University of New Hampshire

Cooperative Extension

Natural Resources
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County Offices

Belknap County
527.5475

Carroll County
447.3834

Cheshire County
352.4550

Coös County
788.4961

Grafton County
787.6944

Hillsborough County
641.6060

Merrimack County
796.2151

Rockingham County
679.5616

Strafford County
749.4445

Sullivan County
863.9200

Education Center
877.398.4769 (Toll Free in NH)

UNH Cooperative Extension State Office
862.1520

August 3, 2017

Dear Selectmen, Town Clerks, Libraries, Conservation Commissions, Fire Chiefs, Parks and Recreation Departments and Road Agents:

The invasive insect emerald ash borer (EAB) has been **found in your town**. EAB is the most destructive forest pest in North America. It kills ash trees and impacts forest products industries, municipalities, and homeowners. EAB was first found in Concord in March 2013, and has since been identified in more than 30 towns across four New Hampshire counties. The four counties currently under quarantine for the movement of ash products are Belknap, Hillsborough, Merrimack and Rockingham Counties.

Enclosed are resources that will help your community learn more about the pest. Some resources are most appropriate at the municipal level, while others are geared toward homeowners. You can order these for distribution within your town. Go to http://bit.ly/NHBugsPubs to place an order, or call 800-444-8978.

Resources for Municipalities

- Community checklist to begin a response plan
- Disposal of EAB generated waste
- Burn it Where you Buy it poster

Resources for Homeowners

- What is the Emerald Ash Borer?
- Recommendations for homeowners and landowners
- Saving Your High Value Ash
- Use Local Firewood

Online Resources

Find these (and many other) resources at www.NHBugs.org:

- Ash tree identification video http://bit.ly/AshIDvid
- Directory of licensed pesticide applicators for EAB treatment https://nhbugs.org/applicators
- Certified New Hampshire arborists http://bit.ly/NHArborists

If you would like more information about EAB, go to www.NHBugs.org or contact your county forester. Call the phone number in the left margin for your county office, or go to www.NHWoods.org to find a list of contacts. If you're not the right person to receive this letter, or if you received two copies, please pass this along.

Sincerely,

Karen P. Bennett
Forestry Specialist

Enclosures

This letter and these materials are part of a collaborative project to slow the spread of EAB. Project partners are N.H. Division of Forests and Lands, N.H. Department of Agriculture, Markets and

University of New Hampshire Cooperative Extension

Emerald Ash Borer Preparation Checklist for New Hampshire Towns and Cities

Emerald Ash Borer (EAB) was found in Concord, New Hampshire in 2013. Towns in the rest of the state can reasonably expect it to arrive in coming years. There are steps towns can take right now to reduce its impact when it arrives. This checklist will help municipalities prepare. Your UNH Cooperative Extension County Forester is available to discuss these recommendations and provide additional information. Call 1-800-444-8978 to contact your local county forester. www.nhbugs.org has more information.

1. COLLABORATION

☐ **Form an EAB working group of key players in your town** such as conservation commissioners, selectmen, parks and recreation, planning, and others. The group will define roles and responsibilities for EAB preparedness. Identifying a "champion" is a good idea so this person can keep momentum going.

☐ **Engage others.** Master gardeners, Coverts Cooperators, foresters, arborist, loggers, and other partners can make your efforts more effective. These people are interested in natural resources, add expert voices to planning discussions, and can help detect EAB early.

2. ACTION

☐ **Determine your EAB management zone on NHbugs.org and examine the current recommendations**. There are three management zones in New Hampshire. Your zone depends on how close you are to a known infestation. Detailed recommendations for homeowners and woodlot owners have been developed for each zone.

☐ **Complete an inventory.** To plan effectively, know how many ash trees are present and, ideally, their size and condition. There are several ways to inventory. Your County Extension Forester can help you get started.

☐ **Conduct a survey for EAB.** A late winter drive-around tour where passengers look for "blonding" is an efficient way to look for new infestations.

3. DECISION

☐ **Triage trees for treatment and removal**. Identify high-value ash trees you'll want to preserve through chemical treatment, as well as trees you are sure will need to be removed. You may be able to complete this step during your inventory work.

☐ **Budget for the future**. Consider treatment, removal, and replacement costs. Your County Extension Forester can help you estimate these costs.

☐ **Don't plant ash.** Every ash you plant now will need to be treated or removed when EAB arrives in your town.

4. EDUCATION

☐ **Hold a public educational program in your town.** Everyone will be affected when EAB arrives. People should know what to expect and what options are available. UNH Cooperative Extension can provide these programs in your town, free of charge.

☐ **Hold a field training exercise.** Involve town staff as well as others who are interested. Go over ash identification and signs of EAB, especially blonding caused by woodpecker activity.

☐ **Make EAB factsheets and information available** at town offices and the town website. See www.nhbugs.org for printable factsheets.

Disposal of emerald ash borer generated waste

Piera Y. Siegert, State Entomologist, 12/22/2016
NH Dept. Agriculture, Markets & Food. 603.271.2561. piera.siegert@agr.nh.gov

Emerald ash borer (EAB) infestations are *guaranteed* to generate dead ash trees and wood waste. Live life stages of emerald ash borer may be hidden within this waste material and pose a risk of spreading the infestation. How you handle and manage this waste is an important part of reducing the spread of this destructive beetle.

Concord Lowe's Plaza, *NW Siegert, USFS*

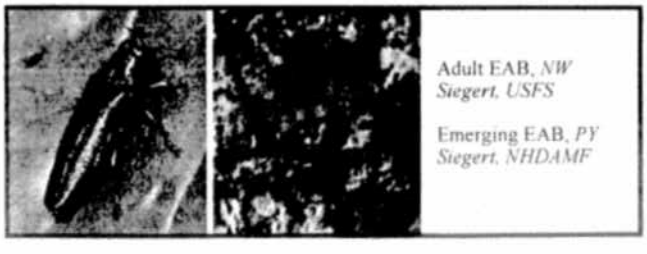
EAB-regulated articles capable of spreading emerald ash borer include: ash logs, ash chips and mulch, and hardwood firewood.

Jobs in Belknap, Hillsborough, Merrimack, and Rockingham Counties with waste moved *out* of those counties: This movement is regulated by state and/or federal quarantine and **requires** a compliance agreement. Depending on your process, destination of material, and timing of projects, you *may* qualify for a compliance agreement. See "Harvesting wood in Belknap, Hillsborough, Merrimack, or Rockingham County?" or call Morgan Dube, 271-3681 for more information.

Jobs in Belknap, Hillsborough, Merrimack, and Rockingham Counties with waste staying *within* those counties: This movement is not regulated by either the state or federal government. Keep in mind, however, that this transportation of potentially-EAB infested material poses a high risk of spreading the beetle and there are steps that you can take to reduce *your* risk of spreading this destructive and devastating beetle. The state has issued recommended best management practices, available at: http://extension.unh.edu/resources/files/Resource004263_Rep6105.pdf. In general, the following actions can reduce EAB populations and your risk for transporting and spreading EAB during your landscape management activities:

EAB larva & gallery. *NW Siegert, USFS*

- **Consider timing of activities:** EAB adults begin to emerge mid-June and are active into September. The optimal time to do a removal of infested ash material would be autumn-early winter. Adults are not active or mobile, and an extended drying period before the next season will increase (but not guarantee) the likelihood that larvae will desiccate and die before the spring.
- **Chip or mulch it:** You can reduce the risk of spreading EAB by chipping ash waste as both the mechanics and the heat generated by the chipping process can kill life stages of EAB. If you are able to chip the waste to a size of 1" or smaller in two planar dimensions, you can qualify for a compliance agreement to move the material out of the quarantine area. If your chip sizes are larger, you have not eliminated the risk, but you have reduced it. Chips of this larger size must not be transported out of the quarantine area without a compliance agreement.
- **Keep it local:** Reduce your spread of EAB by keeping waste material local (on site or within 5 miles of the site). It can be chipped on site, used as local firewood, or aged locally for at least a growing season.



Adult EAB, *NW Siegert, USFS*

Emerging EAB, *PY Siegert, NHDAMF*

Emerald ash borer is difficult to detect, especially early in the infestation. This is the best current information on EAB in NH. The map of active infestations and the counties under quarantine will change with new detections of emerald ash borer. Please visit www.nhbugs.org regularly.

List of towns in Belknap, Hillsborough, Merrimack, and Rockingham Counties by management status

Belknap

[redacted]		
Center Harbor	Meredith	

Hillsborough

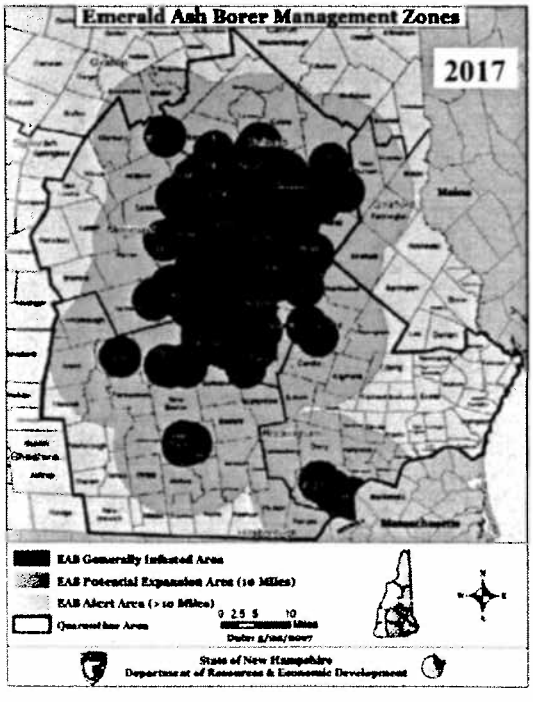
[redacted]	
Antrim	Mason
Bedford	Merrimack
Bennington	[redacted]
Brookline	
[redacted]	Nashua
[redacted]	
[redacted]	New Ipswich
Greenfield	Pelham
Greenville	Peterborough
Hancock	Sharon
Hillsborough	Temple
Hollis	[redacted]
Hudson	Wilton
Litchfield	Windsor
[redacted]	

Merrimack

[redacted]			
	Danbury		
			Sutton
		New London	[redacted]
Bradford		Newbury	
[redacted]			Wilmot

Rockingham

[redacted]	Exeter	Newfields	Rye
Auburn	Fremont	Newington	[redacted]
Brentwood	Greenland	Newmarket	Sandown
[redacted]	Hampstead	Newton	Seabrook
Chester	Hampton	North Hampton	South Hampton
Danville	Hampton Falls	[redacted]	Stratham
[redacted]	Kensington	Nottingham	[redacted]
	Kingston	Plaistow	
East Kingston	Londonderry	Portsmouth	
Epping	New Castle	Raymond	



These towns are all within the EAB quarantine area. If you are moving any regulated articles (ash logs, ash chips, ash nursery stock, all hardwood firewood, etc.) originating in or stored within these towns in NH's quarantined counties to any locations outside of these quarantined counties you must obtain a compliance agreement with the State to do so. If you are in a town with a known EAB population (red), you should follow the best management practices to reduce the risk of spreading EAB. If you are in a town near an EAB infestation (orange), you should strongly consider using best management practices. If you are in a town on alert (green) be informed about EAB risks and detection.

Emerald ash borer is difficult to detect, especially early in the infestation. This is the best current information on EAB in NH. The map of active infestations and the counties under quarantine will change with new detections of emerald ash borer. Please visit www.nhbugs.org regularly.

Recommendations for homeowners and landowners

Recommendations for All Areas

1. Management zones, based on current known infestations, are established for all of New Hampshire. Know your zone. View updated maps at www.NHBugs.org.
2. Inventory your trees by species, size and value.
3. Evaluate ash trees for signs of EAB. Report suspect trees or insects at www.NHBugs.org.

Generally infested area

Landscape trees:

1. You may remove all known infested trees near structures, cars and roads.
2. Consider insecticide treatment options for any high-value ash. Ask three licensed pesticide applicators for quotes.
3. Consider removing remaining ash trees while they're still healthy—dying ash can be hazardous to remove.
4. Use the material as locally as the quarantine allows, to prevent movement of EAB.

Trees in natural settings:

1. Ash may be harvested as small as 6-inches dbh. Leaving some ash standing slows the movement of EAB.
2. Follow best management practices to limit accidental EAB spread. Consult the quarantine if moving ash material out of the current quarantine area or out of state.

Generally infested area
Emerald ash borer is in this area, though not necessarily in all ash trees.

Potential expansion area
Emerald ash borer isn't known to be in the area, but the area is within 10 miles of the outer limits of the known infestation. There is a high probability emerald ash borer will spread naturally to this zone within a few years.

Alert area
Emerald ash borer isn't known to be in the area and it is more than 10 miles from the known infestation.

Quarantine
A quarantine of all hardwood firewood, ash wood-products and all ash nursery stock is in effect for Belknap, Hillsborough, Merrimack and Rockingham counties. To learn about the quarantine, go to www.NHBugs.org.

Potential expansion area

Landscape trees:

1. Consider removing ash trees while they're still healthy—dying ash can be hazardous to remove.
2. Consider preventative insecticide treatments for high-value ash. Ask three licensed pesticide applicators for quotes.
3. Identify large, healthy ash trees and monitor them for signs of EAB regularly.

Trees in natural settings:

1. Ash may be harvested as small as 6-inches dbh. Leaving some ash standing slows the movement of EAB.
2. Identify large, healthy ash trees and monitor them for signs of EAB regularly.
3. Follow best management practices to limit accidental EAB spread. Consult the quarantine if moving ash material out of the current quarantine area or out of state.
4. You may create trap trees to help detect EAB early. Please contact 603-464-3016 for help.

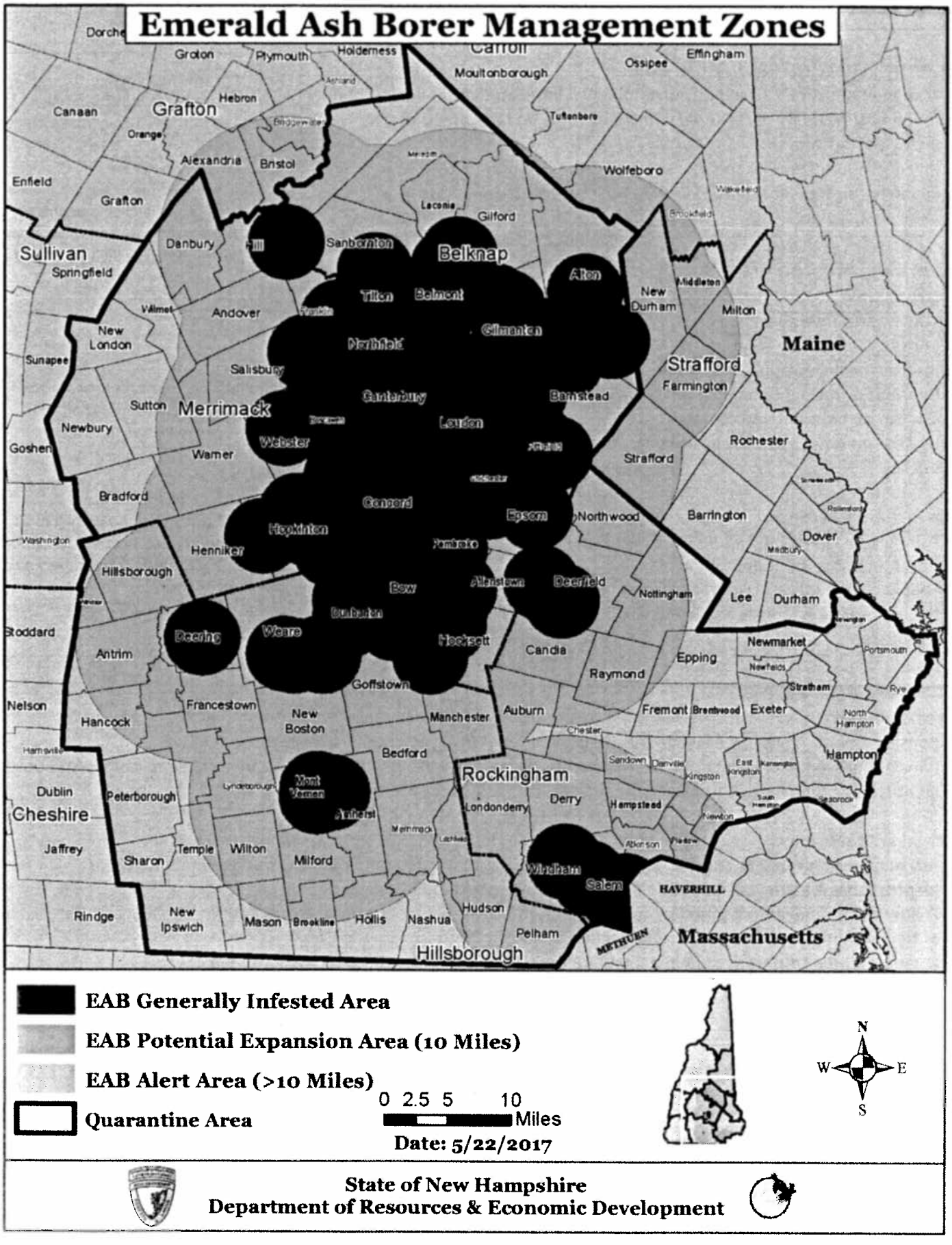
Alert area

Landscape trees:

1. Consider removing ash trees while they're still healthy—dying ash can be hazardous to remove.
2. Identify large, healthy ash trees and monitor them for signs of EAB regularly.

Alert area for forest landscape:

1. Ash may be harvested as small as 6-inches dbh. Leaving some ash standing slows the movement of EAB.
2. Identify large, healthy ash trees and monitor them for signs of EAB regularly.
3. Follow best management practices to limit accidental EAB spread. Consult the quarantine if moving ash material out of the current quarantine area or out of state.
4. You may create trap trees to help detect EAB early. Please contact 603-464-3016 for help.


Emerald Ash Borer Management Zones
Grafton
Belknap
Merrimack
Strafford
Hillsborough
Rockingham
Cheshire
Maine
Massachusetts
EAB Generally Infested Area
EAB Potential Expansion Area (10 Miles)
EAB Alert Area (>10 Miles)
Quarantine Area
0 2.5 5 10
Miles
Date: 5/22/2017
N
W
E
S
State of New Hampshire
Department of Resources & Economic Development

SAVING YOUR HIGH-VALUE ASH

A simple guide for homeowners and municipalities with true ash (*Fraxinus*) trees

Piera Siegert, NH State Entomologist

Emerald ash borer adult
Photo credit: N.W. Siegert

The problem: Emerald ash borer is an introduced and destructive pest of all North American true ash (*Fraxinus*) such as white, green, and black/brown ash. Trees infested with emerald ash borer will die from the infestation within 3-5 years. Management strategies to slow the spread of ash mortality are effective at reducing *overall* emerald ash borer populations, but they may not save the ash tree in front of ***your*** house or in ***your*** park. Potential costs associated with emerald ash borer for municipalities and homeowners include:

- Costs to remove/replace/treat infested trees
- Loss of landscaping and community character
- Increased heating/cooling costs
- Reduction in property value
- Potential property damage/personal injury suits
- Increased power outages

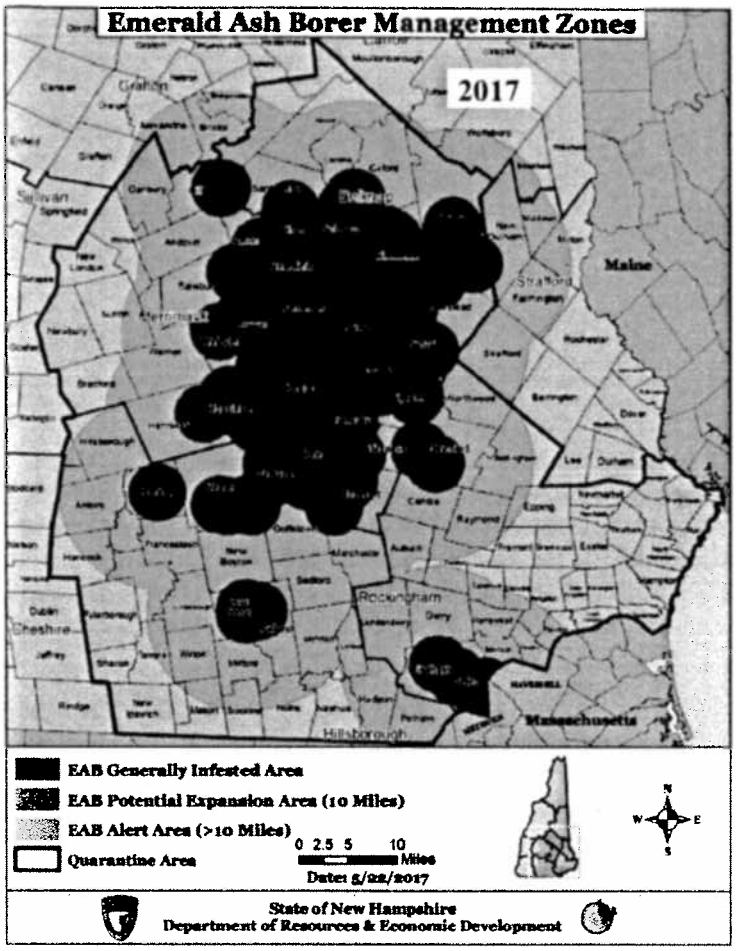
Ash-lined neighborhood in Lebanon, NH.
Photo credit: P.Y. Siegert

Emerald ash borer killed tree in Concord, NH.
Photo credit: P.Y. Siegert

Although you cannot control the arrival of emerald ash borer on your property, you can decide what impact emerald ash borer will have by developing an emerald ash borer plan. This should be done regardless of proximity to known emerald ash borer populations. The first step is to stay informed about known emerald ash borer populations in the state (www.nhbugs.org). Next, determine if you have ash trees, what size they are, where they are located, and if they add value to your property or community. Use local foresters and arborists, on-line calculators (www.extension.entm.purdue.edu/treecomputer/ and other sites) or smart phone apps (ARBORJETP for iphone and ipad and others) to estimate the costs associated with tree removal, replacement or treatment. Once you have determined your investment in ash and considered your budget, you can develop a plan for which trees will be removed, replaced or treated with insecticides when emerald ash borer arrives. Having a plan empowers you to make informed decisions about your property or community.

Don't let the beetle decide what to do with your trees!

More information about using insecticides for emerald ash borer on the reverse
WARNING: *Insecticides are chemicals that can have health or environmental impacts. If you use insecticides always follow all label instructions or hire a licensed pesticide applicator.*
Pollinator impact note: *Some studies have linked imidacloprid to CCD, a world-wide decline in honeybee populations. The body of evidence is inconclusive, but potential impacts to pollinators should be considered when initiating an insecticide regime. For information on insecticides used for EAB see* www.emeraldashborer.info/files/Potential_Side_Effects_of_EAB_Insecticides_FAQ.pdf.



New Hampshire
Department of Agriculture, Markets & Food

Pesticides can be a useful tool for protecting valued ash trees. There are important considerations to keep in mind, however, when selecting an insecticide regime:

- Proximity to generally infested area—insecticide treatment is only recommended in the red and orange areas (see map left or visit www.nhbugs.org for the most current information)
- Size of tree—measure the diameter (in inches) at 4.5 feet above the ground with a caliper or tape measure to get Diameter at Breast Height (DBH)
- Health of tree—systemic insecticides are less effective in trees that are already in decline
- Proximity to socially or environmentally sensitive habitats (like school properties, wells, or wetland areas)
- Mode of application of insecticide
- Effectiveness of treatment
- Cost of treatment
- Frequency of treatment

Not all emerald ash borer-approved insecticides are equally effective, nor are they all appropriate in every circumstance. Choosing an ineffective treatment for your conditions may result in product failure and is not cost-effective. Less effective treatments may prolong the life of an ash tree early in the invasion process but as neighboring untreated ash trees start showing signs of decline, indicating increasing local emerald ash borer populations, a more effective pesticide treatment may be necessary. There are resources available to help you assess the management options and products that are right for you. The table below summarizes recommended chemicals available for use. Active ingredients are listed, not trade names. Most formulations are only available for use by a licensed pesticide applicator. For more detailed information about available insecticides, visit: www.emeraldashborer.info/files/Multistate_EAB_Insecticide_Fact_Sheet.pdf. More resources are also available through www.nhbugs.org and www.emeraldashborer.info, as well as by contacting an experienced certified arborist.

See map above to determine your management zone.		**Ash is less than 18" DBH**	**Ash is greater than 18" DBH**
Generally infested	Ash appear healthy	Imidacloprid, dinotefuran, or emamectin benzoate	Emamectin benzoate
	Ash are in decline	Emamectin benzoate	
	Ash are dead or with greater than 50% crown dieback	Tree removal. Insecticides unlikely to be effective.	
Expansion management zone		Imidacloprid, dinotefuran, or emamectin benzoate	Emamectin benzoate
Alert management zone		Treatment not yet warranted. Develop a plan.	

For assistance in developing a municipal emerald ash borer plan, and to find out how your management goals coincide with state management of emerald ash borer, please contact your local UNH Cooperative Extension County Forester.

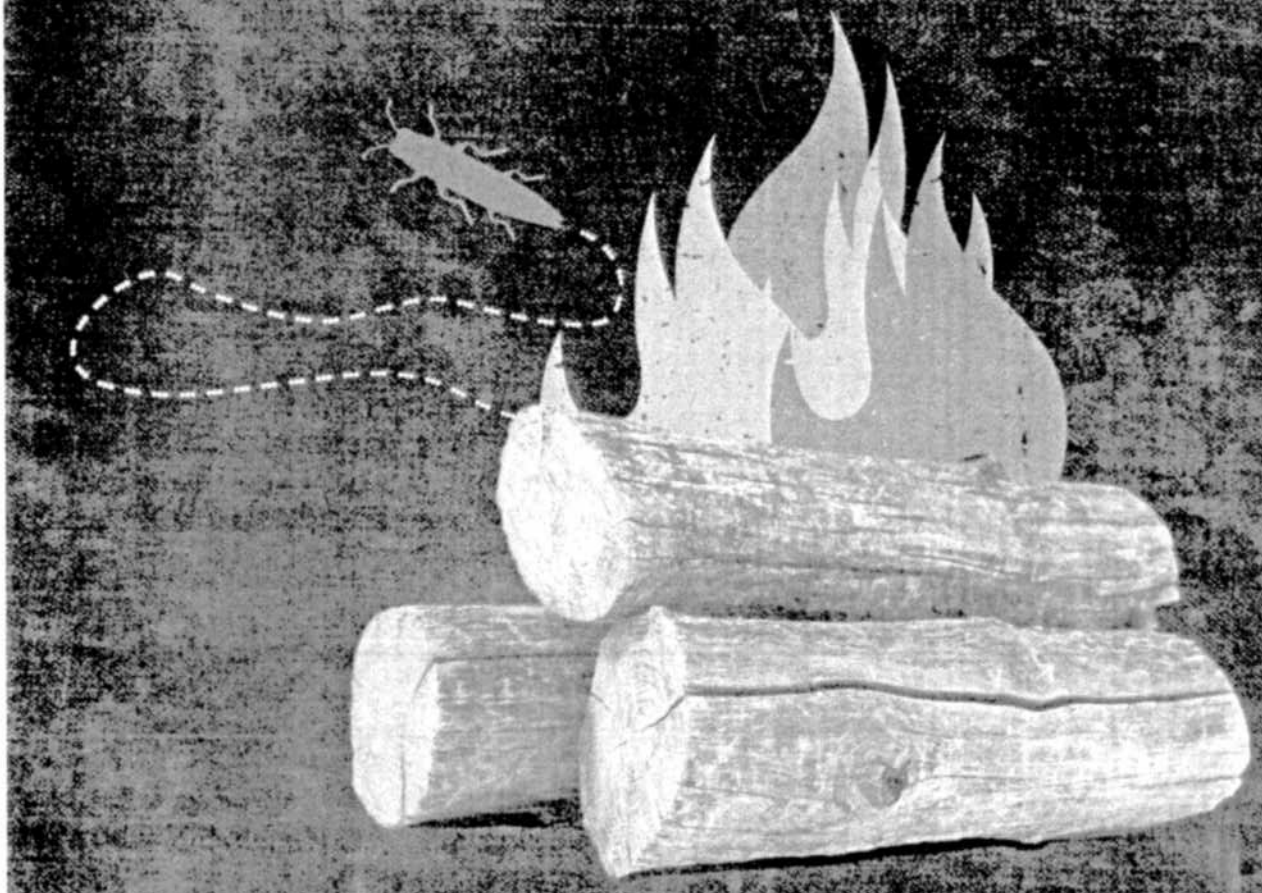
HELP STOP THE SPREAD OF INVASIVE PESTS

Our forests are threatened by non-native insects and diseases that can kill large numbers of trees. Pests like the emerald ash borer, gypsy moth, Asian longhorned beetle, and many others can be transported long distances on firewood. Once they arrive in new areas, these insects and diseases can become established and severely damage our forests. **Protect our New Hampshire forests. Don't give these pests a free ride to your favorite camping place.**

HOW YOU CAN HELP

- Leave firewood at home – buy or gather firewood where you camp
- Use locally harvested or certified heat-treated firewood
- Stay informed about New Hampshire's invasive pests at **www.nhbugs.org**

BUY IT WHERE YOU BURN IT.



DONTMOVEFIREWOOD.org

New Hampshire Department of Agriculture, Markets & Food

University of New Hampshire Cooperative Extension

For more information about invasive pest threats to New Hampshire's forests, visit www.nhbugs.org

PROTECT NEW HAMPSHIRE'S FORESTS

USE LOCAL FIREWOOD

Emerald ash borer infested firewood

Moving firewood spreads insects and diseases that harm trees and forests. Some infestations require drastic control measures, including removal of thousands of trees.

Camping firewood from out of state is prohibited in New Hampshire. Within-state firewood regulations also exist. Find out more at www.NHbugs.org.

Finding firewood near your destination protects New Hampshire's environment, recreational opportunities, and scenic views.

BURN IT WHERE YOU BUY IT

ısects and tree diseases hiding in rewood may not be visible. You can revent them from "hitchhiking" to ealthy trees by using these guidelines:

- **Keep firewood near its origin**
- **Use local firewood when camping**
- **Visit firewoodscout.org to find firewood in your area**
- **Don't travel with firewood**
- **Report sightings of exotic insects to NHBugs.org**

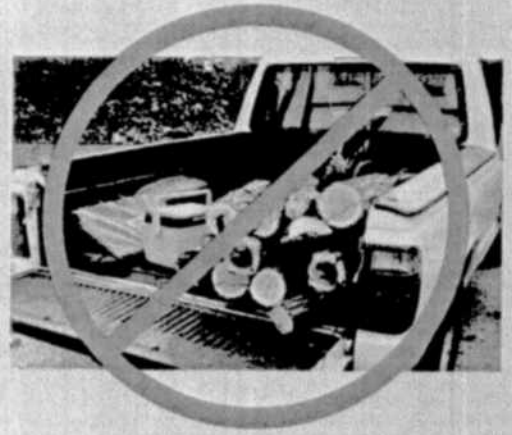
The emerald ash borer, easily moved in firewood, is killing trees in New Hampshire.

New Hampshire
Department of Agriculture, Markets & Food

ALERT!

Protect our Forests and Trees.

Help Stop the Movement of Exotic Pests.



DO NOT MOVE FIREWOOD!

Exotic pests like the emerald ash borer can be spread when infested firewood is transported to new areas.

- Do not bring firewood from home.
- Use local sources of firewood.
- If you have brought firewood from home, DON'T take it with you, DON'T leave it– BURN IT!

REPORT!

If you think you have found emerald ash borer, contact one of these offices in your area:

State Department of Agriculture

State Forestry or Natural Resource Agency

Cooperative Extension Office

USDA Animal and Plant Health Inspection Service

U.S. Forest Service

or

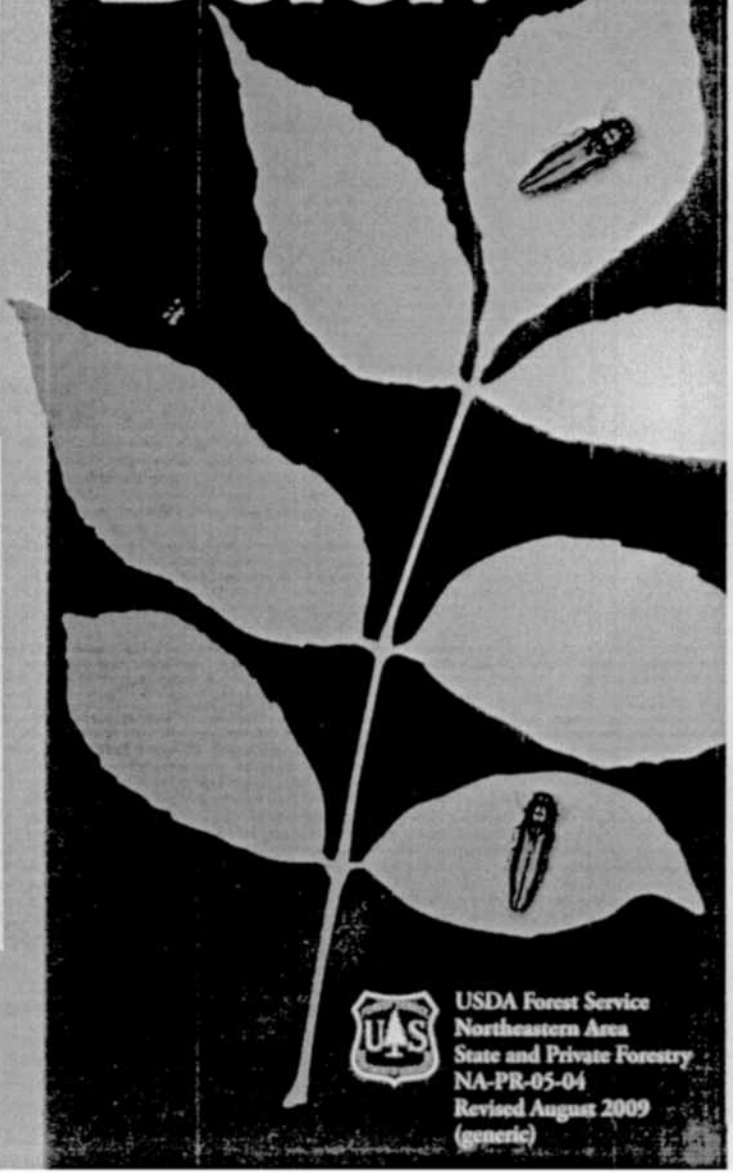
Call Toll Free: 1-800-444-8978

For more information about emerald ash borer please visit:

www.nhbugs.org

USDA United States Department of Agriculture

What is the Emerald Ash Borer?



USDA Forest Service
Northeastern Area
State and Private Forestry
NA-PR-05-04
Revised August 2009
(generic)

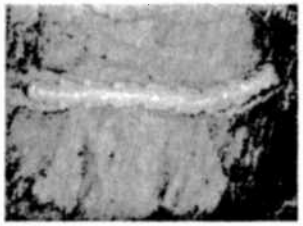
The emerald ash borer,

Agrilus planipennis Fairmaire, a beetle native to Asia, was first detected in Michigan in 2002. Evidence suggests that the beetle was established in Michigan for years prior to its discovery. Emerald ash borer (EAB) has since been detected in many states, and also in Ontario and Quebec, Canada. In addition to spreading by natural means, EAB can be transported to new areas in infested firewood, timber, and nursery stock. This beetle has been responsible for the loss of millions of ash trees in North America.

Actual Size

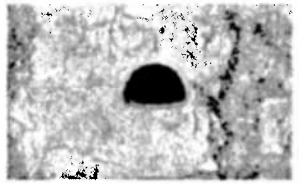
Host:

In North America, EAB is known to infest all species of ash (*Fraxinus* spp.). Ash can be recognized by the presence of compound leaves which are arranged opposite of one another on the branches.



Larva

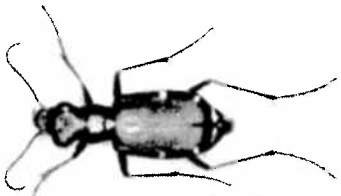
S-Shaped Galleries



D-Shaped Emergence Hole

Biology:

Eggs are laid between layers of bark and in bark crevices. Larvae hatch in about one week and bore into the tree where they feed on the inner bark and phloem, creating "S"-shaped galleries. Larvae go through four feeding stages, and then excavate a pupal chamber in the fall, where they will overwinter as prepupae. Pupation occurs in late spring, and adults begin to emerge through "D"-shaped exit holes in May and early June. Adults will remain active until the end of summer.



Not EAB:

This commonly encountered beetle, the six-spotted green tiger beetle, *Cicindela sexguttata*, is often mistaken for EAB due to its similar appearence. It is a predator of small insects and is frequently found on hiking trails. There are other insects often mistaken for EAB.

Photographs: James W. Smith, David Cappaert, www.invasive.org and PA DCNR

Symptoms and Signs:

New infestations are difficult to detect, as damage to the tree may not be apparent for up to three years. Symptoms of an infestation can include branch dieback in the upper crown, excessive epicormic branching on the tree trunk, and vertical bark splits. Woodpecker damage is sometimes apparent.

Dieback

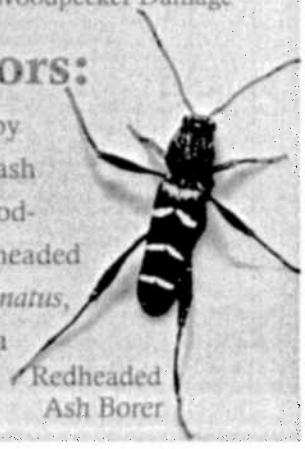
Epicormic Branching

Bark Splits

Woodpecker Damage

Other Stressors:

Ash may also be stressed by drought, diseases such as ash yellows, and by native wood-boring insects like the redheaded ash borer, *Neoclytus acuminatus*, (Fabricius) which creates a round emergence hole.



Redheaded Ash Borer