



# Insects at the Edge: How can bugs impact lake quality?

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# Entomology – it's all about the bugs!



2017: Western CT University  
Monitoring for blacklegged ticks,  
grant-funded research, outreach and  
education to prevent tick bites



Fran-tick, WCSU  
Tick Lab Mascot



Yup, that's me



# Entomology – it's all about the bugs!

I'm holding 1,700 ticks!



Lots of bug searching



Yup, that's me

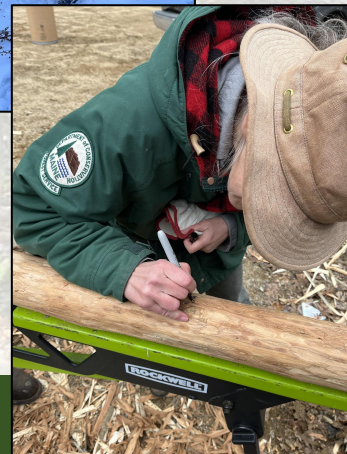


Lots of bug searching (part 2)

# Entomology – it's all about the bugs... right?

2022: Maine Forest Service

It's all about the bugs...  
and the **trees**.



# Healthy lakes – it's all about the water... right?

**2025: Annual Lake Conference**

It's all about the water...and the **surrounding ecosystem.**



Photo: Loon Echo Land Trust

# What threatens a healthy lake?

## TAKING CARE OF **OUR LAKE**

A lake is a magnificent water resource. The quality of its water is a reflection of what happens on the land that surrounds it. Rain and melting snow flow across fields, towns and roads, picking up pollutants along the way...



- Runoff
- Invasive species
- Warming lake temperatures
- Phosphorus deposits
- Bacterial blooms
- Reduced oxygen

Photo: Boothbay Region Water District, Maine

# What makes a lake healthy?

- Biodiversity of plants and animals
- Good water quality & stable temperatures
- Minimal runoff
- Fish & wildlife habitat
- **Healthy trees**

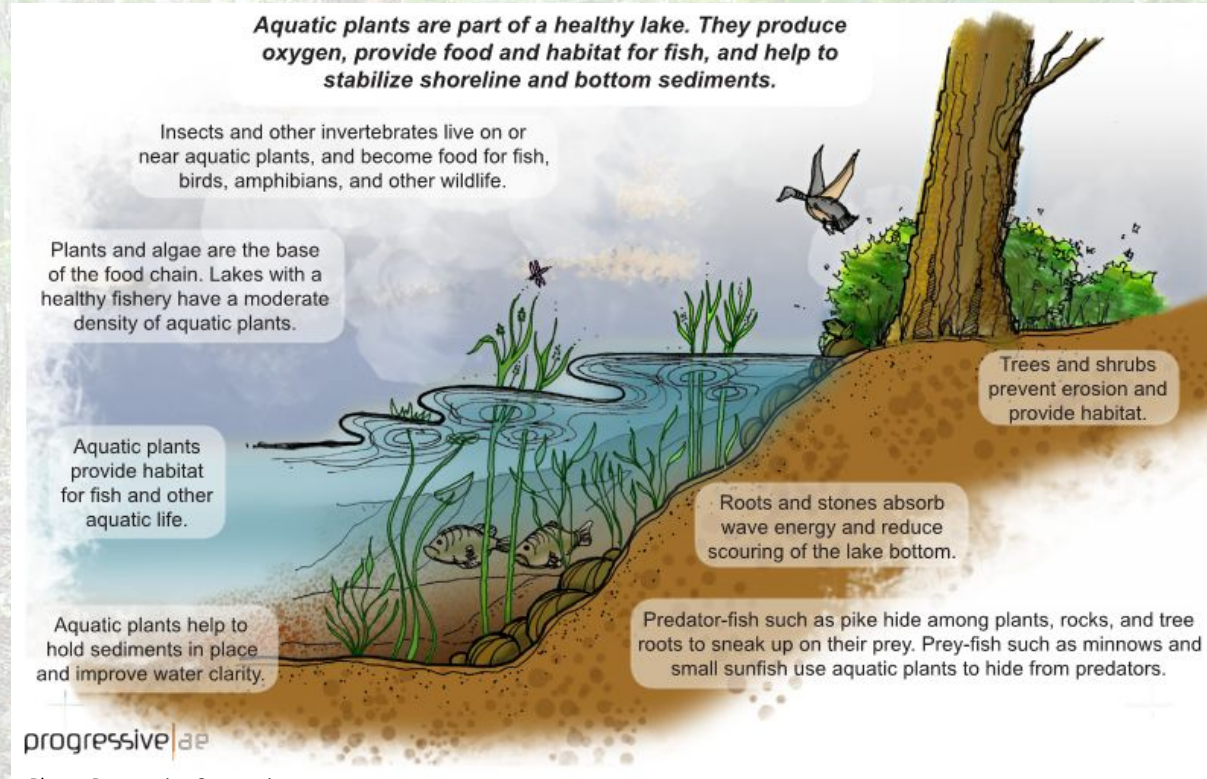


Photo: Progressive Companies



# Importance of trees

## Ecological:

- Provides wildlife habitat, oxygen
- Absorbs carbon dioxide, root stabilization

## Recreational:

- Shade, aesthetics, landmarks

This looks familiar!  
(Farmington, Maine)



# Importance of trees

Outcome based forestry in northern Maine

## Ecological:

- Provides wildlife habitat, oxygen
- Absorbs carbon dioxide, root stabilization

## Recreational:

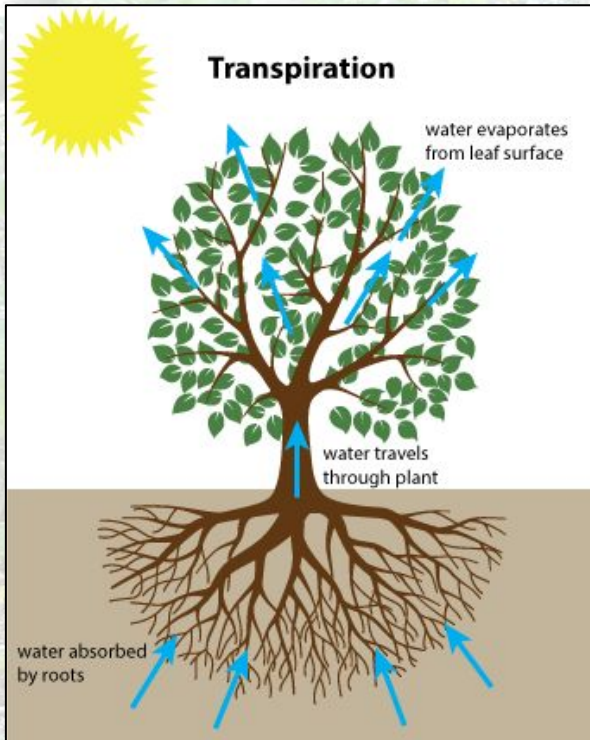
- Shade, aesthetics, landmarks

## Economical:

- Timber industry

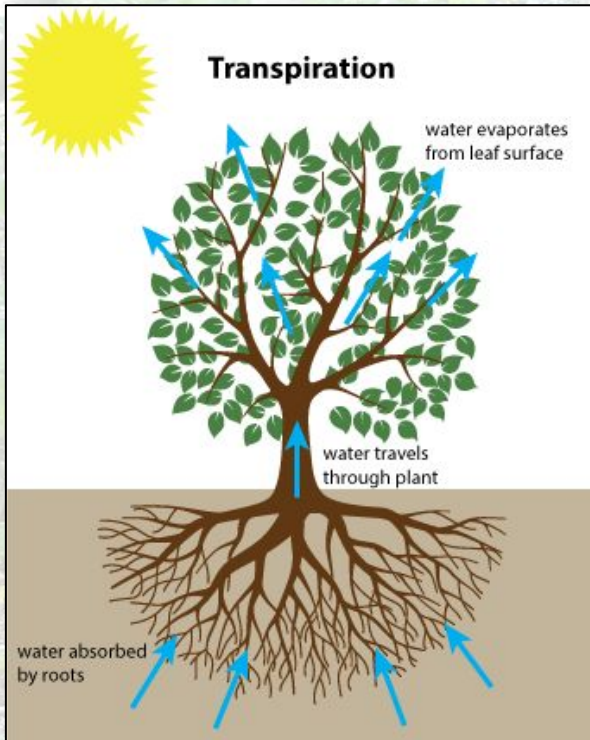


# Importance of trees – lake edition



- Healthy trees **prevent erosion**
  - Canopy breaks the force of falling rain
  - Tree roots stabilize soil
  - Reduced runoff volume
  - Leaf litter adds nutrients to soil and runoff

# Importance of trees – lake edition



- Healthy trees **improve water quality**
  - Filter pollutants from runoff
  - Reduce sediment deposits
  - Keeps water cool

60% of water to American homes come from rivers, streams, and lakes.

# How do you keep trees healthy?

- Lakes are only as healthy as the forest health
- Many factors to consider: drought, pollution, soil compaction and... insect pests

**WANTED**

★ DEAD OR ALIVE ★



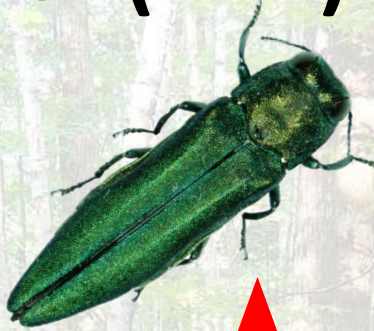
**EMERALD ASH BORER**

FOR THE KILLING OF  
HUNDREDS OF MILLIONS OF  
ASH TREES IN NORTH AMERICA.

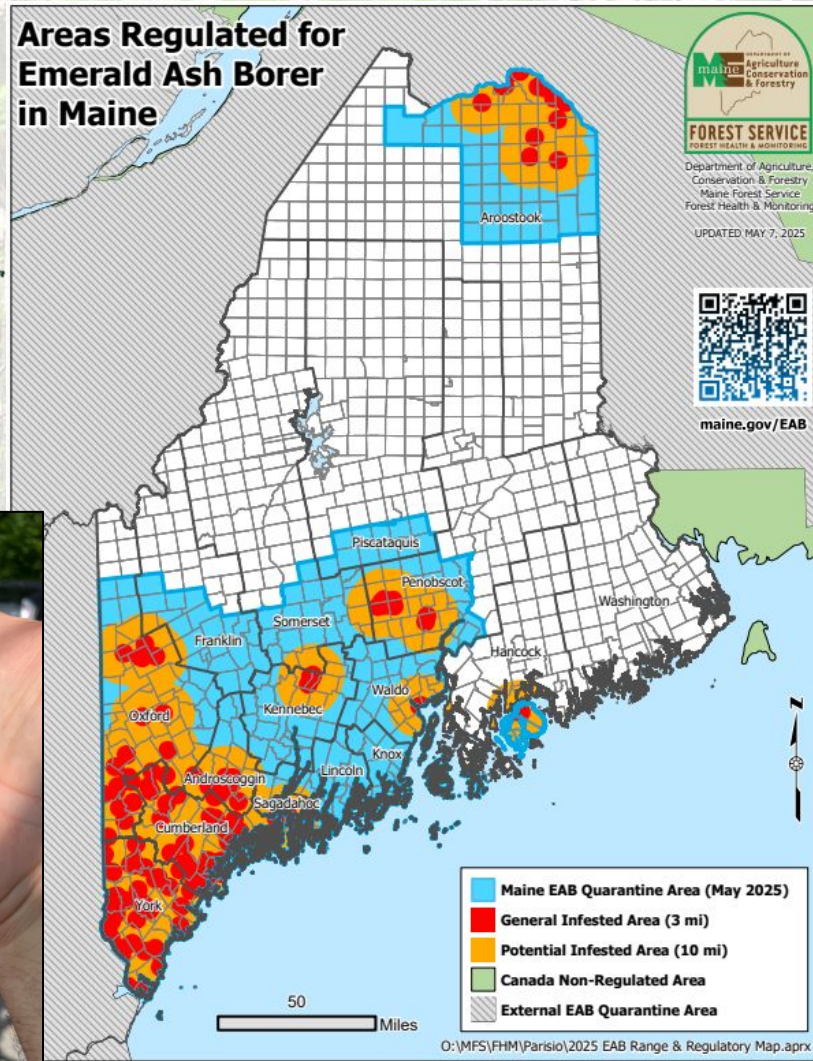
**REPORT INFESTATIONS AND  
DO NOT MOVE FIREWOOD**

# Emerald Ash Borer (EAB)

- Invasive
- Host: Ash
- Detected in Maine in 2018
- **March 2025:**  
**Recent detection**  
**in Bar Harbor**



## Areas Regulated for Emerald Ash Borer in Maine



# Emerald Ash Borer (EAB) - Signs



**S- shaped tunnels**

Photos: Mike Kelly (Flickr), Cliff Sadof (Purdue University), Robert Berry (?), and Kenneth Law (USDA)

# Emerald Ash Borer (EAB) - Signs



**S- shaped tunnels**



**D- shaped exit holes**

Photos: Mike Kelly (Flickr), Cliff Sadof (Purdue University), Robert Berry (?), and Kenneth Law (USDA)

# Emerald Ash Borer (EAB) - Signs



**S- shaped tunnels**



**D- shaped exit holes**



**“Blonding” from woodpeckers**



Photos: Mike Kelly (Flickr), Cliff Sadof (Purdue University), Robert Berry (?), and Kenneth Law (USDA)

# EAB –



Fancy porcupine-weave basket made from Brown Ash by Mary Pelagie, Penobscot woman (c. 1862).



Photo: John Myers / Duluth News Tribune - Minnesota

- Separates inner layers of bark = no transport of nutrients
- Can kill **all** species of Ash
  - 1-several years to die
- Cultural (traditional basket weaving)
- Environmental

# What can you do for your ash?

- Check your ash trees for signs of EAB
- Encourage ash to regenerate
- Consider treatments for infested trees
- Removal of declining ash may be appropriate
- Consult forester for woodlot management advice

We're looking for partners with healthy woodlots at risk (<10 miles from EAB) for ash injections



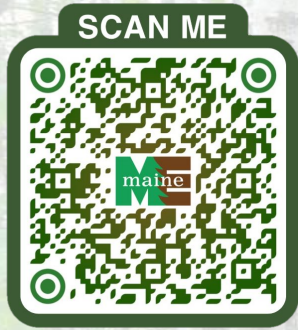
# EAB – Trap tree network

- Remove outer bark to stress out tree and cause it to “smell” good to attract EAB
- Log-peeling workshops in early winter



Mid-May through early June

# What can you do to help?



**Report symptoms of EAB to  
Maine Forest Service**

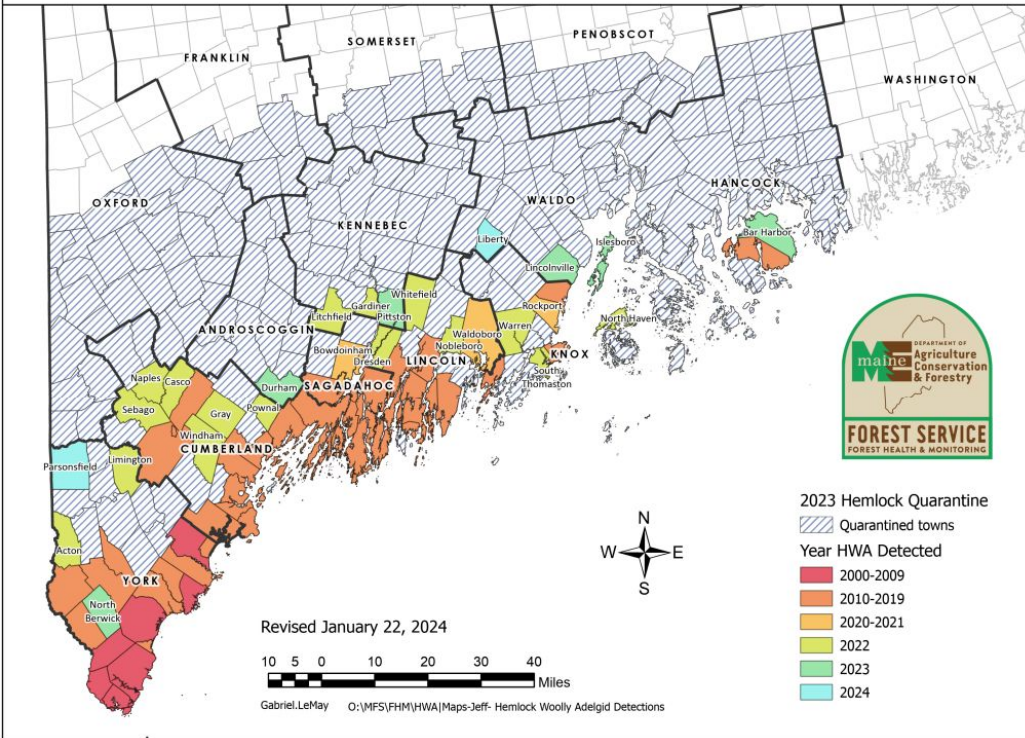


**Don't move firewood –  
buy it where you'll burn it**

# Hemlock Woolley Adelgid (HWA)



Hemlock Woolly Adelgid Detections In Maine Forests Through 2024



- Invasive
- Host: Hemlock
- Detected in Maine in 2000
- **2024: Liberty and Parsonsfield**

# HWA



Present in summer

- A single egg or crawler can start a new infestation
- Highly mobile

# HWA - Signs



UGA1748048



# HWA - Impacts

Withdraws plant sap and damages vascular system

Scar tissue

No transport of nutrients

No new foliage

No energy

**Mortality** from starvation



Hemlock death in  
3-5 years if  
stressed, if healthy  
7-10 years



# What can you do for your hemlock?

- Check your hemlock for HWA in December – February
- Consider woodlot use & stage of hemlock decline when choosing management

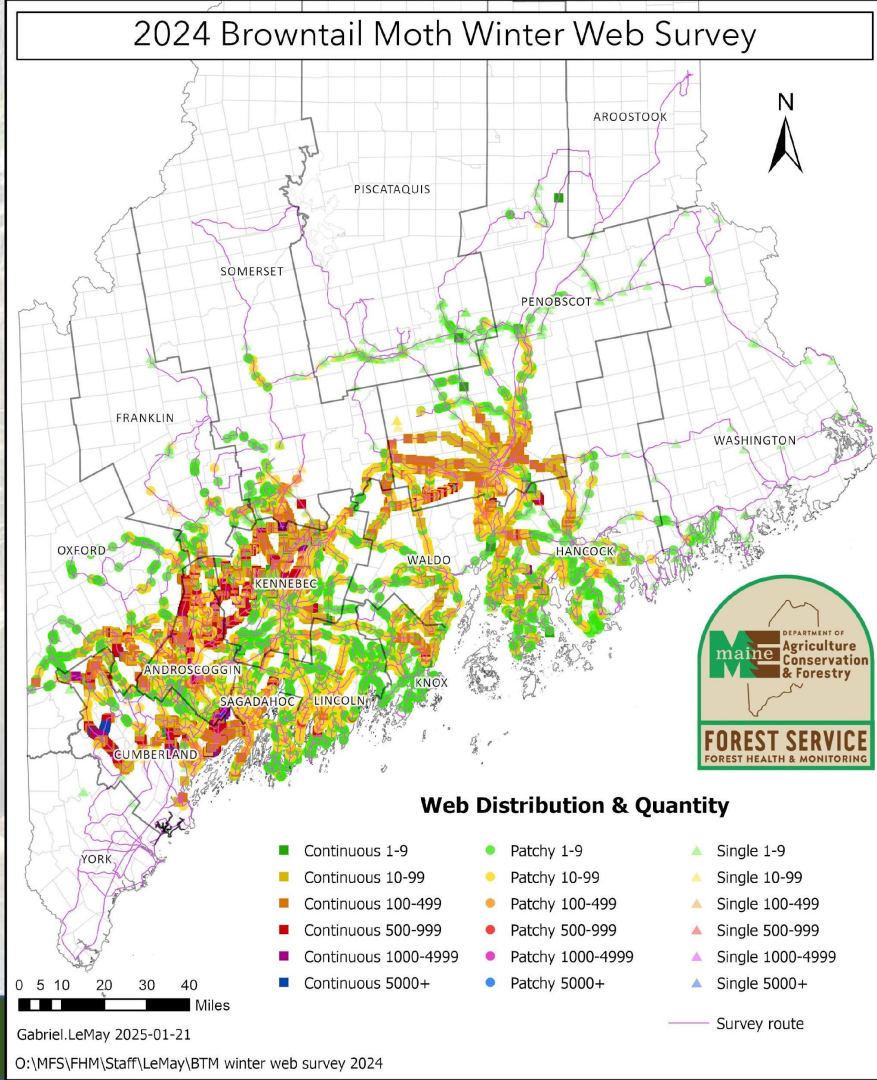
# What can you do for your hemlock?

- Consider:
  - Chemical controls
  - Biocontrol
  - Silviculture: pruning or removal
  - Doing nothing (prevents disturbance for regeneration, preserves genetic diversity)



# Browntail Moth (BTM)

- Invasive
- Hosts: oak, crabapple, apple, cherry, elm, hardwoods
- Detected in Maine in early 1900s
- **Irritating barbed hairs can cause rash**



# BTM - Signs

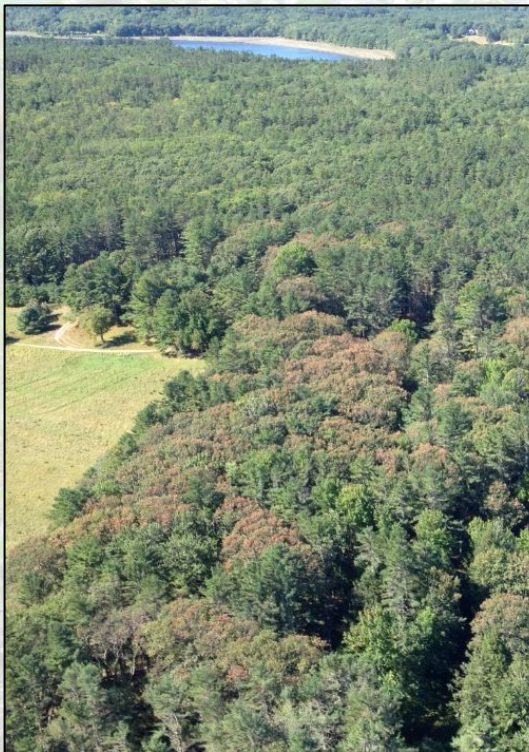


September 15



June 3

# BTM - Signs



September 25



June 3

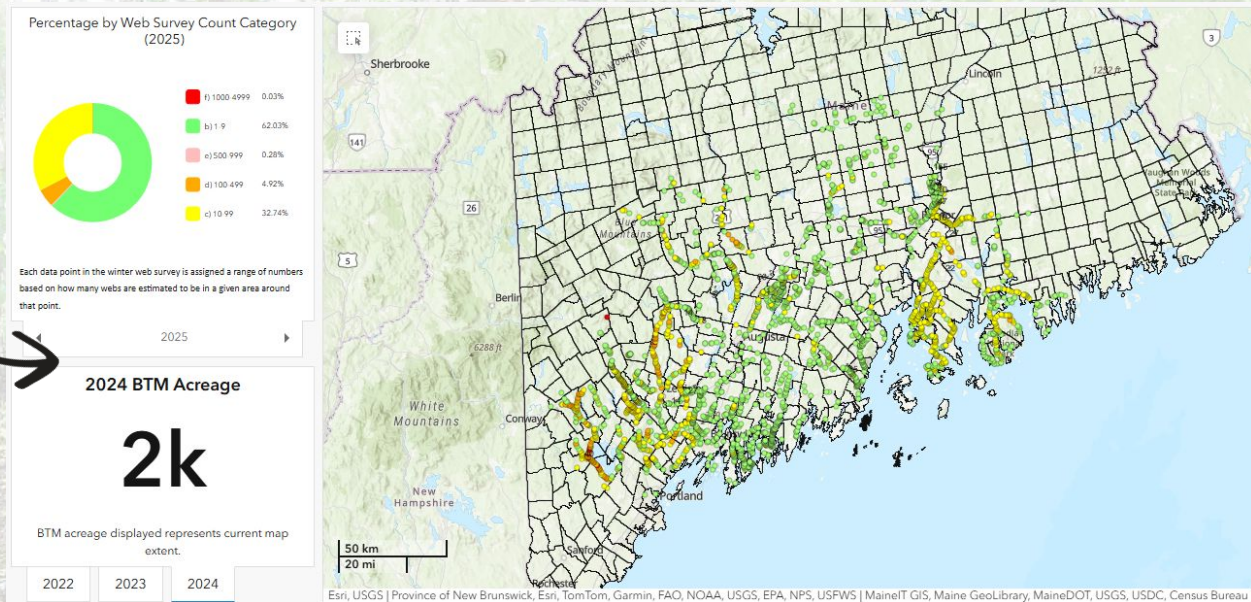
# BTM - Signs

February 19



# What can you do for your trees?

Understand where high populations are using interactive BTM map

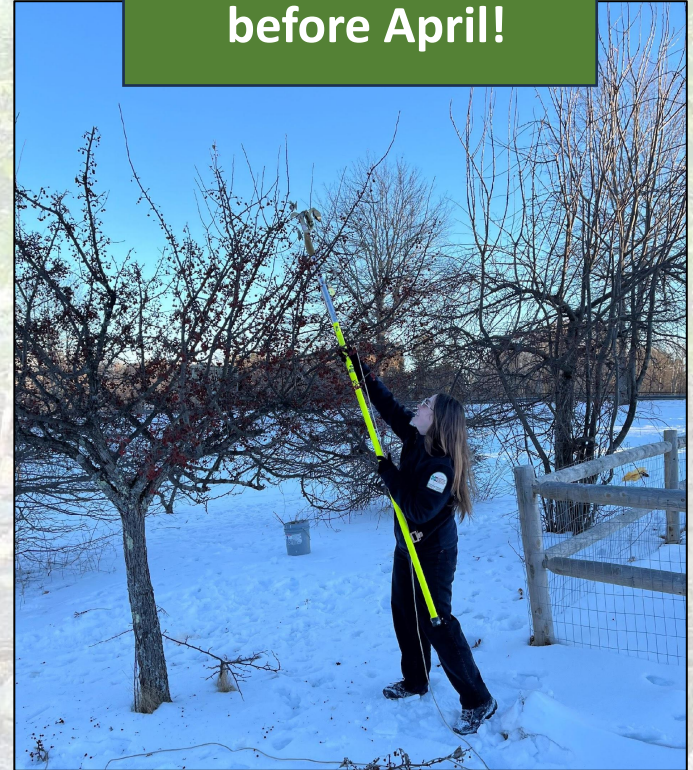


[maine.gov/dacf/knockoutbtm](https://maine.gov/dacf/knockoutbtm)

# What can you do for your trees?

- Check for winter webs in December – March
- Webs can be removed, but not realistic for forest setting
- Turn off outdoor lights in July

Remove webs  
before April!





**HEALTHY  
FORESTS**

**HEALTHY  
LAKES**

SCAN ME



**Thank You!**



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