Wisconsin Forest Health HighLights

Divison of Forestry
WI Dept of Natural Resources

December 2001

The Forest Health Protection Unit and Regional Forest Pest Specialists provided a wide variety of programs and information on forest pests, and continued to teach integrated pest management principles to DNR foresters, industrial foresters, and private woodland owners. **Pine pest management** was the focus of training this year. Maintaining forest health in northern hardwoods was the focus of **logger training**, in cooperation with the Forest Industry Safety Training Alliance (FISTA). Insect and disease detection and evaluation surveys were conducted on approximately 10 million acres.

In this issue:

THE RESOURCE

—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.

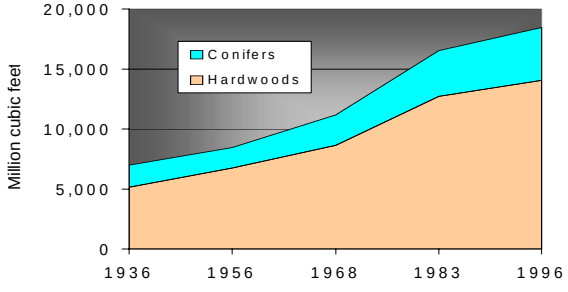


Figure 3. Growing stock volume (in million cubic ft) on timberland in Wisconsin, 1936-96. Data taken from 1996 FIA survey.

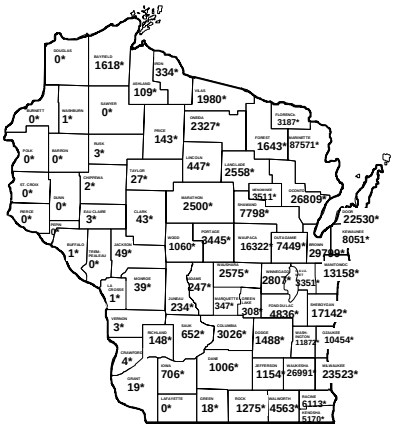
The **area of forestland** in Wisconsin has been steadily increasing in recent decades and currently stands at almost 16.0 million acres, representing 46 percent of the total land area. The state now has the most forest land that it has had at any time since the first forest inventory in 1936. Wisconsin's 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-basswood, which makes up 5.3 million acres (34%) of Wisconsin's timberland area. Conifer types represent 16 percent of the total timberland area (pine forests - 8%, spruce-fir - 6%, and swamp conifers - 2%).

EXOTICS

Gypsy Moth

—Wisconsin's gypsy moth **suppression program** continued to grow, as the number of participating counties increased from 2 in 2000-01 to 9 in 2001-02. In 2001 approximately 1,400 acres in Appleton and Brookfield were treated with Btk in order to suppress outbreaking populations. An estimated 2,700 acres of heavy defoliation was observed in Marinette and Menominee Counties. Nearly 175,000 acres were treated by the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) as part of the national slow-the-spread program. Pheromone monitoring by DATCP trapped an increased number of moths in 2001, com-

pared to prior years. Nuisance caterpillars generated a large number of landowner calls from the Milwaukee and Green Bay metropolitan areas, and from more rural regions in eastern Wisconsin. Egg mass surveys predict heavy defoliation for 2002 in the regions of **Marinette and Menominee counties** that experienced defoliation in 2001. Approximately 3,589 acres were defoliated this year in Marinette County and only 60 acres in Menominee County. Portions of these counties, as well as seven others in eastern Wisconsin, are being proposed for suppression treatment in 2002. Biological control agents were also distributed to a number of cities for introduction.



Gypsy moth trap catch numbers by county.

Multicolored Asian Lady Beetle

—Populations of the Multicolored Asian Lady Beetle (MALB) are at approximately the same level in 2001 as they were in 2000 in Wisconsin. Even though this insect provides some benefit by feeding on aphids that harm agricultural crops and ornamental plants, the MALB has become a nuisance to some individuals. This species can congregate by the thousands on the sides of buildings in the fall and if given the opportunity, move inside. Usually, these insects are harmless, but repeated exposure has caused allergic reactions in a small number of people. Calls and letters requesting biology and management information have been plentiful this year. The University of Wisconsin-Extension, WDATCP and WDNR are all working together to present the same information to the public. An extension bulletin that outlines management options is available at the following website:

http://www.entomology.wisc.edu/entobltn.html.

HARDWOOD PESTS

Ash Yellows - Phytoplasma

—Ash yellows is a disease that affects all ash species in Wisconsin and is caused by a phytoplasma. These organisms slow the growth of ash trees, cause crown dieback and decline, and can lead to premature death. Ash yellows has been found in **ten counties** in Wisconsin: Brown, Calumet, Dane, Door, Sauk, Marathon, Manitowoc, Ozaukee, Sheboygan, and Waukesha counties.

Trees with ash yellows often have thinning crowns with tufts of small lighter colored leaves, epicormic branching along the main stem of the tree and brooms either on the main stem or at the base. Cracks are also common at the base of infected trees. The epicormic branches can appear healthy while the crown is noticeably in decline.



Brooms often form at the base of trees infected with ash yellows.

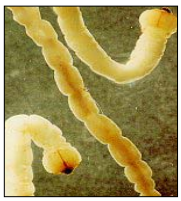
Forest Tent Caterpillar

—Forest tent caterpillars (*Melanocarpa disstria*) caused heavy defoliation on many deciduous trees and shrubs, mainly aspen, oak, and birch, **throughout northern Wisconsin**. The defoliation was most severe in Ashland, Bayfield, Iron, Price, Vilas, Oneida, and Lincoln counties. Approximately 3,742,300 acres were defoliated in northwest Wisconsin with an additional 1,723,500 acres of defoliation in the northeast region. Large numbers of caterpillars with light to moderate defoliation were also reported in **Clark, Marathon, Portage, and Wood counties**. An outbreak of this

insect has been occurring in Wisconsin since 1999, but the areas damaged this year were much larger than in the two previous years.

Two-lined Chestnut Borer

—Mortality of mature oak was observed in the Northern Region, especially in **Bayfield, Douglas, Oneida, Price, Sawyer, Vilas, and Washburn counties**. Mortality was caused by two-lined chestnut borers (*Agrilus bilineatus*), native flatheaded wood boring beetles. Most of the sites with infested trees suffered an infestation by forest tent caterpillars for several years. On the western side of the region, oak mortality was much more prevalent on northern pin oaks growing on light sandy soil. It is suspected that repeated years of defoliation by forest tent caterpillars, and hot and dry weather in July when defoliated trees were producing a second set of leaves caused extreme stress on trees to allow secondary pests to attack and cause oak mortality.



Late Summer Necrosis of Bur and White Oak Leaves

Actinopelte Leaf Spot - and other potential unknown causes

In late July, **bur and white oaks** scattered throughout western and southwestern Wisconsin showed the following symptoms:

- Leaves with **water-soaked lesions**, eventually turning brown, on the distal portion of the leaf.
- **Brown or curled leaves** most common in the lower crown
- Whole crowns with brown and curled leaves

These symptoms have been observed over the past several years yet they appear to be more widespread this year. Affected leaves are heavily infected with a leaf spot fungus called *Actinopelte dryina*; common name, Actinopelte leaf spot. The symptoms show in mid-late summer, typically after the hottest part of the summer. The fungus causes small brown lesions that coalesce and cause the whole leaf tip to turn brown. The disease also causes **small cankers** on the twigs. Some infected trees also had multiple wounds on the twigs from periodical cicada and tree hopper activity.

There may be other factors involved including other insects and diseases as well as environmental factors. Selected infected trees will be closely observed in 2002. Since infected trees did not refoliate late in the summer, nutrient and sugar reserves were not stressed and trees are expected to leaf out next spring. Other stresses such as drought, tatters and defoliation by the gypsy moth are expected to increase the chances of decline and mortality.

Oak tatters

—Oak tatters was observed on scattered white and bur oaks throughout the **southern two-thirds of Wisconsin** this spring. Oak tatters causes newly emerging leaves to develop very little leaf material between the veins, giving leaves a lacy, skeletal, or "tattered" appearance. Trees which are severely affected will attempt to send out a new set of leaves which are often free from tatters. Oak tatters is apparently caused by some sort of damage to the leaf tissue while it is still in the bud or when the leaves are first emerging. The exact type of damage is not known but possible causes include: cold temperatures, insects, and herbicide injury.

Tar spot

—Tar spot (*Rhytisma spp.*) is a **cosmetic disease of maple trees** that causes large black spots on the leaves. Some areas of Wisconsin had particularly high levels of infection in 2001 which caused the leaves to brown and curl. Infection of leaf material occurs in the spring and early summer but the characteristic black "tar spot" fruiting body (see figures) doesn't show up until late summer. The leaves will drop in the fall and fruiting bodies will fully develop to release ascospores the following spring, these will then infect the newly emerging leaves if weather conditions are right.

CONIFER PESTS

Leptographium

—A root disease fungus, *Leptographium* spp., has been reported with much more frequency in **southern and western Wisconsin** in the last 10 years, and has re-

cently been detected in dying red pines in Oneida and Florence counties, as well. These are the first reports of this fungus found in northern Wisconsin and its role in red pine pocket decline in this area of the state has not been studied.

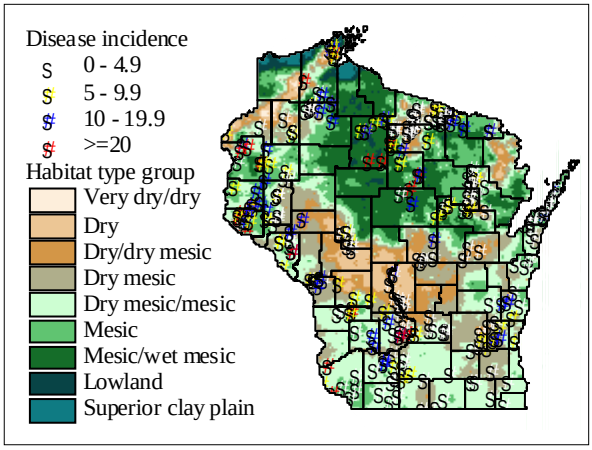
Three areas of investigation will be initiated within the next year: 1) an evaluation of the incidence and severity of pocket decline through a statewide survey of foresters, 2) extensive site evaluation of locations revealed through the survey and, 3) a management trial that focuses on limiting the underground spread of the fungus to healthy trees via root connections.

Sclerophoma Shoot Blight

—A shoot blight on balsam and concolor fir has been tentatively identified as being caused by Sclerophoma (teleomorph) *Delphinella abietis*. Symptoms include curling and necrosis of newly developing shoots in early summer. This condition has been observed in two Christmas tree plantations; one in Dane County, one in Waushara County. After affected shoots turn brown, they dry up and fall off. Additional samples will be collected in 2002 to confirm the identity of the fungus.

White Pine Blister Rust

—A three year study of the incidence of white pine blister rust in Wisconsin was completed this year. The



A total of 224 stands and 16,572 white pine trees were surveyed.

average incidence reported in the survey was **7.1% statewide**. There was a strong positive correlation between disease incidence and the distance to gooseberry, *Ribes* spp, the alternate host. There was also a strong association with habitat type group. Mesic and wetter sites had significantly higher incidence of rust. than very dry to dry mesic habitat types. Stand size was also very important. Incidence increased with average tree size. **Recommendations** to woodland managers vary with habitat type and occurrence of gooseberry. Where

Annosus Root Rot

Annosus root rot *(Heterobasidion annosum)* was first reported killing **plantation red pine** in 1993. Currently Sauk, Richland, Iowa and Adams counties have confirmed infection centers present with this root rot disease. A biological control trial was initiated this year at two locations. The trial included a salvage harvest along with a stand thinning (figure on right). A 30' barrier zone was created around the infection centers. Stumps in this harvested barrier zone were treated with the fungus *Phlebiopsis gigantea* in hopes that this fungus will colonize the stumps and prevent underground spread of H. annosum from the infection centers. Sporax (a product that creats an unfavorable environment) was applied to all the other stumps to reduce the number of new infections. A sanitation burn of the cut infected trees is planned for this fall at these two sites.

gooseberry is close (within about 200 ft) to the stand, recommendations include: 1) maximize the distance between planted pines and *Ribes* 2) plant a heavy-needled buffer species between the two, 3) prune all crop trees, 4) plant dense stands which will self-prune more rapidly, and 5) eradicate *Ribes* where bushes aren't numerous and are close.

Larch beetle

—Mortality and dieback of mature tamarack were noticed in **Oneida County**. The dead and dying trees were infested with larch beetles. Although larch beetles could attack healthy trees, they are usually considered a secondary pest, attacking stressed and recently cut trees. Most stands that were infested with larch beetles have suffered defoliation by larch casebearers for two to four years.

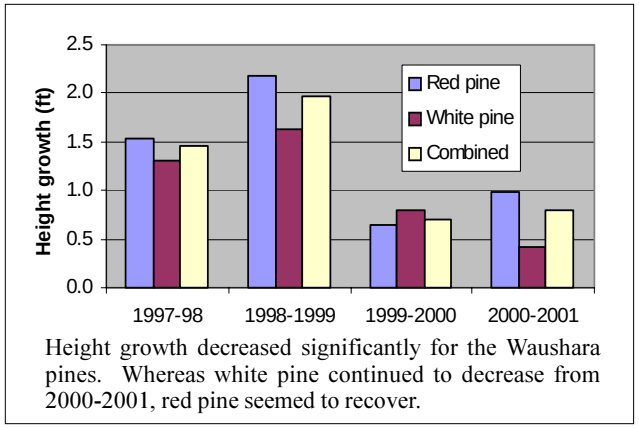
WEATHER DAMAGE

Hail Storm Damage

—Follow-up surveys were done in 2001 of damage caused by last summer's hail and wind storms in Manitowoc, Waushara and Douglas counties. In a privately-owned pine plantation in **Manitowoc County**, results in the spring of 2001 seemed to indicate a favorable outcome. Mortality was only 6% and 72% of trees had 50% or less crown dieback. However, in September mortality had risen to 66% in this stand. Trees that had suffered moderate dieback in the first year after the storm were probably stressed by drought during the summer of 2001.

Swamp hardwoods in Manitowoc County suffered very high mortality.

In the red-white pine study plots in **Waushara county**, leader dieback was pronounced, especially for white pine. Sixty-one percent of all sapling pine had dead leaders, 89% for white pine and 46% of the red pine. Height growth rates had decreased markedly since the storm, with the tallest trees showing the least reduction in growth (see figure in next column). Only 1 tree has died since the storm.



Height growth decreased significantly for the Waushara pines. Whereas white pine continued to decrease from 2000-2001, red pine seemed to recover.

Both red pine and aspen suffered severe damage in **Douglas County** as a result of the August, 2000 storm. However, in both types, larger diameter trees suffered significantly less crown dieback. Red pine saplings showed 100% leader loss and most had lost the last 2-3 years of growth (see figure). Red pine sawtimber suffered less leader mortality but still averaged c. 50% crown dieback. Both stands are scheduled for harvest in the winter of 2001.

Crown dieback in red pine saplings in Douglas County was 100%.

In the sapling aspen plots, fully 2/3 of trees were either dead or had over 75% crown dieback (see figure). Due to ample suckering and poor prospects for recovery, this stand will be clearcut as well. With the aspen as with red pine, the sawtimber-sized trees fared much better. Only 1 tree had died and dieback averaged 55%. This stand will be left to allow for further research on the long term effects of hail injury. In summary, damage from hail and windstorms may not accurately be assessed until 1-2 years after the storm. Apparent initial recovery may be reversed by subsequent climactic stress. Early harvest may be the only way to recoup losses.

Aspen saplings in Douglas County suffered very high rates of crown dieback.

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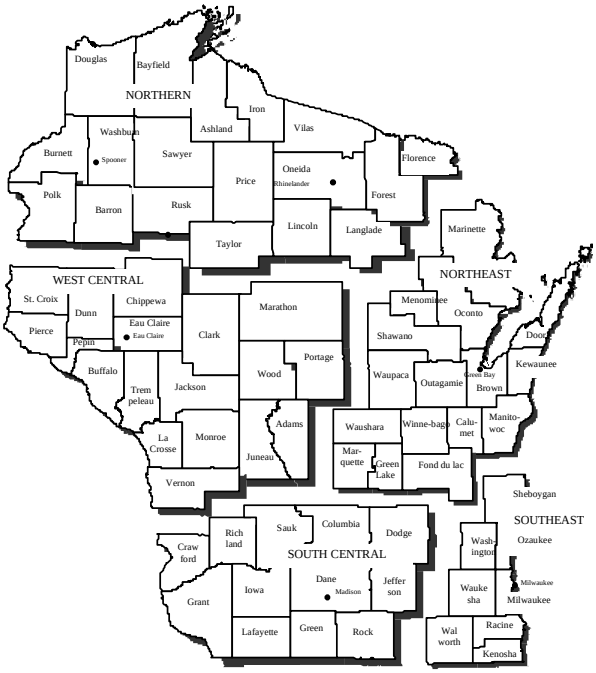

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