NH Department of Natural & Cultural Resources

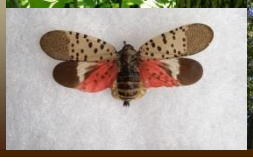
Division of Forests & Lands

Forest Health Program

Annual Newsletter 2018

Spotted Lanternfly
Pine Needlecast Diseases
Emerald Ash Borer

172 Pembroke Rd
Concord NH 03301
603-464-3016



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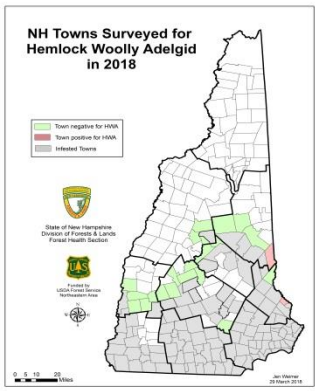
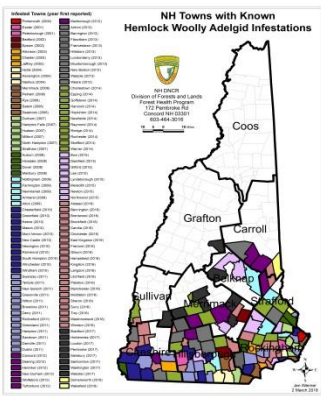
FIELD SURVEYS

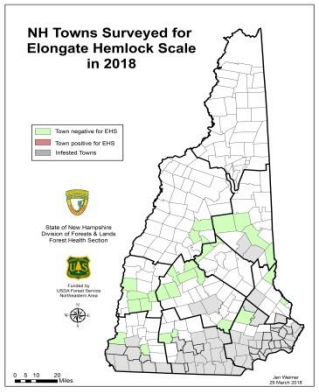
By: Jen Weimer

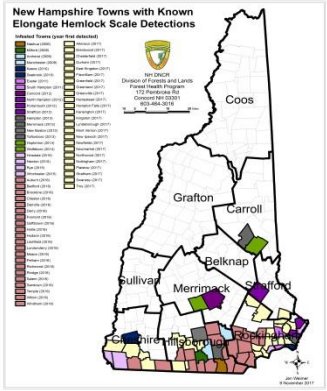
Hemlock Woolly Adelgid and Elongate Hemlock Scale

Hemlock Woolly Adelgid (HWA) surveys for 2018 were done in 23 towns that border the northernmost infested area. Towns surveyed included Claremont, Unity, Acworth, Lempster, Goshen, Newbury, Sutton, Wilmot, Andover, Hill, Franklin, New Hampton, Center Harbor, Ashland, Plymouth, Campton, Sandwich, Tamworth, Ossipee, Wakefield, Milton, Somersworth, and Hooksett. Infestations were found in Wakefield and Somersworth. Elongate Hemlock Scale surveys for 2018 were done in conjunction with HWA surveys. Towns surveyed included towns surveyed for HWA and the towns of Westmoreland, Marlborough, Bennington, Hancock, Deerfield, and Hooksett. No new infestations were detected. While the quarantine was eliminated this year we will continue to conduct surveys to monitor the spread of HWA and EHS.



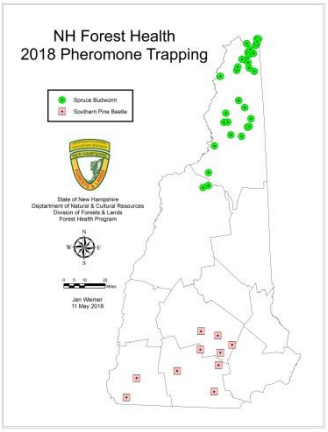




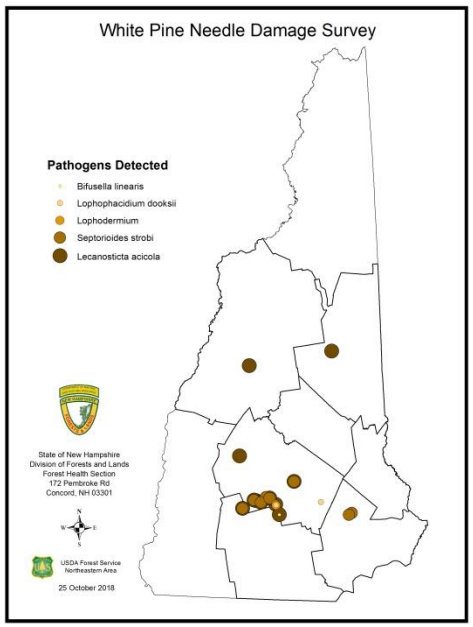


Click on maps to enlarge

Spruce Budworm and Southern Pine Beetle



Spruce Budworm trap catches are up slightly from last year but not as high as 2015 and continue to remain at endemic levels. This was our fourth year trapping for Southern Pine Beetle in response to the recent northern spread of the beetle and we did not detect any in our traps again this year. While the beetle continues to be detected in traps in MA, no infested trees have been found to date in that state.



White Pine Needlecast Diseases

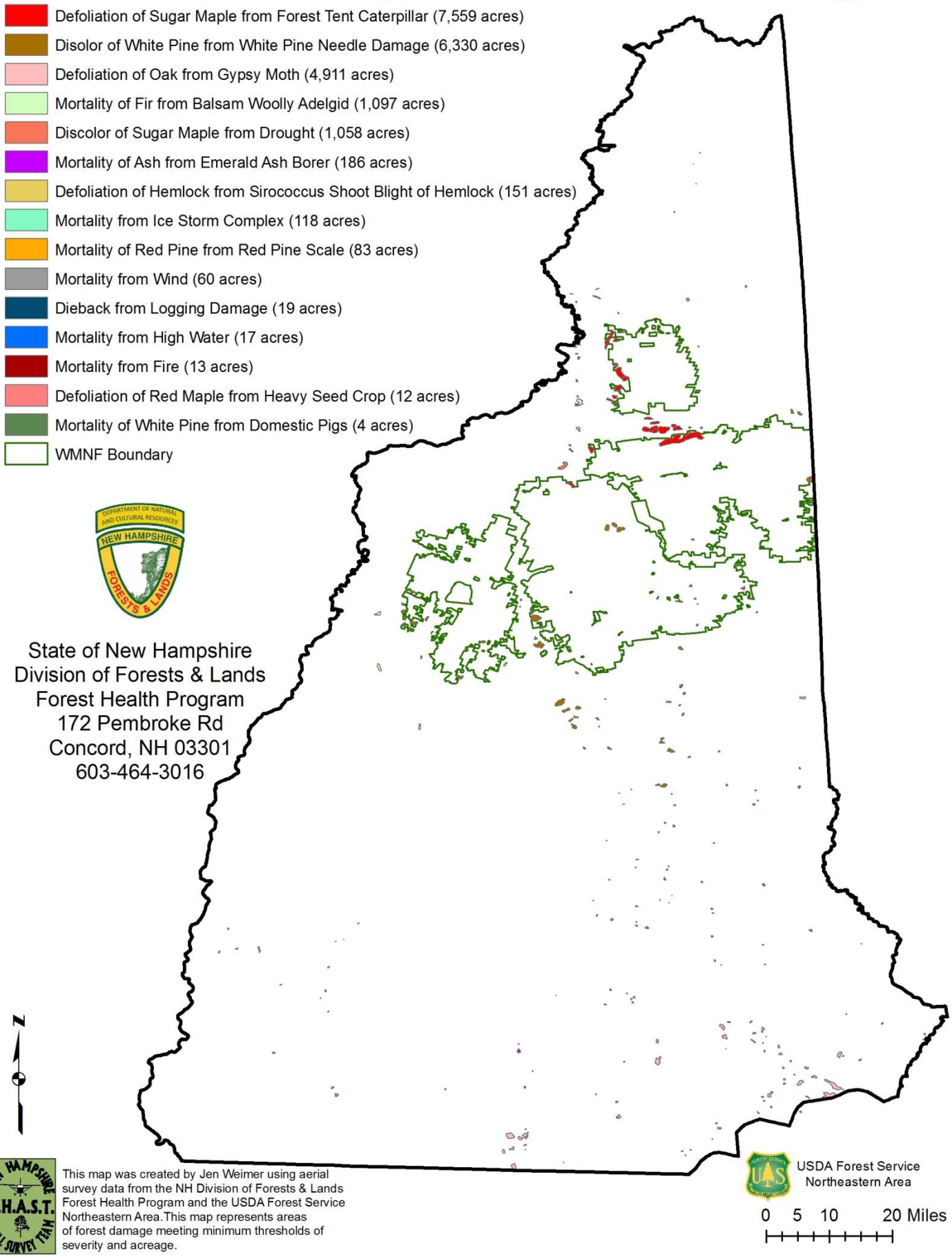
This summer we participated in a region wide evaluation of white pine needlecast diseases. A total of 24 sites in NH were surveyed to better understand the pine pathogens and their associated effects on the health of white pine. Five different pathogens were detected in NH that cause foliage diseases. The most abundant, *Lecanosticta acicola* (formerly *Mycosphaerella dearnessii*) which causes brown spot needle blight, was present at 11 sites. *Septorioides strobi,* a new species recently detected in the U.S., was present at 8 sites, *Lophodermium* and *Lophophacidium dooksii* (formerly *Canavirgella banfieldii*) was present at 2 sites, and *Bifusella linearis* was detected at just 1 site. More info on these pathogens can be found in our 2011 newsletter and at nhbugs.org.

Aerial Survey Highlights for 2018

By: Jen Weimer

New Hampshire's annual aerial survey is a cooperative effort between the NH Division of Forests and Lands (NHDFL) and the USDA Forest Service Northeastern Area State and Private Forestry (USFS). This year we mapped 15,205 acres of damage on state and private lands. The USFS mapped an additional 6,413 acres on the White Mountain National Forest. Nearly 5,000 acres of defoliation from **forest tent caterpillar** was mapped by us in southern Coos County and an additional 2,893 acres was mapped by the USFS on the White Mountain National Forest. Other areas of damage mapped this year include defoliation of oak by **Gypsy moth** (4,911 acres), yellowing of white pine from **needlecast diseases** (6,330 acres), mortality of balsam fir from **balsam woolly adelgid** (1,097 acres), discolor of sugar maple from **drought** (1,058 acres), mortality of ash from **EAB** (186 acres), defoliation of hemlock from **sirococcus shoot blight** (151 acres), mortality from **ice storm complex** (118 acres), mortality of red pine from **red pine scale** (83 acres), mortality from **wind events** (60 acres), dieback from **logging damage** (19 acres), mortality from **flooding** (17 acres), mortality from **fire** (13 acre), defoliation of red maple due to a **heavy seed crop** (12 acres), and mortality of white pine by domestic **pigs** (4 acres).

2018 New Hampshire Forest Damage



EAB UPDATE

By: Bill Davidson

There was a lot happening in regards to emerald ash borer in New Hampshire, and across New England, in 2018. Most notably several detections of emerald ash borer were made in Grafton and Carroll Counties. With these detections 7 of New Hampshire's 10 counties now have known infestations, leaving only Cheshire, Sullivan, and Coos counties emerald ash borer free for the time being. With approximately 70% of the state's area now contained within infested counties it was determined that the most effective method to delay the spread of emerald ash borer to un-impacted areas would be to eliminate New Hampshire's internal quarantine on movement of ash products, and instead focus on public education and outreach, detection of new infestations, and promotion of best management practices (BMPs) for managing ash in forests and handling potentially infested ash wood. Through the use of visual surveys, trap trees, public reporting, and purple panel traps detections were made in the following 22 towns in 2018:

Alexandria, Andover, Auburn, Bedford, Bridgewater, Bristol, Brookline, Derry, East Kingston, Hampstead, Hollis, Kingston, Mason, Meredith, Milford, Moultonborough, New Hampton, Northwood, Plaistow, Salisbury, Tuftonboro, Wakefield, and Wolfeboro.

Of note were the county-first detections in Carroll and Grafton Counties, and the apparent satellite infestation along the Maine border in Wakefield which, at the time of discovery, was over 15 miles from the nearest known infested trees. Additionally, Maine, Vermont, and Rhode Island all made their first detections this year meaning that emerald ash borer is present in all of the northeastern states. Over the past year the area considered to be generally infested in New Hampshire nearly doubled to around 2,000mi^2, mainly due to gradual expansion of the core infested area, and while the situation may seem dire there is still much that can be done to preserve to healthy ash in the state. Even with the accelerated rate of expansion only about 25% of the state is considered to be generally infested. Within this area the vast majority of trees still appear healthy and will not display dieback or other symptoms of ash borer infestation for several years, giving homeowners and land managers valuable time to make decisions about how to prepare for this pest. Another bright spot is that the most ash-dense regions of the state are still for the most part unaffected.

With most of the ash in the state still EAB-free it is important to take steps to slow the spread of emerald ash borer in order to prolong ash health in areas that are currently un-impacted. Adherence to the following best management practices for handling ash material will minimize the risk of accidentally spreading EAB.

When moving firewood:

- Remove ash wood from shipments traveling more than 5 miles from point of origin; only deliver ash wood within 5 miles.

or

- Season ash wood at its place of origin for at least 12 months

or

- Transport ash wood only after September 1st and ensure that it is burned prior to June 1st.

When moving ash logs:

- Ship only to mills willing to debark immediately

or

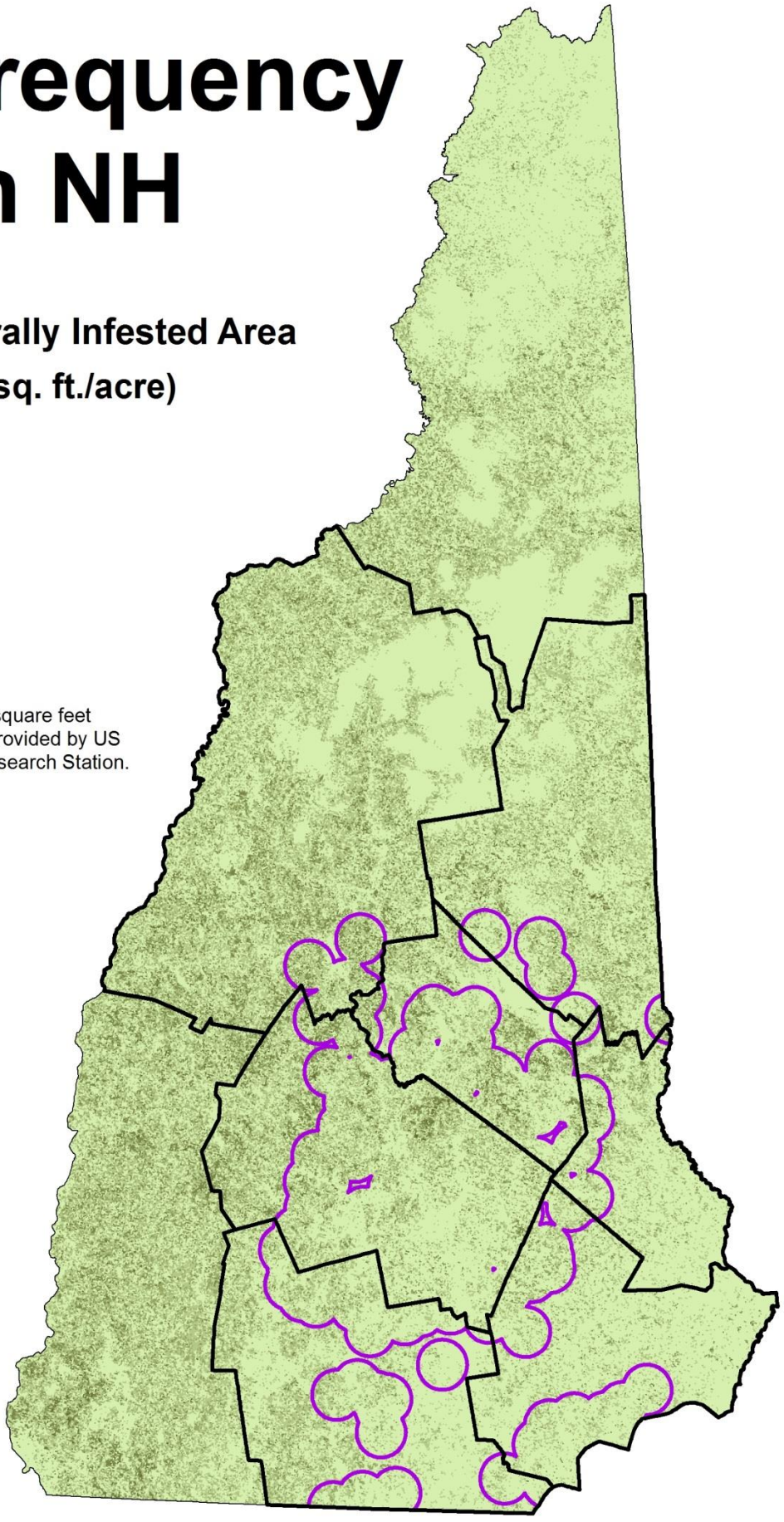
- IF logs are originating from outside of the Generally Infested Area, inspect them closely for symptoms of emerald ash borer infestation to ensure they are not infested. Symptoms include: "D" shaped exit holes, serpentine galleries beneath the bark, and shallow woodpecker holes through the bark.

or

- Transport only after September 1st and have wood processed by June 1st.

As the range of emerald ash borer increases many more people are being forced to make challenging decisions on what to do with their ash when faced with such a destructive pest. It is important to remember that options are available. Insecticides can protect landscape trees and if you have ash trees that you would like to keep around it is necessary to keep track of where you are in relation to infested areas so that applications can be made at the appropriate time. The Management Zones map accessible on www.nhbugs.org has the most up to date information on where emerald ash borer has been detected. Treatments can be delayed until you are in the red Generally Infested Area on the map as it takes several years for trees to succumb to the ash borer, and not all trees will become infested at once. However, it is important to monitor your trees for signs of infestation as it is possible for undetected infestations to exist outside of the Generally Infested Area. If you are outside of the Generally Infested Area and believe you have ash trees infested with emerald ash borer please send in a report using the "invasive insect reporting tool" on the NHbugs website. If you are managing ash in natural settings it is also important to keep track of where you are in relation to the expanding infestation, keep an inventory of your ash trees, survey your ash once a year for symptoms of infestation, and most importantly have a plan for how you will manage your ash once emerald ash borer arrives. A full list of our recommendations for managing ash in natural settings along with additional information on application of pesticides to protect landscape trees can also be found on the NHbugs website.

Ash Frequency in NH



EAB Generally Infested Area

Ash Basal Area (sq. ft./acre)

- 0 - 2
- 2 - 5
- 5 - 10
- 10 - 19
- 19 - 45

Ash Basal Area represents the square feet per acre of live ash. Data was provided by US Forest Service Northeastern Research Station.

State of New Hampshire
Dept. of Natural and Cultural Resources
Division of Forests & Lands
Forest Health Program

N W E S

0 5 10 20 Miles

Efforts to establish natural enemies of emerald ash borer are still underway and this past year three species, and a total of over 60,000 parasitic wasps were released across five sites throughout the infested area. To date, releases have been carried out at 20 locations over the past five years since the discovery of emerald ash borer in New Hampshire. The majority of releases have been carried out by the NH Division of Forests and Lands with researchers at UNH and USDA-APHIS also conducting releases as components of various studies researching the biology of the parasitic wasps. Evaluations of natural enemy establishment have been largely encouraging; with one species, *Tetrastichus planipennisi*, being found to have established in all sites investigated so far. This species has even been recovered several miles from any release areas indicating that not only is it establishing, it is migrating as well. Recent evaluation of the wasp species *Oobius agrili* at a release site in Hopkinton found that just 3 years after the initial releases around 50% of EAB eggs recovered from the site had been parasitized by the wasps.

We have also been working to develop and implement integrated pest management (IPM) strategies to suppress ash borer populations on a local scale as well as maintain ash as a component of our forests into the future. One of these strategies is to select the 12-15 largest and most ecologically significant ash in a small forested area, and protect those trees from EAB with a systemic insecticide while also carrying out biological control releases. Each pesticide treated tree is paired with an adjacent girdled ash in an attempt to lure adult ash borers to the treated trees, increasing the likelihood that adult beetles feed upon the foliage of, or lay eggs on, the treated trees, thus lowering the overall beetle population in the immediate area. Lowered beetle pressure will allow untreated trees in the area to live longer and buy the parasitic wasps released through the biological control program more time to establish, spread, and build their populations. This strategy is not intended to prevent ash mortality completely, but through the work of multiple mitigation tactics working together synergistically delay ash decline, slow the spread of EAB from the treatment area, increase efficacy of parasitic wasps, and allow the ecologically significant treated trees produce seed that will serve as the next generation of ash after the initial EAB wave moves through.

Another method which we have begun implementing with similar goals is to treat with insecticide pairs of male and female ash (sex determination can be achieved by observing flower structure in spring). Vigor of treated trees can be enhanced by thinning around the trees; this will also have the benefit of creating a more receptive environment for ash seedlings.

The sex of ash trees can be determined by the shapes of their flowers which are visible in spring before leaf out. The female flower (left) is more slender than the male flower (right). This is a difference that can easily be seen from the ground.

FEATURE ARTICLE

By: Kyle Lombard

New Hampshire Forest Pest Advisory Group

From 1975 to 1983 a major outbreak of spruce budworm defoliated thousands of acres of balsam fir in Coos County. The defoliation, mortality and subsequent salvage harvesting changed the North Country forest in a way we still see today. During the outbreak there was considerable miscommunication regarding acreages, locations, severity, and management strategy throughout the land ownerships, science community, and State Agencies. The situation left a lot of mistrust between forestry groups responsible for statewide forest health issues. By 1987 New Hampshire was again on the cusp of a major pest outbreak. To avoid the mistakes made during the spruce budworm days, and better manage the emerging gypsy moth situation, John E. (Jack) Sargent, State Forester and Director of the Division of Forests and Lands called for the creation of an Advisory group of Forestry specialists and Forest Pest specialists that could meet and inform each other of any relevant information and strategies that would make pest management more cohesive across all ownerships. The assemblage was called the New Hampshire Forest Pest Advisory Group (FPAG).

Today the FPAG is an association for persons, groups and agencies, concerned about forest pest problems, to discuss their many ramifications throughout the state. Creation of the group provides New Hampshire with a clearinghouse to discuss, inform, explore, and develop possible action plans to deal with forest pest problems. From 1987 to 1991 the group focused on developing guidelines for aerial applications of pesticides for gypsy moth control. In the late 1990's the FPAG supported action plans for Hemlock Woolly Adelgid and Asian Longhorned Beetle. Most recently the group has provided input and support for firewood quarantines, hemlock woolly adelgid quarantines, emerald ash borer BMP's, and a variety of education and outreach products and websites.

Members of the FPAG are not legislatively mandated or created in State administrative rules. And the group continues to expand as new cooperators come forward. The group is chaired by the Forest Health Program Coordinator within the Division of Forests and Lands and meets quarterly.

The modern expressed purpose of the FPAG is *"to provide a forum for public agencies and private organizations to discuss forest pest problems that impact New Hampshire, and to make recommendations relative to forest pests to New Hampshire's State Forester within the Department of Natural and Cultural Resources and the State Entomologist within the Department of Agriculture, Markets and Foods."*

Our current objectives include:
1.) Share information and strategies on forest pests.
2.) Support action plans to address New Hampshire forest pest problems.
3.) Facilitate the distribution of information to the general public on forest pests.

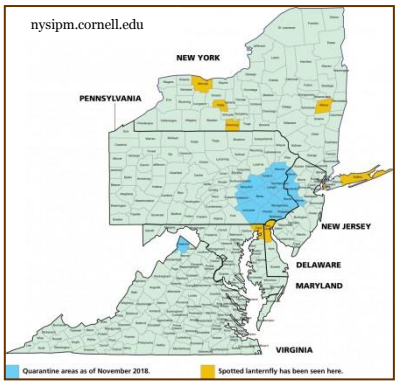
Group members include a representative from each of the following:

NH Department of Natural and Cultural Resources, Division of Forests and Lands
NH Department of Agriculture, Markets and Foods, Division of Plant Industry
UNH Cooperative Extension- Entomology
UNH Cooperative Extension- Pathology
UNH Cooperative Extension- Forestry
USDA Forest Service, Northeastern Area
USDA Forest Service, White Mountain National Forest
NH Audubon Society
Society for the Protection of New Hampshire Forests
Granite State Division of the Society of American Foresters
The Nature Conservancy
USDA APHIS, PPQ

FEATURE CREATURE

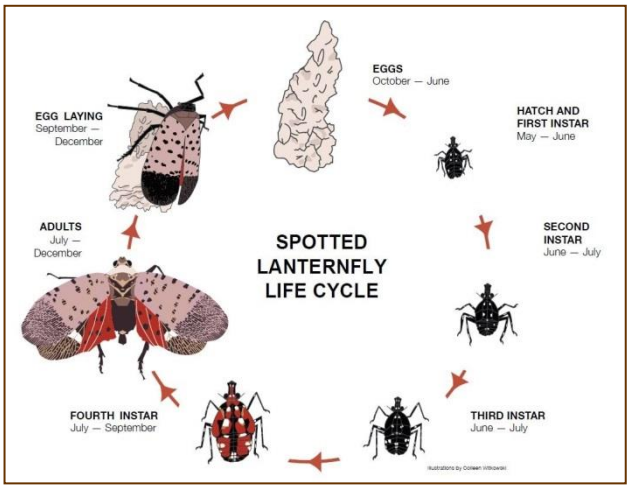
By: Jen Weimer

Spotted Lanternfly (*Lycorma delicatula*)



Spotted lanternfly (SLF) is an invasive species native to China, India, and Vietnam that has recently been detected in the northeast. First detected in Pennsylvania in 2014 it has since been found in Maryland, Delaware, New Jersey, Virginia, New York, and Connecticut (1 dead adult). As with many exotic pests, SLF is easily introduced to new areas as a hitchhiker on firewood, plants, vehicles, and other items kept outdoors. SLF feeds on a variety of fruit, ornamental, and forest tree species and will likely impact our agriculture and forestry industries in the coming years.

SLF changes hosts throughout its lifecycle and tree of heaven (*Ailanthus altissima*) is the preferred host of adults but they will also feed on maple, oak, pine, poplar, sycamore, walnut and willow trees. In addition they will feed on almonds, apples, apricots, cherries, grapes, hops, nectarines, peaches, and plums. SLF doesn't feed on the fruit but rather feeds on the sap of the plant which can lead to reduced yields and plant mortality if infestations are heavy. Similar to aphids, as SLF digests the sap it excretes it as sticky honeydew which promotes sooty mold that can cover leaf surfaces and anything beneath the plants. This can lead to unsightly and slick conditions on patios and decks impacting outdoor activities in infested areas.



Adult SLF are active July through December and are about 1 inch long with large colorful wings and a bright yellow abdomen. Their forewings are light brown with black spots and a black speckled band on the tip. Their hind wings are red with black spots, white bands, and black tips. Adults lay eggs in 1 inch long masses from September through December and the eggs overwinter and hatch May through June. Nymphs are active May through September and are black with white spots but turn red just before becoming adults.

SLF adults and nymphs congregate in large numbers on host plants and are easiest to spot at dusk when they migrate up and down the trunk. Other signs of SLF include oozing sap which gives off a fermented odor and the buildup of honeydew and sooty mold. Egg masses are brownish gray and can be found on smooth surfaces. Remember that egg masses are easily moved when you move items from areas where SLF is found. Inspect your vehicles for adults and destroy eggs when moving from a quarantined area. Keep an eye out for this new pest and contact us if you find any signs in NH.

Office Notes

The NH Forest Health Program office and lab is located at the Caroline A. Fox Research and Demonstration Forest in Hillsboro. Our small staff monitors the condition of New Hampshire's 4.8 million acres of forest. You can help by contacting us if you observe any forest damage. Photos can be uploaded at NHBugs.org or you can contact us for a site visit. You can also follow us on social media to keep up to date on forest health issues. So far this year we have 500 followers on Facebook, 604 followers on Twitter, and 751 followers on Instagram. Thanks for being so social with us! In addition we email quarterly updates in March, June, and September. If you're not already on the mailing list you can sign up on our website or Facebook page.

Forest Health Program Contacts

Program Coordinator	Forest Health Specialist	Forest Health Specialist-EAB
Kyle Lombard	Jen Weimer	Bill Davidson
603-464-3016 x101	603-464-3016 x102	603-464-3016 x103
Kyle.Lombard@dncr.nh.gov	Jennifer.Weimer@dncr.nh.gov	William.Davidson@dncr.nh.gov

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