



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

2009
Forest Health Highlights

- Asian Longhorned Beetle
- Hemlock Woolly Adelgid
- Emerald Ash Borer
- Cerceris

PO Box 1856
 Concord NH 03302
 603-464-3016



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FIELD SURVEYS



Hemlock Woolly Adelgid

Hemlock Woolly Adelgid (HWA) continues to spread slowly throughout southern NH despite our suppression efforts. Surveys in 2009 were conducted in 40 towns in the southern part of the state and included post suppression surveys and a road side survey of lakeside communities. New infestations of HWA were found in 3 towns during the road side survey. These include the towns of Farmington, Nottingham, and Newmarket.

Another infestation was found in Amherst while investigating a report of ALB (no ALB was ever found). The road side survey focused on towns not previously surveyed, towns bordering MA, towns bordering the current quarantine and towns surrounding new infestations. Sites near ponds and lakes were targeted in the surveyed towns since several infestations in recent years have occurred in these areas. Surveys in NH show that trees along roads or other openings such as fields and ponds become infested first. These trees have the greatest chance of appealing to birds that may be carrying HWA and sustaining HWA populations if they are south facing or overhanging roadways.



Infestations were also reported by homeowners in Alton Bay and Hinsdale. The report in Alton Bay is the farthest north we've seen HWA in NH. The infestation was heaviest in a large tree that hung over a garage with a black roof. We suspect the adelgid thrived in this location due to the warmth reflecting off of the roof. Future surveys along the northern edge of HWA will focus on these potential "hot spots". This phenomenon may also explain why we find numerous infestations along roadways where heat radiates off of the pavement.

We also implemented several suppression methods in 2009. We treated numerous small infestations on 10 properties with soil injections of Imidacloprid. We also did a trial basal bark application of Dinotefuran at 1 property. We used a combination of chemical and cultural controls on a large infestation in Pawtuckaway State Park. We cut the core of the infestation and treated trees on the edge of the cut with soil injections of Imidacloprid. The logs were transported to the UNH sawmill and milled for park use. Branches were chipped and left onsite. We also utilized biological control with the release of 500 *Laricobius nigrinus* beetles on conservation land in Amherst. To date we have released 1700 *Laricobius* and 38,052 *Sasajiscymnus tsugae* beetles throughout the south eastern part of the state. No *Laricobius* beetles were recovered this year from previous releases but 1 *Sasajiscymnus* beetle was recovered at a 2006 release site in Seabrook.

HWA predators in NH

Year	Species	No. Beetles Released	No. Locations	No. Locations with Recoveries
2001	<i>Sasajiscymnus tsugae</i>	2950	1	1
2002	<i>Sasajiscymnus tsugae</i>	5000	1	0
2003	<i>Sasajiscymnus tsugae</i>	2480	0	0
2004	<i>Sasajiscymnus tsugae</i>	7500	0	0
2005	<i>Sasajiscymnus tsugae</i>	10122	0	0
2006	<i>Sasajiscymnus tsugae</i>	10000	1	1
2007	<i>Laricobius nigrinus</i>	500	1	1
2008	<i>Laricobius nigrinus</i>	700	3	0
2009	<i>Laricobius nigrinus</i>	500	1	0
Total		39752	8	3

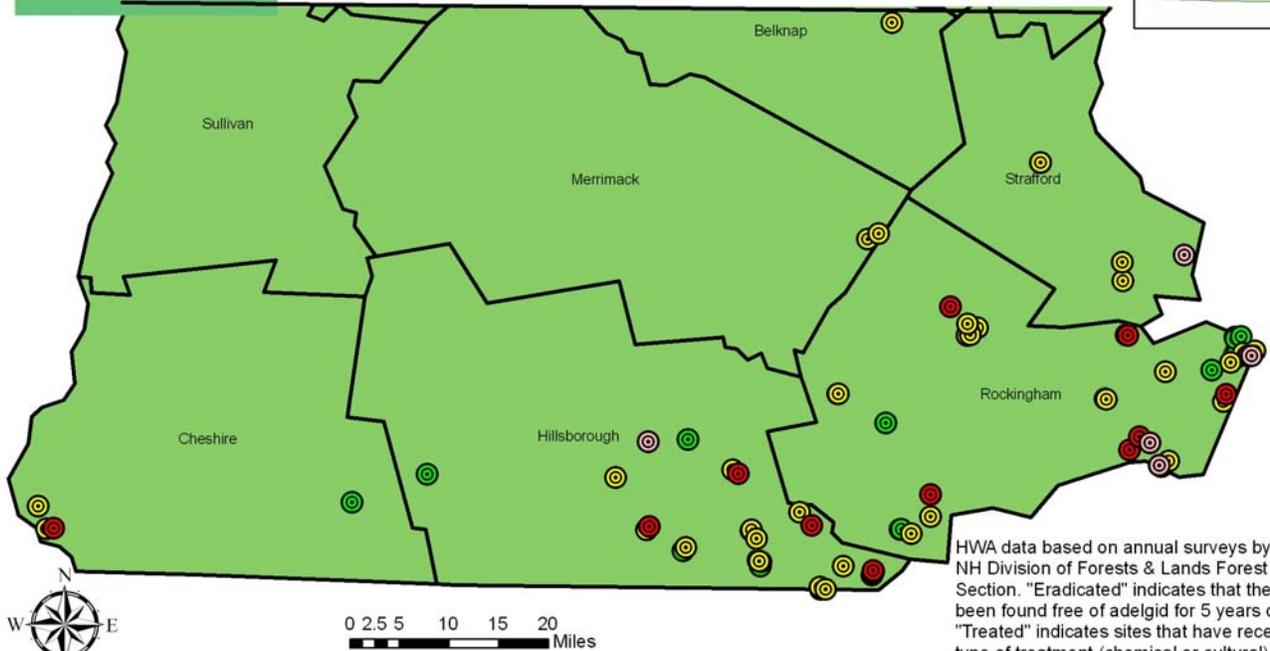
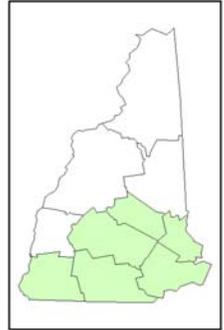
2009 Status

- Eradicated
- Treated
- Ln Released
- St Released
- Infested

HWA in NH



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



Jen Weimer
18 December 2009

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.



Jen Weimer

Emerald Ash Borer (EAB)

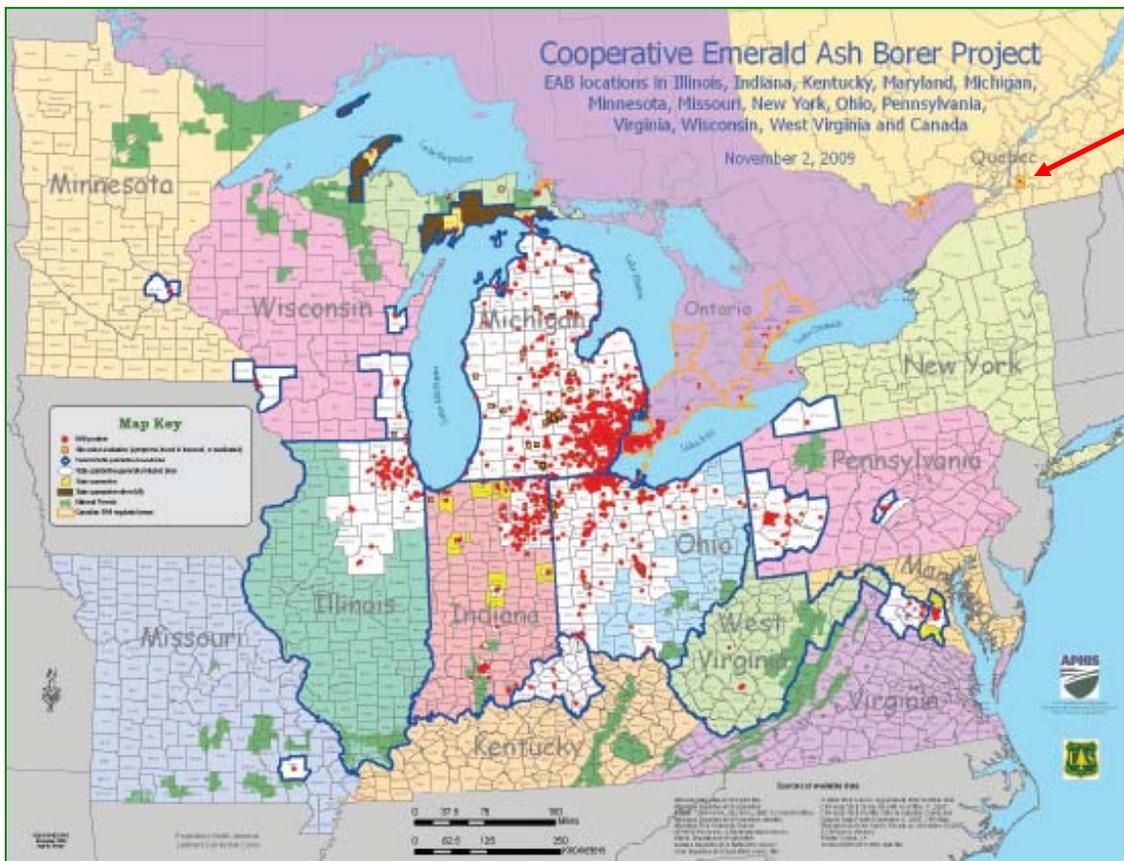
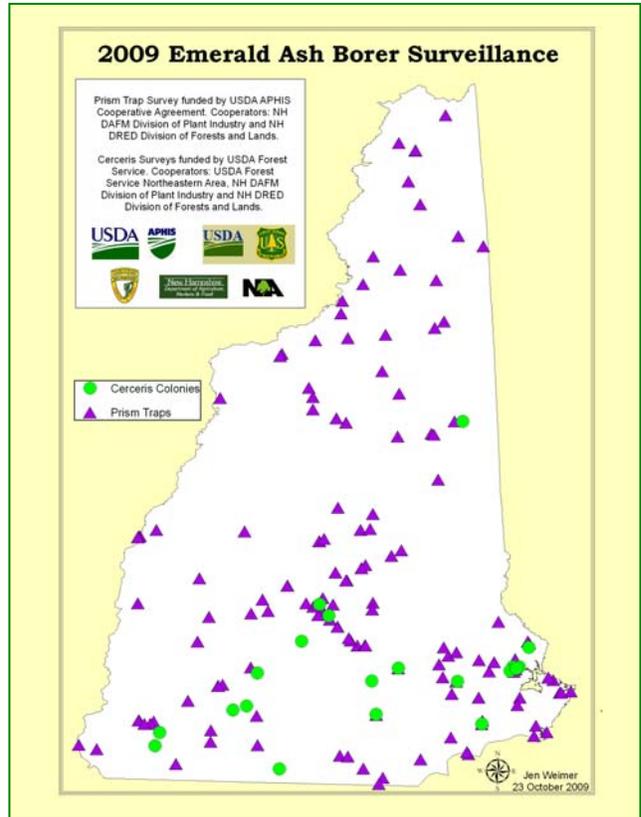
EAB continues to spread in the Midwest and Canada and threaten NH's ash resource (see map on next page). Surveys this year included prism traps and bio-monitoring. We placed 40 purple prism traps around the state as part of a larger cooperative effort with the NH Department of Agriculture. The traps are designed to attract and capture adult beetles. We trapped 15 buprestids and the NH Department of Agriculture collected 68. We also monitored 6 colonies of *Cerceris fumipennis* (See Feature Creature for more info) and collected 198 native buprestids. We also collected 4 chrysomelids, which is unusual but has been noted in literature. This was also a cooperative effort; the NH Department of Agriculture and the USFS Northeastern Area also collected numerous beetles. *Cerceris* seems to be a better tool than the prism traps for collecting buprestids and we plan to use them again next year to survey for EAB. No signs of EAB were found in any of the surveys.



Meena Haribal

2009 Cerceris Collection

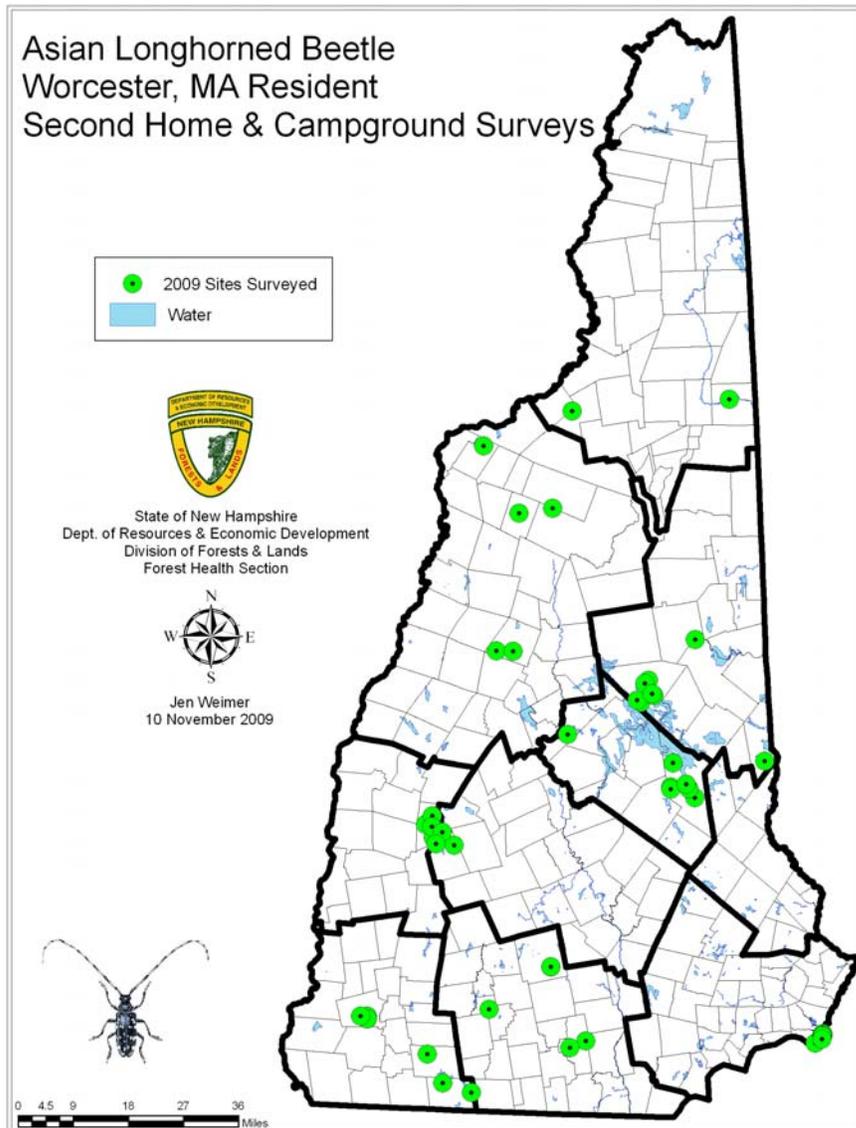
Buprestidae	
<i>Agrilus anxius</i>	4
<i>Agrilus politus</i>	2
<i>Buprestis consularis</i>	1
<i>Buprestis maculativentris</i>	1
<i>Buprestis striata</i>	8
<i>Chrysobothris blanchardi</i>	1
<i>Chrysobothris harissi</i>	1
<i>Chrysobothris sexsignata</i>	2
<i>Chrysobothris spp</i>	5
<i>Dicerca caudata</i>	8
<i>Dicerca divaricata</i>	145
<i>Dicerca punctulata</i>	11
<i>Dicerca spp</i>	4
<i>Dicerca tuberculata</i>	3
<i>Eupristocerus cognitans</i>	1
<i>Melanophila fulvoguttata</i>	1
Chrysomelidae	
<i>Cryptocephalus mutabilis</i>	3
<i>Neochlamisus spp</i>	1



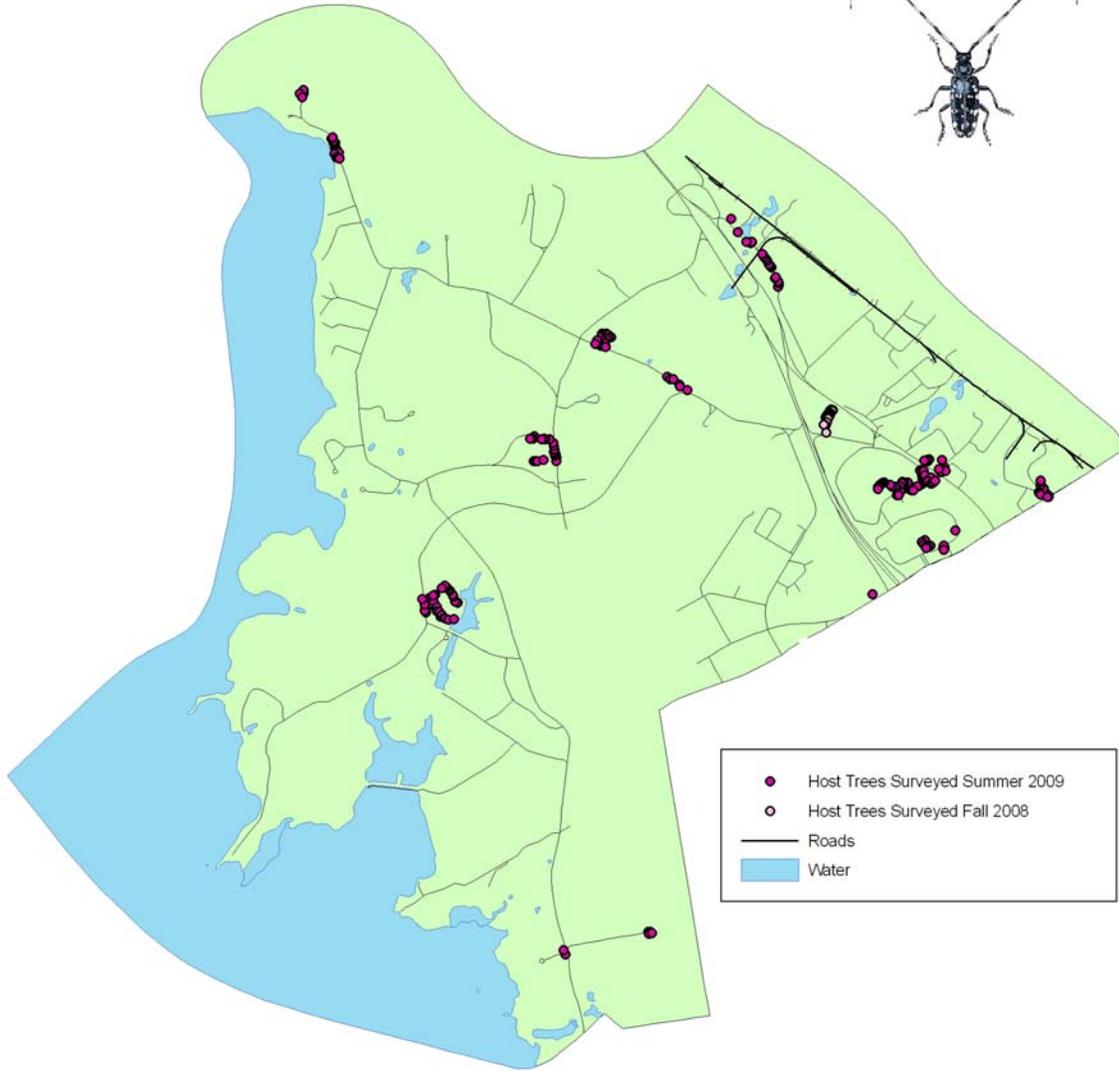


Asian Longhorned Beetle

ALB continues to be detected in Worcester, Massachusetts and the quarantine has expanded to 74 square miles. Roughly 30,000 infested trees have been removed in Worcester and surveys are ongoing. We surveyed nearly 7000 host trees in NH this summer in the cities of Portsmouth, Newington, Manchester, Keene and Nashua (See maps on following pages). In addition, with help from the NH Tax Assessors Association, we identified 213 Worcester area residents with second homes in NH. We sent them letters and asked them to participate in a [survey](#). We prioritized the returned surveys based on whether respondents moved firewood from MA to NH in the past 10 years. All high risk and several low risk properties have been surveyed. We also surveyed state campgrounds that had the highest percentage of campers from Worcester. A total of 359 trees were surveyed at 4 state campgrounds. No signs of ALB were found in any of our surveys.



Asian Longhorned Beetle Survey City of Newington



- Host Trees Surveyed Summer 2009
- Host Trees Surveyed Fall 2008
- Roads
- Water



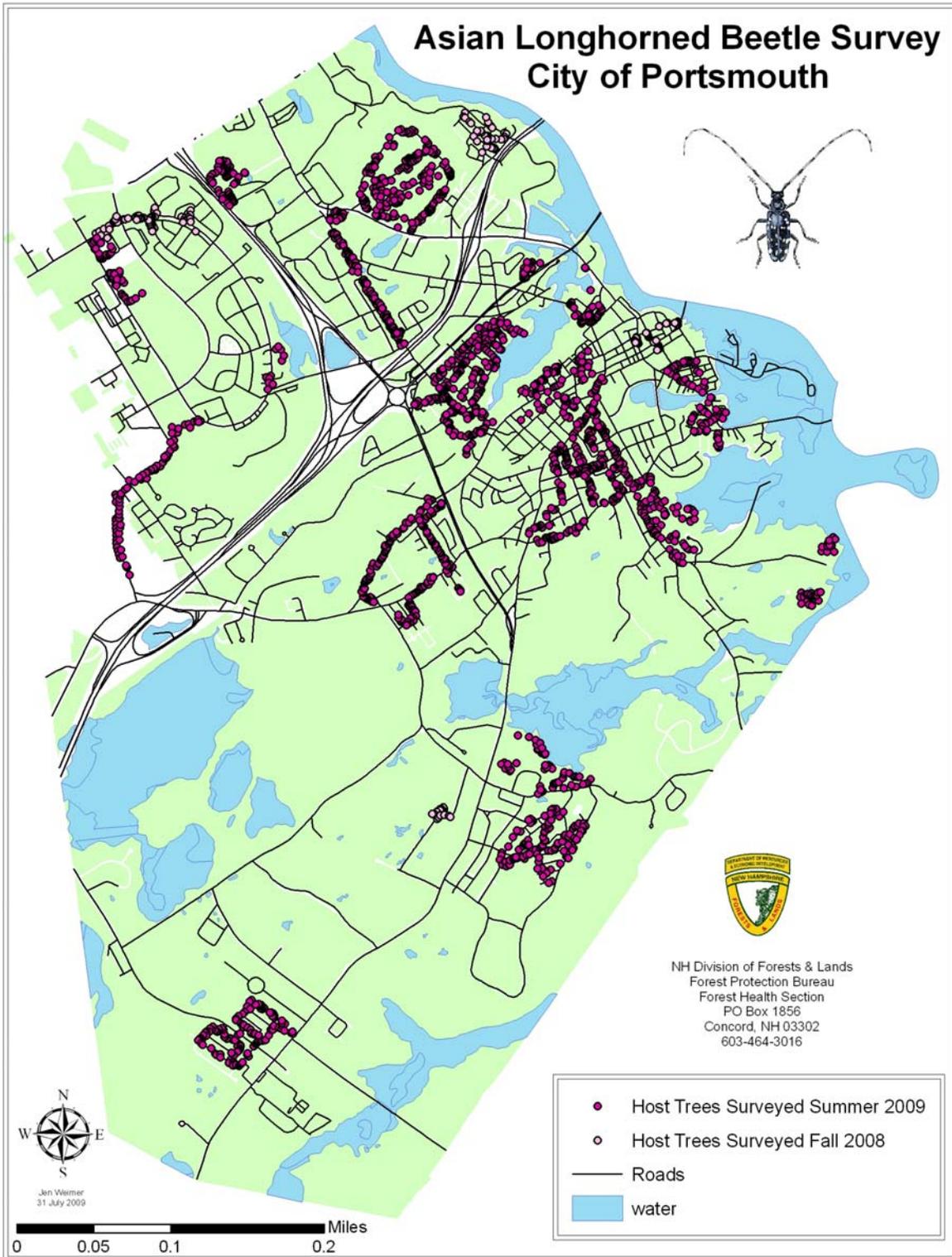
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Jen Werner
5 October 2009

0 0.5 1 2 Miles

Asian Longhorned Beetle Survey City of Portsmouth



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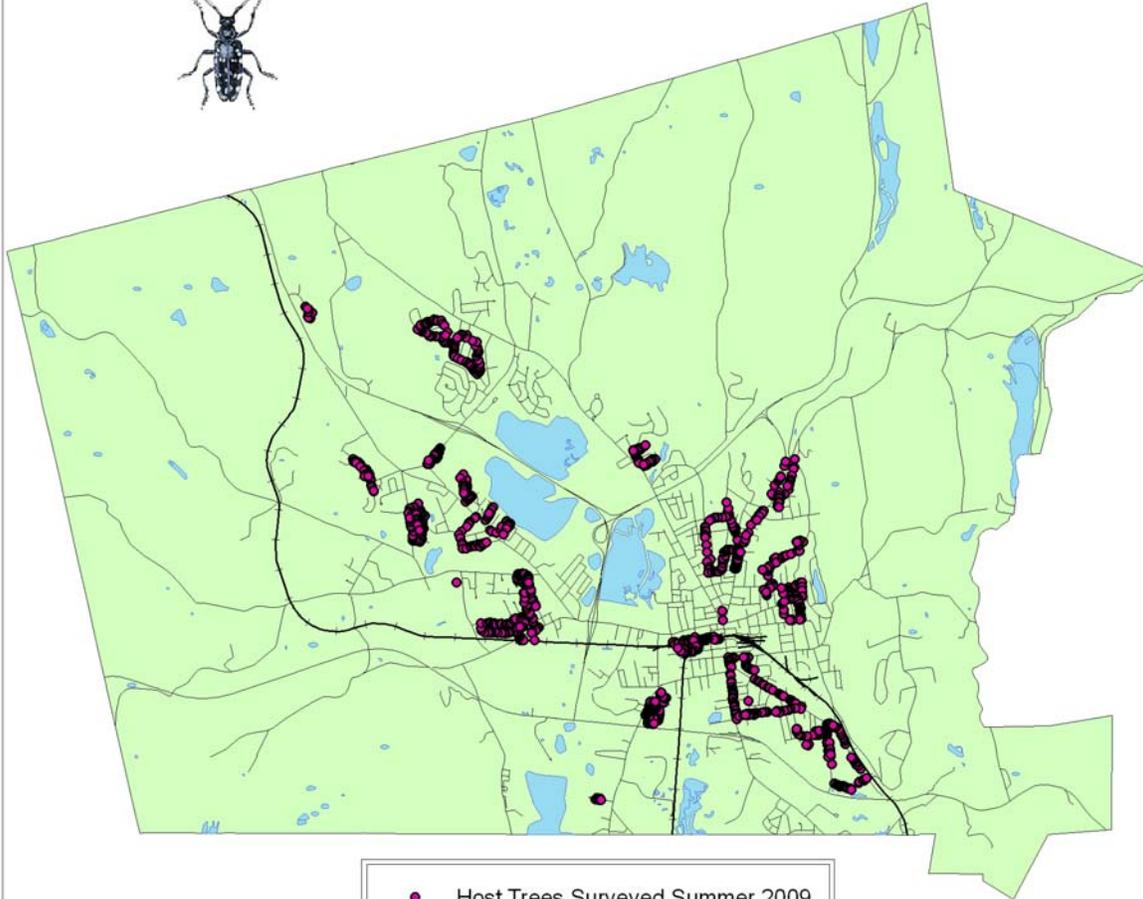
- Host Trees Surveyed Summer 2009
- Host Trees Surveyed Fall 2008
- Roads
- water



Jan Werner
31 July 2009

0 0.05 0.1 0.2 Miles

Asian Longhorned Beetle Survey City of Keene



- Host Trees Surveyed Summer 2009
- Roads
- Water



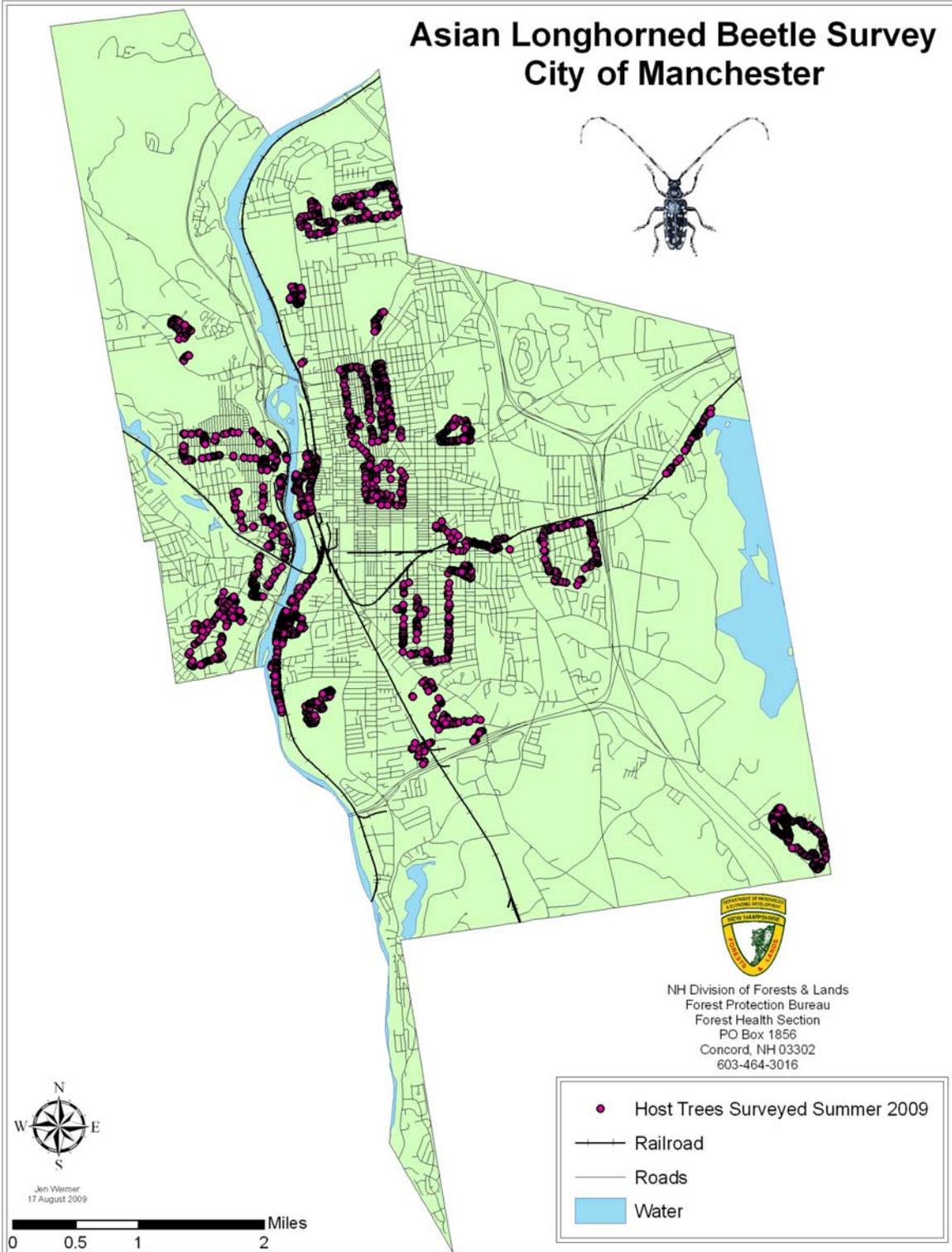
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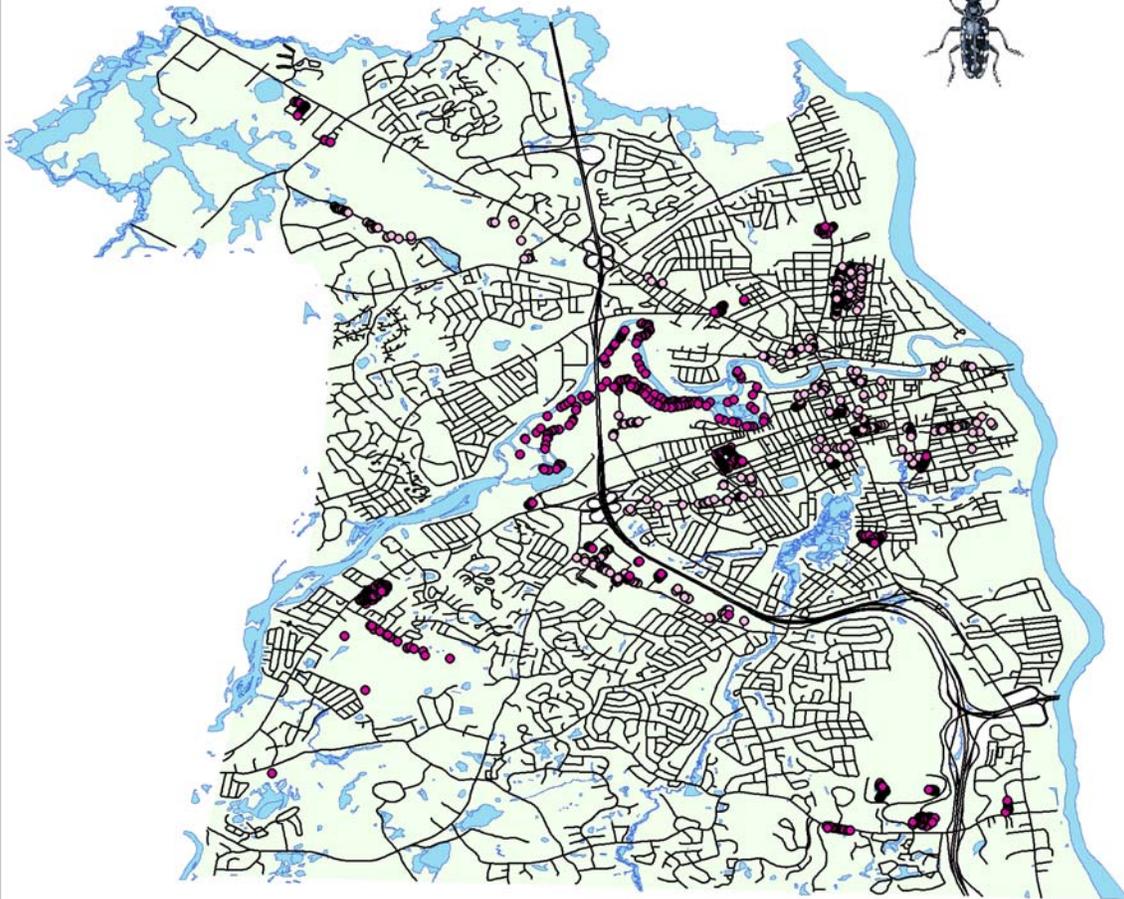
Jen Werner
1 September 2009



Asian Longhorned Beetle Survey City of Manchester



Asian Longhorned Beetle Survey City of Nashua



- Host Trees Surveyed Summer 2009
- Host Trees Surveyed Fall 2008
- Roads
- Water



Jen Weimer
5 October 2009



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Pheromone Trapping of Forest Pests in NH

Each summer pheromone bucket traps are placed around the state to monitor common forest pest populations. Epidemics can be predicted by analyzing trends over time. In 2009 pheromone traps were put out for Spruce Budworm and Forest Tent Caterpillar. Both of these pests remain at endemic levels.

NH Aerial Survey Highlights for 2009

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 2009 State aerial survey mapped 12,898 acres of serious damage or defoliation on state and private lands and the USDA Forest Service mapped an additional 2,928 acres of damage on the White Mountain National Forest.

Oak Leafroller was the primary damaging causing agent in NH this year. Defoliation was mapped on 8,327 acres. Additional defoliation occurred early in the season in the western part of the state that was not visible during the annual survey but is believed to also be from this early season defoliator. We had several weather events this past year that resulted in 2319 acres of **hail** damage, 831 acres of **ice** damage, and 281 acres of **frost** damage. Additional damage occurred during an ice storm in December 2008 that was not visible during the annual survey. This storm greatly affected NH's infrastructure and urban forest but was less severe than the ice storm of 1998.

Other significant forest damage mapped throughout NH this year include **birch dieback** (656 acres), **leaf spots** (308 acres), **balsam woolly adelgid** mortality (88 acres), red pine mortality from **pine gall weevil**, **armillaria**, and **bark beetles** (56 acres), and dieback from **logging damage**, **beech bark disease**, and **armillaria** (32 acres).

In addition browning of white pine was seen throughout the state early in the summer that is believed to have been caused by *Canavirgella banfiedii*. This needlecast disease favors wet weather and causes needles to turn brown in the spring and drop. Symptoms disappear as new growth appears in June. Crowns of affected trees appear thin since only the current year's growth remains.

Map of 2009 major forest damage on the following page

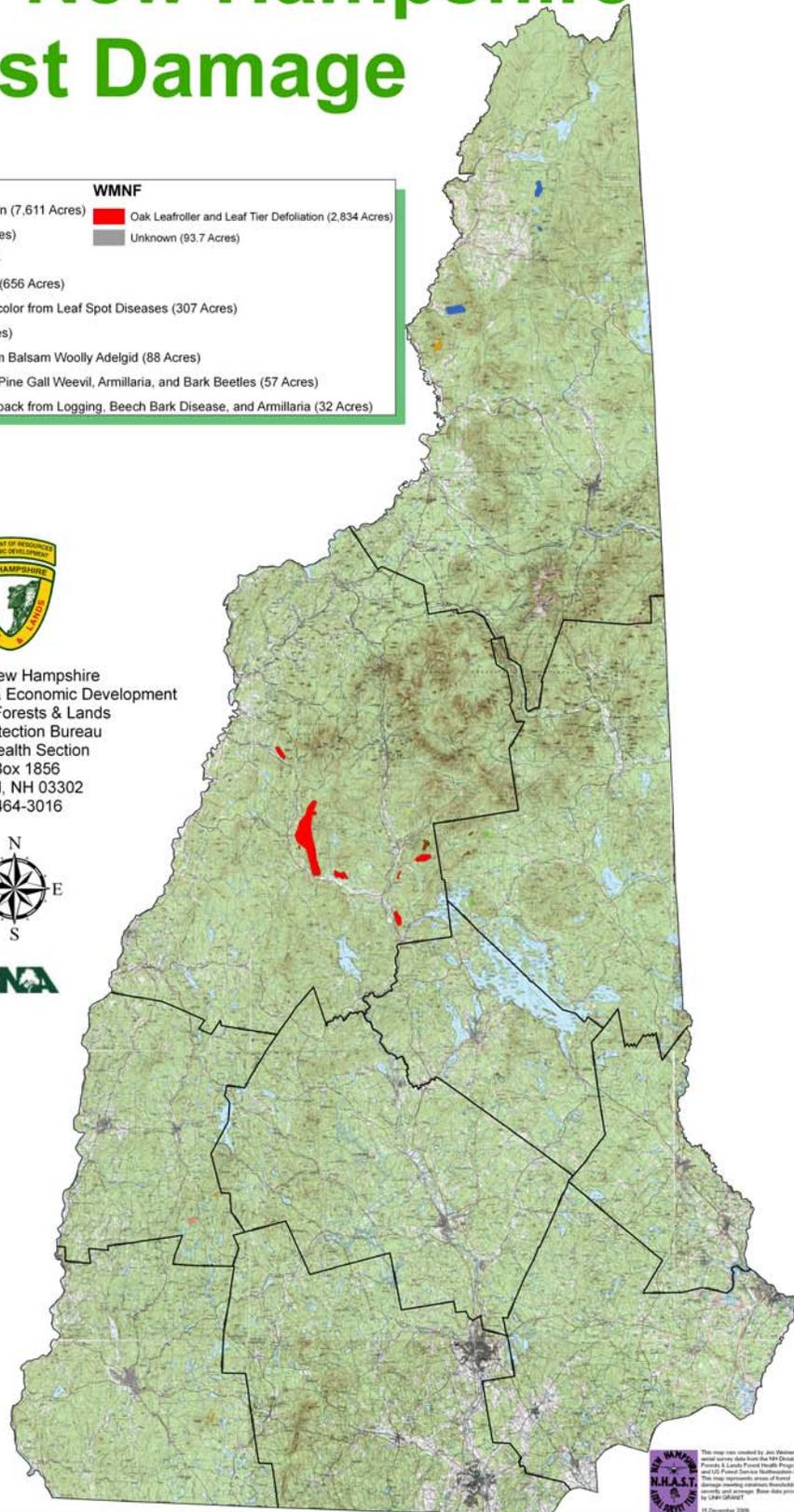


2009 New Hampshire Forest Damage

Damage Causing Agents		WMNF	
	Oak Leafroller Defoliation (7,611 Acres)		Oak Leafroller and Leaf Tier Defoliation (2,834 Acres)
	Hail Damage (2,320 Acres)		Unknown (93.7 Acres)
	Ice Damage (831 Acres)		
	Birch Dieback Complex (656 Acres)		
	Northern Hardwood Discolor from Leaf Spot Diseases (307 Acres)		
	Frost Damage (281 Acres)		
	Balsam Fir Mortality from Balsam Woolly Adelgid (88 Acres)		
	Red Pine Dieback from Pine Gall Weevil, Armillaria, and Bark Beetles (57 Acres)		
	Northern Hardwood Dieback from Logging, Beech Bark Disease, and Armillaria (32 Acres)		



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This map was created by Jim Walker using aerial survey data from the NH Division of Forests & Lands Forest Health Program, and US Forest Service Northeastern Area. The map encompasses areas of forest, and is not intended to show the boundaries of counties and parishes. Base data provided by USGS/USFWS.
 15 December 2009

FEATURE ARTICLE

By: Kyle Lombard

Camper Firewood Is a Vector of Forest Pests

In 2005 it became clear through state and federal research and law enforcement actions that firewood transportation was a major vector of emerald ash borer in Michigan. To determine just how much firewood was being transported to New Hampshire by campers the NH Division of Forests and Lands conducted surveys at many state parks from 2006 to 2008. It was surprising to find that 42% of all campers from around the country were bringing firewood with them from home. And some of the haul distances were impressive as the surveys sited firewood from North Carolina, Virginia, Connecticut and California. The 42% is a troubling figure considering that approximately 26,000 different camping groups visit NH state parks each year and in 2008 campers came from all U.S states except Hawaii; almost all of the Canadian provinces and many European countries. With this amount of firewood moving into the park system the Division needed to evaluate how much of a threat this material was in potentially spreading insects.



Figure 1. Ventilated fiber rearing barrels with glass emergence jars.



Figure 2. Bark beetles emerged from the firewood in a dark barrel and were attracted to the light coming from an attached glass jar. Insects were fumigated, monitored and collected from that jar.

During the summer of 2007 and 2008 the Division of Forests and Lands randomly selected 22 campers that had come from out-of-state and brought firewood from home. A sample of their wood was taken and replaced with an equal amount of local wood. The confiscated firewood samples were placed in rearing barrels and allowed to sit for 12 months in an unheated barn. In May of 2009 the process to collect and catalogue all insects that had emerged from the firewood was initiated.

The results were nothing less than shocking. In just 22 samples of firewood 701 animals emerged including insects, arachnids, crustaceans, mollusks, centipedes, and millipedes. There was an

incredible breath of diversity in the insects that emerged between May and August, 2009. Of those 701 animals, 651 were insects representing 10 different orders and 36 different families that we know of. To date only 30% of the insects have been identified to species. Just 2 samples of the 22 did not have any insects emerge. Interestingly those two samples were the samples without bark. Insect emergence was checked 17 different days from May to September, 2009. New insects had emerged prior to each of those check dates.

It's clear that a large volume of firewood is moving into campgrounds of New Hampshire from around the country. In that firewood is a wide variety of organisms from crustaceans to insects. The majority of insects found in this firewood study were not serious forest health threats but clearly this small investigation shows the potential that firewood presents as a vector. If a serious pest happens to be located where the wood is originally collected this study shows that those insects can travel, survive and emerge from firewood. Insect emergence took place sporadically and unpredictably throughout the study period from May to September suggesting it's possible for insects developing in firewood to emerge after transport to NH and before being burned. The sheer volume of firewood transported annually combined with the amount of insect material in that firewood suggests there will be pests brought to NH in firewood that will accidentally find their way to a native forest and complete their lifecycle.

In order to reduce the spread of exotic forest pests in NH a firewood order prohibiting out of state firewood on state and federal lands is now in effect.

OUT OF STATE FIREWOOD PROHIBITED



In order to reduce the spread of exotic forest pests, the movement of firewood of all types and species into state-owned properties, under the administration of the Department of Resources and Economic Development, from sources outside New Hampshire State boundaries is prohibited; unless it is prepackaged firewood clearly marked with place of origin and labeled "kiln-dried".

Any person, employee, or agent of that person, who violates this order shall be guilty of a violation of up to \$2,000 (RSA 227-K:17).

NH Department of Resources and Economic Development
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FEATURE CREATURE

By: Jen Weimer

Cerceris fumipennis—The Friendly Wasp



Cerceris fumipennis is a solitary ground nesting wasp native to North America. While not a forest pest, this wasp has caught the attention of forest health specialists because of its predatory behavior. *C. fumipennis* preys on buprestid beetles including the exotic Emerald Ash Borer which is currently killing tens of millions of ash trees in the Midwest and Canada. Canadian researcher Philip Careless recognized the connection between *C. fumipennis* and EAB resulting in a new biosurveillance tool that is now being used by several states. By monitoring what the wasps are bringing back to their nests, we can gain knowledge about current buprestid populations in the area.

The genus *Cerceris* is in the Crabronidae family and has thousands of species. They are all solitary ground-nesting **predatory wasps** that primarily prey on beetles. *Cerceris fumipennis* is roughly the size of common yellow jackets and has dark smoky colored wings. The body is mostly black with a single creamy yellow band on the upper abdomen. They also have distinct yellow markings between the eyes which are easily seen as they poke their heads out of their nests. *Cerceris* colonies can be found throughout Eastern North America.



Cerceris fumipennis colonies are typically located in heavily compacted sandy loam soils with little or no vegetation. Colonies are typically found in un-maintained ball fields, campsites, parking areas, and road edges. Adult females dig a solitary nest consisting of underground tunnels. The nest entrance is a pencil sized hole that descends straight down and is surrounded by a mound of excavated soil. Dropped beetles are often left outside the nests. Females leave the nest during the warmest part of the day in summer to hunt for prey. Upon leaving the nest the wasps conduct an orientation flight around their nest so they can find it upon returning. Once prey is captured it is paralyzed and brought back to the nest. Eggs are then laid on the paralyzed victim—supplying emerging larvae with a live food source.



Colonies are in compacted soils



Solitary nests make up a colony



Beetles are often left near nests



C. fumipennis may be more useful for detecting EAB than other detection tools currently available. Traps for EAB in NH and other New England states capture very few buprestids. *C. fumipennis* colonies however can yield upwards of hundreds of beetles in only a few hours depending on the size of the colony. Colonies have been identified throughout NH and vary in size from 2-200 nests.

Colonies of 30 nests or more are ideal for surveying and need to be within 400 yards of ash trees if monitoring for EAB. Surveillance is carried out during warm sunny afternoons in July and August when the wasps are most active. Nests are marked with a golf tee and “collar”— which allows the wasp out of the nest but not back in if it is carrying prey. This allows the surveyor to monitor or steal the prey.



C. fumipennis is a friendly wasp and can be easily netted and handled without being stung. While *C. fumipennis* does have a stinger for paralyzing its prey, it is not known to sting humans. To determine if EAB is present in the area single colonies are monitored until a minimum of 30-50 beetles are collected. All beetles that are collected are identified so that we can enhance our knowledge of buprestids in our forests.

Researchers are also working on the use of mobile colonies. Nests can be relocated without confusing the wasp since they re-orient themselves prior to each flight. Researchers carefully dig up nests while wasps are inactive and move them to new locations. Once placed in a new location, wasps can forage areas where colonies may not be present. This allows surveys to be done in high risk areas without established colonies.



Wasp watching volunteer programs are also becoming popular. If you think you have found a *C. fumipennis* colony or would like to adopt a colony for observation and participate in a volunteer program please contact your local state forest health office or check out the [wasp watcher](http://waspwatcher.org) website. In NH contact Jen Weimer at 603-464-3016 or email jweimer@dred.state.nh.us. Happy hunting!



Office Notes

The Forest Health Office continues to reside in the Caroline A. Fox Research and Demonstration Forest in Hillsboro.

Ray Boivin, our part time Entomologist worked with us again this summer on the firewood study and EAB prism traps. Ray sorted through hundreds of insects. We also

had 2 summer technicians this year: Mike Simmons from UNH and Peter Lucas from Paul Smiths College who surveyed thousands of trees for ALB.

Please don't hesitate to contact us if you observe any forest pest damage. The ALB infestation in Worcester was reported by a curious homeowner. Early detection of exotic pests is especially critical for eradication. We appreciate hearing about any possible sightings. If you find unusual insects please capture them in a hard container, place them in a freezer, and contact us for identification.

WANTED: VOLUNTEER ENTOMOLOGISTS

Help us Preserve NH's Forests and Learn More about Exotic Insects



No Experience Necessary
All levels: Amateur to Retired Professionals
Help Needed Statewide



For more information contact Jen Weimer

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For more information about our program and forest health issues check out our [website](#).

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