

# Invasives Make Bad Neighbors

## Manage, Prepare, and Prevent the Spread of Invasive Plants and Pests

Mollie Klepack, UVM Ext



Elizabeth Spinney, VT FPR



# Overview of Today

& Specific tools +  
resources

& Invasive Plants

& Case Study –  
Emerald Ash Borer  
(Invasive Pest)



# What's an Invasive Species?

Not from “here”

Cause “harm”



Invasive species harm things we value

# Impacts to Human Health

*“There were twice as many adults and nearly twice as many nymphs in plots dominated by exotic-invasives than in plots dominated by native shrubs.”*



S. Bauer, CC BY 3.0 US,  
<http://www.insectimages.org/browse/detail.cfm?imgnum=1324009>

UGA1324009



# *Upland Invasive Plants*

**& Simply –plants that grow on land,  
that are considered invasive**

# Getting Started: Broad Prioritization

## & Assess + Develop Management Plan

		Potential benefit		
		high	medium	low
Difficulty of project (volunteer or financial costs)	high	2	3	*
	medium	1	2	*
	low	1	1	*

## & Cultivate Community Support

# Getting Started: Resources

HOME | TREE PESTS | PLANTS | OTHER INVASIVES | TAKE ACTION | ABOUT US | NEWS | EVENTS | Search our site

## PLANTS

MANAGEMENT CASE STUDIES

GALLERY OF INVADERS

IMPACT OF INVASIVES ▼

PREVENTION AND MANAGEMENT ▼

FUNDING

INVASIVE FREE GARDENING ▼

IMAPINVASIVES - REPORT IT! ▼

PLANT QUARANTINE RULE

VERMONT INVASIVE EXOTIC PLANT COMMITTEE

RESOURCES & LINKS

## Resources & Links

### Invasive plant prevention and management

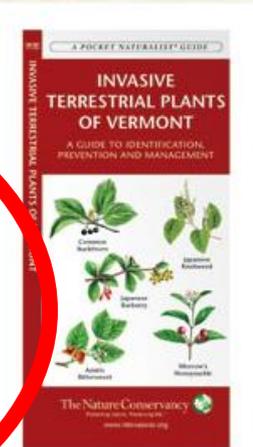
Are you a concerned citizen? Landowner? Forester? Conservation commission member? Check out these new resources!

- **Best Management Practices for the Prevention and Treatment of Terrestrial Invasive Plants in Vermont Woodlands**, an 80 page spiral bound field guide that fully describes the BMPs below
- **A laminated pocket guide, Invasive Terrestrial Plants of Vermont**: a full color 12 panel guide with close to 70 illustrations and a summary of BMPs below.

These are available for \$4 each plus shipping & handling. [Click here to download an order form](#). If you have questions contact us at 802-229-4425 or email [pmarangelo@tnc.org](mailto:pmarangelo@tnc.org)

*The following resources are useful to any forester, land manager, or landowner interested in prevention and management.*

- [Tool 1: A Landowners Guide to Invasive Plant Field Assessment](#)
- [Tool 2: A Forester's Guide to Incorporating Invasive Plant Assessments into UVA Management Plans](#)
- [Tool 3: A Landowners Guide to Seeking Funding from the Natural Resource Conservation Service \(NRCS\)](#)
- [Tool 4: Invasive Plant Treatment Methods](#)
- [Tool 5: Invasive Plant Contractors Guide to Invasive Plant Field Assessment and Cost Proposal Development](#)
- [Tool 6: Weed Management Plan Template](#)
- [Tool 7: Guidelines for Site Restoration](#)
- [Tool 8: Property Summary Assessment](#)
- [Invasive Plant Management Plan Template](#)



### iMap Invasives

- [Field form](#)
- [Supplemental waypoint form](#)

# Assessment: Learn how to ID

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## Gallery of Invaders: Plants by Common Name

[Image View](#) | [List View](#)

Sort By: Common Name

Search Invaders



[Asiatic or Oriental Bittersweet](#)  
*Celastrus orbiculatus*



[Autumn olive](#)  
*Elaeagnus umbellata*



[Black swallow-wort](#)  
*Cynanchum louiseae*



[Burning bush or Winged Euonymus](#)  
*Euonymus alatus*



[Common buckthorn](#)  
*Rhamnus cathartica*



[Common Reed](#)  
*Phragmites australis*



[Dame's Rocket](#)  
*Hesperis matronalis*

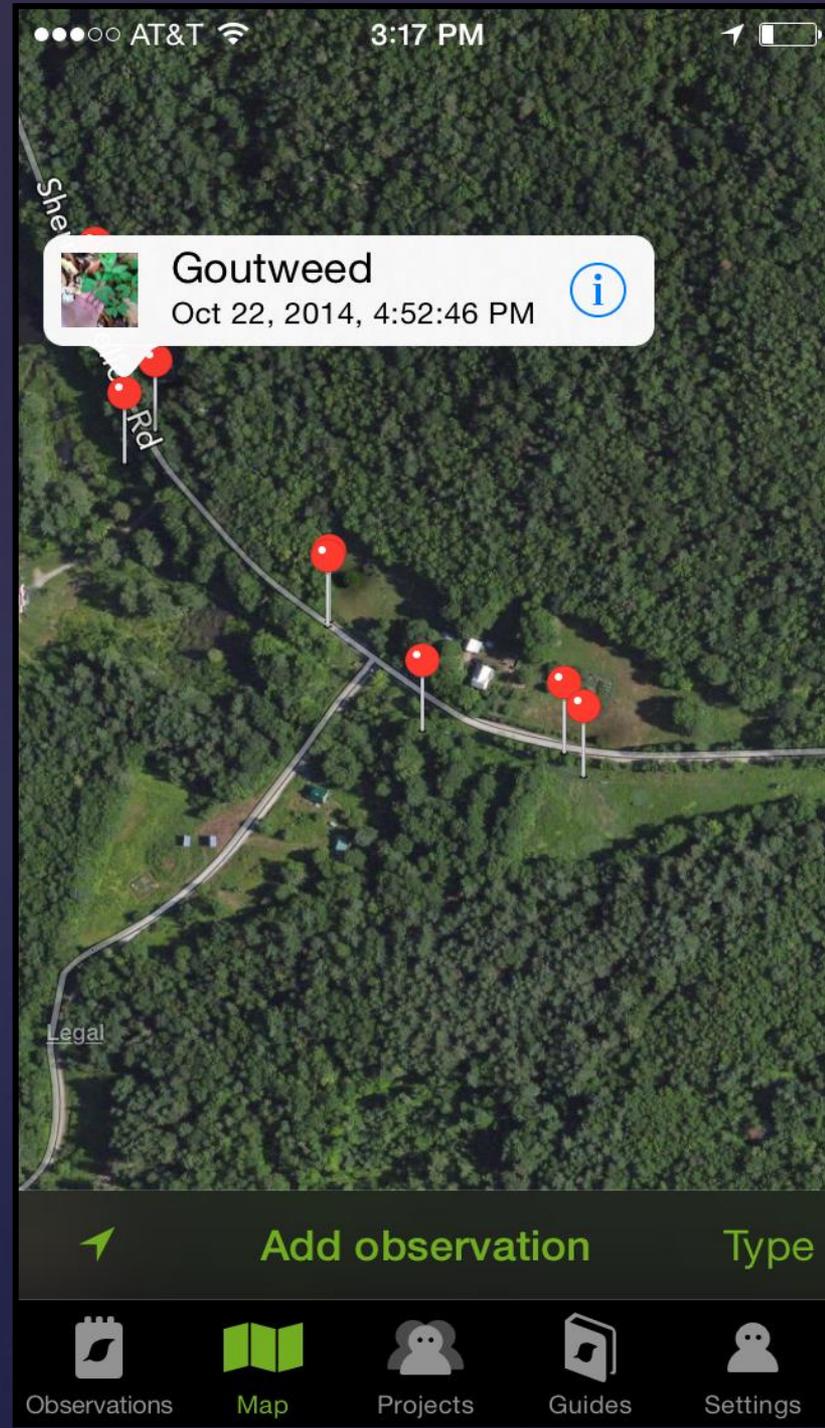


[European Alder](#)  
*Alnus glutinosa*

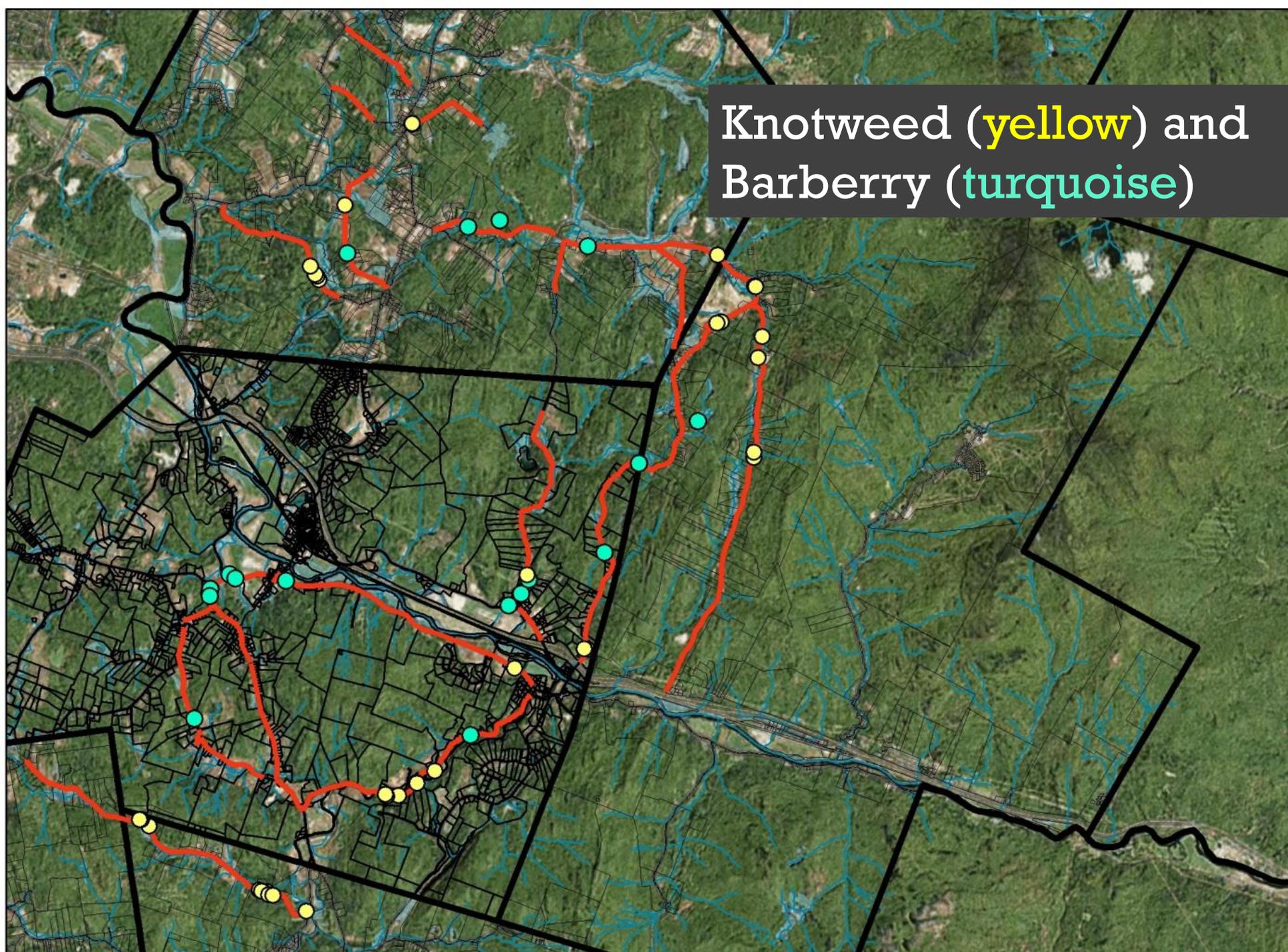


# Assessment: Mapping

- Scope of problem?
- iNaturalist on smartphones w/volunteers
- Contact FPR for more info



Knotweed (yellow) and  
Barberry (turquoise)



# Developing a Management Plan

HOME | TREE PESTS | PLANTS | OTHER INVASIVES | TAKE ACTION | ABOUT US | NEWS | EVENTS | Search our site ▶

## PLANTS

- MANAGEMENT CASE STUDIES
- GALLERY OF INVADERS
- IMPACT OF INVASIVES ▼
- PREVENTION AND MANAGEMENT ▼
  - [Early Detection Rapid Response](#)
  - [Assessing Infestations](#)
  - [Developing A Management Plan](#)
  - [Tips On Hiring A Contractor](#)
  - [Forestry Best Management Practices](#)
  - [Herbicide Use](#)
  - [Road Crew Best Management Practices](#)
- FUNDING
- INVASIVE FREE GARDENING ▼
- IMAPINVASIVES - REPORT IT! ▼
- PLANT QUARANTINE RULE
- VERMONT INVASIVE EXOTIC PLANT COMMITTEE
- RESOURCES & LINKS

## Prevention & Management



Monitoring for and treating **invasive species** is one of the most important things you can do to take care of Vermont's [working forests](#) and [natural areas](#). Be on the lookout for **invasive plants**, and if you're a **land manager** or **landowner**, do everything you can to prevent the spread of invasives and treat existing populations.

To learn more about preventing the spread of invasives, click on the links to the left, and visit the [gallery of invaders](#) and check out the rest of the links under the "Prevention and Management" tab.

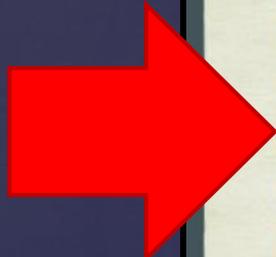
### REPORT IT

Click Plants or Pests to report an invader in your area

[Plants ▶](#) [Pests ▶](#)

[Sign up for e-news ▶](#)

HOME | NEWS | TREE PESTS | PLANTS | OTHER INVASIVES | TAKE ACTION | ABOUT US | LOGIN



# Developing a Management Plan

& Strategic prioritization of projects

& Best Management Practices

& Partner w/VTRANS

& Early Detection/Rapid Response Teams

# Developing a Management Plan

## IPM

- ✓ Assess population
  - near anything we value?
  - does treatment make sense?
  
- Develop Management Plan
  - sites, methods, impacts
  - species specific treatment
  
- Monitoring
  - each year!

# Developing a Management Plan

## Funding Opportunities...a place to start

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### PLANTS

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### Funding



[Click here for a list of current funding opportunities.](#)

While much can be done with volunteers, many larger scale projects benefit from money to help with outreach, project coordination, or hiring a contractor for control work.

For local projects, you could turn to people and businesses within your region that may have connections with private donors or potentially useful organizations. Local businesses may also donate tools, gloves and food for workdays. A local ecologist may contribute to the development of a management plan.

Here are some other potential funding sources:

- The **USDA Natural Resource Conservation Service (NRCS)** offers a number of programs, including the **Wildlife Habitat Incentive Program (WHIP)** and **Environmental Quality Incentive Program (EQIP)**, that can help defray the costs of **invasive plant control** for qualified **private landowners**. For more information, talk to a local NRCS specialist or your county forester, or [click here](#).
- The **USDA** lists a number of sources for federal and private grants [here](#).
- The **National Fish and Wildlife Foundation** funds the **Pulling it Together!** program, which provides money for invasives-related **outreach and management** activities.
- The **National Invasive Species Council** posts grant opportunities [here](#).
- The **Lake Champlain Basin Program** and the **Vermont Department of Fish and Wildlife** have grants that may be used for invasive plant outreach and management.
- **Local private donors and foundations** may help with local projects. For example, the **Vermont Community Foundation** provides up to \$10,000 in unrestricted funding to nonprofits, municipalities or groups with fiscal sponsors for work toward building healthy and vital Vermont communities as part of their **Community Fund Grant**.
- Get a commitment from your **town** to dedicate funding for invasive plant management.

# Cultivate Community Support

Prevention/Mitigation:

& Outreach/Education

& Town Plan/Regional Plan

& Funding: mapping, planning and strategizing

& Amend Zoning ordinances

& Partnerships: Cooperative Invasive Species  
Management Areas (CISMA)

# Cultivate Community Support: Resources

The screenshot shows a website navigation menu at the top with links for HOME, TREE PESTS, PLANTS, OTHER INVASIVES, TAKE ACTION, ABOUT US, NEWS, and EVENTS. A search bar is located on the right. The main content area is titled 'Downloadable Resources' and is organized into several sections. A left sidebar under 'TAKE ACTION' lists categories like 'COOPERATIVE INVASIVE SPECIES MANAGEMENT AREAS', 'PLANTS', 'TREE PESTS', 'ON THE GROUND', 'JOIN A COMMUNITY GROUP', and 'EMPLOYMENT'. The 'PLANTS' section is expanded, showing links to 'Report It', 'Tips For Developing An Outreach Or Management Project', 'PlantVise', 'Downloadable Resources', and 'Post Irene Knotweed Initiative'. The main content area features sections for 'Project how-to guide', 'Planning your project', 'Recruiting and working with volunteers', 'Organizing and executing a workday', and 'Getting the word out'. Each section contains several links to downloadable resources.

HOME | TREE PESTS | PLANTS | OTHER INVASIVES | TAKE ACTION | ABOUT US | NEWS | EVENTS | Search our site

## TAKE ACTION

COOPERATIVE INVASIVE SPECIES MANAGEMENT AREAS

PLANTS

- [Report It](#)
- [Tips For Developing An Outreach Or Management Project](#)
- [PlantVise](#)
- [Downloadable Resources](#)
- [Post Irene Knotweed Initiative](#)

TREE PESTS

ON THE GROUND

JOIN A COMMUNITY GROUP

EMPLOYMENT

## Downloadable Resources

### Project how-to guide

*Developing Invasive Plant Outreach and Management Projects: A Guide for Vermont Communities and Conservation Organizations.* For a copy of this full-color, 100-page guide, send a \$10 check to The Nature Conservancy, c/o Paul Marangelo, 27 State Street, Montpelier, VT 05602 or email [pmarangelo@inc.org](mailto:pmarangelo@inc.org).

### Planning your project

- [Comparison of project strategies based on project scale](#)
- [Finding appropriate partners based on the type of project](#)
- [Ideas for possible partners](#)
- [Sample Memorandum of Understanding](#)

### Recruiting and working with volunteers

- [Resources for recruiting volunteers](#)
- [How to find the right volunteers for your particular project](#)
- [Volunteer interest form template](#)
- [Sample volunteer job description](#)

### Organizing and executing a workday

- [Resources for organizing a successful community event](#)
- [Volunteer sign-in sheet template](#)
- [Work release and sign-in sheet template](#)
- [Common supplies needed for an invasives control workday](#)

### Getting the word out

# Case Studies

HOME | TREE PESTS | PLANTS | OTHER INVASIVES | TAKE ACTION | ABOUT US | NEWS | EVENTS |

## PLANTS

### MANAGEMENT CASE STUDIES

GALLERY OF INVADERS

IMPACT OF INVASIVES ▼

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PLANT COMMITTEE

RESOURCES & LINKS

## Management Case Studies

### [Private landowner, Charlotte, VT](#)

*Charlotte*

Prior to treatment, the wooded areas were very heavily infested with shrub honeysuckles and common buckthorn and a few plants of Japanese barberry. Plants ranged in size from small seedlings/saplings to mature, fruiting plants. Contractors were originally concerned that treatment work on this property might not be feasible or successful due to the heavy level of infestation.

### [Marsh-Billings-Rockefeller National Historical Park in Woodstock, Vermont](#)

*Woodstock*

**Area Identification:** The entire park has been surveyed for invasive plants and the majority of the park has been treated.

**Target Invasive Plant Species:** The dominant invasive plant species at the park are bush honeysuckles, common buckthorn, autumn olive, garlic mustard, black swallow-wort, European alder, Japanese barberry, Norway maple, winged euonymus, and black locust. The park hosts several other less common and less aggressive invasive plants, and will likely be tackling some of those over time.

### [Equinox Highlands Natural Area, Southern Vermont Arts Center, Manchester, VT](#)

*Manchester*

**Area Identification:** The Equinox Highlands Natural Area is 2,276 acres and is owned by The Nature Conservancy. Invasive plant treatment was focused on 312 acres of the SVAC parcel (the parcel was previously owned by the SVAC and purchased by TNC in 2010). On the 312 acres of the SVAC land, invasive plant treatment was concentrated on the lower slopes of the property, between 1100 and 1600 feet in elevation. The area is wooded, bordered by a meadow and adjacent parking lot on the eastern edge. Several hiking trails weave through the property.

### [Green Mountain National Forest-Middlebury District Ranger](#)

# Contact

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VT FPR

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(802) 477-2134



**[vtinvasives.org](http://vtinvasives.org)**

# The Emerald Ash Borer

## The Pest and The Planning



Mollie Klepack  
Forest Pest Outreach Coordinator  
UVM Extension



Credit: UVM Landscape Change Program

# Toledo, Ohio



2006 (Before EAB)



2009 (After EAB)

# Benefits of Urban Trees



# Benefits of Urban Trees



American Journal of Preventive Medicine

Volume 44, Issue 2, February 2013, Pages 139–145



Research article

## The Relationship Between Trees and Human Health: Evidence from the Spread of the Emerald Ash Borer

Geoffrey H. Donovan, PhD<sup>a</sup>,  , David T. Butry, PhD<sup>b</sup>, Yvonne L. Michael, ScD<sup>c</sup>, Jeffrey P. Prestemon, PhD<sup>d</sup>, Andrew M. Liebhold, PhD<sup>e</sup>, Demetrios Gatzliolis, PhD<sup>a</sup>, Megan Y. Mao<sup>a</sup>

<sup>a</sup> Pacific Northwest Research Station, U.S. Department of Agriculture Forest Service, Pacific Northwest Research Station, Portland, Oregon

<sup>b</sup> National Institute of Standards and Technology, Gaithersburg, Maryland

<sup>c</sup> Department of Epidemiology and Biostatistics, Drexel University, Philadelphia, Pennsylvania

<sup>d</sup> U.S. Department of Agriculture Forest Service, Southern Research Station, Research Triangle Park, North Carolina

<sup>e</sup> Northern Research Station, U.S. Department of Agriculture Forest Service, Morgantown, West Virginia

⦿ Burlington: 1,000 ash trees ROW.

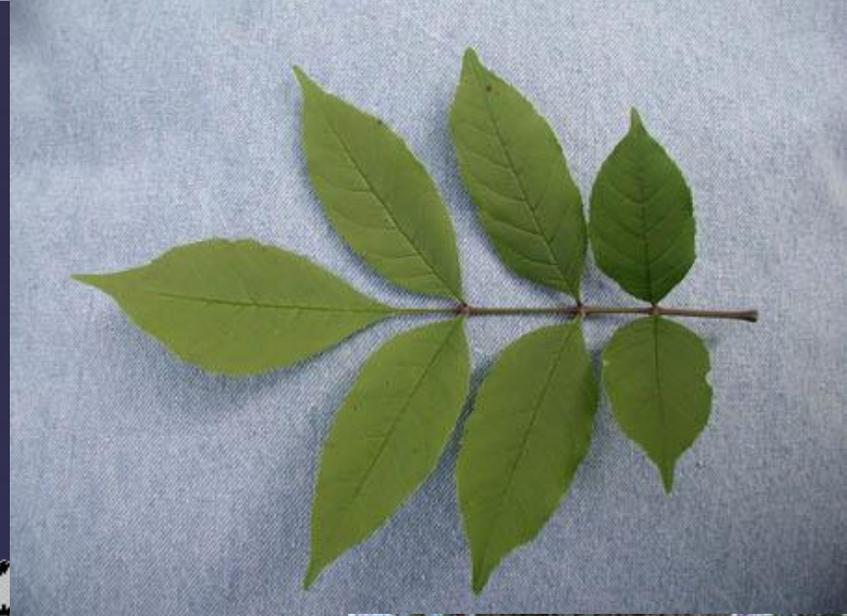
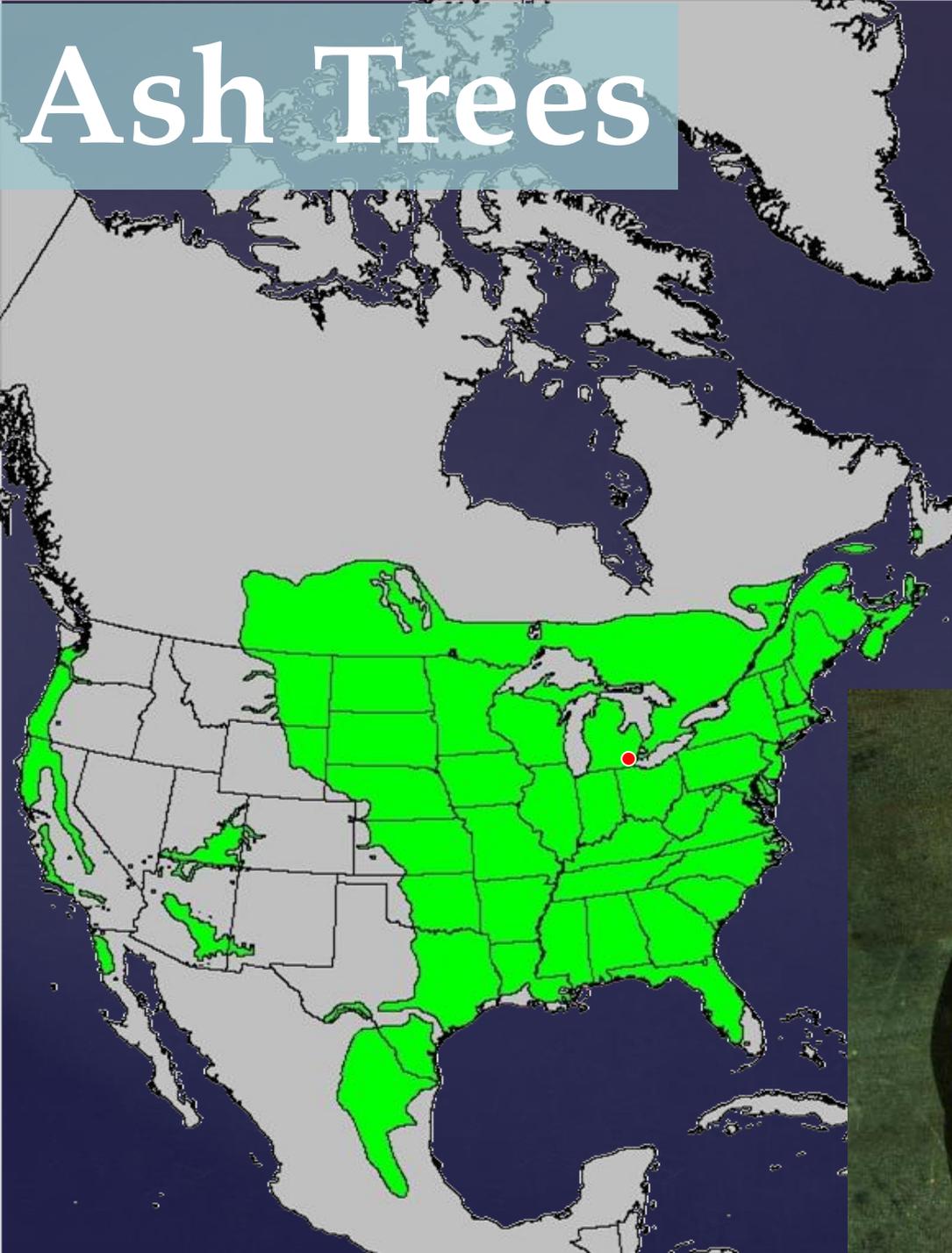
Remove and Replace: **\$500,000**

⦿ Johnson: 440 ash trees along back roads.

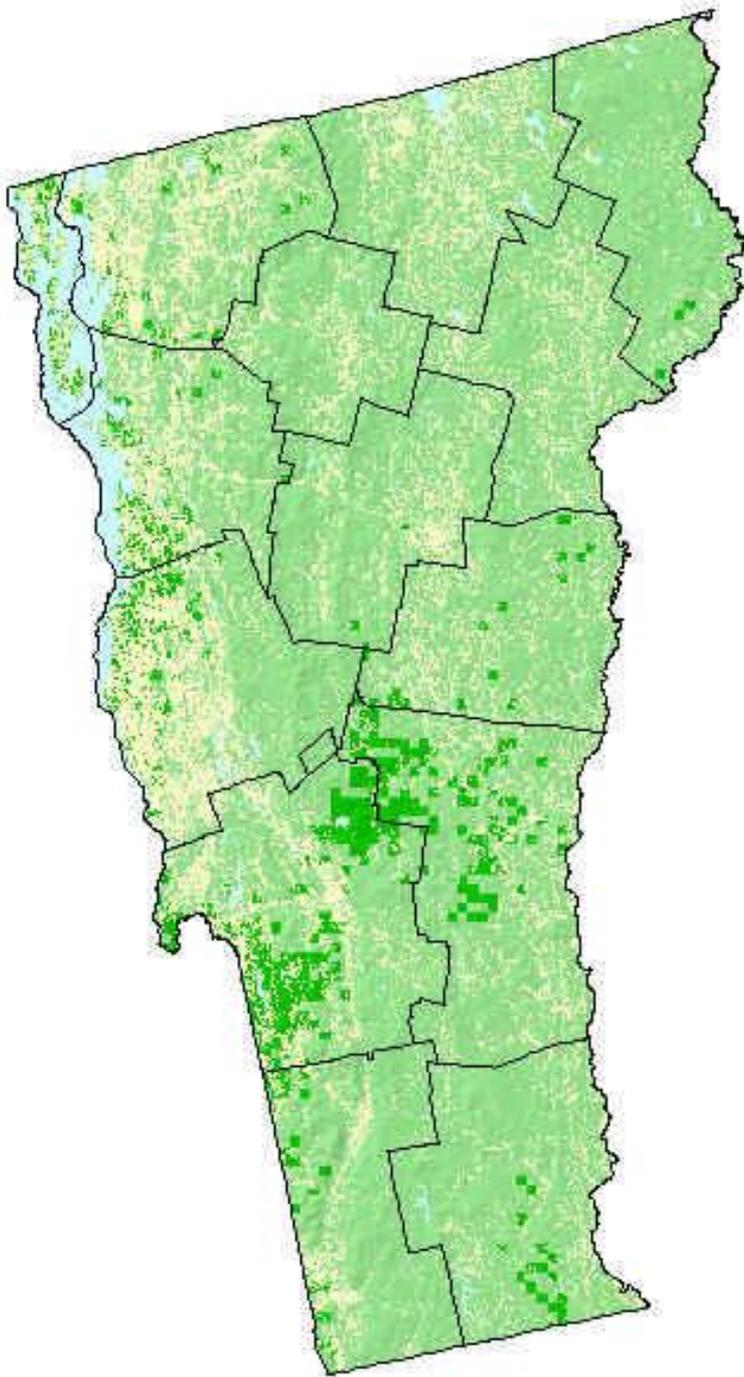
Removal: **\$132,000**

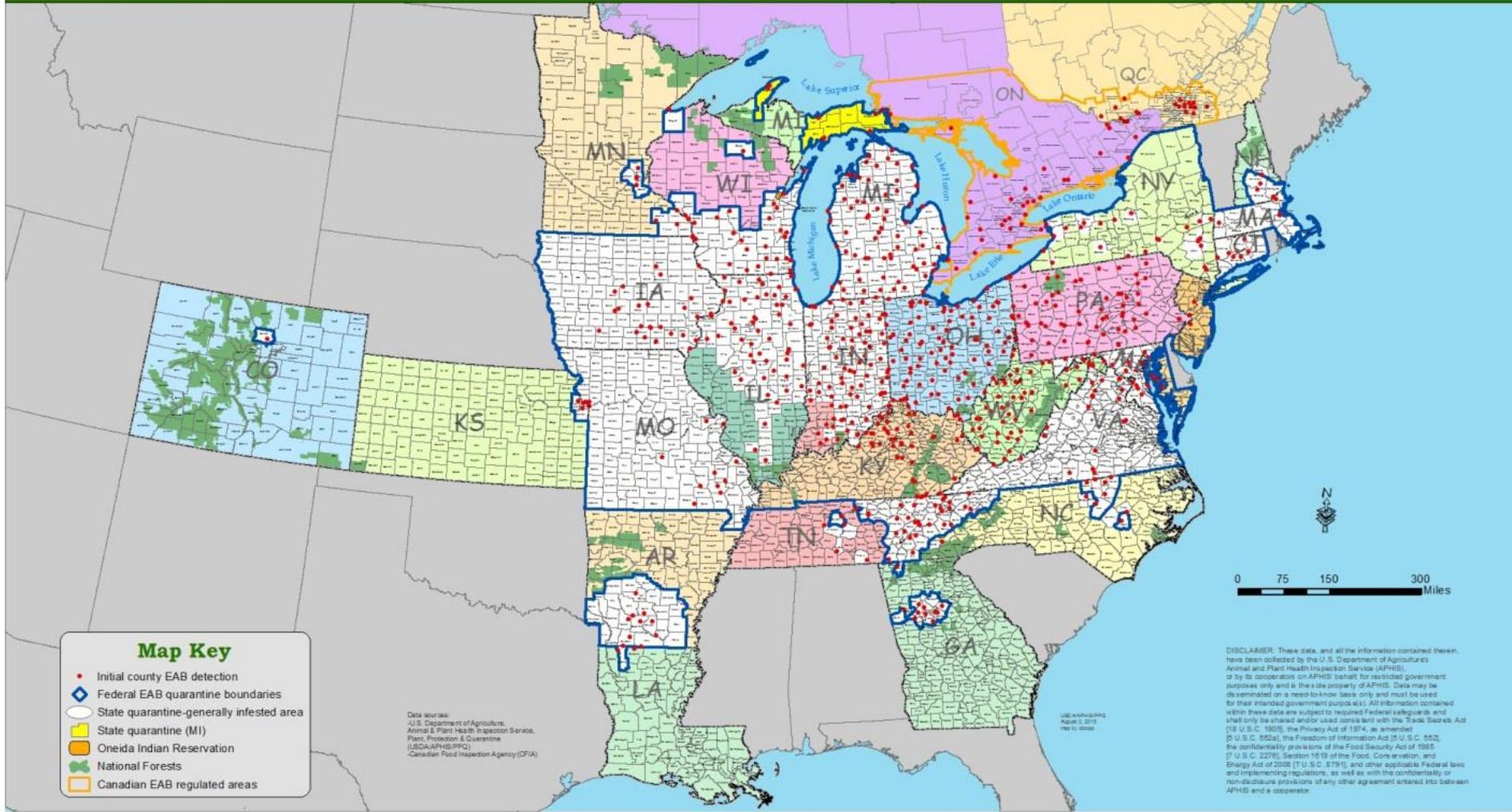


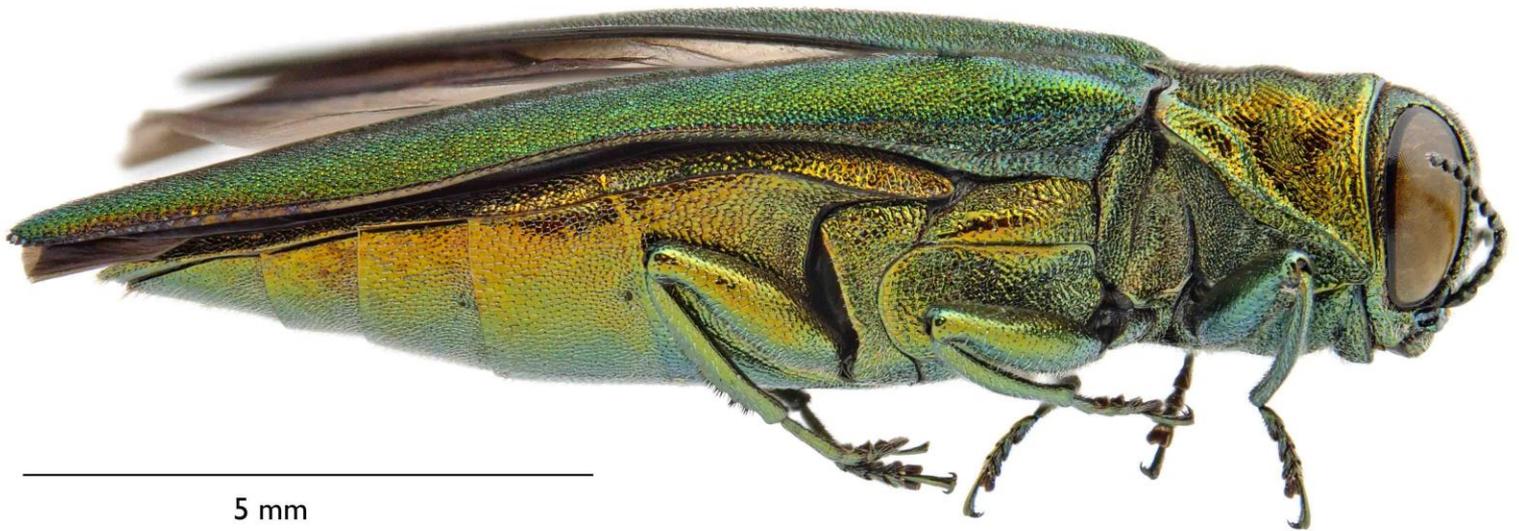
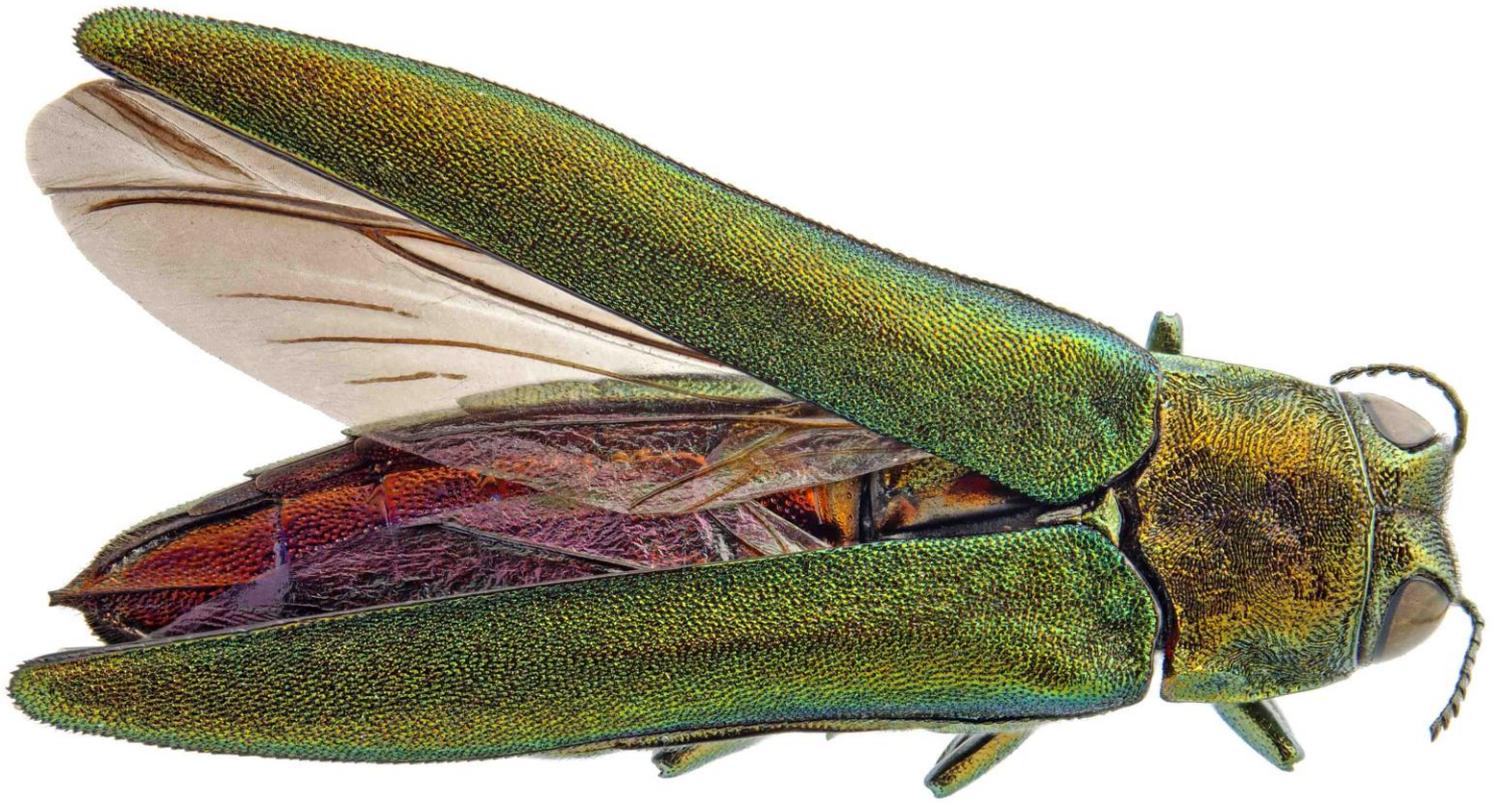
# Ash Trees



# Distribution of white and green ash in Vermont





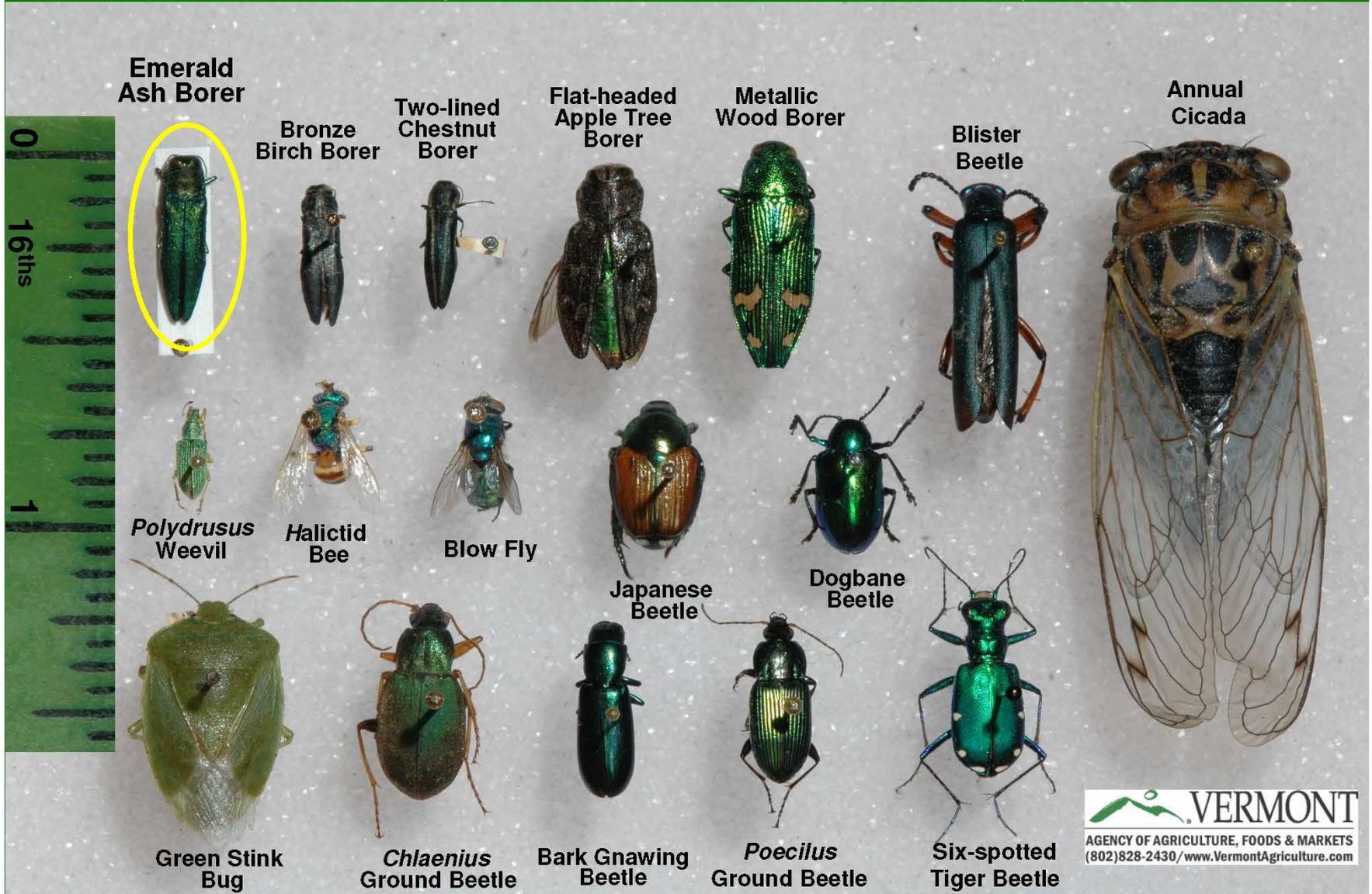


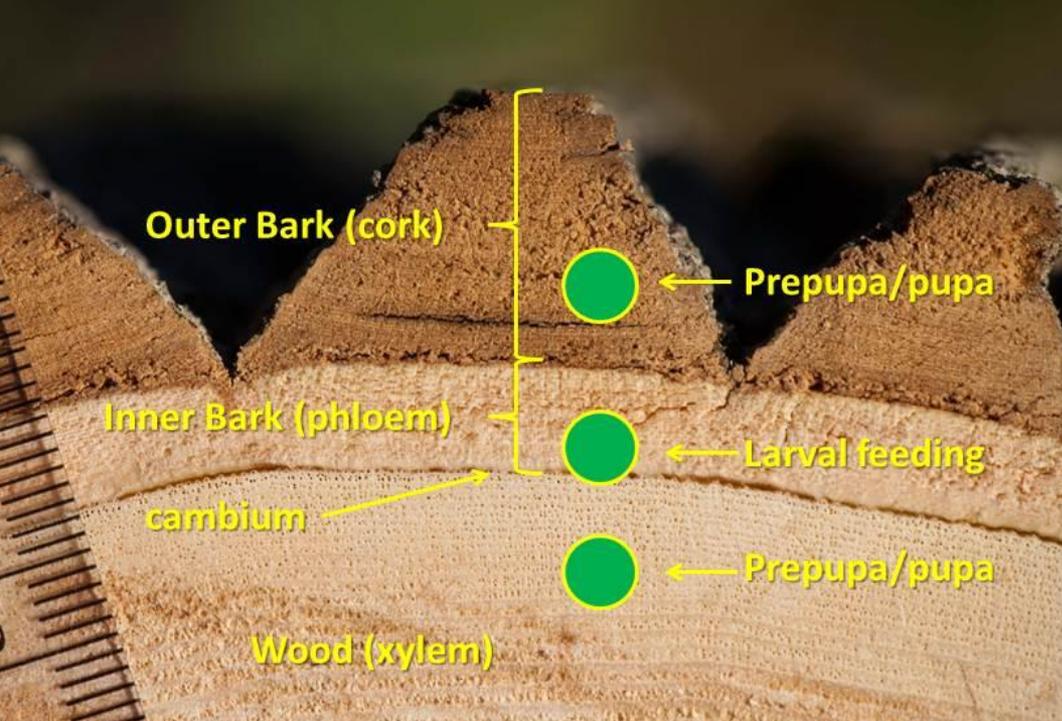
5 mm



# Insects in Vermont that may be confused with Emerald Ash Borer

Adapted from Jeff Hahn, University of Minnesota Extension and Val Cervenka Minnesota Dept. of Natural Resources







June/July  
Oviposition



Summer/Fall  
Larval growth



Winter  
Pre-pupae



Early spring  
Pupation



May/June  
Adult Emergence  
Ovary maturation



# 1-Year Life Cycle







# Bark splitting



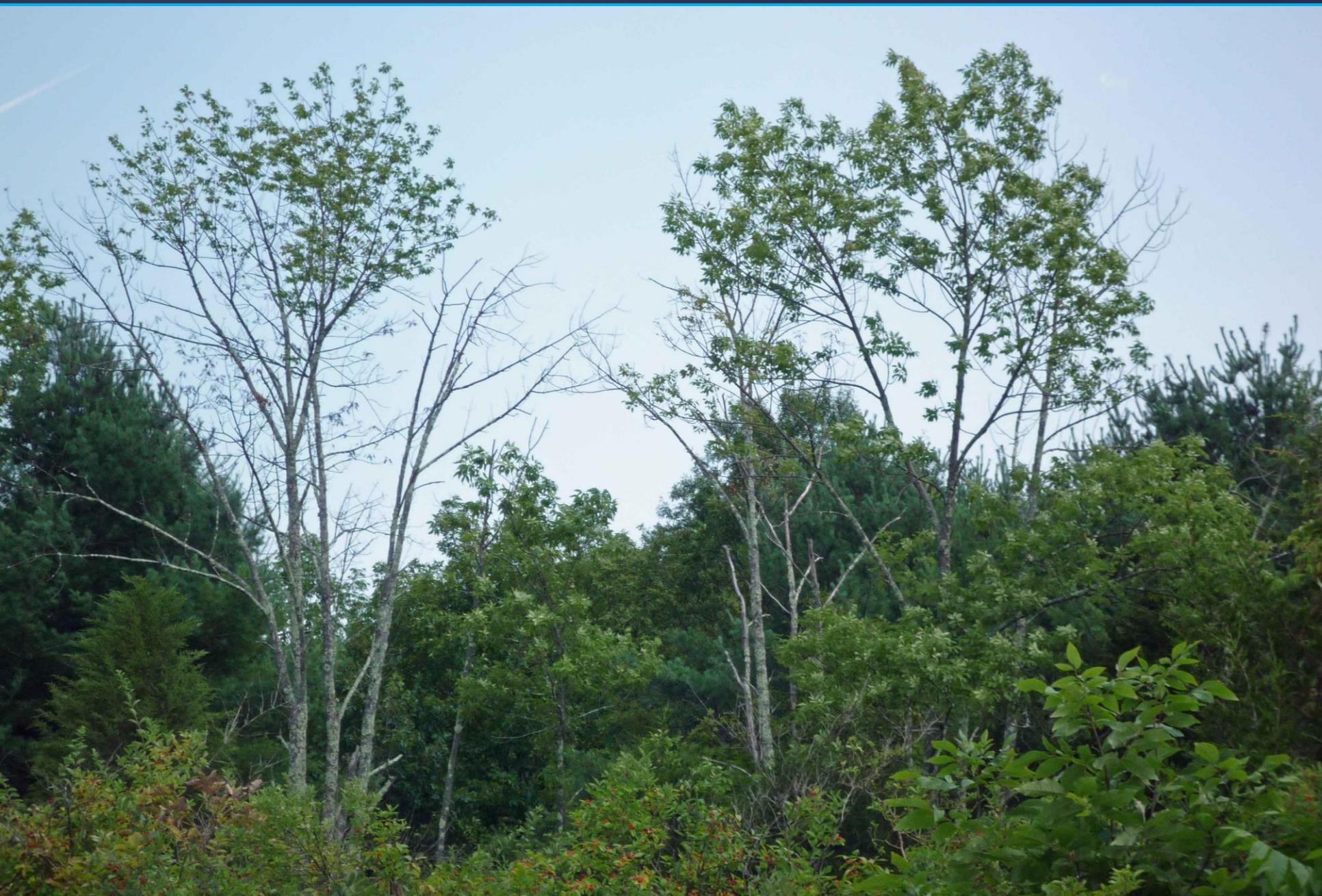
# Woodpecker flecking



# Epicormic, or water sprouts



# Canopy Thinning





## Thinking Snow?

Think Again - It's Hemlock Woolly Adelgid!

[Learn More](#)



## On the ground

### Jefferson Town Triangle

Town removes invasive barberry from landscaping

[Read more](#)

[Read all stories](#)



## Featured Invasive

### Multiflora rose invades old fields

Have an impenetrable thicket of multiflora rose? Learn how to treat it...

[Read more](#)

[Full gallery of invaders](#)

## REPORT IT:

[Plants](#)

[Pests](#)

## RESOURCES

[Sign up for e-news](#)

[Visit the Gallery of Invaders](#)

[Forest Pest First Detector Program](#)

[Invasive plant prevention & management resources](#)

[Media Center](#)

## EVENTS

February 27, 2015 - 10:00am

### The Vermont Flower Show

The 2015 Vermont Flower Show – "Spring Reflections" – will bring three days of spring to life to prepare us for the exciting season ahead!

March 25, 2015 - 10:00am

### Society of American Foresters 2015 Winter Meeting

Attend the NESAF Annual Meeting.

[See more events](#)

## LATEST NEWS



February 4, 2015

### UGA researchers unlock new way to clone hemlock trees able to fight off deadly pest

Athens, Ga. - For the first time, University of Georgia researchers have successfully cryogenically frozen germplasm from hemlock trees being wiped out across the eastern U.S. by an invasive insect. They've also unlocked a new way to...



January 30, 2015

### Finger Lakes Forest officials target tree pest

The government has a plan to combat the spread of a tree-killing insect in the Finger Lakes National Forest.

U.S. Sen. Charles Schumer said the U.S. Department of Agriculture wants to target the Hemlock Woolly Adelgid with...

[Read more news](#)

# What can we do?

- Know the pests
- Stop the spread, don't move firewood
- Look UP to look out for pests
- Develop a **PLAN**



*It's better to look ahead and prepare than to look back with regret.*

Jackie Joyner-Kersee

# Why Plan Ahead at a Municipal Level:



# More Management Options



# More utilization options









# Save Money

- Offset costs
- Coordinate with other towns
- 2-3x more expensive to remove dead trees



# The Vermont Planning Process

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- 1. Get a core team



# The Vermont Planning Process

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- 1. Get a core team
  - A few interested people
  - Planners/writers/innovators/leaders
  - Help is available: UVM Ext., VT FPR, FPFD



# The Vermont Planning Process

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- 1. Get a core team
- 2. Get town's blessing



# The Vermont Planning Process

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- 1. Get a core team
- 2. Get town's blessing
  - Inform them
  - Assure
  - Incentivize



# The Vermont Planning Process

---

- 1. Get a core team
- 2. Get town's blessing
- 3. Get preliminary information



# The Vermont Planning Process

---

- 1. Get a core team
- 2. Get town's blessing
- 3. Get preliminary information
  - How big is problem, what resources do we have
  - Documents
  - Tree inventory



# Inventory

An inventory will tell you:

- How many trees you have
- Condition of trees
- Identify any candidates to preserve using insecticides
- How to direct your management activities



# The Vermont Planning Process

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- 1. Get a core team
- 2. Get town's blessing
- 3. Get preliminary information
- 4. Get help
  - Workforce
  - Direct and delegate
  - Technical help available



# The Vermont Planning Process

---

- 1. Get a core team
- 2. Get town's blessing
- 3. Get preliminary information
- 4. Get help
- 5. Get planning



# The Vermont Planning Process

---

- 1. Get a core team
- 2. Get town's blessing
- 3. Get preliminary information
- 4. Get help
- 5. Get planning
  - Use the planning worksheet
  - Adapt to your town



# The Vermont Planning Process

---

- 1. Get a core team
- 2. Get town's blessing
- 3. Get preliminary information
- 4. Get help
- 5. Get planning



# Management options

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1. Removal
2. Removal and replacement
3. Insecticide treatment

## ◉ WHICH TREES?

- All publically owned ash
- All publically owned and some private ash that have direct impact on public property
- Only high risk ash trees



# Budget

- Tree removals
- Stump removals
- Wood disposal
- Insecticide treatments
- Tree replacement
- Tree maintenance



- TRE
- IMP
- TRE
- SPR
- EDU
- GET
- STO
- REP
- PEST
- FIRS

- IMPACT OF FOREST PESTS
- TREE PEST INVADERS
- SPREAD THE WORD
- EDUCATIONAL MATERIALS
- GET INVOLVED
- STOP THEIR SPREAD
- REPORT IT
- PEST REGULATIONS AND YOU
- FIRST DETECTORS
- INFORMATION FOR LANDOWNERS
- COMMUNITY PREPAREDNESS

INFORMATION FOR LANDOWNERS

COMMUNITY PREPAREDNESS ▾

[Prepare Your Community](#)

[Toolbox](#)

[Inventory Case Studies](#)

MKLEPACK

GROUPS

MY UNREAD

MY ACCOUNT

## Prepare Your Community

[View](#) [Edit](#) [Access control](#) [Clone](#) [Devel](#)

Non-native invasive forest pests, such as the emerald ash borer (EAB), Asian longhorn beetle (ALB) and hemlock woolly adelgid (HWA), know no boundaries. Their arrival does not just affect private landowners; these pests affect communities as well. Plan ahead to minimize the severity of impacts and establish a solid foundation for recovery. Watch an Across the Fence episode to learn about the benefits of ash trees, how the Emerald Ash Borer will impact your community and what the community of Montpelier is doing to prepare for its' arrival.



PREPARE YOUR COMMUNITY

TOOLBOX

INVENTORY CASE STUDIES

START PLANNING NOW!

**1. Educate yourself about the Invasive Forest Pests**—Visit the [Gallery of Invaders](#).

**2. Learn about developing a Forest Pest Preparedness Plan**—When forest pests such as EAB arrive in Vermont, this plan will guide your communities' response. Remember- what you do now to prepare will strongly impact what you'll be dealing with down the road. Read [Vermont Forest Pest Preparedness: Planning Overview](#).

# Contact

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[vtinvasives.org](http://vtinvasives.org)



# Thanks for Attending Our Session!

## Questions?

Mollie Klepack, UVM Ext



Elizabeth Spinney, VT FPR

