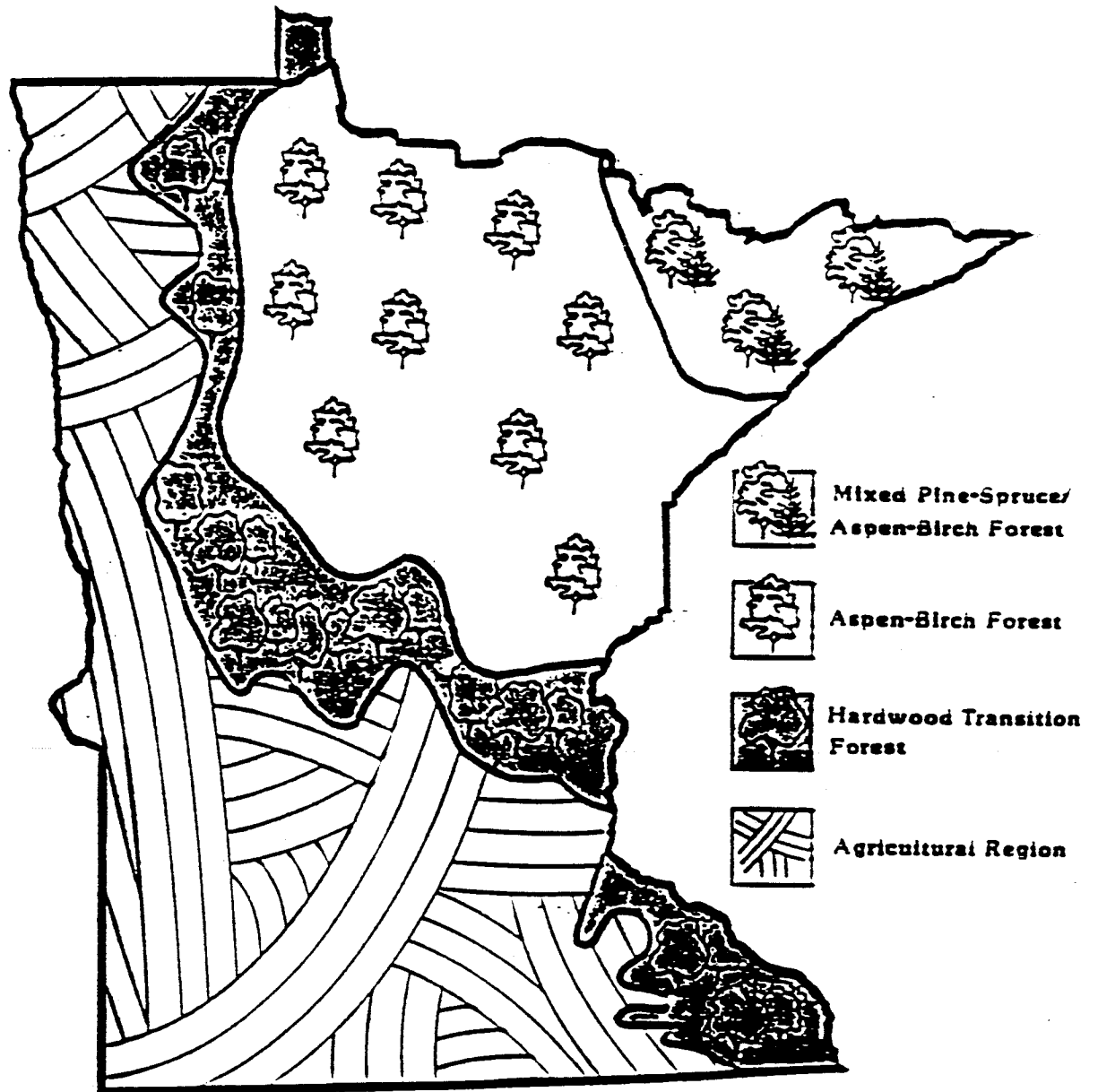


Figure 2. Geographic distribution of Minnesota's forest resources. (Source: Minnesota Department of Natural Resources, Section of Wildlife 1989).

Only one-half of Minnesota's original forest area remains forested today. Since 1952, the state's commercial forest land base has declined by approximately 18 percent. This trend is expected to continue, with an 8 percent decline in commercial forest land anticipated over the next 10 years (Governor's Blue Ribbon Commission on Forestry and Forest Products 1989).

Aspen and other hardwood forest types predominate throughout Minnesota. Together these species account for 71 percent of the state's commercial forest area (figure 3). Spruce-fir is the dominant softwood type (22 percent), while pines make up about 6 percent of the total commercial forest area (Hahn and Smith 1987). The major forest types, as registered in the Minnesota 1977 inventory, are shown in appendix C (Jakes 1980).

b. Ownership characteristics

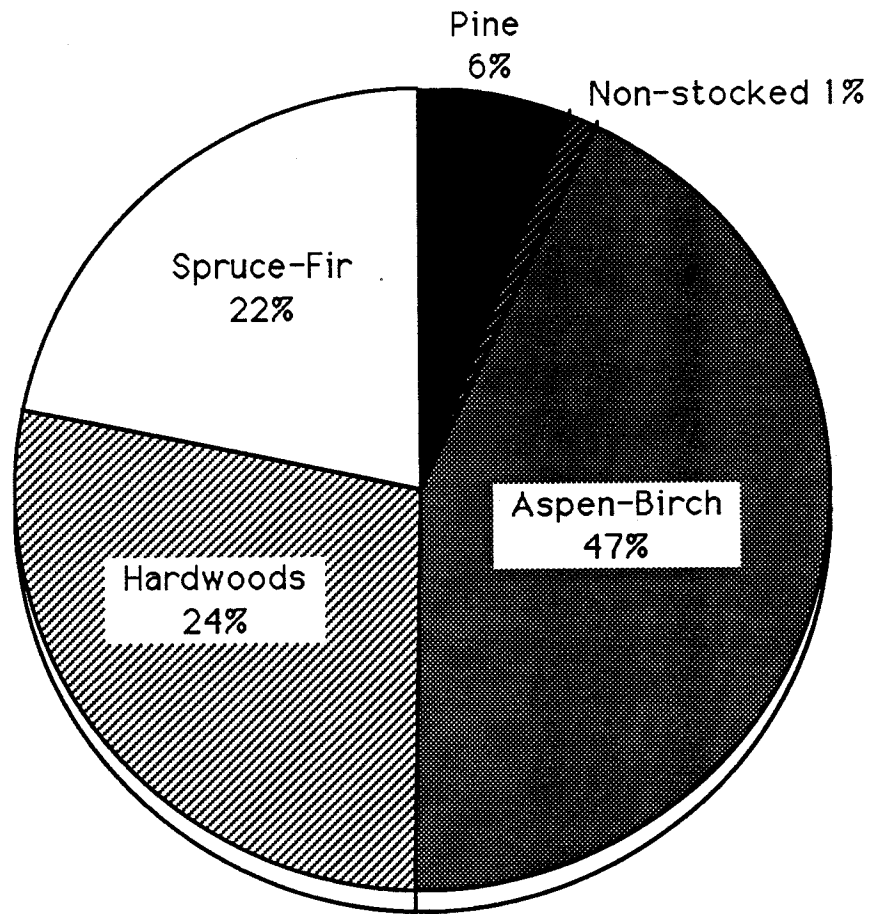
The ownership of the commercial forest land is nearly equally divided between the public (53 percent) and private sectors (47 percent). The state's wood-based industry owns only 6 percent of Minnesota's commercial forest lands and, therefore, depends heavily upon stumpage obtained from other private or public sources. Nonindustrial private owners—including farmers, other individuals and corporations—control 2.2 million hectares (5.5 million acres) or 40 percent of the commercial forest land (figure 4), and thus constitute by far the largest ownership class. Of this share, farmers alone have 60 percent or 1.3 million hectares (3.3 million acres), which is 25 percent of the state's commercial forest land (Hahn and Smith 1987). The nonindustrial landowners, about 130,000 in number, hold some of the most valuable timber lands in Minnesota, i.e. the major part of the hardwoods. Minnesota's softwood is predominantly in public ownership.

State and county governments administer 36 percent of the state's commercial forests, while two national forests administered by the USDA Forest Service comprise the bulk of Minnesota's federal commercial forest lands. Indian lands managed by the U.S. Department of the Interior Bureau of Indian Affairs (BIA) account for most of the other federally administered forests in the state (Lewis 1985).

All public owners hold at least 2,000 hectares (5,000 acres) (Jakes 1980). Looking at the nonindustrial private owners, Carpenter et al. (1986) found that only 10 percent of these owners have 40 hectares (100 acres) or more of commercial forest. The average property size of the nonindustrial private owners is 17 hectares (43 acres), increasing to 25 hectares (63 acres) when ownerships of less than 4 hectares (10 acres) are omitted.

A characteristic feature of the nonindustrial private forest land is the frequent transfer of property. Carpenter et al. (1986) estimated that about 62 percent of Minnesota's private forest landowners have held their forest land 22 years or less, and over one-third 12 years or less. This represents a maximum tenure because many owners have acquired additional forest land after their initial acquisition.

The nonindustrial private owners have diverse motivations and objectives for the use of their land. However, for most landowners timber production is secondary to other uses. This is probably due to low timber prices the last decades. According to Carpenter et al. (1986), the primary ownership reasons were: as part of residence or farm (34 percent of owners),



Aspen

- Aspen
- Balsam Poplar
- Paper birch

Hardwoods

- Oak/Hickory
- Elm/Ash/Cottonwood
- Maple/Basswood

Spruce-Fir

- Balsam Fir
- White Spruce
- Black Spruce
- White-cedar
- Tamarack

Pine

- Jack Pine
- Red Pine
- White Pine

Figure 3. Commercial forest land in Minnesota (5.5 million hectares) by forest type, percentage of total. (Source: Hahn and Smith, 1987).

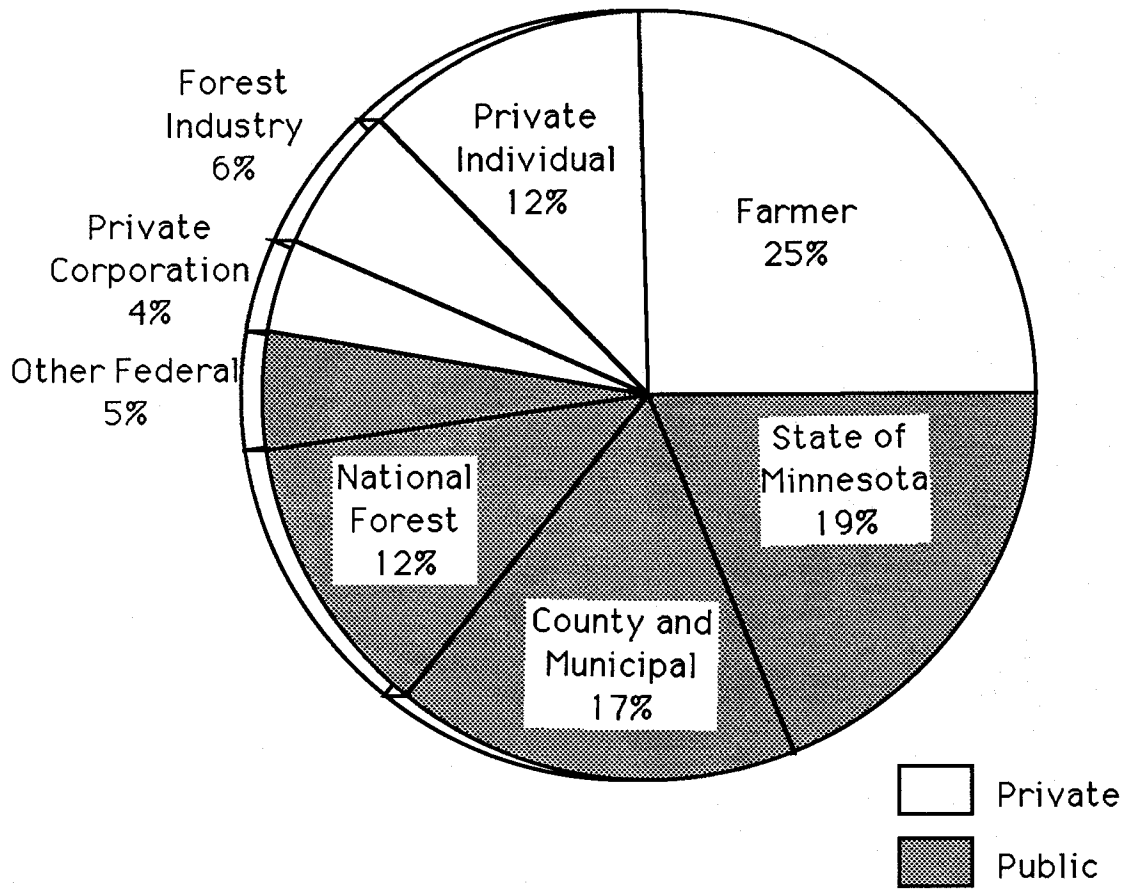


Figure 4. Distribution of commercial forest land (5.5 million hectares) by ownership class, Minnesota, 1987 (Source: Hahn and Smith 1987).

for aesthetic enjoyment (16 percent), to produce firewood for their own use (15 percent), and for nonmotorized recreation (12 percent). Hunting was the most popular recreation use.

Despite this, timber harvest levels on these lands are greater than average harvest levels for all other forest land ownership categories, except industrial forest lands. Among the nonindustrial private owners, the farmers harvest most frequently. According to the Department of Forest Resources, University of Minnesota (1989), there is increasing interest in economic potentials of forest management by landowners, because of expanding markets and financial incentives. However, the Minnesota State Planning Agency (1988) indicated that there is also a need for more specific management programs, policies and incentives to encourage long-term forest management from private, nonindustrial owners, if these lands are expected to continue contributing their share of timber.

The nonindustrial private owners' use of professional forestry assistance is moderate. In their study, Carpenter et al. (1986) found that owners of about one-fifth of the commercial land had requested professional assistance. Of landowners citing an assisting source, most owners contacted foresters employed by the Minnesota Department of Natural Resources. The next most frequently contacted were the U.S. Forest Service and the Agricultural Stabilization and Conservation Service.

c. Forest growth, timber harvest and forest industry

The 1988 net annual forest growth on the commercial forest land was estimated to be 13.9 million cubic meters (6.2 million cords). In 1995 it's estimated to be 16.1 million cubic meters (7.2 million cords) (Minnesota Department of Natural Resources, Division of Forestry 1990a).

Since the late 1970s, Minnesota has experienced a tremendous expansion of the forest products industries. This is due to new technology and expanding markets for forest products, partly or mainly made from deciduous tree species. Aspen in particular has played a key role in the development of the state's forest products industry, a species considered to be a *weed* in the early 1970s. Nearly all of the major capital investment projects within the 1980s use aspen as a primary raw material. The largest industrial expansion has been within the paper mills (making business and high quality magazine paper), and the waferboard mills (making structural panelboards, a plywood substitute. Minnesota is today the leading waferboard producer in the United States (Minnesota State Planning Agency 1988).

Forest products are today Minnesota's second largest manufacturing industry. According to the Minnesota Department of Natural Resources, Division of Forestry (1990a), the industry provided jobs for 55,600 people and wages of \$1.9 billion in 1988. The value of the wood products was \$5 billion the same year. Each job within the industry is estimated to create 2.7 additional jobs in other sectors of the economy. Eight pulp and paper mills look to the forest resources for their raw materials, as do four hardboard and speciality plants, five waferboard mills, 900 sawmills and over 850 secondary wood product related operations.

In 1988 the timber harvest reached 7.2 million cubic meters (3.2 million cords). Of this total, approximately 6.1 million cubic meters (2.7 million cords) were used for industrial purposes and 1.1 million cubic meters (0.5 million cords) were used for residential fuelwood. The extensive expansions in the wood using industry are expected to demand an additional 3.8 million cubic meters (1.7 million cords) of wood by 1995, which makes a total harvest of 11 million cubic meters (4.9 million cords) (Minnesota Department of Natural Resources, Division of Forestry, 1990a) (see figure 5). Further, much of the expansion noted will require increased timber supply inputs, especially from the nonindustrial private landowners. This may lead to changes in the market economics of the wood resource, particularly its aspen. The demand for aspen will probably exceed its annual growth. However, much of the aspen timber supply is an accumulated surplus over the last decades (mature and over-mature age classes), which may allow annual removals to surpass annual growth for some time. The situation may also lead to use of surplus species, recycled paper, increased utilization of trees, and/or increased imports of timber or semifinished pulp.

Further development potential also exists for other forest product industries such as Christmas trees, maple syrup, mushrooms, chemicals, etc. For example, the Christmas tree industry involves some 300 growers and sales totaling over \$30 million annually (Department of Forest Resources, University of Minnesota 1989). Minnesota Christmas tree growers supply between 2 and 3 million trees, wreaths and other greenery to customers throughout America. Most Christmas trees are grown in plantations.

d. Other consumptive and nonconsumptive uses

Coincident to this emphasis on intensification of forest management, there is increased interest in forest management for benefits such as water quality, energy conservation, wildlife, recreation, tourism, and aesthetics. Minnesota's forests provide habitat for more than 80 percent of the state's wildlife species, serve as the setting for much of the state's outdoor recreation, and play a crucial role in protecting water quality. In addition, forests act as buffers and nutrient sinks to reduce water quality problems caused by other pollution sources (Governor's Blue Ribbon Commission on Forestry and Forest Products 1989).

In recent years, Minnesota has begun vigorously marketing the out-of-doors. There is a proliferation of recreation clubs, people have more leisure time, are concerned with their health and are demanding a high quality environment not only for themselves, but for their children and grandchildren. Demands for recreational use commonly compete with demands from forest industry (Minnesota Forests 1989).

Tourism, a \$3 billion industry, is Minnesota's third largest economy. Annual visits to state parks alone are on a steady increase—5.5 million visitors in 1986, 6.7 million in 1987 and 7.7 million in 1988. During the past 20 years, recreational use of federal land increased 138 percent (Minnesota Forests 1989).

In response to recent investment of the forest products industry, Minnesota's governor in 1988 established a commission to identify and recommend appropriate strategies and policies to deal with long-term management in the state. Commission members represented a broad range of interests, including industry, education, landowners, public land managers and conservation groups. The charge of the commission was to assess the ability of the

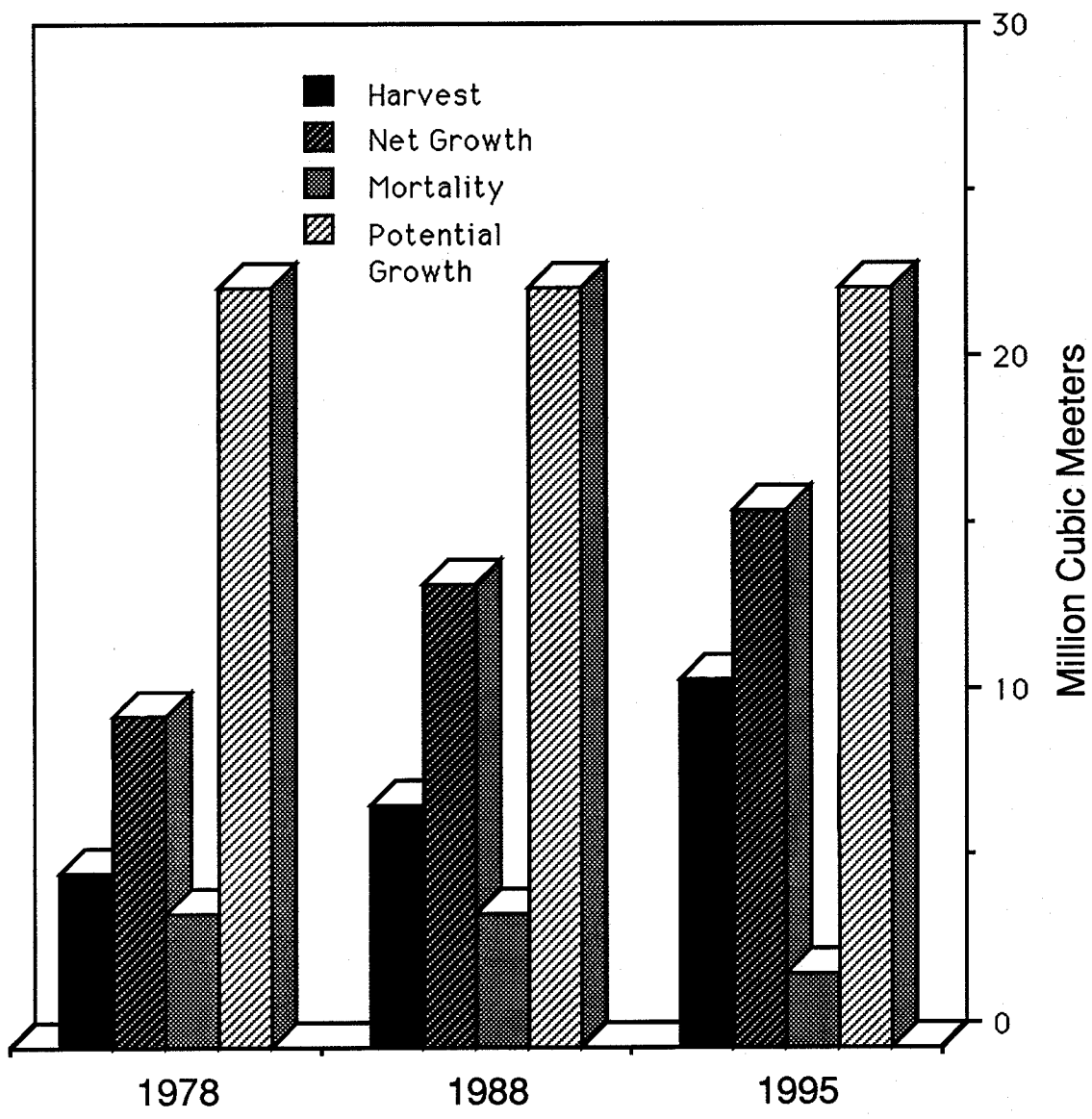


Figure 5. Minnesota timber harvest and growth on commercial forest land (Source: Minnesota Department of Natural Resources, Division of Forestry 1990).

state's forest resources to sustain additional economic development while accommodating increased use for recreation, wildlife, water, environment and amenity values. The commission presented their final report on *Minnesota's Forest Resources* in 1989 (Governor's Blue Ribbon Commission on Forestry and Forest Products 1989).

However, environmental groups have been expressing increasing concerns that the forest products industry will be raping the environment. Questions are being raised about the impact of large scale harvesting on recreation, wildlife, plant communities, old growth forest, forest soils, water quality, biodiversity, tourism, etc. This has resulted in an agreement to prepare a Generic Environmental Impact Statement that will assess the consequences of increased harvesting. An advisory committee has determined that the statement address the following issues (Laszewski 1990):

- Ensure forests can continue to produce large amounts of timber over a long period of time.
- Determine how the size and composition of the state's forests have changed over time and what caused the change.
- Ensure forest health and especially its ability to resist disease and insects.
- Ensure plant and animal diversity in the forests.
- Ensure that wildlife and fish flourish in forest areas.
- Protect the water quality and quantity of forest lakes and streams.
- Protect the fertility and prevent erosion of forest soil.
- Determine how timber cutting affects recreational activities.
- Determine economic effects of logging on regions and other industries such as tourism and recreation.
- Determine effects of logging on the beauty of the forests.

Consequently, the demands on Minnesota's forest resource are great. The variables in the management equation are complex and dynamic and include biology, economics, technology and public policy. There is a need to determine and communicate wise management to ensure compatibility of consumptive and nonconsumptive uses. Society depends upon and demands both.

III. MINNESOTA EXTENSION SERVICE

a. Historical background

The Minnesota Extension Service (MES) was established at the University of Minnesota in 1909 (then called the Agricultural Extension Service). However, in Minnesota, as in all other states of the United States, the origin of the extension system goes back to 1862. The passage of the Morrill Land-Grant Act gave impetus to the idea of using colleges to take practical education to the masses. The legislation gave the states federal land to be used as a source of financial support for the colleges (Encyclopedia Americana 1975b). The act's creation of the Land-Grant University System, committed the universities to offer instruction in agriculture, home economics and mechanic arts in the American higher education system. The University of Minnesota is a land-grant university, and became one

of the pioneering institutions in the establishment of the act, largely by assigning land-grant functions to existing institutions.

The passage of the federal Hatch Act of 1887 established agricultural experiment stations at the land-grant institutions. This was an important stimulus to agricultural extension (Encyclopedia Americana 1975a).

The organizational structure of today's extension system goes back to 1914, when the Smith-Lever Act established *the Cooperative Extension Service* in agriculture and home economics at the land-grant institutions in association with the U.S. Department of Agriculture (USDA). State legislation enabled local governments or organized groups in the nation's counties to become a third legal partner in this new educational endeavor (Extension Service-USDA 1986a).

By the middle of the 20th century, extension education was gaining wide acceptance. Today this educational system is comprised of an extension administrative group of about 100 professionals at the federal level within the USDA, professionals in each of America's land-grant universities, professional staff in nearly all of the 3,150 counties of the United States, thousands of paraprofessional staff serving in the counties, and nearly 3 million volunteer leaders assisting in extending programs under guidance and direction from Cooperative Extension staff (Extension Service-USDA 1986a).

The basic mission of the nationwide Cooperative Extension System today is to disseminate and encourage the application of research-based knowledge and leadership techniques to individuals, families, and communities. It is educational in program content and methodology, not regulatory or financial. Cooperative Extension is administratively attached directly to the 1862 land-grant university system and is a major part of it, rather than being attached directly to state government (Extension Service-USDA 1986b).

When the Minnesota Extension Service was established in 1909, a university dean wrote that "the whole state is aroused as never before to the need for agricultural education. The need for agricultural education" remains, but it is just one part of the multifaceted educational effort of today's MES (Minnesota Extension Service 1989). This is due to profound changes in the social and economic fabric of rural Minnesota over the last two decades. Today MES has the following program units: agriculture, home economics, 4-H youth development, community economic development, and natural resources. Forestry extension belongs to the latter program unit.

At the university level, MES has disciplinary specialists in numerous academic departments. Extension agents in every county tailor educational programs to meet local needs, drawing upon research from the university and other sources as well as ties to other local agencies and organizations. Additionally, some 50,000 extension-trained volunteers help plan and deliver education programs each year (Minnesota Extension Service 1989).

Forestry was first given a place as an agricultural extension project in Michigan in 1911. However, it was not until 1914, when the Smith-Lever Act authorized federal-state cooperation in establishing a systematic, large-scale agricultural extension effort, that farm forestry was regularly included in extension programs. Progress in farm forestry was slow

until 1924 when the Clarke-McNary Act provided a much needed stimulus. The act directed the Secretary of Agriculture to work with the states in developing extension forestry efforts. By 1925, forestry projects were underway in 25 states.

In subsequent decades, new legislation has strengthened extension forestry. Still, extension forestry has lagged far behind extension agricultural programs in terms of human and fiscal resources (The North Carolina Agricultural Extension Service 1976). A stronger support for forestry extension has been enabled through the passage of the Renewable Resources Extension Act (1978), which authorized additional funding for extension programming relating to forestry and other renewable natural resources.

Educational outreach in forestry in MES dates back to 1926 when appropriations became available to states following passage of the Clarke-McNary Act. At that time the first extension forestry specialist began helping farmers to improve woodlands and to establish shelterbelts and windbreaks (Department of Forest Resources, University of Minnesota 1989). According to Wegner (1990), the MES established extension foresters in five counties in 1949. However, only Itasca County (office in Grand Rapids) has continued with a wide range of forestry programs.

The legislative mandate objectives for forest extension in Minnesota is stated in the Minnesota Forest Resource Management Act of 1982. The act authorizes the director of the Minnesota Extension Service to conduct, support, and cooperate in forestry extension activities including, but not limited to, the following (Minnesota Statutes 1982):

1. Providing educational programs that will enable individuals to recognize and capture opportunities for managing forests for purposes of recreation, timber, water, wildlife, forage, and other purposes.
2. Using educational programs to disseminate the results of forestry research.
3. Providing for the forestry educational needs of the private, nonindustrial forest landowner.
4. Assisting in providing continuing education programs for professionally trained resource managers.
5. Provide educational programs that will enhance in harvesting, processing, and marketing of wood.
6. Assisting in the identification of topics in need of forestry research.

b. Recent developments in organization and planning

The last decade's economic crisis in rural Minnesota (decline of the family farm), decline of universities as a primary source of research results, and society's scrutinizing of publicly funded programs sparked a self-evaluation of MES (organizational structure and mission).

In 1985, a strategic planning process was initiated to ensure that MES stay in tune with the times and is prepared for the future.

The first step was the development of a *strategic plan (Focus on People*, adopted in 1986 [Minnesota Extension Service 1990]). The planning process involved MES faculty at all organizational levels throughout the state. Critical issues were identified, mission and values were re-examined and recommendations were made. In this process much emphasis was placed on issues programming, which is extension's planned response to issues, i.e. matters of wide public concern. Issues programming differs from traditional disciplinary programming. It is a different way of thinking about the origins of programs. It identifies human problems in their own context (i.e., outside the extension organization) without prior regard for traditional extension subject matter, audiences, and methods of program delivery (Extension Service-USDA 1988). The strategy for issues programming includes identification of issues, stating of issues, selecting of issues, and moving from issues to programs.

The *Focus on People* plan describes the overall mission, core values, goals, major strategies, central issues, linkages to other organizations, expected outcomes and next steps. It sets a new direction focusing on programs and priorities around critical issues. The planning activity also gave rise to a new name for the organization, altering it from the Agricultural Extension Service to the Minnesota Extension Service. This reflects a commitment to a broader range of programs (Minnesota Extension Service 1986).

The mission of MES is defined as "the outreach of the University of Minnesota that offers research-based education to people of all ages through-out the state, in cooperation with county, state, federal and private partners." Important roles for extension are to identify societal needs that can be solved through research, and to transfer new knowledge back to individuals, families and communities.

The Focus on People strategic plan—which is system wide—outlines four central issues common to all program units: I) economic development, II) environment and natural resources, III) human development, and IV) community leadership.

From system wide planning, the planning process went further to each program unit to identify their mission, goals, strategies, issues and program priorities.

In 1987, the natural resources program unit developed the following program priorities (Minnesota Extension Service 1988):

I) Economic development

- economic and industrial development of forest resources
- aquaculture
- land use alternatives
- tourism

II) Environment and natural resources

- water quality
- forest resource assessment, use, protection, monitoring
- resource management by private landowners
- fisheries and wildlife management
- soil conservation
- waste management
- outdoor recreational opportunities

III) Human development

- cold climate housing
- youth education
- public understanding of natural resources and their value

IV) Community leadership

- developing volunteer leadership
- natural resource policy development

Other types of planning—short-range and long-range—occur at various intervals and deal with more specific activities as they put the strategic plan into action.

According to the Minnesota Extension Service (1990), the second major step in the strategic planning process was the *restructuring plan* in 1987. It established clusters of counties and specializations for agents. Though county agents mostly work within county boundaries, this initiative also made it possible to work across county lines to share their specialized area of knowledge and experience. An agent's specialization is a focused topical area in which agents commit up to 25 percent of their effort (e.g., natural resources, livestock systems, energy and the environment) (Blinn 1990).

The third step in strategic planning was the *staffing plan*, adopted in 1990. The plan aims at having the right expertise in the right positions at the right time. Though MES staff are administratively housed in their units and work in disciplines, they increasingly team up with faculty in other units to mount educational efforts that are interdisciplinary. On major issues, teamwork is the answer. Extension specialists and agents working across program and county boundaries develop teams of expertise to deal with complex issues. The application of interdisciplinary responses arises from the fact that problems are complex and require diverse skills and approaches. Another result of the staffing plan will be the development of a pool of flexible resources (funds) to address emerging issues (Blinn 1990, Laursen 1990).

The staffing plan suggests that by 1995, MES staffing will be characterized by (Minnesota Extension Service 1990):

- More emphasis on leadership education, community economic development, natural resources and environment.

- Collaboration with other agencies, transferring programs if appropriate.
- Greater proportion of staff located throughout the state.
- Agents spending more time on their specialization.
- Increased participation by volunteers.
- Master's degrees as minimum for new agents, by 1995.
- More use of short-term assignments and positions.
- Organizational environment that encourages cultural diversity.
- Leadership in employment of new technology.
- More shared staffing arrangements within the total university.

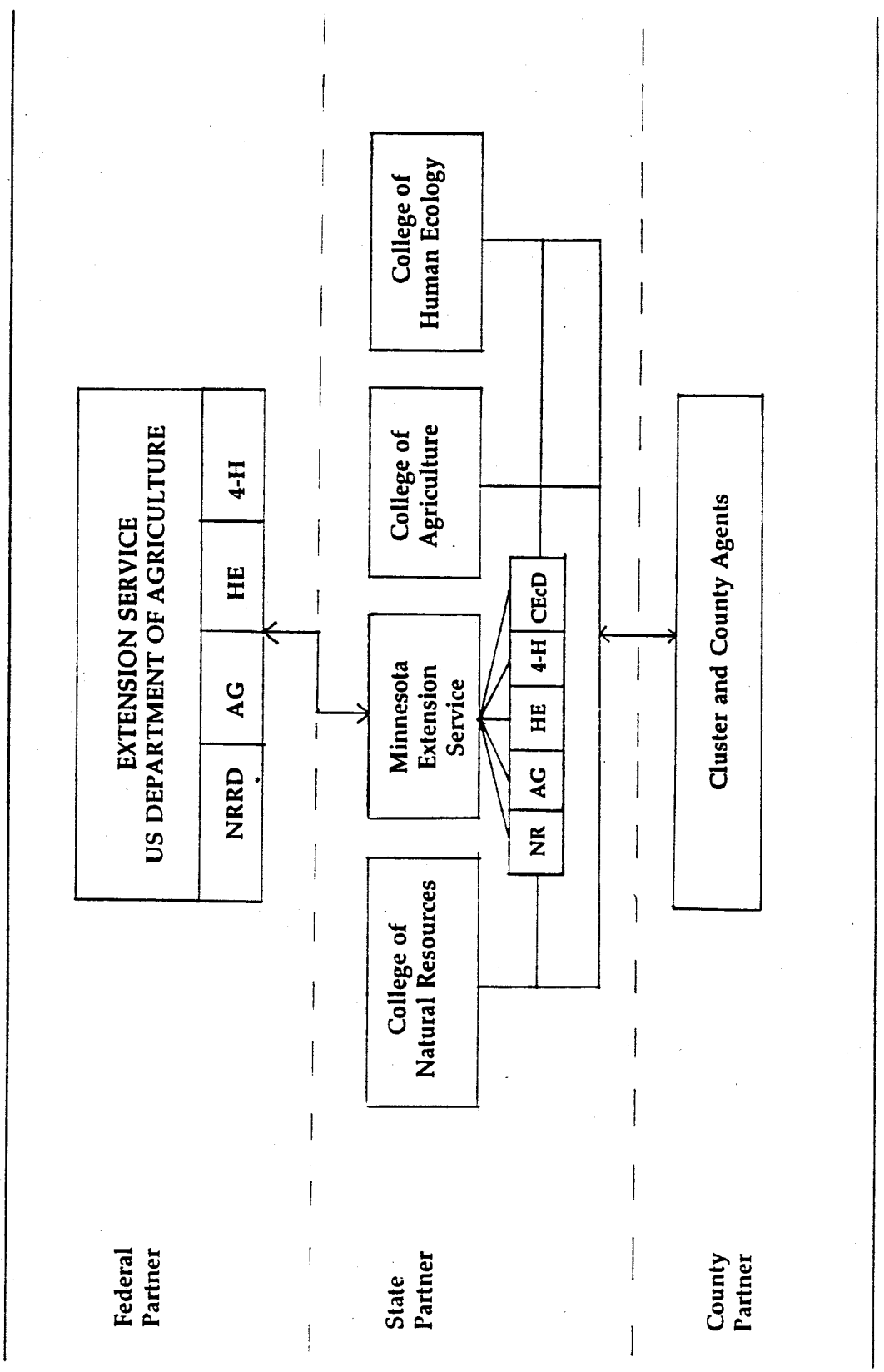
Similar planning processes have also been carried out at the federal level. This has led to identification of nationwide issues and core programs. Many national reports during the 1980s—from the USDA Extension Service or joint councils or committees within the Cooperative Extension Service—reflect the socioeconomic change across the USA and include recommendations for modifying the organization, issues and programs on which to focus use of resources. Exemplary publications include: *Extension in the 80's: A perspective for the future of Cooperative Extension Service* (Extension Service-USDA 1983a), *Challenge and change....* (Extension Service-USDA 1983b), *Renewable Resources Extension Program: Five-year plan, 1986-90* (Extension Service-USDA 1986c), *Extension in transition. Bridging the gap between vision and reality* (Virginia Cooperative Extension Service 1987), *Issues programming in extension* (Extension Service-USDA 1988), and *New directions for a new decade* (Extension Service-USDA 1989).

In summary, the ongoing and continuing planning process of MES is a tool to meet the rapidly changing demands of today's society. Through this new approach to *stay alive and healthy*, MES aims to be a dynamic and relevant organization characterized by responsiveness, innovation, adaptability and flexibility.

Extension is now in the early stages of change in the approach for developing and implementing programs—from disciplinary programming to issues programming. This involves fundamental changes in the reason for the existence of extension and in the way extension's work gets done. Issues programming can renew extension's traditional emphasis on being proactive rather than reactive. Moving ahead aggressively with issues programming will allow extension to take the offense rather than to become preoccupied with defending itself from external attack. Issues programming exemplifies the original mission of the Land-Grant University to serve the general public in its broadest sense. When extension was founded, the majority of the population was rural and agriculturally-based, and extension programs focused on rural issues of wide public concern. Since issue programming places emphasis on matters of wide public concern, the organization will reaffirm its mission of public service in its broadest configuration (Extension Service-USDA 1988).

c. Organizational structure and funding

The relationship between federal and state extension is a partnership (see figure 6). The partners in the Cooperative Extension system are interdependent, yet each has considerable autonomy in funding, staffing, and programming.



Abbreviations: NRRD = Natural Resources & Rural Development; NR = Natural Resources; HE = Home Economics; AG = Agriculture; CEcD = Community Economic Development; 4-H = 4-H/Youth Development

Figure 6. Simplified Organizational Chart of the Cooperative Extension System Highlighting the Minnesota Extension Service. (Source: Laursen 1990)

The federal partner, the Extension Service-USDA, is an executive branch agency that carries out the president's agenda, maintains contacts with the Congress, and seeks federal funding opportunities. It also informs Congress about natural resource needs in the country and recommends program directions for state and county extension partners. The federal partner informs the state or county units about program priorities at the federal level. At the federal level, forestry has two program leaders (Forest Land Management and Wood Products Marketing) and a portion of two natural resource program administrators (Laursen 1990).

On the state level or land-grant university level, the Minnesota Extension Service has a status similar to a college. The specialists in the five program areas are located in academic departments in different colleges. The Minnesota Extension Service has a director and program leaders, subject matter specialists in the departments, and county agents at the local level. The extension administrators and specialists facilitate development of statewide program priorities and provide support for programming at the local level. They do not dictate program priorities at the county level. There is a great deal of freedom at the local level in identification and implementation of priority programs.

MES has nine specialists with 50 to 90 percent extension appointments in forest resources and forest products on the state level, and a full-time program leader for natural resources. Their full-time equivalents in extension amount to about five person-years. The extension natural resources program also provides program support for faculty specialists in the Department of Fisheries and Wildlife and in departments of the Colleges of Agriculture and Home Economics who do natural resources programming. In Minnesota there are 89 county extension offices and a couple hundred county agents. Four county agents have expertise in forest management. Few agents have academic training in natural resource management or conduct natural resource programs on a regular basis (Laursen 1990).

As indicated, natural resources represents just a small portion of the staffing and fiscal resources of the National Cooperative Extension System. The funding of natural resource extension programs (nationwide) in 1989 totaled \$9.5 million (including approximately \$2 million from the Renewable Extension Act of 1978) (Ellefson 1991a). In the Minnesota Extension Service, the natural resources program unit has about 3 percent of the total MES budget. About one-third of the fiscal resources come from federal appropriations and two-thirds from the Minnesota State Legislature. Subject matter specialists also obtain grants through public or private sources to support their projects. The main funding source at the local level is the counties themselves, with some support from the state legislature (Laursen 1990).

The federal, state and local partners work together and separately seek funding and other outside support for implementation of programs.

In recent years, the natural resources program unit has to some extent expanded its staff and fiscal resources within the MES. Because of increasing competition for the natural resources, and increasing public demand for programming relating to environmental quality, this reallocation of resources within the MES will continue into the future (Laursen 1990).

The current economic situation is characterized by budget cuts. The strategic budget plan for the MES prepares for reductions of up to 14 percent over the next five years (1991-1996). This means that program units and core programs will be evaluated and that redirection and reallocation of resources will occur (Blinn 1990). Reduced operating budgets, flexible staffing, alternative delivery methods for programs and outside funding, are means that will need to be further explored to help the organization maintain its prominence.

Even in the face of budget cuts, the MES natural resources program plans to enhance programming on integrated forest land management, waste management, water quality, energy systems and urban forestry (Laursen 1990).

d. Extension programs in forest resources.

Forest resources extension (conducted by the Department of Forest Resources, College of Natural Resources) focuses on *environment and natural resources management* and *economic development* issues. Priority programs (ongoing programs) for faculty with extension appointments include forest management practices, economic opportunities in forest management, small woodlot management, windbreak/shelterbelt design and use, timber harvesting and specialty crops management (maple syrup and Christmas tree industries). The staff expertise is concentrated on resource management and the economic aspects of forestry issues (Department of Forest Resources, University of Minnesota 1989).

Extension faculty are an important communication link between faculty research, natural resource agencies, industry, special interest groups and landowners. Educational delivery is accomplished through workshops, seminars, correspondence courses, training sessions, conferences, field tours, software, publications, video, slide sets, telephone calls, and use of mass media. Target audiences for the educational activities include natural resource managers and related professionals seeking continuing education, nonindustrial private forest landowners, loggers, public policy makers, youth, tourism business, and the general public.

With reference to the Department of Forest Resources, University of Minnesota (1989), Baughman (1990b), Blinn (1990), and Laursen (1990), a detailed description of staffing areas is shown below. There also is a description of staffing needs within new initiatives or emerging issues, as addressed in the Comprehensive Staffing Plan.

Ongoing programs:

Integrated Forest Management - providing forestry professionals and landowners with information about multiple use management of woodlands. Providing loggers, landowners, forest industry and other users with information on technologies, management systems and policy alternatives for the production of a variety of products from the forest.

Forest Economics/Policy - providing forestry and related natural resource professionals with approaches to the analysis of forest management problems important to wise use of forest resources and assessing management alternatives. Approaches involve economic analysis

of management prescriptions, including tax implications, and development and use of computer models and expert systems.

Specialty Crops - providing technical, biological and managerial information for specialized industries based on forest resources such as maple syrup and Christmas tree industries, and potential new industries.

Windbreaks/shelterbelts - providing information to landowners, extension agents and other agricultural professionals on the establishment and maintenance of tree plantings to conserve topsoil and moisture and to protect farmsteads from cold winter winds and blowing snow. Such plantings are crucial to sustainable agriculture and increasingly important to energy conservation.

Proposed needed staffing areas:

Geographic Information System (GIS) - providing natural resource management and extension staff with computer based tools and analysis on the extent and spatially referenced character of natural resources and land use relationships. Emphasis is on building comprehensive data bases and techniques for collecting, updating, processing, analyzing and distributing information. (A short-term staffing priority).

Forest Water Quality and Watershed Management - providing information on the establishment and management of forest watersheds to alleviate water quality problems, particularly for southeastern Minnesota. Forests and their associated ecosystems can play an important role above and beyond that of a buffer in controlling stream and surface water pollution and sedimentation in agricultural and other areas of intensive land use. (A short-term staffing priority).

Silviculture - providing technical information on the establishment and culture of forest stands. The proposed staffing would concentrate on the establishment and silviculture of hardwood and aspen forest types (A long term staffing priority). At the present there is some short-term staffing in this area from the Forest Vegetation Management Cooperative, notably in the area of providing information on forest weed control in young forest stands, herbicide application and Best Management Practices. The Minnesota Legislature also is providing funds for 2 years that enable MES to hire a hardwood specialist for southern Minnesota (A long-term staffing priority).

Urban Forestry - providing technical information and policy alternatives for the establishment, maintenance and protection of urban forest resources. These resources include street and yard trees, parkland and urban wildlands that are important to the quality of life in urban areas from the standpoint of aesthetics, ecological stability, recreation and energy conservation. Those factors in turn are extremely important to community economic health. (A long-term staffing priority).

Most of the staffing with positions in Forest Resources Extension are located at the University of Minnesota in St. Paul. However, two positions are also located at the Cloquet Forestry Center near Duluth. This center is also a part of the university. One additional staff person is funded by the Minnesota Tourism Center and located in St. Paul. This

person primarily focuses on management of nonconsumptive uses of forests (recreation/tourism), wildlands and water resources.

The staffing plan also contains a proposal to achieve the objectives of diversity, vision, flexibility and access. Flexibility is best achieved by concentrating a significant portion of the staffing resources on short-term (2-5 years) issue needs. The plan is supposed to achieve that in conjunction with flexibility needs in departmental research and teaching programs and plans to seek grant support. For the future, extension faculty will be encouraged to seek outside support to meet the needs that arise that are difficult to fund from traditional sources.

Access is a difficult objective for forest resources extension because of the part-time appointments, the large geographic area that must be covered and the diversity of forest owners and users, their location and motivation. Planned audiences include extension agents, nonindustrial private landowners, forestry professionals, policymakers, farmers, youth and the general public.

To address these audiences, the Department of Forest Resources intends to be a leader in electronic communication, notably voice and video. The building facilities of the department today include local area network linkages (LAN) and provision for implementing satellite and interactive video fiber optics. Through this technology they plan to link campus based faculty, specialists outside and clientele. However, county clusters, branch stations and coordinate campuses are also sites of interest. The intent is also to augment technology transfer and education through a series of friendly microcomputer models, notably knowledge based or expert systems (Department of Forest Resources, University of Minnesota 1989).

The staffing plan also addresses the need for county cluster agents/specialists in natural resources. Such long-term staffing is essential to reach extension audiences statewide in a cost effective manner and to communicate needs to campus-based faculty. Priorities for such agents/specialists are:

- hardwood forest management/water quality in southeastern Minnesota;
- forest management in northeastern and north central Minnesota;
- woodlot and windbreak/shelterbelt management in west central Minnesota along the prairie-forest border; and
- urban forestry in the metro area and rural communities.

This list is looked at as just a small start on such staffing needs and possibilities.

As described above, forest resources extension in Minnesota is presently short of staffing to deal with biological questions on environmental management, particularly best management practices (BMPs). They are also short of staff with expertise that can adequately address urban forest management. Such forests have become a necessity for attracting industry, ensuring a high quality living environment, for recreation and energy conservation. Information needs are also placing demands on geographic information system capabilities to assist extension and other agencies and local governments with their analysis efforts.

e. Extension Forestry Programs in the county.

Forestry extension programs in Itasca County are a good example of a county extension program. Much emphasis is currently put into a new *Woodland Advisor Program* for nonindustrial private forest owners. This program offers 40 hours of training in return for 50 hours of volunteer service promoting forestry. The program covers subjects such as management planning, woodland ecology, Project Learning Tree, tree identification, taxes, Christmas tree production, forest products, softwood and hardwood management, timber marketing, harvesting, fire management, insect and disease, wildlife management, best management practices, and maple syrup production.

The program was developed by the *Itasca County Woodland Committee* with guidance from the Minnesota Forestry Association. The natural resources county agent has been the organizing force. The committee of 14 members contains a broad range of forestry interests including people representing industry, landowners, loggers, research, county, and public agencies within extension and assistance services. The committee is of an advisory nature, aimed at developing programs for the nonindustrial owners. Similar woodland committees exist in some other counties in northeast and north central Minnesota.

Other forestry information delivered by the Itasca County office is provided through loggers' workshops, forest management correspondence courses, newsletters, radio programs, newspapers, etc. While some of these materials are developed within the county, other materials are provided to the county through MES and other sources.

Important issues for the future, as seen by the natural resource county agent, are programs that make the landowners better aware of their resources, water quality, size of clear cuts, wildlife management, education of the public, and the herbicide issue (Wegner 1990).

f. Problems faced by Extension Forestry Programs.

Challenges faced by extension forestry programs include questions of public versus private roles in the supplying of information, the targeting of information to appropriate groups of landowners, the meshing of extension programs with other types of programs (such as cost-share and technical assistance), and concerns over program efficiency and effectiveness in general. Questions are also raised about why extension still is affiliated with the university system, and if extension yet has succeeded in defining its new mission (Ellefson 1991a,c).

IV. MINNESOTA DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FORESTRY.

a. Department of Natural Resources.

The Department of Natural Resources (DNR) is the state agency responsible for management of public lands, timber, waters, minerals, fish and wildlife. This responsibility includes authority to control the use, sale, leasing or other disposition of various resources on state land. The DNR has dual goals of protecting the environment and promoting resource use and development (Minnesota Department of Natural Resources, Division of Forestry 1983).

With approximately 1,600 full-time employees, 1,400 seasonal employees, and operations in every county of the state, the DNR is a complex organization. The following is a brief overview of how the department is organized.

DNR's top management consists of a Commissioner who serves in the governor's cabinet, a Deputy Commissioner, an Assistant Commissioner for Administration, an Assistant Commissioner for Operations, an Assistant Commissioner for Planning and Special Programs, and an Assistant to the Commissioner for Departmental Relations (Minnesota Department of Natural Resources 1989) (see organization chart in figure 7).

There are six operating divisions in the DNR, which include forestry, waters, enforcement, fish and wildlife, minerals, parks and recreation. In addition there is a special unit of trails and waterways. Each division is responsible for management and regulation of the natural resources reflected by its title. The director of each division and unit is appointed by the commissioner.

The field operations are organized in six administrative regions in Minnesota. Field structure below the regional level varies by division. DNR field offices are located throughout the state based on resource and public service needs.

In each DNR region, a regional administrator and administrative support staff provide services to field operations, coordinate and monitor departmental programs, and ensure public participation in DNR programs.

The divisions are supported by several administrative bureaus to generate efficiencies through functional specialization and to prevent unnecessary duplication.

The planning and special programs unit also provide programs to support the divisions. The three larger bureaus are planning, human resources, and information and education. Smaller specialized units include volunteer programs, youth programs, affirmative action, and the department library (Minnesota Department of Natural Resources 1989).

Several changes in the organizational structure are proposed for 1991 by the new Minnesota governor (elected in 1990) and DNR commissioner (appointed by the governor) (Olson 1991).

b. Division of Forestry, historical background.

The Minnesota legislature took the first small step toward preserving the state's forests and preventing forest fires by the appointment of the state auditor as forest commissioner in 1895. The same year, General C. C. Andrews, long a pioneer in the fight for forestry, became Minnesota's first chief fire warden. However, it was not until 1911 that a forestry organization was established which marked the beginning of the Division of Forestry in the present Department of Natural Resources. Previous fire tragedies gave the impetus to enact laws in 1911 to develop the *Minnesota Forest Service*. All responsibility was transferred from the state auditor and placed under a forestry board. The board of nine members appointed W. T. Cox as Minnesota's first state forester and General C. C. Andrews as secretary. Mr. Cox organized the state forest protection system with district rangers under whom worked

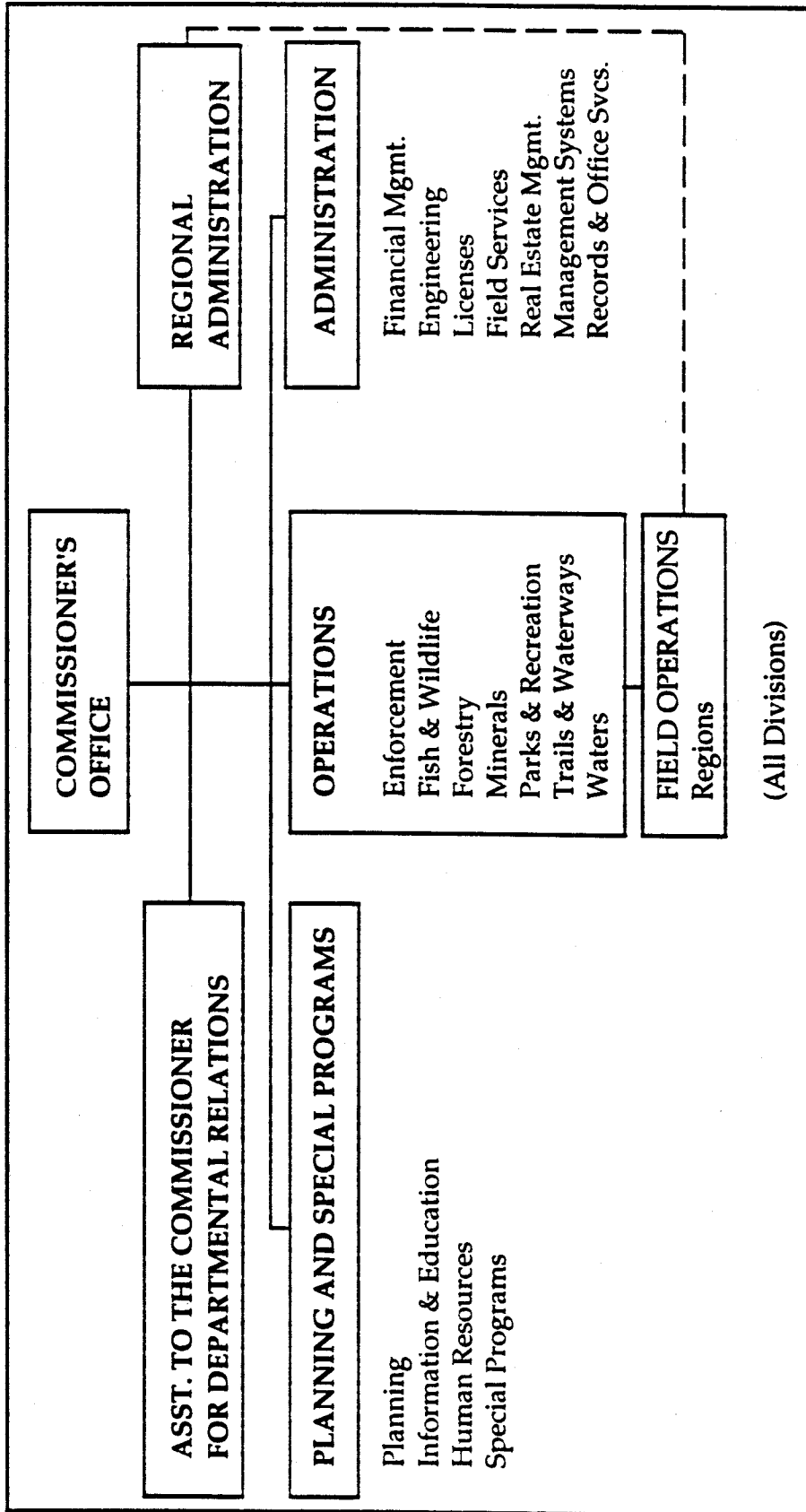


Figure 7. Organizational chart, Minnesota Department of Natural Resources. (Source: Minnesota Department of Natural Resources 1989).

state and federal patrolmen (Minnesota Department of Natural Resources, Division of Forestry 1971).

The Minnesota Forest Service was reorganized in 1925 and came under the Department of Conservation as the Division of Forestry. Reorganization of the department took place several times after that, in 1931, 1937, 1956, 1967, and in 1974 (Minnesota Department of Natural Resources, Division of Forestry 1971, Olson 1991). Less drastic reorganizations have taken place since 1974. The reorganization in 1956 resulted in a line-and-staff organization for the Division of Forestry, similar to the existing model.

The 1969 legislature passed a law changing the name of the Department of Conservation to the Department of Natural Resources. The change became effective in January 1971. This was a common action taken by many states at about that time. Conservation was viewed as a *resource utilization* term that did not adequately reflect the growing concern for *resource preservation* (Olson 1991)

c. Organization, obligations and funding.

Beginning in 1895 with a single employee, Minnesota's Division of Forestry has developed into an organization of 411 permanent employees in 1990. The present Division of Forestry organization consists of four functional staff groups in St. Paul and field personnel in each of the regions (see figure 8). The division has one director and four assistants to the director, who are in charge of the four functional staff groups (administration, resource management, resource protection, and resource information and planning). Each assistant director has staff comprised of professional specialists and administrative or office personnel (Minnesota Department of Natural Resources, Division of Forestry 1990b). The central administration located in St. Paul and Grand Rapids had a staff of 68 persons in 1990 (Olson 1990).

The resource management section consists of two major program areas:

1. State Forest Land Management Program (land administration, forest recreation, state forest roads, timber management, timber sales, fish and wildlife habitat management), and
2. Cooperative Forest Management Program (private forest management, urban and community forestry, cooperative county forest management, forest pest management, forest soils).

The resource protection section provides wildfire protection on private and public land and law enforcement related to wildfire prevention.

The information and planning section is responsible for programs in forest resource assessment and analysis, forest products utilization and marketing, forestry information systems, forest resource planning and public affairs (Minnesota Department of Natural Resources, Division of Forestry 1990b).

Division of Forestry - 1990

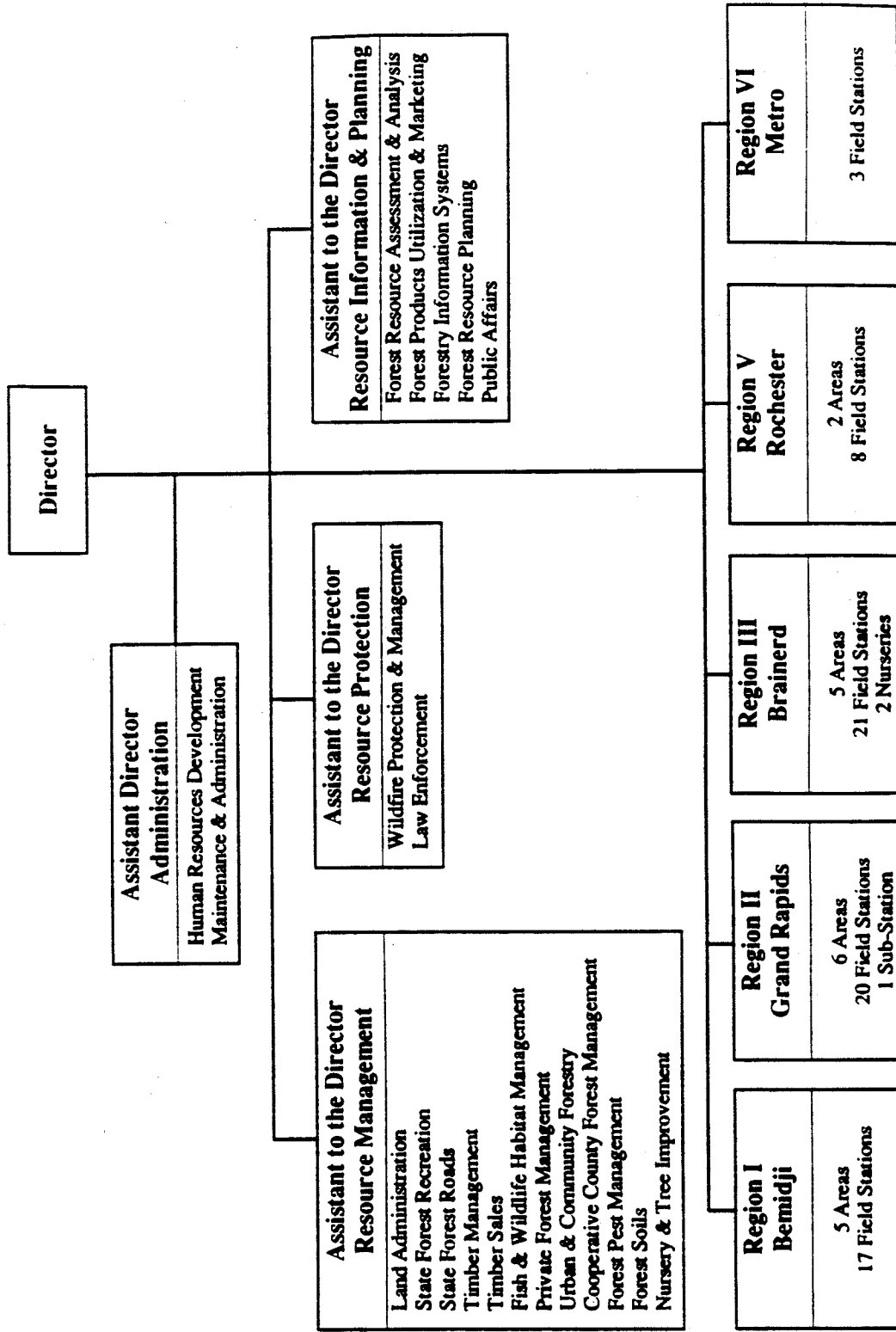


Figure 8. Organizational chart, Minnesota Department of Natural Resources, Division of Forestry. (Source: Minnesota Department of Natural Resources, Division of Forestry 1990 b).

The field operating group is composed of 6 regions, 18 administrative areas and 69 field stations, all with office and professional staff. The field level also operates two tree nurseries. The Division of Forestry had 343 permanent employees in the regions in 1990, of which 42 were located at the regional offices, 116 at the area offices, 159 at the field stations, and 26 at the two state nurseries (Olson 1990).

The Division of Forestry is charged with the protection and multiple-use management of 1.9 million hectares (4.6 million acres) of state forest and other state-owned lands. The division seeks to maintain and enhance forest resources for the benefit of present and future generations. In so doing, it is also responsible for preventing and controlling wildfire on 20.6 million hectares (50.9 million acres), insect and disease protection on 6.5 million hectares (16 million acres) of forest lands, annual production of between 22 and 25 million tree seedlings from two state tree nurseries, and for assisting private forest landowners in managing their lands (Minnesota Department of Natural Resources, Division of Forestry 1990b).

The forest resources requiring management and protection include—as defined by the division—timber and other forest crops, recreation, fish and wildlife habitat, wilderness, rare and distinctive flora and fauna, air, water, soil, and educational, aesthetic, and historical values. A primary objective of the division is to provide a sustained yield of the various products and renewable resources of state forests including wildlife habitat, biologically diverse vegetation communities, aesthetics, and water quality (Minnesota Department of Natural Resources, Division of Forestry 1990b).

The Division of Forestry had a budget of \$34.3 million in 1990. The Minnesota Legislature provided \$25 million or 72 percent of the fiscal resources. This primary source of the budget finances the basic operation. Federal appropriations counted for \$3.3 million (10 percent). This source funds forestry assistance programs or forestry incentives programs for nonindustrial private landowners. Other sources of funding were dedicated receipts (\$2 million or 6 percent), pass-through grants from the State (\$3.3 million or 10 percent), and finally general obligation bonding (\$0.7 million or 2 percent) (Minnesota Department of Natural Resources, Division of Forestry 1990b).

In recent years, budget appropriations have consistently fallen below even modest budget requests. Major impacts of these reductions include the closing and/or consolidation of 18 field offices, phasing out six county assistance foresters, maintaining numerous position vacancies, eliminating or reducing maintenance of recreational facilities and recreational trails, elimination of road construction and rehabilitation projects, and an overall reduction of field and staff activities in most program areas. Budget reductions are expected to be even more severe in the 1992-1993 biennium (Minnesota Department of Natural Resources, Division of Forestry 1990b).

d. Planning activities.

In the early 1970s, there were few initiatives and little growth in forestry programs. There was little coordination or agreement among the major actors (DNR, U.S. Forest Service, University of Minnesota, forest industries) as to the role of forestry in Minnesota (Olson 1991).

In 1976, the Division of Forestry developed a long range plan. Due to changes in the DNR administration, the plan was not finalized or completed.

In 1978, the Legislative Commission on Minnesota Resources (LCMR) initiated a policy study to examine the prospects for forestry in Minnesota. The study was completed by Jaakko Poyry, a Finnish consulting firm. This preliminary study led to a much more comprehensive study by George Banzaf & Company that was completed in 1980. The Banzaf study, entitled *Minnesota Timber Resource Study*, resulted in several LCMR sponsored forestry initiatives in the early 1980s (Olson 1991).

The most notable result of the LCMR effort was the Forest Resources Management Act, enacted by the Minnesota legislature in 1982. This was the most comprehensive and significant forestry-related legislation in many years. A major purpose of this act was to establish a statewide forest planning effort (Minnesota Department of Natural Resources, Division of Forestry 1983). The act directs the DNR, Division of Forestry to prepare and maintain a statewide forest resource management plan consisting of an assessment and a program.

The division completed the first Minnesota Forest Resources Plan (MFRP) in June 1983. The assessment part of the plan described and evaluated the past, present and prospective forest resource conditions of Minnesota. It analyzed the demands for Minnesota's forest resources and the capabilities of the resources to meet those demands. The assessment portion of the MFRP is required to be updated every 10 years (Minnesota Department of Natural Resources, Division of Forestry 1990b).

The program part of the plan contained goals, strategies, and recommended actions to resolve important forest management issues identified in the assessment portion of the plan. The program portion is updated every four years, first in 1987 for the fiscal years 1987-1991, then again in 1991 for the fiscal years of 1991-1995. The last plan contains four major sections: future division direction, budget and staffing summary, recommended program, and appendices.

The Forest Resource Management Act of 1982 also authorizes development of regional and area forest resource management plans to set forth specific goals and objectives for the management, protection, and production of forest resources. The division's administrative areas were selected as planning units in 1983. In 1988 the Division of Forestry decided to switch its planning efforts to the regional level (Olson 1991).

The division is implementing its MFRP through an improved management system which links the plan to various management processes such as budgeting, work planning, accomplishment reporting and program analysis. Program supervisors will have the primary responsibility to assure that the plan is implemented by providing oversight and direction through the above mentioned processes. Field staff then will have the primary responsibility for carrying out individual tasks (Minnesota Department of Natural Resources, Division of Forestry 1990b).

Annual work plans are the primary tool used to communicate to the division what is expected and to guide the operations of the division. The division develops annual work

plans at the beginning of each fiscal year to set specific targets for the year. Annual work plans are guided by the direction established in the MFRP.

Accomplishment reports are the primary tool used to determine how well the division is meeting its goals and objectives. The division develops an accomplishment report at the end of each fiscal year which compares actual accomplishments with the objectives established in the annual work plan (Minnesota Department of Natural Resources, Division of Forestry 1990b).

There will always be factors beyond the control of the Division of Forestry that will affect focus, direction and implementation of the different plans, such as social, economic, political and technologic changes. Therefore, considerable flexibility is provided when applying programs and policy directions, and when targeting ongoing activities of the organization.

e. Minnesota Private Forest Management Program.

Federal-State Cooperation

The Division of Forestry is the lead organization in delivering technical assistance to private forest landowners in Minnesota. Assistance is offered through cooperative federal-state forestry programs, such as Minnesota's Private Forest Management (PFM) Program, which have their roots in federal legislation enacted early in the century. Enacted in 1911, the Weeks Law authorized matching federal funds for state fire protection efforts on both private and public lands. Cooperation expanded with the Clark-McNary Act of 1924 which called for federal-state cooperative funds for distributing seedlings and providing forestry technical assistance and educational programs to farmland owners (Henly et al. 1988).

The cooperative federal-state role in providing assistance to private forest landowners has been legislatively expanded over time. Early legislation includes the Soil Conservation and Domestic Allotment Act of 1936, which established the Agricultural Conservation Program (ACP), the 1937 Cooperative Farm Forestry Act, and the 1950 Cooperative Forest Management Act, which greatly expanded the provision of forest management advice to landowners by providing funds and authorizing the Secretary of Agriculture to cooperate with the states to provide technical assistance to forest landowners (Henly et al. 1988).

In 1956, the Division of Forestry entered into agreements with the U.S. Forest Service for cooperation in the federal Soil Bank Conservation Reserve Program and the Agricultural Conservation Program (ACP). The division agreed to grow forest planting stock for use in the programs and to provide technical forestry assistance. As a consequence, all state nurseries run by the Division of Forestry at that time were expanded considerably (Minnesota Department of Natural Resources, Division of Forestry 1971).

More recently, the federal Forestry Incentives Program (FIP) of 1974, and the Cooperative Forest Management Act of 1978 brought together and enlarged much of the previously-enacted cooperative forest legislation. The Conservation Reserve Program (CRP) initiated by the 1985 Farm Bill constitutes a federal-state effort aimed in part at reforesting highly erodible agricultural lands (Henly et al. 1988).

Most recently, the Forest Stewardship Act of 1990 authorizes the Secretary of Agriculture to establish a rural forestry assistance program which is designed to provide financial, technical and educational assistance to the forestry community via state foresters and state extension directors. The act focuses on enhancement of multiple forest benefits, and cost-share assistance for nonindustrial private forests which is provided by a Stewardship Incentive Program (SIP) (Ellefson 1991b). The stewardship program is also expected to provide significant funding for private forest management planning. It also initiates an America the Beautiful Program which is an urban tree planting program intended to revitalize America's urban forests by providing cost-share money to communities throughout the nation (Minnesota Department of Natural Resources, Division of Forestry 1990 b) (see chapter V under federal agencies).

In 1991 Minnesota received \$269,000 for the stewardship program. It was decided to use 70 percent for technical assistance through the DNR, Division of Forestry and through Soil and Water Conservation Districts, and 30 percent for educational activities through the Minnesota Extension Service and other organizations (Kroll 1991b).

Private forestry assistance in Minnesota began at a minimum level in 1926, when the state fielded its first extension forester (Department of Forest Resources, University of Minnesota 1989). In 1946, the Minnesota Timber Producers Association funded two foresters in the Division of Forestry, Department of Conservation, to assist private forest landowners in northeastern Minnesota.

State legislative action providing private forestry assistance dates from 1947, when the legislature authorized the Commissioner of Conservation to "employ competent foresters" to assist private forest landowners in land management (Henly et al. 1988). The legislative act provides for management service to owners with land of not more than 400 hectares (1000 acres) (Minnesota Department of Natural Resources, Division of Forestry 1971). This statute limit is still in effect.

Another statute directs the Commissioner of the Department of Natural Resources to "cooperate with the several departments of the state and federal governments and with counties, towns, corporations, or individuals in the preparation of plans for forest protection, management, replacement of trees, woodlots, and timber tracts, using his influence as time will permit toward the establishment of scientific forestry principles in the management, protection, and promotion of the forest resources of the state" (Henly et al. 1988).

The legislature reaffirmed its commitment to private forest management assistance in the 1982 Forest Resource Management Act, instructing the Commissioner of Natural Resources to add ten PFM specialists to the 1984-85 biennial budget request. The positions were approved and funded by the legislature in 1983 (Henly et al. 1988).

The 1986 Reinvest in Minnesota (RIM) legislation has added to the state's role in funding and coordinating reforestation and other natural resource protection efforts. However, funding for RIM activities has and will continue to be difficult to obtain (Minnesota Department of Natural Resources, Division of Forestry 1990b).

The major goal of Minnesota's PFM program is to "improve and increase the multiple-use forest resource management of non-industrial private forest lands in a way that is cost-effective to the Division, consistent with Departmental policies and complementary of other governmental and private efforts" (Minnesota Department of Natural Resources, Division of Forestry 1990b).

Minnesota strives to meet its goal by providing technical forest management assistance to private nonindustrial forest landowners. This assistance is provided directly through assistance from state forestry personnel, and indirectly by encouraging additional private forestry consultants to become active in providing such services (Henly et al. 1988).

Administrative Organization

Though Minnesota's PFM program formally is organized under the Resource Management Section (figure 8), PFM is integral to the overall activities of the Division of Forestry, as described by Henly et al. (1988). It cannot be entirely separated from other division efforts. Formal authority in the division flows from the director, through 6 regional supervisors, to 18 area supervisors, to the 69 forest districts (field stations).

PFM is coordinated primarily by a cooperative forest management specialist located within the Resource Management Section of the division's St. Paul central office. The cooperative forest management specialist position is described as coordinating all aspects of the PFM, identifying problem areas, developing policies and procedures to overcome such problems, and proactively improving the program (Henly et al. 1988).

An important position activity, particularly with the recent Stewardship Incentives Program, is keeping field staff informed about administrative and technical requirements of new federal forestry programs. A team approach, involving Division of Forestry field staff from across the state, is used to develop policies and procedures.

Each region has a PFM contact managing the program at the regional level. Area supervisors have the greatest control over administrative areas, for achieving program targets, prioritizing activities, and balancing PFM work with other area responsibilities. Twelve of the 18 administrative areas have staff foresters coordinating the PFM within their respective areas. In the other areas, a district forester or technician has been delegated this responsibility (Henly et al. 1988).

PFM responsibilities are spread widely among division employees. Even designated PFM foresters usually spend no more than 75 percent of their time on PFM related work. Most PFM assistance is provided by area and district foresters and technicians whose other responsibilities include fire prevention/suppression and all phases of state-owned forest land management.

The PFM program has somewhat lower budgetary priority compared to other Division of Forestry programs, such as management of state-owned forest lands and fire suppression. PFM assistance levels have risen and fallen over the years. Peak assistance levels have coincided with the various federal agriculture-forestry programs which have come and gone. After all, PFM has become an important, integral, and ongoing part of the division's

mission. It will continue as a major program effort without being tied so closely to the levels of landowner cost-share and assistance programs as it was formerly (Henly et al. 1988).

Assistance provided

Division of Forestry provides private nonindustrial forest landowners with a broad range of assistance. That range runs from simply providing information, to directly performing services. Most of the services offered are free of charge, however, fees are charged for services pertaining to timber sales.

The following types of assistance may be provided by Division of Forestry personnel (Minnesota Department of Natural Resources, Division of Forestry 1980):

- detailed, brief, or revised multiple-use management planning;
- timber sale contract and bid preparation;
- marking, designation or scaling forest products in accordance with established fees;
- volume estimates for timber marked or designated for harvest;
- forest product marketing and utilization;
- reforestation and timber stand improvement;
- state tree planter rental;
- insect and disease evaluation and damage assessments;
- technical assistance and promotion of federal cost-sharing programs to any qualifying landowner;
- urban and community forestry;
- general tax advice; and
- referral to consulting foresters, vendors, or tax advisors.

Though not directly described in the *Private Forest Management Service Policies*, the service foresters also provide advice on erosion and sediment control, wildlife habitat improvement, forest recreation and road construction (Baughman, 1990a).

Another important part of the PFM activities is assistance with the administration of the Minnesota Tree Farm System (Minnesota Department of Natural Resources, Division of Forestry 1986a).

The most fundamental service provided is the preparation of a comprehensive forest management plan. The first and perhaps most important step in preparing a plan is for the forester to become acquainted with the landowner's objectives. The forester (accompanied by the landowner) next makes a general survey of the owner's forest land (Henly et al. 1988).

The plans entail classifying and mapping the various timber stands on a tract into management units, and then preparing both a general description and basic management recommendations for each of those units. Recommendations are tailored to specific objectives of the landowner, reflecting wildlife, recreation, and other landowner concerns, as well as timber production goals. Comprehensive management plans are usually written to cover a five-year period.

Most of the plans prepared by state service foresters are called *brief* management plans. Despite their name, these plans are not necessarily short and simple. Rather, they provide detailed prescriptions, usually for a single management unit, such as timber stand improvement or regeneration of a stand after harvest (Henly et al. 1988).

Brief plans are sometimes written to follow-up and reinforce verbal management recommendations. As with comprehensive management plans, concerns for nontimber resources are incorporated into brief plans.

The state charges landowners fees for management planning on a free will basis. In 1990 the fee was \$1.25 per hectare (\$0.50 per acre) (Kroll 1991a).

Another major category of assistance is timber sale preparation. In helping a landowner set up a timber sale, the forester will (Henly et al. 1988):

- Cruise the timber, marking individual trees for selection cuttings or delineating the harvest area boundaries for clear cuts.
- Estimate timber volume and value.
- Prepare prescriptions for regeneration and recommendations for timber cutting procedures to be followed by the logger.
- Provide the landowner with a list of potential local loggers or timber buyers, a sample timber harvest contract, and recommendations regarding bidding procedures for selling the timber.
- Scale the cut timber, if the landowner wishes.

Beginning 1991, the fee charged for timber sale preparation was 7.5 percent of the estimated stumpage value of the timber designated to be sold (Kroll 1991a). Typical private consultant fees for timber sale assistance have been 15 percent of the sale value, though consultant involvement in the sale process may be much greater (Henly et al. 1988).

Fees also are charged for rental of state owned tree planting equipment to landowners. These fees pay for equipment wear and tear. In 1990, the rental fee was \$25 per day (Kroll 1991b).

Service foresters or hired consultants working under Minnesota's PFM program also provide hands-on assistance applying the six forestry cost-sharing programs available. They make initial site inspections, write plans for the cost-share treatments, and conduct follow-up inspections of the forest lands once the treatments have been completed.

Cost-share programs in 1991 included four federal programs administered by the Agricultural Stabilization and Conservation Service (ASCS): Agricultural Conservation Program (ACP), Forestry Incentives Program (FIP), Conservation Reserve Program (CRP), and the new Stewardship Incentives Program (SIP). Minnesota programs, administered by

the Soil and Water Conservation Districts (SWCD), include the Minnesota Forestry Incentives Program (MFIP) and the Re-invest in Minnesota Program (RIM).

The available cost-share programs are more closely described in a paper by Barzen and Kroll (1989) (appendix B) and in chapter V. Many of the forestry programs have cost-sharing for wildlife habitat improvement. However, there are cost-share programs designed specifically for wildlife management purposes.

A significant amount of assistance provided to landowners comes as general forest management information or advice via telephone, letters, or in-office contacts. The advice may deal with any facet of forest management: silviculture, forest protection, timber sales, wildlife habitat improvement, basic forest management tax provisions, etc. (Henly et. al. 1988).

State service foresters also promote the PFM program and provide private forest management information through group presentations and the mass media. Group presentation activities include organizing field demonstrations or tours and staffing county fair booths. The division encourages their use of mass media (particularly local newspapers and radio stations) to promote PFM. And, they are encouraged to facilitate the establishment of woodland owner organizations.

Legislative and Administrative Policies

A number of administrative policies and one statute provide the framework within which the PFM program operates. Most fundamental is the 1947 statute which specifically authorizes state assistance to private forest landowners. Agreements, memoranda of understanding and matching federal funds through the U.S. Forest Service regulate the types of services that can be provided. Local, area and regional policies which are stricter than statewide policies, may be adopted to satisfy local conditions (Minnesota Department of Natural Resources, Division of Forestry 1980).

Division of Forestry policy limits landowner assistance to a maximum of four man days per year. This time does not include assistance provided in conjunction with the federal FIP, ACP, CRP and SIP programs. Exceptions may be made in parts of the state where private forestry consultants are not available.

As previously mentioned, the Minnesota statute of 1947 limits assistance to owners of not more than 400 hectares (1,000 acres). However, division policy recommends that ownerships larger than 200 hectares (500 acres) be referred to private consultants. Such areas are difficult to serve within the four-man day limitation (Minnesota Department of Natural Resources, Division of Forestry 1980).

Division policy specifically prohibits types of assistance where "the forester will be acting as agent for the landowner."

Landowner-Consultant Referral Policy

A *Landowner-Consultant Referral Policy* was prompted by concerns of private forestry consultants. They were concerned that the state's free or low-cost assistance to private landowners was taking business from them. In response, the division in 1984 established policies and procedures to provide consultants access to the names and addresses of persons seeking forestry assistance from the DNR. In the future this type of information may be accessible to consultants through computer terminals in county extension offices throughout Minnesota (Henly et al. 1988, Kroll 1991a).

A landowner requesting PFM assistance which requires a field visit, must fill out an *Application for Forestry Assistance*. An application copy is forwarded to the Division of Forestry area office. For 90 days, that copy is open for review by private forestry consultants, industrial foresters, or forestry service vendors. The purpose of this review period is to allow private forestry practitioners an opportunity to identify landowners to whom they might offer their services. During this period, the division may provide the landowner with the service requested, in accordance with standard policies.

Private landowner requests for timber sale assistance require both a review period and a waiting period. When a landowner requests this assistance, an application is again completed, with a review copy forwarded to the division area office. When the application is filed, the landowner is given a list of consulting and industrial foresters compiled by the division and urged to consider using their services. The landowner is told there is a 30 day waiting period after the initial visit, during which no further sale assistance can be provided (Henly et al. 1988; Minnesota Department of Natural Resources, Division of Forestry 1984a).

The waiting periods give consultants, industrial foresters and forestry practitioners the opportunity to identify and approach potential clients. It also gives landowners the opportunity to contact these foresters to engage their services.

Another provision of the Landowner-Consultant Referral Policy provides a list of consulting and industrial foresters to landowners requesting assistance beyond the scope of PFM permitted services (Henly et al. 1988).

Until recently, the policy has accomplished little in increasing private consultant business, but the cost of maintaining the policy has been very low relative to the political problems its termination might cause.

Division concern for consultants goes beyond trying to minimize the appearance of competing with them. The division genuinely wants private forest landowners in the state to receive more forest management assistance, and it recognizes that private consultants can expand the assistance available to private forest landowners. They can offer more of the services the state already provides as well as offering ones the state does not.

While the division has had limited success in expanding professional forestry consultant work in Minnesota, it has created many opportunities for forestry vendors providing such services as tree planting, herbicide application, and timber stand improvement cuttings. Many of

these opportunities stem from the federal and state cost-share programs. The division has offered a number of training programs for individuals interested in providing such services (Henly et al. 1988).

Program Funding and Staffing

The Minnesota Division of Forestry's PFM program is supported both by federal and state funds. Funding levels have generally decreased over recent years. For 1991 the PFM funding is expected to be \$1.46 million, which represents about 5.3 percent of the Division of Forestry's total budget of \$27.55 million for that year. The funding will hopefully stay at such a level in the years to come (Minnesota Department of Natural Resources, Division of Forestry 1990b).

Parallel to the decrease in funding, staffing of the PFM program has also decreased somewhat. For 1991 the staffing level is expected to be 36 full-time equivalents (FTEs), which is about 7 percent of the division's total staff budget (518 FTEs). For comparison, 152 FTEs is dedicated to state forest management in 1991, equal to 29 percent of total division FTEs for that year.

The division also contracts for some forestry assistance related to the Agricultural Conservation, Forestry Incentives, and Conservation Reserve Programs, and for the new Stewardship Incentives Program. The division finds it more cost-effective to hire consultants to provide services than to add new staff.

Present PFM staffing levels appear to be somewhat inadequate, relative to landowners' demands for assistance. Excess demand is dealt with by carefully targeting assistance to committed landowners. For example, PFM foresters emphasize harvesting as only one part of the total management process. Landowners who will follow up harvesting with other appropriate silvicultural treatments receive a high assistance priority. Landowners interested in harvesting timber only for the immediate return are given low priority. And, landowners not following through on management recommendations are given low priority when seeking additional assistance (Henly et al. 1988).

Program Accomplishments

The Division of Forestry uses a detailed accounting procedure to track PFM accomplishments (Minnesota Department of Natural Resources, Division of Forestry 1984b). Focusing on 1990, service foresters prepared 2301 management plans covering 36,570 hectares (90,363 acres). Timber harvest assistance was provided on 5,045 hectares (12,466 acres). Planting/replanting was guided on 8,156 hectares (20,153 acres). Nontimber management improvements (wildlife, recreation, watershed) were aided on 8,863 hectares (21,900 acres). The accomplishment report also includes figures on thinning, pruning, school forest assists, consultant referrals, articles and news releases, tree farm inspections/reinspections, field days/presentations, displays or exhibits, etc. (Minnesota Department of Natural Resources, Division of Forestry 1991a).

The timber sale assistance levels have increased greatly in recent years, resulting in a greater portion of private timber being sold with PFM assistance. Ideally, this should result in

better silvicultural practices on more of Minnesota's nonindustrial private forest lands (Henly et al. 1988).

Annual PFM accomplishment target levels are developed at the area level each year. They are based on demand for PFM services and other division program responsibilities. An area's initial target plans are moved up through the regions, to the St. Paul office for review. Modifications are made and then are routed back to the area level. Approved area targets are allocated to the various districts. Each forester and technician providing technical assistance is allotted individual accomplishment targets to achieve, and is evaluated through the year on achievement of accomplishment targets.

Accomplishment targets are seen as guides, however, rather than absolute goals. Unexpected factors such as severe fire seasons can rapidly bring a change in program priorities and output goals (Henly et al. 1988).

Future Program Directions

The 1990 program update document of the Division of Forestry's Minnesota Forest Resources Plan sets out future directions (1991-1995) for the PFM program (Minnesota Department of Natural Resources, Division of Forestry 1990b). The statewide direction is described as follows:

"An increased awareness of the environment is expected to bring extra attention and funds to the PFM program. Much of this will be directed through the Federal Stewardship Initiative. This program requires comprehensive planning and implementation to achieve a variety of natural resource products which optimize the potential of the land. Single products and/or species must be considered in context with the overall ecosystem. A 30 percent increase in management plan activity is expected because of the Stewardship Initiative. Close inter-agency cooperation will be necessary to achieve this initiative. This inter-agency cooperation will be a hallmark of the program.

The federal Conservation Reserve Program (CRP) may be modified to promote tree planting. If so, the level of planting may continue at 8,000 hectares (20,000 acres) per year. The Stewardship Initiative will also increase tree planting.

Another potentially large program affecting PFM is the 'America the Beautiful' program. The impact on the Division is unpredictable until more about the program is known. Most of this work will be tailored to community forestry.

The Division will also continue to assist in private timber sales and will continue to encourage increased participation by consultants."

The Minnesota Forest Resources Plan update also lists major strategies and objectives for 1991-1995. Statewide, these includes (Minnesota Department of Natural Resources, Division of Forestry 1990b):

- Expand public knowledge and awareness of forestry and its importance to Minnesota.

- Increased professional resource manager's knowledge and commitment to managing from the perspective of the ecosystem, thereby providing an optimum variety of products for society without impairing long-term ecosystem productivity and diversity.
- Target assistance to landowners who demonstrate commitment to managing their lands. The level of plan detail must reflect the resource potential and the landowner's needs. Recognize differences between regions and adjust type of service provided to best suit needs.
- Actively promote the use of consulting, industrial and other private foresters in managing private forest lands.
- Minimize the conversion of nonindustrial private forest (NIPF) lands to non-forest uses.
- Coordinate the PFM services so that they complement those provided by other DNR divisions, industry, consulting foresters and forestry vendors.
- Utilize increased environmental awareness, from stronger alliances with those who share an interest in NIPF forests and/or overall environmental concerns.
- Promote changes in the current property tax system to encourage increased management of NIPF lands.
- Expand the system requiring NIPF landowners to pay for services for which they receive significant benefit (i.e. timber sales).
- Integrate NIPF management planning into the development of Regional Forest Plans and other local planning efforts.
- Identify and promote the use of private consultants for special temporary projects which focus on specific products or objectives.
- Include other governmental agency personnel and private consulting and industrial foresters in PFM-related training sessions.

The plan also sets specific targets for the division's central office in St. Paul:

- Form a closer alliance between the division and various statewide PFM-related forest user groups.
- Provide information and support as needed to promote Stewardship Initiative.
- Rewrite the present PFM service and PFM timber sales policies, to combine them into a single, comprehensive PFM program policy. Include revisions in the fees charged for PFM services.

- Provide information and support necessary to pass legislation regarding changes in forest property taxation.
- Streamline the paperwork needed to operate an effective PFM program.
- Develop an improved *stewardship* format for landowner management plans to replace current format for comprehensive plans and brief plans which cover more than one activity.
- Establish statewide policies regarding the involvement of the DNR Section of Wildlife in the preparation of forest management plans and other aspects of the PFM program.
- Continue adoption of local agreements between Soil and Water Conservation Districts (SWCD) and area forestry offices. Where significant local matching funds are available, use SWCDs to increase effectiveness of the PFM program.
- Participate in the implementation of a computerized tracking system for PFM cooperators and their forest resources.
- Establish closer working relationships with Resource Conservation and Development (RC&D) Committees through the joint funding of an RC&D forester position and through cooperative projects.
- Streamline paperwork needed to operate the PFM program, and provide tools needed to efficiently provide PFM service in the field.

f. Future Direction for the Division of Forestry

The Minnesota Forest Resources Plan also points out the future direction (1991-1995) for the entire division, which is based upon a series of *basic assumptions*.

For example, the division wishes to maintain a leadership position within both the state and national forestry communities. This goal requires a highly trained and skilled professional staff with a diversity of talents and expertise. It will require a commitment on behalf of the division and its employees to continued professional development, and a willingness to adapt during periods of rapid change.

The future program direction is also based on the realization that government is in the midst of an extended period of contraction. Times are tough and increasingly competitive. At a time when public demands are continually increasing, the division will need to establish priorities for its activities. This means that the Division of Forestry must become more efficient and innovative in meeting its targets, however, low priority activities may not be accomplished.

To deal effectively with changing conditions, the division must substantially broaden and diversify its management strategy, providing for a diversity of public needs and land uses, while maintaining the basic integrity of the forest resource. The continued success of the

organization will hinge on its ability to implement the *multiple-use, sustained yield* philosophy through integrated management with other organizations and disciplines, and balanced consideration of commodity and noncommodity production (Minnesota Department of Natural Resources, Division of Forestry 1990b).

The Division of Forestry's *vision* is to provide quality forest resources for the people of Minnesota through leadership and coordination with the forestry and related community by balancing public needs with sound natural resource management principles.

The division's future *mission* is to work with public and private entities to promote the conservation, protection and enjoyment of Minnesota's forest resources through multiple-use management, wildfire and pest protection, and technical forestry assistance.

As a *preferred future*, the division envisions a more efficient, effective organization, one closer to the public it serves, more interactive with its customers and more responsive to public needs. More stable budget and staffing levels would enable a more consistent effort over time (Minnesota Department of Natural Resources, Division of Forestry 1990b).

The division also foresees that it must market its activities and services. It is not only important that the division's clientele understands and appreciates its key role in the management of Minnesota's forest resources. It also is important that the division understands what its clientele wants from them.

The division's goals for the future are described as (Minnesota Department of Natural Resources, Division of Forestry 1990b):

- Increase the health and productivity of forest lands to achieve higher, yet balanced levels of both commodities and amenities to strengthen Minnesota's forest products and tourism economies.
- Improve the ability to protect life, property and natural resources from wildfire.
- Improve the coordination of public/private forestry programs to more effectively achieve shared goals.
- Improve the dissemination of forest resources information to better meet user needs.
- Intensify effort to enhance aesthetics, water quality, fish and wildlife habitat, plant communities, manage for biological diversity, and improve the quality of the state's forest resources.
- Maintain close communications with forest user groups in order to remain sensitive to the broad range of public needs and expectations.

Further, the Minnesota Forest Resource Plan sets out a set of strategies and objectives to reach these goals.

V. OTHER PUBLIC AGENCIES, PRIVATE ORGANIZATIONS AND INDIVIDUALS

Many other agencies, private organizations and individuals have a role in providing information and service program initiatives for private forest landowners and managers. Those that have major involvement or impact on forestry—besides the MES and the DNR—are discussed in this section.

a. Federal Agencies

As indicated in previous chapters, many publicly sponsored forestry programs involve partnerships between federal and state forestry agencies. The federal agencies are under the *U.S. Department of Agriculture (USDA)*, include the Forest Service, the Soil Conservation Service and Agricultural Stabilization and Conservation Service.

The USDA Forest Service

The USDA Forest Service (USFS) activities are divided into three major program areas: forestry research, national forest management, and state and private forestry.

Research projects are carried out in eight regional forest experiment stations throughout the United States. One is located in St. Paul, Minnesota, and is called the North Central Forest Experiment Station.

The National Forest System section of the Forest Service manages two national forests in Minnesota—the Chippewa National Forest and the Superior National Forest. The national forest offices offer information and educational materials to landowners on a wide variety of management activities including timber, wildlife and fish habitat, soil and water conservation, recreation, road and facility construction, reforestation, timber stand improvement, and fire protection and suppression. However, they do not sell tree seedlings or provide on-the-ground technical assistance (Minnesota Department of Natural Resources, Division of Forestry 1983; Baughman 1990a).

The role of the state and private forestry (S&PF) section is to develop policies and guidelines and supervise the administration of the federal forestry assistance programs. These programs provide financial assistance for reforestation and forest improvement and technical assistance on all forest management aspects to private forest landowners. S&PF also provide financial and technical assistance to state forestry agencies in fire control, insect and disease protection, utilization and marketing, forest management, tree improvement, and urban forestry. In addition S&PF provides specialized technical advice and training to state and other foresters and forest industry, provides leadership in the forestry phases of the soil and water protection programs administered by the Soil Conservation Service, and in cooperation with the state foresters, provides leadership and assists local governments in rural development projects (Department of Natural Resources, Division of Forestry 1986a).

The S&PF section of the Forest Service is administratively divided into areas throughout the United States. The Northeastern Area State and Private Forestry office is responsible for insuring the productive use of forest resources in the northeast and midwest on state and

private lands. In Minnesota, it provides technical and financial assistance to the DNR to support its PFM programs (Baughman 1990a).

The USDA Agricultural Stabilization and Conservation Service

The USDA Agricultural Stabilization and Conservation Service (ASCS) provides federally sponsored cost-share programs for a variety of soil and water conservation practices, including tree planting and timber stand improvement.

The ASCS administers the Conservation Reserve Program (CRP). The CRP offers cost-sharing for tree or grass planting and annual rental payments for 10 years to farmers that take highly erodible cropland out of production. The program is rather new, authorized by the Food Security Act of 1985 (Baughman 1990a, Ellefson 1991a).

The ASCS also administers the Agricultural Conservation Program (ACP); a cost-share program designed to encourage resource-conservation practices on farmland (authorized by the Soil Conservation and Domestic Allotment Act of 1936). Although focused on installment of agriculturally-oriented soil conservation practices to prevent soil erosion, the program does promote tree planting, timber stand improvement and wildlife habitat management. Cost-sharing is available for tree planting, thinning, pruning, releasing desirable young trees, site preparation for natural reseeding, wildlife ponds and habitat improvement (Baughman 1990a, Ellefson 1991b).

The ASCS also administers the Forestry Incentives Program (FIP), which is a cost-share program authorized by the Agricultural and Consumer Protection Act of 1973. The FIP later was made part of the Cooperative Forestry Assistance Act of 1978. In 1990, the Forest Stewardship Act amended the FIP and established a new Stewardship Incentives Program (SIP) (Ellefson 1991a). FIP is similar to ACP, but it is designed to increase sawtimber growth, and it is limited to highly productive forest land and to stands of at least 10 acres (Baughman 1990a).

The FIP will be phased out by 1995 and gradually replaced by the SIP that will focus on multiple forest benefits. In 1991, Minnesota received \$440,000 for cost-sharing through SIP, and is expected to receive about \$2 million for 1992 (Kroll 1991a,b).

The DNR, Division of Forestry provides technical assistance to private landowners for the CRP, ACP, FIP and SIP programs (Baughman 1990a). While the USDA Forest Service is the major funding source for technical forestry assistance (through the DNR, Division of Forestry) for the CRP, ACP, FIP and SIP, the ASCS is the primary administering agency for the cost-sharing (handles eligibility, waiver procedures and payments to participants).

The USDA Soil Conservation Service

The USDA Soil Conservation Service (SCS) provides leadership in the conservation, development, and productive use of soil, water and related resources. The SCS functions primarily as a source of technical assistance for agricultural landowners, but the SCS also cooperates with the USDA Forest Service and the DNR, Division of Forestry in carrying

out conservation programs (Minnesota Department of Natural Resources, Division of Forestry 1983).

The SCS provides technical assistance to woodland owners through the Soil and Water Conservation Districts (SWCDs). SWCD is a *sister organization* of SCS (see section regarding state agencies).

SCS offers technical assistance to plan erosion and sediment control practices. Published soil surveys help woodland owners and foresters to assess land productivity for timber, wildlife, and agricultural purposes. Soil surveys indicate erosion hazards, equipment limitation, expected seedling mortality, windthrow hazard, plant competition, common trees found on soil types, site indices of important tree species, and trees adapted for planting on each soil type. The SCS also assists woodland owners with land use planning including assistance with access road locations, grade stabilizations, water control structures, abandoned mine reclamation, and wildlife management (Baughman 1990a; Minnesota Department of Natural Resources, Division of Forestry 1986a).

b. State Agencies

The Minnesota Department of Natural Resources, Section of Wildlife

The Minnesota DNR, Section of Wildlife offers brochures on managing woodlands for wildlife as well as limited cost-sharing and technical assistance on wildlife habitat improvement. PFM foresters cooperate with the division in such services (Baughman 1990a, Kroll 1991a).

Soil and Water Conservation Districts

At the county level there are Soil and Water Conservation Districts (SWCD) funded by county taxes. The SWCDs help the public locate resource information and programs, provide technical assistance for woodland owners, and administer cost-share programs provided by the state.

The SWCDs administer two cost-share programs funded by the state. The Minnesota Forestry Incentives Program (MFIP) provides cost-sharing for forestry related practices not covered by other state or federal programs, such as gopher control, fire break establishment, forest road construction, and woodland fencing. Reinvest In Minnesota (RIM) is the other program, and it is similar to the federal CRP except that additional types of land are eligible under RIM, and RIM easements are longer term (Barzen and Kroll 1989).

Because the SWCDs are policy setting organizations that are directly responsible to locally elected County Boards of Supervisors and work closely with other agencies (USDA-SCS, Minnesota DNR), they are a good place to go for one-to-one help and referrals to other agencies (Baughman 1990a).

Through their contacts with landowners regarding agricultural conservation practices, many forest management needs are identified and are referred to the Minnesota DNR, Division of Forestry (Wurdeman 1991).

c. Private Organizations and Individuals

Although publicly sponsored programs involving technical assistance to nonindustrial private landowners is the primary focus of this report, such assistance is also offered by private forestry consultants and by industrial forestry firms.

Consulting Foresters

Consulting foresters are self-employed foresters. They may be either general practitioners or specialists. They provide a wide range of services to private landowners, industries, and governmental agencies. Some consultants perform almost any service, while others specialize in just a few areas. Consultants can be a landowner's agent in timber sales, tree planting, damage appraisals or trespass cases. Other services they provide may include woodlot improvement marking, management plans, Christmas tree culture, insect and disease control, investment analysis, forest taxation, timber appraisals, land appraisals, tree and landscape appraisals, legal advice, urban forestry, and road location and design (Minnesota Department of Natural Resources, Division of Forestry 1986b; Brokl 1988).

In Minnesota, anyone can call themselves a forestry consultant. There are no state licensing or educational requirements needed to be called a forester or forestry consultant. One way to assess a consultant's qualifications is to check their affiliations with professional groups (Brokl 1988). Otherwise, good consultants are considered to have a college education in forestry, several years of experience, subscription to a code of ethics developed by their professional organization, and no business connection with a forest products company where a conflict of interest may occur (Baughman 1990a).

Consultant fees are based on hourly rate, a percentage, a piecework rate, or other basis mutually agreed upon. This fee is a management expense that a landowner usually can deduct from timber sale income, damage award, or other taxable income (Baughman 1990a).

While many southern states have as many as 200 consultants, Minnesota has only about two dozen (Brokl 1988). There are several reasons why consultants presently provide a fairly limited amount of private forest management assistance in Minnesota. Among them is that timber sales work (the *bread and butter* for many consultants) is not particularly lucrative in Minnesota, since many private timber sales are of fairly low value. Consultants, who generally are paid a percentage (typically 15 percent) of the stumpage sale price for providing marketing assistance, often cannot obtain a large enough fee from a small or low-value sale to make it economically worth their time (Henly et al. 1988).

When it comes to other forest management work, such as management planning, and timber stand or wildlife habitat improvement, most landowners are reluctant to invest in consulting forester services, though they may be more than willing to use free assistance provided by state foresters.

Despite the amount of timber harvesting activity on private nonindustrial forest lands in Minnesota, Henly et al. (1988) indicates that there will be only a limited role for consultants to play in the management of these lands. In their opinion, this would not change even if free or low-cost state forester assistance were curtailed or eliminated.

Because of the tough economic environment consultants often face, many have a part-time or long-term contractual arrangement with a landowner organization, university, or natural resource agency. Some also have a related business, such as a tree nursery or a Christmas tree operation. Brokl (1988) indicates that the increasing contracting opportunities by natural resource agencies has the potential to attract more foresters to the consulting field.

Industrial Foresters

An industrial forester is a company forester or a wood buyer employed by a wood-using industry. They manage company lands and are involved in wood procurement. These foresters or wood procurers also may provide services to private woodland owners (Minnesota Department of Natural Resources, Division of Forestry 1986a). Industry foresters employed to offer assistance programs have been more common the last decade because of the large expansion of the Minnesota forest industries accompanied by increased demand for wood.

They may provide the following services to private nonindustrial landowners (Minnesota Department of Natural Resources, Division of Forestry 1986a; Baughman 1990a):

- land surveys,
- forest management plans,
- harvesting assistance,
- reforestation guidance,
- timber tax assistance, and
- information and advice on forest management practices, laws, government cost-share programs and current issues that affect woodland owners.

Some companies have formal landowner assistance programs. In return for company services, a landowner is asked to grant the company access to carry out management recommendations developed by the forester and to grant the company the right to purchase timber for a specified time. Other companies provide their services under a less formal arrangement to landowners that have marketable timber (Baughman 1990a).

Many industrial foresters are involved in the American Tree Farm System as tree farm inspectors and will write forest management plans in that capacity, free of charge or obligation (Minnesota Department of Natural Resources, Division of Forestry 1986a).

d. Associations

The Minnesota Tree Farm System

The Minnesota Tree Farm System is part of the *American Tree Farm System*. The American Tree Farm System is a nationwide program encouraging private forest owners to do an effective job of growing trees as a crop. A *tree farm* is a tract of privately owned forest managed to produce continuous crops of trees with added benefits of improved wildlife habitat, watershed protection, outdoor recreation and aesthetic value. In the USA today, there are more than 61,000 tree farmers who manage 36 million hectares (89 million acres) of woodlands for pride, profit and pleasure (Tjader 1990).

The tree farm system was launched in 1941 by the wood-using industries. The system is managed by the American Forest Council under the sponsorship of the American Forest Foundation. Funds for the program come from forest industry, forest landowners and others interested in encouraging good forestry on private lands. At the state level the program operates through state tree farm committees under the guidance of the American Forest Council. Professional foresters from industry, government and consulting firms volunteer their time in the program. State tree farm committees make arrangements for foresters to inspect and certify tree farms (Tjader 1990).

Certified tree farmers receive a tree farm certificate and sign. They also receive regular mailings of the *American Tree Farmer* magazine from the American Forest Council, as well as tree farm newsletters and bulletins from their own state tree farm committee. Certified tree farmers are eligible to compete for prizes in *Outstanding Tree Farmer* contests.

To get started in the process of being a tree farmer, a free inspection has to be arranged for by a professional forester, where the owner's objectives are determined, followed by the development of a forest management plan. The forester will reinspect the woodland every five years and update the forest management plan accordingly. In return the forest owner agrees to follow up the plan and protect the woodland from fire, insects, disease, and grazing. The purpose of these on-the-ground reinspections is to determine whether certified tree farm properties still qualify for membership in the American Tree Farm System. In Minnesota there are nearly 200 inspecting foresters (Minnesota Department of Natural Resources, Division of Forestry 1986a; Baughman 1990a; Tjader 1990; Wickman 1990a).

In 1989, Minnesota had 2,346 tree farms with a total of 370,456 hectares (915,385 acres). Minnesota ranks eleventh in the nation for total number of tree farms (Marshall 1989).

The Central Minnesota Small Woodlot Owners Association

The Central Minnesota Small Woodlot Owners Association (CMSWOA) is made up of woodland owners from all walks of life who want their woodlands healthy, attractive, productive, and wisely managed. The association conducts and co-sponsors annually a woodland owner field day that shows how to manage woodland wisely, where to get advice and assistance, and how to negotiate timber sale contracts. A sealed-bid timber auction is conducted for its members every February and October (Baughman 1990a).

The Northwestern Minnesota Woodland Owners Association

The Northwestern Minnesota Woodland Owners Association is a nonprofit organization formed to meet the needs and interests of nonindustrial private woodland owners. The group's activities include timber sales, assistance in marketing and reforestation, and educational tours. Information is offered on thinning, planting, and harvesting. The newsletter keeps members up-to-date on market conditions, cost-share programs, field days and seminars (Baughman 1990a).

The Minnesota Forestry Association

The Minnesota Forestry Association (MFA) is comprised of a broad range of people and organizations dedicated to the wise use of Minnesota's forest resources.

The first Minnesota State Forestry Association was formed in 1876 over concern about protecting the state's forests from wildfires. The association began publication of a monthly magazine, developed a strong public forest educational program, published tree planting manuals, promoted the establishment of the first Minnesota State Park (Itasca State Park) and promoted the establishment of game refuges and forest research (Wickman 1990b).

In response to the need for and interest in forest management by public agencies and private landowners, as well as public concern for the entire forest community, the Minnesota Forestry Association reorganized in 1977 and carried on its activities entirely by volunteers through 1983. By 1985 a full-time director was on board and in 1987 the staff included a full-time director, full-time secretary, part-time director of field operations and part-time director of publications.

As a part of this reorganization, the Minnesota Forestry Association identified a *new mission* to declare its concern and dedication to the integration of all forest resources. That mission is one dedicated to "better forests for people, wildlife and timber through public education."

The *purpose* of the MFA is to foster proper utilization and conservation of forests and other natural resources through public education, development and publication of resource information, development and demonstration of forest management techniques and other related activities (Wickman 1990b).

MFA publishes *Minnesota Forests*, a quarterly publication reaching over 10,000 public and private agencies, resource professionals, legislators, educators, wood workers and landowners. The publication carries information related to forest and wildlife research, forest land legislation, current events and MFA programs.

The association promotes the observance of Arbor Day and conducts an annual Arbor Day tree seedlings sales program in cooperation with schools, scouts, churches and businesses.

MFA firmly believes that if public support for sound forestry management is to be achieved, citizens must be informed about intelligent resource policy, as well as of the techniques and ethics inherent in sound decisions (Wickman 1990b).

e. Others

Several other organizations promote forest management in Minnesota, such as the Minnesota Christmas Tree Growers Association, the Minnesota Maple Syrup Producer's Association, the Minnesota Deer Hunters Association, and the Ruffed Grouse Society. These groups promote forest management through activities that promote their interests. They also are cooperators in public education efforts (Wurdeman 1991).

These organizations and other public agencies in Minnesota that provide information, education and assistance on forestry related topics are further described in the *Minnesota Woodland Owners' Resource Directory* by Baughman (1990a) (see appendix A).

VI. LINKAGES BETWEEN AGENCIES, AND BETWEEN AGENCIES AND PRIVATE ORGANIZATIONS

The most striking impression from Minnesota's extension and technical assistance programs is the great number of public and private organizations that are involved. With all these *actors* playing a role in private forest management, cooperation/communication is the key to getting the most out of professional and fiscal resources. Apparent from the previous chapters are all the partnerships between public organizations. They share the responsibilities of accomplishing different parts of established programs.

Highly visible are the partnerships between federal and state forestry agencies, where the state agencies (e.g., Minnesota Department of Natural Resources) deliver services in the field, while the federal agencies (e.g., USDA Forest Service) provide funding and specialized assistance. Visible also is the Cooperative Extension Service involving the U.S. Department of Agriculture-Extension Service, the Minnesota Extension Service and county governments. All three levels of government provide financing, but services are provided by the Minnesota Extension Service through state and county offices.

The linkages between agencies and between agencies and private partners are established through legislation, federal and state administrative policies, formal agreements, etc. Recent collaborative efforts in forestry extension and technical assistance programs also are a result of the complexity of many issues and budget reductions.

The Minnesota Department of Natural Resources, Division of Forestry (1986a), for example, uses the following policy guidelines for their PFM foresters regarding their relationship to other agencies:

1. establish and maintain a good working relationship with agency individuals;
2. understand how the agency operates;
3. understand how their goals differ from the division's; and
4. work together to avoid or solve problems.

Coordination among forestry-related agencies and organizations at the state level is facilitated by the Minnesota Forestry Coordinating Committee (MFCC). This is a loose-knit organization with one representative from each forestry-related agency and organization. Subcommittees coordinate activities regarding specific problems or issues. For example, the Forest Stewardship Committee is a subcommittee of the MFCC which plans programs for improving management of private forest lands (Baughman 1991).

Coordination among forestry-related agencies and organizations also take place at the county level. Representatives meet on an irregular basis to coordinate activities. The recently established *Private Woodland Committees* in several Minnesota counties are good examples of cooperation. The committees include members representing forest industry,

landowners, loggers, research, county land departments, and different federal and state agencies. The committees make up the Minnesota Private Woodland Council, which is administered by the Minnesota Forestry Association (MFA). The council and its county committees provide training programs for woodland owners, loggers and natural resource professionals, production of several informational publications, and creation of forestry demonstration sites. They are identified as a primary means of increasing educational programs at the local level. A MFA goal is to increase the number of private woodland committees from 10 to 30 by 1995 (Brokl 1990).

VII. SOME COMPARISONS BETWEEN THE *SERVICE SYSTEMS* IN NORWAY AND MINNESOTA

To better understand similarities and differences between Norway and Minnesota, this chapter emphasize some basic characteristics of Norwegian forestry, organizations and programs, assuming knowledge about the previous chapters.

a. Area, forest character and ownership

For comparison, some statistical data for Minnesota and Norway are shown in table 1. Population levels are nearly the same. Land area, forest area, annual growth and timber harvest is somewhat larger in Norway. Figure 9 shows the geographic distribution of the main forest areas in Norway and Minnesota.

Norway is a mountainous, narrow and elongated country stretching up the western side of the Scandinavian peninsula from the 58th to the 71st degree of north latitude. The capital, Oslo, is situated at 60 degrees north, the same latitude as Anchorage, Alaska. The total land area is 32.4 million hectares (80 million acres), of which approximately one-fourth lies north of the Arctic Circle.

Due to the ameliorating effect of Gulf Stream currents in the Atlantic Ocean, the climate is not as harsh as its latitude might indicate. In general Norway has milder winters and cooler summers than Minnesota. The climate is more humid with precipitation ranging from 2,000 mm (80 in.) on the west coast to 1,000 mm (40 in.) in the north. The southeastern part of Norway, which is the most important region for forest production (50 percent of the productive forest area), has more moderate precipitation, ranging from 600 to 900 mm (24 to 35 in.) per year (Norwegian Forestry Society 1991). Therefore, forest fires do not play any significant role in forest ecology or forest management.

Most of the forest area in Norway is situated in the western branch of the circumpolar boreal forest, which means that the forest resources are dominated by coniferous forest. The few tree species in Norway are in sharp contrast to the diversity of tree species in Minnesota. Norway spruce (*Picea abies*) and Scots pine (*Pinus sylvestris*), both climax species, are the dominant species and the most important ones for the forest industry. Norway spruce and Scots pine constitute 55 percent and 30 percent respectively of the timber-growing stock. The balance of 15 percent consists of deciduous trees, mainly birch (*Betula verrucosa*, *Betula pubescens*) and aspen (*Populus tremula*). However, the coastline of southern Norway has areas of hardwood species, such as maple, ash, oak, beech, basswood,

elm and alder. Although these species do not play any significant economic role in Norwegian forestry, they are considered highly valuable for wildlife, recreation and aesthetics.

Table 1. Forest statistics: Minnesota vs. Norway.

Item	Minnesota	Norway
Human population, 1988 ^a	4,307,000	4,221,000
Total area (hectares) ^b	21,800,000	32,390,000
Forest area (hectares) ^c	6,714,000 (31%)	8,330,000 (26%)
Commercial/productive forest area ^d	5,494,000 (25%)	6,660,000 (21%)
Annual timber growth (mill. m ³) ^e	13.9	16.2
Timber harvest, 1988 (mill. m ³) ^f	7.2	10.6
Forest ownership: ^g		
Private	41%	82%
Public	53%	13%
Industry	6%	5%

^aSource: U.S. Department of Commerce, Bureau of the Census 1990. Royal Ministry of Foreign Affairs 1990.

^b1 hectare = 2.47 acres. Source: Minnesota Department of Natural Resources, Division of Forestry 1990 a. Norwegian Forestry Society 1991.

^cSource: Hahn and Smith 1987. Norwegian Forestry Society 1991.

^d**Minnesota:** Commercial forest land. Forest land capable to produce more than 1.4 cubic meters per hectare (20 cubic feet per acre) per year of annual growth. **Norway:** Productive forest land (forest land capable of yielding on average at least 1.0 cubic meters per hectare (14.3 cubic feet per acre) per year. Both: Forest land not withdrawn from timber utilization. Source: Hahn and Smith 1987. Norwegian Forestry Society 1991.

^e1 m³ (cubic meter) = 0.447 cords (solid wood excluding bark and air space). Source: Minnesota Department of Natural Resources, Division of Forestry 1990a. Ministry of Agriculture, Department of Forestry 1989.

^fRoundwood cut for sale and industrial production. Source: Minnesota Department of Natural Resources, Division of Forestry 1990a. Central Bureau of Statistics of Norway 1990.

^g**Minnesota:** Forest ownership of commercial forest land. **Norway:** Forest ownership of productive forest land. Source: Hahn and Smith 1987. Ministry of Agriculture, Department of Forestry 1989.

The forest ecology and tree species composition are thus quite different in Norway and Minnesota. On the other hand, tree sizes and rotation ages are similar for corresponding species.

Comparing the ownership structure, Norway has far more forest land in private ownership, especially farm forests. In Norway, 87 percent of the productive forest land is in private ownership (industry included), a higher percentage than any other nation with a major forest products industry. This private forest ownership is owned 76 percent by individuals, 3 percent by common farmer ownership, 3 percent by joint ownership, and 5 percent by industry. Farmers comprise the bulk of the individual owners, and control 66 percent of the productive forest area. The remaining 13 percent owned by the public is shared between the state (10 percent) and the municipalities (3 percent) (Ministry of Agriculture, Department of Forestry 1989). As in Minnesota, or the United States, there are regional differences in ownership patterns.

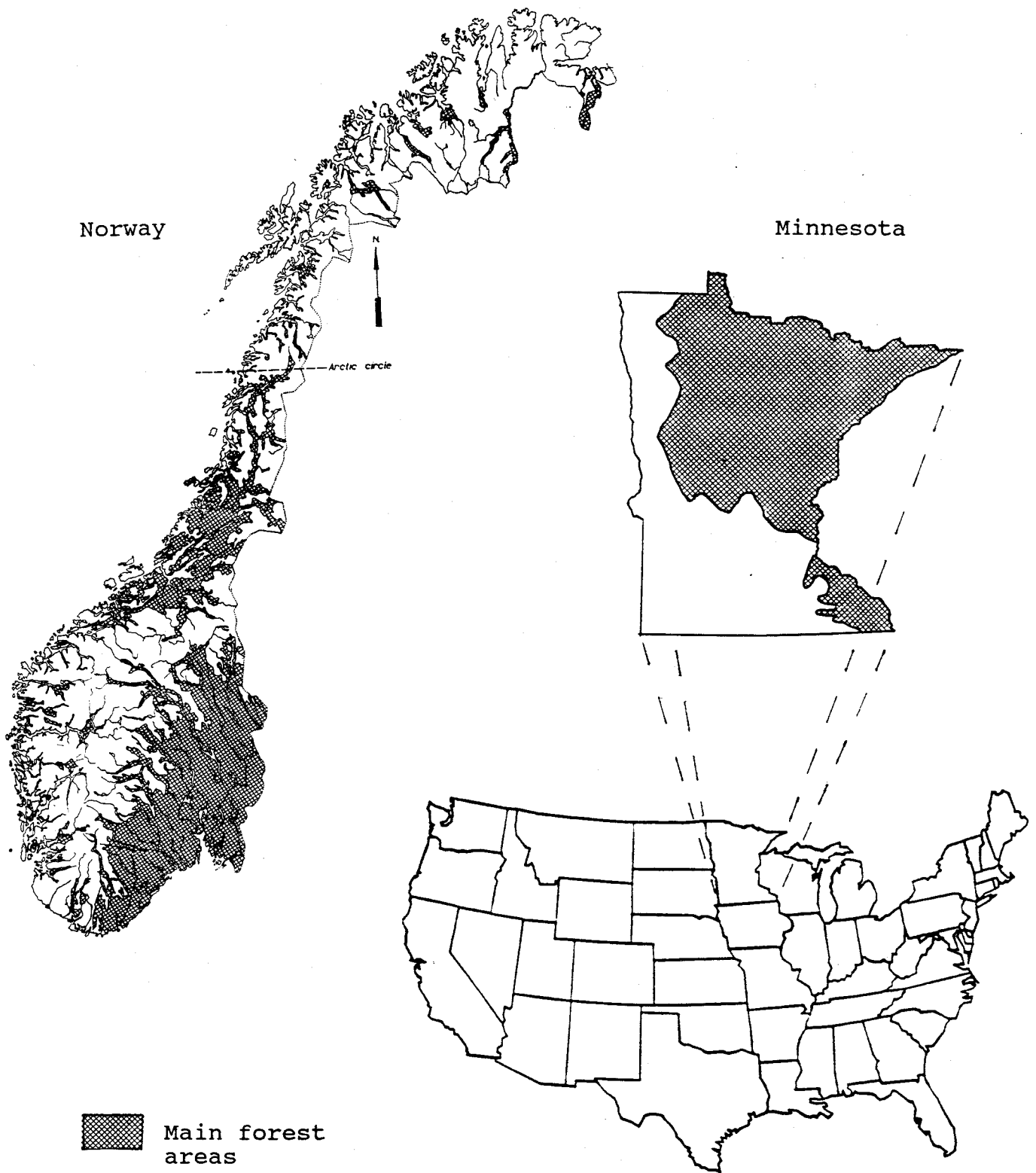


Figure 9. Geographic distribution of the main forest areas in Norway and Minnesota. (Source: Norwegian Forestry Society 1976, Minnesota Department of Natural Resources, Section of Wildlife 1989).

Out of Norway's 121,000 forest properties, about 118,000 are owned by individuals, with an average property size of 43 hectares (107 acres). However, 72,000 of these holdings are smaller than 25 hectares (63 acres) (Norwegian Forestry Society 1991, Næss 1990). This means that forestry is of relatively minor economic importance to quite a few owners.

Compared with Minnesota, Norwegian wood-based industry is far more dependent on wood procurement from privately owned forests, and from farmers in particular. The current ownership structure dominated by small private holdings, extends back over hundreds of years. No major political initiatives have been made so far in order to change it. The problems of small woodland management have accordingly been a challenge of great importance to Norwegian forest policy makers.

Roundwood cut for sale and industrial production in Norway has increased substantially the last half of the 1980s. In 1988 it was 10.6 million cubic meters (4.7 million cords) with a gross value of NOK 3.47 billion (approximately \$0.5 billion). Of the removals, 23 percent of the harvesting and 26 percent of the hauling were performed by private owners and their families, the remaining was performed by hired labor (Central Bureau of Statistics of Norway 1990).

Unlike Minnesota, Norway has a *common access prerogative* to private, as well as public forest land. These ancient rights of the Norwegian people include some free uses as long as these activities do not harm the land. They are activities such as hiking, cross-country skiing, and picking wild berries, mushrooms and flowers. Camping is free, but permission from the landowner is necessary for stays longer than two days. This means that outdoor recreation activities are more dispersed and do not depend as much on organizational initiatives as they do in Minnesota.

Forest resource related businesses like hunting, fishing and tourism are on the rise in the rural areas of Norway.

b. Wood-based industry

More than one-half of the annual cut in Norway goes to the 225 sawmills and planing mills, the rest to the 39 pulp-, paper- and board mills, the 7 particle board mills, and the 4 fiberboard mills (Norwegian Forestry Society 1991). The value of the processed wood products are about NOK 40 billion (\$6.5 billion).

Forestry, primary wood industries, secondary wood businesses engaged in further processing of intermediate goods, and transportation of raw materials and finished products, provide jobs for about 35,000 people in Norway. This is 11 percent of the employment in the industrial sector (Norwegian Forestry Society 1991).

The export value of wood-based products was well in excess of NOK 10 billion (approximately \$1.5 billion) in 1989, equivalent to 3 to 4 percent of total Norwegian exports. The wood-based industries account for about 10 percent of the total exports of nonpetroleum goods.

c. Extension and technical assistance programs

The public and private organizational landscape offering educational and technical assistance programs in Minnesota and Norway is in many ways different. What may seem confusing and irrational to Norwegian foresters about Minnesota, and to Minnesota landowners as well, are the great number of organizations involved. This is in particular true about the many public agencies that have intertwining responsibilities, requiring a great deal of cooperation. Norway has a much more centralized system with 3 major actors, the *Forest Service* (public), the *Forest Owners' Federation* (cooperative private), and the *Forest Extension Service Institute* (partnership). However, the differences have to be viewed within the context of historic, economic, social, political and resource conditions. In addition, Norway is a small nation, Minnesota a state of a large nation.

The Forest Service

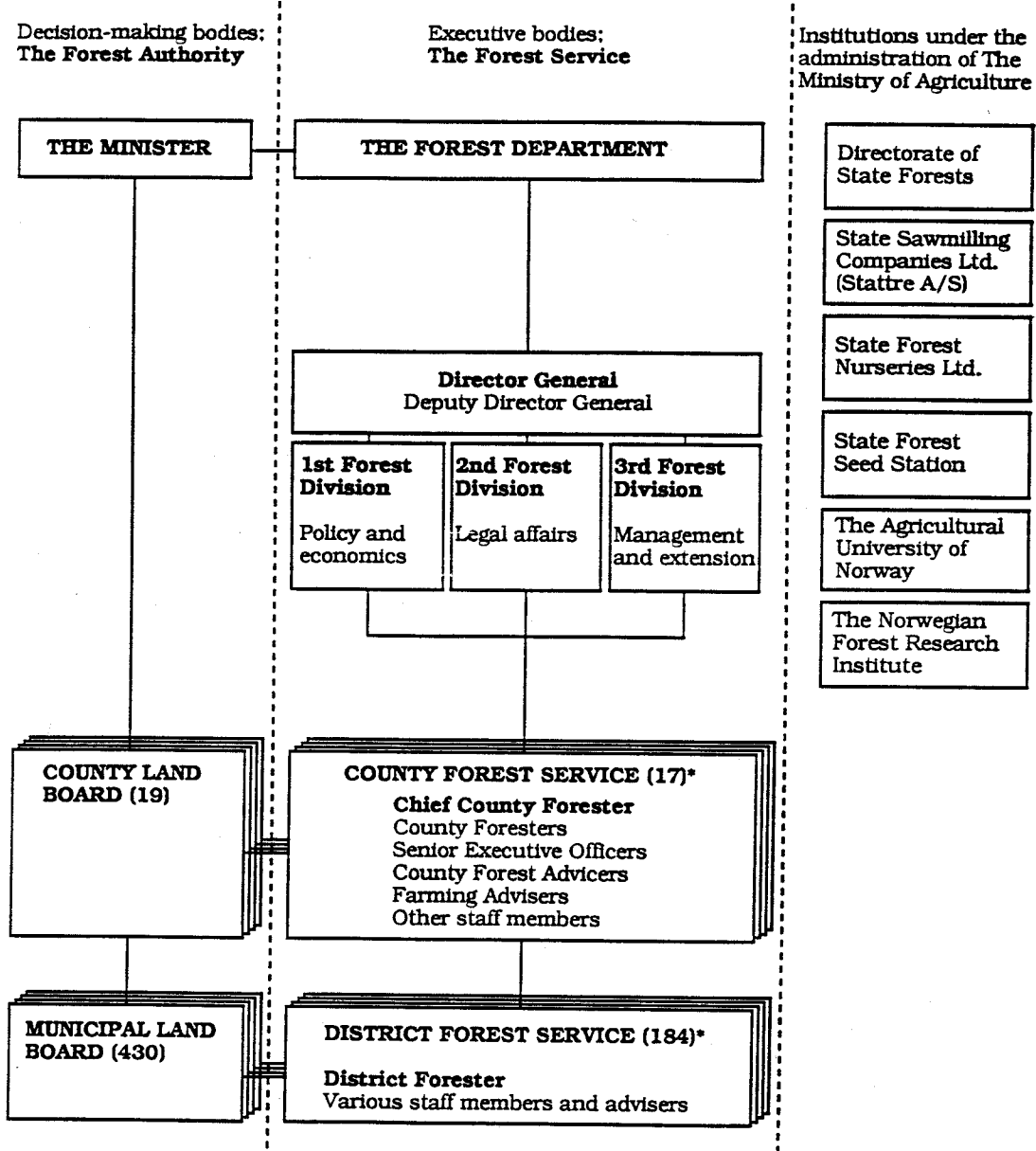
The Norwegian Forest Service is a public administrative, planning and consultative body organized under the Ministry of Agriculture, Department of Forestry. The agency is established under the Forestry Act with direct responsibilities for encouraging private forest management. The Forest Service has a staff of about 530 professional foresters and office personnel. Out of this number about 30 are located at the national level, 100 at the county level (17 counties) and 400 at the municipal or district level (186 districts). The professional staff at the county level consists of a county chief forester and specialists. The municipal level has a district forester, often with one or more assistants (forestry technicians) (see figure 10).

Through a reorganizational process in the 1980s, the Forest Service established joint offices with the Agricultural Service at the county and district level. The Agricultural Service is another government body under the Ministry of Agriculture with responsibilities for extension and technical assistance services towards the agricultural community.

The principal responsibilities of the Forest Service are to:

1. Ensure that forest land is managed in accordance with the Forestry Act.
2. Administer forestry incentives programs from the government.
3. Provide extension and technical assistance services to forest owners.
4. Participate in various planning activities in the society, especially regarding forest land use and multiple use.
5. Keep account of the Forest Trust Fund for each forest holding and authorize use of the money.

THE MINISTRY OF AGRICULTURE
 The Ministry of Agriculture is divided into six departments including the Forest Department



Notes
 * Some of the staff members at county and district level participate in various common services for The Agricultural Service and The Forest Service.

Figure 10. Public Forest Administration in Norway.
 (Source: Norwegian Forestry Society 1991).

Re³: 1. The Forestry Act is the main legal basis for the work carried out by the Forest Service. Unlike much of the forest legislation in the United States, this Act applies to both private and public forest land.

The objective of the Forestry Act is to promote forest production, afforestation and forest protection. It aims to obtain satisfactory results for those employed in forestry by means of rational silviculture and to secure wood supplies for the wood-based industry. The act also stresses the importance of sound multiple-use forest practices. It contains guidelines for forestry practices, such as marking, harvesting, regeneration and silviculture, under which multiple-use considerations should be taken.

Although the Forestry Act is a regulatory law which gives the Forest Service regulatory authority, these measures have not been applied much in practice. The emphasis in administering the law has been on education and assistance rather than on enforcement. The main principle of the act is that the forest owner shall be free to manage his/her forest without intervention from the authorities, as long as this is done under sound forestry practices. The Forest Service intervenes only in cases of poor management and natural calamities (forest fires, windthrow, landslides, insects diseases, etc.).

The main use of the law has been in protecting forest land against conversion to other land uses, such as agriculture and urban purposes. In these cases, the forest owner has to apply for permission to the Forest Authority, which is composed of politically elected decisionmaking bodies on the national (ministry), county (county land boards) and district level (municipal land boards) (see figure 10). The significance of each case determines at which level the application will be concluded. Applications that are turned down can be appealed to a higher level of authority. The Forest Service Act as secretaries for these political boards.

Minnesota has no regulatory forest practice laws applied to private land, but have zoning restrictions on development of forest land in the vicinity of urban areas.

However, regulation of forestry activities on private forest land have been effected in other states. Beginning in the early 1970s, state governments began to seriously consider stringent, more comprehensive forest practice laws. Especially noteworthy were laws enacted in Alaska (1978), California (1973), Idaho (1974), Massachusetts (1983), Nevada (1971), Oregon (1971) and Washington (1974) (Ellefson 1991a).

Arising from growing public concern over environmental protection and from federal law mandating state programs to protect water quality (especially the 1972 Amendments to the Federal Water Pollution Control Act), forest practice laws were established to protect a much wider range of forest resources than earlier laws, including water, soils, wildlife, recreation, fisheries, and aesthetic beauty. The laws provide for rigorous administrative and enforcement structures that assure achievement of specified resource protection goals. Various requirements are established for timber harvesting permits,

³ With regard to the original point above.

management plan preparation, resource protection, achievement of adequate reforestation levels, and state inspection for compliance (Henly and Ellefson 1986).

State service and extension programs in *best management practices* are currently carried out both in Norway and Minnesota as a means to minimize the impact of forestry practices on the environment and to avoid stricter regulations by law in the future. The whole *forestry community* is educated through these programs, i.e. private owners, loggers, and staff in agencies and private organizations.

Re: 2. In Norway as in Minnesota, cost-share programs are used as incentives in private forest management. In Norway all cost-share programs are government-sponsored (state) and channeled through one agency, i.e., the Forest Service, that provides both the field and disbursement services. All programs are linked to timber production and harvesting.

The official policy is dominated by economic support concerning long term investments, such as silvicultural practices (planting, cleaning, precommercial thinning, commercial thinning, drainage) and forest road construction. Cost reducing support also is given to management planning and to timber harvesting when topographic conditions are major obstacles to rational economic forestry. To encourage rational use, as well as multiple use, the cost-share rates from government increase when joint investments are made by cooperating forest owners or when multiple use interests are taken into consideration. Higher rates also are offered in certain geographic regions with less favorable economic conditions, to encourage investments and employment. To be eligible for a cost-share program, certain conditions have to be met by the forest owner.

Public support also is given to long distance transportation of roundwood to the industry, forestry campaigns, projects, courses and other activities of various types.

In 1988 government support to previously mentioned investments in Norwegian forestry was NOK 322 million (approximately \$50 million), of which two-thirds supported silvicultural practices and forest road construction (Ministry of Agriculture, Department of Forestry 1989). On an comparable acreage basis, this is about four times the level of federal and state cost share funds spent in Minnesota, which for 1991 is about \$4.3 million (Minnesota Department of Natural Resources, Division of Forestry 1991b).

Minnesota has similar cost-share programs on silvicultural practices (except for drainage), road construction and forest management planning, provided either by federal or state agencies (see appendix B, chapter IV and V). However, Minnesota also offers cost-share programs on wildlife habitat improvement and erosion control/water quality protection which do not exist in Norway. These programs are provided both from private and public sources.

In Norway the responsibilities for wildlife management are administered by the Directorate for Nature Management under the Ministry of Environment. This agency cooperates with the Forest Service and in many districts agreements are made to let Forest Service employees function as secretaries for local wildlife committees.

Re: 3. The Norwegian Forest Service offers comprehensive educational and technical assistance services to individual owners, as well as groups of forest owners (special arrangements, courses) on subjects, such as:

- forest production (silvicultural practices),
- logging operations (marking of trees, harvesting, forest roads, machinery, etc.),
- forest economics (preparation of management plans, financial calculations regarding forest operations, etc.), and
- multiple use management.

Most emphasis is put on silviculture, forest road construction, long term investments and multiple use. The delivery methods of extension and assistance services are the same as used by the public agencies in Minnesota.

In recent years the Forest Service and the Forest Owners' Associations have been working closely together to develop models for cooperation between individual private owners. The main approaches to this challenge have either been to educate active forest owners to carry out one or a few operations on neighbouring properties, or by making one operational unit from several properties under the supervision and administration of the local forest owners' association.

Re: 4. The Norwegian Forest Service has, together with other natural resource agencies, an obligation under the Building and Planning Act to participate in land use planning with the governments at the county and municipal level—on short term (4 years) and long term (12 years) plans. The Forest Service promotes forestry interests and may propose implementation of strict zoning regulations regarding development in valuable forestry or multiple use areas. In these planning activities, the Forest Service cooperates with other interests (public and private) on the forest resources.

Re: 5. One important provision of the Norwegian Forestry Act is the Forest Trust Fund, which is a mandatory investment system. In order to secure sufficient investments on the forest resources, the law provides that all forest owners shall set aside a certain percentage of the gross value from timber sales. The owner may decide the percentage within the interval of 5 to 25 percent. When the forest owner sells timber to a buyer (wood processing industry, forest owners' associations), the investment contribution is automatically deducted by the buyer and deposited in the owner's trust fund account in the local bank with the best possible interest rate. The Forest Service keeps an account of the fund and authorizes use of the money.

The Forest Trust Fund is primarily to be used for long term investments in the forest where the timber was harvested. The fund money is invested in activities such as silviculture (reforestation, tending of young stands), forest road construction and alternative harvesting methods in specifically protected areas. The forest owner gets tax advantages when the money is used for such purposes. The trust fund also can be used for road maintenance, management planning, forest insurance, courses, marking of property boundaries, etc., but without tax advantages.

As stated by the Forestry Act, the forest owner cannot claim interest earned on fund in the Forest Trust Fund account. The interest money generally is used for the "common benefit of Norwegian forestry" at the municipal, county and national level. Each year the interest money is distributed as follows: 25 percent to the Ministry of Agriculture, Department of Forestry, 20 percent to the Forest Owners' Associations, 10 to 20 percent to the Forest Service at the county level, and 30 to 40 percent remains at the municipal level. At the local and county level the money is mainly used for projects beneficial to the forest owners and forestry interests in general (demonstrations, excursions, initiation and administration of management planning, technical equipment for rent, local organizations, specific projects, etc.). The ministry supports ideal forestry organizations (the Norwegian Forestry Museum, the Norwegian Forestry Society, the Forestry Extension Service Institute, the Norwegian 4H, etc.), course systems, seed orchards, nurseries and fighting the impact of forest disasters.

In 1988 Norwegian forest owners invested about NOK 330 million (approximately \$50 million) in forestry activities through the Forest Trust Fund system. As previously mentioned, the government contributed a similar amount the same year through various incentive programs. In addition, about NOK 63 million (approximately \$10 million) of interest money from the trust fund was used for different purposes (Central Bureau of Statistics of Norway 1990).

The Forest Trust Fund system is regarded as an important means or lever for effecting investments in the Norwegian forestry of small private woodland ownership. It is fully supported by the forest owners' organizations, which in fact took the first initiatives to establish a forest fund system early in the 20th century. The first system was established under the Forestry Act of 1932. It was replaced by the current system provided for under the Forestry Act of 1965 (Ministry of Agriculture, Department of Forestry 1990).

Among the reasons for establishing a trust fund system was the state of the forest resources by the turn of the 19th century. When great numbers of Norwegians had to emigrate to America in the 19th century, the forest conditions were very poor. For several hundred years forests had been heavily exploited for timber, fire wood, pasture and other goods. As a consequence, the forests also were low in the number of many wildlife species. These conditions were especially true in southern Norway. New forest policies, therefore had to be introduced to restore the forest resources. The most significant step in this direction was the Forestry Act of 1932, which both authorized the establishment of the Forest Service and the first Forest Trust Fund system.

The Forest Trust Fund system is unique to Norwegian forestry. To the author's knowledge, no other country has a similar system.

So far, all services provided by the Forest Service have been free of charge, except for those pertaining to forest road construction.

In addition to the previously mentioned duties, the Forest Service also carries out a number of administrative tasks involving compiling of statistics, assistance with research projects, etc.

Many Forest Service activities are undertaken in close cooperation with the Forest Owners' Associations and the Agricultural Service.

The Norwegian Forest Service has much in common with the Minnesota DNR, Division of Forestry. Both agencies are decentralized with strong PFM programs at the local level. Unlike the DNR, the Norwegian Forest Service has no responsibilities for managing state land, which belongs to a different agency, the Directorate of State Forests (DSS), under the Ministry of Agriculture (see figure 10). One-third of Norway's total land area, of which vast areas are situated above the timberline, especially in the north, is under the supervision of the DSS and its 160 employees. As previously mentioned, only 10 percent of Norway's productive forest land lies within the area managed by the DSS.

About 25 percent of the total area under the DSS consists of properties on which about 20,000 citizens of the rural population have ancient and permanent rights, such as access to fuelwood, timber, grazing, hunting and fishing, i.e., State Common Land. Eighteen national parks with a total of 1,400,000 hectares (4,900,000 acres), mostly above the timberline, are organized under the DSS, as well as 50 forest reserves (Norwegian Forestry Society 1991).

Norway has no forestry agency equivalent to the Minnesota Extension Service, where much of the responsibilities for extension forestry rest with the University of Minnesota, and where the extension forestry professionals are members of academic institutions.

The effectiveness of private forest management assistance has generally been found to be positive, both in Norway and the United States. However, relatively little has been done in Norway to look closer into this subject. To be mentioned, however, are reports by Bjørnsrud (1981), who made an assessment of the extension and technical assistance services of the Forest Service, and Aastad (1988), who evaluated the impact that the Forest Service and the Forest Owners' Associations had on the level of timber harvesting in a specific geographic region of Norway.

The effectiveness of technical assistance in the United States has been analyzed in states like Georgia (Cubbage et al. 1985), Minnesota (Henly et al. 1988) and Illinois (Budelsky et al. 1989).

The Forest Owners' Federation

The forest owners (acting as individual sellers in the 19th century) were in a weak position in the timber market. This situation was the main reason for the formation of a cooperative organization of forest owners, first on a regional basis around 1900, later on a nationwide basis in 1913, when the Forest Owners' Federation was founded. Over the years and especially after World War II, this organization has gained a central and powerful position in all aspects of Norwegian forestry (Norwegian Forestry Society 1991).

The federation consists of 19 regional associations, which include 455 local associations. The federation has in total about 520 employees, and is, therefore, equal to the Forest Service in size. About 20 people are involved in the main administration at the *national* level, 300 at the regional level and 200 at the local level. Most employees are forestry professionals.

The following figures illustrate the importance of the federation. It has 56,000 members holding 3.7 million hectares (9.1 million acres), which comprise 56 percent of Norway's productive forest land. About 75 percent of the roundwood used in the wood-based industry is sold cooperatively through the regional associations (Norwegian Forestry Society 1991).

To ensure the interests of the members, the main tasks of the organization are to (Ministry of Agriculture, Department of Forestry 1986):

1. Negotiate the highest possible timber prices and secure timber sales.
2. Influence public opinion on forest policy issues.
3. Operate wood processing industries.
4. Provide a wide range of professional services.

Re: 1 and 3. The price negotiations are based on basic agreements between the Forest Owners' Federation and the Norwegian Forestry Association on one side, and the branch organizations of the wood processing industry on the other. The price agreements usually last for a year or half a year.

The fact that the forest owners also are owners of wood processing industry, means that they are represented on both sides of the negotiating table. This has consequently been a conflicting issue to many members. However, industry involvement to secure timber sales have in recent years been voiced to be equally as important as being in the position of negotiating timber prices.

Re: 2. One important objective of influencing forest resource policy issues, has been to ensure that goals and public measures are effectively coordinated (legislation, incentives, research, etc.) (Ministry of Agriculture, Department of Forestry 1986).

On political matters, the federation closely cooperates with the Norwegian Farmers' Association.

Re: 4. Since the beginning of the 1950s, the Forest Owners' Associations have provided the members with a wide range of professional forestry services, such as information, technical assistance, education, and also administration and undertaking of forest operations. Services are offered within the following areas (Norwegian Forest Owners' Federation 1989):

- silviculture and investment analysis;
- management planning;
- timber appraisal, harvesting, marketing and transport;
- road construction;
- hunting, fishing, tourism; and
- property issues and forest taxation.

Regional Forest Owners' Associations are financed partly by the industry and partly by the members. The timber buyer pays a fee of 3.0 to 3.5 percent of the gross sales value, while the forest owner is charged a membership fee from 1.0 to 2.5 percent. The membership fee is determined by the annual general meeting of each association. Payment for special services requested by the forest owner is based on the actual cost (Norwegian Forestry Society 1991).

The development of two strong forest service organizations in Norway, one private (the Forest Owners' Federation) and one public (the Forest Service) has not proceeded without elements of competition and tensions. This was particularly true in the 1950s and 1960s. This led to formal agreements between the organizations in the 1970s and 1980s. Today the Forest Service and the Forest Owners' Federation in many ways supplement each other. While the Forest Service concentrate its efforts on investments in silviculture (including cost-share programs), forest road construction and multiple use forestry, the Forest Owners' Federation emphasizes forest operations linked to timber harvesting and management planning. Areas of close cooperation in the 1980s have been management planning, models for cooperation between neighboring private individual forest owners, and a nationwide course trains forest owners and loggers in practical forestry.

Because of these two strong organizations, private consultants and industrial foresters play a rather limited role in Norwegian private forest management.

No private forest owner cooperative organization in Minnesota, or anywhere else in the United States, is nearly so powerful as the federation in Norway. Such an organization probably would not gain any strong foothold in the social and political landscape of the United States, where free enterprise is so highly appreciated.

The Norwegian Forestry Association.

Whereas the members of the Norwegian Forest Owners' Federation mainly comprise small farm forest properties, the members of the Norwegian Forestry Association constitute the bulk of the large private forest property owners, about 250 in number. These owners represent about 12 percent of the annual cut. Some members run their own wood-based industry, however, most members derive their income from forestry alone. Many members prefer to have their own professional staff, loggers and harvesting equipment.

The association works to promote the common interests of its members in relation to forest policy issues (questions related to taxation, legislation, land use, etc.). A professional service staff is at members' and nonmembers' disposal to deal with surveys, management planning, timber sales, etc. (Norwegian Forestry Society 1991).

The Forest Extension Service Institute

The Forest Extension Service Institute was founded in 1958 from an initiative by the Norwegian Forestry Society. The institute is a joint venture between 30 forestry organizations and scientific institutions, organized as a partnership (Forest Extension Service Institute n.d.).

The objective of the institute is to organize and conduct educational programs for professionals and forest owners in all fields of forestry and related fields of natural resource management (fisheries and wildlife). The institute also develops informational and educational material.

The institute has at present two permanent centers at its disposal, one in south Norway and one in mid Norway. At these centers, about 70 courses, conferences, symposia, etc., are arranged each year for foresters and other natural resource professionals (Skogbrukets Kursinstitutt 1989).

Local activities also are arranged nationwide, especially through a short course program called *Activity in Forestry*. This has been a very successful decentralized course system for loggers (7 days) and for self-active forest owners (3 days) mainly on practical topics, i.e., efficiency and safety in different forestry practices. Since this educational endeavor was initiated in 1979, about 8,000 courses have been carried out with about 50,000 participants (Skogbrukets Kursinstitutt 1989). The course program is a cooperative venture between the Forest Extension Service Institute, the Forest Service and the Forest Owners' Federation. While the institute is responsible for development and coordination of the courses at the national level, the two *services* have been responsible for the accomplishment at the local level.

In recent years, a new course series aimed at private owners has been developed in *Economic Forestry*. The institute has also developed an educational program that is offered to the Norwegian school system (primary school, junior high) in forestry, forest ecology and outdoor recreation activities), which is a parallel to the American *Project Learning Tree* program.

The Forest Extension Service Institute is recognized for its responsiveness and adaptability to new challenges arising regarding the use of natural resources. Assignments within new fields are, therefore, carried out on short notice.

The institute has a staff of 23 persons, of which 13 are forest or natural resource professionals. In addition to these people, a large number of specialists are called upon each year to act as lecturers or instructors. Institute activities are financed by public grants and by fees paid by the participants (Forest Extension Service Institute n.d., Skogbrukets Kursinstitutt 1989).

The Norwegian Forestry Society

The Norwegian Forestry Society was founded in 1898. The society today is an ideal and nonpolitical organization whose objectives are to foster understanding of the importance of the forest resources and to encourage sound forestry practices. The Norwegian Forestry Society is the common body of 20 county forestry societies, and is also comprised of many other organizations and institutions dedicated to the forest resources (Det norske Skogselskap 1989).

The society is engaged in many fields of forestry, such as silviculture (nurseries, seed orchards), informational and educational efforts (monthly periodical, brochures, seminars),

public relations activities, plus secretariat functions for new ideas and new initiatives to the benefit of forestry. Nurseries run by the society provide about 60 percent of Norway's total tree production, which is 70 million per year (Ministry of Agriculture, Department of Forestry 1986, Norwegian Forestry Society 1991).

The Norwegian Forestry Society in many ways is similar to the Minnesota Forestry Association.

d. "Advantage Norway"

In conclusion, it seems that Norway has a stronger commitment to private forestry than Minnesota, or the United States in general. This has to be viewed in a perspective of forest history and ownership structure. While Minnesota and the United States still could harvest from an abundance of timber resources early in the 20th century, Norway had to initiate forest policies and programs to restore its forest resources. In this effort, Norway has depended on responsible stewardship of its forests. Privately owned forests have played a key role.

So far we can say that "the timber resource restoration project" has been a success story. In the 60 year period from 1930 to 1990, forest growth increased by over 60 percent, despite conversions of large areas of highly productive forest land to agricultural and urban development uses. Forest growth per year, about 16.2 million cubic meters (7.2 million cords) in the 1980s, is steadily increasing. Future levels depends on the investments in afforestation (west Norway), reforestation and other silvicultural practices.

Norwegian forestry today meets the wood-based industry's need for wood. A major challenge for forestry in the future, will be to meet the industry's increasing demands for quality timber.

Besides the national commitment to forestry in Norway, some basic conditions for private forestry have been more favorable compared to those of Minnesota, such as:

1. stronger traditions in silviculture;
2. relatively high timber quality;
3. relatively high timber prices and net income;
4. stable market conditions, same tree species; and
5. stable ownership conditions.

Re: 1. For decades silvicultural practices have been accepted as important means to improve timber production and quality. Forest resources consequently have been subject to a relatively high intensity of silviculture with educational and financial programs as motivating forces.

Re: 2. Timber quality is generally higher on most comparable species, which most likely is to be explained by tree genetics and silvicultural practices.

Re: 3. Norwegian forest owners obtain a net income from timber harvesting that is 3 - 4 times higher for comparable species and timber assortments. This may be due to more favorable market conditions, and the system of timber price negotiations between sellers and buyers. Timber production as a source of monetary return has always been viewed as a primary objective of forest ownership.

Re: 4. Market conditions for timber in Norway have generally been good. The forest ecology enabling the long-term use of the same few major species, highly valued for wood processing, has formed the basis of a solid and continual wood-based industry. This is in sharp contrast to Minnesota where the market has been highly vulnerable to dramatic changes in forest cover types, due to harvesting and forest fire suppression in a different and much more complex forest ecosystem. Most of the original coniferous forests were gone in Minnesota by 1930. They were replaced by deciduous forests. Market conditions for these species, especially aspen, were poor until the mid 1970s when new technologies and markets changed this situation drastically.

Re: 5. The turnover rate of private ownership in Norway is low. A major reason is the high share of productive forest land that is economically and operationally tied to agriculture. Most farms are kept within the family for generations, and general government regulations are attached to this ownership group, stating conditions of residential and operational presence of the owner. Continuity in ownership is advantageous considering implementation of forest policies and programs, and for the owner's motivation and willingness to make investments.

The forest property market in Norway is heavily regulated by government. A policy "to prevent property speculation and to keep forest land mainly on the hands of people living in rural areas," makes it difficult for outsiders to buy forest property. Farms or forest properties sold out of the family, require government (Ministry of Agriculture) approval of the new owner. In cases where the ministry disapproves a sale, the ministry may buy the property at the current market price and then sell it to one or several neighbors.

In Norway, interests in addition to timber have been emerging on the forest scene since the 1960s, when conflicts started developing between outdoor recreation interests and timber production, especially around the capital of Oslo. In the 1970s and 1980s, these events were followed by public concerns over environmental quality (for example biological diversity, old growth).

A multiple-use strategy towards forest land management has been viewed as an appropriate response to the new challenges. As a consequence, the Forestry Act was altered in 1976 to accommodate recreational and environmental interests. This was followed up with practical guidelines for forestry. In the 1980s, criticism again was voiced against forest management practices, claiming that forestry in reality does too little to protect environmental quality. This led to organized nationwide hearings on multiple-use forest management in 1987 and 1988. The outcome of the hearings effort so far has been educational, fiscal and service

program initiatives. Regulatory initiatives also may be proposed through new amendments to the Forestry Act.

e. Final remarks

Norwegian forestry probably has not much to learn from Minnesota forestry with respect to timber production. However, Norwegian forestry has much to learn from the more sincere United States' attitude towards management of other forest resource benefits, such as wildlife and water resources. Wildlife management has strong traditions in Minnesota forestry. Today both game and nongame wildlife are given high attention in forest resource management.

Water resources in the United States have been regarded as an asset to be handled with care. Watershed protection has always been an important part of the forestry profession, aiming at the benefits of high quality surface water and the recharge of ground water.

Wetlands also are given greater respect in Minnesota forestry. They are regarded as highly valuable for biodiversity and for numerous environmental functions (wildlife habitat, holding of surface runoff, nutrient sinks). In Norway, the predominant focus on timber production is a main reason why a surplus of water still is viewed as more of *a problem you get rid of through drainage*, rather than as a valuable resource with multiple functions.

Nontimber benefits—water, recreation, fish and wildlife, aesthetic beauty—are given high priority in Minnesota forestry. This is reflected by the way the educational system, federal and state agencies, and private forestry organizations are organized, and in which these values play an important and integral part.

It is difficult to predict where Norwegian forestry is heading in the future. The environmental role of the forest resources is likely to be given higher priority, which means stronger integration of environmental concern in forest policy. On the other hand, much will depend on Norway's relationships with *the new Europe* and the European Common Market. A future membership in the Common Market, which is most likely, means that forest policy will have to be adjusted to complement the policies of other nations'. It also will bring about changes in the timber market and in the regulatory landscape of the forest property market.

VIII. SUMMARY

This report primarily describes the American forestry extension and technical assistance services accessible to private forest owners, using the state of Minnesota as a case study. Most attention is paid to the Minnesota Extension Service and Minnesota Department of Natural Resources, Division of Forestry, the two most important organizations, both public agencies. Private organizations and other public agencies are described in a more summarized manner. Some comments are given in the last chapter about similarities and differences between the *service systems* in Minnesota and Norway.

In Minnesota 5.5 million hectares (13.6 million acres) is classified as commercial forest land, of which aspen and other hardwoods cover 71 percent. Spruce-fir is the dominant softwood type (22 percent), while pines make up about 6 percent.

Ownership of commercial forest land is nearly equally divided between the public (53 percent) and private (47 percent) sector. Nonindustrial private owners (130,000)—including farmers, other individuals and corporations—control 40 percent of the commercial forest land, and constitute by far the largest ownership class. Most nonindustrial private lands are in small holdings, with an average size of 17 hectares (43 acres), increasing to 25 hectares (63 acres) when ownerships of less than 4 hectares (10 acres) are omitted. A characteristic feature of these private lands is the frequent transfer of property.

The nonindustrial private owners' use of professional assistance is moderate. Owners of about one-fifth of the commercial forest land have ever requested assistance. More owners are likely to request assistance in the future because of increasing demand and competition for wood.

Since the late 1970s, Minnesota has experienced a tremendous expansion of the forest products industries. This is due to new technology and expanding markets for forest products, partly or mainly made from deciduous tree species. Aspen in particular has played a key role in this development, a species considered to be a *weed* in the early 1970s. The forest products industry today is the second largest manufacturing industry in Minnesota. In 1988 it provided jobs for 55,600 people and made wood products worth \$5 billion.

The forest products industry is expected to demand 11 million cubic meters (4.9 million cords) of wood by 1995. Annual timber growth is estimated to be 16.1 million cubic meters (7.2 million cords) at that time. However, the demand for aspen may exceed its annual growth.

Increased demand for timber has led to environmental concerns. Questions are being raised about the impact of large scale harvesting on recreation, wildlife, plant communities, old growth forest, forest soils, water quality, biodiversity, tourism, etc.

Extension forestry programs in the United States are the primary means for transferring research-based education to groups of landowners. Extension forestry is organized as a partnership involving the U.S. Department of Agriculture (USDA), land-grant universities in most states and local governments (counties), in what is called *the Cooperative Extension Service*. In the Cooperative Extension system, forestry extension belongs to the natural resources program area, which is just one program area out of several others.

At the federal level, programmatic focus is on natural resources (forest management, wildlife and fisheries, soil and water) as identified by the Extension Service-USDA.

At the state level, extension forestry is administered by land-grant universities, and as such, extension professionals are members of academic institutions. The relationship between federal and state extension units is not hierarchial, but is more one of negotiation between concerned equals. State extension organizations typically have a director, program leaders, subject matter specialists, and county agents. The role of specialists is to provide specialized

technical assistance to county agents and group audiences, while county agents are charged with providing for the direct delivery of information to owners and users of forests.

Minnesota's *contribution* to the Cooperative Extension System is the Minnesota Extension Service (MES). It was established in 1909 at the University of Minnesota. MES has five program units: agriculture, home economics, 4H youth development, community economic development, and natural resources. Natural resources represents just a small portion of the staffing and fiscal resources of the MES at the state and county level.

Within the MES, forest resources extension, which is conducted by the Department of Forest Resources in the College of Natural Resources, focuses on environment and natural resources management and economic development issues. Priority programs for faculty with extension appointments include forest management practices, economic opportunities in forest management, small woodlot management, windbreak/shelterbelt design and use, timber harvesting and specialty crops (maple syrup and Christmas tree industries). Forest resources extension in Minnesota is presently short of staffing to deal with areas such as forest water quality and watershed management, hardwood silviculture, urban forestry, and geographic information systems (GIS). There also is a need for more county agents/specialists in natural resources.

Extension faculty are an important communication link between faculty research, natural resource agencies, industry, special interest groups and landowners. Educational delivery is accomplished through workshops, seminars, correspondence courses, training sessions, conferences, field tours, publications, video, software, slide sets, telephone calls, and use of mass media. Target audiences for the educational activities include natural resource managers and related professionals seeking continuing education, nonindustrial private landowners, loggers, public policymakers, youth, tourism businesses, and the general public.

The 1980s economic crisis in rural America, and society's scrutinizing of publicly funded programs, has given rise to extensive planning efforts within the Cooperative Extension system. Strategic planning processes have been a tool to meet the rapidly changing demands from society. Planning resulted in recommendations for organizational changes, it identified issues and programs on which to focus and changes in the use of resources, etc. Much emphasis has been placed on issues programming. The philosophy is that compelling issues facing people must drive the system.

Planning in the Minnesota Extension Service gave rise to a name change for the organization. Formerly called the Agricultural Extension Service, the new name reflects a shift in focus and commitment to a broad range of programs outside the traditionally strong agricultural program area. Other results from planning have been a restructuring plan (establishment of clusters of counties, specializations for agents), and a new staffing plan.

The Minnesota Department of Natural Resources (DNR) is the state agency responsible for management of public lands, timber, waters, minerals, fish, and wildlife. The DNR has dual goals of protecting the environment and promoting resource use and development.

The DNR is organized into operating divisions which include forestry, enforcement, fish and wildlife, minerals, parks and recreation, waters, and the trails and waterways unit.

At the state level the present Division of Forestry consists of four functional staff groups: administration, resource management, resource protection, and resource information and planning. The field operating group is composed of 6 regions, 18 administrative areas, and 69 field stations.

The Division of Forestry is charged with the protection and multiple-use management of 1.9 million hectares (4.6 million acres) of state forest and other state-owned lands. It also is responsible for preventing and controlling wildfire on 20.6 million hectares (50.9 million acres), insect and disease protection on 6.5 million hectares (16 million acres) of forest lands, annual production of between 22 and 25 million tree seedlings from two state nurseries, and for assisting private forest landowners in managing their lands.

In 1982 the Minnesota Legislature passed the Forest Resources Management Act. It directs the Division of Forestry to prepare and maintain a Minnesota Forest Resources Plan (MFRP) consisting of an assessment (to be updated every 10 years) and program (to be updated every 4 years). The division is implementing its MFRP through a system which links the plan to various management processes such as budgeting, work planning, accomplishment reporting, and program analysis.

The Division of Forestry is the lead organization in delivering technical assistance to private forest landowners in Minnesota. This is carried out through cooperative federal-state forestry programs, such as Minnesota's Private Forest Management (PFM) Program. The PFM program is established by federal and state legislation which authorizes funding from the U.S. Department of Agriculture and the state legislature.

The major goal of Minnesota's PFM program is to "improve and increase the multiple-use forest resource management of nonindustrial private forest lands in a way that is cost-effective to the Division, consistent with Departmental policies and complementary of other governmental and private efforts."

PFM is coordinated primarily by a cooperative forest management specialist located in the Resource Management Section of the division's central office. Each region has a PFM contact managing the program at the regional level. Area supervisors have the greatest control over administrative areas, for achieving program targets, prioritizing activities, and balancing PFM work with other area responsibilities. Most PFM assistance is provided by area and district foresters and technicians whose other responsibilities include fire prevention and suppression and all phases of state-owned forest land management.

For 1991 the staffing level for the PFM program was expected to be 36 full-time equivalents (FTEs), which is about 7 percent of the Division of Forestry's total staff budget (518 FTEs).

DNR foresters provide nonindustrial private forest owners with a broad range of information and assistance. They examine woodlands, prepare management plans, timber sales and tree planting recommendations, mark timber for improvement cutting and firewood harvesting, and provide field assistance on federal and state cost-sharing programs, advice on erosion and sediment control, wildlife habitat improvement, insect and disease control, forest recreation, road construction, and urban and community forestry. Owners

are referred to consulting foresters for large commercial timber sales, trespass appraisals, and several other activities.

Increased awareness of the environment is expected to bring extra attention and funds to the PFM program. Emphasis will be on management from the perspective of the ecosystem, thereby providing an optimum variety of products for the society without impairing long-term ecosystem productivity and diversity.

Other state and federal agencies—besides the MES and the DNR—with major involvement or impact on private forestry are:

- The State and Private Forestry unit under the USDA Forest Service (USFS) that provides financial and specialized technical support to state agencies such as the DNR.
- The USDA Agricultural Stabilization and Conservation Service (ASCS) which administers four federally sponsored cost-share programs for a variety of soil and water conservation practices including tree planting, timber stand improvement, and wildlife habitat improvement.
- The USDA Soil Conservation Service (SCS), which offers agricultural landowners a variety of technical assistance to plan erosion and sediment control practices (plant grasses and trees). Their published soil surveys help woodland owners assess land productivity for timber, wildlife, and agricultural purposes.
- The Minnesota Soil and Water Conservation Districts (SWCDs)—a *sister organization* of the federal SCS—help the public locate resource information and programs, provide some technical assistance for woodland owners, and administer two state cost-share programs.

The most important private organizations and individuals involved in private forestry are:

- Consulting Foresters. They provide services that are similar to those provided by public service foresters, and in addition services often considered inappropriate for public service foresters.
- Industrial Foresters. With the expansion of the wood using industries in the 1980s, the industry has hired staff to provide private forest management services to private landowners.
- The Minnesota Tree Farm System. It is part of the American Tree Farm System, which is a forest industry sponsored program encouraging private forest owners to produce continuous crops of trees with added benefits of improved wildlife habitat, watershed protection, outdoor recreation and aesthetic value.
- The Minnesota Forestry Association (MFA). The purpose of the MFA is to foster proper utilization and conservation of forests and other natural resources through

public education, development and demonstration of forest management techniques, and other related activities.

The population size of Minnesota and Norway is nearly the same. The forest resources with regard to area, annual growth, and timber harvest is somewhat larger in Norway.

The forest ecology and tree species composition are quite different in Norway and Minnesota, partly due to different climatic conditions. Norway's forest resources are dominated by coniferous forest, where Norway spruce and Scots pine, both climax species, are most important to the wood-based industry.

Norway has far more forest land in private ownership, and farm forests are a major element. About 87 percent of the productive forest land is in private ownership (industry included), 13 percent in public ownership. Individuals control 76 percent of the productive forest land. Out of Norway's 121,000 forest properties, about 118,000 are owned by individuals, with an average property size of 43 hectares (107 acres). However, 72,000 of these holdings are smaller than 25 hectares (63 acres).

The most striking impression from Minnesota's extension and technical assistance programs are the great number of public and private organizations that are involved. Partnerships between agencies and between agencies and private organizations, are established through legislation, federal and state administrative policies, formal agreements, etc.

The public and private organizational landscape offering educational and technical assistance programs are much more centralized in Norway. Norway has three major actors, *the Forest Service*, *the Forest Owners' Federation*, and *the Forest Extension Service Institute*.

The Norwegian Forest Service (530 employees) is a public administrative, planning, and consultative body organized under the Ministry of Agriculture. The agency is responsible for encouraging private forest management. Besides providing extension and technical assistance services, the Forest Service has the charge of administering the Forestry Act (regulatory law applied both to private and public land), the government forestry incentives programs (including cost-share programs), the Forest Trust Fund System, and participation in societal planning activities on forest land use.

Norway and Minnesota have similar cost-share programs on silvicultural practices (except for drainage), road construction and forest management planning. Minnesota's programs also offer cost-sharing on wildlife habitat improvement and soil and watershed protection, while all Norwegian programs are linked to timber production and harvesting. The yearly investment level of Norway's cost-share programs in forestry is about four times higher than Minnesota's on a comparable acreage basis.

One important provision of the Forestry Act is the Forest Trust Fund, which is a mandatory investment system for all forest owners with the purpose of securing sufficient investments in forest resources. In 1988 forest owners invested about NOK 330 million (approximately \$50 million) in forestry activities through the Forest Trust Fund system.

The Norwegian Forest Service has most in common with the Minnesota DNR, Division of Forestry. Both agencies have decentralized organizations with strong PFM programs at the local level. Norway has no agency equivalent to the Minnesota Extension Service, which is linked to the university system.

Different from Minnesota or the United States, Norway has a strong forest owners' cooperative, the Norwegian Forest Owners' Federation (520 employees), consisting of 19 regional associations and 455 local associations. It has 56,000 members holding 56 percent of Norway's productive forest land. About 75 percent of the roundwood used in the wood-based industry is sold cooperatively through the regional associations.

To ensure the interests of its members, the main tasks of the organization are to negotiate the highest possible timber prices, secure timber sales, influence forest policy issues, run wood processing industries, and provide a wide range of professional services. Services are financed by fees on timber sales paid by the industry and the members.

The Forest Service and the Forest Owners' Federation closely cooperate on many programs, and in many ways supplement each other. While the Forest Service concentrates its efforts on investments in silviculture (including cost-share programs), forest road construction and multiple-use forestry, the Forest Owners' Federation emphasizes forest operations linked to timber harvesting and management planning.

The Norwegian Forest Extension Service Institute (23 employees) is a joint venture of 30 forestry organizations and scientific institutions, organized as a partnership. The objective of the institute is to organize and conduct educational programs for professionals and forest owners in all fields of forestry and related fields of natural resource management.

Norway has a stronger commitment to private forestry than Minnesota, which has to be viewed in a perspective of forest history and ownership structure. Relying on responsible stewardship from the private owners, Norwegian forestry has succeeded in an effort to restore the timber resources after centuries of rather heavy utilization. Norwegian forestry today meets the wood-based industry's demand for wood.

Some basic conditions for private forestry have been more favorable in Norway than in Minnesota, such as stronger traditions in silviculture, higher timber quality, higher timber prices and net income from timber harvesting, stable market conditions, and stable ownership conditions.

In the 1970s and 1980s, a multiple-use strategy towards forest land management has been viewed as an appropriate response to demands from outdoor recreation and environmental interests in Norway. Educational, fiscal, regulatory, and service program initiatives have been implemented to better meet these challenges.

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Appendix A

Minnesota Woodland Owners' Resource Directory



Minnesota Woodland Owners' Resource Directory

Melvin J. Baughman

A WELL MANAGED WOODLAND can provide timber, wildlife, recreation, soil conservation, water quality, and other benefits. Managing woodlands without professional guidance may reduce benefits and adversely affect the woodland's character for decades to come. This publication is for those seeking advice or assistance in better management of their woodland property. The public agencies and private organizations listed here provide information, education, and technical assistance on marketing timber, obtaining cost-sharing for land improvement, improving wildlife habitat, and other woodland topics.

Public Sources

The University of Minnesota conducts research and education to increase the economic, social, and environmental benefits of our renewable natural resources. Four units cooperate in carrying out this mission: the Minnesota Extension Service, College of Natural Resources, Minnesota Agricultural Experiment Station, and Natural Resources Research Institute.

The Minnesota Extension Service is an outreach arm of the University. It offers practical, research-based information on a wide range of forestry, forest products, and wildlife management subjects. It provides information and informal education through conferences, workshops, tours, publications, audio-visual materials, personal contact, and mass media. There is an extension office in every county. A county extension agent can help you find educational materials or programs or refer you to a specialist. Contact your county extension office listed by county name in the telephone directory, or contact the following University offices:

Forest Products Extension
University of Minnesota
204 Kaufert Lab
St. Paul, MN 55108
(612) 624-7712
(wood product manufacturing, wood characteristics and use)

Forest Resources Extension
University of Minnesota
116 Green Hall
St. Paul, MN 55108
(612) 624-3020
(timber management, marketing, harvesting, weed control, maple syrup, Christmas trees, wind-breaks, taxes)

Wildlife & Fisheries Extension
University of Minnesota
216 Hodson Hall
St. Paul, MN 55108
(612) 624-3298 (wildlife damage control, management, habitat)
(612) 624-2720 (fish farming, aquaculture)

The COLLEGE OF NATURAL RESOURCES is the only institution of higher learning in the state offering B.S., M.S., and Ph.D. programs in forest products, forest resources, fisheries, and wildlife. The College engages in undergraduate and graduate education, basic and applied research, extension, and public service. For information about curricula or credit classes contact the College of Natural Resources, University of Minnesota, 135 Natural Resources Administration Building, St. Paul, MN 55108; telephone (612) 624-3216. The College's Cloquet Forestry Center has a self-guiding trail where visitors can see demonstrations of forest regeneration, wildlife habitat, tree improvement, harvesting, and other practices. Contact the Cloquet Forestry Center, 175 University Road, Cloquet, MN 55720; telephone (218) 879-4528. The College's extension programs are conducted in cooperation with the Minnesota Extension Service.

The MINNESOTA AGRICULTURAL EXPERIMENT STATION provides research funds to faculty in the Minnesota Extension Service, College of Natural Resources, and other colleges. Research-based information on forestry, forest products, and wildlife is available through the Minnesota Extension Service.

The NATURAL RESOURCES RESEARCH INSTITUTE is located at the University of Minnesota, Duluth. Its major emphasis is forest products research, but its research encompasses resource analysis, aspen management, ecosystem studies, short rotation hybrids, wood industry assessments, secondary solid wood products, and the manufacturing and development of composite products. Contact Natural Resources Research Institute, 3151 Miller Trunk Hwy., Duluth, MN 55811; telephone (218) 720-4294.

The MINNESOTA DEPARTMENT OF AGRICULTURE, AGRONOMY SERVICES DIVISION implements and enforces the Minnesota Pesticide Control Law, including registration of pesticides, licensing and certification of pesticide applicators and investigation of pesticide accidents. Contact Agronomy

Services, Minnesota Department of Agriculture, 90 West Plato Boulevard, St. Paul, MN 55107; telephone (612) 296-3349.

The MINNESOTA DEPARTMENT OF AGRICULTURE, PLANT INDUSTRY DIVISION's Shade Tree Program works primarily through local governments to provide technical assistance in community forestry topics including oak wilt control, gypsy moth detection and eradication, tree inspector certification, and diagnostic laboratory services. These services, along with a free quarterly newsletter *Overstory*, are available to the public. Contact the Shade Tree Program, Minnesota Department of Agriculture, 90 West Plato Boulevard, St. Paul, MN 55107; telephone (612) 296-3349.

The MINNESOTA DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FORESTRY offers information and technical assistance to woodland owners. DNR foresters will examine woodlands; prepare management plans and tree planting recommendations; mark timber for improvement cutting and firewood harvesting; and provide advice on erosion and sediment control, wildlife habitat improvement, insect and disease control, forest recreation, road construction, and urban and community forestry. There generally are no charges for these services; however, fees may be charged for services pertaining to timber sales. Services are limited to four days per ownership per year. Owners are referred to consulting foresters for large commercial timber sales, damage and trespass appraisals, and several other activities. Forest tree seedlings are sold for reforestation. Local offices are usually listed in the telephone directory of the county seat under "Minnesota." You also may contact the Department of Natural Resources, Division of Forestry, 500 Lafayette Road, St. Paul, MN 55155-4044; telephone (612) 296-4401 or toll free 1-800-652-9747.

The MINNESOTA DEPARTMENT OF NATURAL RESOURCES, SECTION OF WILDLIFE offers brochures on managing woodlands for wildlife as

well as limited cost-sharing and technical assistance on wildlife habitat improvement. Contact an Area Wildlife Manager through the local DNR Division of Forestry office or contact the Minnesota DNR, Section of Wildlife, 500 Lafayette Road, St. Paul, MN 55155; telephone (612) 296-3344 or toll free 1-800-652-9747.

SOIL AND WATER CONSERVATION DISTRICTS (SWCD) help the public locate resource information and programs, technical assistance for woodland owners, and funding for access roads, pocket gopher control, woodland fencing, firebreaks, and fire suppression lanes. Because the SWCDs are policy setting organizations that are directly responsible to locally elected supervisors and work closely with other forest resource agencies, they are a good place to go for one-to-one help and referrals to other agencies. Contact the local SWCD office listed in the telephone directory of the county seat under either U.S. or County Government.

The USDA AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE (ASCS) offers cost-sharing for a variety of soil and water conservation practices including tree planting and timber stand improvement. The Conservation Reserve Program offers cost-sharing for tree or grass planting and annual rental payments for 10 years to farmers that take highly erodible cropland out of production. The Agricultural Conservation Program (ACP) provides cost-sharing for forestry practices that prevent soil erosion and produce forest products. Cost-sharing is available for tree planting, thinning, pruning, releasing desirable young trees, and site preparation for natural re-seeding. The Forestry Incentives Program (FIP) is similar to ACP, but FIP is designed to increase sawtimber growth and it is limited to highly productive forest land and to stands of at least 10 acres. Contact the local ASCS office found in the telephone directory under U.S. Government or the Minnesota State ASCS Office, 400 Farm Credit Services, 375 Jackson Street, St. Paul, MN 55101-1852.

The USDA FARMERS HOME ADMINISTRATION (FmHA) offers loans or loan guarantees to establish forestry practices such as thinning, pest control, and fire protection; to purchase farm and forestry equipment, materials, and labor; to buy, improve, or enlarge farms and farm buildings; and to develop outdoor income-producing recreational facilities. To be eligible, landowners and operators must have enough farm and other income to provide a living standard considered adequate for the area and be unable to obtain reasonable credit terms and rates from private sources. Contact the local FmHA office listed in the telephone directory under U.S. Government.

The USDA FOREST SERVICE, NORTH CENTRAL FOREST EXPERIMENT STATION conducts research in forestry and related fields throughout a seven-state area in the North Central United States. Fields of study include forest management, silviculture, fire management, economics, forest engineering, wood utilization, insect and disease management, tree physiology, genetics, resource evaluation, wildlife habitat management, and water quality management. The Station issues more than 250 new publications each year reporting on research results. Publications are available free as long as the supply lasts. Contact North Central Forest Experiment Station, 1992 Folwell Avenue, St. Paul, MN 55108; telephone (612) 649-5000.

The USDA FOREST SERVICE, NORTHEASTERN AREA STATE AND PRIVATE FORESTRY is responsible for insuring the productive use of forest resources in the Northeast and Midwest on state and private lands. It provides technical and financial assistance to the Minnesota Department of Natural Resources (DNR). The DNR in turn has cooperative programs which assist woodland owners in managing forest resources, forest pests and fire.

The USDA FOREST SERVICE, CHIPPEWA AND SUPERIOR NATIONAL FORESTS offer information and educational materials to landowners on a

wide variety of management activities including timber, wildlife and fish habitat, soil and water conservation, recreation, road and facility construction, reforestation, timber stand improvement, and fire protection and suppression. Information and most educational materials are free. They do not sell tree seedlings or provide on-the-ground technical assistance. Contact Chippewa National Forest, Rt. 3, Box 244, Cass Lake, MN 56633; telephone (218) 335-2226 or Superior National Forest, P.O. Box 338, Duluth, MN 55801; telephone (218) 720-5324.

The **USDA SOIL CONSERVATION SERVICE (SCS)** provides technical assistance to woodland owners through Soil and Water Conservation Districts. Technical assistance is available to plan erosion and sediment control practices. Their published soil surveys help woodland owners assess land productivity for timber, wildlife, and agricultural purposes. Soil surveys indicate erosion hazard, equipment limitation, expected seedling mortality, windthrow hazard, plant competition, common trees found on soil types, site indices of important tree species, and trees adapted for planting on each soil type. The SCS also assists woodland owners with land use planning including assistance with access road locations, grade stabilizations, water control structures, abandoned mine reclamation, and wildlife management. Some financial aid is available for Resource Conservation and Development projects, and Public Law 566 watershed projects. Contact the local SCS office listed in the telephone directory of the county seat under U.S. Government or write to USDA Soil Conservation Service, Room 600 Farm Credit Building, 375 Jackson Street, St. Paul, MN 55101-1854.

Private Sources

FOREST INDUSTRIES provide the market for timber produced on private woodlands. Some large companies in the paper and waferboard industries and a few large sawmills employ foresters who

provide services to woodland owners. Timber management services may include drafting forest management plans, harvesting plans, timber tax assistance, reforestation guidance, and information on government cost-share programs.

Some companies have formal landowner assistance programs. In return for company services, a landowner is asked to grant the company access to carry out management recommendations developed by the forester and to grant the company the right to purchase timber for a specified time. Other companies provide their services under a less formal arrangement to landowners that have marketable timber. To obtain a list of industry foresters, contact Minnesota Forest Industries, 208 Phoenix Building, Duluth, MN 55802; telephone (218) 722-5013.

The **FOREST RESOURCE CENTER** is a nonprofit corporation that conducts educational programs for private woodland owners, youth, and others. Its programs are aimed at improving management and utilization of hardwood forest resources in southeastern Minnesota and adjoining areas of Wisconsin and Iowa. The Center is developing a demonstration forest where a variety of forest regeneration and management practices can be seen, including how to grow Shiitake mushrooms. Workshops on forestry subjects are offered periodically in cooperation with public agencies. Contact Forest Resource Center, Route 2, Box 156A, Lanesboro, MN 55949; telephone (507) 467-2437.

FORESTRY CONSULTANTS provide a wide range of forest management services including timber appraisals, marketing assistance, management plans, timber stand improvement, tree planting, and pest management. Consultants may be either general practitioners or specialists. Good consultants have a college education in forestry, several years of experience, subscribe to a code of ethics developed by their professional organization, and have no business connection with a forest products company where a conflict of interest might occur. Consultant fees are based on an hourly

rate, a percentage, a piecework rate, or other basis mutually agreed upon. This fee is a management expense that a landowner usually can deduct from timber sale income, damage award, or other taxable income.

The Minnesota Association of Consulting Foresters can furnish a list of its members. Contact Minnesota ACF, c/o Maynard W. Underbakke, Route 1, Box 80, Fountain, MN 55935; telephone (507) 765-2713. The Minnesota Department of Natural Resources, Division of Forestry, also can provide a list of forestry consultants that assist Minnesota woodland owners.

Associations

The AMERICAN FORESTRY ASSOCIATION (AFA) is America's oldest national conservation organization focused on trees and forests. It is independent and nonpartisan. The AFA advances the intelligent management, enjoyment, and use of forests, soil, water, wildlife, and other natural resources, both rural and urban. It promotes an enlightened public appreciation of natural resources and their role in the social, recreational, and economic life of the nation's woodlands and communities. This is done through publication of its magazine, *American Forests*; its newsletters, the *Urban Forest Forum* and *Resource Hotline*; and through its Global ReLeaf program which promotes the growing of more and better trees for America and the world. Contact the American Forestry Association, P.O. Box 2000, Washington, DC 20013; telephone (202) 667-3300.

The CENTRAL MINNESOTA SMALL WOODLOT OWNERS ASSOCIATION (CMSWOA) is made up of woodland owners from all walks of life who love the land and want to see their woodlands healthy, attractive, productive, and wisely managed. The association conducts and co-sponsors annually a woodland owner field day that shows how to manage woodlands wisely, where to get advice and assistance, and how to negotiate timber sale

contracts. A sealed-bid timber auction is conducted for its members every February and October. Members of the CMSWOA are also members of the Minnesota Forestry Association. Contact association chairperson, Forest Dingman, R.R. 1, Motley, MN 56466; telephone (218) 352-6128.

The MINNESOTA CHRISTMAS TREE GROWERS ASSOCIATION (MCTGA) promotes cooperation among growers and researchers to solve production and marketing problems. Members are informed about research and legislation by the quarterly *Christmas Tree Growers NEWS*. Contact MCTGA, P.O. Box 124, Osseo, MN 55369.

The MINNESOTA DEER HUNTERS ASSOCIATION (MDHA) is a non-profit wildlife conservation organization. The MDHA is dedicated to developing the best possible deer herd and to promoting quality deer hunting. Its objectives are to improve hunting, habitat, education, and legislation. MDHA provides funding for land acquisition, clearcutting, prescribed hunting, access, seeding, and food plots. It sponsors meetings with other agencies to promote forest and wildlife management. Members receive a quarterly publication, *Whitetails*. Contact the Minnesota Deer Hunters Association, 423 4th Street NE, Box 413, Grand Rapids, MN 55744; telephone 1-800-777-4503.

The MINNESOTA FORESTRY ASSOCIATION (MFA) is comprised of a broad range of people and organizations dedicated to the wise use of Minnesota's forest resources. It promotes intensive forest management to achieve greater production of timber products, forest wildlife, and expanded recreation opportunities. MFA aims to increase public understanding of multiple-use management of forests and related natural resources. Members receive *Minnesota Forests* and may attend periodic educational programs on forest management. Contact the Minnesota Forestry Association, 220 First Avenue NW, Room 210, Grand Rapids, MN 55744; telephone (218) 326-1239.

MINNESOTA FOREST INDUSTRIES, INC. comprises major paper and wood products companies operating in Minnesota. Its purposes are to educate the public about forestry, promote multiple use of forest resources to perpetuate the forest, strengthen the forest industry, and promote policies that will stabilize the state's forest economy. It provides information and educational materials. Contact Minnesota Forest Industries, Inc., 208 Phoenix Building, Duluth, MN 55802; telephone (218) 722-5013.

The **MINNESOTA MAPLE SYRUP PRODUCER'S ASSOCIATION** is a non-profit organization of persons and firms engaged in all phases of producing maple syrup and related products. The association attempts to increase public awareness of the maple industry and provides information for its members. Contact Carmen Maschler, Route 1, Randall, MN 56475 or Wanda Patzoldt, 3002 Horseshoe Lake Road, Grand Rapids, MN 55744.

The **MINNESOTA TIMBER PRODUCERS ASSOCIATION** is a non-profit organization comprising logging businesses and small sawmills. Its purpose is to educate the public about forest management and multiple uses of forests and to perpetuate the forest and its benefits, to strengthen and promote forest policies that will stabilize the forest economy, and to promote forest-related businesses in Minnesota. It provides informational and educational materials. Contact Minnesota Timber Producers Association, 208 Phoenix Building, Duluth, MN 55802; telephone (218) 722-5013.

THE MINNESOTA TREE FARM SYSTEM is part of the American Tree Farm System. Members who own forest land receive a forest management plan developed for their particular woodland by a professional forester, a free subscription to *The American Tree Farmer*, and eligibility to compete for prizes in "Outstanding Tree Farmer" contests. A forester will inspect the woodland every five years and update the forest management plan ac-

ordingly. In return the forest owner agrees to follow the plan and protect the woodland from fire, insects, disease, and grazing. This service is offered at no cost. Contact the Minnesota Tree Farm Committee, 208 Phoenix Building, Duluth, MN 55802; telephone (218) 722-5013.

The **NATIONAL WOODLAND OWNERS ASSOCIATION (NWOA)** is an organization of non-industrial private woodland owners with members from all 50 states. It is affiliated with state and county woodland owner associations throughout the United States. NWOA is independent of the forest products industry and forestry agencies. NWOA works with all organizations to promote non-industrial forestry and the best interests of woodland owners. Members receive four issues of National Woodlands magazine and eight issues of Woodland Report with late-breaking forestry news from Washington, D.C. and state capitols. An introductory visit from a professional forester is available in most states (for holdings of 20 acres or larger), plus other member benefits. Contact National Woodland Owners Association, 374 Maple Avenue East, Suite 210, Vienna, VA 22180; telephone (703) 255-2700.

THE NATURE CONSERVANCY is an international non-profit conservation organization. It protects land with unique plants, animals, or habitats and usually sells the land to federal, state, or local agencies which can manage land for public use. The Conservancy also conducts research on unique plants, animals, and habitats. Members can participate in a wide range of educational outings. Contact The Nature Conservancy, 1313 5th Street SE, Box 110, Minneapolis, MN 55414; telephone (612) 379-2134.

The **NORTHWESTERN MINNESOTA WOODLAND OWNERS ASSOCIATION** is a non-profit organization formed to meet the needs and interests of non-industrial private woodland owners. The group's activities include timber sales, assistance in marketing and reforestation, and educational tours. Information is offered on thinning, planting, and harvesting. The newsletter keeps mem-

bers up-to-date on market conditions, cost-share programs, field days, and seminars. For information about membership call (218) 835-6684, or leave a note at the Minnesota Department of Natural Resources office in Blackduck, MN, or write to Northwestern Minnesota Woodland Owners Association, P.O. Box 293, Blackduck, MN 56630.

The **MINNESOTA SOCIETY OF AMERICAN FORESTERS** is a chapter of the Society of American Foresters (SAF). The SAF is a professional society composed of foresters, forestry students, and scientists or practitioners in fields closely allied to forestry who hold bachelor or higher degrees. Members also may be students or graduates of SAF recognized forestry technician programs. The *Journal of Forestry* keeps members up-to-date on forestry issues, practical forestry information, and new forestry products and equipment. Members are entitled to attend SAF chapter, state, and national educational meetings. Woodland owners can obtain from the SAF a publication describing careers in forestry and a directory of all foresters in Minnesota. Contact the Minnesota Society of American Foresters, c/o University of Minnesota, Department of Forest Resources, 1530 North Cleveland Avenue, St. Paul, MN 55108

The **RUFFED GROUSE SOCIETY** is a national non-profit conservation organization dedicated to enhancing habitat for ruffed grouse, American woodcock, and other wildlife that utilize young forests. Society supported research on forest wildlife habitat management has yielded publications useful for both the public land manager and the private woodland owner. Members receive *RGS* magazine and notices about chapter meetings and fund-raising banquets. Habitat management publications are available. Contact Ruffed Grouse Society, 1400 Lee Drive, Coraopolis, PA 15108.

The **WALNUT COUNCIL** sponsors meetings of agencies, landowners, producers, and woodland

users interested in walnut culture and utilization. The council also functions as a means to exchange information and propagational materials. Members are kept up-to-date on the best known techniques to grow walnut by means of the *Walnut Council Bulletin*, a quarterly newsletter. Contact the Walnut Council, 5603 West Raymond Street, Indianapolis, IN 46241; telephone (317) 244-3386.

Other Sources

This publication describes the best-known regional, state, and national forestry agencies and organizations that assist woodland owners, but there may be others. For additional information contact the Minnesota Department of Natural Resources or your county extension office.

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Melvin J. Baughman is an Extension Specialist -- Forest Resources and associate professor in the Department of Forest Resources.

MINNESOTA EXTENSION SERVICE
UNIVERSITY OF MINNESOTA
NATURAL RESOURCES

SERVICES

ORGANIZATIONS	Christmas Trees	Forest Management	Insects & Diseases	Maple Syrup	Soil & Water Conservation	Taxes	Timber Appraisal	Timber Marketing	Tree Planting	Wildlife Management
Public										
MN Dept. of Agric., Agronomy Services Division, Plant Industry Division			CET							
MN DNR, Division of Forestry	CT	CET	CET	CT	CT	CE	CT	CT	CT	CT
MN DNR, Section of Wildlife										ETF
Soil and Water Conservation Districts	C	CETF			CETF				CT	CET
USDA, Agric. Stabilization & Cons. Serv.		F			F			F	F	F
USDA, Chippewa & Superior National Forests		B	E	E	E	E	E	E	E	
USDA, Farmers Home Administration		F			F				F	
USDA, NC Forest Experiment Station	E	E	E	E					E	E
USDA, Soil Conservation Service	C	C			CETF				C	CE
Univ. of MN, College of Natural Resources, MN Extension Service	CE	CE	CE	CE	CE	CE	CE	CB	CE	CE
Private										
Forestry Consultants	CT	CT	CT			C	CT	CT	CT	CT
Forest Industries		CT	CT				CT	CT	CTF	
Forest Resource Center		CE	CE	E	E		E	CE	CE	CE
Associations										
American Forestry Association		E						CB	CE	
Cent. MN Small Woodlot Owners Assoc.		CE								
MN Christmas Tree Growers Assoc.	E								EF	F
MN Deer Hunters Association		BF								
MN Timber Producers Association		E								
Minnesota Forest Industries		E						E		
Minnesota Forestry Association	E	E	E	E	E	E	E	E	E	E
MN Maple Syrup Producers Assoc.		E			CE					E
Minnesota Nature Conservancy		E								
Minnesota Tree Farm System		CTE	CT				CT	CT	CT	CT
MN Society of American Foresters		E								
National Woodland Owners Assoc.		TE				E	T	T	T	T
NW MN Woodland Owners Assoc.		E				E	E	TE	TE	
Ruffed Grouse Society		E						CE		
Walnut Council		E						E	E	E

KEY TO FORESTRY ORGANIZATIONS AND SERVICES:

- C - Consultation (by mail, telephone, office visit)
- E - Educational information (publications, meetings, tours, workshops)
- T - Technical assistance (inspect woodland and advise owner)
- F - Financial aid (cost-sharing or loans)

Appendix B

Federal, state and local cost-share
programs in Minnesota

SOURCES OF FINANCIAL SUPPORT
FOR PRIVATE WOODLAND OWNERS

Mimi Barzen
PFM Specialist
DNR-Forestry
Box 157
Deer River, MN 56636

Tom Kroll
Forester
3725 12th St. N.
Box 370
St. Cloud, MN 56302

Forest management encompasses a wide range of activities and practices. Planting trees, building wildlife ponds, erecting fences, creating food plots and restoring prairie habitat are just a few of the myriad of management practices that can occur on privately owned property.

All of these involve time, motivation, strategy, physical labor and money. Of these, the biggest constraint is usually money. If a person has all the time in the world and is highly motivated and capable of seeing an activity through from start to finish but does not have the money requires to purchase the planting stock and tools necessary to perform the task, the project will not get past the drawing board.

Another factor, which is often overlooked but which can determine the success or failure of a practice is strategy. Even the best laid plans can run into a few snags, but without prior strategy, these snags can become insurmountable and the practice becomes a failure.

The other three factors, time, motivation and physical labor, intertwine with those mentioned above. The time and physical labor devoted to a practice is dependent upon the size of the project, prior planning and the budget. And without motivation, the project doesn't get past the wishful thinking stage.

How to conquer and then incorporate these factors into a successful management activity begins with advice and assistance, which, in most cases is free. Foresters, wildlife managers, soil and water specialists are just a phone call away. Ask to have someone visit your property so that they can see the terrain, timber types and configuration of the land. Let your objectives for the property be known. A management plan can then be tailored to each landowners specific needs and wants.

Once a plan has been written, words can be put into action. Strategy for a management practice can be developed by the landowner with assistance from a professional natural resource manager. The amount of time and physical labor a landowner devotes to a practice is dependent upon the type of practice and the amount of participation the landowner desires.

Some practices, such as tree planting allow the landowner total flexibility in determining participation. A landowner can become immersed in this practice, planting all of the trees. Or, only a portion will be planted by the landowner and the remainder by a vendor. Or, the vendor may be hired to do the entire planting.

Other practices, such as wildlife pond construction allow virtually no landowner participation, unless the landowner is versatile in the operation of heavy equipment. Most management practices fall between these two extremes.

As mentioned previously, money is the backbone of every practice. Without the investment of money, most practices would never occur. Fortunately, there are a wide variety of Federal and State financial assistance programs available to landowners.

Some of these programs are outlined below. Some practices which are targeted for non-forested cover types, such as field windbreaks, have been omitted. Landowners interested in farm practices should contact the Soil and Water Conservation District (SWCD) office in the county where the land is located. Some of the practices listed below have more than one management option. An example, listed under the Agricultural Conservation Program (ACP) is seeding. Three types of seeding can be done under this practice. Each has a different cost-share rate. The mid range rate is used in these examples.

All of these cost-share programs are administered at the county level. For most of these programs, the counties have the latitude to tailor a program to better suit the needs of the private woodland owner within that county. All practices have specifications which must be followed before payment is made. These specifications ensure that the practice follows sound natural resource management and not haphazard or poorly planned activities. Please contact the appropriate agency for specific information.

AGRICULTURAL CONSERVATION PROGRAM (ACP)

Provides cost-sharing with landowners to carry out conservation and environmental practices that result in long-term public benefits.

<u>Fund Source</u>	<u>Cost Share Rates</u>	<u>Maximum</u>	<u>Available</u>
Federal ASCS	75% of actual cost	\$3,500/yr.	All counties

<u>Practice</u>	<u>Max. c/s per unit</u>
Site Preparation	\$100/acre
Planting Softwoods	\$13/hundred
Planting Hardwoods	\$20/hundred
Planting Shrubs	\$34/hundred
Seeding	\$45/acre
Thinning Softwoods	\$110/acre
Thinning Hardwoods	\$65/acre
Pruning to 17 feet	\$90/acre
Release from weeds	\$60/acre
Natural Regeneration	\$100/acre
Habitat Improvement	
Trees Shrubs	Set by county
Grasses and Legumes	Set by county
Wildlife Ponds	Set by county

More information or assistance in applying can be obtained by contacting your local forester, DNR wildlife manager, or Soil Conservation Service (SCS) or Agriculture Conservation and Stabilization Service (ASCS).

FORESTRY INCENTIVES PROGRAM (FIP)

Encourages landowners to plant trees on suitable open lands or cutover sites. This practice is quite similar to the above ACP tree planting practice except that FIP has a primary goal of timber production and the landowner may receive more cost-shares under FIP. Up to \$10,000 may be earned each year with FIP which allows for completion of larger projects.

<u>Fund Source</u>	<u>Cost Share Rates</u>	<u>Maximum</u>	<u>Available</u>
Federal USFS	65% of actual cost	\$10,000/yr.	N. counties

<u>Practice</u>	<u>Max. c/s per unit</u>
Site Preparation	\$87/acre
Planting Softwoods	\$11/hundred
Planting Hardwoods	\$17/hundred
Planting Shrubs	\$29/hundred
Seeding	\$39/acre
Thinning Softwoods	\$95/acre
Thinning Hardwoods	\$56/acre
Pruning to 17 feet	\$78/acre
Release from weeds	\$60/acre
Natural Regeneration	\$87/acre

For more information contact your local forester or county ASCS

MINNESOTA FORESTRY INCENTIVE PROGRAM (MFIP)

Provides cost-sharing for forestry related practices not covered by other state and federal program, but which will result in increased forest production and protection of the environment.

<u>Fund Source</u>	<u>Cost Share Rates</u>	<u>Maximum</u>	<u>Available</u>
DNR Forestry	65% of actual cost (50% for roads)	None	24 counties

<u>Practice</u>	<u>Max. c/s per unit</u>
Road Construction	\$0.60/foot
Woodland Fencing	\$11/rod
Firebreak Const.	\$.75-1.25/rod
Gopher Control	\$20/acre

Funds for this practice are administered by Soil and Water Conservation Districts. For more information contact your local forester or local SWCD.

REINVEST IN MINNESOTA (RIM)

Purchase 20 year or permanent easements from landowners on erodible acres. A permanent cover crop is established to control erosion and provide wildlife habitat. Similar to CRP except that additional acres are eligible under RIM and RIM easements are longer term.

<u>Fund Source</u>	<u>Cost Share Rates</u>	<u>Maximum</u>	<u>Available</u>
State Bonding	75% of actual cost 100% perpetual easement	\$50,000	All counties

<u>Practice</u>	<u>Max. c/s per unit</u> <u>20 yrs.</u>	<u>Max. c/s per unit</u> <u>permanent</u>
Vegetative Cover	\$75/acre	\$100/acre
Prairie Grass Pltg	\$75/acre	\$100/acre
Woody Cover Pltg	\$200/acre	\$300/acre

This program is administered by the SWCD. Contact them for more information.

FOREST WILDLIFE HABITAT IMPROVEMENT PROGRAM (FWHIP)

Evolved through RIM program to provide technical and cost-share assistance to landowners to improve wildlife habitat when cost-sharing is not available through other programs.

<u>Fund Source</u>	<u>Cost Share Rates</u>	<u>Maximum</u>	<u>Available</u>
DNR Wildlife	75% of actual cost (100% for brushland)	No Max	All counties

<u>Practice</u>	<u>Max. c/s per unit</u>
Wildlife Opening	\$175/acre
Seeding of Openings	\$30/acre or \$45/mile
Brushland Management	\$100/acre
Browse Management	\$100/acre
Firebreak Construction	\$175/mile
Timber Stand Management	\$150/acre

For more information contact your local DNR-Wildlife manager.

CONSERVATION RESERVE PROGRAM (CRP)

Pays farmers, based on bids, to discontinue growing crops on highly erodible land. A cover crop of grass, shrubs or trees must be planted to control erosion. Ten year contracts are developed for enrolled acres with annual payments to the landowner. Average bids in Minnesota are \$45 per acre per year.

<u>Fund Source</u>	<u>Cost Share Rates</u>	<u>Maximum</u>	<u>Available</u>
Federal ASCS	50% of actual cost	\$50,000/yr	All counties

<u>Practice</u>	<u>Max. c/s per unit</u>
Vegetative Cover	\$30/acre
Prairie Grass Plntg	\$55/acre
Site Preparation	\$45/hundred
Softwood Planting	\$9/hundred
Hardwood Planting	\$13/hundred
Shrub Planting	\$23/hundred
Wildlife Planting	\$40/hundred

For more information contact your local forester, SWCD or county ASCS.

SHARP TAILED GROUSE SOCIETY

This private, non profit group does not have financial assistance available to private landowners, but the society will provide seed such as sunflowers and small grains (wheat, oats, corn) to individuals for food plots. The only requirement is that the food plot must be in sharp-tail habitat.

For further information contact MN Sharp-Tailed Grouse Society, PO Box 3338, Duluth, MN 55803.

MN WATERFOWL ASSOCIATION

Through this organization individuals can file project applications for wetlands, waterfowl and upland nesting habitat. The project is reviewed by the association and by DNR Wildlife. There are currently seventeen chapters in the State. An individual need not be a member to apply for a specific project.

For further information contact MN Waterfowl Association, 5701 Normandale Road, Minneapolis, MN 55424.

RUFFED GROUSE SOCIETY

This society provides wildlife management assistance to individuals that are members of the society. Membership is \$15.00 per year. They also sell "Managing Northern Forests for Wildlife" by Gordon Guillon, which provides detailed guidelines on ruffed grouse management.

For further information contact the Ruffed Grouse Society, 2301 Pokegama Ave. So., Grand Rapids, MN 55744.

MINNESOTA DEERHUNTERS ASSOCIATION

This private organization may provide funding for special projects. This could include projects improving deer habitat where other funding has expired or for priority projects.

For more information contact the Minnesota Deerhunters Association, Grand Rapids, MN 55744.

PHEASANTS FOREVER

This private group will provide cost-sharing to assist private landowners improve pheasant habitat. This could include "piggy-backing" on other cost share programs for such practices as winter cover, food plots and nesting habitat.

For more information contact Pheasants Forever, PO Box 75473, St. Paul, MN 55175.

FEDERAL WATERBANK PROGRAM

Authorized 10 year lease contracts with landowners to protect qualifying wetlands. Payments are approximately \$10 per acre per year for wetlands and \$30 per acre per year for adjacent uplands. These acres make excellent wildlife, particularly waterfowl, habitat.

For more information contact your county ASCS or SCS office.

STATE WATERBANK PROGRAM

Provides funds to compensate landowners who have been denied permission to drain potentially farmable wetlands.

For more information contact the DNR-Division of Waters.

WILDLIFE HABITAT IMPROVEMENT PROGRAM (WHIP)

This program is for food plots and winter cover on agricultural lands. This is used mostly for pheasant habitat and deer yards.

For more information contact DNR Area Wildlife Manager.