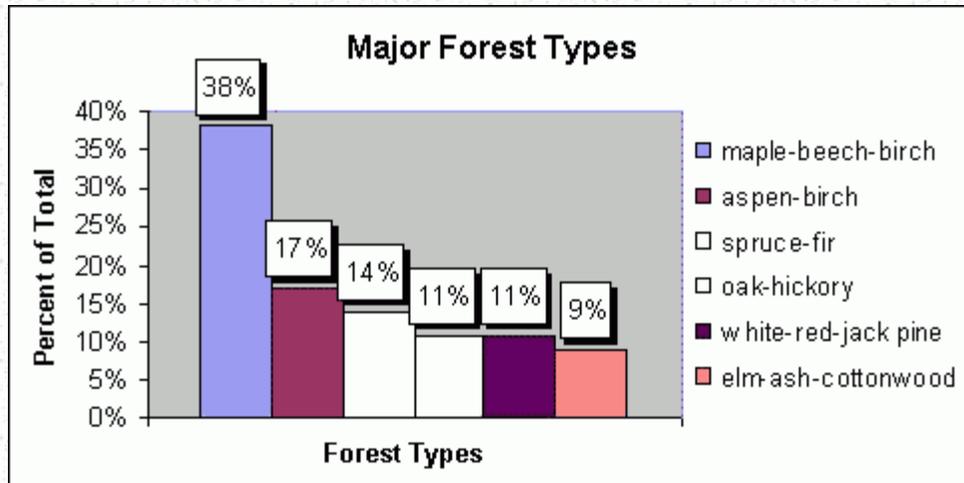


# 1997 Forest Health Highlights

## Michigan

### The Resource

Forests comprise 53% of the land area of the state, or about 19.3 million acres. These forests are a critical component of Michigan's economy for the recreational opportunities and the products they provide. Forestry related industries and manufacturing employ 150,000 people statewide, and annually contribute \$9 billion to the state's economy. Additionally, forest-based tourism and recreation support 50,000 jobs and add \$3 billion to Michigan's economy. Michigan's forests contribute to clean air, water, and reduce soil erosion.



### Special Issues

Gypsy moth, introduced over a century ago from Europe, causes defoliation across the northeastern United States each year. Until 1997, gypsy moth populations in Michigan had declined dramatically since 1992 when defoliation exceeded three-quarters of a million acres. This decrease was largely due to the fungus *Entomophaga maimaiga*, a particularly effective natural enemy of the gypsy moth. This fungus was introduced into the state in the early 1990's, when gypsy moth populations were at an all-time high. The fungus spread quickly, and is now established in nearly all counties that have experienced gypsy moth defoliation. The fungus, which is harmless to other wildlife and the environment, is a powerful natural control, but its effectiveness depends on weather conditions. Warm, wet weather favors the spread of the fungus, which infects caterpillars as they move across the ground in search of food. Recent cool, dry spring weather is blamed for a resurgence in gypsy moth defoliation. Defoliation increased from 3300 acres in 1996 to 38,000 acres in 1997. Fortunately, *Entomophaga* can remain dormant in the soil for several years until weather conditions are favorable.

No gypsy moth caterpillars or defoliation were detected in the Upper Peninsula in 1997. The Michigan Department of Natural Resources continues to cooperate with the USDA Forest Service, Michigan State University Extension, and the Michigan Department of Agriculture in a Slow-the-Spread of gypsy moth project in the Upper Peninsula. About 4,000 pheromone traps were placed in the 3,400 square mile Slow-

the-Spread area of the Central Upper Peninsula. A significant increase in moth catch throughout the STS zone in 1997 is currently being evaluated. A significant proportion of these moths may be blowing in from nearby infested areas of Wisconsin.



### **Regional Surveys**

**Forest Health Monitoring.** In 1994, permanent plots were established to monitor the health of Michigan's forests. This is part of a nationwide Forest Health Monitoring Program, in partnership with the Environmental Protection Agency. The motivation to begin monitoring the health of forested ecosystems grew out of the concern for the potential effects of air pollutants, insects, diseases, and other stressors, and concern for the potential effects of global climate changes. There are 247 plots in Michigan, of which 133 are forested.

A second plot monitoring system, the **Michigan Impact Monitoring System**, provides a more detailed look at stressors affecting the major forest types in the Upper and northern Lower Peninsulas. Over 600 plots are measured each summer to determine the health of mature trees and young seedlings and saplings in the understory of Michigan's oak, aspen, and northern hardwood forests.

Recently, information collected from these two plot systems detected a problem with basswood across much of its range. Repeated attacks by a group of insect defoliators may be one factor contributing to the decline and death of basswood trees. A cooperative effort between the U.S. Forest Service and several Lake State agencies will try to unravel the causes and effects of this decline.

### **Other Issues**

Numbers of the **jack pine budworm**, a needle feeding caterpillar that attacks jack pine of all sizes, have increased sharply since 1996. Some 25,000 acres were defoliated by the budworm in the northcentral Lower Peninsula in 1997. Jack pine that is 60 years of age or older is particularly susceptible to topkill and death. Stands of jack pine that are under stress from competition caused by poor growing conditions are also prone to mortality following defoliation. Management efforts focus on identifying high-risk stands for harvest prior to defoliation, and prompt salvage of trees killed by the budworm. Use of insecticides is rarely cost-effective against the budworm except in areas, where dead trees may decrease recreational value. **Exotic Forest Pests Other Than Gypsy Moth**

The **pine shoot beetle** (*Tomicus piniperda* (L.)) was first discovered in two Upper Peninsula counties in 1997. These counties are included in a quarantine with 63 counties in Lower Michigan. Although Scots pine is a preferred host, other pines are attacked. Attacked shoots usually bend and break at the point of attack.

Tomicus is an exotic pest discovered in Ohio in 1992. It has now been found in Michigan, Indiana, Ohio, New York, Illinois, and Pennsylvania. A quarantine is in place to hinder its spread to new areas as evaluations of its environmental and economic impact determine the next course of action.

The impacts of exotic weeds are not well understood, but the threats are real. Native plants and habitat in wetlands are being displaced by **purple loosestrife** (*Lythrum salicaria* & *L. virgatum*). Loosestrife is an aggressive invader, excluding native vegetation where it grows. Purple loosestrife is not a food source for native animals or insects.

Spotted knapweed (*Centaurea maculosa*) is an aggressive invader of disturbed sites and releases chemicals in the soil that affect growth of nearby vegetation. It is a prolific seeder. It is not eaten by animals because it can irritate their mouths. Knapweed is a poor soil stabilizer on disturbed sites due to bare ground under plants via allelopathic exclusion of other plants.

Other examples of exotic weeds of concern in Michigan include **leafy spurge** (*Euphorbia esula*) and **garlic mustard** (*Alliaria officinalis*). Exotic plants have the advantage of not being limited in growth or reproductive potential by biological controls such as insects feeding on leaves, roots, flowers or seeds. This gives them a very strong competitive advantage over native flora. Thus, native flora are competitively displaced, disturbing natural floral, faunal and ecosystem functions.

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