

1997 Forest Health Highlights

Minnesota

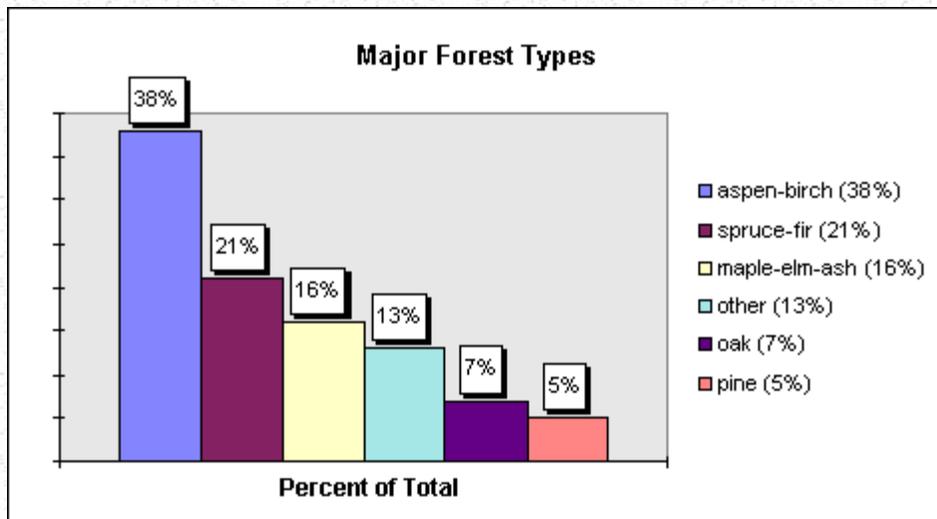
The Resource

Minnesota's trees are a valuable resource. Forests account for 33% of Minnesota's land area, or about 16.7 million acres. The area of all forest land in the State has increased by 0.7 percent since 1977. Private land owners control 48.5% of the timberland; state, county, and municipal governments administer 37.8%, and the National Forest comprises 12.4%.

These forests are important to both the wood products and tourist industry. Forestry related industries and manufacturing employ about 60,000 people. The value of wood products annually exceeds \$8 billion. A total of 4 million cords of wood were cut in 1993, pulp and paper and oriented strand board accounts for 34% of the cut. Window frames make up 20% of all the value of products produced. Other products include sawlogs, veneer, post and poles, wood chips for landscaping, and fuelwood, although wood for energy accounts for only 4% of the volume cut, down from 12% in 1990. The Christmas tree industry annually produces more than 3 million trees worth over \$25 million.

Trees are also important components in wilderness and urban settings. The Boundary Waters Canoe Area (over 1 million acres) has more visitors than any other wilderness in the United States. Forests in the state are home to the largest wolf and bald eagle populations in the lower 48 states. Annually, millions of people visit to camp, canoe, fish, hike and hunt.

Urban trees increase property values and enhance the beauty of open spaces. More than half of the population of Minnesota lives in the Twin Cities Metro Region. The developed areas of the Metro Region have a dense tree canopy cover of over 50%. At least 10% of the urban area is kept in natural open space including lakes, wetlands, prairie, and forests. No community has planted more than 10-15% of any one species, a lesson learned from the widespread mortality from Dutch elm disease in the 1970's.



Special Issues

Since 1991, USFS S&PF has funded a cooperative suppression program in the metropolitan region to control oak wilt, a fungal disease that kills oaks. 3568 sites (500 in 1997), out of 7250 known sites, have been treated by vibratory plow in order to break root grafts so the disease can't spread to adjacent healthy oaks. On these sites, more than 8900 infected trees have been removed and destroyed to prevent overland spread of the disease.

Minnesota caught 261 **gypsy moths** in the pheromone trapping grid. This was not even close to the record of 580 moths taken in 1984 or the "Breach Year" (1994) catch of 350 moths. We have actually seen a dramatic increase in the number of sites over the past three years: from 67 in 1995, to 117 in 1996, and to 154 in 1997. The increase in just the last year was 37 new sites. In the county department, we tied the record of 25 counties established in 1995.

The most significant increase in site numbers was produced in three key southeastern counties of Fillmore, Houston, and Winona. In 1994, this area was trapped and produced just four moths at four sites. This year's take was an astounding 65 moths from 49 sites.

Metro counties actually showed a decrease in sites to 68, down from 86. One bright spot was the discovery of an infested cotoneaster shrub in the Apple Valley spray area from 1996. The shrub produced an astounding nine egg masses and six pupae. The other "hot spot" this year was over in Eden Prairie where some "uncertified" blue spruce from Michigan were planted. These did not come through legitimate nursery channels and the USDA is investigating.

Analysis of Gypsy Moth Damage Potential in Minnesota

With the specter of gypsy moth knocking at our door, we need to take a deep breath, lean back, evaluate the situation, and earnestly begin to prepare for a forest ecosystem that includes an increased defoliation stress component.

A four layer, weighted model was created to assess the potential damage to forested stands in Minnesota due to the introduction and outbreak of the exotic gypsy moth, *Lymantria dispar*. In this analysis, the damage potential of the gypsy moth was identified relative to where defoliation is (1) likely to be heavy and sustained and (2) have the greatest chance of "contacting" additional environmental stress.

The damage potential model was created by combining four Minnesota data sets. These sets can be classified into two groups, biological and environmental, based on their general nature and dynamic state. Biological data sets consisted of land cover type and forest cover density. These describe the general vegetative cover of the land and are considered to be dynamic variables in the analysis, i.e. they can change with time. The environmental variables of soil type and environmental stress, measured as Evapotranspirational Shortfall (*EVTS*), are generally considered to be fixed save major catastrophic events of geology or climate.

As the result of this analysis, we are able to predict that the introduction of gypsy moth into Minnesota's forest ecosystems is likely to have a major impact on the nature of the forest cover. If the pattern of damage holds from other states, this change will occur over a period of years, likely decades, as gypsy moth outbreaks wax and wane. Damage will likely occur in individual stands as mortality of preferred host species, oak and aspen, leads to stands with a higher component of non-preferred species. Mortality will be highest in intermediate and suppressed trees and be worse on sandy or droughty soils. It is likely to accelerate dramatically in areas where drought and defoliation due to forest tent caterpillar occurs.

According to this model, the highest GMDP ratings are in these counties: Winona, Houston, Itasca, Kanabec, Wabasha, Fillmore, Cass, Crow Wing, Carlton, Pine, Todd and Morrison. The Twin Cities area will suffer some damage but will likely bear the brunt of the "nuisance damage factor" due to high public contact in the urban forest.

The 1997 spring **record flood** along the upper reaches of the Minnesota River and Red River of the North broke most existing flood records in Minnesota. In the post-settlement era, no sequence of extreme precipitation events has impacted these river basins as those experienced during the autumn of 1996 through the spring of 1997. The Federal Emergency Management

Agency's estimate of public infrastructure damage was approximately \$300 million. Before the water receded, 58 of 87 counties were declared federal disaster areas. The American Red Cross reported that 23,263 families were affected by the massive floods. Total flood damages and associated economic impacts were estimated to be as high as \$2 billion. At the present, the impact on woodlots and shade trees is not known. Reports should be available in 1998.

A **straight line wind** and a tornado knocked thousands of acres of woodlands down this year. On the evening of July 1st, straight line wind cut a wide swath across central Minnesota that included Wright County east through Sherburne County, western Anoka County, and on into Wisconsin. It is estimated that a swath 5 to 10 miles wide by 40 miles long was affected.

The second notable storm was a **tornado** on September 18th that cut a sinuous path through Morrison, Mille Lacs and Kanabec Counties. Over 5,000 acres of trees were blown down or destroyed.

Other Issues

Spruce budworm is a defoliator of balsam fir and white spruce that causes topkill and mortality after 5 to ten years in any one location. In its forty-fourth year of "outbreak" in northeastern Minnesota, spruce budworm defoliated 257,000 acres. This is an increase of nearly 50,000 acres compared to last year, which was a "low" year. The population center seems to be in northern St. Louis County and over the years, the center has slowly moved west from Cook and Lake Counties. **Regional Surveys**

Since the early 1980's, the "bellwether" locations for **fall defoliators** have been quiet. In 1995, one location had noticeable feeding on oaks and by 1996, forty acres were defoliated there. This year orangestriped oakworms, *Anisota senatoria*, redhumped oakworms, *Symmerista canicosta*, yellownecked caterpillars, *Datana ministra*, and pinkstriped oakworms, *Anisota virginiana*, defoliated about 1700 acres in central Minnesota. Walkingsticks defoliated about 200 acres there also. Defoliated sites ranged from five to 1500 acres in size. Caterpillars are predicted to increase in 1998 because their observed natural enemies (parasites, diseases, predators) were minimal. Walkingsticks won't be back until 1999 since they have a two year life cycle.

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