



Lake States Forest Health Watch



December 30, 2004

About this newsletter...

The Forest Health Protection unit of the Forest Service located in St. Paul, Minnesota produces this newsletter. Our intent is to keep Federal land managers in the Upper Great Lakes region abreast of forest health related issues such as insect and pathogen outbreaks. We need your assistance, please contact us with your observations.

Aerial survey maps...

The Forest Service Forest Health Protection unit along with cooperators in the state forest health groups, conduct annual surveys for forest insect and disease outbreaks. Each Lake State National Forest along with most other Federal properties are flown annually and damage is recorded onto maps. This information has been gathered for many years, in some cases since the 1950's in Michigan, Minnesota and Wisconsin. This past year we made a big leap forward in making the information more accessible. You can now access the annual survey data on our web site at:

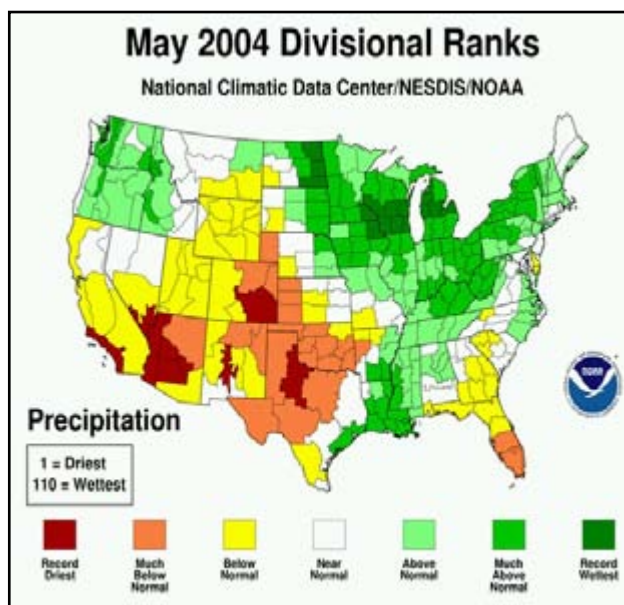
<http://www.na.fs.fed.us/spfo/fhp/maps/aerial.shtm>

We encourage you to visit that site and take a look at the information available. Hopefully, we will begin to get historical data added soon. If you have questions or suggestions for improvement of the site or about the surveys please contact Quinn Chavez at qchavez@fs.fed.us

What happened in 2004...

Spring 2004 was cool and wet in many areas which had some very positive impacts. Cool damp spring weather tends to encourage disease outbreaks in many caterpillar populations and this did indeed occur in gypsy moth populations across much of the area where we have infestations. This caused a regional crash in gypsy moth populations. In addition, the damp weather helped mitigate past drought concerns. Drought had been a major factor in widespread oak mortality across parts of northern Minnesota and Wisconsin. Very little new oak mortality was observed in 2004. We also had fewer reports of dead and dying red pine, again probably related to easing of drought conditions. Damp, cool spring weather often encourages leaf pathogens as well, but for some reason we did not have widespread reports of leaf pathogen outbreaks.

Despite improvements, lingering drought impacts can still be observed in many areas. Black ash stands, especially in northern Minnesota and northwest Wisconsin have suffered major decline. In addition, white spruce plantations in northern Wisconsin and adjacent Upper Michigan have suffered heavy mortality from a complex of problems interacting with drought.



Black ash decline – Apparently related to drought, we have observed many black ash stands that have widespread decline symptoms and high levels of tree mortality. Trees growing in wet soils, such as black ash, often suffer during prolonged droughts. These trees tend to develop shallow root systems that cannot cope with a rapid drop in the water table. Black ash decline has occurred across much of the region. It is very conspicuous in east central Minnesota between Cloquet and Grand Rapids.

Many trees have not died, epicormic branches and sprouting are common (see picture). These trees may eventually recover, though this could take many years. One concern is that this decline can mask emerald ash borer damage making it more difficult to find infestations of that threatening pest.

Black ash decline is nothing new, in many stands it has been observed on and off since the early 1990's. In the past it has been blamed on drought, late spring frost events, and anthracnose outbreaks.



White spruce plantation decline and mortality – We have reported on this problem for the past two years in white spruce plantations on the Chequamegon-Nicolet and Ottawa National Forests. The Park Falls District on the Chequamegon has the most extensive damage. The vast majority of this damage has been occurring in plantations, naturally occurring white spruce do not appear to be impacted. This past summer the Chequamegon-Nicolet proposed a large salvage initiative in many affected stands. Increment cores indicated that many trees in these stands had grown little over the past 10-12 years, despite thinning operations. Drought and a local outbreak of spruce budworm have compounded the problem. Armillaria root disease, at least two needle pathogens and several bark beetle species are also active in these stands. Mortality is becoming very widespread (see photo).



Paper birch decline and mortality was very evident along Minnesota's North Shore of Lake Superior this past summer. This problem has persisted for many years slowly removing more and more of the mature paper birch in the area. The birch resource along the North Shore is old and therefore very sensitive to stress events such as droughts and defoliation. Each stress event provides opportunities for the bronze birch borer and Armillaria root disease to successfully invade and kill trees. In addition to old age, drought and defoliation, the area has seen lots of road work and development. Paper birch does not handle site disturbance well, its' shallow root system is easily damaged. Eventually, much of the local paper birch will succumb and probably be replaced by other tree or brush species.



Jack pine budworm – Localized jack pine budworm outbreaks have been reported for the past two years in northwest Minnesota, northwest Wisconsin, the eastern U.P. and in east-central lower Michigan. The current outbreak is a bit unusual in that these local outbreaks have not coalesced into one large regional outbreak. Northwest Wisconsin appears to be the most active location at this time. Heavy defoliation is possible next summer in that part of Wisconsin. Both Wisconsin and Minnesota have reported a couple of areas where jack pine budworm outbreaks have damaged red pine plantations. This does occur on occasion. For further information on jack pine budworm see: http://www.na.fs.fed.us/spfo/pubs/howtos/ht_jack/ht_jack.htm



Budworm-caused mortality

Any idea what's going on here???



The red pine stand above is part of a large red pine plantation complex on the Chequamegon National Forest just northwest of Hayward. Two summers ago the Forest reported that many trees appeared to be in decline. Tree crowns were very thin (easy to see through), growth was reduced and overall vigor appeared to be low. The photograph above may not show the problem well but it was obvious that something was amiss. The lower crowns had died despite plenty of growing space. Scattered dead shoots were present in the upper crowns. The culprit appears to be shoot blight fungi. We have found both *Diplodia* and *Sirococcus* shoot blights actively killing shoots in these stands. Infections appear to be killing the lower branches.

What is the prognosis for these trees? We don't know. Regional drought conditions were probably playing an important role here and if moisture conditions improve, the trees will hopefully recover. On the other hand, decline may persist and these productive stands could soon start to have other secondary pests become more common such as *Ips* bark beetles and *Armillaria* root disease. We have seen similar damage on the other Lake States Forests, in most situations, trees have eventually recovered.

Where did all the Asian Ladybeetles go???

This past fall (2004) we heard fewer complaints about Asian ladybeetles than we did in 2003. Though still common, numbers of multicolored Asian ladybeetles were lower in 2004 than in 2003. What happened? The most likely explanation is that ladybeetle populations were lower because aphid populations, their main food source, were lower. Aphids do well when drought conditions predominate, the cool wet spring and summer of 2004 kept aphid numbers low.

Asian ladybeetles have made Michigan, Minnesota and Wisconsin home over the past 5 years, they will be a part of our outdoor experience from now on. In Asia, they are mainly an arboreal species feeding on aphids in trees. Here in North America they have shifted into agricultural fields as well. In many situations they are beneficial, feeding on aphid pests. But, their massive numbers and interest in using our homes as over-wintering sites make them pests. Again, this is an insect that we will need to put up with in future years. They are here to stay.



Updates on exotic pests...

Exotic insects, pathogens and weeds are causing great concern in the Great Lakes region. This problem is nothing new, we have had exotic insect and pathogen introductions in the past that have greatly altered our forests. Tamarack forests were decimated in the early 1900's following the introduction of two needle feeding insects, larch casebearer and larch sawfly. Gypsy moth has been in the U.S. since 1869 and chestnut blight wiped out American chestnut many years ago. White pine blister rust has been killing white pine for more than 70 years in the region. More recently we have virtually lost our butternut resource from a disease called butternut canker and our basswood trees face regular bouts of defoliation from a small insect called introduced basswood thrips. Despite past experiences, we continue to see new damaging introductions. Several very significant threats are active in the region and others are relatively close. The species most at risk in the next 5-10 years include all of our native ash (*Fraxinus* spp.), and American beech. We are also monitoring significant threats to hemlock, and oaks.

Beech bark disease (BBD) -- was detected in Michigan in the spring of 2000 and is established in the western Lower Peninsula and in the eastern Upper Peninsula. 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.

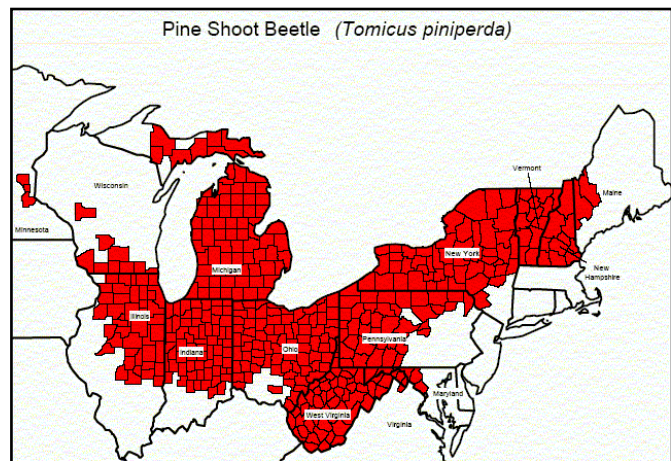
Beech bark disease is viewed as a major threat to American beech. For more see:

<http://www.na.fs.fed.us/spfo/pubs/fidls/beechnbark/fidl-beech.htm>

Beech scale (white)
covering the bark of an
American beech

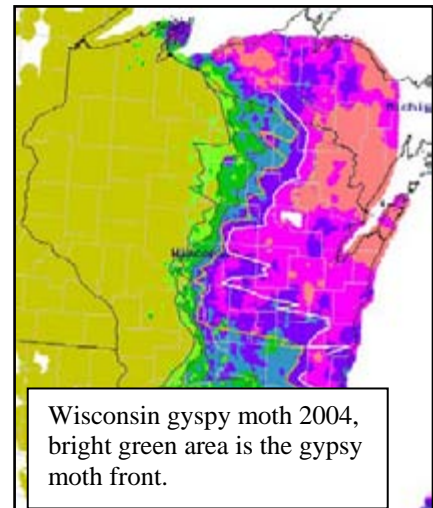


Pine shoot beetle, *Tomicus piniperda*, is a European bark beetle that was first found in northern Ohio about 10 years ago. Soon after its initial discovery it was found to be present across a large area from lower Michigan to New York. The map to the right illustrates the currently known range of this beetle. In the spring, pine shoot beetle behaves like our native *Ips* beetles, infesting and reproducing in freshly cut or killed pine material. However, unlike *Ips* beetles, pine shoot beetle adults have a shoot mining phase in mid to late summer. This shoot feeding has been destructive in Europe where this beetle attacks Scotch pine. Heavily infested trees are largely defoliated. To date we have not observed any significant damage from pine shoot beetle on red, jack or white pine, all potential hosts. It appears that unless Scotch pine is in close proximity, the likelihood of our native pines being damaged is minimal. Pine shoot beetle does bring with it a Federal quarantine, southern and western states are still concerned that it may be a pest on their local pines. More information can be found at



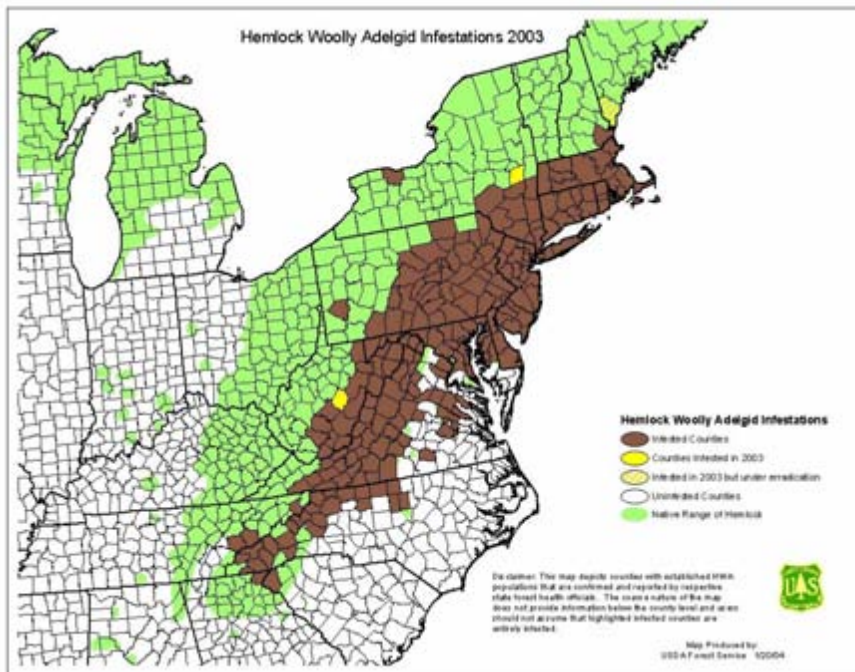
http://www.na.fs.fed.us/spfo/pubs/pest_al/shootbeetle/shootbeetle.htm

Gypsy Moth – The cool wet weather that occurred across most of the region in spring 2004 was ideal for the fungus *Entomophaga maimaga* that infects and kills gypsy moth caterpillars. Many reports of dead gypsy moth caterpillars were received this spring. We were expecting Wisconsin's first very large wave of oak defoliation in 2004 but that failed to materialize as caterpillars died from disease epizootics of *Entomophaga* and the gypsy moth Nucleopolyhedrosis virus (NPV). Instead of widespread defoliation, Wisconsin only reported 20 acres of gypsy moth defoliation statewide! *Entomophaga* is an introduced gypsy moth pathogen that is an excellent biological control under certain conditions, basically cool wet weather in May and June. Once we have a couple of warm, dry years gypsy moth populations are again likely to build to high levels, especially in areas where oaks dominate the landscape. But, the presence of *Entomophaga* does bode well for gypsy moth management. Even an occasional cool wet spring should result in widespread disease outbreaks.



An isolated gypsy moth population was found on the Superior National Forest this past year (2004). It is in the Ely area. The infestation was found via a state trapping program that collected a high number of male gypsy moths along a road on the east end of Lake Vermillion. Ground surveys around the trap locations found an egg mass that confirmed a reproducing population. It is likely that egg masses or some other life stage was transported into this area on a boat trailer, RV or perhaps on firewood. An eradication treatment is proposed for spring 2005 on approximately 640 acres.

Hemlock woolly adelgid, *Adelges tsugae*, has been in the eastern United States since 1924. It continues to expand its range into more and more of the native hemlock range. This sap-sucking insect can be lethal on hemlock and great concern exists it could eventually show up in our Lake States region though its ability to survive cold weather is still unclear. An active biological control effort is underway trying to identify and establish safe and reliable natural enemies. Watch for the diagnostic white, woolly material at the base of hemlock needles that cover the adelgids.



You can get more information on this insect at: <http://www.fs.fed.us/na/morgantown/fhp/hwa/hwasite.html>

Emerald ash borer (EAB) has been found across a large area in southeast Michigan where the existing EAB quarantine was recently expanded to 20 counties. A number of smaller quarantine areas have been established around infestations found in lower Michigan counties. Additional infestations have been found in northeast Indiana and northwest Ohio. Many outlying populations have apparently been established through the movement of infested firewood. There are literally millions of dead ash trees in southeast Michigan and some of this wood is being moved as firewood. This insect is proving to be a tremendous tree killer, with all of our native *Fraxinus* (ash) susceptible. Two locations were found this fall on or in very close proximity to the Huron-Manistee National Forest.

For emerald ash borer status in Indiana

<http://www.entm.purdue.edu/EAB/>

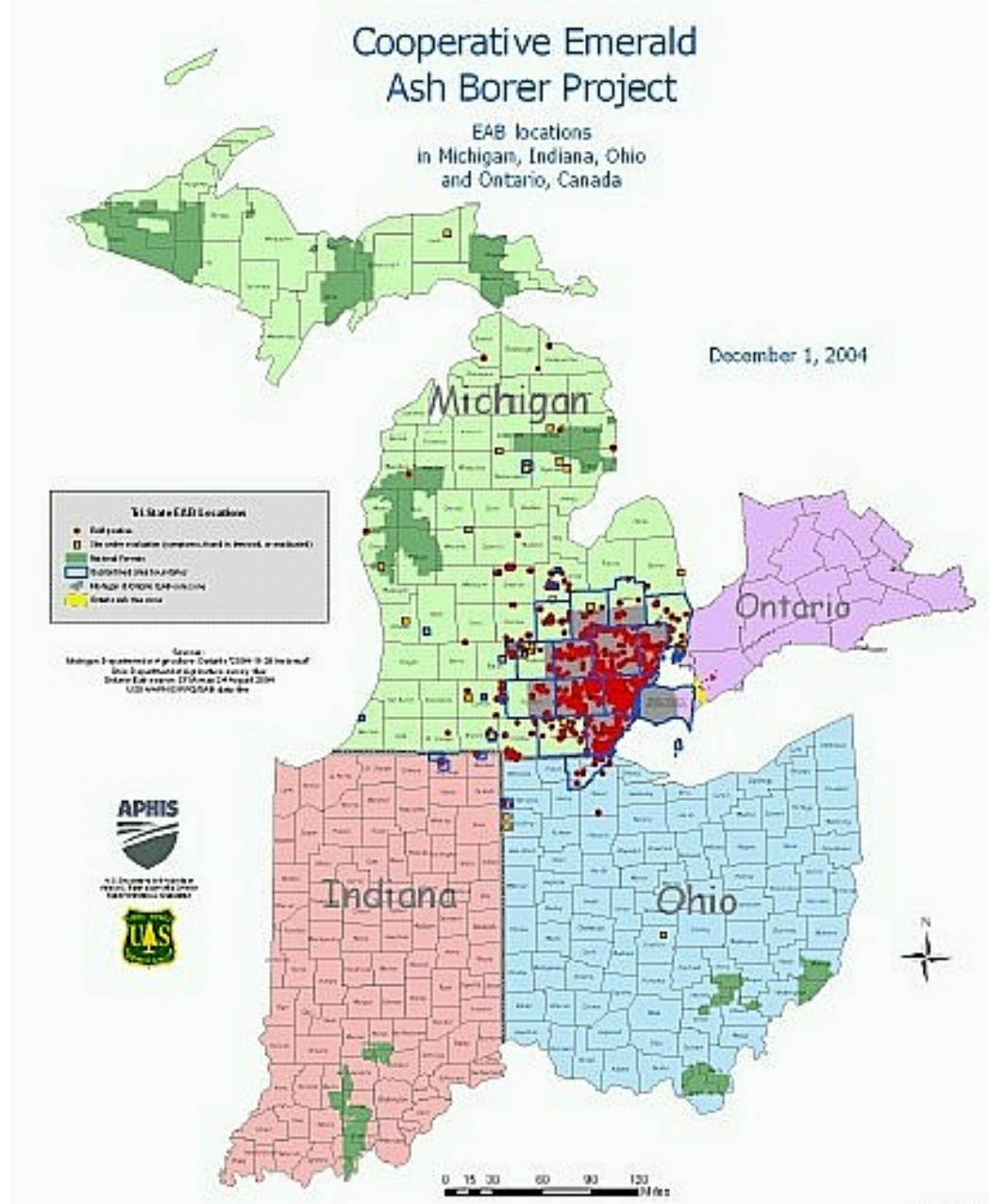
For emerald ash borer status in Ohio

<http://ashalert.osu.edu/>

For emerald ash borer status in Michigan

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

In 2004, our Field Office conducted visual surveys at recreation areas on Federal Lands across the Lake States. Additional surveys on state and private lands were conducted by many of our cooperating state partners with Forest Service financial assistance. No evidence of EAB was observed in Illinois, Iowa, Wisconsin or Minnesota. If interested in more information on these surveys please contact our office. Additional survey efforts are likely next summer. We welcome any reports of recently dead or dying ash. Send reports to skatovich@fs.fed.us



Asian longhorned beetle, *Anoplophora glabripennis*. Finally some good news to report. An infestation of this large Asian beetle was found in Chicago in 1998. An intensive eradication program has made big strides in eliminating ALB from the Chicago area. Unfortunately, while Chicago has been largely successful, an infestation in New York City has continued to persist and has expanded into New Jersey. In addition, another population of Asian longhorned beetle was found in the Toronto, Canada area. This beetle is a concern because it has a wide host range that includes some regionally very abundant trees such as sugar maple and poplars. For more information visit:

<http://www.na.fs.fed.us/spfo/alb/index.htm>



Sudden Oak Death -- The fungus-like plant pathogen *Phytophthora ramorum* is the cause of several diseases of woody plants, including sudden oak death (SOD). The pathogen causes bleeding cankers and tree mortality on oak species and tanoak in California, and also causes a variety of leaf, twig, branch and trunk symptoms on a variety of plants in several different families.



To date, the pathogen has been found in forested landscapes in the U.S. only in California and Oregon, despite the fact that in the spring of 2004, millions of nursery plants from infected nurseries in California were shipped to hundreds of locations across the country. Expedited and extended surveys of nurseries in 2004 resulted in 176 confirmations of the pathogen in 22 states, including CT, MD, NY, and PA in the Northeast. There were no positive nursery identifications in 2004 in any of the states in the St. Paul Field Office area. However, large numbers of potentially infected nursery plants were already sold by the time the trace-forward and survey was undertaken. More than one million nursery plants from infected nurseries are currently unaccounted for, and have probably been planted across the country.

In addition to a nursery survey, a survey of forested landscapes adjacent to ornamental nurseries and in other forested areas was conducted in 2004. In the Eastern U.S., no positive confirmations of *Phytophthora ramorum* were detected in the forest survey in 2004. These survey results suggest that *P. ramorum* is not yet widely established in forest landscapes in the Eastern U.S., but the risk posed by the missing, potentially infected nursery plants is very high.

Recent findings of sudden oak death in Europe on *Quercus rubra* and *Q. falcata* supplement findings from inoculation trials that these oak species are very susceptible to *P. ramorum*. The host list of *P. ramorum* continues to grow as additional hosts are found in both Europe and California, but the range of potential hosts in the Eastern U.S. is still largely unknown. Surveys will continue in 2005.

What About Exotic Weeds...

Weedy plants have become recognized as a major pest concern in many forested systems. European buckthorn and garlic mustard are two of the most commonly encountered and invasive plants in the Great Lakes region. Finding a long-term management solution to these species may be difficult. The establishment of biological control organisms is one area of interest. Recent successes with the release of two small leaf-feeding beetles on purple loosestrife have reinforced the positive benefits that a successful and carefully implemented biological control program can have. Purple loosestrife populations have declined in many areas where *Galareucella* beetles have been released.



The Forest Service, Forest Health Protection program, in cooperation with the Minnesota DNR and University of Minnesota, has been supporting a biological control program targeted at garlic mustard. In the past year, two European weevil species have arrived at the University of Minnesota, St. Paul campus. These weevils have undergone initial plant host specificity tests at a biological control facility in Switzerland. In St. Paul they are being housed in a quarantine facility undergoing further specificity tests. Before field releases occur, researchers and managers should have a clear understanding of what these weevils will feed upon. If the risk to native or important horticultural or agronomic plants is minimal, these weevils will likely be approved for field release. Biological control programs can take many years to implement and become successful but, they offer the possibility of a long-term solution.

Want to learn more about garlic mustard and buckthorn? A two-day workshop is being held on the St. Paul campus of the University of Minnesota on March 17 and 18. This workshop will update participants on a number of research and management issues including biological control updates. For more information contact Luke Skinner with the MN DNR at luke.skinner@dnr.state.mn.us

State Forest Health Highlights...

Our state cooperators in Michigan, Minnesota and Wisconsin annually put together a report called forest health highlights. At this time, the Highlights for 2004 have been posted for Minnesota and Wisconsin. These reports are an excellent record of the major insect and disease activity within each state. Much of the information is directly relevant to Federal lands in the Lake States. They are developed in cooperation with the Forest Service, Forest Health Monitoring (FHM) program, and can be accessed at the FHM web site:

<http://www.fhm.fs.fed.us/fhh/fhmusamap.shtm>

Quiz...



Test your knowledge. The photograph on the left is a relatively common species found feeding on the leaves of several hardwoods but most commonly on American elm. Here is a hint, count the number of prolegs, those are the fleshy legs that can be seen following the three jointed thoracic legs. A second hint, note the C-shape posture to the body. The middle photograph shows two whitish moths that would be roughly 1 inch in length. The buff colored areas behind these moths are actually egg masses that in this case are about the size of a quarter. The photograph on the right was taken in a black spruce stand in northern Minnesota. No hints for this one!

Quiz answers...

The photograph on the left is the elm sawfly, *Cimbex americana*. This is our largest native sawfly. This one was feeding on basswood. The pink color phase is unusual, most are yellowish or greenish white. A key character to distinguish sawflies is the number of pairs of prolegs, caterpillars (moth and butterfly larvae) have 2-5 pairs, sawflies have more than 5 pairs. The center photo shows two female gypsy moths with their egg masses. This is a common site in a gypsy moth infested area, females often die soon after egg laying and can be found as shown

clinging tightly to the tree for several weeks. The final photo (right) shows several black spruce trees with witches brooms caused by eastern dwarf mistletoe, *Arceuthobium pusillum*. Dwarf mistletoes are parasitic plants that utilize, in this case, black spruce as a host. The dwarf mistletoe seeds can be moved long distances via birds. Once established on a tree, seeds are expelled onto neighboring trees forming pockets of infection. These pockets expand in black spruce stands forming openings in the canopy that can be several acres in size.

Upcoming forest health workshops...

Garlic Mustard/Buckthorn workshop, March 17 and 18, St. Paul Campus, University of Minnesota. Co-sponsored by the Minnesota DNR, University of Minnesota and the U.S. Forest Service, Forest Health Protection. This workshop will update participants on a number of research and management issues including biological control updates. For more information contact Luke Skinner with the MN DNR at luke.skinner@dnr.state.mn.us

MN Statewide SAF session titled, "What's Bugging You?? Insects & Disease Threats to Minnesota's Trees" Feb. 15-16th, 2005, Holiday Inn, Mankato, MN. For more information visit <http://www.mnsaf.org/>

New forest planning website...

The Center for Land Use Education at the University of Wisconsin – Stevens Point has just released a new website called *Forest Planning for Wisconsin's Future* to assist local officials, forestland owners and the public with forest planning and plan implementation. The website contains a detailed description of the planning process and how forests and forest issues can be addressed during each step. Case studies describe a variety of forest conservation tools used in Wisconsin, from the County Forest Program to working forest conservation easements. For additional information on the project contact Bobbie Webster at 715-346-2407 or bwebster@uwsp.edu The project web site can be found at www.uwsp.edu/cnr/landcenter/forestplanning.html

Publications and resources...

Almost all of our publications are available via our home page found on the World Wide Web. This can be accessed at:

<http://www.na.fs.fed.us/spfo/>

Copies can be obtained by contacting our office at the address or phone number listed to the right.

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