# Forest Health Concerns for Tribal Forestry Programs in the Northeast

4/3/2024

## Yale Forest Forum

### Tribal Forestry:

### Understanding Current Issues and Challenges

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Citizen of Mi'kmaq Nation
Doctoral Graduate Student

# The Hats I Wear…

- **PhD Student University of Maine – Ash Protection Collaboration Across Wabanakik**
- **Tribal Forest Adaptation Technical Assistant**
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Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

# Species Preservation Framework

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**Field Notes - forest threats**

OXFORD

## Species Preservation in the Face of Novel Threats: Cultural, Ecological, and Operational Considerations for Preserving Tree Species in the Context of Non-Indigenous Insects and Pathogens

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### Abstract

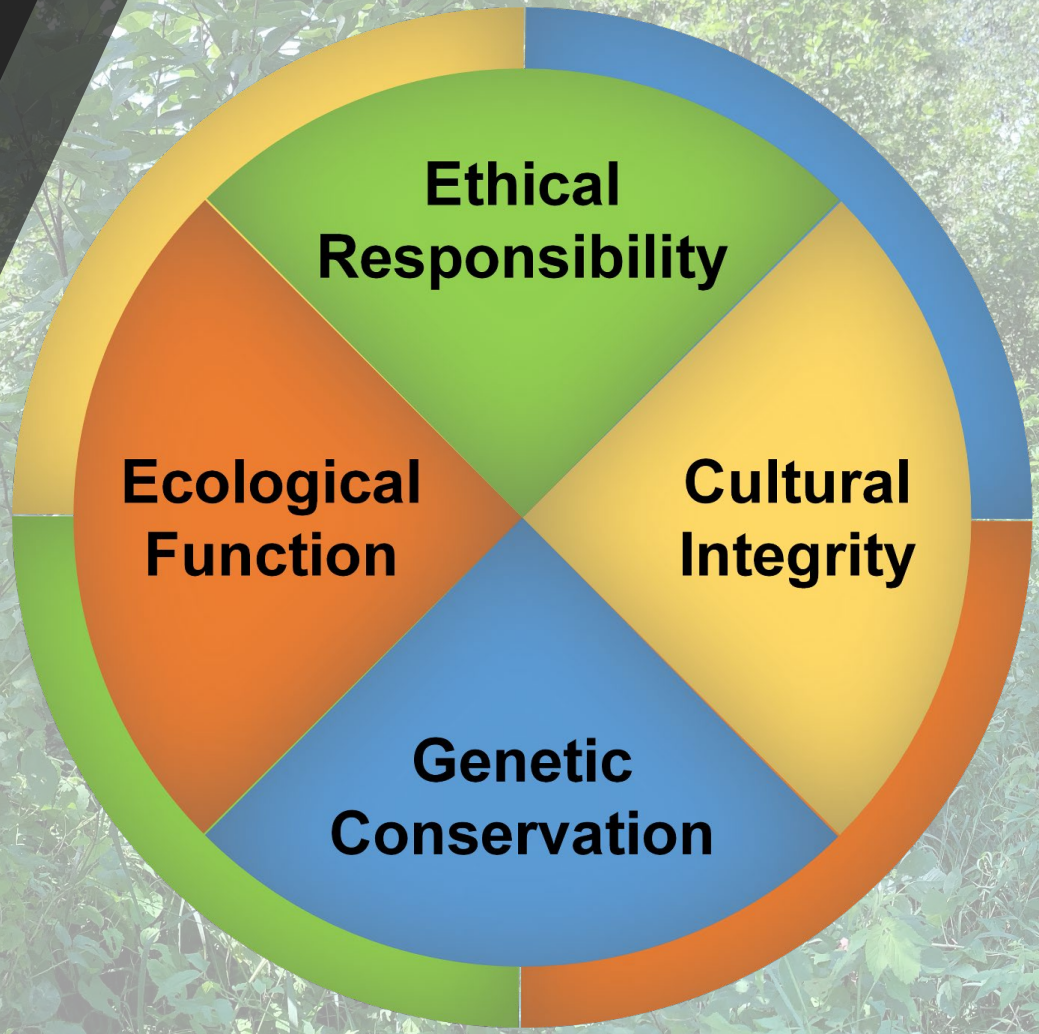
Non-Indigenous insects and pathogens (NIIP) have functionally eliminated numerous tree species of immeasurable cultural and ecological significance over the past century, with the number of species introductions and associated impacts growing each year. Foresters are often on the frontlines of these impacts, tasked with quickly adapting management plans to recover potential economic losses and maintain future silvicultural options following tree species loss. We highlight that the irreplaceable cultural and ecological values provided by many tree species argues for renewed focus on applying integrated pest management and adaptive strategies in novel ways to sustain these values for future generations. To guide these efforts, we describe a framework for adapting to NIIP centered on three interrelated components: preservation value, preservation approach, and preservation strategy. This framework and emerging species preservation efforts provide an alternative path forward to sustain threatened species and their associated values in an era of increasing change.

- **A need for renewed focus in species preservation and IPM**
- **More Holistic: A plan to take care of and challenge new distant relatives**
- ***Mi'kmaq: Ilsuteget ango'tg aq gaqamutoq pilei gneg wetagutijig***

Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

# Species Preservation Framework

- Preservation Values are foundational – to ID them:
  - Ask yourself what is the reason for preserving this species?
  - Everyone has different worldviews and perspectives
  - The driving values are interrelated - complementarity




Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

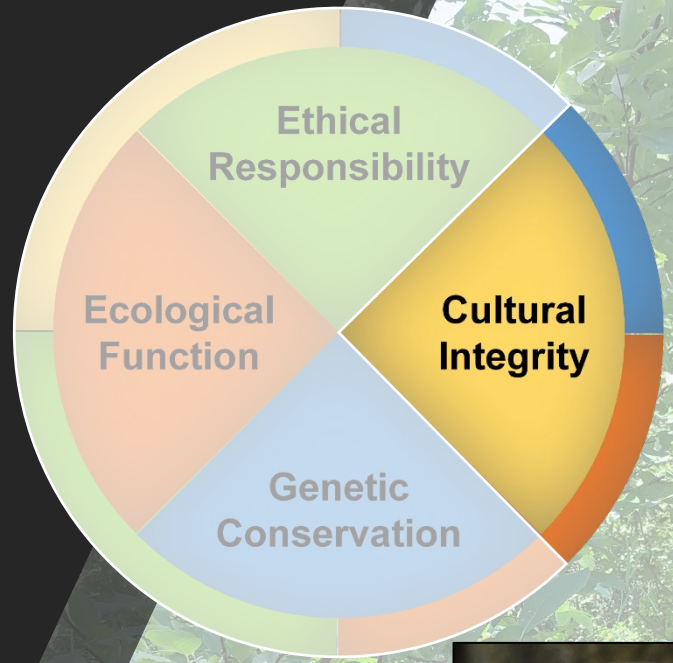
# Preservation Value: Ethical Responsibility

- Indigenous Peoples see a responsibility to take care of these natural relatives
- Professional Code of Ethics may identify this responsibility in western science
- These species have been put in peril at the hands of humans – time to right our wrongs


Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

# Preservation Value: Cultural Integrity

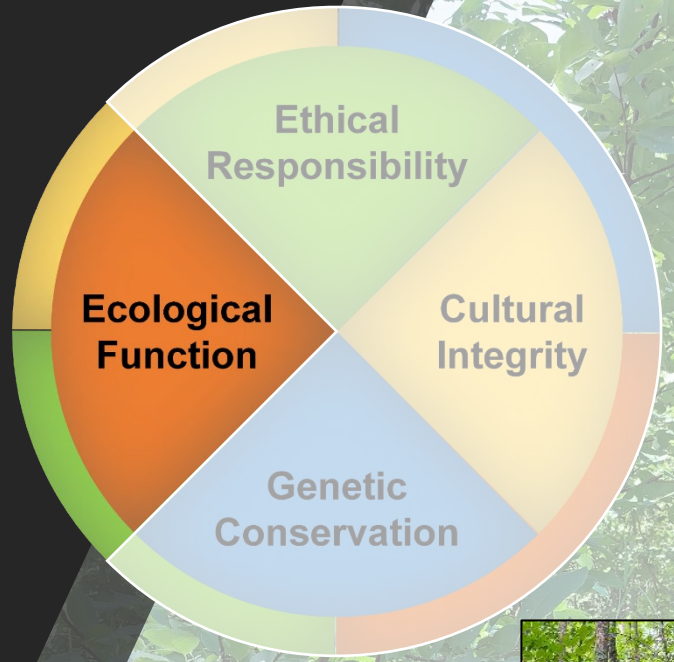
- Relationship have been fostered between these trees and peril and the regions Indigenous Peoples
- These trees can carry profound cultural significance
- Cultural Integrity is all about maintaining that relationship




Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

# Preservation Value: Ecological Function

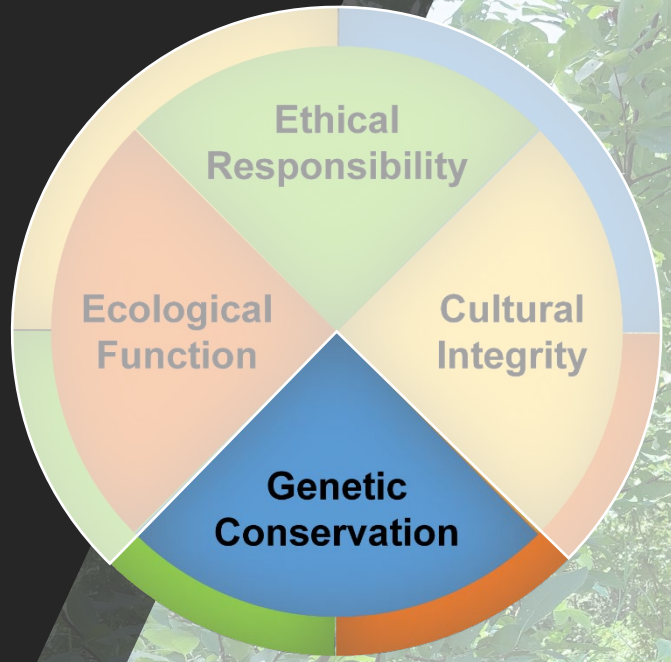
- Every tree is unique and has a function within their ecosystem
- Maintaining these functions makes resilient ecosystems
- Resilient ecosystems show clear reasoning for the value of ecological function




Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

# Preservation Value: Genetic Preservation

- Thinking generations ahead....
- Maintaining genetics on the landscape
  - Reserving select trees during pre-salvage harvests
  - Collection seed and other genetic material
  - Using that material and reserved trees to understand and leverage genetics in the preservation effort

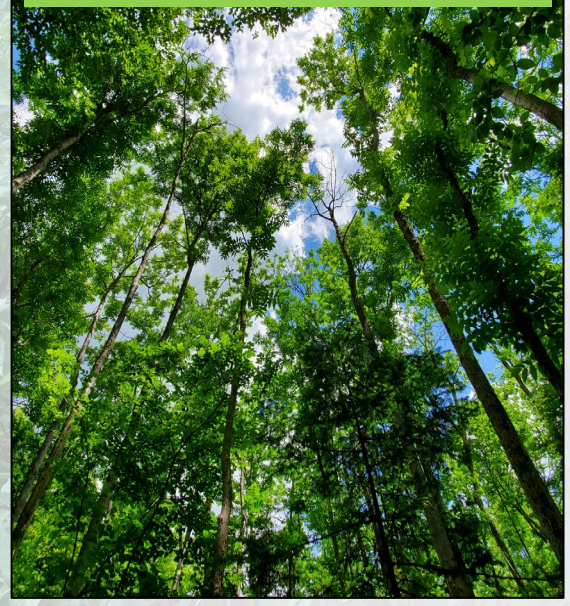



# Conceptualizing on the Ground Action

**Preservation Value**

Specific purpose for preservation

**Preserve ecological function**



## Preservation Strategies will vary

- Silviculture
- Biological Controls
- Chemical Treatments
- Cultural Resource – Protection/Storage/Enhancement

**Preservation Strategy**

Tactic or action that helps fulfill a preservation approach

**Adaptive Integrated Pest Management**

Photo: L. Benedict

# Brown Ash or Black Ash

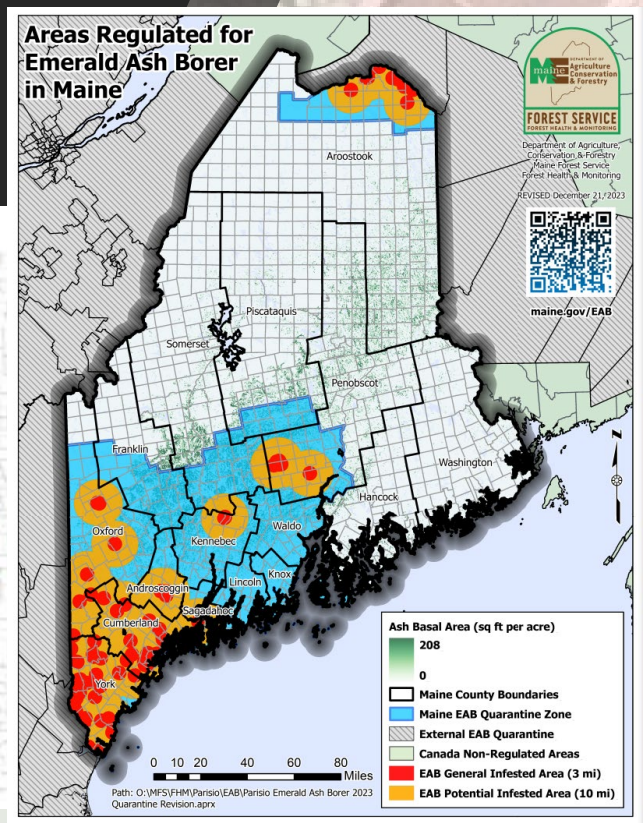
## (*Fraxinus nigra* Marsh.) *Wisqoq*

- Habitat: moist to wet muck or shallow organic soils, especially in swamps, floodplains, terraces, ravines, and on small, poorly drained upland pockets.
- Shade Intolerant Species
- Found in primarily even-aged pockets across the Great Lakes and Acadia regions of North America, and in southeastern Canada.
- Maine's brown ash population occurs in scattered pockets across the landscape, rarely creating large contiguous stands of pure ash trees.

Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

# The Threat: Emerald Ash Borer

- NIIPP from Southeast Asia
- First detected in Detroit Michigan
- A Woodboring Insect That Readily Girdles North American Ash Trees
- Severe and Extensive Impact has been observed
- Detections in 36 states, and 5 Canadian Provinces
- Potentially Impacting the Forests of 117 Federally Recognized Tribal Nations
- Detected in Maine in 2018




Images: Maine Forest Service, Art Wagner, USDA - APHIS, Bugwood.org; Debbie Miller, USDA Forest Service, Bugwood.org

# Brown Ash & Emerald Ash Borer:
## Preservation Value: Cultural Integrity-

Profound Cultural Significance:

- Basketry a Cultural Lifeway and a Source of Economic Income
- Referenced in the Wabanaki Creation Story
- Generations of Basket Makers and Ash Harvesters in certain families
- Woven into the cultural identity of the Wabanaki People



Images: Basketry Photos – Jeremy Frey; Passamaquoddy Forestry photos

# Brown Ash & Emerald Ash Borer: Strategies Being Considered -

- Follow the advancement of EAB and
- Monitor for its arrival on Tribal Land
- Continuing Basket Making Classes
- Seed Collection and other Genetic
- Store Basket Making Material Long-term Material
- Continue to learn from Basket Makers, Ash Harvesters, and knowledge holder in our communities
- Silvicultural Prescriptions – Increase Resiliency & Maintain Ash
- Biological Controls – Parasitoid Wasps


Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

# Eastern Hemlock

## (Tsuga canadensis) *Gsu'sqw*

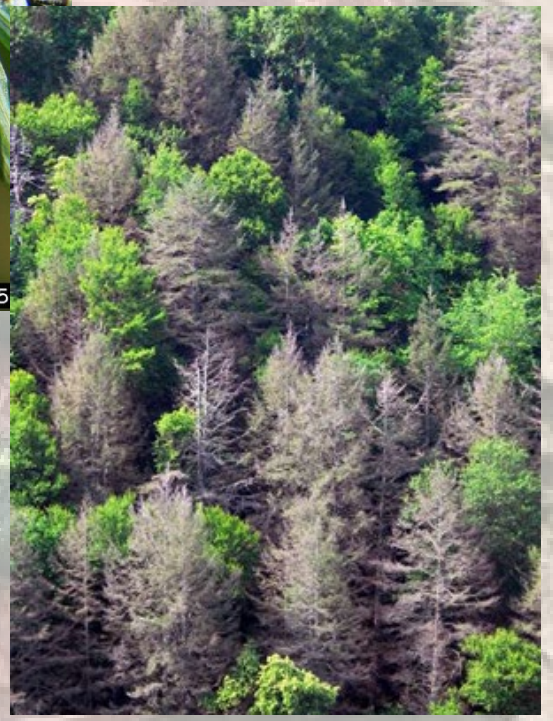
- Habitat: This tree like cool humid climates, enclosed canopies in dense hemlock groves create unique micro-climates
- Shade tolerant Species that helps to perpetuate hemlock recruitment
- Maintains high levels of even aged cohorts throughout stand lifecycles.

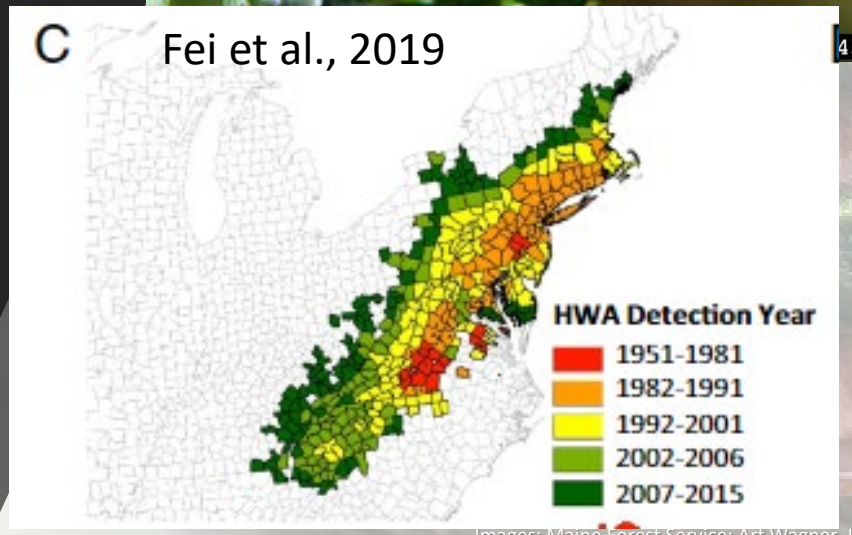



Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

# The Threat: Hemlock Wooly Adelgid

- NIIPP Introduced from Japan in the 1950's
- Native to Asia and Western N. America
- Uses Siphoning Mouth Stylets to Feed on Hemlock twigs
- Spread across >50% of EH Range – 99% mortality rate
- Detections in 20 states, and 2 Canadian Provinces
- Detected in Maine in 2003 – Has spread along the coast.
- Asexual reproduction twice in the year:
  - Sistens – wooly substance
  - Prorgredians – small black specks






Images: Maine Forest Service; Art Wagner, USDA - APHIS, Bugwood.org; Debbie Miller, USDA Forest Service, Bugwood.org

# Eastern Hemlock & HWA:

Preservation Value: Cultural Integrity & Ecological Function-

## Cultural Significance:

- Medicinal uses and use in dying basket making material
- Deer relying on this habitat are vital sustenance
- The act of hunting is a cultural lifeway

## The Ecological Significance:

- The deer herd relies on this Hemlock Dominated Deer Wintering area (DWA):
  - 12000 ac in size (8000 core DWA)
  - Largest in Eastern ME/Whole State
  - 3.5 Months of use by deer
  - 16.5 avg migration (120 miles for some)
  - Deer migrate from the NW

Images: Basketry Photos – Jeremy Frey; Passamaquoddy Forestry photos

# Eastern Hemlock & HWA: Strategies Being Considered -

- Monitor for HWA (Dec – Feb) for wool
- Study the Deer Herd and their use of the DWA
- Chemical Control of HWA (Concerns of toxicity)
- Biological Control (Laricobius/silver flies)
- Integrating Chemical and Biological
- Managing Transitional Yarding Area
- Managing Hemlock Recruitment



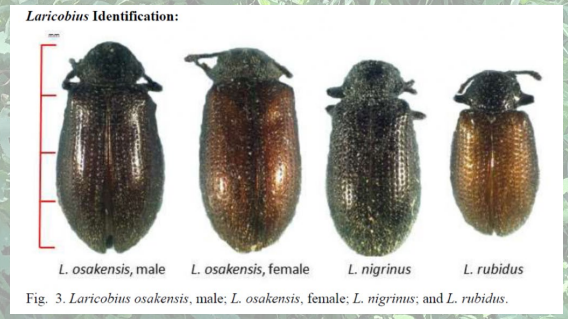


Fig. 3. *Laricobius osakensis*, male; *L. osakensis*, female; *L. nigrinus*; and *L. rubidus*.

Images: Keith Kanoti, Maine Forest Service, Bugwood.org; Rob Routledge, Sault College, Bugwood.org

# Acknowledgements

# *Wela'lin! Thank you!*

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**Ash Protection Collaboration Across Wabanakik**

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