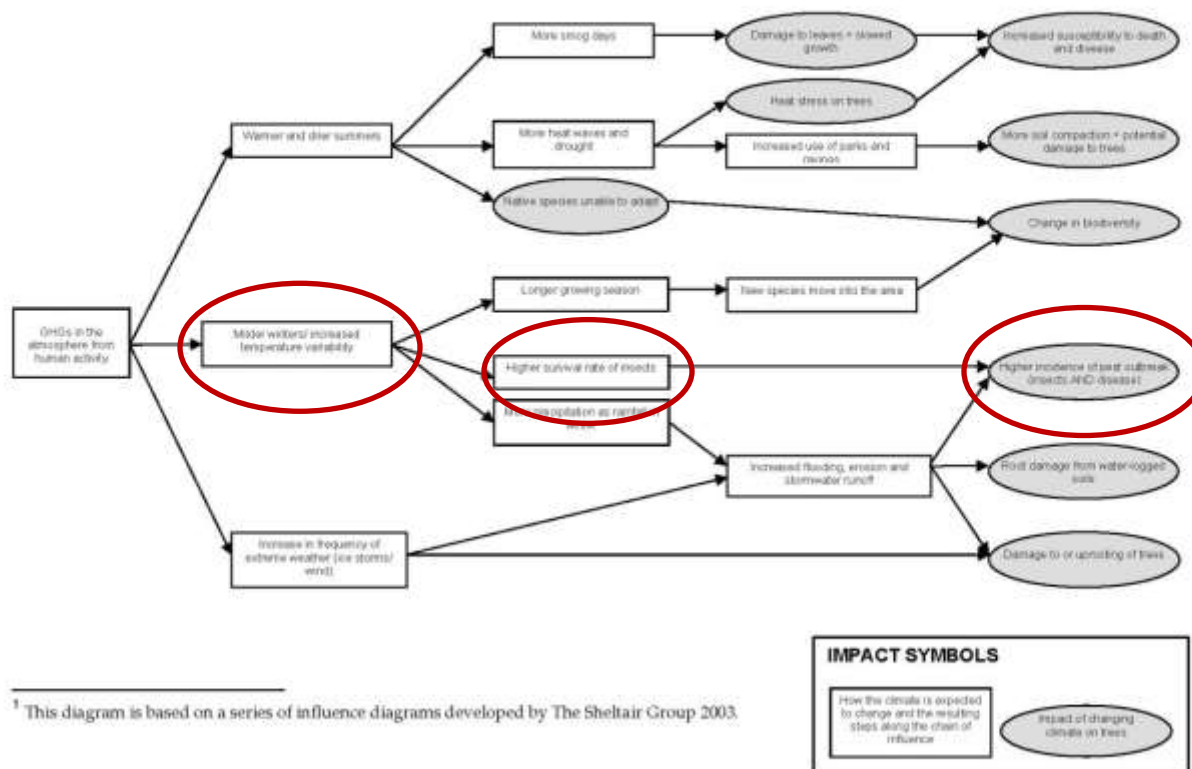


Preparing Vermont's 251 Communities for the Emerald Ash Borer (EAB)

Caitlin Cusack

University of Vermont Extension

FIGURE 1: SUMMARY OF LIKELY CLIMATE CHANGE IMPACTS ON THE URBAN FOREST IN THE CITY OF TORONTO¹

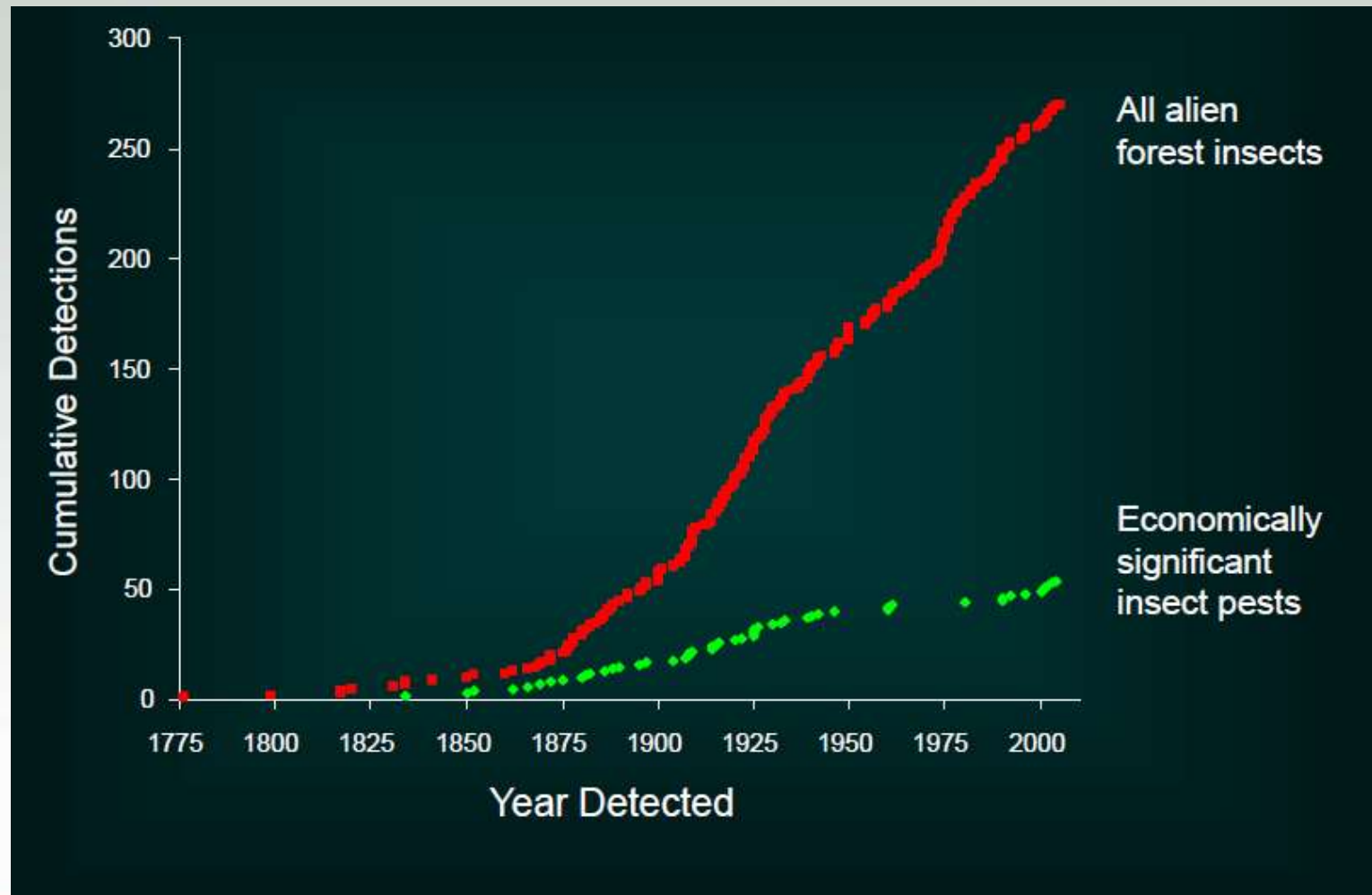


¹ This diagram is based on a series of influence diagrams developed by The Sheltair Group 2003.

What is an Invasive Species?

- 1) non-native (or alien) to the ecosystem under consideration and
- 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Non-native Forest Insects Established in the U.S. Over Time



*Hemlock
woolly
adelgid*



*Asian
longhorned
beetle*



*Emerald ash
borer*



Emerald Ash Borer

Agrilus plannipennis



Marianne Prue, Ohio Department of Natural Resources - Division of Forestry,
Bugwood.org



Photo credit: Emilie Inoue, VT Agency of Agriculture

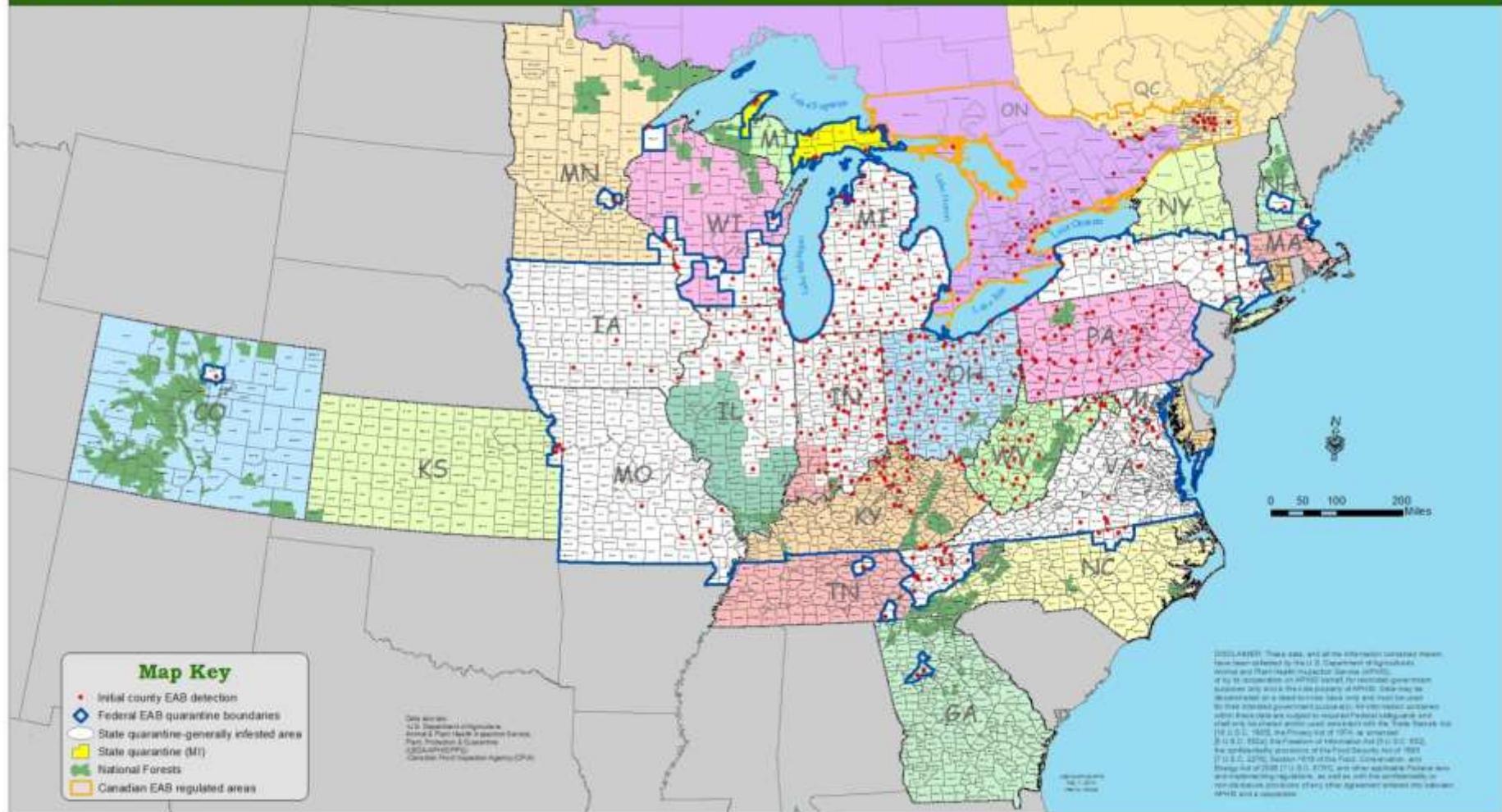


United States
Department of
Agriculture

Cooperative Emerald Ash Borer Project

Initial county EAB detections in North America

May 1, 2014



BEFORE

AFTER



Photo Credit: Dan Herms, Ohio State University



Urban Trees

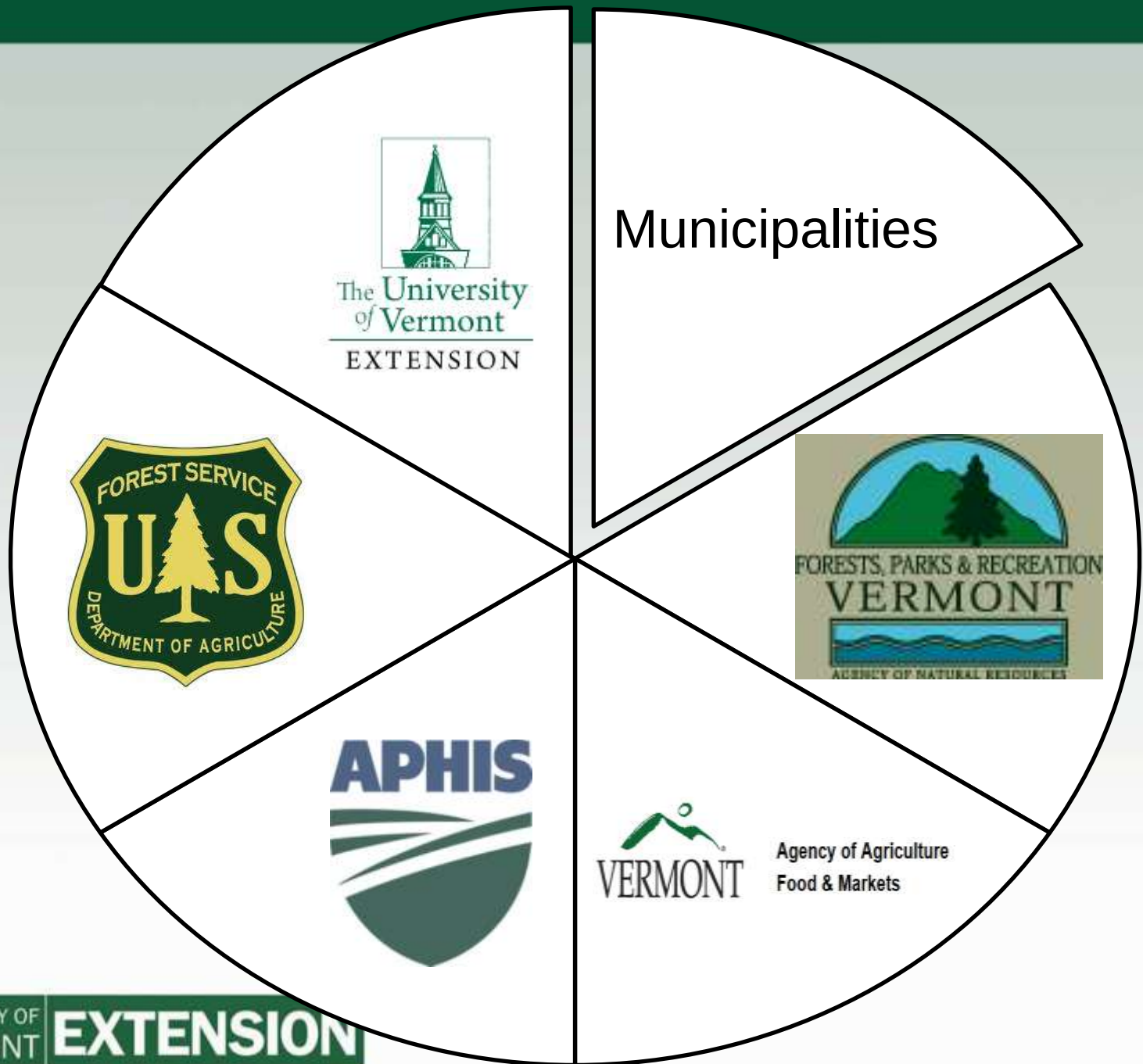


Roadside Trees

Photo credit: Lee Krohn

- Remove & replace 1,000 trees in Burlington ROW = **\$0.5million**
- Remove 440 trees along Johnson's back roads = **\$132,000**





Economic Impacts of Non-Native Forest Insects in the Continental United States

Juliann E. Aukema^{1*}, Brian Leung^{2,3}, Kent Kovacs⁴, Corey Chivers², Kerry O. Britton⁵, Jeffrey Englin⁶, Susan J. Frankel⁷, Robert G. Haight⁸, Thomas P. Holmes⁹, Andrew M. Liebhold¹⁰, Deborah G. McCullough¹¹, Betsy Von Holle¹²

¹The National Center for Ecological Analysis and Synthesis, Santa Barbara, California, United States of America, ²Department of Biology, McGill University, Montreal, Quebec, Canada, ³School of Environment, McGill University, Montreal, Quebec, Canada, ⁴Department of Applied Economics and Institute on the Environment, University of Minnesota, St. Paul, Minnesota, United States of America, ⁵U.S. Forest Service, Research and Development, Arlington, Virginia, United States of America, ⁶Marsson

Published September 9, 2011

Excerpts from the study:

- “We found that costs are largely borne by homeowners and municipal governments.”
- “Wood- and phloem boring insects are anticipated to cause the largest economic impacts by annually inducing nearly \$1.7 billion in local government expenditures and approximately \$830 million in lost residential property values.”

Vermont Pre-detection Strategy

Surveys



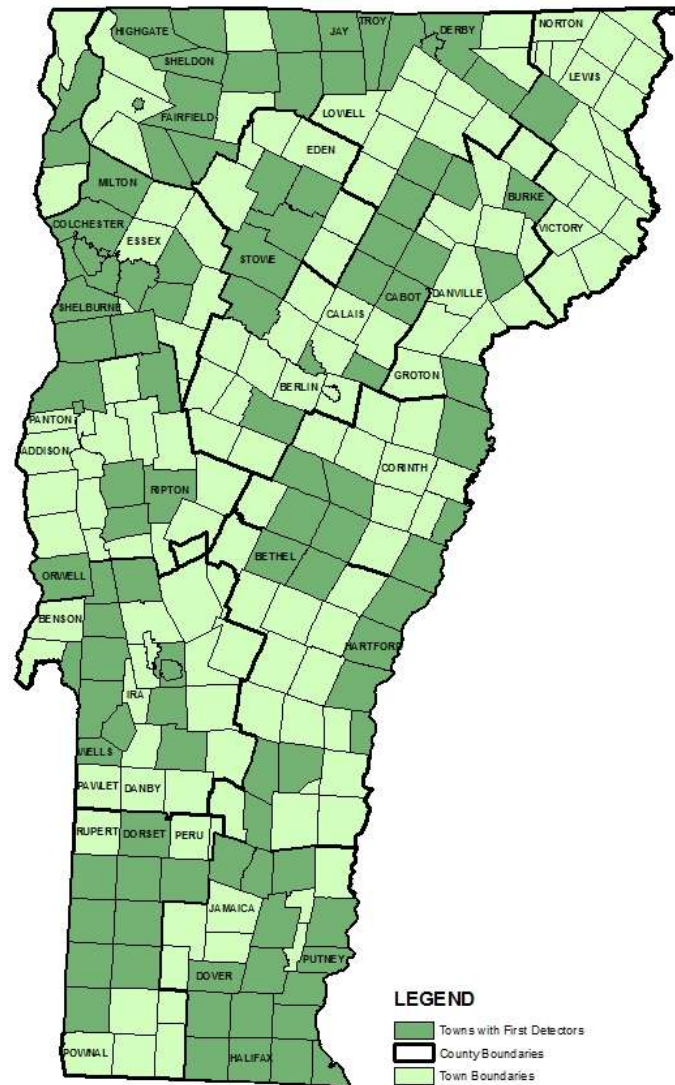
Prevention



Outreach & Education



Preparedness



Vermont Forest Pest First Detector Network
July 2013

0 3.75 7.5 15 22.5 30
Miles

Map updated by Caitlin Cusack, July 3, 2013

Online, classroom, field training and trips provided



Outreach

Screening



**Preparedness
Planning**

UNIVERSITY OF MONTPELIER
**EMERALD ASH BORER
PREPAREDNESS PLAN**

Surveying

VERSION 1.0
Summer, 2013

- How many trees are at risk to EAB?
- Who owns them?
- Whose responsibility is it to treat or remove potentially hazardous ash trees?
- Will you treat or remove your community's trees?

CITY OF MONTPELIER

EMERALD ASH BORER PREPAREDNESS PLAN

VERSION 1.0

Summer, 2013

Can you afford to
manage them?

Can you afford not to?

EAB Preparedness Plan

Key Components

Executive summary

Summary of community tree assessment

Management recommendations, preparations and actions for:

- Insecticide Treatment of Historic/Significant Trees
- Tree removals on public and private property
- Wood utilization and disposal
- Planting and restoration
- Forest pest monitoring and reporting

Assessment of resource needs

Planning templates

VERMONT FOREST PEST PLANNING WORKSHEET

This planning worksheet will help your community identify the policies, resources, and actions needed to respond to invasive forest pests such as the Emerald Ash Borer (EAB). By preparing for forest pests, your community can minimize the impact of forest pests and reduce the risk of spreading them. We recommend that all Vermont communities plan for EAB. Some will want to plan for HWA as well.

You may not have answers for all questions posed in this worksheet because of community. Instructions and background information are provided in black text considerations for your community to fill in are in red. In numerous cases you a Resource Toolbox. This online toolbox is available at <http://www.vtinvasives.org/preparedness/toolbox> and provides background information, links and other resources.

This planning worksheet will guide you through the following checklist for developing a forest pest management plan.

Action	Lead person
☐ A. <u>Identify key stakeholders and develop a resource list.</u>	
☐ B. <u>Convene an initial pest planning informational meeting.</u>	
☐ C. <u>Form a pest planning team.</u>	
☐ D. <u>Gather town documents & information.</u>	
☐ E. <u>Assess your community tree resource.</u>	
☐ F. <u>Define the purpose of developing a community preparedness plan.</u>	
☐ G. <u>Identify priority trees.</u>	
☐ H. <u>Monitor forest pests.</u>	
☐ I. <u>Plan for tree protection and removal.</u>	
☐ J. <u>Determine how infested wood will be disposed of & utilized.</u>	
☐ K. <u>Plan recovery efforts.</u>	
☐ L. <u>Evaluate your community's public policies.</u>	
☐ M. <u>Estimate costs.</u>	
☐ N. <u>Develop a plan for educating and communicating with community members.</u>	
☐ O. <u>Summarize your policies, resources and next steps.</u>	
☐ P. <u>Preparedness Plan Outline</u>	
☐ Q. <u>Definitions</u>	

Some communities may choose to simply use this completed worksheet as their others may choose to use this worksheet to organize information but prefer to which a suggested outline is provided at the end of this document. The preparedness should be a working document and will need to be updated as new information management strategies, pest spread and available resources.

VTinvasives.org

Last updated 2/28/13

Tree policy templates

VERMONT URBAN & COMMUNITY FORESTRY PROGRAM

TREE ORDINANCES and POLICIES



What is a tree ordinance?

A tree ordinance is a municipal regulatory tool used by communities to attain and support healthy, vigorous, and well-managed urban & community forests. A municipality's tree ordinance reflects the goals and perspectives of the community, and should be based on local management goals, needs, and capacity.

What are the benefits of a tree ordinance?

- A tree ordinance provides the opportunity for a municipality to:
 - Identify roles and responsibilities;
 - Protect the town from liability;
 - Define language locally, such as what qualifies as a public shade tree;
 - Establish and prioritize procedures for tree plantings, removals, and protection;
 - Establish procedures for the prevention and control of damage from forest pests;
 - Demonstrate a town's commitment to its community forest; and
 - Become eligible for the Tree City USA designation through the Arbor Day Foundation.

What's the difference between a tree policy and a tree ordinance?

But aren't municipalities already covered under the Vermont Tree Warden Statutes?

Under the Vermont Tree Warden Statutes enacted in 1994, each municipality shall, upon petition from among the town's legally qualified voters (24 V.S.A. § 871). The tree warden, among other duties, shall enforce all laws relating to public shade trees and may prescribe such rules and regulations for protection, care or removal of public shade trees as he deems expedient... (Amended 1998, 2000, 2001, § 4)

Vermont's Tree Warden Statutes provide a mechanism for public tree management. However, the scope and lack of specificity including defining key terms such as what is a public shade tree ordinance allows a community to develop local regulations that meet its needs and help it protect, manage, and grow its urban forest.

Building on the Vermont Tree Warden Statutes



The town of Brattleboro included in their initial public shade tree ordinance both the local and the size of a tree - in rural areas at least 9 inches in diameter and in the downtown only need to be 2 inches in diameter. This allows tree regulatory processes differently across the town of definition for both a public shade tree and rural.

In the town of Hartford's tree policy, they not only define: street tree, park tree, hazard tree, and private tree. By defining these under which a tree could be removed when it interferes with the flow of traffic and visibility, the policy reduces the circumstances under which a

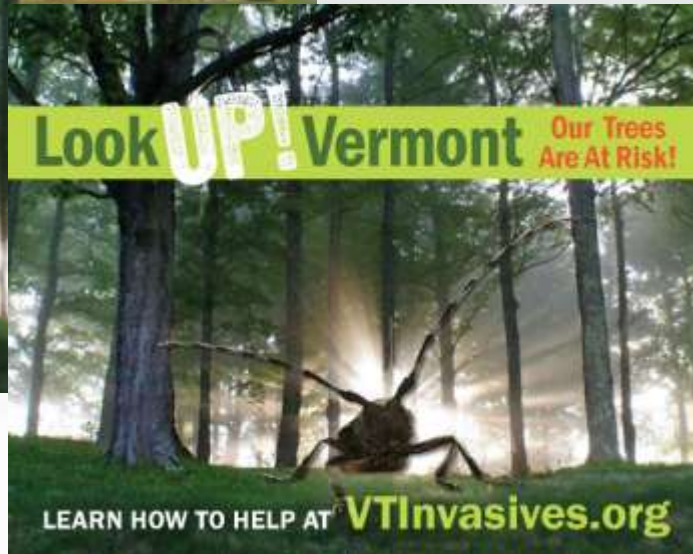
Resource toolbox

The screenshot shows the 'Vermont Invasives' website with a navigation bar including links for HOME, TREE PESTS, PLANTS, OTHER INVASIVES, TAKE ACTION, ABOUT US, NEWS, and EVENTS. The main content area is titled 'Vermont Forest Pest Preparedness: Community Resource Toolbox'. It includes a section for 'TREE PESTS' with links to IMPACT OF FOREST PESTS, TREE PEST MONITORING, STOP THE SPREAD, UPGRADE THE WARDEN, GET INVOLVED, REPORT IT, PEST REGULATIONS AND POLICIES, ARREST DETECTORS, INFORMATION FOR LANDOWNERS, and COMMUNITY PREPAREDNESS. The 'COMMUNITY PREPAREDNESS' section is expanded, showing links to Assess Your Community, Tree Policy, and EAB Plan Outline. The main text describes the toolbox as a resource for communities to develop a forest pest preparedness and response plan, and lists various resources available, including Vermont Department of Forests Parks and Recreation (DPFR) staff surveys, Vermont Agency of Agriculture, Food & Markets (VAFM) staff surveys, and University of Vermont (UVM) research and education resources.

Education and outreach materials



Over half of Vermont's trees, including sugar maples, could be lost to tree killing pests.



\$500 EAB incentive

VERMONT EAB PREPAREDNESS PLAN INCENTIVE PROGRAM
Attn: Caitlin Cusack
655 Spear St, Burlington, VT 05405
caitlin.cusack@uvm.edu
802-656-7746

Participant Agreement

Municipality Name: Town of Fairfax
Contact Person: Stacy Wells Phone: 802/849-6111 x7
Mailing Address: P.O. Box 27
Town, State, Zip: Fairfax, VT 05454
Email Address: fairfaxselectboard@yahoo.com
Website: FAIRFAX-VT.gov
Federal Tax ID #: 03-1438310

1. I agree to carry out the "EAB Preparedness Plan Incentive" project described in the attached application.
2. I understand that funds cannot be used for anything other than what is specifically described in my application without prior written approval from the Vermont Urban and Community Forestry Program (UCF).
3. I agree to submit a written EAB Preparedness Plan (following the format in the Vermont Forest Pest Planning Worksheet) by November 1, 2013. If the project is not completed, I will file a progress report and request an extension by that date.
4. I agree to respond after the project is completed to requests from the UCF Program for follow-up information about how the EAB preparedness plan developed with this agreement is being implemented in my community.
5. I agree to list the Vermont Urban and Community Forestry Program as a sponsor/supporter of this project on any flyers, program materials, and new releases, emails and website pages I issue in connection with the project, and in any presentations I make about the project.



Technical assistance

VERMONT INVASIVES

Actively Conserving our Environment

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

NEWS

[SUBMIT NEWS](#)

[NEWSLETTER](#)

First Detector finds hemlock woolly adelgid in Marlboro, VT

February 13, 2012

ALERT



A volunteer with Vermont's Forest Pest First Detector Program has discovered a new infestation of hemlock woolly adelgid (HWA) in Marlboro, VT; a town previously thought to be free of this tiny insect that is responsible for the death of thousands of acres of hemlocks across the eastern U.S. While this may seem like horrible news, if we detect HWA early, when it is still in isolated pockets, it gives Vermont a better chance of controlling it and limiting its' spread. To date HWA is still confined to Windham County. Hemlock products from Windham County are subject to quarantines. Vermont facilities may freely receive hemlock logs, pulpwood, or chips as long as the site has a compliance agreement. For more information on Vermont's quarantine rules go to

<http://www.vtfpr.org/protection/hwawoodproductconsiderations.cfm>.

Thank you to the volunteers who are scouring the woods in search of HWA. To join their efforts in looking for HWA contact Jim Esden at Jim.Esden@state.vt.us or (802) 777-1591. To learn more about becoming a First Detector go to <http://www.vtinvasives.org/tree-pests/first-detectors/program> or contact Caitlin Cusack at caitlin.cusack@uvm.edu or (802) 223-2389.

Related Species:

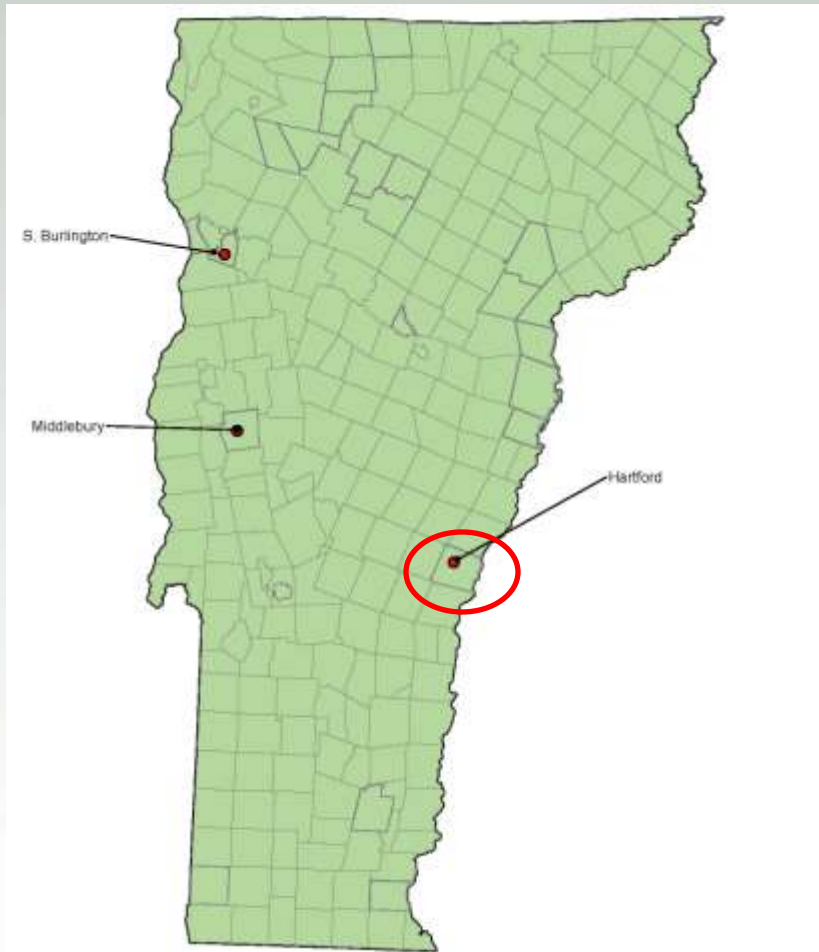
[Hemlock Woolly Adelgid \(*Adelges tsugae*\)](#)

Planning Process



Step 1: Form a local pest planning team

Hartford, Population 10,000



“We needed to understand the scope of the problem before making recommendations.”

Brad Goedkeep, Hartford Tree Warden

Step 2: Convene a pest planning information meeting



Step 3: Brief your decision makers



Step 4: Assess your community tree resource



Ash Tree Inventory

Village (WRJ, Wilder, Hartford, Quechee, West Hartford) ash trees total 63 trees

tree size DBH	1-6"	6-12"	12-18"	18+"
ash (all reported in good condition)	26	22	6	9
none reported as utility conflict, survey did not assess road hazard potential				

Roadside/ROW ash trees total 1778

ash in poor condition (196 trees)

tree size DBH (diameter at breast height)	1-6"	6-12"	12-18"	18+"
road hazard * total 80 trees	11	45	16	8
utility hazard** total 116 trees	12	65	27	12

ash in average condition (284 trees)

tree size DBH	1-6"	6-12"	12-18"	18+"
road hazard* 145 trees	33	54	45	13
utility hazard** 139 trees	12	78	33	16

ash in good condition (1298 trees)

tree size DBH	1-6"	6-12"	12-18"	18+"
road hazard* 658 trees	137	266	196	59
utility hazard** 640 trees	69	337	161	73

* trees presenting a road hazard alone

** tree presenting both a hazard to road and utility lines

(there were virtually no trees presenting a hazard to utility lines alone)

These trees provide residents roughly **\$241,171** annually in environmental benefits; their death has significant economic, environmental, social and legal ramifications.

Step 5: Assess your community's level of preparedness & prioritize action steps

Estimate costs

- Remove & replace 63 village ash trees =
\$105,000
- Remove large roadside ash trees=
\$330,000



Prioritize different management, utilization and disposal options

Prioritized removal:

High priority—street trees in densely settled/high use areas, village centers & along emergency routes, prominent shade/ornamental trees in parks/other town recreation areas

Medium priority—Private trees that impact town land/ROW, back roads trees in public ROW

Low priority—trees in public wooded/natural areas, other private trees

Preservation of high-value trees:

Trees to be identified, started research on potential organic and non-organic insecticide options



Plan for recovery and resilience

Species	No. village trees (% total)
E. White Pine	246 (18%)
N. Red Oak	209 (16%)
Norway Maple	123 (9%)

Genera	% total
Acer	23%
Pinus	18%
Quercus	17%
Fraxinus	5%

Identify policies/protocols

By **OSHA regulations** hazard trees within a 10' radius of powerlines can only be removed by utility company arborists . Currently of the 196 ash trees in poor condition along back roads, 116 are within 10' of powerlines

Town is liable for hazardous trees that threaten public property or town ROW, which also includes private trees.

VT's Tree Warden Statutes

Hartford's Comprehensive Tree Policy

Assess current capacity & resources needed

Equipment



Funding



Labor



Step 6: Formalize the forest pest preparedness plan and have it officially adopted by the town decision makers

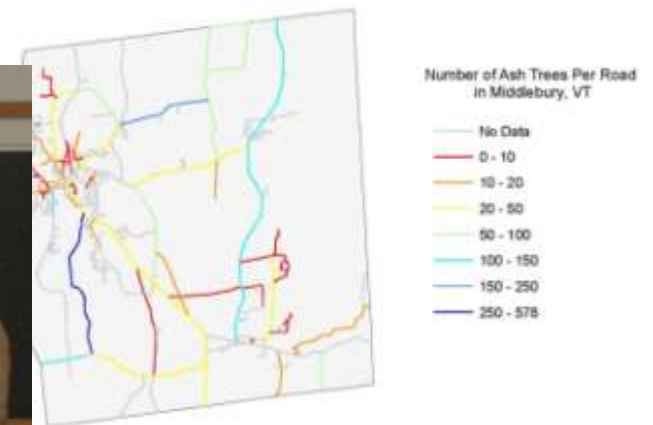
- *Of the approximately 1841 total ash trees in Hartford, 196 are in ROW and in poor condition. **80 of these trees jeopardize roads alone and 116 trees jeopardize both roads and utility lines.... these trees warrant removal as soon as resources allow** by the responsible parties - either the Town or the Utility companies respectively.*
- *The Tree Board, Tree Warden, Parks and Recreation Department will plan a recovery planting strategy to identify resources to replace ash in important public spaces with mixed species not threatened by invasive pests or pathogens.*
- *In time, perhaps a period of 10 years, **approximately 779 trees will jeopardize utility lines** as the EAB establishes itself. The town should **notify utility officials** of this eventuality.*

Lessons Learned

Students are a great catalyst and boots on the ground



The Local Forest: Evaluating Ash Trees in Middlebury, VT



Lessons Learned

Rapid assessment (collect minimum data to determine costs & management)

**Collected data on
diameter, health and
location for 627 ash
street trees in
residential
neighborhoods**



**Data used by City
Arborist to develop
EAB plan**



Maintain realistic expectations on volunteer roles



Education and outreach needs to happen at all stages of plan development



Lessons Learned

Volunteer First Detectors and local tree champions are the critical factor



VT Volunteer Tree Steward Group of the Year!



Vermont Tree Steward Unsung Hero!

Never doubt that a small group of thoughtful committed citizens can change the world. Indeed, it's the only thing that ever has.

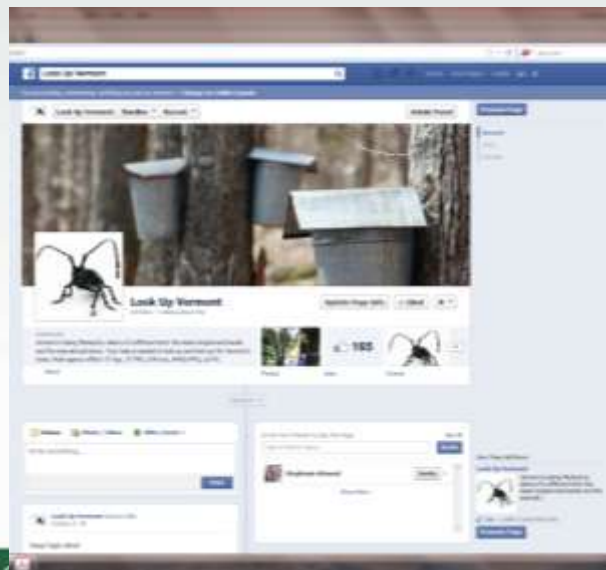
-Margaret Mead

Keep up-to-date



VTinvasives e-news

<http://www.vtinvasives.org/news/e-newsletter-sign>



Look Up Vermont

Caitlin Cusack

UVM Extension

655 Spear St

Burlington, VT

caitlin.cusack@uvm.edu

802-656-7746

VTinvasives.org

