

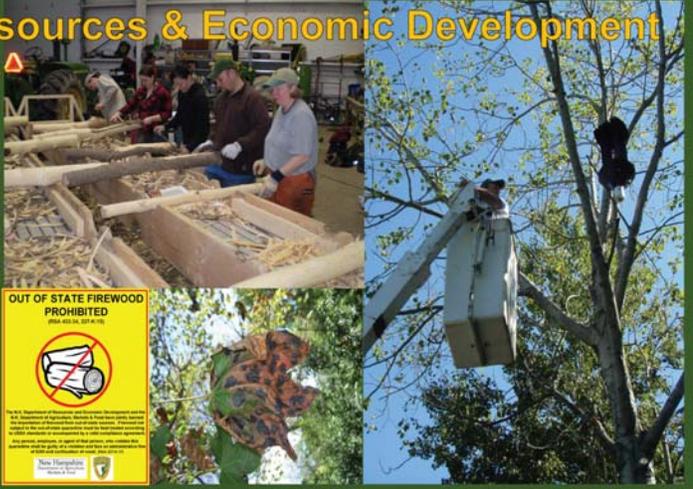


**NH Department of Resources & Economic Development**  
 Division of Forests & Lands   
 Forest Health Section

2011  
 Forest Health Highlights

- New Firewood Quarantine
- Foliage Diseases
- Asian Longhorned Beetle
- Emerald Ash Borer

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## FIELD SURVEYS

### Hemlock Woolly Adelgid & Elongate Hemlock Scale

Hemlock Woolly Adelgid (HWA) continues to spread slowly throughout southern NH. Surveys for 2011 included post suppression surveys and a border town survey in cooperation with Vermont and Maine. Several new infestations of HWA were discovered during the border town surveys. All towns that bordered towns with known infestations of HWA were surveyed. A minimum of 200 branches per site at 5 high risk sites per town were surveyed in 62 towns. New infestations of HWA were found in 12 of those towns. These include the towns of Swanzey, Temple, New Ipswich, Greenville, Wilton, Brookline, Derry, Rollinsford, Greenland, Hampton, Sandown, and Danville. Other new infestations were found post survey in Dublin and Exeter. Elongate Hemlock Scale was also reported in Exeter and South Hampton as it also continues to spread north.

In 2011 we treated small HWA infestations on 14 properties with basal bark applications of Dinotefuran. We treated new sites and retreated any sites that turned up positive in the post suppression survey. In addition we treated one site in Manchester that had been infested with Elongate Hemlock Scale for several years. All prior biological control release sites were also monitored. No *Laricobius nigrinus* beetles were recovered this year but one *Sasajiscymnus tsugae* beetle was recovered at a release site in Seabrook. A total of 10,000 *Sasajiscymnus* were released at this site in 2006.



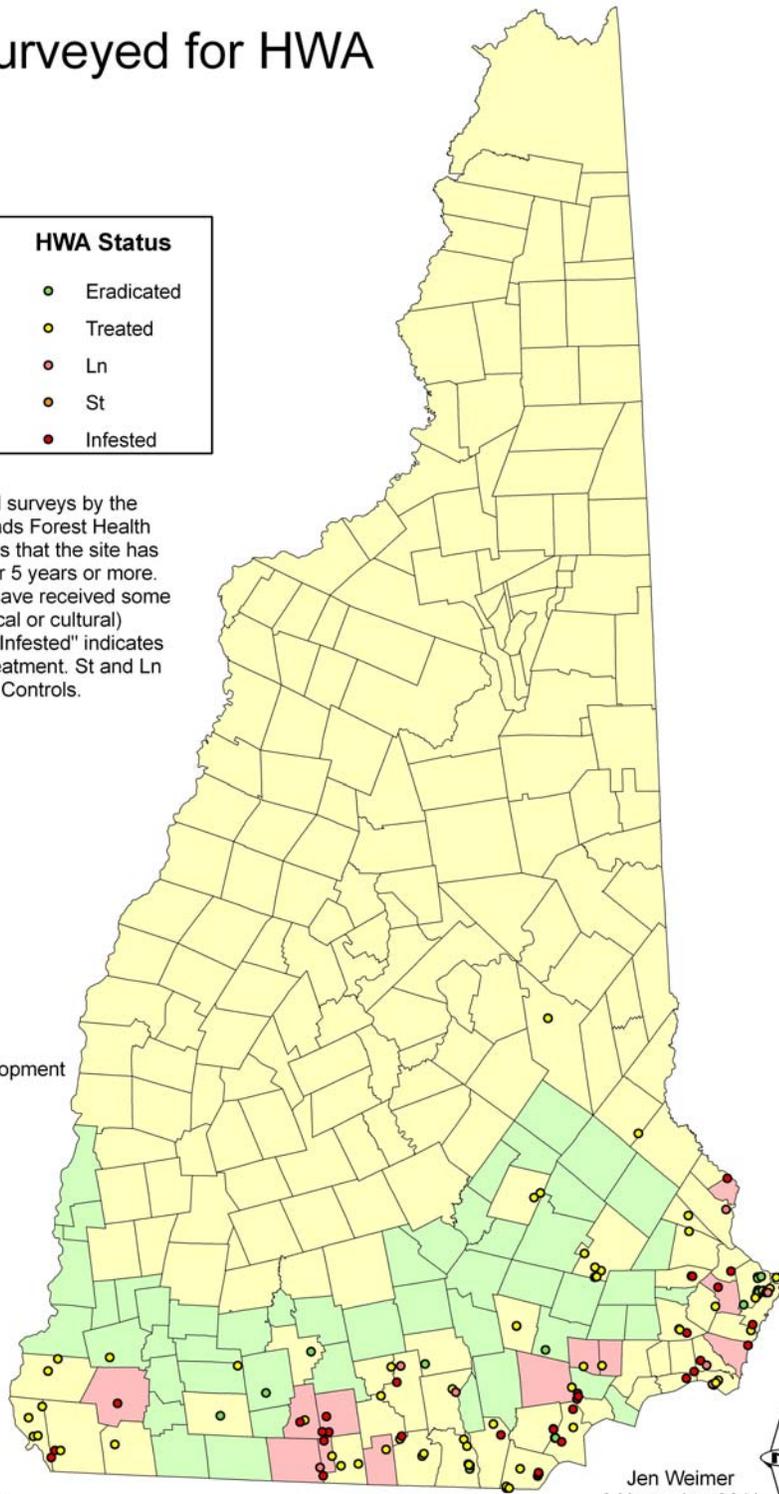
# 2011 Towns Surveyed for HWA

2011 Town Status	HWA Status
 Town Negative for HWA	 Eradicated
 Town Positive for HWA	 Treated
 Town not Surveyed	 Ln
	 St
	 Infested

HWA data based on annual surveys by the NH Division of Forests & Lands Forest Health Section. "Eradicated" indicates that the site has been found free of adelgid for 5 years or more. "Treated" indicates sites that have received some type of treatment (chemical or cultural) but has not been eradicated. "Infested" indicates sites that have received no treatment. St and Ln are Beetle Biological Controls.



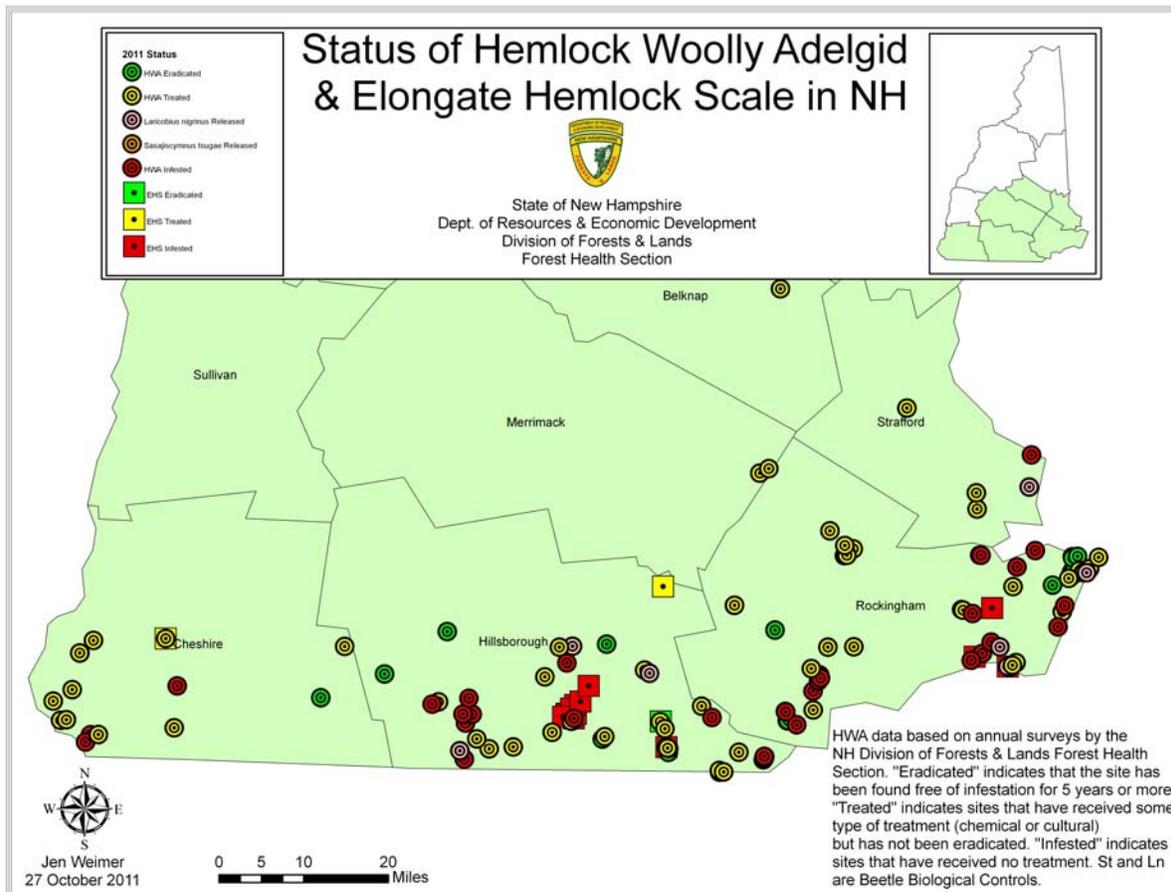
State of New Hampshire  
 Dept. of Resources & Economic Development  
 Division of Forests & Lands  
 Forest Health Section



0 10 20 40 60 80 Miles

Jen Weimer  
 8 November 2011





## **Emerald Ash Borer (EAB)**

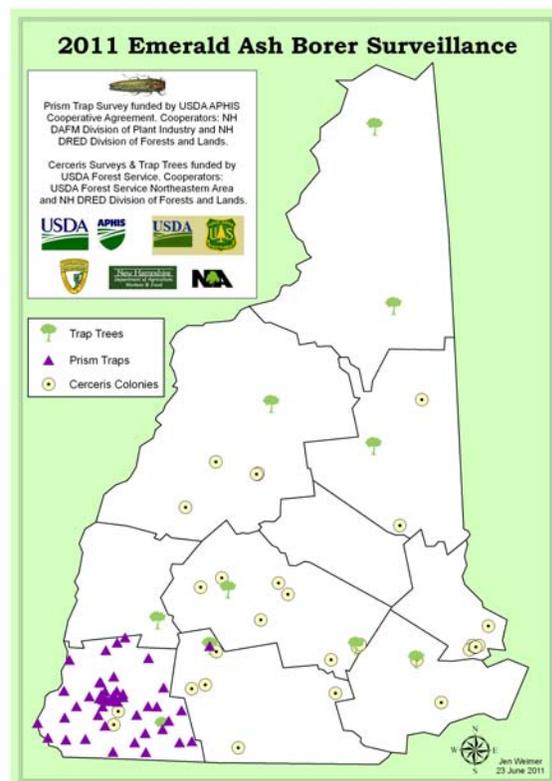
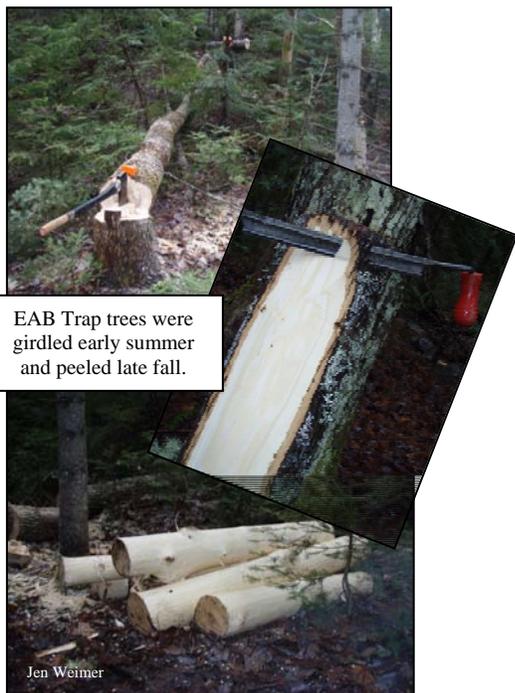
**EAB** continues to spread and threaten NH's ash resource. Surveys this year included purple prism traps, trap trees, and bio-monitoring. Due to the increasing threat of EAB spreading from the west we placed 50 traps in Cheshire County. This year our traps caught 70 buprestid beetles which is significantly more than in other years. This may be due to the addition of a new lure. We also hired a graduate student from Antioch University to prepare an invasive insect preparedness & action plan for the city of Keene, which is the largest city in NH closest to a known EAB infestation.

The closest infestations continue to be in New York. This past spring we assisted NYDEC and the US Forest Service with the peeling of ash logs to delineate the Kingston, NY infestation. Thousands of logs were inspected for EAB and the infestation remains on the west side of the Hudson River. New infestations of EAB were found this summer in western NY at West Point and in Rochester.





Colonies of *Cerceris fumipennis* were also monitored at 25 sites and almost 600 native buprestids were collected. In addition 10 trap trees were girdled, felled, and peeled with the help of the US Forest Service. There was one trap tree in each county. No signs of EAB were found in any of the surveys.



## Asian Longhorned Beetle

**ALB** continues to be detected in the Worcester, Massachusetts area and the quarantine has expanded to 110 square miles. In addition ALB was detected in Ohio this summer resulting in a 56 square mile quarantine. To date over 5,000 trees have been confirmed infested in Ohio and eradication efforts have begun with plans to remove tens of thousands of trees. No additional infested trees have been found in the 2010 Boston infestation that consisted of six trees.

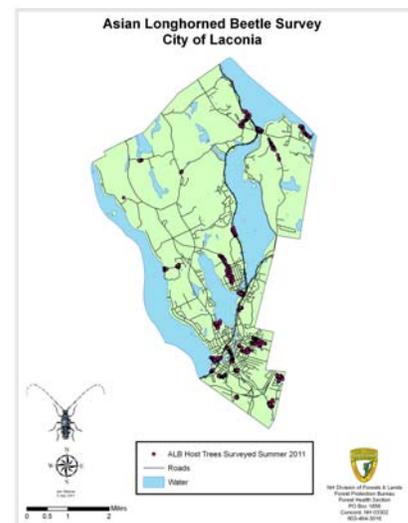
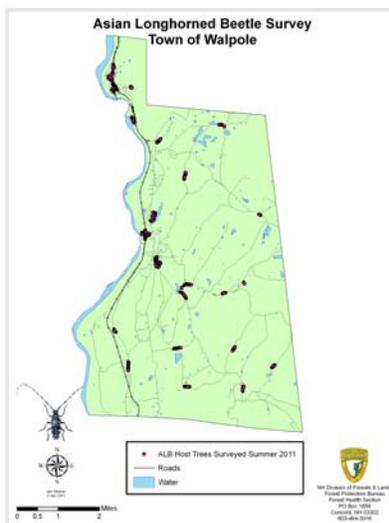
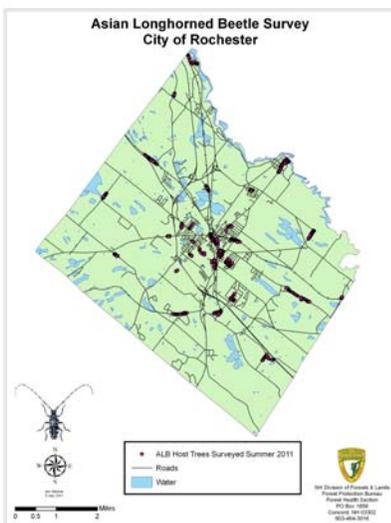


ALB Traps are Hung High in Trees at High Risk Urban Sites



The second year of our pool filter survey in cooperation with UNH Cooperative Extension was completed with 25 volunteer pool owners participating in 2011. Participants this year were asked to photograph insects found in their pool filters and post them to a [website](#). We received roughly 50 submissions of critters (everything from beetles to chipmunks) over the summer.

Over 3000 ALB host street trees were surveyed this summer in the cities of Laconia, Walpole, and Rochester (see maps below). In addition three private and four state campgrounds were surveyed for ALB. We also continue to survey second homes owned by Worcester, MA residents. To date we have surveyed 131 second homes. We also monitored 5 traps in cooperation with the US Forest Service. No ALB was found in any of the surveys.



# 2011 ALB Surveillance

-  Traps
-  Second Home & Campground Survey
-  Pool Filter Survey
-  City Street Tree Surveys



State of New Hampshire  
Dept. of Resources & Economic Development  
Division of Forests & Lands  
Forest Health Section



Funded by US Forest Service  
Northeastern Area

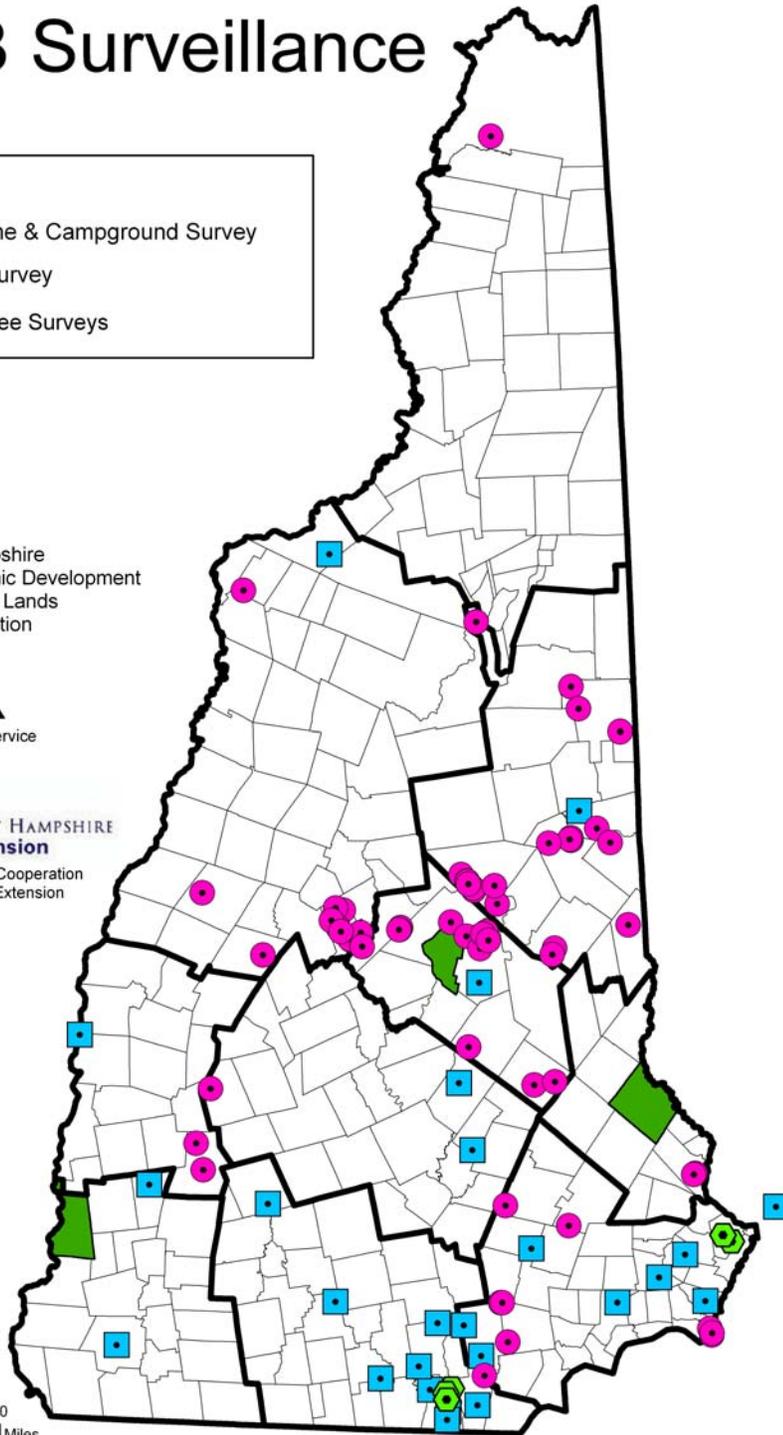


UNIVERSITY of NEW HAMPSHIRE  
Cooperative Extension

Pool Filter Survey done in Cooperation  
with UNH Cooperative Extension

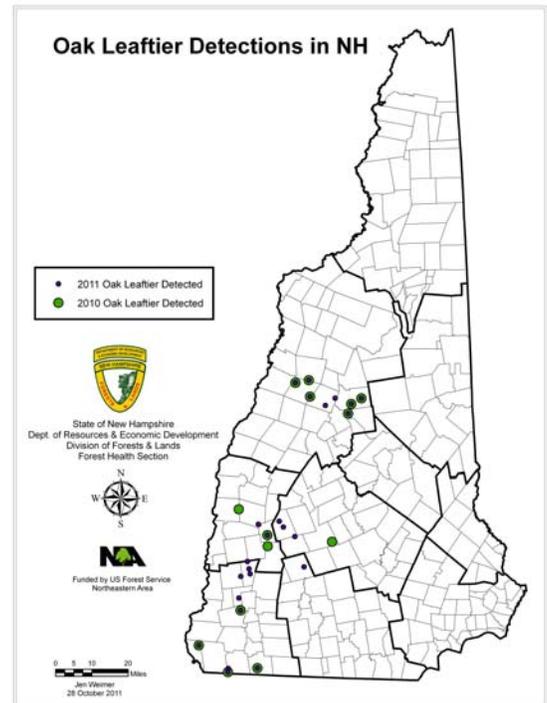


Jen Weimer  
27 October 2011



## Pheromone Trapping of Forest Pests

Each summer pheromone bucket traps are placed around the state to monitor moths that have the potential to defoliate large acreage. Epidemics of forest pests can be predicted by analyzing trends over time. In 2011 pheromone traps were put out for Spruce Budworm, Forest Tent Caterpillar, and Oak Leaf-tier. Spruce Budworm and Forest Tent Caterpillar remain at endemic levels. Oak Leaf-tier was detected at numerous traps which is consistent with the defoliation detected in the aerial surveys. Heavy defoliation in isolated areas may be seen again next year.



## NH Aerial Survey Highlights for 2011

NH's annual aerial survey is a cooperative effort between the NH Division of Forests and Lands and the USDA Forest Service Northeastern Area State and Private Forestry. The 2011 NH state aerial survey team mapped almost 4000 acres of serious damage or defoliation on state and private lands and the USDA Forest Service mapped an additional 1600 acres of damage on the White Mountain National Forest.

Damage observed included defoliation of hardwoods from Anthracnose (2740 acres), dieback of hardwoods from prior ice storm damage (77 acres), mortality of white pine from Ips Bark Beetles (20 acres), defoliation of white oak by oak skeletonizer (12 acres). Defoliation of red oaks by oak leaf-tier (1596 acres) was also observed again and has resulted in some dieback and mortality.

**Map of 2011 major forest damage on the following page**

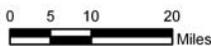
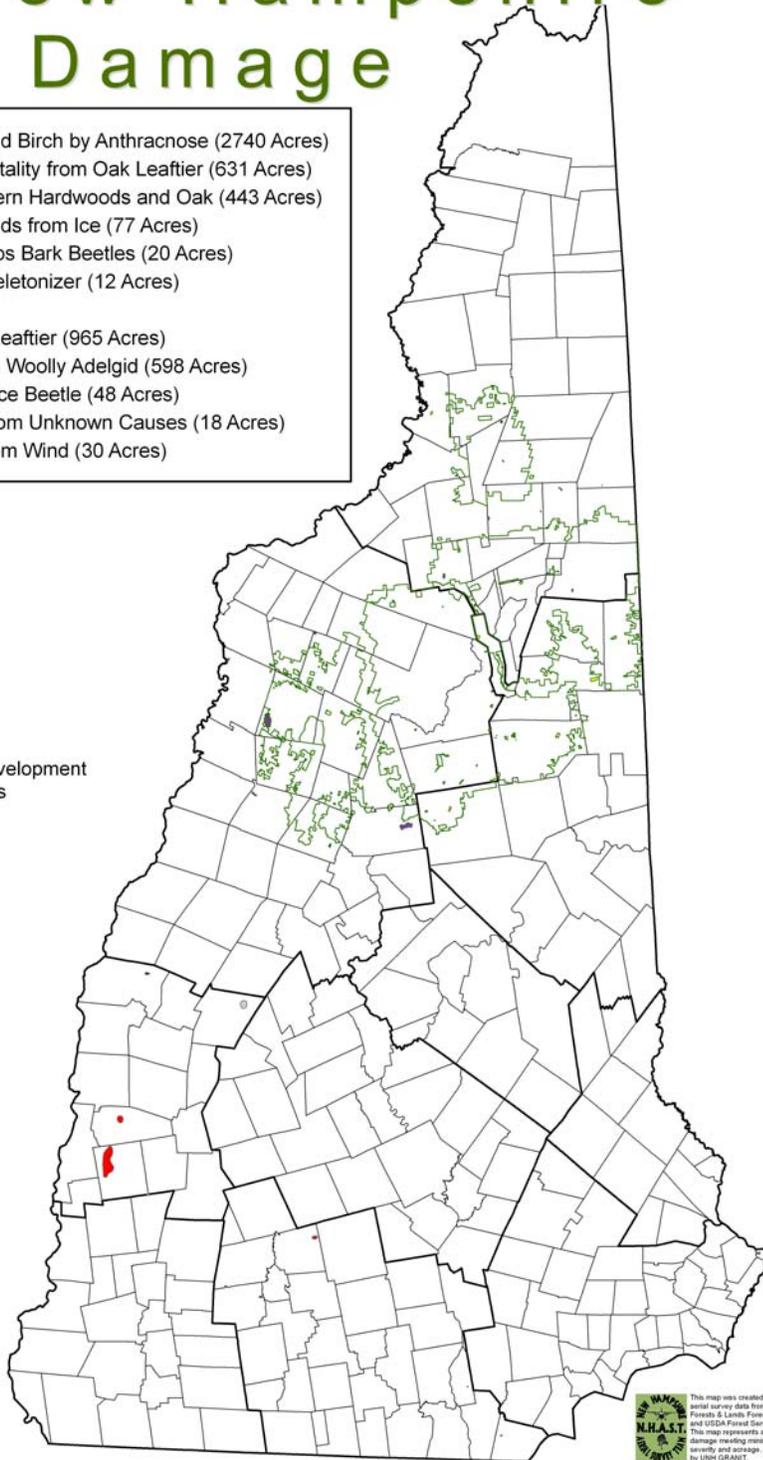


# 2011 New Hampshire Forest Damage

- Defoliation of Sugar Maple and Birch by Anthracnose (2740 Acres)
- Defoliation, Dieback, and Mortality from Oak Leafhopper (631 Acres)
- Unknown defoliation of Northern Hardwoods and Oak (443 Acres)
- Dieback of Northern Hardwoods from Ice (77 Acres)
- Mortality of White Pine from Ips Bark Beetles (20 Acres)
- Defoliation of Oak by Oak Skeletonizer (12 Acres)
- WMNF
- Defoliation of Oak from Oak Leafhopper (965 Acres)
- Defoliation of Fir from Balsam Woolly Adelgid (598 Acres)
- Mortality of Spruce from Spruce Beetle (48 Acres)
- Discoloration of White Pine from Unknown Causes (18 Acres)
- Mortality of Spruce and Fir from Wind (30 Acres)



State of New Hampshire  
 Dept. of Resources & Economic Development  
 Division of Forests & Lands  
 Forest Protection Bureau  
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This map was created by Jim Skinner using aerial survey data from the NH Division of Forests & Lands Forest Health Program and USDA Forest Service Northeastern Area. This map represents areas of forest damage meeting minimum thresholds of severity and acreage. Base data provided by UNH GIS/RS&T.

6 December 2011

## FEATURE ARTICLE

By: Kyle Lombard

### External Firewood Quarantine Now In Affect Statewide

Bringing untreated firewood into New Hampshire from out-of-state is now restricted. But before going into the details of the quarantine let's review how we got to this point. In 2002 emerald ash borer (EAB) was discovered to be the cause of a major ash mortality event in Michigan. Emerald ash borer is a wood borer from Asia and is now considered the worse forest insect pest to reach North America in over 100 years. EAB has killed more than 30 million ash trees to date and puts the future of all ash species in the northeast in jeopardy. Research on EAB quickly started in the great lakes region, and it was discovered 75% of the EAB infestations originated in or around a campground. It turns out firewood movement from infested towns to un-infested towns had spread the devastating pest hundreds of miles. This discovery spurred more research to investigate firewood as a vector of forest insects and disease.

The first step here in New Hampshire was to survey campers coming from out-of-state, to see if firewood really does travel long distances. The results were surprising. In 2006, 42% all campers coming to New Hampshire brought firewood from their home state. That included states like California, North Carolina, Florida, New York, and so many others in the mid-Atlantic. During 2007 and 2008 the Division of Forests and Lands confiscated random samples of this out-of-state firewood and placed them in quarantined rearing barrels to catalogue any insects that emerged from the wood. Again the results surprised us. In 22 samples of firewood 701 animals emerged in the form of insects, arachnids, crustaceans, mollusks, centipedes, and millipedes. 651 of these critters were insects covering 10 different orders and 36 different families. It was clear after our study (and many other studies around the country) that firewood had been a source of forest pests for decades and had flown under the radar of forest health specialists.

In 2009 the Department of Resources and Economic Development issued an order banning all out-of-state firewood from entering State reservations. In a parallel action the White Mountain National Forest also banned out-of-state firewood. Public outreach related to this issue grew across the country and by 2011 the New Hampshire Campground Association, local firewood dealers, and other partners supported the effort to ban untreated firewood from coming into New Hampshire whether its destination was public or private lands. Today, some variation of an out-of-state firewood quarantine is in effect in all 24 of the northern and eastern states.

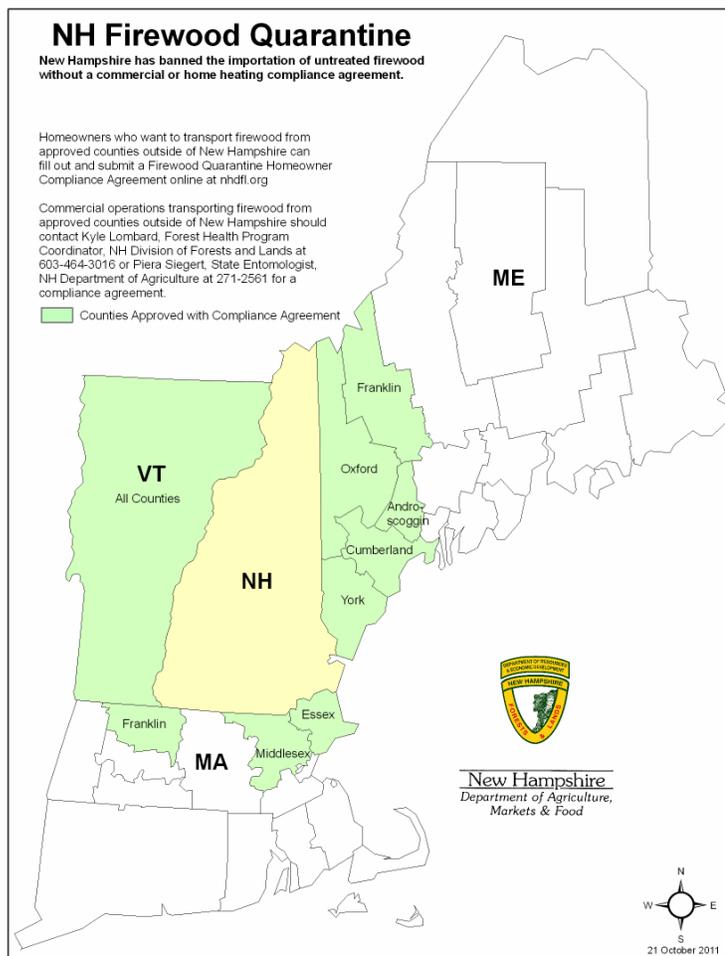


**Figure 1. Bark beetles emerging from firewood in a dark barrel were attracted to light coming from an attached glass emergence jar. Insects were fumigated, monitored and collected from that jar.**



Now, back to the details of the New Hampshire quarantine. With no federal guidance each state across the region has created a slightly different model to implement. Most states have a hard and firm “no untreated wood from outside the state border”, and many of the larger states also restrict interior movement to less than a 50 mile radius. New Hampshire has created a unique variation of these quarantines to best suit our New Hampshire geography and population distribution.

In a cooperative effort between the Department of Agriculture, Foods & Markets (DAMF) and the Department of Resources and Economic Development (DRED), and guided by the Forest Pest Advisory Group, all non-heat treated firewood is quarantined from entering New Hampshire unless there is documented proof of origin from specific bordering counties (green shaded area in Figure 2.) and the delivery location is under a compliance agreement with DRED or DAMF. “Heat treated” means that the wood is kiln dried to 160 degrees F. for 75 minutes at a certified kiln location and that the wood is properly packaged and labeled. There are two compliance agreement options. The first is for homeowners moving a cord or more wood for home heating from a site within the approved buffer area. They can go on-line to the DFL website at <http://www.nhdfi.org/forest-health/firewood/agreement.aspx> and fill out the abbreviated compliance agreement. The second option is for commercial operations shipping multiple loads from approved border counties. These commercial businesses need to contact the Division of Forests and Lands at 603-464-3016, or the Department of Agriculture, Markets and Foods at 603-271-2561.



**Figure 2. Un-treated firewood from green shaded counties may be imported under a compliance agreement with DAMF or DRED.**

# FEATURE CREATURE

By: Jen Weimer

## Foliage Diseases - Fungi or Foe

Foliage diseases were prevalent throughout the northeast this year following another wet spring. It appeared that every tree species was affected by one fungus or another and newspapers were reporting concerns of dampened fall colors. Fall foliage was however just as spectacular as usual unless you were one of the unlucky that had an infected tree in your yard. The following is a summary of the many foes that infected our trees this year.



Signs of needlecast disease on white pine was noted early in the summer for the third year in a row throughout the state and was caused by one of three fungi; *Bifusella linearis*, *Canavirgella banfieldii*, or *Mycosphaerella dearnessii* (Brown Spot Needle Blight). Diagnosis between these diseases can be difficult since they produce similar symptoms. The fruiting bodies of *C banfieldii* are produced through the winter and are visible earlier in the spring; *B linearis* fruits late spring; whereas *M dearnessii* fruits in June. Samples were collected throughout southern NH and confirmed by Isabel Munck, a Forest Pathologist with the USDA Forest Service Northeastern Area. All three pathogens can occur individually or on the same tree and cause trees to appear brown in early summer. Once the affected needles fall crowns appear green again but thinner with only the current years growth remaining.



Hardwoods were also affected this year by the wet spring and leaf blights were seen all over the state. Birches, maples, oaks, and ash were infected with Anthracnose diseases. Anthracnose is caused by a variety of fungi and can affect leaves, twigs, buds, shoots, and fruit (see figure 1). Symptoms vary depending on the host but typically cause brown necrotic spots on foliage along the veins and leads to early leaf loss. This summer leaves of sugar maple and ash were very susceptible leaving many trees leafless by summers end. Oak leaf petioles were also found to be infected this year with *Apiognomonia quercina* causing leaves to droop and fall early.

Figure 1: Hardwoods Affected by Anthracnose Diseases

[Anthracnose Diseases of Eastern Hardwoods USDA Forest Service FIDL 133](#)

Host	Causal Fungi	Parts of tree affected
Ash, several species	<i>Discula umbrinella</i> (Berk. et Br.) Sutton ( = <i>Gloeosporium addum</i> )	Leaves
Basswood	<i>Apiognomonina tiliae</i> (Rehm) v. Hoehnel ( = <i>Gnomonia tiliae</i> )	Leaves, twigs
Birch, several species	<i>Asteroma microspermum</i> (Peck) Sutton ( = <i>Gloeosporium betulaeluteae</i> )  <i>Cryptocline betularum</i> (Ell. et Mart.) v. Arx ( = <i>Gloeosporium betularum</i> )	Leaves
Catalpa, northern and southern	<i>Colletotrichum gloeosporioides</i> (Penz.) Sacc. ( = <i>Gloeosporium catalpae</i> )	Leaves
Elm, several species	<i>Asteroma inconspicuum</i> (Cav.) Sutton ( = <i>Gloeosporium inconspicuum</i> )	Leaves, twigs
Hickory, several species	<i>Gnomonia caryae</i> Wolf	Leaves, twigs
Horsechestnut	<i>Glomerella cingulata</i> (Stonem.) Spauld. & Schrenk	Leaves, twigs
Maple, several species	<i>Kabatiella apocrypta</i> (Ell. et Ev.) v. Arx ( = <i>Gloeosporium apocryptum</i> )	Leaves, twigs
Oak, many species	<i>Apiognomonina quercina</i> (Kleb.) v. Hoehnel ( = <i>Gnomonia quercina</i> )	Leaves, twigs, buds, shoots
London planetree	<i>Apiognomonina veneta</i> (Saec. et Speg.) v. Hoehnel ( = <i>Gnomonia platani</i> )	Leaves, twigs, buds, shoots
Sycamore, American and European	<i>Apiognomonina veneta</i> (Saec. et Speg.) v. Hoehnel ( = <i>Gnomonia platani</i> )	Leaves, twigs, buds, shoots
Tuliptree or yellow-poplar	<i>Colletotrichum gloeosporioides</i> (Penz.) Sacc. ( = <i>Gloeosporium liriodendri</i> )	Leaves
Walnut, several species	<i>Gnomonia leptosyla</i> Ell. et Ev.	Leaves, twigs, fruit



In addition, leaf spot and tar spot diseases were seen on maple this year. *Septoria* is a common leaf spot disease on maple and appears as small necrotic tan or brown spots that form in mid to late summer. When numerous, the spots can coalesce into large necrotic areas causing the leaves to turn yellow and brown. The fungus *Rhytisma* causes distinct shiny tar-like black spots on leaves causing premature fall coloration and defoliation. Outbreaks of tar spot are common on Norway maple and since it is a common street tree entire neighborhoods can become unsightly by late summer if infected.



All of the aforementioned diseases are typically not harmful to the tree unless they have infected the same tree for several years in a row. Fungicides can be applied in the spring when the trees leaf out but can be expensive and tricky to get full coverage. Trees can also be protected from reinfection by removing fallen needles and leaves which harbor the over wintering fungi. Infections are unlikely to reappear next year if the weather remains dry, however if climate change predictions are accurate we may continue to see the wet conditions that lead to happy fungi.



## Office Notes



The NH Forest Health Office is located at the Caroline A. Fox Research and Demonstration Forest in Hillsboro. This summer a dozen additional *Acer mono*'s were planted around the office by Margaret Skinner and Bruce Parker at the University of Vermont as part of a study in NH, VT, and NY to test the growing ability and invasiveness of the species in the northeast. A *mono* is a highly favored host of ALB and is being used as a sentinel tree to detect new infestations.

The forest health office consists of two full time staff and several part time seasonal staff. Ray Boivin, our part time Entomologist, worked with us again this summer on the firewood study and pool filter survey. We also had 2 summer technicians again this year: Molly Heuss and Sarah Frischknecht who surveyed thousands of trees for ALB and assisted with the EAB surveys. In addition Lisa Yeaw, an intern from Antioch University, assisted with EAB outreach and developed an invasives preparedness plan for Keene.

We have a new two-sided wallet card for HWA and EHS (see below).  
Contact us if you would like to receive some.



### Forest Health Section Contacts

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For more information about our program and forest health issues check out our website:

<http://nhdfl.org/forest-health>



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JW 12/11