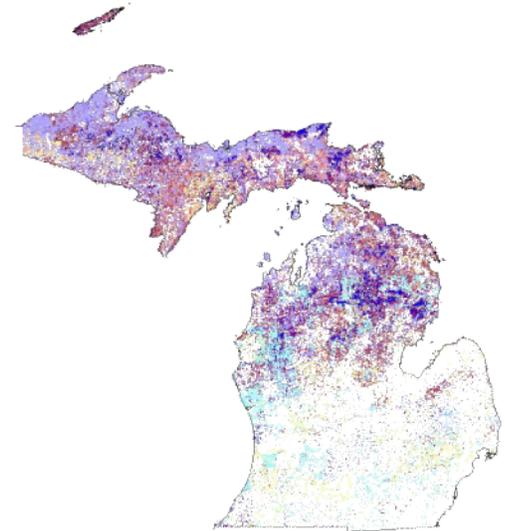
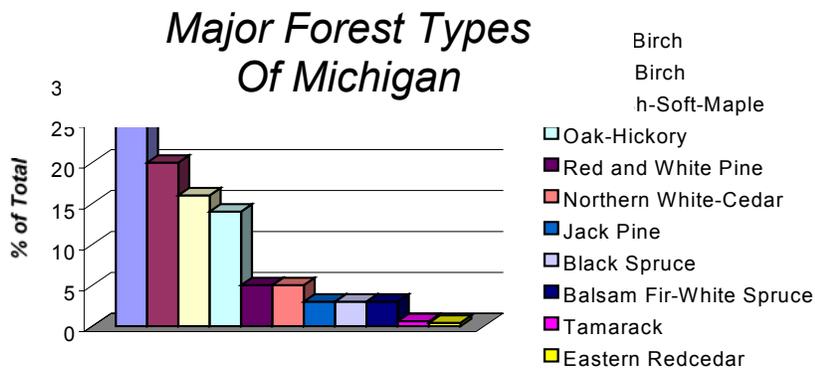




### The Resource

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 environment and 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.



The introduction of **exotic organisms** is perhaps the most serious health threat to our native forest ecosystems. State and federal agencies are preparing contingency responses and increasing resistance to the possible introduction of exotics such as the **Asian longhorned beetle**, the **Hemlock Woolly Adelgid**, the **Balsam Woolly Adelgid**, and **Sudden Oak Death**.

A **Hemlock Woolly Adelgid** Quarantine now restricts movement of eastern hemlock into Michigan from infested counties of other states. All eastern hemlock shipments require a phytosanitary certificate. Two infested shipments of hemlock were intercepted in 2001. Both shipments were made prior to enacting the HWA quarantine. These introductions were eliminated by immediate and aggressive action by the Michigan Department of Agriculture.



**Beech bark disease** (BBD) was detected in the spring of 2000. The interaction of an exotic scale insect (*Cryptococcus fagisuga*) and a native and exotic canker-causing fungus (*Nectria* sp.) cause beech bark disease. Once infected by the fungus, trees usually decline and trunks may break at canker sites. Two state parks are currently removing many infested beech because of the hazard posed by these potentially dangerous trees. The disease has significant implications for wildlife in areas where beechnuts are the major or only mast crop in the northern hardwoods.



As the disease progresses, the majority of large, mature trees will die. Salvage or pre-salvage operations are only recommended for heavily infested stands. A system of monitoring plots is being established to 1)

Delineate the advancing & killing front of the scale; 2) Identify & quantify tree, stand & site factors influencing rates of decline; 3) Identify potentially resistant trees; 4) Measure impacts of native & exotic *Nectria*; 6) Study regeneration potential of beech & other tree species; 6) Evaluate wildlife impacts; and 7) Revise beech productivity models to ensure the affected forest resource is sustainably managed.



**Sudden Oak Death** (*Phytophthora ramorum*) poses a real threat to Michigan's forest resources. We are currently conducting a risk analysis to determine the exact nature of this threat. This will be an ongoing effort, as this potentially devastating new disease is better understood. For more information visit <http://www.suddenoakdeath.org>

In the past decade **Sphaeropsis** (*Sphaeropsis sapinea*) has been increasingly associated with damage and mortality of red and jack pine in Michigan. Prior to the 1980s, damage by the pathogen was rare in the Lake States. Increasing damage by the pathogen has been correlated to the increasing prevalence of a more virulent and more aggressive form (morphotype), called Type A. There is evidence that the Type A *S. sapinea* may be an introduced species that is replacing the presumptive native and less virulent, less aggressive Type B. Severe damage is often associated with site stresses, and drought years like 2001 when 1,174 acres of affected plantations were detected. Research efforts are currently underway to evaluate the presence of Type-A *S. sapinea* in Michigan red and jack pine.



An exotic plant receiving much attention in the UP is **garlic mustard** (*Alliaria petiolata*). Garlic mustard poses a severe threat to native forest plants communities. Garlic mustard completely displaces native hardwood wildflower communities. A few small

introductions have been detected in the Eastern UP. This is one of several exotic plants of concern. A new interagency council, the Michigan Invasive Plant Council (MIPC) has been formed to address exotic plant issues and actions in Michigan. For more information visit the MIPC website at <http://www.msue.msu.edu/mipc>.

Incidence of the vascular disease **oak wilt** continues to increase from 2000 levels in several areas around the Upper Peninsula and the northern Lower Peninsula of Michigan. In response, a statewide oak wilt initiative is underway in cooperation with the Michigan Department of Agriculture and the Michigan Department of Natural Resources. This effort is focusing on detecting new and established oak wilt pockets across the state, and working with local communities to suppress the spread of infection centers. In addition, a 7-state consortium is forming to address research and management issues in the Midwest.

Detection is being accomplished through ground surveys conducted by state, federal, and private foresters, consultants, and nursery inspectors. For the first time, the public will be able to view maps and information about the status of oak wilt in Michigan by pointing their browser to the **Report a Forest Pest** feature on the **Michigan DNR Forest Health website** at <http://www.michigan.gov>.



To slow the overland spread of oak wilt, harvesting restrictions are being exercised on state land. Forest stands with oak trees are not being cut between April 15 and July 15 in areas where the risk of oak wilt is high. These dates mark the period when the **sap-feeding beetles** responsible for spreading oak wilt are most active. These small (1/4-inch long) beetles are attracted to fresh tree wounds and transmit spores to oak trees that have been damaged during logging operations.

**Multicolored Asian lady beetle** (*Harmonia axyridis*) continued to enter homes by the hundreds in the fall. Based on the number of calls and publicity, populations were significantly down from 2000. This lady beetle is one of many exotic ladybeetle purposely released in the U.S. since the early 1900's as a biological control of selected insect pests.



The **Larch Casebearer** defoliated tamarack (eastern larch) in the central Upper Peninsula for the second consecutive year. Larch casebearer is an exotic insect introduced to the Lake States since the early 1900's. Introduced parasites have effectively protected the tamarack resource.

Public agencies and private groups are creating a **Michigan Invasive Plant Council**. The Council's mission is to protect Michigan from the threat of invasive plants like purple loosestrife, leafy spurge, spotted knapweed and garlic mustard by 1) Raising public awareness about the spread and impact of invasive plants; 2) Facilitating the exchange of information concerning management, control, inventory and monitoring of invasive plants; 3) Providing a forum for all interested parties to discuss issues relating to invasive plants; 4) Serving as an educational, advisory and technical support council for all aspects of invasive plants and related issues; 5) Preventing future introductions of new invasive plants; and 6) Developing, maintaining and publishing a council-reviewed invasive plant species list.

### Other Michigan Forest Health Issues

**Gypsy moth** (*Lymantria dispar*) populations continued their downward trend. This marks the first year since the mid-1980's that no gypsy moth defoliation was detected during the annual statewide aerial survey. In the Upper Peninsula, ground surveys indicate that the moth continues its westward movement. All of Michigan is now federally regulated. The first gypsy moth defoliation in the Upper Peninsula could occur in an oak area near Gladstone in the South-central UP in the next few years.



A buildup of **jack pine budworm** (*Choristoneura pinus pinus*) populations began in the Eastern UP this year. The epidemic will spread westward affecting most of the UP jack pine resource in the next 3-4 years. In the Lower Peninsula, jack pine budworm numbers rebounded somewhat in the northcentral and northeastern areas of the region. This follows a widespread collapse in 2000 of an outbreak that began in the 1997. Budworm populations will be monitored in 2002. Stands that were defoliated previously and show signs of heavy population buildup are at high

risk of mortality. These stands will be harvested. Chemical treatment of jack pine budworm infestations is rarely cost-effective. Isolated pockets of **spruce budworm**, *Choristoneura fumiferana*, were detected on 3,600 acres of spruce/fir in Michigan's Upper Peninsula.



The **locust leafminer** (*Odontota dorsalis*) made an unusual appearance in the southwest Lower Peninsula. This insect emerges as the leaves are developing and lay small clusters of overlapping eggs on the lower surface of the leaf. On hatching, the larvae form a common mine that is initially white but turns brown as it becomes larger. Large areas of black locust were affected. Fortunately, parasites of the larvae and pupae of this leafminer reduce high populations before trees are damaged or killed.



The **Forest Tent Caterpillar** (FTC) (*Malacosoma disstria*) defoliated 11.5 million acres. The FTC is a native leaf-feeding caterpillar. Epidemics occur about every 10-15 years in the Great Lakes region, and last for 2-4 years. FTC prefers to eat aspen leaves in the UP though it also readily consumes paper birch, green and white ash, basswood, oak and willow leaves. Sugar maple is readily consumed only in the Northern Lower Peninsula. FTC can defoliate trees for several years with little ill

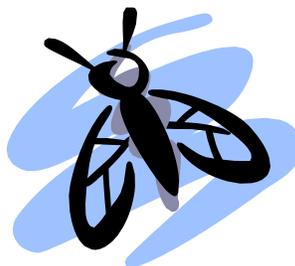
effect. This is especially true for years with average or above average rainfall. Parasites were abundant in this year's populations, signaling a likely significant population reduction in these areas next year.



Tamarack, also known as Eastern Larch (*Larix laricina*) were defoliated by the **larch casebearer** (LCB) (*Coleophora laricella*). Brown trees were evident in many areas of the Central and Eastern U.P. This is an introduced species from Europe, first recorded in Massachusetts in 1886. It now occurs throughout most of the range of tamarack in North America. The LCB is a serious defoliator of tamarack of all ages. Defoliation for two or more consecutive years can cause tree decline and mortality. Populations generally collapse

after a single year of damage thanks to two parasites imported from Europe. These parasites have widely established and are believed to be the reason that outbreak severity has diminished throughout North America.

In the Lower Peninsula, **late spring frosts** damaged new growth on oak trees in low-lying areas. Some oak stands were affected for the second consecutive year. Most trees re-foliated by late June. Wet, cool spring weather led to a widespread outbreak of **hardwood anthracnose** across the Lower Peninsula in 2001. This disease was common on white oak, ash and maple. Many homeowners confused the symptoms of this disease with oak wilt. Because anthracnose is usually isolated to the leaves, trees rarely suffer long term effects. Raking and bagging infected leaves may help reduce the spread of the disease.



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