



Central States Forest Health Watch



Current forest health information for land managers in Illinois, Indiana, Iowa and Missouri

May 3, 2006

About This Newsletter...

This collaborative effort of the USDA Forest Service Northeastern Area, Missouri Department of Conservation, and Indiana, Iowa and Illinois Departments of Natural Resources will provide updates three times per year (Spring, Summer, Autumn) on forest health issues of regional interest.

Important Regional Forest Health Issues

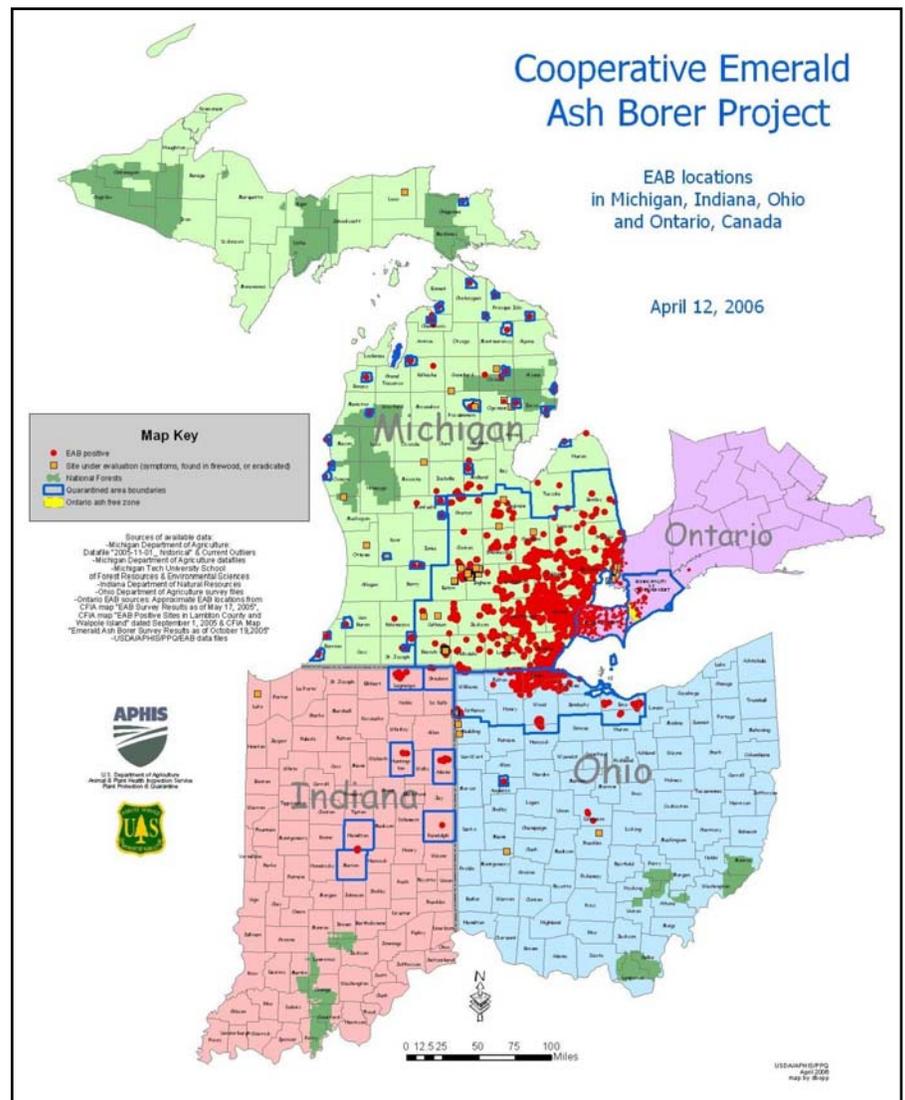
Nonnative insect and pathogens continue to be highly significant forest health issues in our region. In this edition you will find updates on Emerald Ash Borer, Sudden Oak Death, and Gypsy Moth. We also have information on two other regional problems: hickory mortality and oak tatters.

Emerald Ash Borer (EAB)

Emerald Ash Borer continues to be discovered in new locations in Lower MI, IN and OH. Introductions are being traced back to movement of nursery stock, infested firewood and infested logs that appear to have occurred several years ago. Lower MI has scattered populations reported in many counties, from its southern border to the Mackinac Bridge. The most extensive outbreak is still located in southeast MI, northwest OH and neighboring Ontario. Only one known population has been found in the Upper Peninsula and that spot has undergone an eradication treatment. Hopefully, EAB can be kept out of the U.P. for some time. To the south however, populations have been found in the Indianapolis and Columbus areas and in a few counties in central IN and OH. This southern expansion is obviously a concern as the EAB program attempts to keep EAB bottled up in northwest OH and northeast IN.

The following website provides general information on EAB and links to specific information on the infestations in Michigan, Ohio, and Indiana:

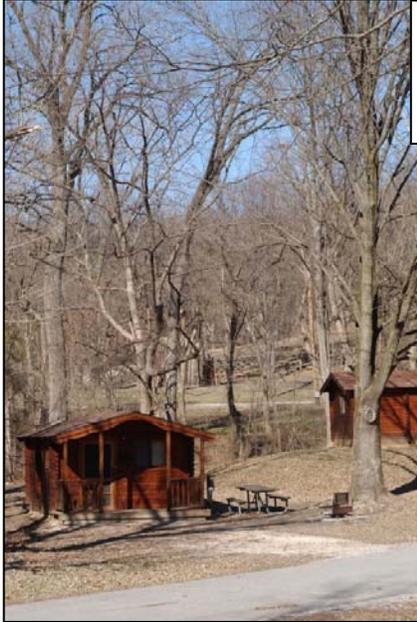
<http://www.emeraldashborer.info/index.cfm>



In the table below you will find a brief state-by-state description of how each of the Central States is responding to the threat of EAB.

State-by-State summary of EAB activities		
	2006 Survey	EAB preparedness
IA	<p>The 2006 plans for Iowa include:</p> <ul style="list-style-type: none"> • Visual surveys at registered sawmills and other wood products sites. • Visual surveys of ornamental nursery stock during IDALS State Entomologist inspections. • Visual surveys of federal, state and county campgrounds; emphasis on campgrounds along major highway routes or tourism sites; other areas surveyed as time permits. • Trap trees in 14 locations throughout state, again centering on the highest risk sites of campgrounds; containerized trees placed at private campgrounds and standing timber for state-owned areas. 	<p>Educational efforts are underway. Materials include two types (EAB life cycle, firewood) and sizes (8x11, 11x17) of posters, wallet ID cards, DVD (The Green Menace), USDA APHIS PPQ brochure (The Green Menace) and USDA FS Pest Alert. These have been sent to Iowa State University Extension county and area offices, ISU Extension state and county horticulture specialists, State campgrounds, County conservation boards, Iowa DNR foresters, and sawmills and other wood products sites. In addition, posters have been provided to the Iowa DOT for placement at each of the 20 rest areas along the major highway thoroughfares.</p> <p>Iowa has also prepared an EAB Readiness Plan, which will hopefully be posted on IDNR-Forestry's Web site very soon.</p>
IN	<p>Indiana (primarily APHIS) will implement a detection tree survey, using girdled 4-8" DBH ash trees on a 5-star point system (center point plus additional subpoints ½ to 2 miles out in cardinal directions). As many as 1000 or more center points may be established at locations identified in 2005 as high risk. The priority for point location is as follows:</p> <ol style="list-style-type: none"> 1. campgrounds 2. sawmills 3. tree nurseries 4. solid waste management sites (woody debris) 5. new subdivisions, delimiting surveys in infested townships as needed, etc. <p>There are 26 people on survey staff this summer.</p>	<p>When EAB was initially discovered in Indiana, eradication was attempted. As additional locations have been identified, the current management tool is quarantine, compliance agreements, survey, and education. There is currently no requirement for removal of infested trees, but quarantine is in place for 7 counties with infestations. 12 Townships within those 7 counties have a stricter quarantine on movement of ash materials. See the IN website for more details.</p> <p>In addition to responding to the actual EAB infestations, IN is working on communication efforts to educate the public and prevent movement of EAB. The DNR is exploring changes in their firewood policy on state lands and is monitoring vehicles coming into state campgrounds from infested states and counties. They have also been adapting the forest management guidelines for landowners with ash resources near infestations.</p>
IL	<p>During 2005 visual surveys were conducted and trap trees were established in areas that are used extensively for camping, near tree nurseries, and in urban areas where there are a large number of ash trees. Trap trees were girdled in early May, felled in the autumn months and the bark removed and inspected. Visual surveys were conducted mainly during July and August. No evidence of EAB infestations were noted in any of the survey sites or in any of the trap trees.</p> <p>In 2006 continued EAB visual and trap tree surveys will be conducted throughout the state.</p>	<p>High fuel prices continue to drive the trends of shorter vacation trips and saving on overnight expenses by camping (complete with the campfire experience). Campers may come to IL from an area that is infested with the EAB. Even with quarantine regulations in effect in the infested areas, sometimes people are unaware of the regulations or simply choose to disobey such restrictions and might bring infested ash wood into IL. Beetles emerging from the wood throughout the summer could infest Illinois ash trees. During 2005 and 2006 a firewood warning leaflet describing the dangers of moving infested wood into IL was distributed at many educational meetings.</p> <p>There is also concern that infested ash trees may have been shipped to IL before quarantine regulations became established</p>
MO	<ul style="list-style-type: none"> • The 2005 survey found no evidence of EAB at 31 sites, including the Gateway Arch grounds, commercial campgrounds, and recent commercial and residential developments in the St. Louis area, and two large State Parks (Babler and Lake of the Ozarks) that receive a high volume of interstate visitors. • The Missouri Dept. of Agriculture (MDA) and Missouri Dept. of Conservation (MDC) will conduct a visual survey in 2006 at high-risk areas not included in the 2005 survey. • MDA Plant Protection Specialists are closely examining ash trees for EAB signs and symptoms during nursery inspections. 	<ul style="list-style-type: none"> • The MO Departments of Agriculture, Conservation, and Natural Resources are cooperating in invasive species educational efforts. • A firewood alert poster is being developed and will be distributed to state and commercial campgrounds throughout the state. • An article about firewood and other introduction pathways of invasive forest pests is being written for "The Missouri Conservationist" magazine. • Information on EAB and other invasive species concerns is presented at a variety of workshops for arborists, community foresters, Master Gardeners, and State Park campground hosts. • Data from urban tree inventories were compiled from over 60 MO communities to determine the quantity of ash trees potentially at risk from EAB. Ash comprised over 13% of all surveyed urban trees, going as high as 25% of street trees in some locations, and over 30% of trees surveyed in Forest Park (St. Louis).

A common theme in the risk of introducing EAB, and in individual state response plans, is concern over the movement of infested firewood. See this month’s feature article for a more in-depth discussion of this.



A typical area in one of Illinois’ state parks where trap trees were located near a cabin site. (Courtesy Jim Appleby).



Campfire wood under an RV from out of state, parked at Jellystone campground near St. Louis, MO. (Courtesy Rob Lawrence).

Gypsy Moth Activities – Spring 2006

States without established populations:		
	Treatment Activities	Trapping Activities
Iowa	None	A joint effort of IA DNR Bureau of Forestry, USDA APHIS, IDALS, and City Foresters will place approximately 5000 gypsy moth detection traps across the state.
Missouri	None	MO Dept. of Agriculture, MO Dept. of Conservation, USDA APHIS, U.S. Dept. of Defense and MO National Guard will cooperate to set out over 9,000 detection traps in Missouri. Delimit trapping will be done in 9 counties where gypsy moths were recently captured (Boone, Camden, Clay, Crawford, Franklin, Greene, Jackson, Pettis, and Ste. Genevieve).
States with established populations:		
	Planned Treatment Activities	Trapping Activities
Illinois	Aerial spray of Btk on 13 sites (5739 acres) and pheromone flakes on 12 sites (25,038 acres) in Northern Illinois. The intent of the treatment of these 30,777 acres on 25 sites is to slow the spread of gypsy moth by eliminating reproducing populations on the treatment sites.	USDA APHIS traditionally places detection traps in the portion of the state not covered by the STS program and delimit traps in areas where moths were caught the previous year. The Shawnee National Forest traditionally places 100 traps on National Forest lands. STS monitoring traps will be placed in the northern ¼ of the state.
Indiana	Aerial spray of Btk on approx 11,243 acres (16 sites) and pheromone flakes on approx 46,097 acres (8 sites). The intent of the treatment of these 24 sites in 8 counties is to slow the spread of gypsy moth in northern Indiana. One eradication site (378 acres) is being treated with Btk in Scott County (southern IN).	Over 17,000 traps will be placed on 2K or 3K grids over the entire state. Delimit surveys are planned for all positive sites in front of the generally infested area.

‘Sudden Oak Death’

All Central States will participate in the 2006 SOD survey, which will be implemented as in 2005. The objective is 30 plots per state, 20 of which are targeted at nursery perimeters. After 3 years, there have been no confirmed findings of the SOD organism in our surveys in the East. Providing this remains the case after this season, the survey will likely be modified in subsequent years to include stream baiting and focusing terrestrial surveys in the highest risk areas, e.g. those parts of the East with high populations of rhododendron and mountain laurel. Research on SOD continues, with new information continually being discovered about the pathogen and its host range. The “[California Oak Mortality Task Force](#)” website continues to be a good source of current info on SOD.

Hickory mortality

Hickory mortality has been common across the Central States and upper Midwest for many years. Bitternut hickory tends to be more commonly affected than shagbark hickory. Often there is an identifiable cause, with the “usual suspects” being *Armillaria* root disease and hickory bark beetle (*Scolytus quadrispinosus*). However, sometimes hickory decline and mortality do not have significant bark beetle activity or root disease associated with them, and we suspect something else is involved.

In a recent study of “phylogeny and taxonomy” of the fungus *Ceratocystis fimbriata* in North America, researchers at Iowa State University identified and named two distinct, but closely related, species of *Ceratocystis* on hickories (see Johnson, J. A., T. C. Harrington, and C. J. B. Engelbrecht. 2005. Phylogeny and taxonomy of the North American clade of the *Ceratocystis fimbriata* complex. *Mycologia* 97(5):1067-1092). These are newly described, but they are most likely native pathogens. In host-range studies, both were able to infect and cause discoloration on *Carya cordiformis*, *C. ovata*, *C. illinoensis*, *Juglans nigra*, and *J. cineria*.

- *Ceratocystis carya* causes a “canker-wilt” disease. It causes wilting, but is not a true vascular wilt pathogen—it doesn’t clog the xylem, but instead colonizes parenchyma tissue, causing localized lesions. It is often associated with wounds, and may be vectored by sap beetles. Cultures produce a sweet banana-like odor.
- *Ceratocystis smalleyi* is very closely related to *C. carya*, but has some distinct morphology and is associated with the hickory bark beetle. Cultures do not produce a banana odor. *C. smalleyi* may play a significant role in hickory mortality associated with the hickory bark beetle. Many years ago the late Dr. Eugene Smalley of Wisconsin described a new species he referred to as *Ceratocystis caryae* associated with hickory bark beetle, but did not publish the taxonomy. Dr. Smalley’s isolates are included in the species that Tom Harrington named *Ceratocystis smalleyi*, in recognition of his work.

Either or both of these pathogens has the potential to be responsible for, or at least involved in, a significant amount of the hickory mortality we observe in the Midwest, but their importance is unknown. The USDA Forest Service is initiating a study to find out more about the distribution of these pathogens, their association with hickory mortality, and the potential role of insect vectors. During summer 2006, preliminary information will be collected from sites in WI, IA, and MO. If you have hickory mortality sites which you would like to see included, contact the forest health specialist in your State’s DNR/Dept of Conservation.

Oak Tatters

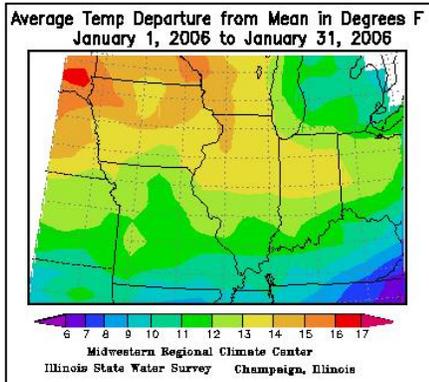
As white and bur oaks and hackberry break bud and begin leaf expansion, **oak tatters** and **hackberry laceleaf** symptoms often appear across the Corn Belt. Speculation has been made for many years that these symptoms (lack of interveinal leaf tissue) may be caused by agricultural applications of herbicides. In 2004 and 2005, researchers at University of Illinois Urbana-Champaign were able to demonstrate that low levels of chloroacetamide herbicide can cause tatters on expanding leaves of oak seedlings (see May 2005 edition of CSFHW). In 2006 they will conduct additional experiments to explore the effect of chloroacetamide herbicides on hackberry.

The Iowa DNR Forestry Bureau is also continuing to explore whether chloroacetamide herbicides may be involved in the development of tatters and subsequent decline in health of white oaks in eastern Iowa. For several years they have monitored the development of tatters symptoms on 3 sites, along with measurement of temperature, observation of activities on nearby agricultural land, and recording other insect and disease factors. In spring 2006 they are working in cooperation with the University of Iowa Hygienic Labs to determine the ambient levels of chloroacetamide herbicide residues in rain water and air samples from two woodland sites that have previously shown oak leaf tatters. Rainwater samples will be analyzed to see if they carry a measurable concentration of chloroactemide residues. Air samples will be analyzed to determine the ambient level at which chloroacetamides occur in the air during the progression of spring planting season.

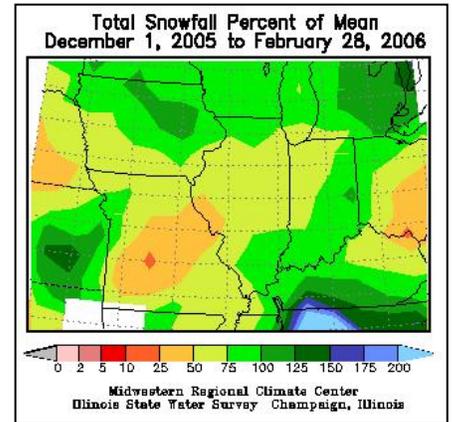
Leaves will be collected as they emerge from their dormant buds, for later tissue analysis to determine whether chloroacetamide residues are present prior to or after the development of tatters symptoms. The results of these preliminary measurements will indicate whether further studies are warranted in future years.

Weather Overview

We left off in November 2005 with a substantial band of abnormally dry to extreme drought condition stretching from northern MO, across the southern 1/2 of Iowa and the northern 1/2 of Illinois, and into northern IN.



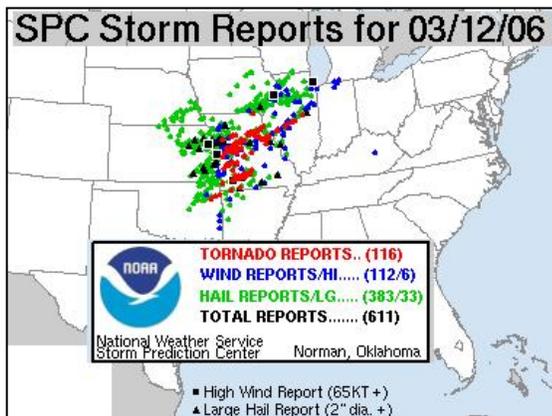
Winter (December through February) snowfall for the driest part of the region was generally only 25-75% of normal. Fortunately spring rains have somewhat relieved the drought situation. Each month in 2006 has been marked by its own weather events that may affect tree health.



January was extremely warm, with the average temperature departure from mean being 10 to 15 degrees above normal across the region.

In February, temperatures returned to near normal, but it was dry. A large swath across MO, southern IA, and central IL received only 5 to 50% of normal precipitation, which did little to relieve their soil moisture deficits.

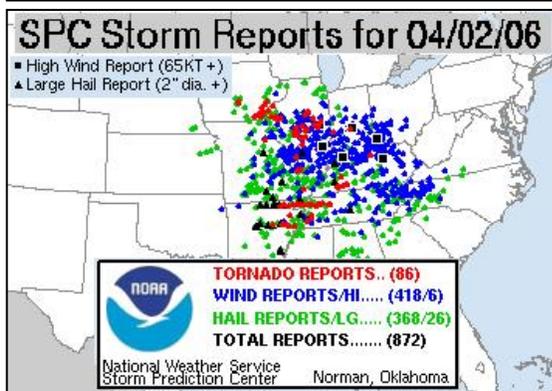
March was marked by stormy weather. In particular, the March 12th outbreak brought tornados, hail, and flash flooding to various parts of the region. In MO, March set a one-month record with 51 tornadoes



(<http://agebb.missouri.edu/weather/bull13h.htm>).

We even had a fairly significant spring snowstorm on March 21st.

Fairly mild winter conditions coupled with the warm January, led to accelerated phenology; plants were breaking dormancy early. Early-blooming plants in central MO were blooming one to two weeks earlier than average dates for the past few years. However, plant phenology slowed when colder weather arrived in late March. By early April, blooming of some tree and shrub species in central MO was only 2 to 4 days ahead of average.



April brought a return to above average temperatures, causing the plant development to accelerate again. By the end of April, parts of MO were 10 days or more ahead of schedule. Very large forest tent caterpillars were observed near St. Louis, MO, indicating that the insects were also ahead of normal development.

April was also a very active severe weather month, with major storm systems rocking the region on April 2nd and 13th. The tornados that accompanied these systems caused loss of life and damage to resources.

The accumulated effects of drought, wind, hail, and altered phenology, particularly when combined with insect and disease problems, may impact our forest resource across the central states this year.

Maps and most of the climate information are from the Midwest Regional Climate Center's "Midwest Climate Watch" at <http://mcc.sws.uiuc.edu/cliwatch/watch.htm#>

A Look into the Crystal Ball...

The uplands in the Southeast corner of **Indiana** have been in a **Forest Tent Caterpillar** (FTC) outbreak from 2003-2005. The population of FTC is starting collapse, but an increase in tree mortality (primarily in black and red oak, some in white oak and sugar maple) is likely to occur over the next few years due to the stress caused by repeated defoliation. The "Knob" area southeast of Bloomington, IN, has also experienced a cycle of defoliation due to the **looper complex**, which may lead to increased mortality of hardwoods (primarily scarlet and black oak, some red oak and hickory, and to a lesser extent white oak) in this area over the next few years, especially if additional stresses occur. The looper complex generally has a 25-year recurring cycle in Indiana. Outbreaks occurred in 1978-1981, and again in 2003-2005. Remnants of looper activity are expected to continue in 2006, particularly in Brown County in South Central Indiana.

Many non-native pines were planted in **Indiana** in 1930's to 1950's. As these trees age, and particularly if there is drought stress, storm damage or defoliation, these trees tend to be susceptible to attack by **Ips and Turpentine beetles**. Expect increased pine mortality in Indiana.

Common spring pests to watch for across the region include **anthracnose** on hardwoods, particularly if we have wet weather, and **cedar-apple rust** on juniper. Following periods of spring rains, the telial tentacles of cedar apple rust will emerge from galls on cedar, and give rise to spores that infect leaves of multiple of roseaceous hosts such as apple and hawthorn.

Telial tentacles emerging from a cedar apple rust gall, caused by *Gymnosporangium juniperi-virginianae*, on juniper in MO.
(Courtesy Bruce Moltzan)



What else is being reported across the Region

Yellow poplar decline has been reported in the southeast 1/3 of Indiana, probably due to lingering effects of the 1999-2000 drought.

In Missouri, **conifer problems** have been the dominant source of reports to the diagnostic lab this spring. Samples from Austrian, white and Scotch pine have been diagnosed as having *Mycosphaerella dearnessii*, the fungal cause of **brown spot needle disease**. Spruce samples with the classic "SNEED" symptoms of purple 2nd-year needles accompanied by subsequent needle drop are beginning to come in to the lab. Spruce sudden needle drop, affectionately called "SNEED", is caused by *Setomelanomma holmii*. See the November 2003 CSFHW for more information: <http://na.fs.fed.us/fhp/fhw/csfhw/nov03/sneeddetail.pdf>

There have also been several reports in MO of **winter desiccation on conifers**, which occurs when the trees can't take up water because the soil remains frozen, but above ground temperatures rise and trees increase transpiration. Generally the trees recover once we thaw out; however in exposed, windy places the condition can become severe, resulting in complete desiccation and brown out.

Feature Topic: Pest Risks in Campfire Wood

It's the "all-American" experience... in summer we load up the family and head out to enjoy the great outdoors, complete with marshmallows toasting over the crackling campfire. How could this innocent activity endanger our forest resource? When we move the sticks of wood for our campfire, we are also potentially moving several serious forest insects and pathogens. In the paragraphs below, we'll take a look at who some of these sinister hitchhikers are, what can be done about it, and what larger efforts are being taken across the region to spread the word.

- Emerald ash borer—This is the exotic beetle that is wreaking havoc across Michigan and has been discovered at new locations in Indiana, Ohio, and Canada. Many of these new locations have been associated with movement of wood from infested areas, often from before the source area was known to be infested. This beetle lives in galleries under the bark of infested ash trees, which may not be dead yet. This insect is very difficult to detect in ash wood, as there may be no obvious signs on the exterior of the log. Enough beetles to establish an infestation can be moved in a single stick of firewood.
- Gypsy moth-- This notorious hitchhiker has been moving around the US for over 50 years on THINGS transported by people. In late summer, the female moth lays its egg masses in hidden places and on the surfaces. A nice pile of old firewood is a great THING and PLACE for a gypsy moth to put an egg mass. The eggs hatch in spring, and the tiny caterpillars disperse to find nice green hardwood leaves to chew.
- Dutch elm disease— This disease has also been around for awhile, but this villain doesn't act alone. It relies on a get-away vector to get it to new trees... Elm bark beetles (the smaller European elm bark beetle and the native elm bark beetle, and probably the newly introduced *Scolytus Schevyrewi*) under the bark of dying and dead elm pick up the spores of the fungus from their galleries and move it to new trees. The bark beetles can have multiple generations per year, so infested beetles can emerge from elm wood pretty much any time the weather is warm enough that you might be going camping.
- Oak wilt disease—Oak wilt also relies on insects to move it to new locations, but it's mode of movement is a bit more specific than Dutch elm disease. The oak wilt pathogen, *Ceratocystis fagacearum*, kills oak trees and then produces spore-bearing mats of fungus under the bark of recently killed trees. These mats of fungal tissue smell fruity and attract sap-feeding beetles, who pick up spores of the fungus from the mats and then go visit fresh wounds on oak. Oak wilt mats can form on firewood that has been cut from diseased oaks.
- Pine wilt disease— Pine wilt is a native disease caused by a nematode that kills trees by proliferating in the tree and clogging the resin ducts. The nematode is carried to new host trees by longhorned beetles, which are attracted to dying and dead pines and also feed on wounds of healthy trees near branch tips. It is particularly a problem on Austrian and Scotch pine, but also can affect all other pines.
- Sirex woodwasp—*Sirex noctilio* is a new player in our woods. The females lay eggs in pine trees, especially stressed ones, and the larvae bore deep into the wood. The larvae can tunnel around in the wood for over a year, giving great opportunity for the infested wood to be cut and made into pallets or firewood to be moved all over the world. Sirex and the fungus associated with it kill trees. Sirex woodwasp was first discovered in North America in 2005, and it has been found so far in parts of New York State and over the border in Canada. The actual extent of distribution in North America is still unknown.

The list could continue to include beech bark disease, hemlock woolly adelgid, butternut canker, and Asian longhorned beetle. In addition to these few known insects and pathogens of concern, there are also any number of other unknown villains out there that can be moved in firewood or other wood products. The tendency to use "rough" wood from dead and dying trees as campfire wood makes this an ideal mode of

transportation for these pests. **The best prevention is to use local sources of campfire wood, to eliminate the risk of inadvertently bringing in a pest from somewhere else.**

Since the introduction of emerald ash borer, Michigan, Indiana, and Ohio have developed ‘stop moving firewood’ strategies in their respective states. These outreach strategies are enhanced by Federal/State regulations banning the transportation of ash firewood due to the emerald ash borer. Wisconsin, Missouri, Minnesota, and Illinois are all gearing up for independent ‘Stop Moving Firewood’ strategies. For the most part, the transportation of firewood is not regulated in these states. Wisconsin recently passed a law regulating the transportation of out of state firewood into state parks and forests (http://dnr.wi.gov/invasives/firewood/firewood_greensheet.pdf).

There is a desire among states to coordinate efforts, strategize together, develop consistent messages, and potentially share resources and networks to raise public awareness about transporting firewood as well as improve public understanding of their role in prevention and detection of invasives. To be successful, states will need to coordinate beyond their borders and reach out to the places where their tourists, cabin owners, and campers live. To this end, a “Firewood Forum” has been scheduled for May 24, 2006, in Lisle, Illinois (near Chicago) so communications experts as well as land managers within state departments of natural resources, agriculture, tourism, parks, transportation, etc. can develop consistent messages, coordinate efforts and share existing products for distribution. From this meeting it is hoped that further collaboration and tools will be developed. For more information on the Firewood Forum, contact Judy Antipin at jantipin@fs.fed.us.

Upcoming Opportunities

Illinois has scheduled a training opportunity for IL Dept of Natural Resources District Foresters on May 17-18, 2006. Contact Jim Appleby at (217) 244-3431 for more information.

Other Resources and Sources of Information

This month we have links to a couple of websites that provide access to information on invasive plants:

The Midwest Invasive Plant Network represents IA, MO, MN, IN, WI, OH, IL and MI, with the mission to reduce the impact of invasive plants in the Midwest. Their website can be found at www.MIPN.org

The Northeastern Area Invasive Plants Website provides fact sheets on a number of major invasive plants, downloadable invasive plant publications, links to invasive plant organizations, and Area-wide contact information. The website is located at: http://www.na.fs.fed.us/fhp/invasive_plants/

This newsletter is also available on the WWW at:

<http://na.fs.fed.us/fhp/fhw/csfhw/>

	<p>For More Information:</p> <p>Forest Health Protection USDA Forest Service 1992 Folwell Avenue St. Paul, MN 55108 (651) 649-5029 lhaugen@fs.fed.us</p>
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