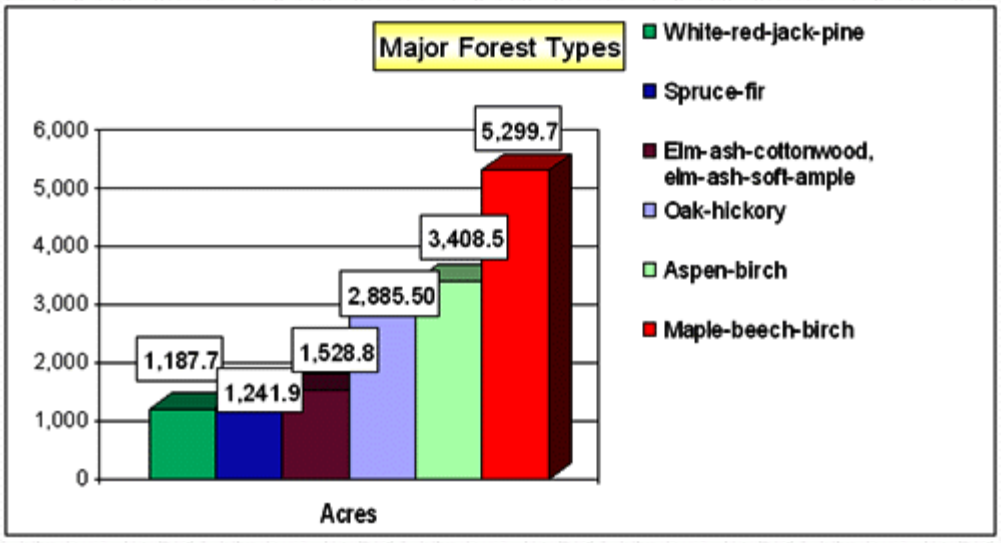
1997 Forest Health Highlights
Wisconsin

The Resource

The area of forest land in Wisconsin has been steadily increasing in recent decades and currently stands at 16.0 million acres, representing 46 percent of the total land area. Wisconsin's forests are predominately hardwoods, with 84 percent of the total timberland area classified as hardwood forest types. The primary hardwood forest type in the state is maple-beech-birch, which makes up 5.3 million acres.

Forests are important to the economy of Wisconsin, not only in the form of wood products but also in the form of recreation and tourism. The primary and secondary wood products industry is the second largest employer in the state and puts Wisconsin first in the nation in the production of fine paper, sanitary paper products, children's furniture, and millwork. The value of shipment of these products annually exceeds $19.7 billion. Forest and water resources in Wisconsin are a primary tourism attraction for both residents and visitors. The variety of Wisconsin's forest ecosystems support a great diversity of wildlife species, while recreational use of the forests continues to grow and expand.



Special Issues

In 1997, insect and disease detection surveys were conducted on approximately 5.5 million acres and evaluation surveys on 3.8 million acres. In addition, Wisconsin DNR regional forest pest specialists continued to teach integrated pest management principles to Wisconsin DNR foresters, industrial foresters, and private woodland owners. Regional forest pest specialists and forest pest unit staff provided a wide variety of programs and information on forest pests in 1997. Approximately 3,800 individuals were educated at 70 different training sessions.

Wisconsin recorded its first visible **gypsy moth** defoliation in 1997. A two-acre patch of willow and aspen in Oconto County was completely defoliated; surrounding willows were lightly defoliated. In mid July, 5th and 6th instar caterpillars were massed on trunks of partially defoliated trees. Some of the caterpillars exhibited symptoms of the gypsy moth nucleopolyhedrosis virus (NPV); presence of the virus was confirmed by lab analysis.

In the spray program, 40,520 acres in 24 locations in 13 counties were sprayed twice with 36 BIU of *Bacillus thuringiensis* var. kurstakii, by fixed wing aircraft. Trapping results indicated

that the spraying was successful in reducing numbers in the spray blocks.

The entire state was trapped in a grid of over 55,000 delta pheromone traps this year. Adult males were caught in every county and a preliminary survey of traps as of November 15, 1997 revealed a total of 91,491 moths collected throughout the state. During the trapping period, egg masses, larvae, pupae, or adult females were found in over 100 locations. The formal egg mass survey began in mid October and will continue through 1998.

During the field season of 1997, the fungus *Entomaphaga maimaiga,* the larval parasite *Cotesia melanoscela,* and the egg parasitoid *Ooencyrtus kuvanae* were introduced as a means of biocontrol for gypsy moth in Wisconsin. Soil containing spores of *E. maimaiga* were released in 32 locations in eastern Wisconsin. Gypsy moth larvae from these populations will be collected in June of 1998 and reared to determine if they have become infected with the fungus. Cocoons containing pupae of *C. melanoscela* were introduced into three sites in Brown, Manitowoc, and Oconto counties. The sites will be revisited next June to determine how many adult parasites successfully emerged. Gypsy moth larvae from these sites will also be reared to determine if they have become parasitized. *O. kuvanae* was released in several locations in Door, Manitowoc, and Oconto counties. A follow-up survey conducted to look for current gypsy moth egg masses that showed signs of *O. kuvanae* emergence yielded negative results.

Extremely **high winds** blew through the Menominee Indian Reservation in Menominee County on July 16, 1997. The storm path was a corridor approximately three miles wide and 12 miles long running almost directly north to south across the entire reservation. Winds were estimated to be in excess of 80 mph in the worst hit parts of this corridor.

The forest lands were the most seriously affected parts of the reservation. It is estimated that 21,000 acres were affected by the storm, with 3,000+ acres having actual damage ranging from scattered fallen trees to nearly complete blow down. White pine shelterwood cuts in the southern part of the reservation bore the brunt of the damage, with over 75% of the seed trees snapped off or tipped over in the hardest hit areas. Some prime sawtimber hardwood areas just north of the reservation also incurred extremely heavy damage. Estimates of blow down are over 30,000,000 board feet.

Northwestern Wisconsin saw a resurgence of the **jack pine budworm** this year. Defoliation occurred in four northwestern counties covering about 120,000 acres, with Douglas County receiving the bulk of the damage. Most of the defoliation was no more than moderate in intensity and caused little significant damage. However, scattered pockets of heavy defoliation covered close to 10,000 acres. In these areas topkill was prevalent and tree mortality was not uncommon. Egg mass survey results indicate that these areas will start the 1998 growing season with slightly fewer budworms than in 1997.

Butternut canker is a devastating fungus disease of butternut. In Wisconsin, butternut canker has been reported in 48 of the 62 counties where butternut trees occur. This disease has been observed on 91% of the butternuts surveyed in 79 locations throughout Wisconsin.

Collections of butternut scion wood were expanded to three new locations where apparently disease resistant trees are growing in Menominee, Waupaca, and Winnebago counties. Scion wood is grafted onto black walnut root stock and planted in orchards in an effort to preserve and maintain potentially resistant trees. This is a cooperative project with the USDA Forest Service, North Central Experiment Station.

A survey of members of the Wisconsin Woodland Owners Association was conducted to locate potentially disease resistant butternut trees and to initiate a network of landowners interested in butternut. Results of the survey will be summarized in the Wisconsin annual report of forest

pest conditions.

Oak wilt, a fungus disease of oaks, continues to be of major concern in Wisconsin's rural and urban forests, especially in the southern two-thirds of the state. Oak wilt is now present in 51 of Wisconsin's 72 counties; no new counties reported the presence of oak wilt this year. Recent efforts to control this disease have concentrated in two areas: 1) formation of a committee (associated with the WI Arborists Association) that concentrates efforts on information and education in communities, and 2) surveying areas pruned by two electric utilities in an effort to monitor the effects of various pruning practices on the overland spread of oak wilt (1997 is the third year of this survey and it will continue for two more). Three years of survey data support the current pruning practices of these utilities as being effective in minimizing the chance of overland spread of oak wilt. Current guidelines for electric utilities state, in rural areas only, pruning of oak may be conducted from April 15 to July 1, but pruning wounds must be covered immediately with a wound dressing. The guidelines also state that pruning may be conducted in urban and rural areas after July 1 and no wound dressing is required.

A workshop on the current status, biology, and management of oak wilt was conducted in cooperation with the WI Arborists Association. The workshop concentrated on disease management options in the urban setting. Approximately 60 arborists attended.

Other Issues

Defoliation by the **cherry scallop shell moth** (*Hydria prunivorata*) increased in Portage and Sauk counties, where trees of all ages were completely brown in mid summer. Most of the defoliated trees refoliated and no mortality was observed during the outbreak. This pest was also found widespread in the west central region of the state where Adams, Jackson, Juneau, Monroe, and Wood counties were heavily affected.

White oak was lightly to heavily damaged by **oak tatters** for the second year in a row. Heavy defoliation to individual trees and groups of trees was noted in many locations throughout southern Wisconsin. Oak tatters is caused by an undetermined spring weather phenomenon. Some specialists believe that the injury is caused by cold temperatures after the bud has broken dormancy, but before it opens. When the leaves open, the tissue between the veins is missing, giving the leaves a "tattered" appearance.

The **pecan leaf casebearer (***Acrobasis juglandis***)** and another **shoot borer (***Acrobasis juglanivorella***)** erupted in 1997 to cause extremely heavy damage to young black walnut in scattered locations throughout southern Wisconsin. Both species mine the buds shortly after bud break in the spring. The shoot borer causes further damage by mining out new shoots. The casebearer spins a cigar-shaped case between two leaflets where it feeds on a small amount of foliage. A five-year-old plantation in Washington County was stripped of nearly all new growth this year. New buds then formed and the damaged trees produced a light second flush of foliage. In Richland County 15-year-old trees were also nearly stripped of all new growth. Damage was more severe on hill tops and less severe on the lower ground. The heavily damaged trees produced a second flush of foliage.

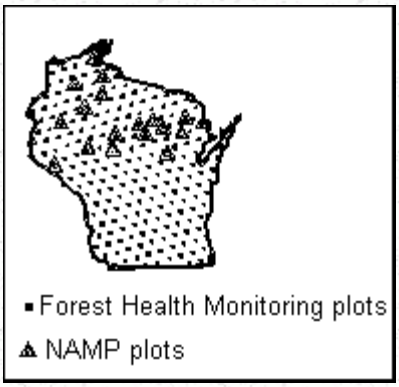
The **red pine shoot moth** (*Dioryctria resinosella*) normally attacks windbreaks and edge trees of red pine plantations, as it has been doing throughout the west central region this year. In the Central Sands counties it appears to have increased in numbers to its outbreak level for the first time since the early 1980's. The uppermost shoots of interior trees have been heavily attacked, and if this continues for several years, as it has in previous outbreaks, the main stem of sapling and pole-sized red pines may become deformed.

Greenstriped mapleworm (*Dryocampa rubicunda*) caused severe defoliation of red maple on over 5,000 acres in Sawyer and Washburn counties. It also completely stripped 30 acres of

silver maple in Interstate Park in Polk County. Since the affected trees did not attempt to reflush, they are expected to recover well in 1998.

Regional Issues

Efforts to detect changes in forest health on a regional (Lake States) basis continues through data collection on permanent plots - 89 for Forest Health Monitoring (FHM) and 18 for North American Maple Project (NAMP). In addition to visiting all plots on the ground, all 18 NAMP plots were observed from the air in an attempt to detect major outbreaks of spring defoliators. No widespread defoliation of sugar maple was detected in 1997. Data for both of these plot programs centers on monitoring crown conditions, including dieback, foliage transparency, and crown density.



The regional forest entomologist position in Green Bay is vacant due to the transfer of Andrea Diss to the new Gypsy Moth Coordinator position in Madison. Plans are under way to fill the position as soon as possible. Kyoko Shimizu, plant pathologist, has joined the staff as the forest pest specialist in Rhinelander.

Forest health remained stable based on data on crown conditions and damage assessments from the 89 **forest health monitoring** plots in Wisconsin. The Wisconsin Department of Natural Resources, in cooperation with the USDA Forest Service and the Lumberjack Resource Conservation and Development, monitored forest health throughout Wisconsin. This is Wisconsin's third year in this program designed to monitor the current health and changes in forest health on a regional basis.

The Wisconsin Department of Natural Resources is a participant in the international **North American Maple Project** (NAMP) designed to evaluate the health of sugar maple forests. This project grew out of a concern that sugar maple decline and mortality was affecting the overall health of sugar maple and threatening the maple syrup producing industry. A total of 18 plots have been established in Wisconsin and trees are evaluated annually. Results indicate that sugar maples are in good condition and have recovered from the 1988 and '89 drought.

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February 1997