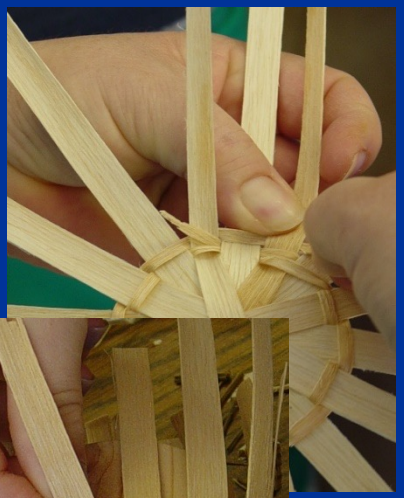
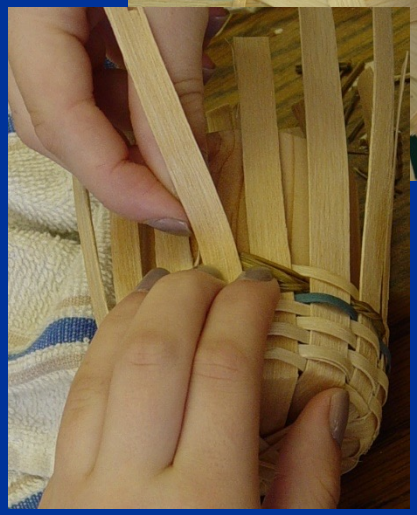
# Building a community of interest and response to an invasive species threatening Maine's ash trees and Wabanaki cultural lifeways

**John Daigle**
Citizen of Penobscot Nation

**University of Maine**
School of Forest Resources





Mitchell Center Talk Series

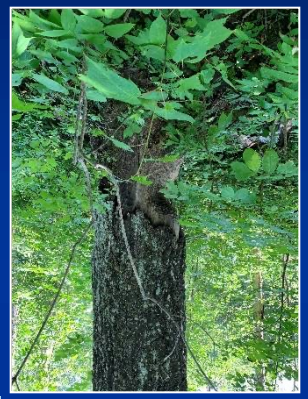
April 11, 2022

# A life-long connection to basketmakers and Wabanaki cultural lifeways


# Tribal elder Richard Silliboy

- https://emergencemagazine.org/film/richard-silliboy/

# The Significance of Ash Trees



The Cultural Significance:

- Basketry a Cultural Lifeway and a Source of Economic Income
- Referenced in the Wabanaki Creation Story
- Woven into the cultural identity of the Wabanaki People

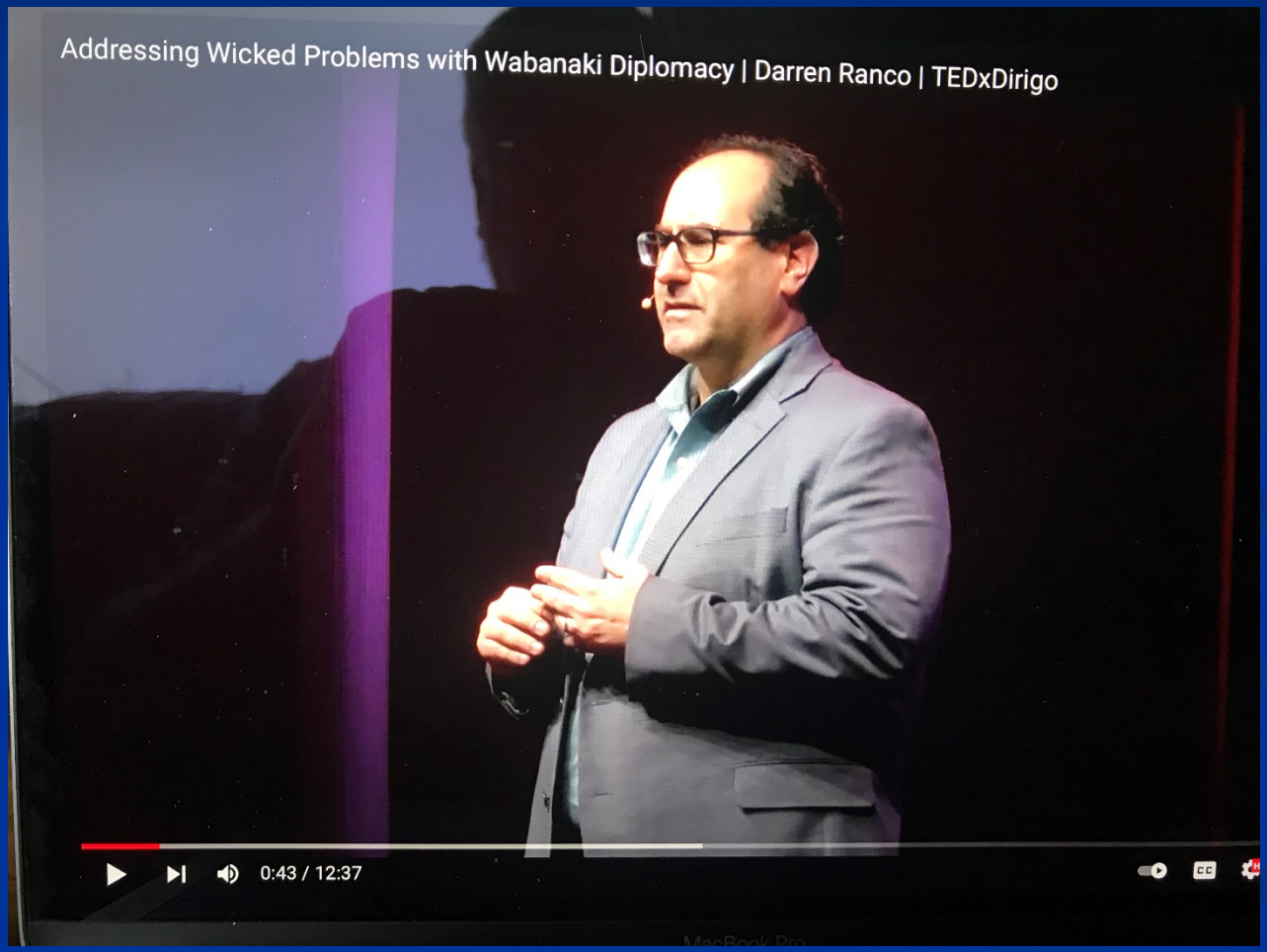
The Ecological Significance:

- Support a range of flora and fauna
- High nutrient leaf litter
- Regulate hydrology
- Carbon sequestration and storage

The Economic Significance:

- Important shade trees in urban settings
- Valuable Timber Species
- Income from basket sales

# Emerald Ash Borer is a “wicked problem”

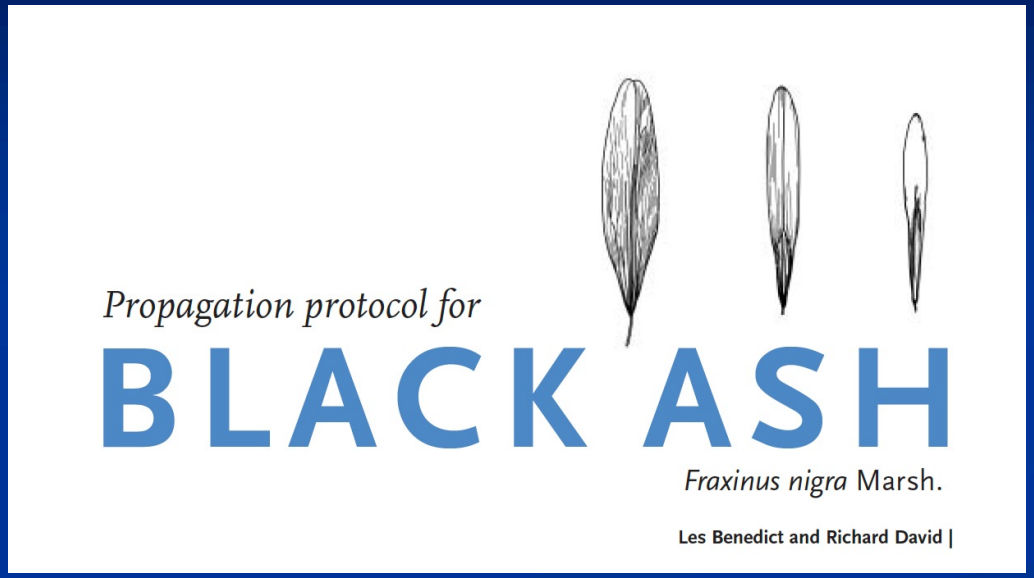


# How do we respond and adapt to a future with diminishing ash resources?



# Meeting in Michigan

# Meeting in New York




Akwesasne Mohawk Territory
Emerald Ash Borer Community
Response Plan

Final

Akwesasne Task Force on the Environment (ATFE), Saint. Regis Mohawk Tribe, USDA-APHIS PPQ

# Meetings and research colloquium on black ash in Maine

REVIEW ARTICLE

*J. For.* ●(●):000–000
https://dx.doi.org/10.5849/jof.2016-034R1


forest ecology

## The Precarious State of a Cultural Keystone Species: Tribal and Biological Assessments of the Role and Future of Black Ash

**Kara K.L. Costanza, William H. Livingston, Daniel M. Kashian, Robert A. Slesak, Jacques C. Tardif, Jeffrey P. Dech, Allaire K. Diamond, John J. Daigle, Darren J. Ranco, Jennifer S. Neptune, Les Benedict, Shawn R. Fraver, Michael Reinikainen, and Nathan W. Siegert**

**Black ash (*Fraxinus nigra* Marsh.) plays a central role in several Native American teachings (including a Wabanaki creation story) and has long been used for basketry, yet relatively little is known about the species' ecology. The recent and ongoing invasion of emerald ash borer (*Agrilus planipennis* Fairmaire), an invasive beetle killing millions of ash trees in eastern North America, threatens the future of black ash and the centuries-old basketry tradition. In recognition of the precarious state of this cultural keystone species, basketmakers, basket-tree harvesters, and researchers assembled to discuss traditional ecological knowledge and research advancements related to black ash. Here we provide an overview of basket-quality ash, synthesize current knowledge of black ash biology and ecology, and report findings from this successful tribal and scientific collaboration. Management recommendations were developed and future research needs outlined in hopes of sustaining an ecologically important tree species and maintaining a Native American tradition that has cultural and spiritual significance.**

**Keywords:** *Agrilus planipennis*, emerald ash borer, *Fraxinus nigra*, basketry, invasive forest pest, traditional ecological knowledge

Black ash (*Fraxinus nigra* Marsh.) is a unique and significant tree species from ecological, economic, and cultural perspectives. The species occupies a particular ecological niche in forested wetlands where few other woody plants thrive. Ecosystems containing black ash stands also play an important role in supporting other unique species, including flooded jellyskin (*Leptogium rivulare* [Ach.] Mont.), a threatened arboreal lichen that preferentially occurs on the basal bark of mature black ash (Lee 2004). In addition, Native American and European American basketmakers derive socioeconomic benefit

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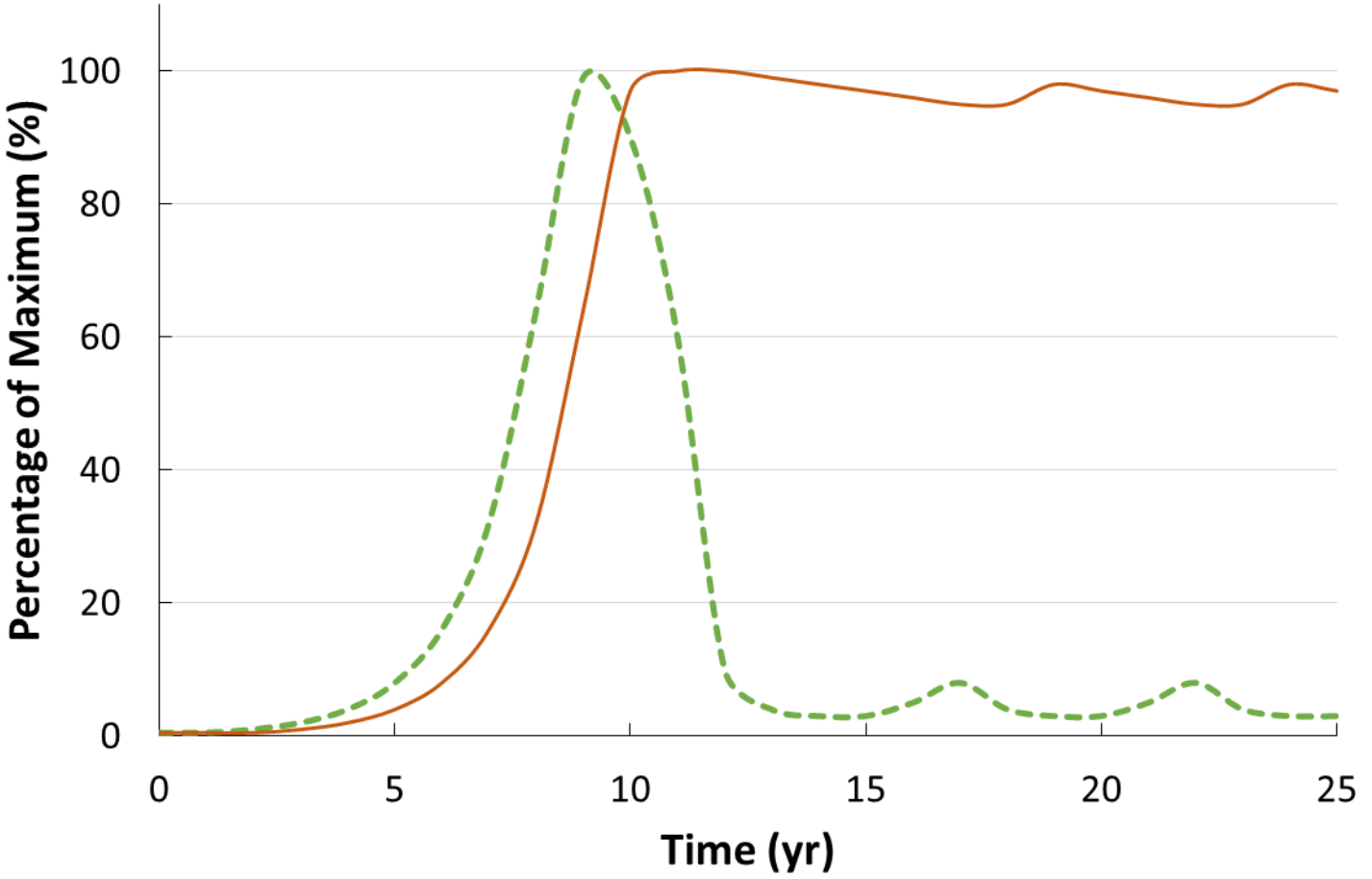
*Acknowledgments: We appreciate the traditional ecological knowledge regarding black ash basketry and basket-quality ash that was generously shared by Gabriel Frey (Passamaquoddy Tribe, Indian Township), Jeremy Frey (Passamaquoddy Tribe, Indian Township), Elden Hanning (Micmac Tribe), Frank Hanning (Micmac Tribe), Gerald "Butch" Jacobs (Passamaquoddy Tribe, Pleasant Point), Peter Neptune (Passamaquoddy Tribe, Pleasant Point), Richard Silliboy (Micmac Tribe), Fred Tomah (Maliseet Tribe), and Richard David (Saint Regis Mohawk Tribe). Photos were taken by Sheridan Adams and Knife Edge Productions, Nathan W. Siegert, and Kara K.L. Costanza. This work was supported by the USDA Forest Service, Northeastern Area State and Private Forestry, Forest Health Protection, and by the National Science Foundation (Award EPS-0904155 to Maine EPSCoR at the University of Maine), and by the USDA National Institute of Food and Agriculture, McIntire–Stennis project number #ME0-M-8-00501-12 through the Maine Agricultural and Forest Experiment Station. Maine Agricultural and Forest Experiment Station Publication Number XXXX.*

# EAB Invasion Wave




EAB density

Ash mortality

| Cusp | Crest | Post Crest |
|---|---|---|

# Susceptibility of Eastern North American Ash Species

black ash > green ash > pumpkin ash > white ash > blue ash

Most Preferred

Least Preferred

An estimated 1% of ash may exhibit greater levels of potential tolerance to emerald ash borer.

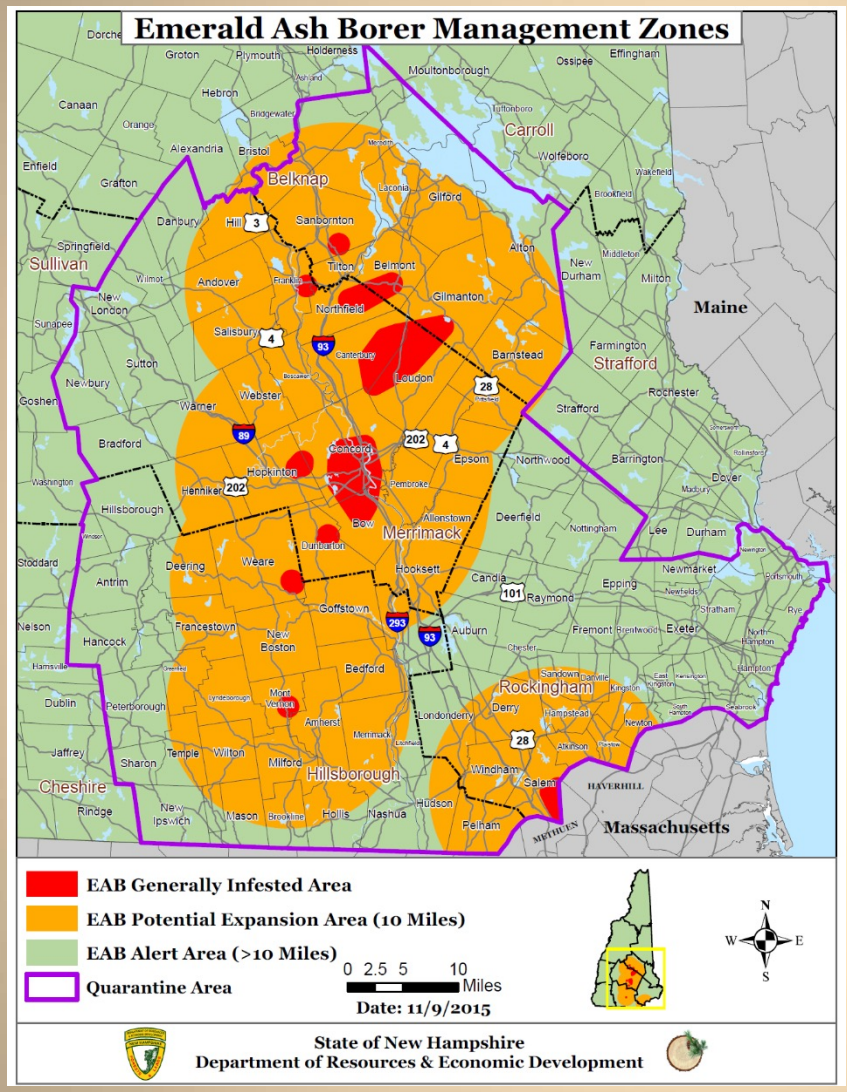
# Research colloquium meeting in Vermont

# TEN
# RECOMMENDATIONS FOR MANAGING ASH
# IN THE FACE OF EMERALD ASH BORER AND CLIMATE CHANGE

Forest Stewards Guild
putting the forest first

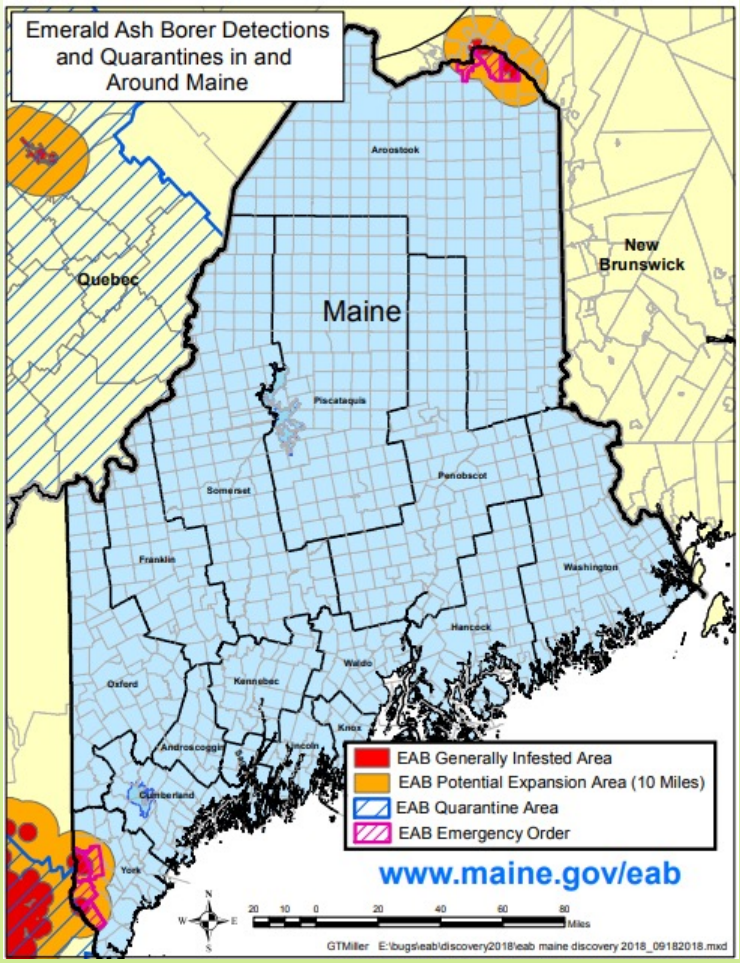
July 22, 2020

Anthony D'Amato - University of Vermont
Amanda Mahaffey & Leonora Pepper - Forest Stewards Guild
Alexandra Kosiba & Nancy Patch - Vermont Department of Forests, Parks and Recreation
Pieter van Loon - Vermont Land Trust




# 2016 NH Infestation

NH EAB Infested Area (red)




## ORDER AREA 2018:

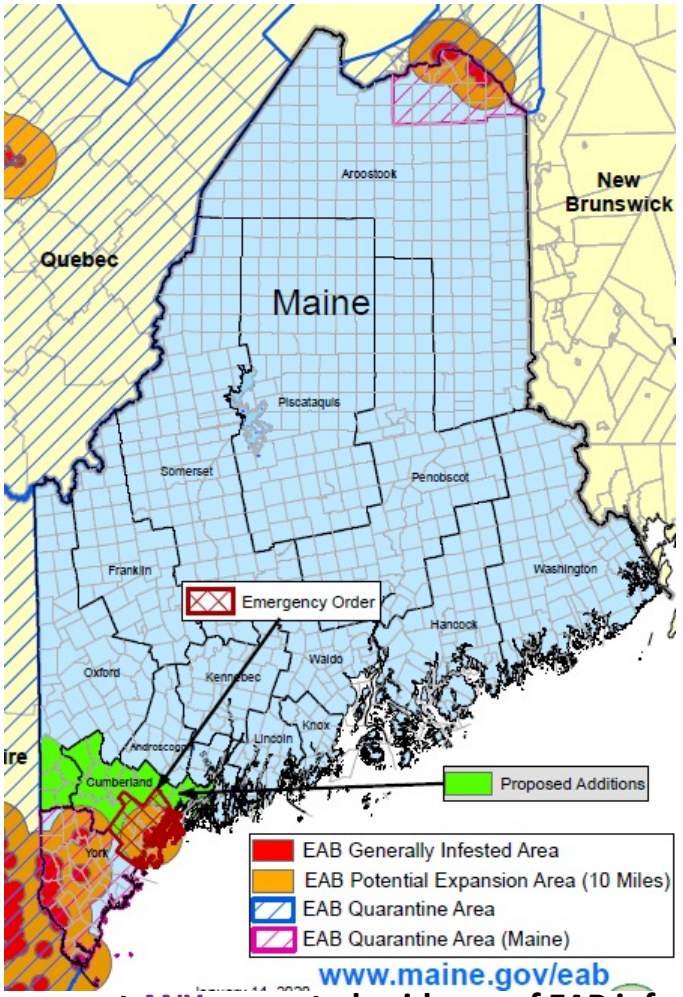
Aroostook: Frenchville, Madawaska, Grand Isle

York: Acton, Berwick, Lebanon, Shapleigh

- Based on detections in trees and on traps and trap trees
- Kept small to limit spread
- Any future detections would influence Order Area
- Final quarantine will be larger

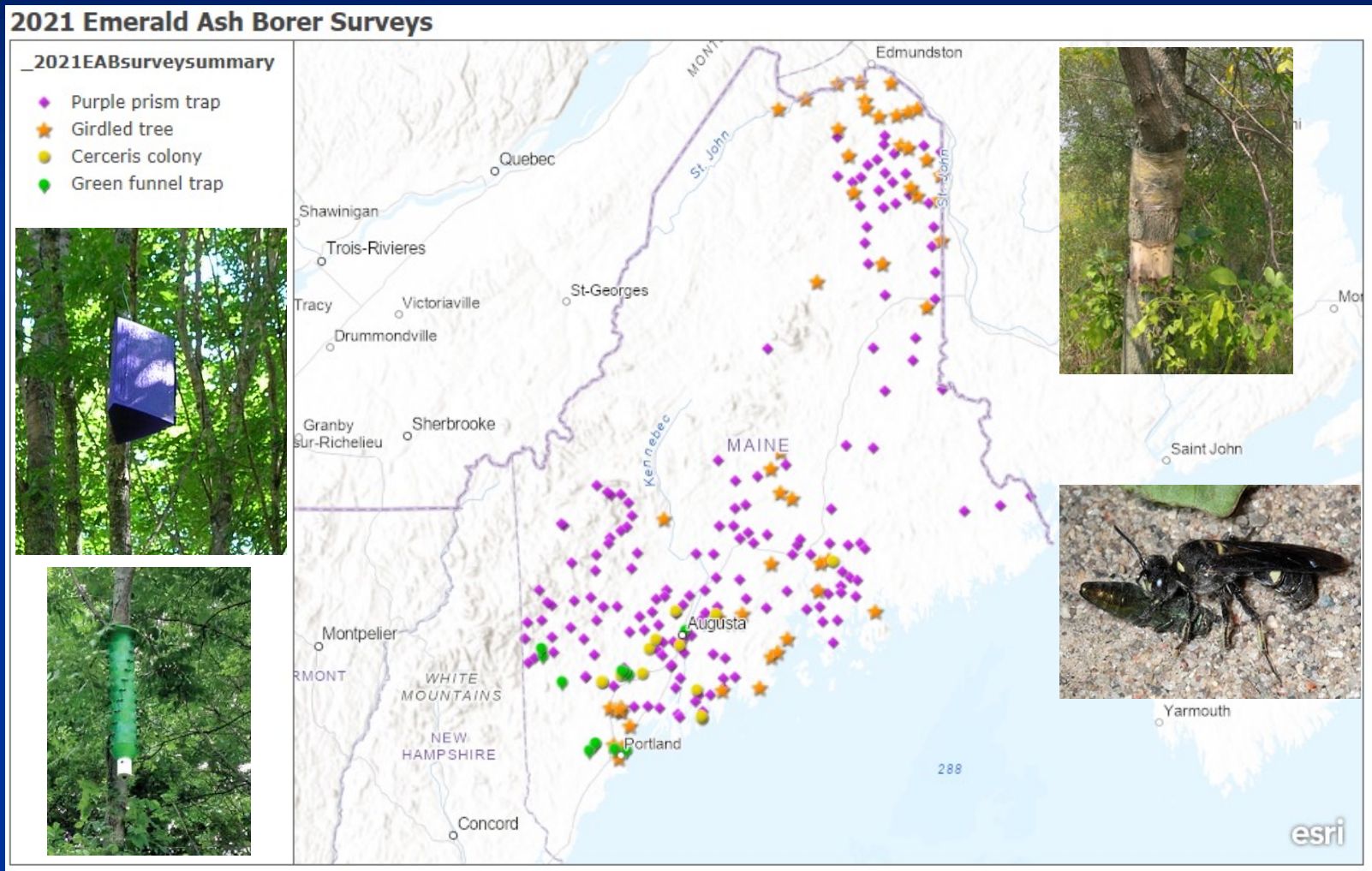
# Emerald Ash Borer Detections in Maine

**May 2018: Madawaska (tree)**
**August 2018: Grand Isle (trap)**
**September 2018: Acton, Lebanon, Frenchville (trap)**
**November 2018:** Madawaska **(trap tree)**
**February 2019: Berwick,** Acton **(branch)**
**September 2019:** Lebanon **(branch)**
**October 2019: Portland (trap)**
**Nov/Dec 2019: Alfred, Kittery, Limington,** Acton, Lebanon, Berwick **(trap tree)**




**Please report ANY suspected evidence of EAB infestation (unless previously confirmed/ or recently ruled out by DACF)**

# Monitoring for EAB

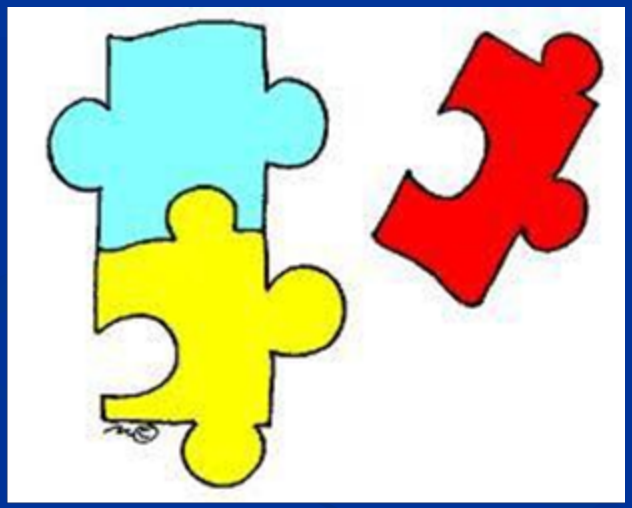



Location data for purple traps (PPT), girdled trap trees (GTT), Cerceris monitoring (Cf) and green funnel traps (GFT) in Maine in 2021

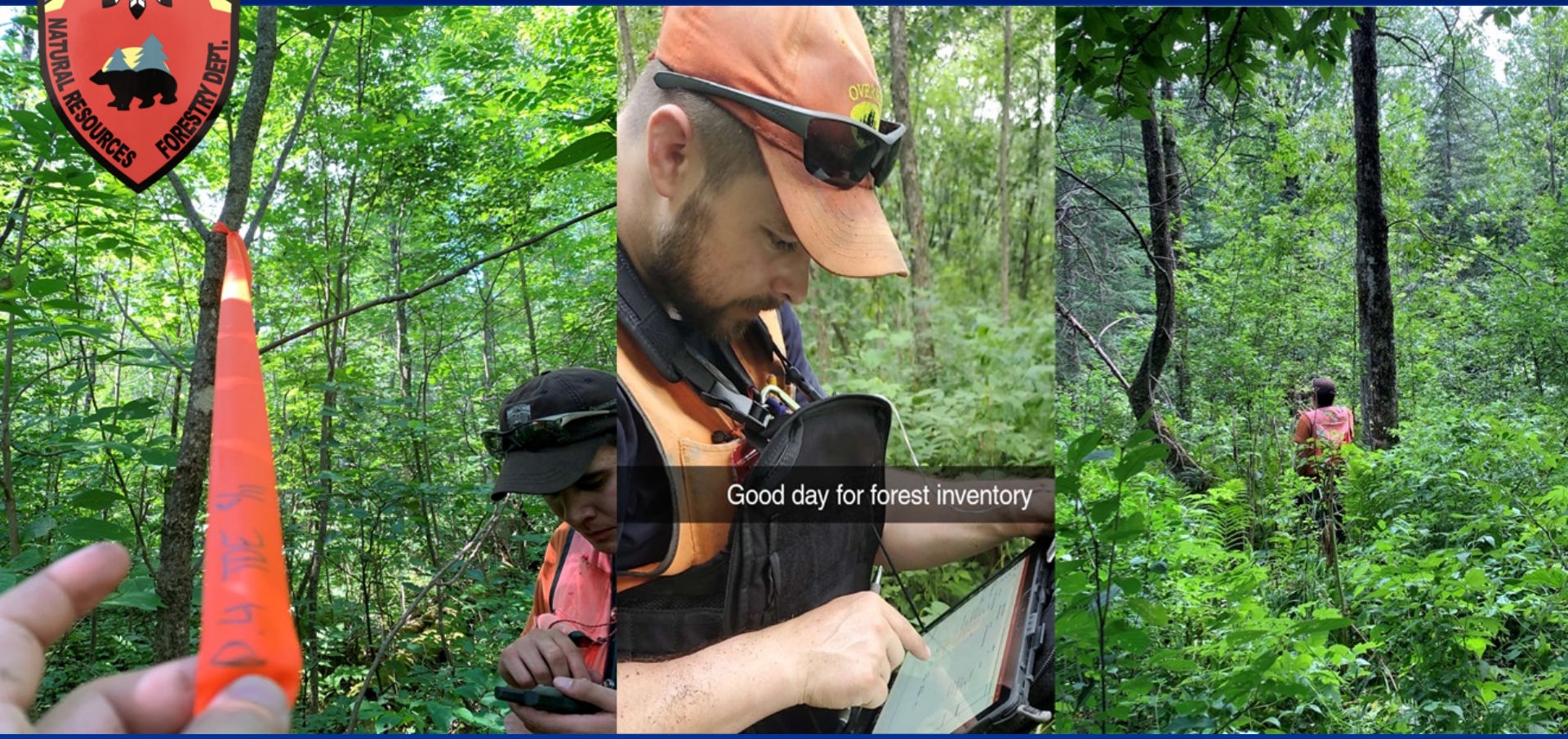
Esri, USGS | Province of New Brunswick, Esri Canada, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, NRCan, Parks Canada | Province of New Brunswick, Esri Canada, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, NRCan, Parks Canada

# Integrated approaches to Ash Preservation Management

- Inventory and monitoring



# *EAB Response: A Tribal Ash Inventory Field Manual*

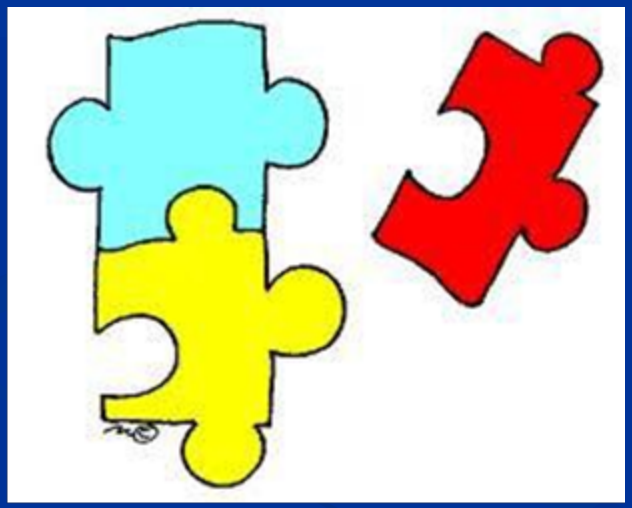



*-Silviculture -Seed Collection -Biological Controls -Insecticide Treatments*

# Field training and learning together with foresters and basket tree harvesters

# Integrated approaches to Ash Preservation Management

- Inventory and monitoring
- Seed collection and banking



# Seed collection and seed banking

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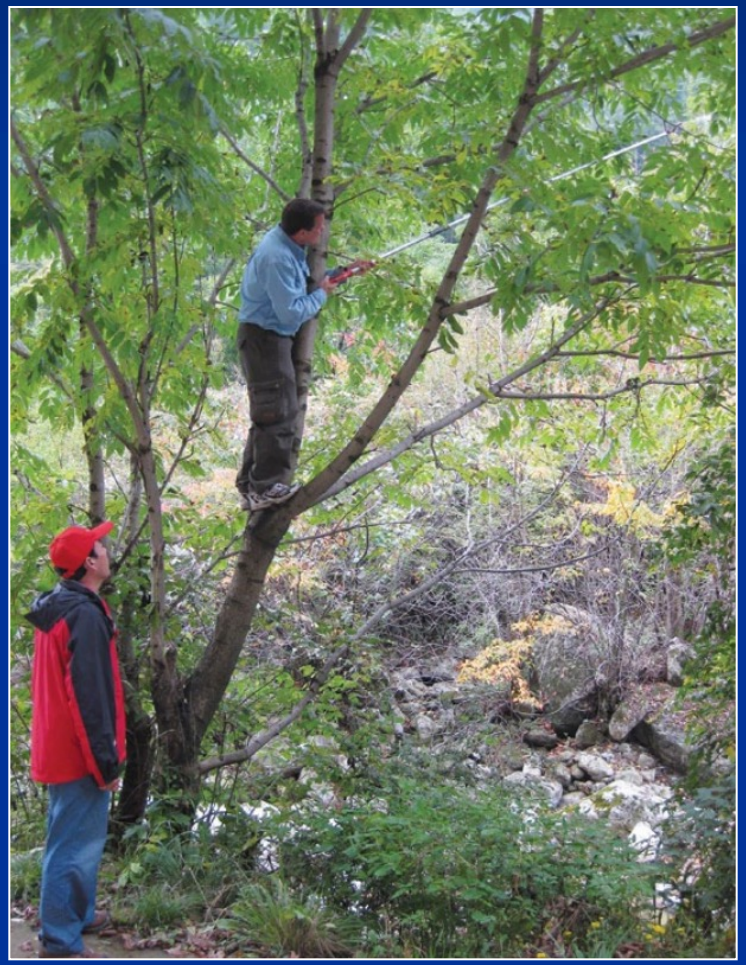
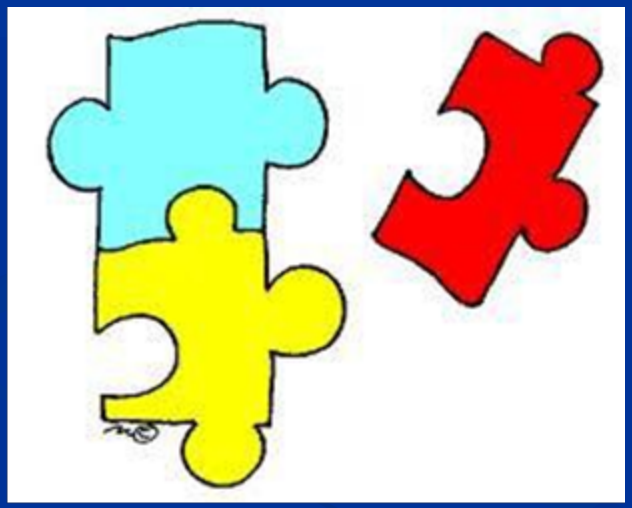


# Integrated approaches to Ash Preservation Management

- Inventory and monitoring
- Seed collection and banking
- Silvicultural practices focused on reserving select ash trees

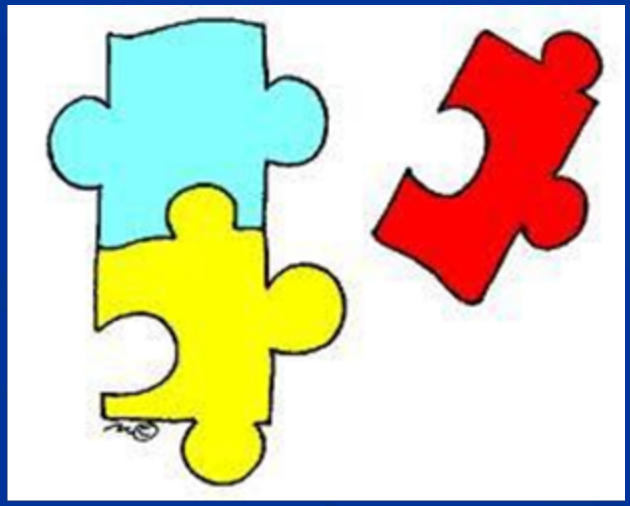


# Manage the forest, not the insect

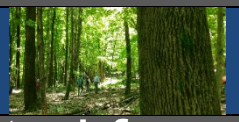
- Retention of ash seed-bearing trees a priority (i.e. female trees) generally more male trees (ratio 7:1)
- Determining sex of tree challenging but still need male trees in proximity for pollination
- Consider openings to encourage seedling growth

# Integrated approaches to Ash Preservation Management

- Inventory and monitoring
- Seed collection
- Silvicultural practices focused on reserving select ash trees
- Chemical controls targeted for natural seed production



# Chemical approaches



- Emamectin benzoate (trunk injection) primary option suited for preservation in forested contexts given treatment duration (3 yrs)
  - No documented aquatic or pollinator impacts
  - Cost per tree ($150-175; $5-10/in)
  - Effective for multiple years on all size classes, including very large trees (28-60 in)
  - Organic alternative (TreeAzin [Azadarachtin]) less effective under high EAB densities (requires annual application)

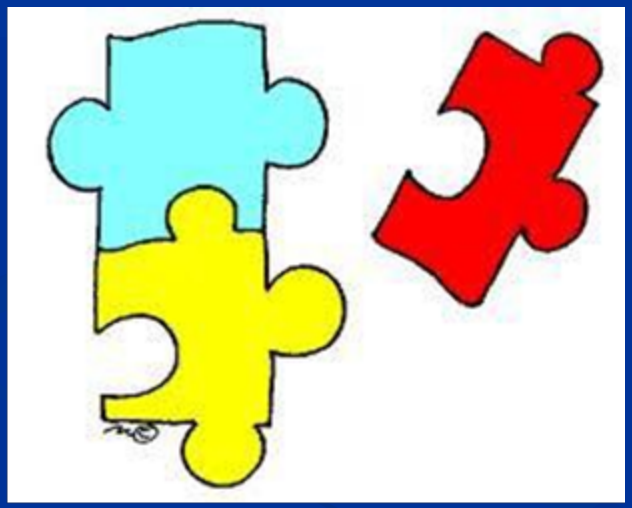

Photo: Pristine PHC


Photo: M. Rose


Photo: C. Sadoff

# Integrated approaches to Ash Preservation Management

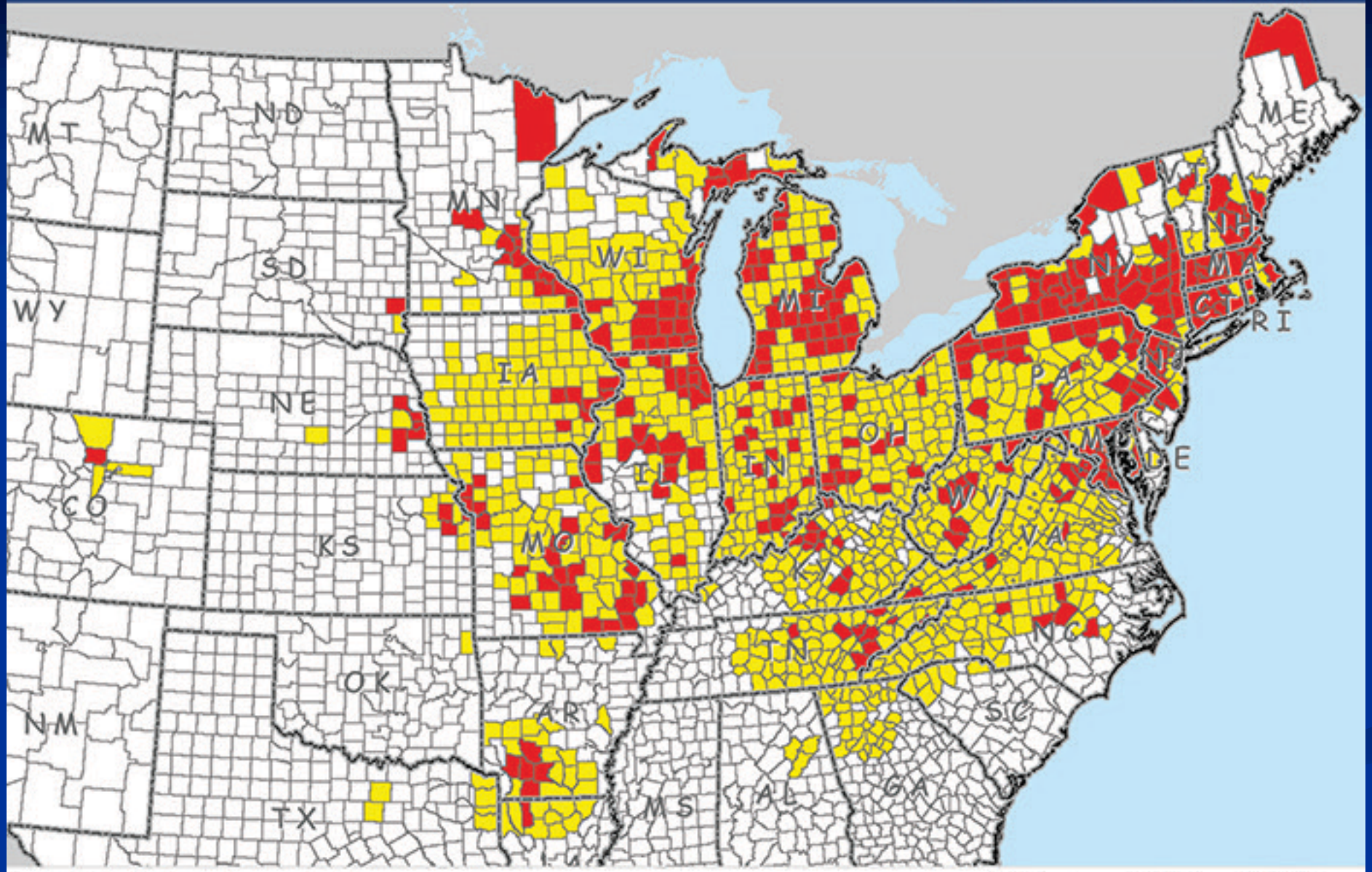
- Inventory and monitoring
- Seed collection and banking
- Silvicultural practices focused on reserving select ash trees
- Chemical controls targeted for natural seed production
- Native and non-native biological controls



USDA United States Department of Agriculture

# CURRENT EAB INFESTATION AND PARASITOID RELEASE AREAS BY COUNTY

## Cooperative Emerald Ash Borer Project




Please note: Due to release site reporting methods the release illustration should be considered approximate

EAB infested county with parasitoid releases

EAB infested county

Data Source: USDA-APHIS-PPQ-EAB

Date Created: 8/24/2010

USDA, APHIS, PPQ Brighton, MI

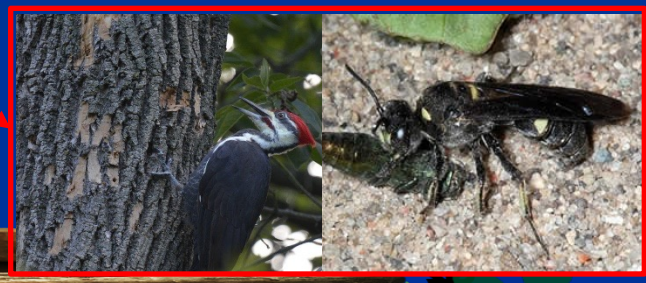
# Biological controls – Woodpeckers and Parasitoids

**Native Bio-controls:**

- Woodpecker predation of EAB
- Native wasps

**Non-native Bio-controls:**

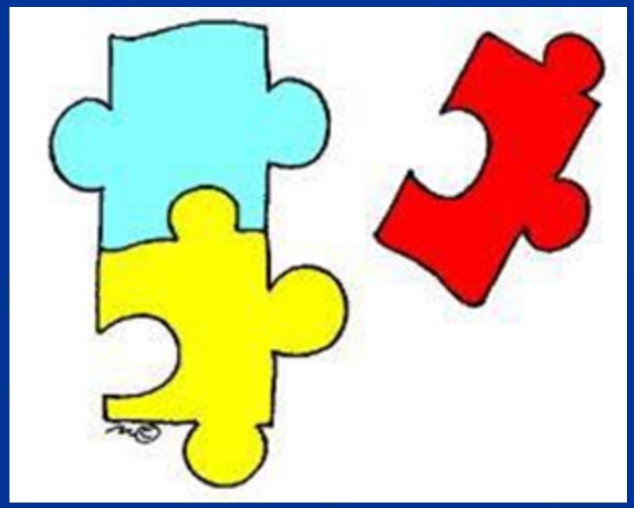
- Controlled Release of Parasitic Wasps – a Natural Enemy of EAB
  - Wasps are native to Asia
  - Releases are actively being carried out nationwide and in Maine

Images: Mass. Forest Service, Art Wagner, USDA - APHIS, Bugwood.org, [illegible], Univ. of Maine

# Integrated approaches to Ash Preservation Management

- Inventory and monitoring
- Seed collection and banking
- Silvicultural practices focused on reserving select ash trees
- Chemical controls targeted for natural seed production
- Native and non-native biological controls
- Develop native genetically resistant trees



# Replanting resistant ash trees

# What are important next steps?

# Doubling down on outreach and education

# Doubling down on outreach and education

APPLIED RESEARCH

*For. Sci.* XX(XX):1–10
doi: 10.1093/forsci/fxy056


social sciences

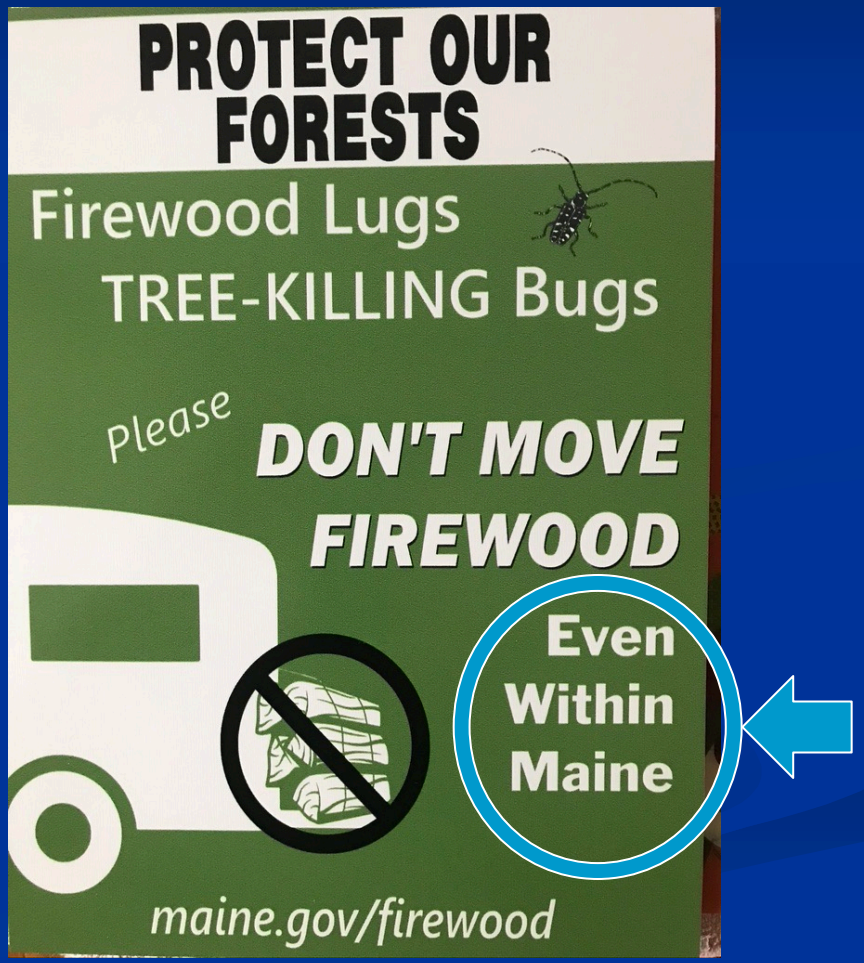
## How Campers' Beliefs about Forest Pests Affect Firewood Transport Behavior: An Application of Involvement Theory

**John J. Daigle, Crista L. Straub, Jessica E. Leahy, Sandra M. De Urioste-Stone, Darren J. Ranco, and Nathan W. Siegert**

We conducted a survey of 272 campers at 18 private and public campgrounds in Maine ($n$ = 101), New Hampshire ($n$ = 88), and Vermont ($n$ = 83) to learn about their firewood movement behavior, and knowledge and beliefs about invasive forest pests. More than 25 percent of respondents reported that they often or always brought firewood from home for camping. Most (92 percent) had heard of invasive forest pests, but <25 percent could name an example without being prompted, affirming a need for increasing exposure of outreach materials to facilitate activation of attitudes associated with forest pests and transport of firewood. Campers provided helpful suggestions to improve current outreach and education efforts such as illustrating more of the detrimental impacts forest pests have on trees near homes or recreation areas. For campers who believe their wood is safe and therefore okay to transport regardless of regulations, a need exists to re-message arguments. Furthermore, results suggest that some campers with low involvement who are less engaged and less inclined to seek out information may additionally need more direct approaches. Actions to better capture the attention of these campers could potentially include confiscating illegally transported firewood at check stations, issuing warnings, or administering fines for moving nonlocal or nonheat-treated firewood in order to obtain compliance with protective firewood regulations.

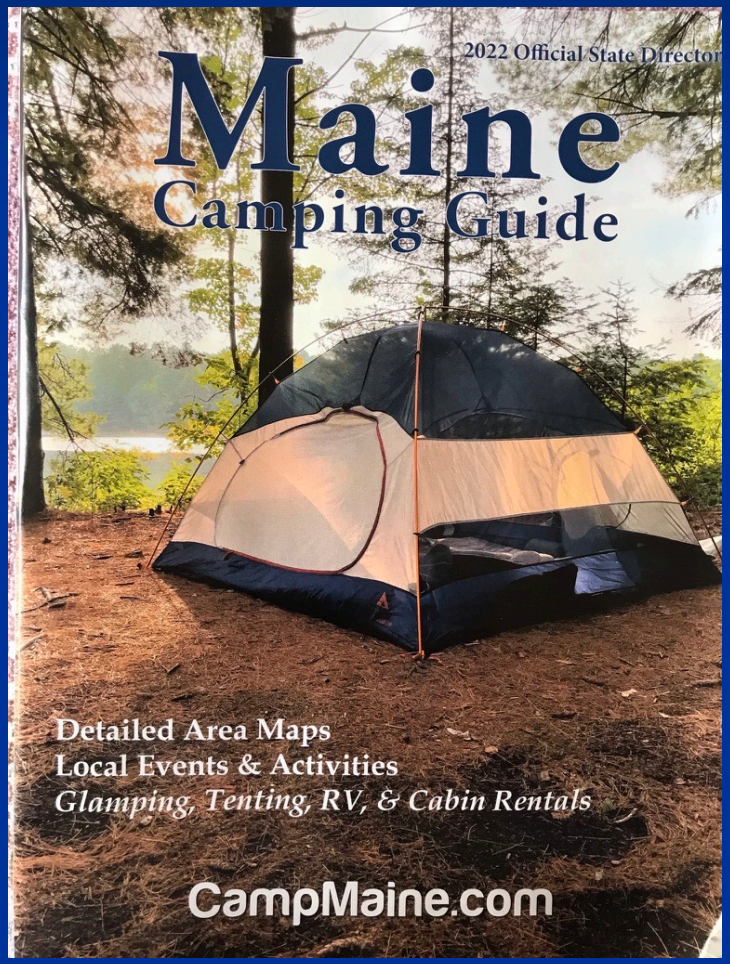
**Keywords:** *Agrilus planipennis*, *Anoplophora glabripennis*, Asian longhorned beetle, emerald ash borer, firewood movement

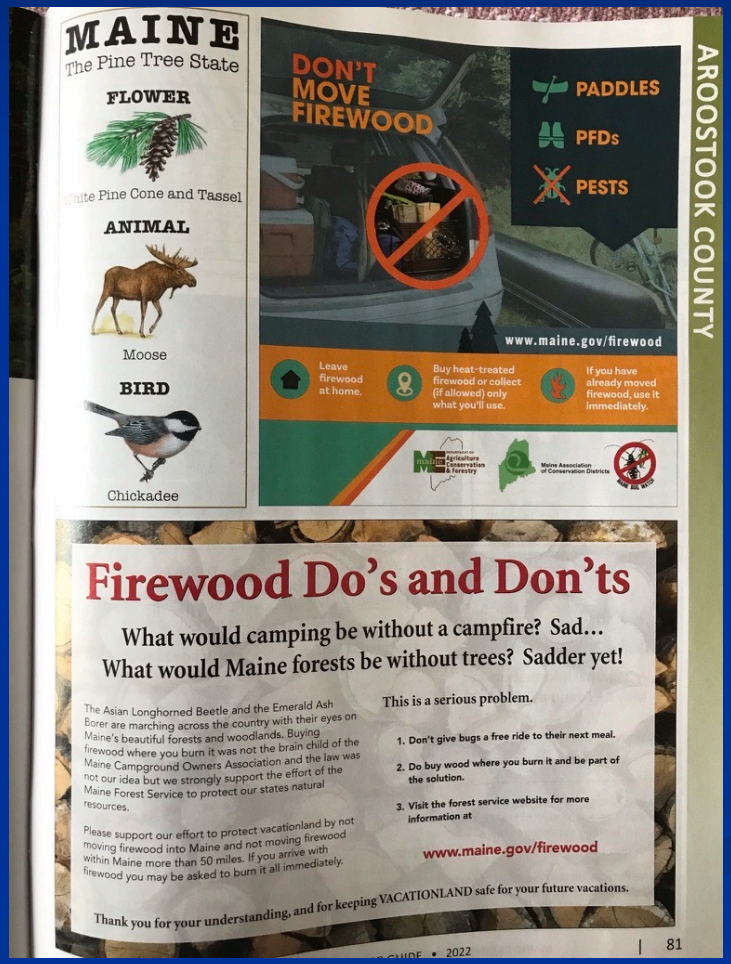
The movement of firewood is a documented invasion pathway for invasive forest pests that affect or threaten many of our North American forests (Reid and Marion 2005, well as transporting noncommercial firewood for camping and other outdoor recreational activities (e.g., Haack et al. 2010b, Jacobi et al. 2011, Siegert et al. 2015b). Although commercial



# Vacationland RV and Camping Show
# Auburn - April 2, 2022


# Doubling down on outreach and education



# We need to direct attention towards firewood used for heating camps and homes

# Increased efforts with inventory and monitoring of our ash trees

- Ash trees (especially black ash trees) typically not a huge part of inventory in management plans.

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- Even with few ash trees or no formal management plan monitoring helps to inform in a timely manner decisions (your trees, large and small forest landowners, large cities, towns) with EAB response plans.

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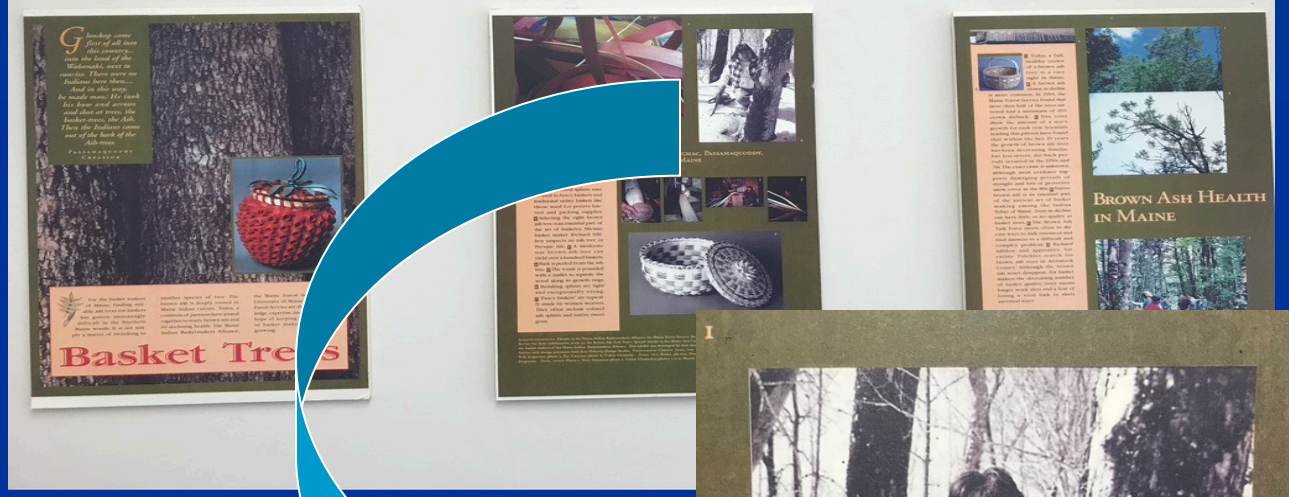
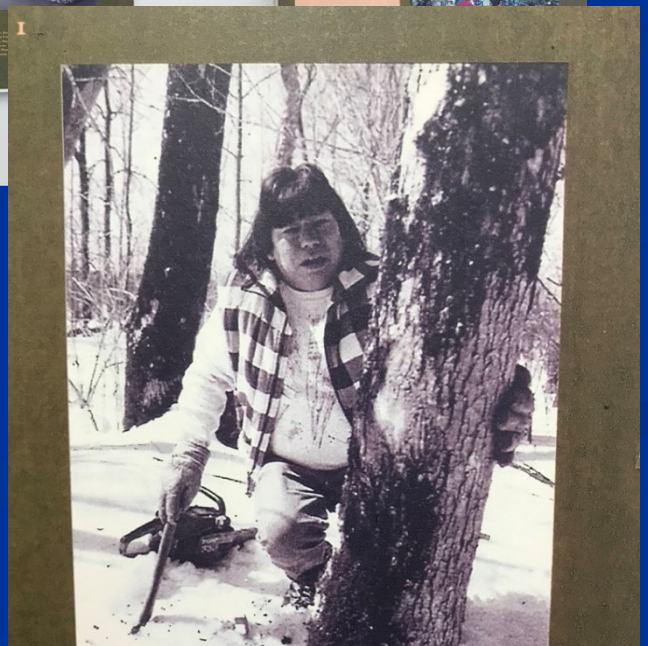
# Circling back reflections and looking forward

Around 1990's Maine Indian Basketmakers Alliance Poster
In John Daigle's Nutting Hall office - University of Maine




Maine Indian Basketmakers Alliance



Cultural lifeways and the inherent
Long-term concern for forest health

# The importance of sustaining a cultural practice

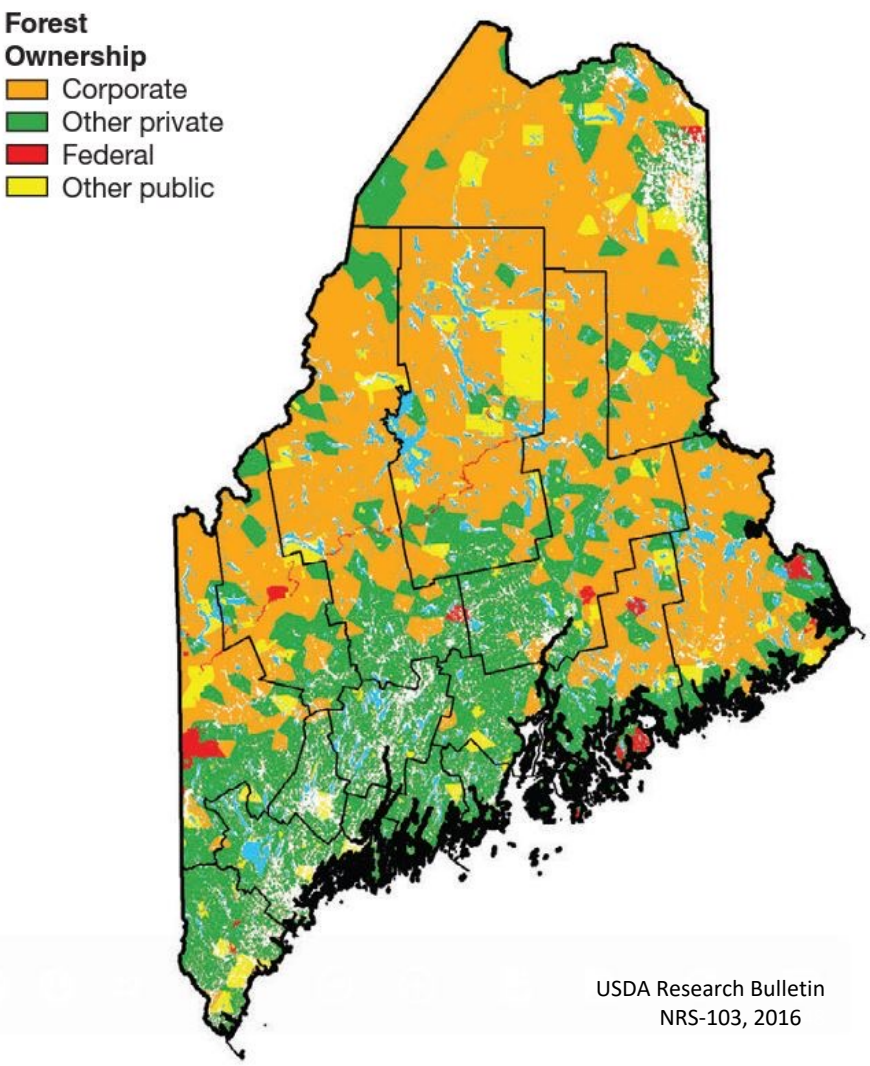
- As Robin Kimmerer notes it is the "doing" of the cultural practices that works to instill meaning, reflect our cultural values such as taking care of the plants, and our identity.


# Tribal elder Les Benedict of Saint Regis Mohawk tribe – "the threats created by EAB has resulted in being a mechanism for re-establishing tribe to tribe relationships"

**More awareness of EAB and connections to Wabanaki cultural lifeways is leading to more strategic planning with access, monitoring, and seed collection efforts with private landowners**

# Landowner Survey: What are we hoping to learn?

- **Those who own land in Maine:** what are the plans for the ash on **their properties**?
- What is **their knowledge** of ash as a cultural keystone species for the Wabanaki People?
- What can be done to influence **their involvement** in conserving ash for the future?




USDA Research Bulletin NRS-103, 2016

# Growing community and sharing information related to strategies for Ash Preservation Management


# Acknowledgements








# Wiliwon (Thank you!)