

1994 Forest Health Highlights

Minnesota

The Resource

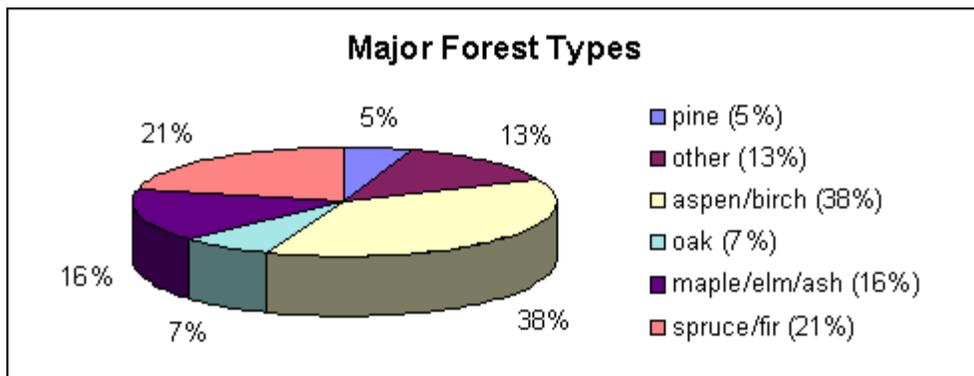
From urban forests to wilderness areas, trees in the state of Minnesota are a valuable resource. Forests in the State are home to the largest wolf population in the lower 48 states, and annually, millions of people visit to canoe and fish.

In addition, forestry related industries and manufacturing employ about 60,000 people. The value of wood products annually exceeds \$7 billion. A total of 4 million cords of wood were cut in 1993. Pulp and paper accounts for 31% of the cut. Other products include sawlogs, veneer, posts and poles, fuelwood, and wood chips for landscaping. Window frames make up 20% of all the value of products produced. The Christmas tree industry in Minnesota is valued at over \$25 million each year.

- 33% of the state is forested (16,718,000)

Out of the forested area:

- 88.0% timberland
- 6.6% non commercial or reserved forestland



Special Issues

The **oak wilt** suppression program began in 1991. Approximately 1700 sites in urban areas have been treated by severing root grafts between infected and healthy trees using a vibratory plow. Over 130 miles of plow line have been installed and 5,000 spore producing trees removed. Four communities have effectively cleaned up the oak wilt problem as of December, 1994.

Due to a quarantine breach involving commercial nursery stock, Minnesota has been dealt a major blow in its battle to keep **gypsy moth** out of the state. Infested nursery stock were shipped to approximately 200 nursery outlets and sold around the state before the incident was discovered in late May. The result is an increase in the number of male moths captured in pheromone traps from 1993 levels. Follow-up surveys found new egg masses at seven sites. All areas will be sprayed, mass trapped, and monitored.

A study of the **birch resource** was undertaken to determine losses due to drought and defoliation during the late 1980's. Over 1,000 birch trees were evaluated in Carlton, Cook, Koochiching, Lake, and St. Louis Counties to determine crown dieback and mortality. The survey found a 400% increase in the annual birch mortality rate between 1990 and 1992; 104 million cu ft were lost each year. About 20% of the trees alive

in 1989 died before September 1992. It is estimated that 105 million trees died statewide. This corresponds to when drought and defoliation conditions were most severe in northeastern Minnesota. However, the trend in birch decline and mortality appears to be improving, with over one-third of the live trees showing no dieback and 60% having less than 5% dieback.

Butternut in Minnesota is in the most northern and western part of its natural range. **Butternut canker**, caused by a fungus believed to be introduced, *Sirococcus clavigignenti julandacearum*, is rapidly killing off butternut trees as the disease spreads throughout its range. In 1994, all cankered trees were found in four additional counties in the state, which enlarges the known range of the disease. The percent of butternut trees cankered in a stand ranged from 10 to 70%. Cankers predominated on trees larger than 10" dbh.

Other Issues

The winter of 1993-1994 caused the most serious **injury to black walnut** trees ever observed in southeast Minnesota. Most of the injury occurred either in valley or bottomland sites. It is estimated that 10% of walnut plantations were lost. The vast majority of affected plantations had no past history of any winterkill problems. State plantations in Wabasha and Goodhue Counties on upland and bottomland sites also were surveyed. About 20% sustained some level of winter injury. Of the eight plantations in this survey, three were severely damaged. All three are located in valley positions with steep adjacent side slopes. Seventy-five to 100% of the trees had crown dieback of more than 50%. In the years of 1989, 1990, and 1994, the low temperature reached below -40°F. Black walnut silvicultural recommendations have been altered in response to this dramatic and serious winterkill event.

Spruce budworm defoliation in central Minnesota is concentrated in 20 to 40 year old white spruce plantations, with no notable defoliation of balsam fir. This is a rare occurrence in Minnesota. The last time budworm was active in these counties was in 1954, when a one year outbreak occurred on the Chippewa National Forest. Most of the plantations had two or three years of heavy defoliation, resulting in sufficient shoot mortality which caused a tufting of the branches. In the next one or two years, these trees will become top-killed if there is continued feeding damage. Currently, the budworm population is not large enough to utilize all the new growth, therefore, there is enough food for the population to increase. The outbreak could collapse next year, but it more likely will run its course, with possibly 4 to 12 more years of defoliation.

Regional Surveys

Forest Health Monitoring

From June to September 1994, crews travelled throughout Minnesota installing plots to begin monitoring the health of the forests. This is a new effort in Minnesota and is part of a nationwide Forest Health Monitoring Program. The motivation to begin monitoring the health of forested ecosystems grew out of the concerns for the effects of air pollutants, insects, diseases, and other stressors, as well as the concern over the potential effects of global climate changes to the composition and stability of forests. The program began in 1990 in the northeastern states and is a partnership between the Environmental Protection Administration and State agencies involved in managing forests.

The monitoring program includes a network of permanent plots and surveys of forest pests and other stressors. In Minnesota there are 360 plots, of which 120 are forested plots, for sampling trees, seedlings, saplings, and other vegetation. In addition, Forest Health Specialists conduct aerial and ground surveys of forested areas for damage. Surveys for Jack pine and spruce budworms, pine tussock moth, and gypsy moth are also carried out. Other indicators of forest health have been measured in various locations, including ozone sensitive plants, lichens, plant diversity, and photosynthetic efficiency. Monitoring will be useful to look at current health and changes in forest condition.

North American Maple Project

For the third field season, Minnesota has participated in this joint international project with Canada and several northeastern States. Each year maple tree crowns are evaluated for branch dieback, foliage transparency, foliage discoloration, dwarfed foliage, and defoliation. Any new insect or disease injury and amount of seed production are also recorded.

In 1994, most trees had good crown condition. Since there has been little disturbance since 1989, (drought or defoliation), there was little dieback and the crown transparencies were good. For the second year of collecting seed production data there was little seed production in these stands.

Stewardship

Farmers own about one-quarter of all commercial forest land in the State. Since the inception of this program in 1990, nearly 350,000 acres of these lands are being managed under stewardship plans which provide guidelines for meeting wildlife, soil and water, recreation, and forestry objectives. Forest health and fire protection principles are incorporated into stewardship plans.

For More Information

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