

2009

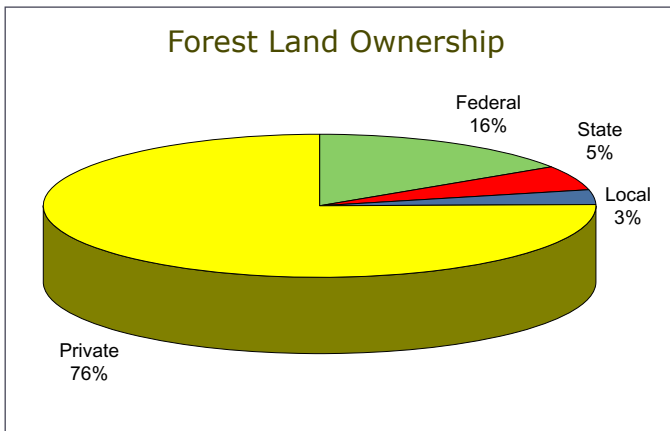
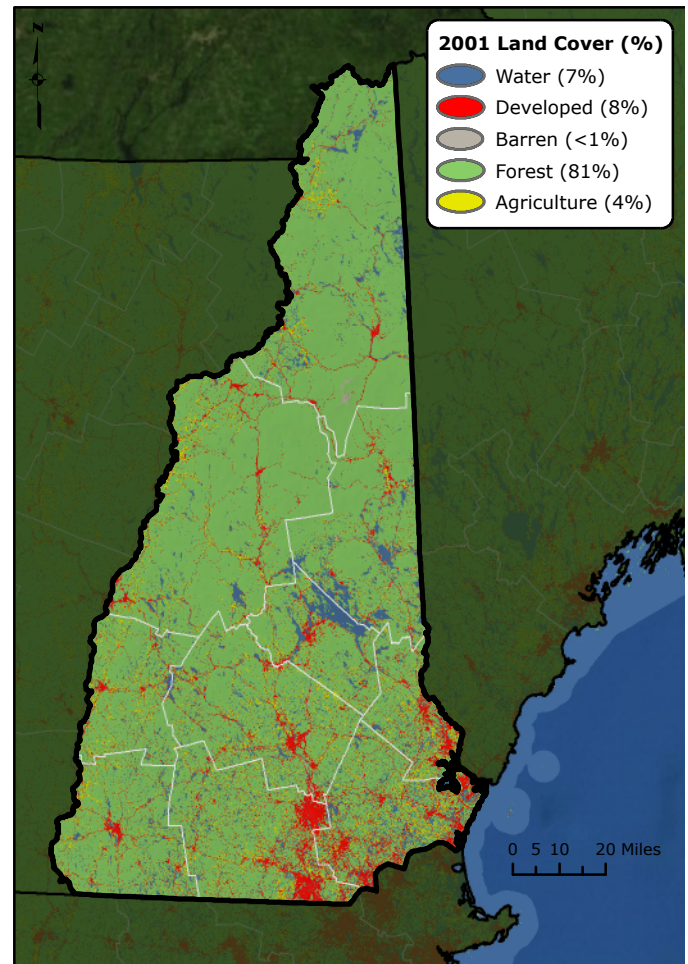
# Forest Health

NEW HAMPSHIRE *highlights*



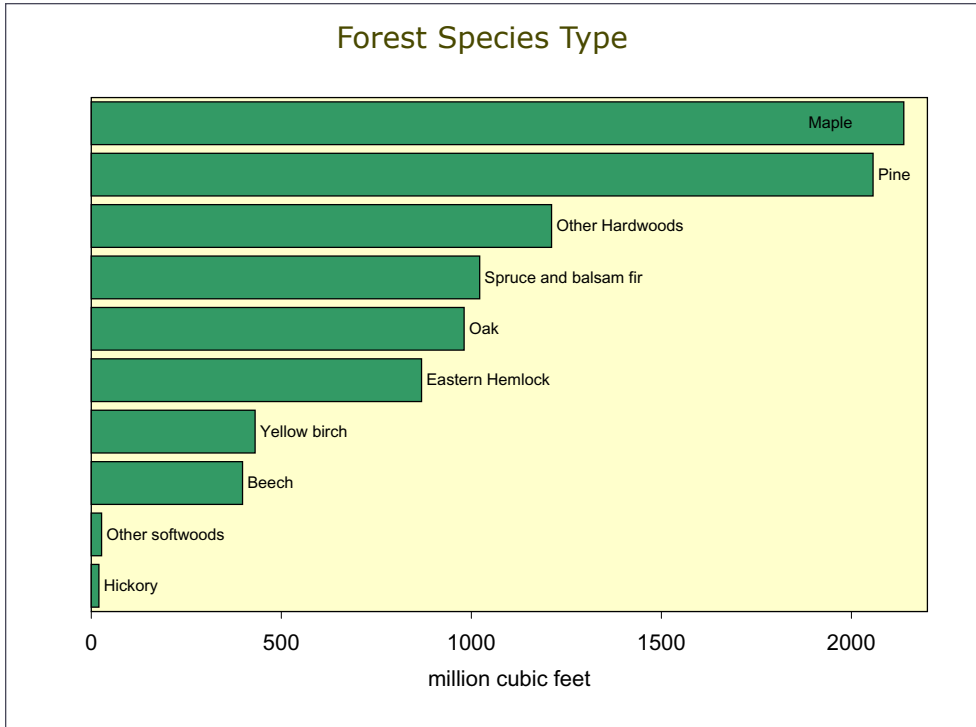
## Forest Resource Summary

Approximately three-quarters of the forest land in New Hampshire is privately owned. Only 16 percent is in Federal ownership, which includes the White Mountain National Forest. The latest New Hampshire forest inventory estimates that 81 percent—approximately 4.8 million acres—of New Hampshire is forested. The forest resource is made up of a variety of forest types mostly comprised of maples, pine, other hardwoods, spruce and balsam fir, oaks, and hemlock. These forests provide a variety of goods including recreational opportunities, clean water, and wildlife habitat as well as paper and wood products. Keeping New Hampshire forests healthy enhances the quality of life for those who live, work, and recreate in the State.



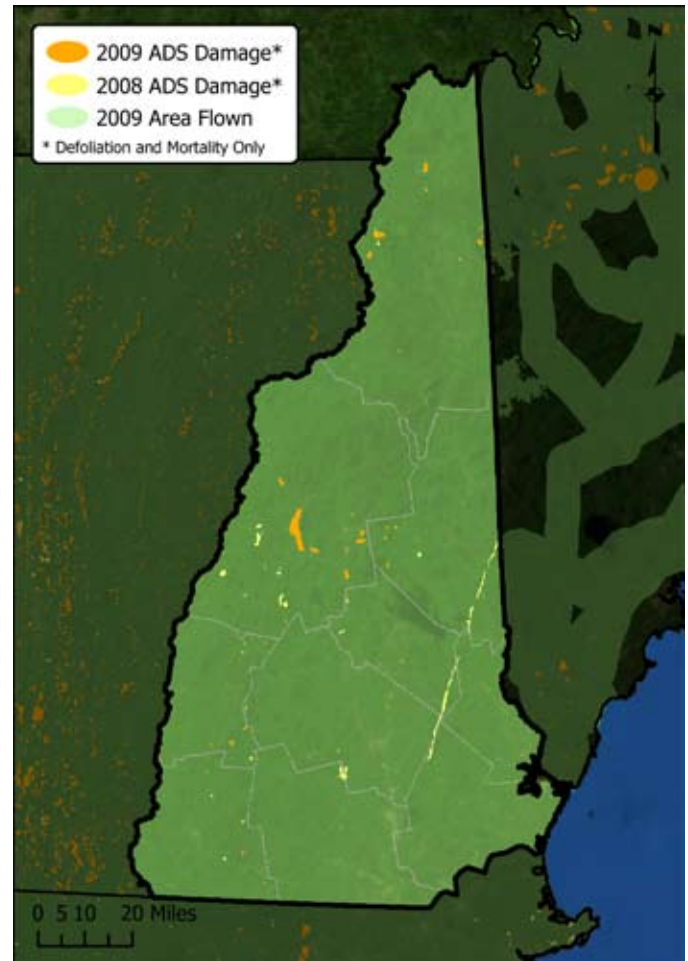
## Forest Health Programs in the Northeast

State forestry agencies work in partnership with the U.S. Forest Service to monitor forest conditions and trends in their State and respond to pest outbreaks to protect the forest resource.



## Aerial Surveys

In New Hampshire, nearly 15,700 acres of damage were reported. The majority of damage, 10,051 acres, was due to defoliation and discoloration caused by oak leafroller. There was another 2,834 acres of damage caused by oak leaf-tier. About 2,300 acres were categorized as defoliation resulting from hail damage.



This map delineates aerial detection survey (ADS) results for New Hampshire in 2008 and 2009.

## Forest Damage

In New Hampshire, there are currently no extensive pest outbreaks or widespread damage from forest diseases. In 2009, **oak leaf roller** was the primary defoliator, affecting over 10,000 acres. Damage also occurred from an early season defoliator in the western part of the State. Several **weather events** resulted in damage from hail, ice, and frost, including the significant ice storm in December 2008. This storm greatly affected New Hampshire's urban and rural forests, but was less severe than the ice storm of 1998.



Tree damage from December 2008 ice storm.

Other forest damage that occurred in several locations included birch dieback; leaf spots; balsam woolly adelgid mortality; and dieback from logging damage, beech bark disease, and Armillaria root disease. Browning and thin crowns on white pine were seen throughout the State early in the summer that is believed to have been caused by **Canavirgella banfiedii**, a needlecast disease.

## Pheromone Trapping of Forest Pests

Each summer, pheromone bucket traps are placed around the State to monitor common forest pest populations. Epidemics can be predicted by analyzing pest population trends over time. In 2009, pheromone traps were set out for spruce budworm and forest tent caterpillar. Results indicate that these pests remain at endemic levels.

## Introduced Forest Pest Concerns

**Hemlock woolly adelgid** has been spreading slowly throughout southern New Hampshire despite various suppression efforts. Surveys were conducted in 40 towns in 2009 in the



Eastern hemlock tree infested with hemlock woolly adelgid.

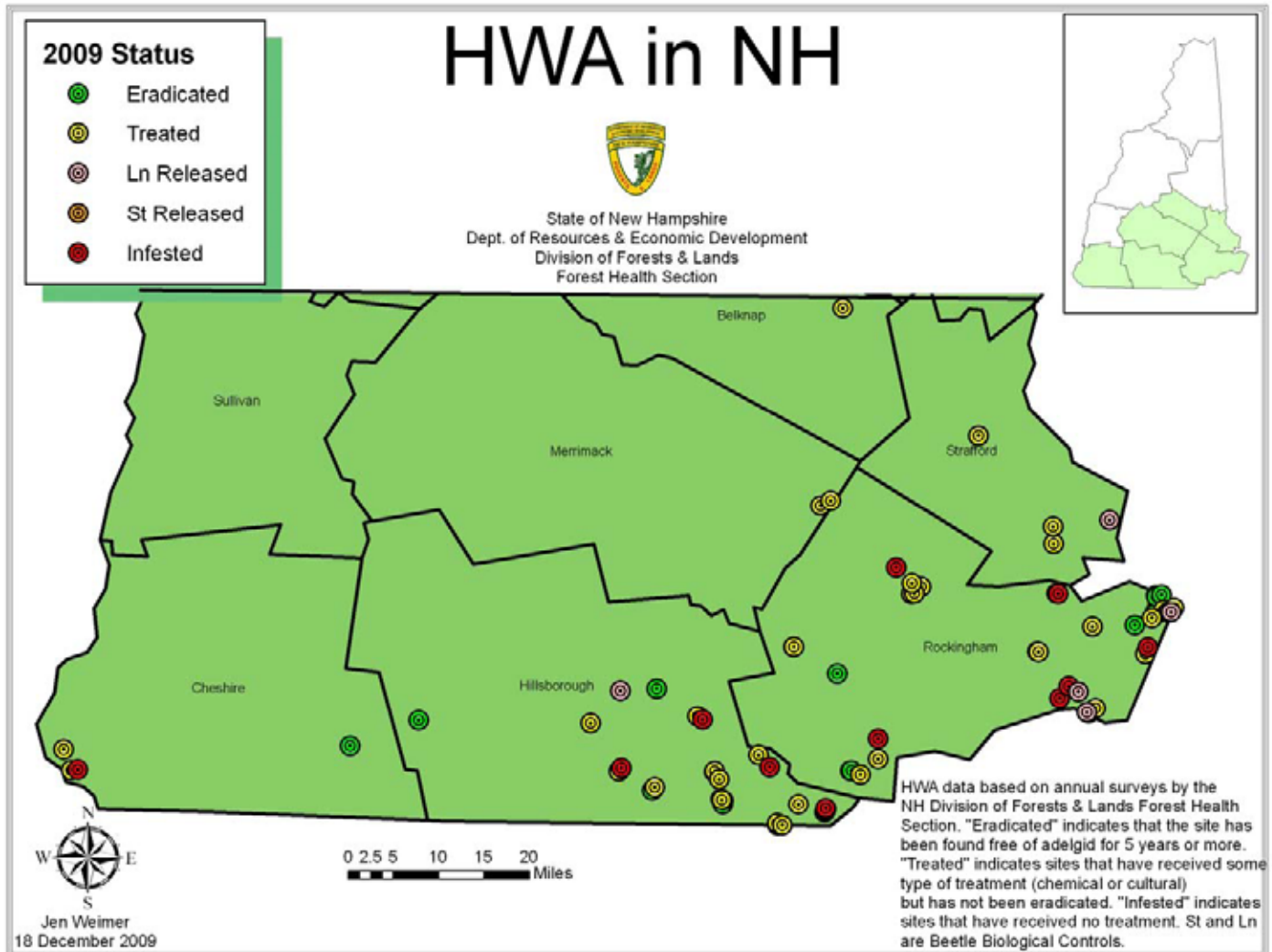
southern part of the State that included post suppression surveys and a roadside survey of lakeside communities. New infestations were found in Farmington, Nottingham, and Newmarket, and another was later discovered in Amherst. Infestations were also reported by homeowners in both Hinsdale and Alton Bay, the furthest north the adelgid has been found in the State.

The roadside survey focused on towns not previously surveyed, towns surrounding new infestations, and towns bordering Massachusetts or the current quarantine. Sites near ponds and lakes were targeted because surveys in New Hampshire have shown that trees growing 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 the adelgid and may also help sustain adelgid populations if they are facing south or overhanging roadways.

Several suppression methods were implemented in 2009. Small infestations on 10 properties were treated with soil injections of imidacloprid. A trial basal bark application of Dinotefuran was also conducted at one property. A combination of chemical and cultural controls was used on a large infestation in Pawtuckaway State Park. Trees in the core of this infestation were cut, and trees on the edge of the cut were treated with soil injections of imidacloprid.

Biological control was also implemented with the release of 500 *Laricobius nigrinus* predatory beetles on conservation land in Amherst. To date, 1,700 *Laricobius* and 38,052 *Sasajiscymnus tsugae* beetles have been released throughout

the southeastern part of the State. No *Laricobius* beetles were recovered in 2009 from previous releases, but one *Sasajiscymnus* beetle was recovered at a 2006 release site in Seabrook.



Map of hemlock woolly adelgid infested areas and treatment sites

**Emerald ash borer** is an exotic beetle that is killing tens of millions of ash trees in the Midwest and Canada and threatens New Hampshire's ash resource. Surveys this year included prism traps and biomonitoring. No signs of the emerald ash borer were found in New Hampshire in any of the surveys. Forty purple prism traps were placed around the State as part of a larger cooperative effort with the New Hampshire Department of Agriculture. The traps are designed to attract and capture adult beetles. The New Hampshire Division of Forests and Lands trapped 15 buprestids, and the New Hampshire Department of Agriculture collected 68.

As part of a biosurveillance effort, colonies of *Cerceris fumipennis* were monitored. This insect is a ground-nesting wasp native to North America that preys on buprestid beetles,



Cerceris wasp with captured buprestid beetle nearby nest.

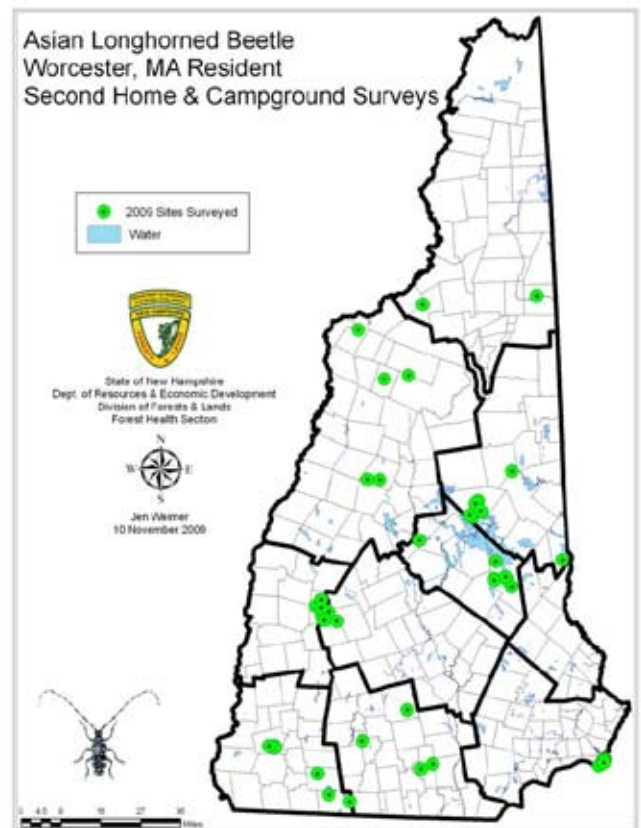
including the emerald ash borer. Canadian researchers recognized the connection between the wasp and emerald ash borer, resulting in a new biosurveillance tool that is now being used by several States. By monitoring what insects the wasps are bringing back to their nests, information can be gained about buprestid populations in the area. In 2009, 198 native buprestids were collected. This was a cooperative effort with the New Hampshire Department of Agriculture and the U.S. Forest Service, Northeastern Area State and Private Forestry, collecting numerous buprestids. Colonies have been identified throughout New Hampshire. The wasp nests will be used again next year as a monitoring tool.

**Asian longhorned beetle** continues to be detected in Worcester, MA, where the quarantine has been expanded to 74 square miles. Roughly 30,000 infested trees have been removed in Worcester and surveys are



Photo of the Asian longhorned beetle.

ongoing. Nearly 7,000 host trees were surveyed in New Hampshire in 2009 in Portsmouth, Newington, Manchester, Keene, and Nashua. In addition, with help from the New Hampshire Tax Assessors Association, 213 Worcester-area residents with second homes in New Hampshire were identified. Letters were sent asking them to participate in a survey. The returned surveys were prioritized based on whether respondents moved firewood from Massachusetts to New Hampshire in the past 10 years. All high-risk and several low-risk properties were surveyed. State campgrounds that had the highest percentage of campers from Worcester were also visited. A total of 359 trees were inspected at four State campgrounds. No signs of Asian longhorned beetle were found in any of the surveyed areas.



**Camper firewood** can be a transporter of forest pests. In 2005, it became clear through State and Federal research, along with law enforcement interceptions, that firewood transportation was a major vector of emerald ash borer in Michigan. To determine the amount of firewood being transported to New Hampshire by campers, the New Hampshire Division of Forests and Lands conducted surveys at several State Parks from 2006 to 2008. It was surprising to find that 42 percent of all campers from around the country were bringing firewood with them from home.

Some of the haul distances were impressive with firewood originating from North Carolina, Virginia, Connecticut, and California. This is troubling considering that approximately 26,000 different camping groups visit New Hampshire State Parks each year. In 2008, campers came from across the United States and almost all of the Canadian provinces. With this amount of firewood moving into the park system, the State needed to evaluate how much of a threat this material was in potentially spreading insects.

During summer 2007, and again in 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 placed in rearing barrels for 12 months in an unheated barn. An incredible diversity of organisms emerged between May and August 2009—a total of 701 species of insects, arachnids, crustaceans, mollusks, centipedes, and millipedes. Of those organisms, 651 species were insects representing 10 different orders and 36 different families. Only two firewood samples, those without bark, did not have any insects emerge.

The majority of insects found in this firewood study were not forest health threats. However, if a serious pest is located where the wood is originally collected, those insects can travel, survive, and emerge from firewood. New Hampshire is using a variety of media to discourage residents and visitors, especially

campers, from moving firewood. The State also enacted an order prohibiting out-of-State firewood on State and Federal lands.

**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).

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Insects collected during survey of firewood brought into New Hampshire.



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