



# Plants, worms & bugs

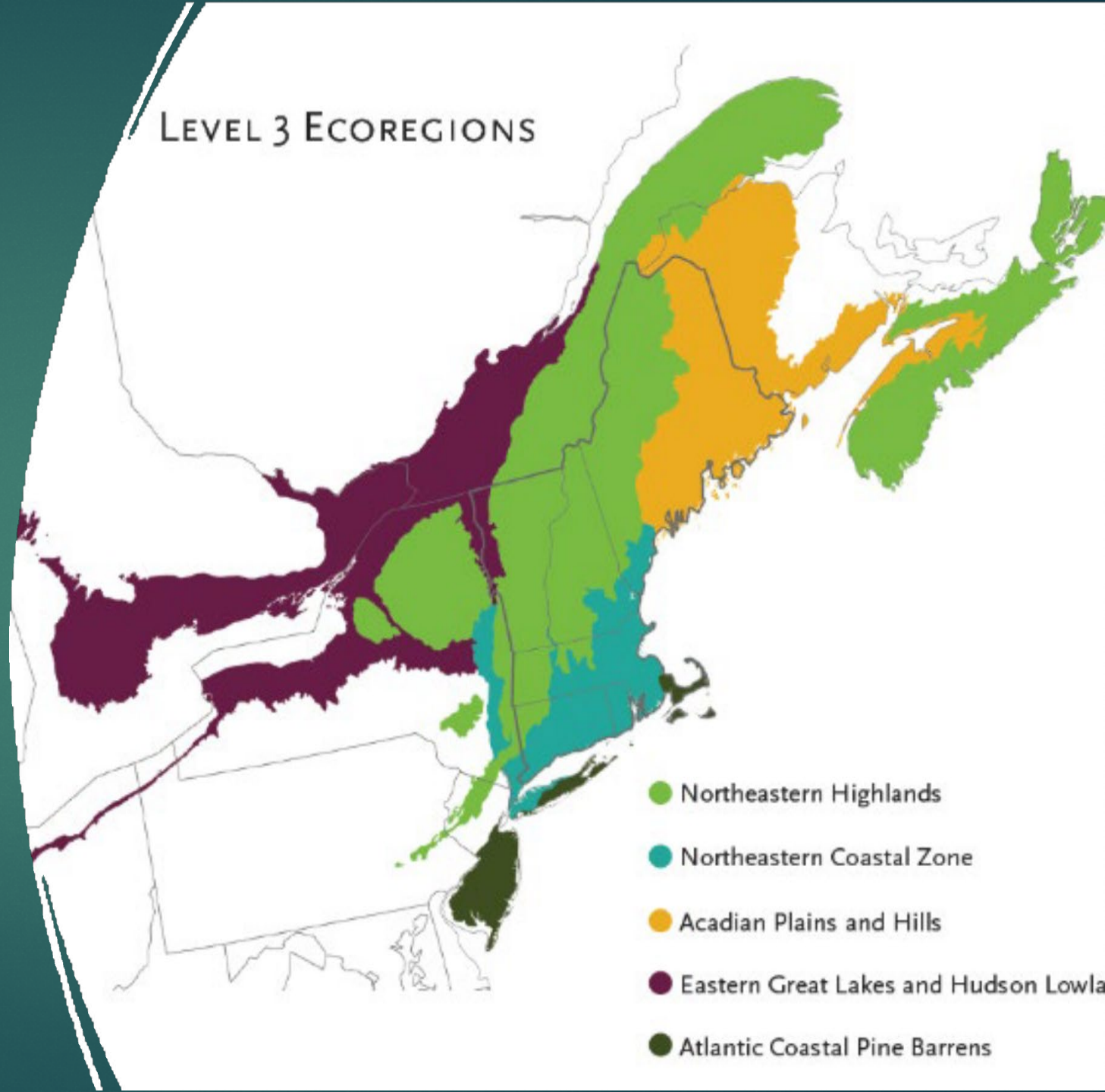
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Slowing the spread of invasive species?



# Definition

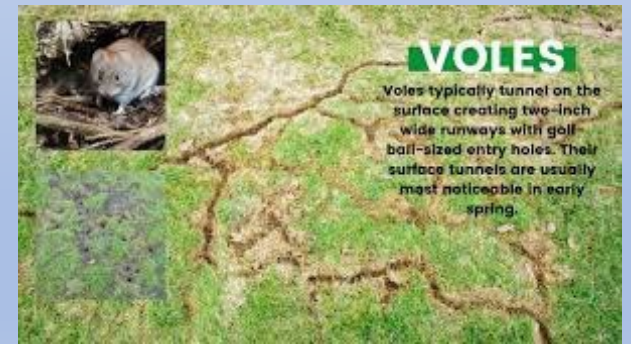
An "invasive species" is defined as a species that is non-native to the ecoregion; and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.





Native species are NOT invasive species

Native species  
are NOT  
invasive  
species





Why be concerned about  
invasive species?

Because we  
love Maine!



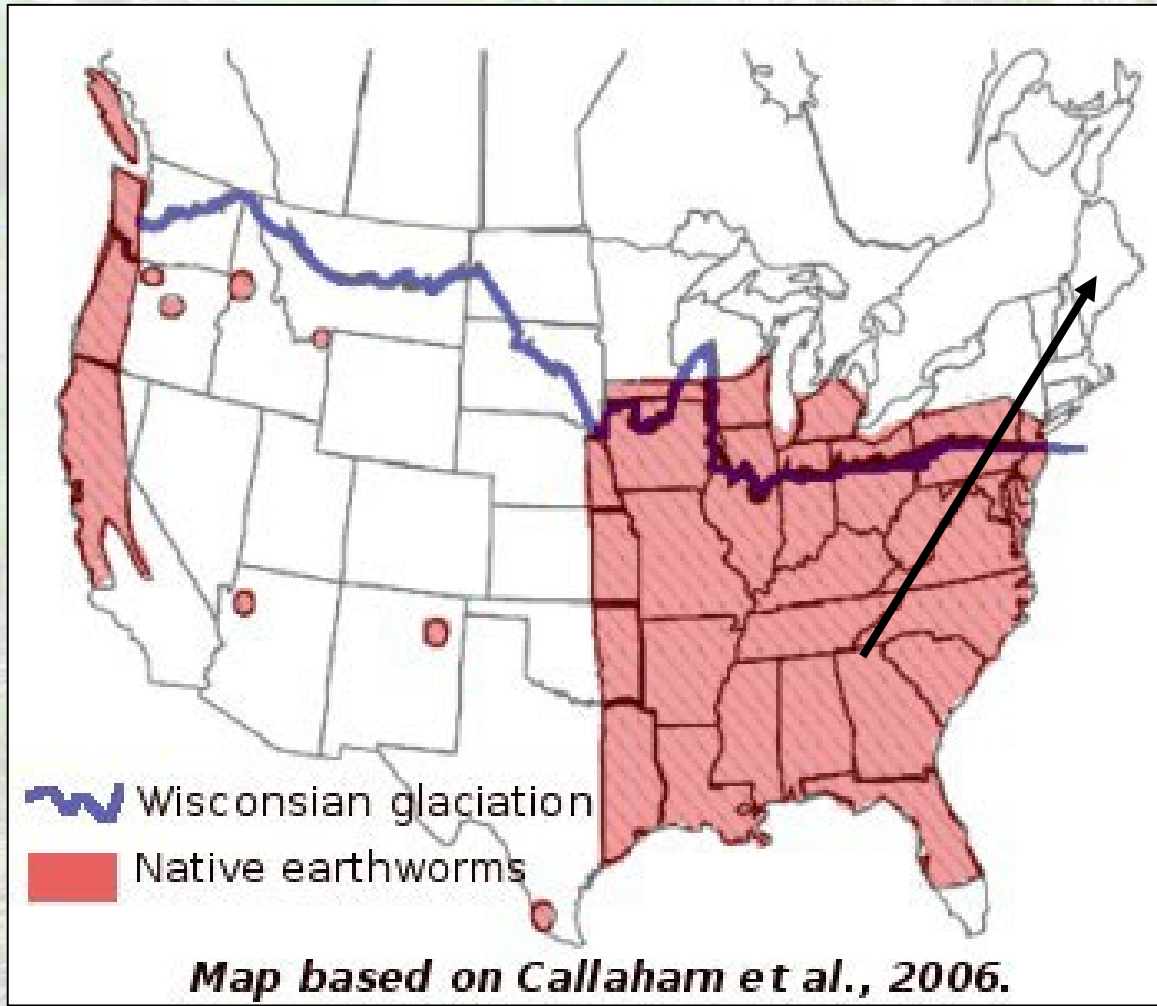
Invasive  
species don't  
fit into Maine's  
ecological  
puzzle



# CREEPY CRAWLIES

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# There are no native earthworms in Maine



- Native earthworms have expanded northward
- Introduction of invasive worms...

# What are Jumping Worms?

- 3 species in Maine
  - *Amyntas agrestis*, *Amyntas tokioensis*, and *Metophire hilgendorfi*
- AKA: Crazy Worms, Snake Worms, “Jumpers”
- Native to eastern Asia
- Non-native & invasive



Photo: Brittany Schappach, Maine Forest Service



**Amynthus tokioensis**

**Amynthus agrestis**

## **Amyntas worm spp.**

**Jumping Worm, Crazy Worm, Snake Worm, Alabama Jumper**

### **Characteristics**

- Darker in color – appearing almost gray
- Glossy smooth skin
- Light milky white clitellum smooth to the body
- Very active, thrashing and jumping
- Moves like a snake
- Sheds its tail when handled
- Parthenogenic – asexual reproduction so it only takes one worm to start a family.

# Where are Jumping Worms?



Found on the top 2 inches of soil, leaves, mulched garden beds, crop beds, shaded forests, newly disturbed areas

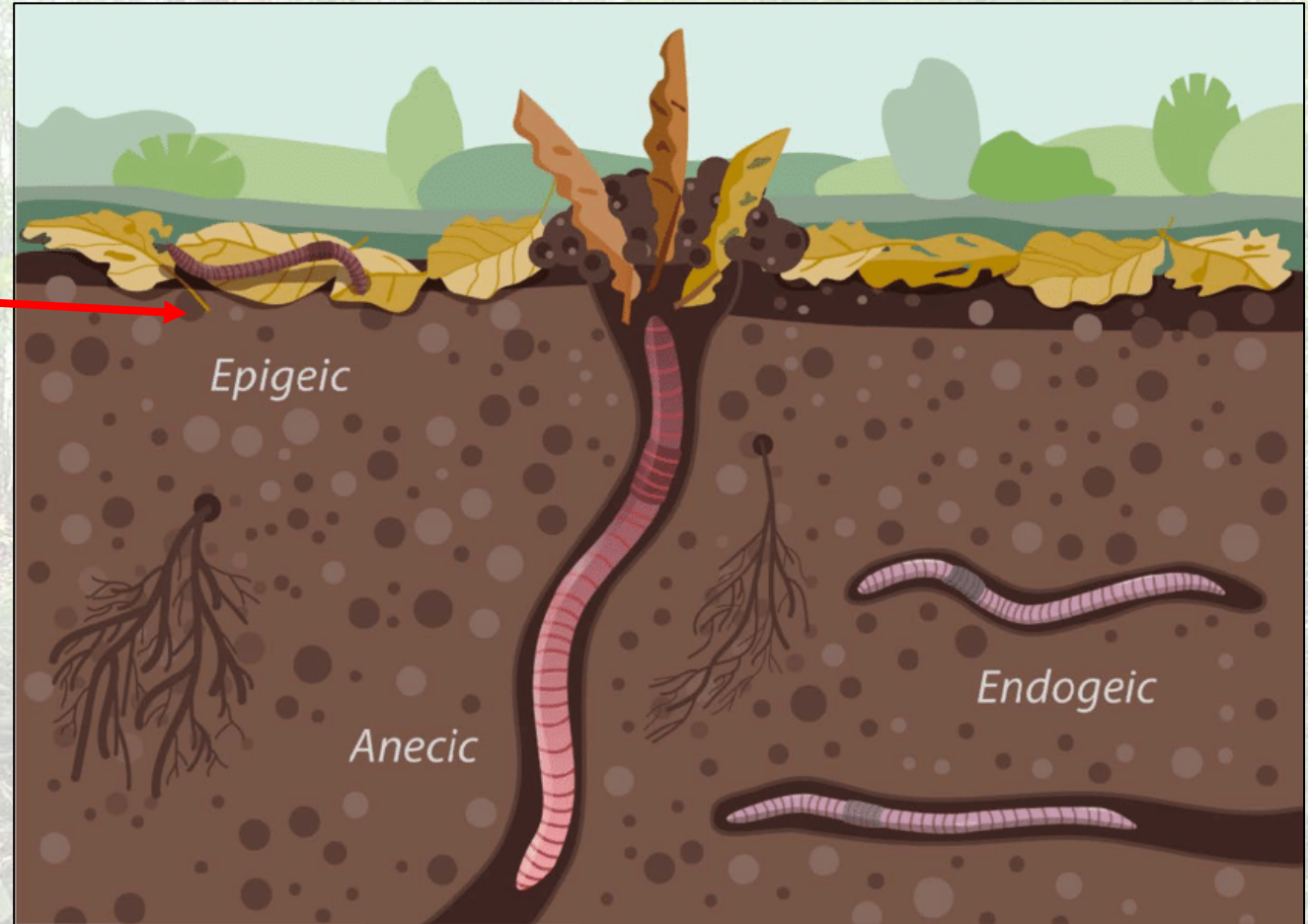
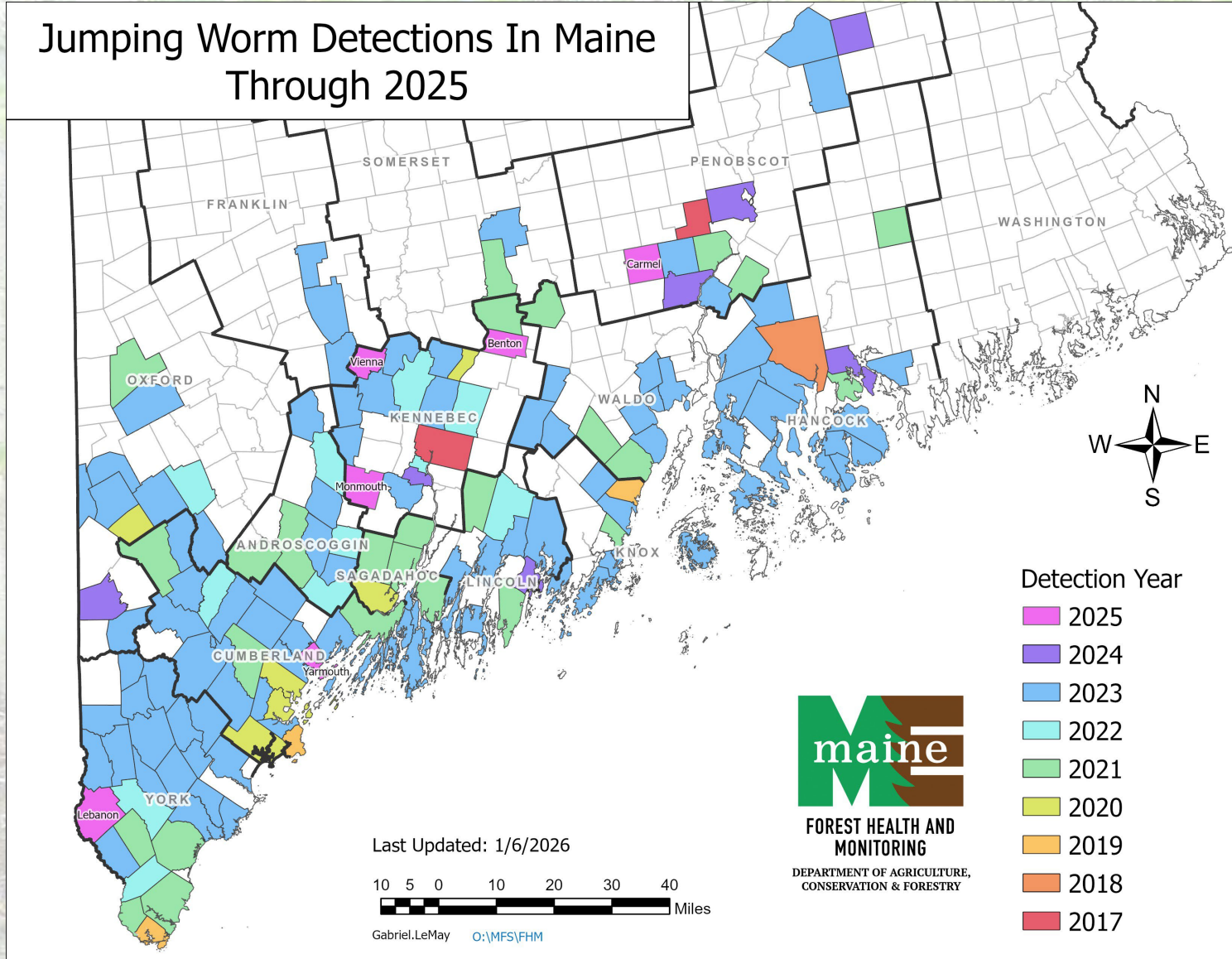
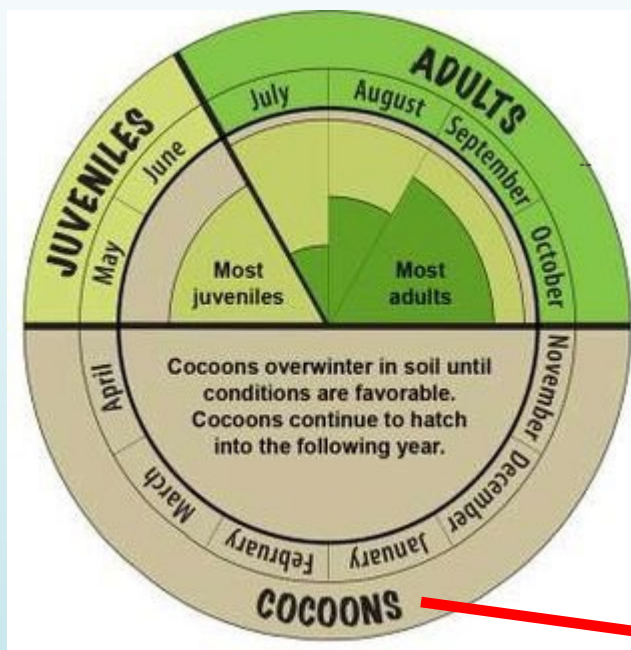


Image: Eisenhauer, N., and E. Eisenhauer. 2020. The intestines of the soil: the taxonomic and functional diversity of earthworms." DOI: 10.32942.

# 2017 - 2025 Jumping Worm Survey – Maine Confirmed Reports





# Life Cycle



# Jumping Worms – Soil ID

- Loose & dry soil
- Coffee grounds/nerds candy/  
ground beef consistency
- Tree roots may be exposed



Photo: Brittany Schappach, Maine Forest Service

# Jumping Worms – Worm ID

## 1. Check the clitellum (Aug - Oct):

- ✓ Smooth and flat
- ✓ Milky white or gray
- ✓ Fully encircles worm
- ✓ Found on segments 14-16



Photo: Brittany Schappach, Maine Forest Service



Young worms are more difficult to identify

# Jumping Worms – Worm ID

## 2. Check the setae (“hairs”)

Hair pattern can be used to ID juvenile worms with no clitellum

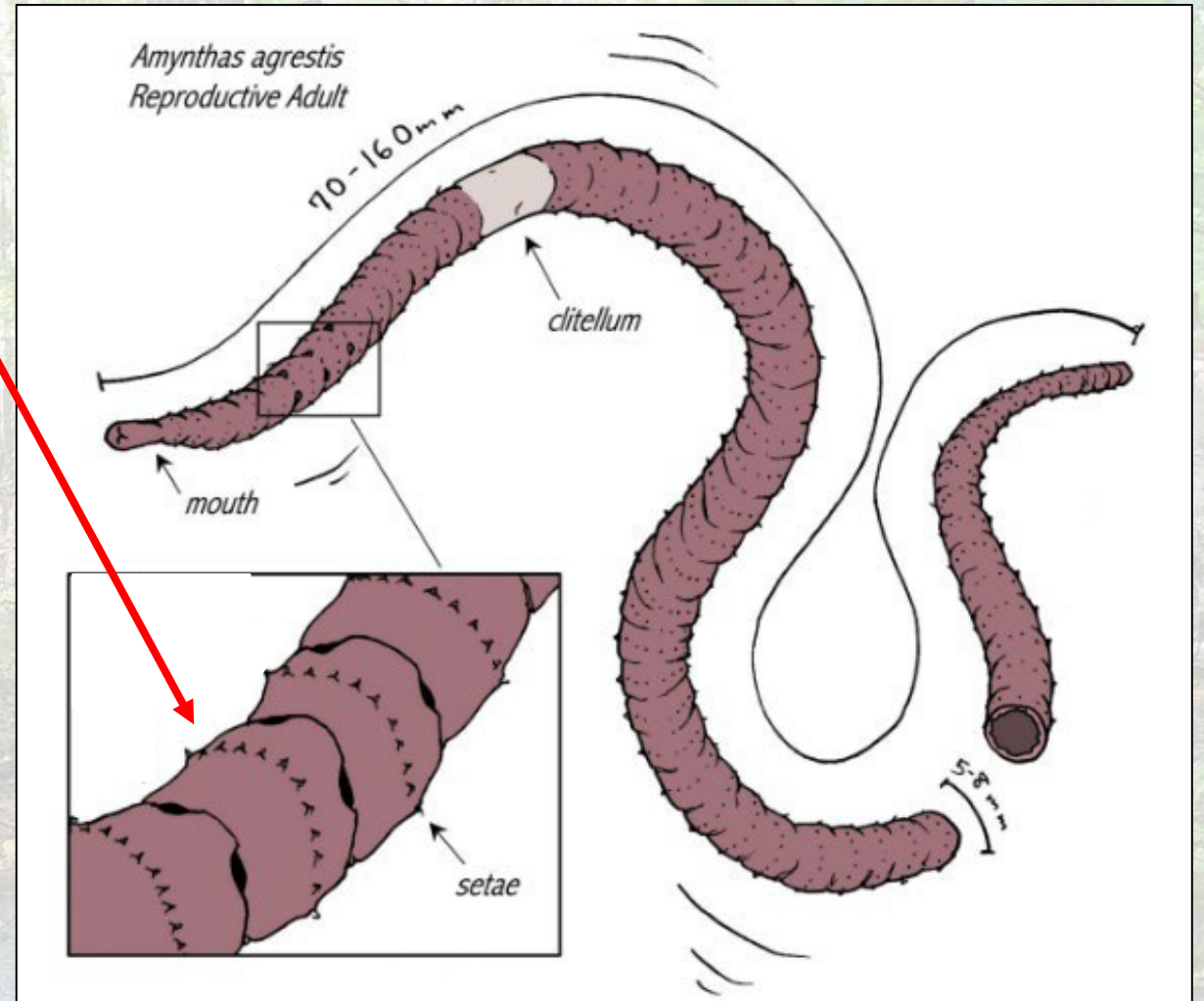
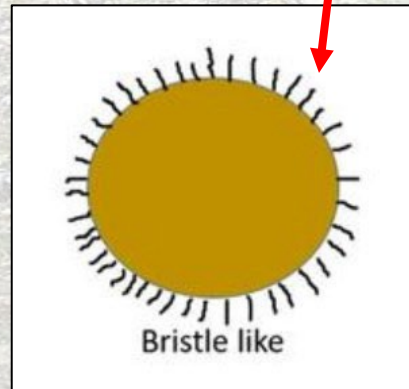


Photo: Portland State University/Oregon State University

# HOW ARE THEY SPREADING?



**Earthworms in the genus  
Amyntas soil amendments many  
which may be used in landscaping  
and horticulture.**



# What can Jumping Worms do to our forests?



- Plant diversity**
- Native plants & insects**
- Healthy tree roots**
- Leaf litter**
- Soil nutrients & moisture**
- Supported wildlife**

Photo: Wisconsin DNR

# What can Jumping Worms do to our forests?



Forest damage =



Invasive plant presence



Garlic mustard  
*Alliaria petiolata*



Japanese barberry  
*Berberis thunbergii*



Glossy buckthorn  
*Rhamnus cathartica*

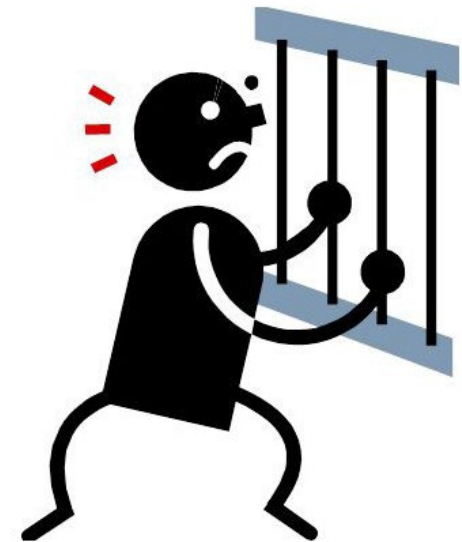
# What is Maine doing?

- Illegal to import, but not a regulated invasive species – DACF cannot take action beyond education and outreach
- Multi-agency working group cooperating with University of Massachusetts, Cornell University, University of Vermont, Yale University, and University of Minnesota
- Long term monitoring sites

# Management: Pesticides

- **There are currently no products registered for use to manage jumping worms**
- Using pesticides for pests not listed on the label is likely ineffective and may cause unintended consequences
- Research on effective products is ongoing

**THE LABEL  
IS THE LAW!**



# Prevention – Arrive clean, leave clean

- Clean soil and debris from vehicles, equipment, boots, and other gear before arriving/leaving hiking trails or forests



## GIVE INVASIVE SPECIES THE BRUSH OFF

Clean your gear before entering and before leaving the recreation site.



STOP INVASIVE SPECIES IN YOUR TRACKS.  
PlayCleanGo.org

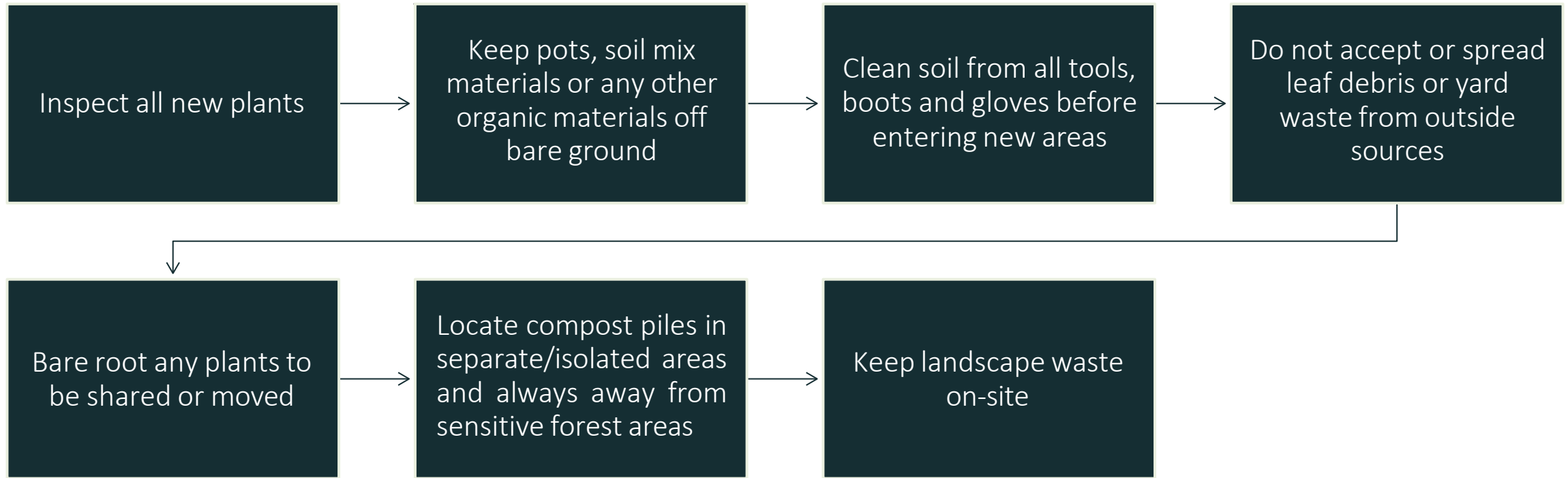




# Prevention

- **Don't** purchase jumping worms for composting, vermicomposting, gardening, or fishing bait
- **Don't** discard live worms in the wild
- **Don't** discard infested yard waste in the woods
- **Do** teach others about jumping worms

Photo: Brittany Schappach, Maine Forest Service



# BMPs to slow the spread of *Amynthas* worms



I pledge to protect our waters  
from invasive species

# Never Release Bait

I will always **DISPOSE**  
of unwanted bait  
in the trash.

EWR\_0039\_22



# Report suspected jumping worms in Maine

https://www.maine.gov/dacf/php/horticulture/jumpingworms.shtml

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Division of Animal and Plant Health

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Laws & Rules

Programs

- Agricultural Compliance
- Animal Health
- Animal Welfare
- Apiary (Bees)
- Arborist
- Board of Pesticides Control (BPC)
- Compost
- Ginseng
- Hemp

## Horticulture Program


### Jumping/Snake (Amynthas) Worms in Maine

On this page:

- [What are Amynthas Worms?](#)
- [History in Maine](#)
- [Why are Amynthas Worms a problem?](#)
- [Amynthas Worm Identification](#)
- [What can you do?](#)

### What are Amynthas Worms?

Due to our history of glaciation, there are no native earthworms in Maine. Non-native earthworms from Europe (such as nightcrawlers) have become well established here through



European nightcrawler  
Raised clitellum, further from head

### FEATURED LINKS

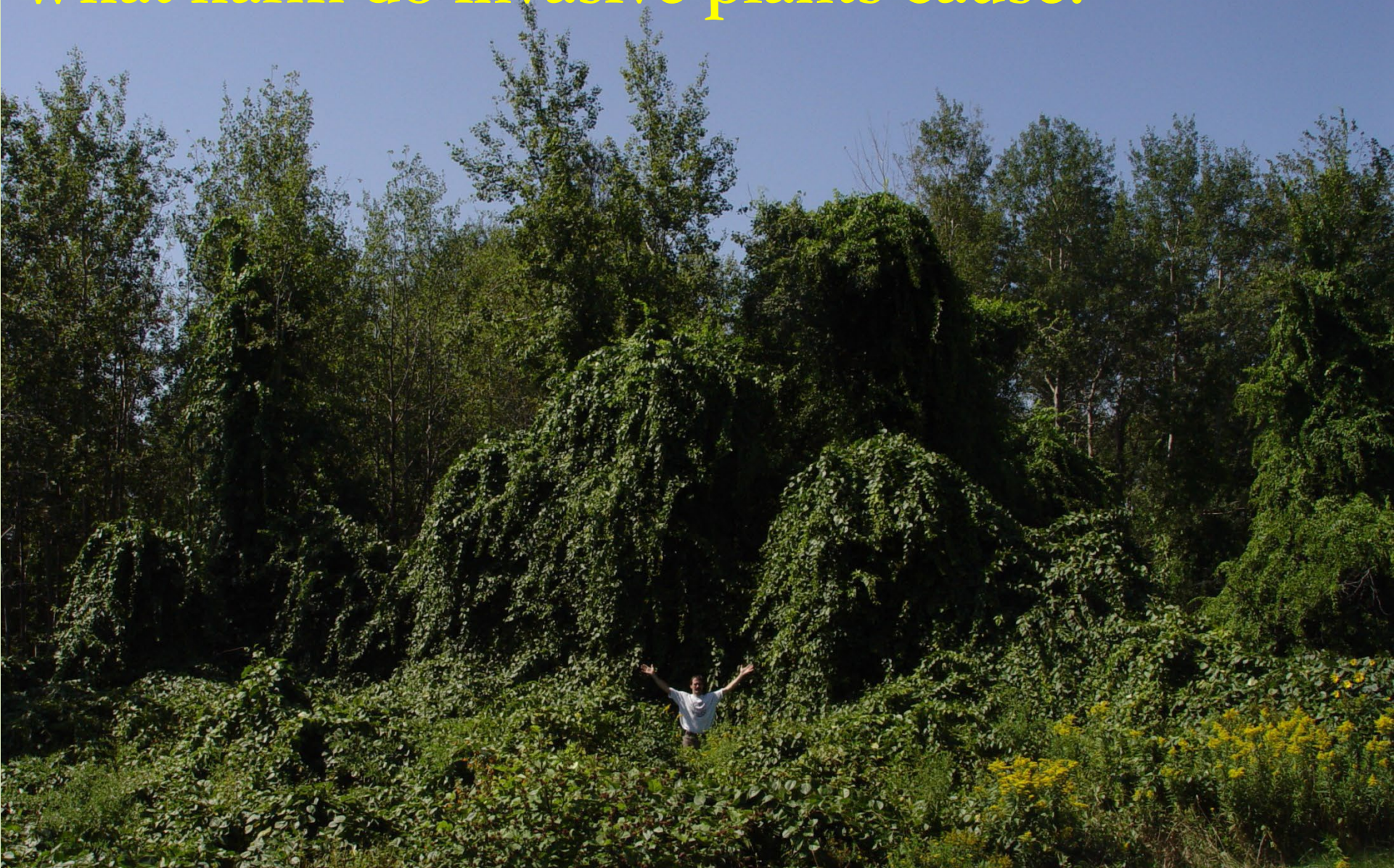
- [Jumping Worm Report Form](#)
- [2025 Jumping Worm Update \(PDF\) / Jumping Worms: A Conversation \(June 17-18, 2025\) - YouTube](#)
- [Invasive Jumping Worm Frequently Asked Questions \(UMass Extension\)](#)
- [Jumping/Crazy/Snake Worms Fact Sheet \(UMass Extension\)](#)
- [Factsheet for Homeowners](#)
- [Impacts and Implications of](#)



Terrestrial invasive plants

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# What harm do invasive plants cause?



**Out-compete native plant species, overrun habitats**

# Invasive plants can exacerbate climate change



## CLIMATE CHANGE POLICY MUST ADDRESS INVASIVE SPECIES' CAPACITY TO:



Damage ecosystem function and reduce nature-based solutions like carbon sequestration



Degrade natural and built infrastructure resilience, impacting rural and urban communities



Reduce coastal communities' resilience to storms, erosion, flooding, and biodiversity loss



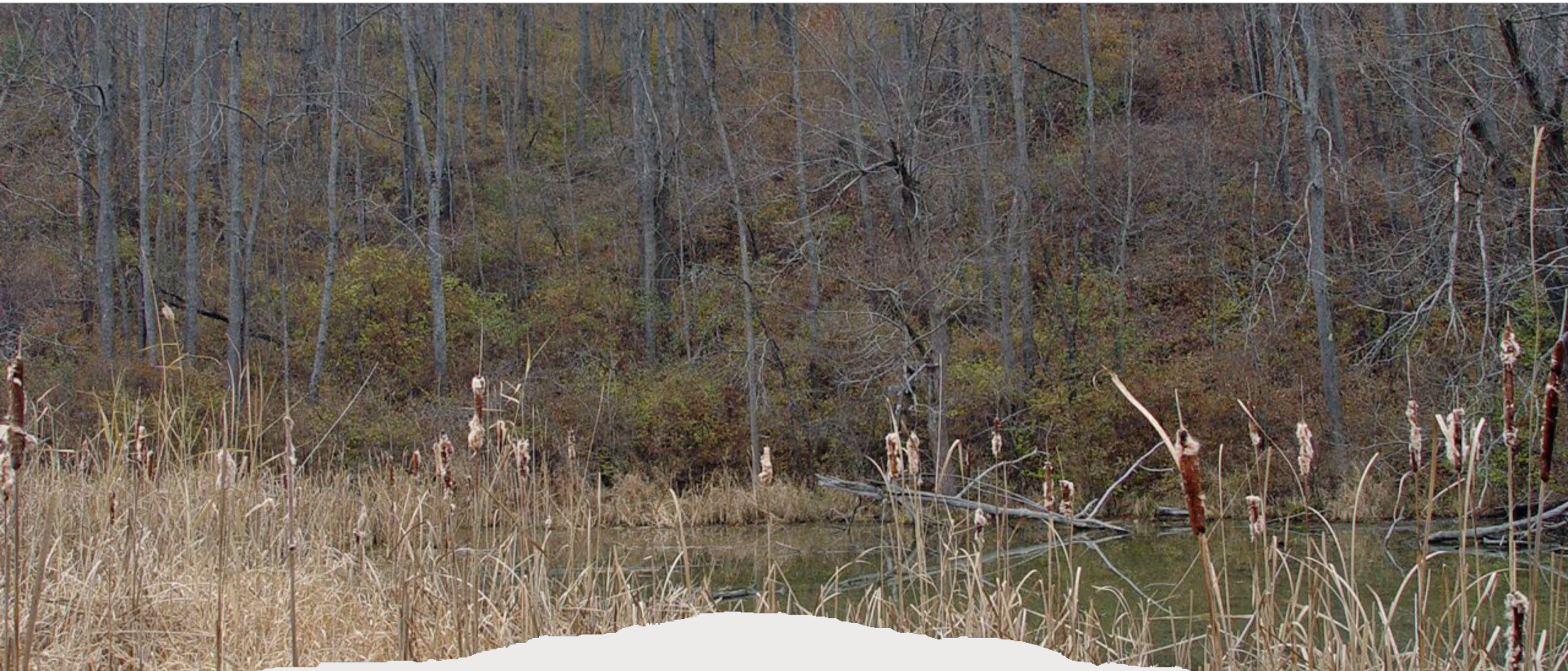
Imperil Indigenous cultural practices, food security, and ways of life



Threaten island sustainability, human health, food systems, and transitional practices



**Damage or kill plants  
directly or indirectly**



**Displace native trees, shrubs, and wildflowers**

**Alter wildlife  
habitat &  
prevent forest  
regeneration**



# Harm food webs that depend on native plants

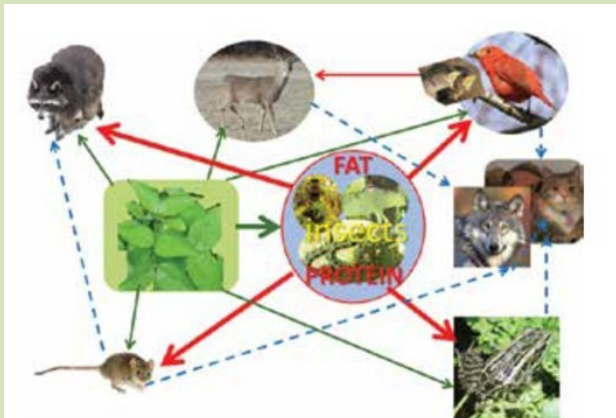
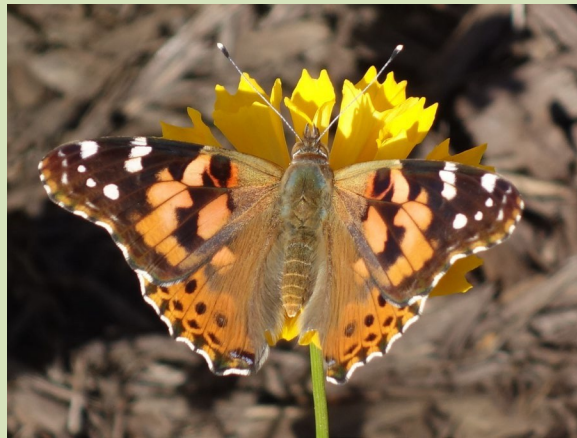


Figure 4. A simple food web showing the importance of insects in transforming plant material into food for many other animals.



Figure from Jordan 2014, Novel ecosystems, invasion and the forgotten food web, Quarterly Newsletter of the Long Island Botanical Society, Spring edition.

# WHAT CAN WE DO ABOUT INVASIVE SPECIES?

## Key steps in addressing invasive species

- Prevent new introductions
- Identify, assess,
- Report ([horticulture@maine.gov](mailto:horticulture@maine.gov)) ([iMapInvasives.org](http://iMapInvasives.org))
- Prioritize
- Control
- Monitor
- (repeat)



# Identification of invasive plants

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- Plant ID requires practice
- Go outside, look at plants
- Use the MNAP field guide
- Use the GoBotany website to look at photos



# Maine Invasive Plants Field Guide



The cover of the 'Maine Invasive Plants Field Guide' features a green background with a white title. It includes four photographs: a tall, thin plant on the left, a dense patch of white flowers in the top right, a close-up of green leaves in the bottom left, and a field of purple flowers in the bottom right.

**Maine Invasive Plants Field Guide**

Maine Natural Areas Program  
Department of Agriculture, Conservation and Forestry

## GOUTWEED

(Bishop's weed)

*Aegopodium podagraria*

Status in Maine: widespread

SEVERELY  
INVASIVE



**Description:** Herbaceous, perennial ground cover, 1-2' tall, with many common names. **Leaves:** Compound with variable triternate leaflets; pointed leaflets have serrate margins. Most leaves are basal with long petioles. Wild type is a medium green color while the variegated form is pale bluish green with white margins. **Flowers/seeds:** Typical carrot family flowers; 2-5" diameter umbels of tiny white flowers atop 2-3" stalk. Plants require at least partial sun to flower. Seeds are brown, small and flat. **Roots:** Fleshy long white rhizomes, like quackgrass (*Elymus repens*).

**Native range:** Europe & Northern Asia. **How arrived in U.S.:** As an ornamental.

**Reproduction:** While research shows that goutweed's insect pollinated flowers can produce viable seed, seedlings are rarely encountered. Its branching network of rhizomes allows it to grow aggressively away from plantings or colonize a new site via contaminated soil.

**Habitat:** Moist soil and light shade are preferred garden spots, but goutweed is content in many habitats. It typically enters forests from runaway plantings or via fill contaminated with rhizome fragments.

**Similar native species:** Golden alexanders (*Zizia aurea*) has somewhat similarly shaped leaves but yellow flowers. Anisewood and sweet-wicely (*Osmorhiza* spp.) also have somewhat similarly shaped leaves but are anise-scented.

herbs & grasses



- Essential ID and control information
- 46 species
- Waterproof, small
- \$30 including S&H
- Visit MNAP website to order
- Read the “Managing Invasive Plants” section in the back!

# Chapter 273 - Criteria for Evaluating Terrestrial Plant Species

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- In order to include a plant on a list of invasive terrestrial plant species administered by the Maine Department of Agriculture, Conservation, and Forestry, ALL the following criteria must be met:
  - Be non-native to Maine, and
  - Have the potential for rapid growth, dissemination, and establishment in minimally managed habitats, and
  - Have the biological potential for widespread dispersion and for dispersing over spatial gaps, and
  - Have the biological potential for existing in high numbers or large colonies in minimally managed habitats, and
  - Have the potential to displace native species in minimally managed habitats.

# Invasive Plants Prohibited from Sale or Import in Maine What you need to Know



CMR 01-001 Chapter 273: Criteria for Listing Invasive Terrestrial Plants makes it illegal to sell, import, export, buy or intentionally propagate for sale the 33 plant species listed below.

<i>Acer ginnala</i> (amur maple)	<i>Impatiens glandulifera</i> (ornamental jewelweed)
<i>Acer platanoides</i> (Norway maple)	<i>Iris pseudacorus</i> (yellow iris)
<i>Aegopodium podagraria</i> (bishop's weed)	<i>Ligustrum vulgare</i> (common privet)
<i>Ailanthus altissima</i> (tree of heaven)	<i>Lonicera japonica</i> (Japanese honeysuckle)
<i>Alliaria petiolata</i> (garlic mustard)	<i>Lonicera maackii</i> (amur or bush honeysuckle)
<i>Amorpha fruticosa</i> (false indigo bush)	<i>Lonicera morrowii</i> (Morrow's honeysuckle)
<i>Ampelopsis glandulosa</i> (porcelain berry)	<i>Lonicera tatarica</i> (Tatarian honeysuckle)
<i>Artemisia vulgaris</i> (common mugwort)	<i>Lythrum salicaria</i> (purple loosestrife)
<i>Berberis thunbergii</i> (Japanese barberry)	<i>Microstegium vimineum</i> (Japanese stilt grass)
<i>Berberis vulgaris</i> (common barberry)	<i>Paulownia tomentosa</i> (paulownia, princess tree)
<i>Celastrus orbiculatus</i> (Asiatic bittersweet)	<i>Pericaria perfoliata</i> (mile-a-minute)
<i>Elaeagnus umbellata</i> (Autumn olive)	<i>Phellodendron amurense</i> (amur cork tree)
<i>Euonymus alatus</i> (winged euonymus)	<i>Populus alba</i> (white cottonwood)
<i>Euphorbia cyparissias</i> (cypress spurge)	<i>Robinia pseudoacacia</i> (black locust)
<i>Fallopia baldschuanica</i> (Chinese bindweed)	<i>Rosa multiflora</i> (multiflora rose)
<i>Fallopia japonica</i> (Japanese knotweed)	
<i>Frangula alnus</i> (glossy buckthorn)	
<i>Hesperis matronalis</i> (dame's rocket)	

## Quick Facts

- The sale/import ban includes the listed species and all cultivars, varieties and hybrids.
- Variations may be applied for and granted for scientific research and for varieties, cultivars or hybrids that have been shown to not be invasive through peer reviewed scientific research.
- The invasive plant rule and included prohibited plant list will be reviewed every 5 years.
- Recent changes to the rule will prohibit the sale of an additional 30 species starting January 1, 2024 (see back).
- Find more information at [www.maine.gov/dacf/plphorticulture/ma-sic-plants.shtml](http://www.maine.gov/dacf/plphorticulture/ma-sic-plants.shtml)



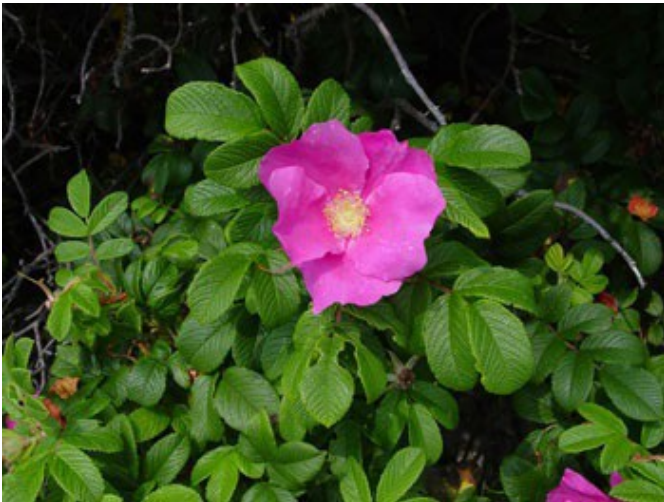
**FOR MORE INFORMATION:**  
MAINE DEPARTMENT OF AGRICULTURE,  
CONSERVATION AND FORESTRY  
DIVISION OF ANIMAL AND PLANT HEALTH  
28 STATE HOUSE STATION  
AUGUSTA, ME 04333  
207-287-3891  
[HORTICULTURE@MAINE.GOV](mailto:HORTICULTURE@MAINE.GOV)  
[WWW.MAINE.GOV/HORT](http://WWW.MAINE.GOV/HORT)

Scientific name	Common name	Effective Date
<i>Alnus glutinosa</i>	European alder	1/1/2024
<i>Angelica sylvestris</i>	Woodland angelica	1/1/2024
<i>Anthriscus sylvestris</i>	Wild chervil, raven's wing	1/1/2024
<i>Aralia elata</i>	Japanese angelica tree	1/1/2024
<i>Butomus umbellatus</i>	Flowering rush	1/1/2024
<i>Elaeagnus angustifolia</i>	Russian olive	1/1/2024
<i>Euonymus fortunei</i>	Wintercreeper, climbing spindle tree	1/1/2024
<i>Festuca filiformis</i>	Fine-leaved sheep fescue	1/1/2024
<i>Ficaria verna</i>	Lesser celandine	1/1/2024
<i>Glaucium flavum</i>	Yellow hornpoppy	1/1/2024
<i>Glechoma hederacea</i>	Ground ivy, creeping charlie	1/1/2024
<i>Glyceria maxima</i>	Great manna grass, reed manna grass	1/1/2024
<i>Hippophae rhamnoides</i>	Sea buckthorn	1/1/2024
<i>Ligustrum obtusifolium</i>	Border privet	1/1/2024
<i>Lonicera xylosteum</i>	Dwarf honeysuckle	1/1/2024
<i>Lythrum virgatum</i>	European wand loosestrife	1/1/2024
<i>Miscanthus sacchariflorus</i>	Amur silvergrass	1/1/2024
<i>Petasites japonicus</i>	Fuki, butterbur, giant butterbur	1/1/2024
<i>Phalaris arundinacea</i>	Reed canary grass, variegated ribbon grass	1/1/2024
<i>Photinia villosa</i>	Photinia, Christmas berry	1/1/2024
<i>Phragmites australis</i>	Common reed	1/1/2024
<i>Phyllostachys aurea</i>	Golden bamboo	1/1/2024
<i>Phyllostachys aureosulcata</i>	Yellow groove bamboo	1/1/2024
<i>Pyrus calleryana</i>	Callery ("Bradford") pear	1/1/2024
<i>Ranunculus repens</i>	Creeping buttercup	1/1/2024
<i>Rubus phoenicolasius</i>	Wineberry	1/1/2024
<i>Silphium perfoliatum</i>	Cup plant	1/1/2024
<i>Sorbus aucuparia</i>	European mountain-ash	1/1/2024
<i>Tussilago farfara</i>	Coltsfoot	1/1/2024
<i>Valeriana officinalis</i>	Common valerian	1/1/2024

## Invasive Terrestrial Plant Species of Special Concern

Scientific Name	Common Name
<i>Rosa rugosa</i>	Rugosa rose, beach rose

# Rosa rugosa - invasive species of special concern starting 1/1/2024



1. Must provide signage or plant tags (next slide)
  - A. The plant vendor must provide species specific guidance at the time of sale to notify the purchaser about the invasive potential of the species and what habitat types to avoid when installing the plant.
  - B. No person selling or offering for sale an invasive terrestrial plant species of special concern shall conceal, detach, alter, deface, or destroy any label, sign, or notice required under this section.

# New requirements for *Rosa rugosa*

*Rosa rugosa*  
**Invasive Species—Harmful to the Environment**  
Do not plant in coastal environments, especially on or near sand dunes.  
**Alternatives:** Virginia rose, bayberry, sweet fern, red chokeberry, beach plum and sand cherry.

*Rosa rugosa*  
**Invasive Species – Harmful to the Environment**  
  
**Ask About Alternative Plants**  
  
**Follow Species Specific Instructions Provided by the Vendor**  
  
Protect native species; do not plant in coastal areas, especially on or near sand dunes.  
**Alternative plants include:** virginia rose and other roses, bayberry, sweet fern, red chokeberry, beach plum and sand cherry.

*Rosa rugosa*  
**Invasive Species—Harmful to the Environment**  
Do not plant in coastal environments, especially on or near sand dunes.  
**Alternatives:** Virginia rose, bayberry, sweet fern, red chokeberry, beach plum and sand cherry.

## Plants on the “Watch List”

- ▶ Hardy kiwi
- ▶ Chocolate vine
- ▶ Italian arum
- ▶ Paper mulberry
- ▶ Butterfly bush
- ▶ Sweet autumn
- ▶ Indian yam
- ▶ Chinese yam
- ▶ Weeping lovegrass
- ▶ Queen of the meadow
- ▶ Two-colored bush clover
- ▶ California privet
- ▶ Honeyberry
- ▶ Ragged robin
- ▶ White mulberry
- ▶ Sawtooth oak

## Plants on the “Watch List”

- ▶ Rosa rugosa
- ▶ Hardy pampas grass
- ▶ Sticky sage
- ▶ Milk thistle
- ▶ Japanese spiraea
- ▶ Sapphire-berry
- ▶ Japanese tree lilac
- ▶ Chinese cedar
- ▶ Siberian elm
- ▶ Linden arrowwood
- ▶ Siebold viburnum
- ▶ Japanese wisteria
- ▶ Chinese wisteria

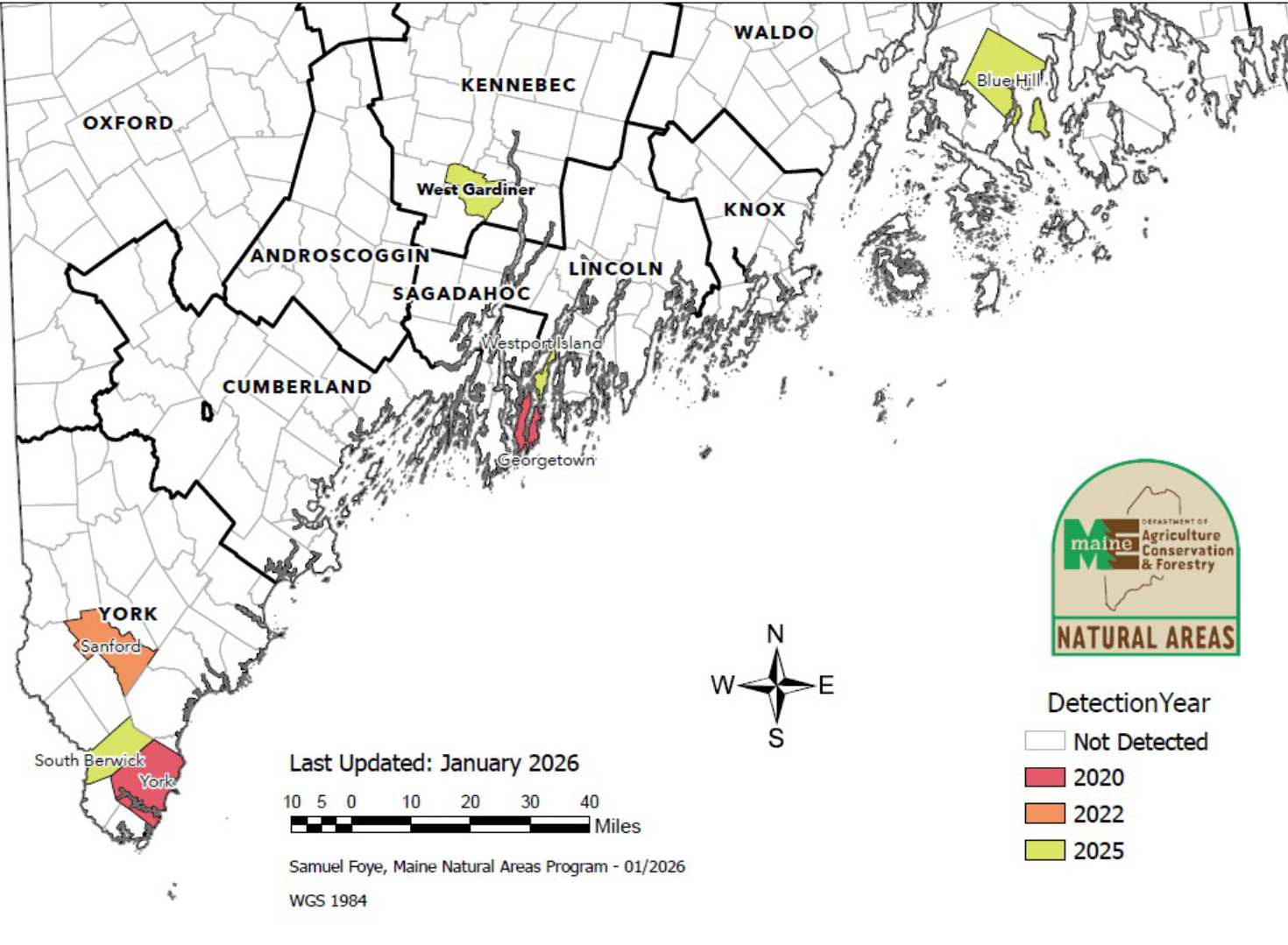
## STILTGRASS (*MICROSTEGIUM VIMINIUM*)

- Found at York county nursery and two Georgetown properties
- Be on the lookout for dense patches of unfamiliar grass
- Built up thatch is fire risk
- Crowds out natives



# Stiltgrass

## Japanese Stiltgrass Detections in Maine Through 2026



- 7 Towns infested
- Found in Forests

# Invasive Stiltgrass

*Microstegium vimineum*



# Have you seen this plant?



Invasive stiltgrass (*Microstegium vimineum*) is a highly invasive annual weed that causes ecological and economic harm by forming a thick thatch layer that makes it difficult for native trees, shrubs and wildflower seeds to establish and grow. The presence of invasive stiltgrass in a forest may also increase fire risk.

Please help us find this Early Detection, Rapid Response plant in Maine. **You can help!** If you suspect invasive stiltgrass, **note the location** and **send a photo** to [invasives.mnap@maine.gov](mailto:invasives.mnap@maine.gov). Look for these characteristics:

1. 2-4" long leaves that are ½" wide and alternate along the stem.
2. Upper leaf surface has a stripe of reflective hairs along the mid-rib.
3. Leaf edges that feel smooth to the touch. Unlike some native grasses that have stiff hairs that make the leaf edges feel rough or sticky.
4. Plants that flower and set seed late in the season (September-October), much later than many other grasses. Seed spikes are similar to crabgrass.
5. Stems may develop a reddish tint late in the season.



# MILE-A-MINUTE VINE (*Persicaria perfoliata*)

- Not yet established in Maine
- Several reports/interceptions in 2023
- Climbing/sprawling annual vine
- Can grow 6" in one day
- Produces seeds June-Sept
  - Be vigilant in cutting back
- Seeds viable up to 6yrs
- Lots of look-a-likes

Photo credit: Richard Gardner, Bugwood.org

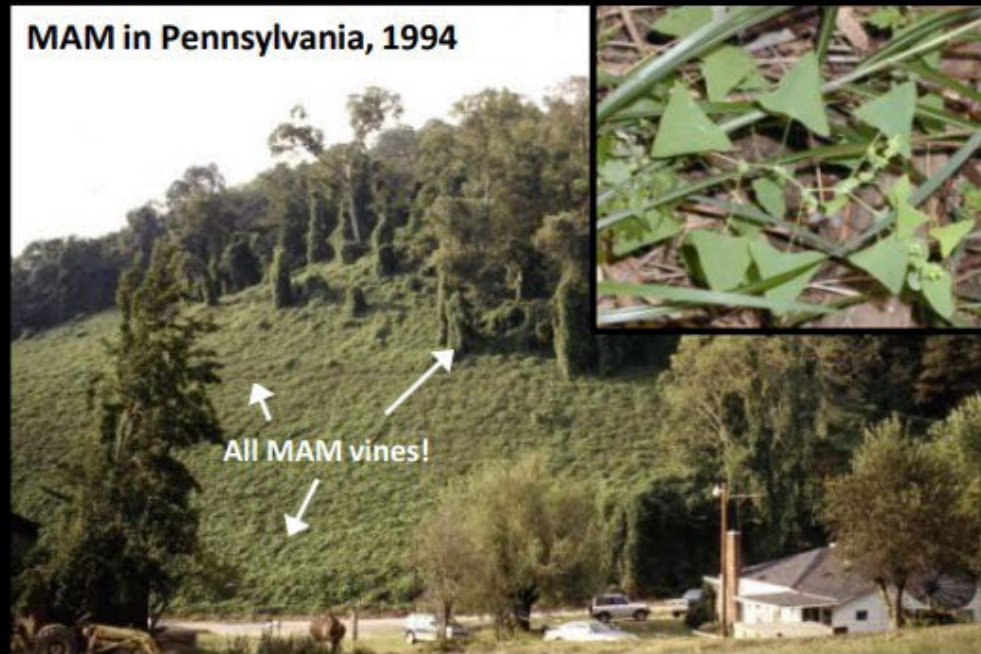
# Mile-a-minute Vine (MAM)

*Persicaria perfoliata*

1. Triangular leaves- no lobes or indentations



MAM in Pennsylvania, 1994



2. Small barbs along stems



3. Saucer-shaped leaves (called ocrea) at nodes

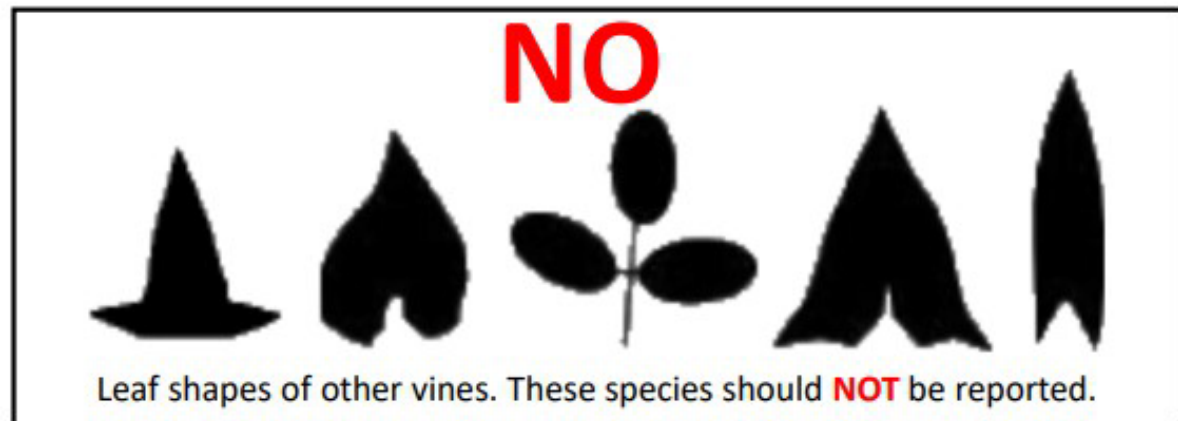


# Have you seen this plant?



Mile-a-minute vine (*Persicaria perfoliata*) is a highly invasive annual weed that causes ecological and economic harm by out competing and overgrowing native species. A single mile-a-minute vine can grow up to 6 inches per day and will climb trees and posts and scramble over other vegetation.

Please help us find this Early Detection, Rapid Response plant in Maine. **You can help!** If you see a vine with **all three** of these characteristics (1) very triangular leaves, (2) very sharp barbs on the stem, and (3) clasping ocrea, **note the location** and **send a photo** to [invasives.mnap@maine.gov](mailto:invasives.mnap@maine.gov).



*Photos & thanks to Todd Mervosh, Les Mehrhoff, Hope Leeson, Judy Hough-Goldstein, Renee Sullivan & the CT Invasive Plant Working Group*

# MILE-A-MINUTE LOOK-A-LIKES

**Tearthumbs** are closely related to Mile-a-Minute vine. Many have prickles on the stem, but their leaves are longer, less triangular, and often lobed at the base. There are many species, most lack the clasping bract. Top photos of **Halberd-leaved Tearthumb**, bottom photos of **Arrow-leaved Tearthumb**.



Photos: Bruce Patterson | Glen Mittelhauser | Arthur Haines | Arieh Tal

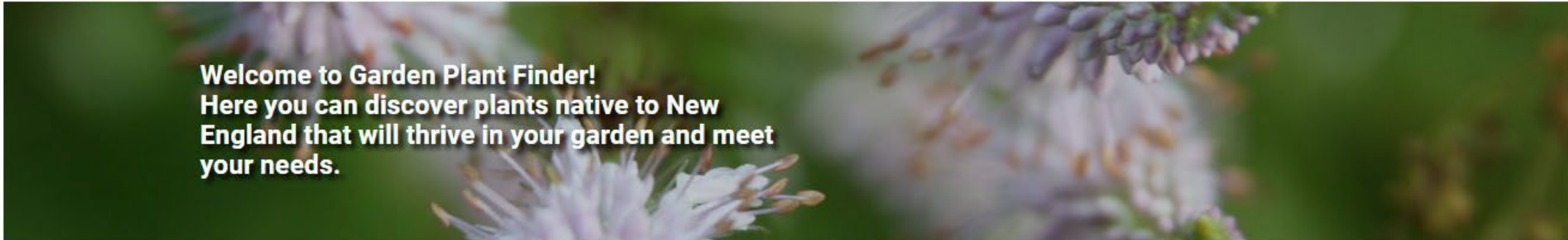


[https://www.maine.gov/dacf/mnap/features/invasive\\_plants/mile-a-minute.pdf](https://www.maine.gov/dacf/mnap/features/invasive_plants/mile-a-minute.pdf)

**Fringed Bindweed**, **Climbing Bindweed**, and **Black Bindweed** are similar vining plants in the genus *Fallopia*. The first two are native, though Black Bindweed is non-native and weedy. These three species have nodes along their stems and superficially resemble each other. The nodes are fringed in Fringed Bindweed but not the other two. Keels on flower petals and fruit texture distinguish the other two species.



Fringed Bindweed (left and right above): Don Cameron | Frank Bramley



**Additional Information**

- About Ecoregions, Cultivars and More

Search for plants by name using "quick search," or narrow your results based on plant type, flower color, New England Level 3 ecoregion, exposure, moisture, bloom season, and even cultivation status. Specify whether to show results that meet *all* or *any* of your search criteria by toggling the box at the bottom of the page. You can also use our search tool to access information about the full range of plants sold at Garden in the Woods and Nasami Farm.

Check out our [Important Definitions](#) page to learn more about ecoregions, cultivation status, and why certain plants are included in this database.

<https://plantfinder.nativeplanttrust.org/Plant-Search>

# Many great plant choice sources today

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## Where to Buy Native Plants

The native plant movement is gaining traction in much of the U.S. — and that is fantastic! It can still be difficult, though, to source local native plants and seeds; so to help, we've carefully curated the following directory of where to buy northeastern native plants by state, including:

- Wholesale and retail nurseries that specialize in or include a wide selection of native plants
- Native plant sales hosted by nonprofits and co-ops annually or seasonally

While we include the highest quality plant nurseries in this directory, it is still important that you do your own research to find out what native plants are in stock, if the plants are grown from seed, and if the nurseries use



Where to buy native plants

# Where to buy & learn more

## Maine Native Plant Sources

[Androscoggin Valley Soil & Water District](#)

[Bas Rouge Farm & Forge](#)

[Crystal Lake Farm & Nursery](#)

[Eastfield Native Plants](#)

[Edgewood Nursery](#)

[Ellsworth Garden Club](#)

[Fedco Trees](#)

[Fernwood](#)

[Figwort Farm](#)

[Flora Maine Native Plants + Gardens](#)

[Honey Petal Plants](#)

[Knox-Lincoln Soil and Water Conservation](#)

[District](#)

[Maine Audubon](#)

[Marpa Farm & Nursery](#)

[Native Gardens of Blue Hill](#)

[Native Haunts](#)

[Northern Bay Organics](#)

[Pierson Nurseries](#)

[Radical Roots Nursery](#)

[Rebel Hill Farm](#)

[Ripley Farm](#)

[Rooted Elements](#)

[Sweetfern Maine](#)

[5 Star Orchard](#)

[Wells Reserve at Laudholm](#)

[Whaleback Nursery](#)

## Internet Native Plant Sources

[Prairie Moon Nursery](#)

[NorthCreek Nurseries](#)

[Blue Stem Natives](#)



# Tree, Forest & Agricultural Insects and Diseases





# Beech Leaf Disease – a newer concern



## BEECH LEAF DISEASE

- First reported in OH, 2012
- American, European, and Oriental beech are susceptible



- Perhaps caused by a foliar nematode, *Litylenchus crenatae*



**BLD leaf**



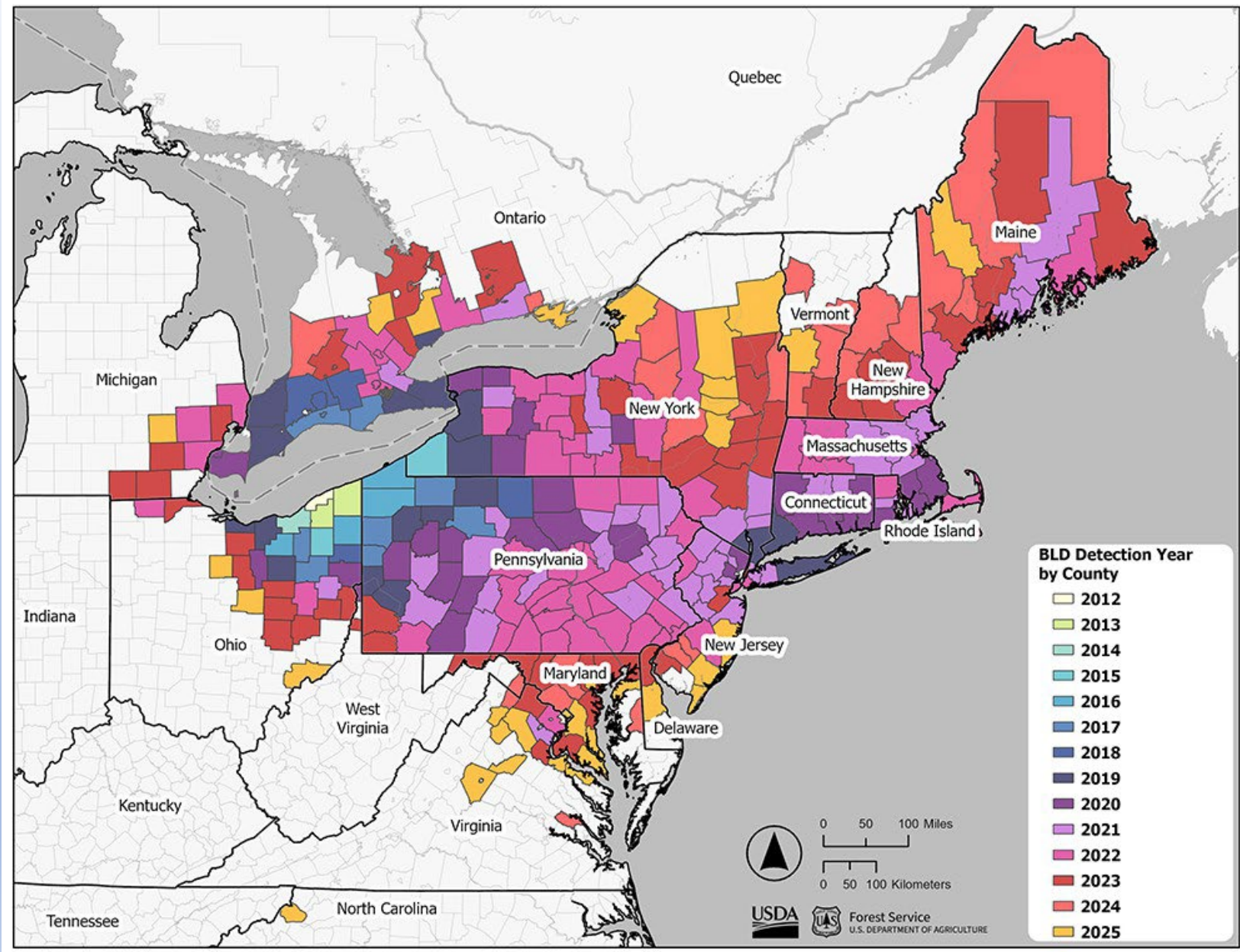
Late summer - fall season

Nematodes collected from 10-15 BLD leaves



Nematode-wool: typical agglomeration of nematodes within this family

Fast spread –  
Likely carried  
by storms

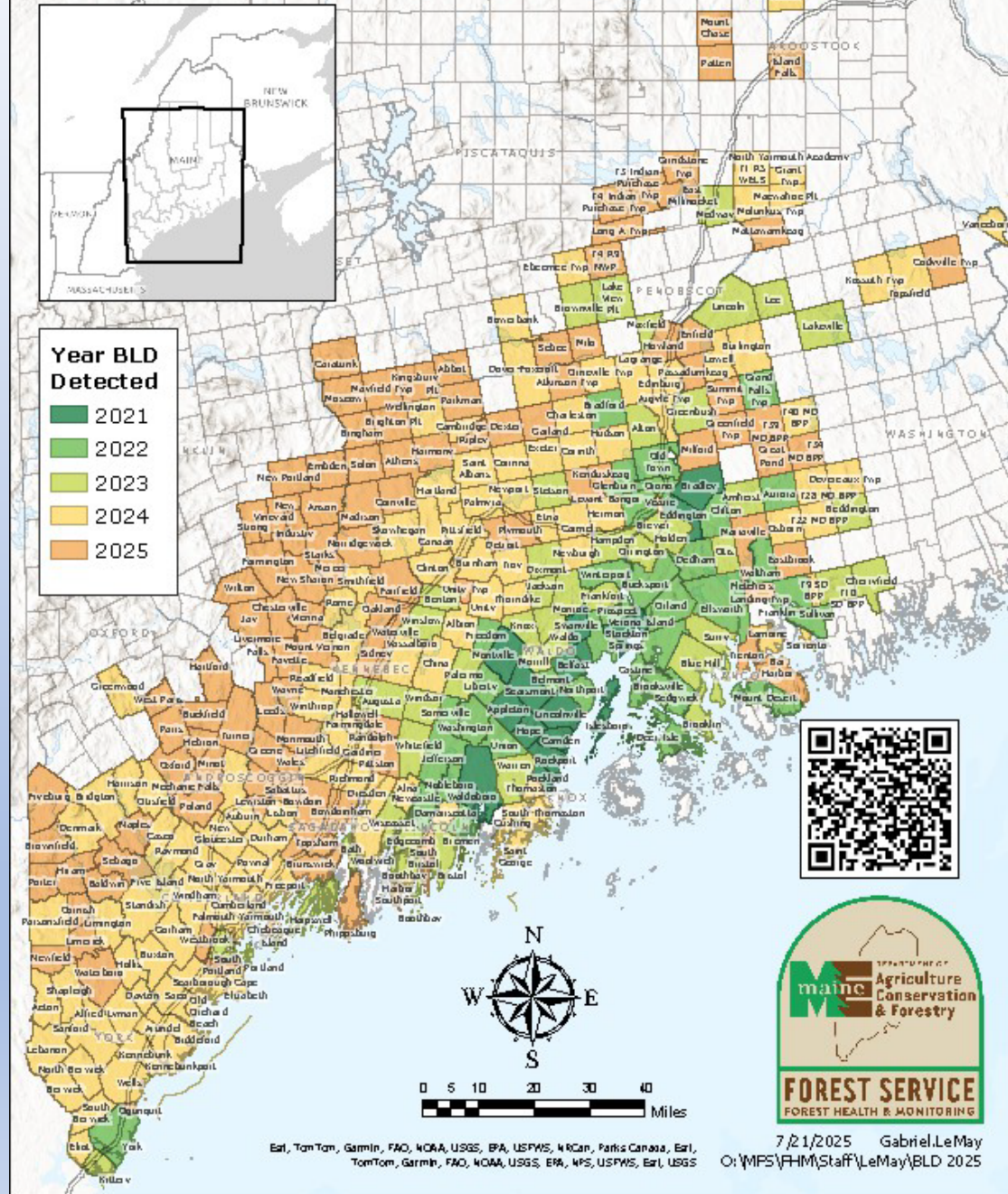


# First reported in Maine – June 2021

- Cumberland Co. – 2023
- Hancock Co. – 2022
- Kennebec Co. – 2023
- Knox Co. – 2021
- Lincoln Co. – 2021
- Penobscot Co. – 2021
- Piscataquis Co. – 2023
- Sagadahoc Co. – 2023
- Waldo Co. – 2021
- Washington Co. – 2023
- York Co. – 2023
- Oxford Co. – 2024
- Aroostook Co. – 2024
- Somerset Co. – 2024
- Androscoggin Co. – 2024
- Franklin Co. – 2025



## Beech Leaf Disease (BLD) Known Distribution in Maine



# Beech leaf disease symptoms

- Leaf symptoms are the result of overwinter feeding in the buds; no more feeding occurs after that
- The severity depends on the degree of feeding damage in the buds
- Severe feeding damage leads to bud failure
- In some cases, trees can produce a second flush of smaller, lighter-green leaves
- Seedlings and saplings often die within the first few years of infestation
- Mature trees have died within 4 years
- The combination of severe beech bark disease and BLD seems to accelerate decline
- Specimen trees can be treated with thiabendazole, fluopyram, or Polyphosphite-30®





Accident caused by falling ash in Hudson, NH Image: WMUR



# Emerald ash borer – A reason for concern?

---

Over 100 million ash trees killed

# Recognizing EAB

Up close

Bark splitting



S-shaped galleries under bark



EAB



NOT EAB



*Pennsylvania Dept. of Conservation and Natural Resources*



D-shaped exit holes

# Recognizing EAB

From afar

Woodpecker activity!!!



USDA APHIS PPQ, Bugwood.org

Crown dieback



04/24/2012

USDA APHIS PPQ, Bugwood.org



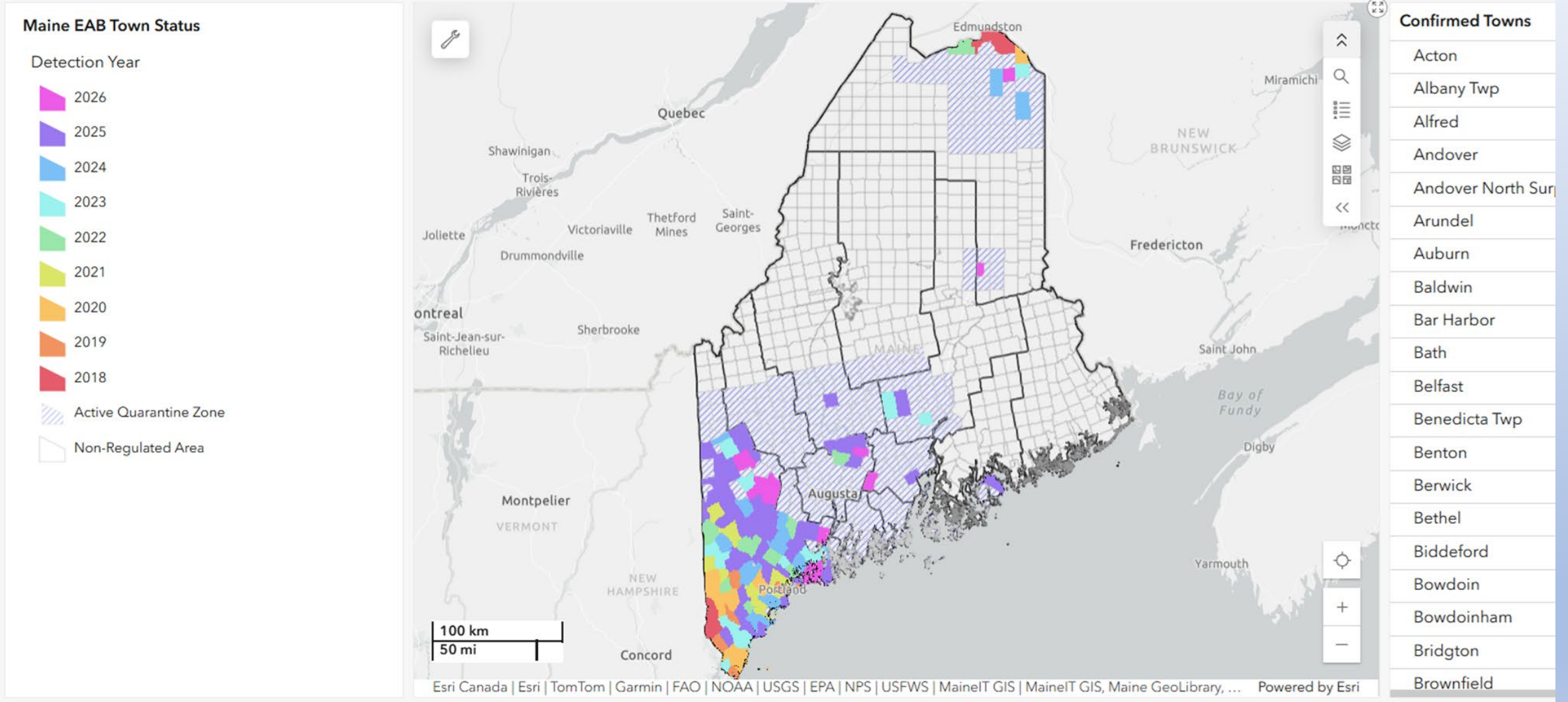
J. Ellis, Purdue University

Epicormic shoots

# What to look for in the winter



Click on a town to view EAB status - if outside the quarantine zone OR in a town where EAB is not confirmed, [please submit photos of potential EAB sightings](#)



<https://maine.maps.arcgis.com/apps/dashboards/8ab0defa38514c128e8b6dc67e40d9b>

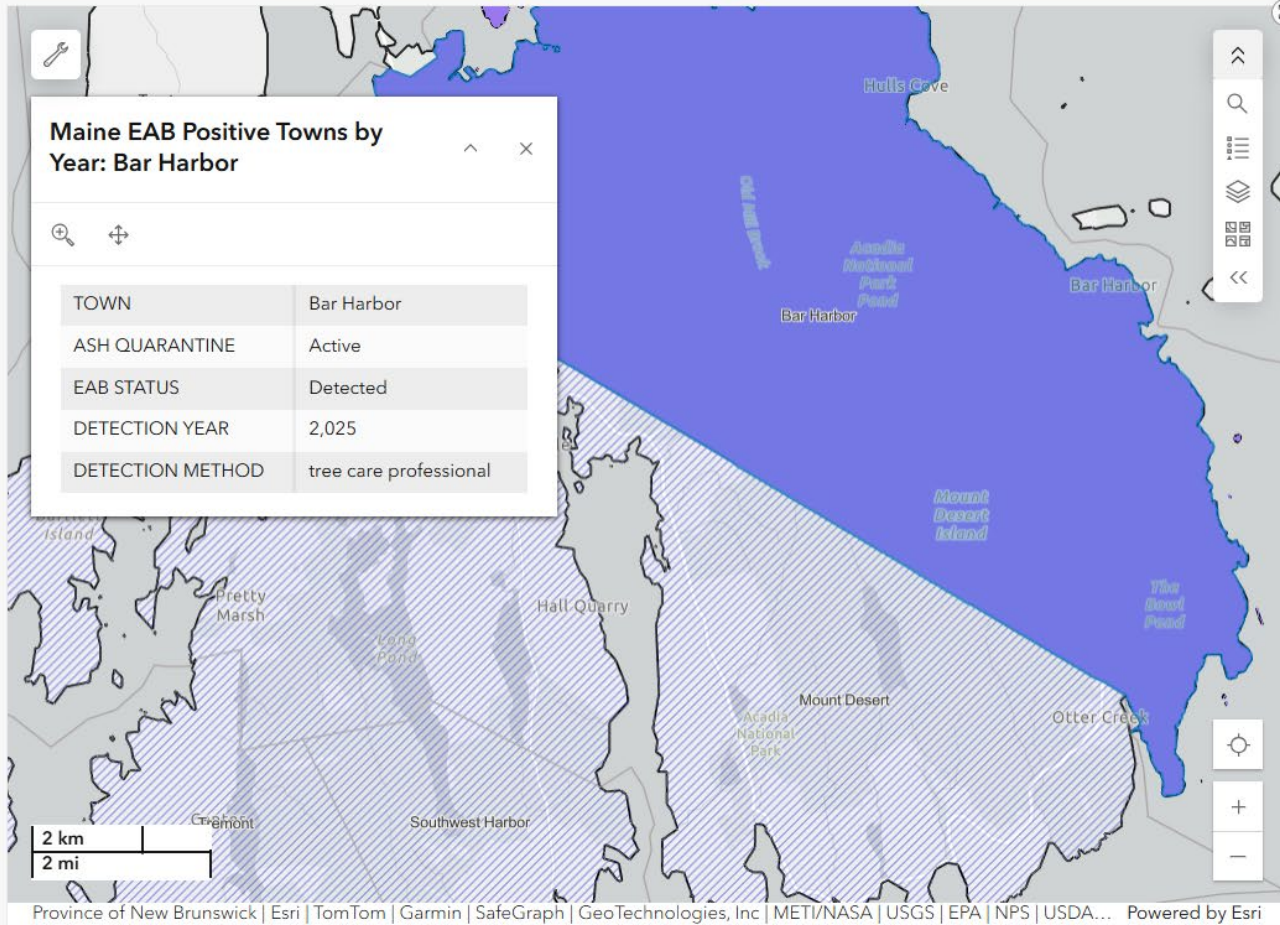
Click on a town to view EAB status - if outside the quarantine zone OR in a town where EAB is not confirmed, [please submit photos of potential EAB sightings](#)

### Maine EAB Town Status

#### Detection Year



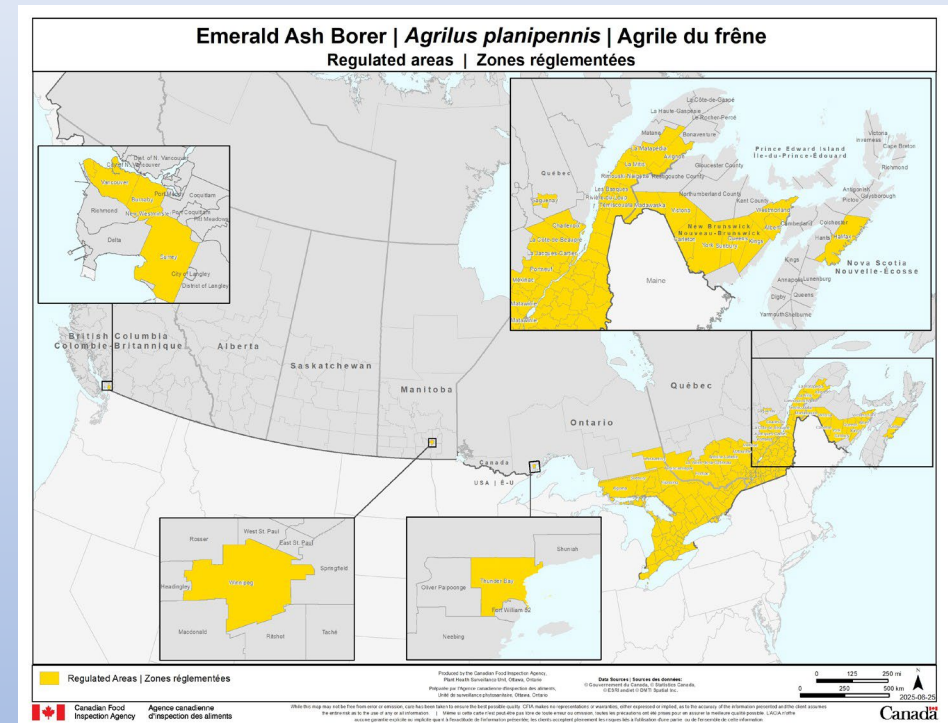
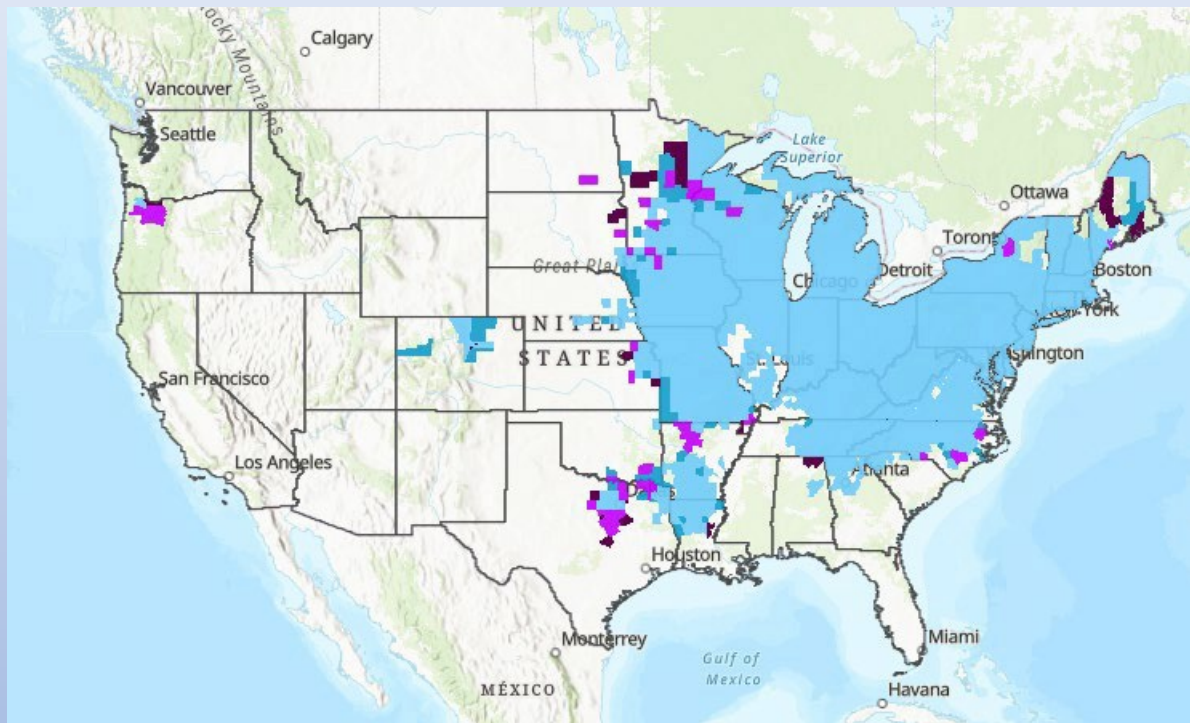
### Maine Town Boundaries



### Confirmed Towns

- Acton
- Albany Twp
- Alfred
- Andover
- Andover North Surplus Twp
- Arundel
- Auburn
- Baldwin
- Bar Harbor**
- Bath
- Belfast
- Benedicta Twp
- Benton
- Berwick
- Bethel
- Biddeford
- Bowdoin
- Bowdoinham
- Bridgton
- Brownfield

# EAB infestations across the US and Canada



<https://www.aphis.usda.gov/plant-pests-diseases/eab/eab-infestation-map>

<https://inspection.canada.ca/en/plant-health/invasive-species/directives/forest-products/03-08/regulated-areas#a1>

## Emerald Ash Borer Biocontrol in Maine

Three tiny, non-stinging parasites released at suitable sites with EAB



*Oobius agrili*  
parasitizes  
EAB eggs on  
ash bark



*Tetrastichus planipennisi*  
parasitizes  
EAB larvae  
under ash  
bark



*Spathius galinae*  
parasitizes  
EAB larvae  
under ash  
bark

These parasites will not save the trees standing now, but they should help the next generation of ash to survive.



[www.maine.gov/eab](http://www.maine.gov/eab)

Photos: Maine  
Forest Service &  
UMFK Forestry

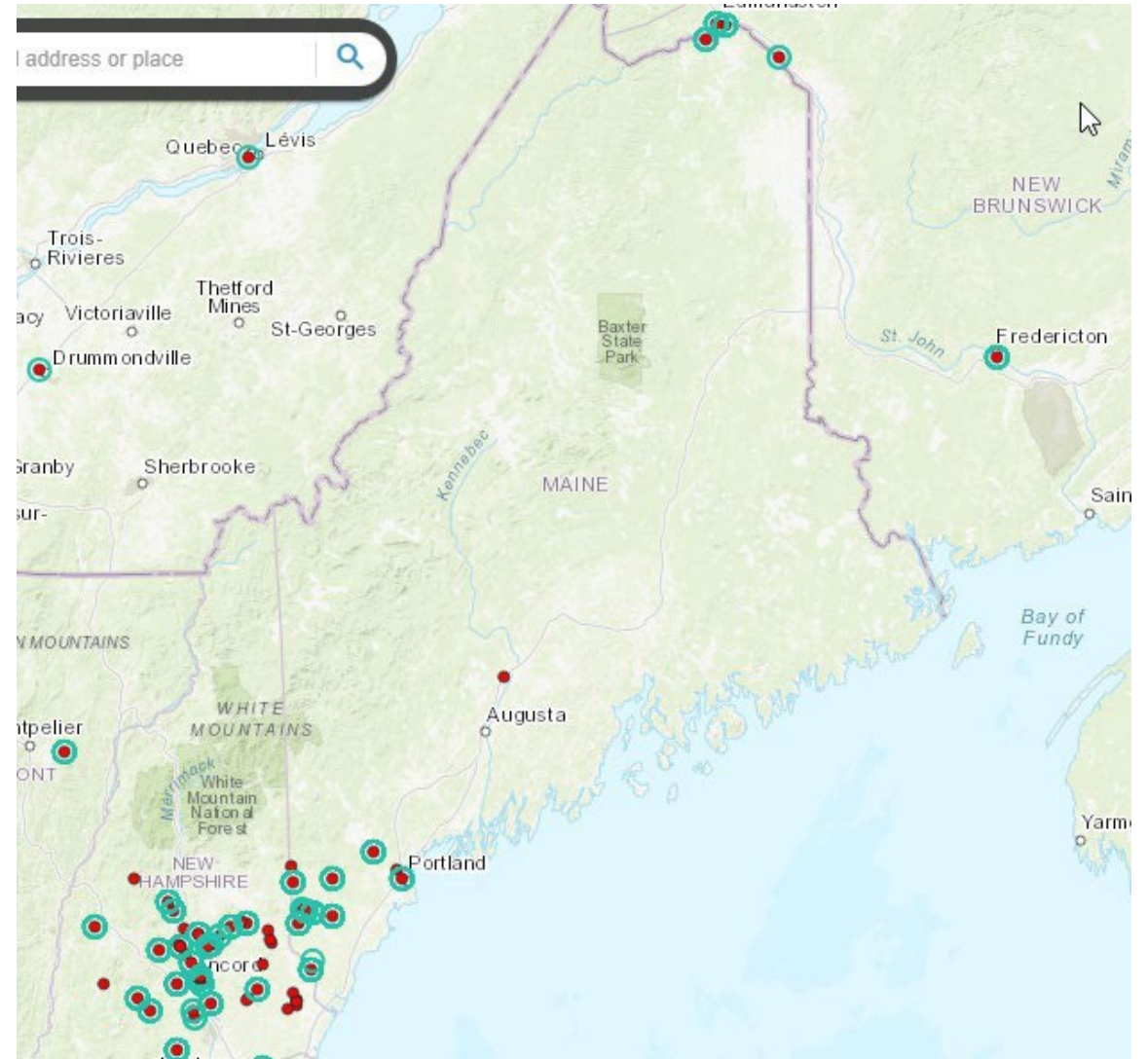
# Biological controls may save our future ash

Is it safe to release wasps since they are non-native insects?

Before the wasps were released, research in China and in the United States revealed that the wasps prefer EAB over other insects

No adverse effects were found or raised through the environmental assessment process

# Parasitoid wasp release sites for control of emerald ash borer



<https://msugis.maps.arcgis.com/apps/webappviewer/index.html?id=255045037dbb455a8f836a19e9d4a172>

# Winter Moth

## Geometrid moth "inchworm"

Adults  
emerge  
late Fall



Tom Murray, BugGuide.net

Nov - Jan



Waltham Services

Eggs  
overwinter



Gyorgy Csoka,  
Hungary Forest  
Research Institute,  
Bugwood.org

Dec - Apr

Pupa looks  
like soil



Maine Forest Service



Hannes Lemme, Bugwood.org

Jun - Nov



Cape Cod Times/Steve Heaslip

Apr - Jun

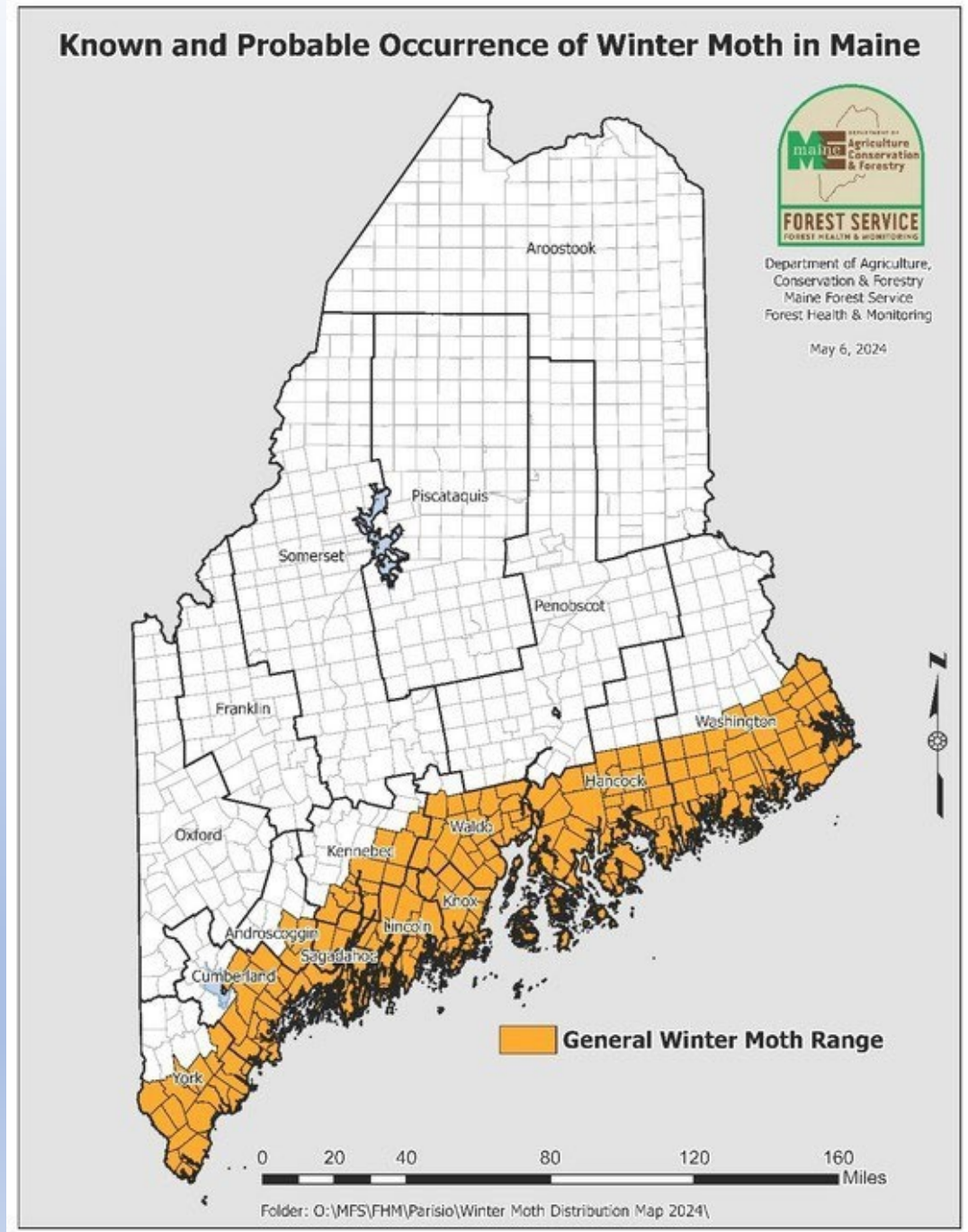
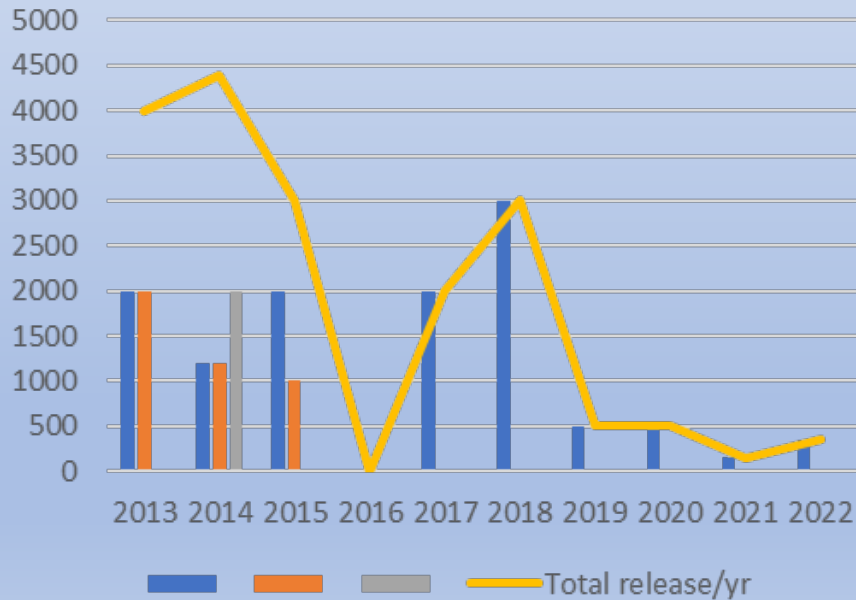
Caterpillars  
chew leaves



# Winter Moth

Damage reported in coastal locations from Kittery to MDI

*Cyzenis albicans* Releases



# Biological control for winter moth

CATERPILLAR COLLECTION SITE	2023 PARASITISM RATES
Bath	18%
Boothbay Harbor	6%
Cape Elizabeth	0%
East Boothbay (first recapture)	41%
Harpswell	2%
Kittery (Release Site)	34%
Kittery (Braveboat Harbor Rd)	23%
South Bristol (first recapture)	36%
South Portland	14%

Town	County	Release Dates	Number of <i>Cyzenis albicans</i> Released	Recovery Comments
Cape Elizabeth	Cumberland	1-May-2013	2,000	First recovery 2016; 27.4% parasitism in 2020
Harpswell	Cumberland	16 & 22-May-2014	1,200	Survival not good
Kittery	York	16 & 23-May-2014	1,200	First recovery 2016; 35.75% parasitism in 2021
Vinalhaven	Knox	21-May-2014	2,000	First recovery in 2018
Portland	Cumberland	15-May-2015	2,000	First recovery in 2018, 4.7% parasitism in 2020
Cape Elizabeth	Cumberland	15-May-2015	1,000	In 2021 parasitism rates at 10.95%
Harpswell	Cumberland	Cage set: 15-Nov-2016	2,000	First recovery 2020 0.85% parasitism in 2021
South Portland	Cumberland	Cage set: 29-Nov-2017	3,000	0.84% parasitism in 2021
Bath	Sagadahoc	21-May- 2020	500	Few flies emerged; cage was tampered with. 5.71% parasitism in 2021 (first recovery)
Boothbay Harbor	Lincoln	29-April-2020	500	Great emergence
East Boothbay Harbor	Lincoln	17-May-2021	150	Good emergence
South Bristol	Lincoln	5-May- 2022	329	Great emergence with breeding observed
South Bristol	Lincoln	May 1 2023	447	Great emergence
West Bath	Sagadahoc	Cage set: oct 13,2023	1300	To be released May 2024



*Cyzenis albicans*

# Browntail Moth

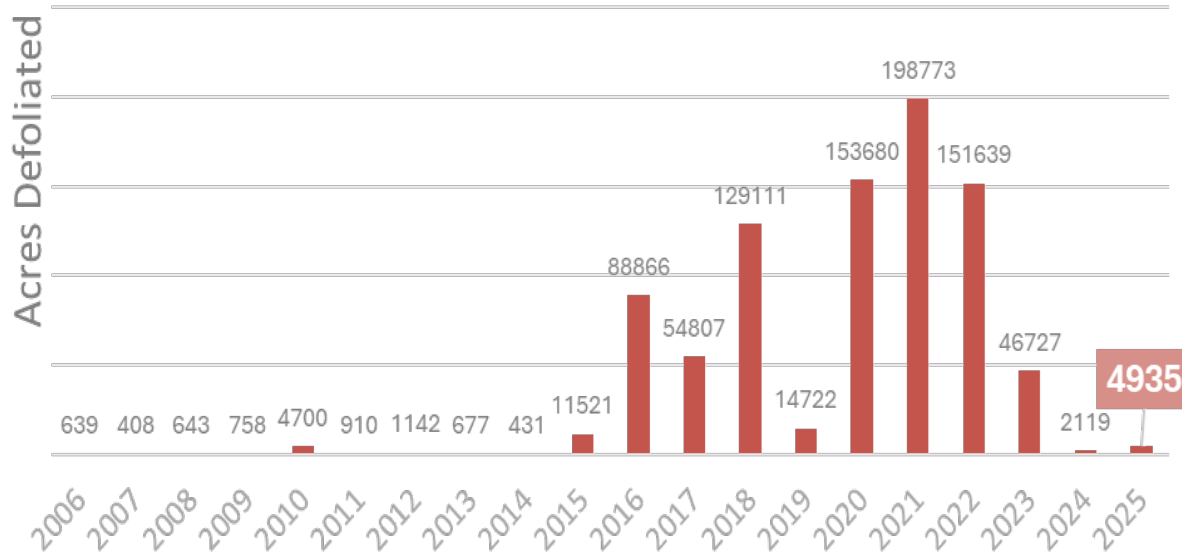
*Euproctis chrysorrhoea*

- Invasive insect from Europe
  - Order: Lepidoptera (moths)
  - Family: Lymantriidae
- Caterpillars have toxic hairs



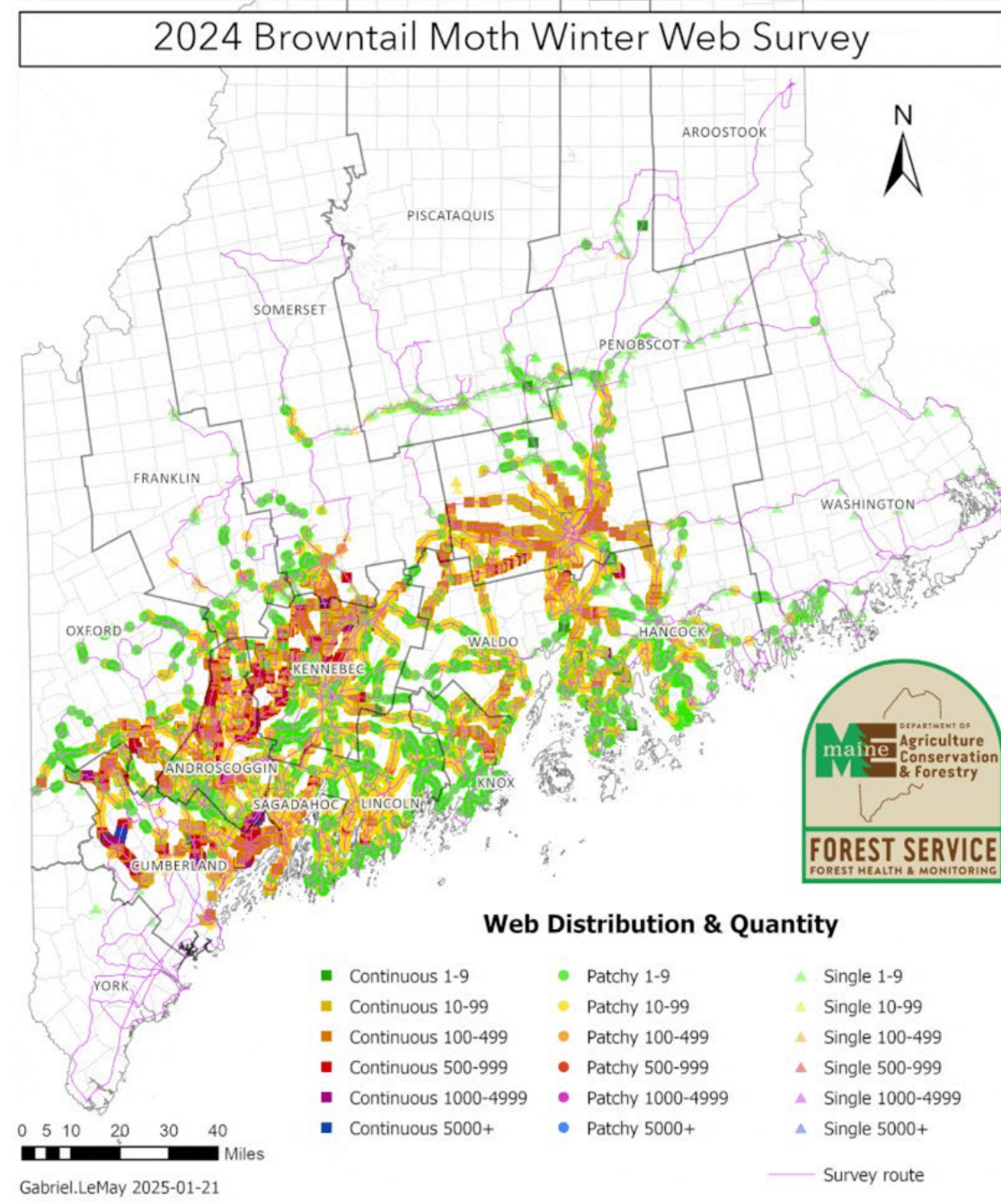
# Browntail moth

- Decline of outbreak continued in 2025
  - Defoliation scattered throughout the state



# Browntail moth

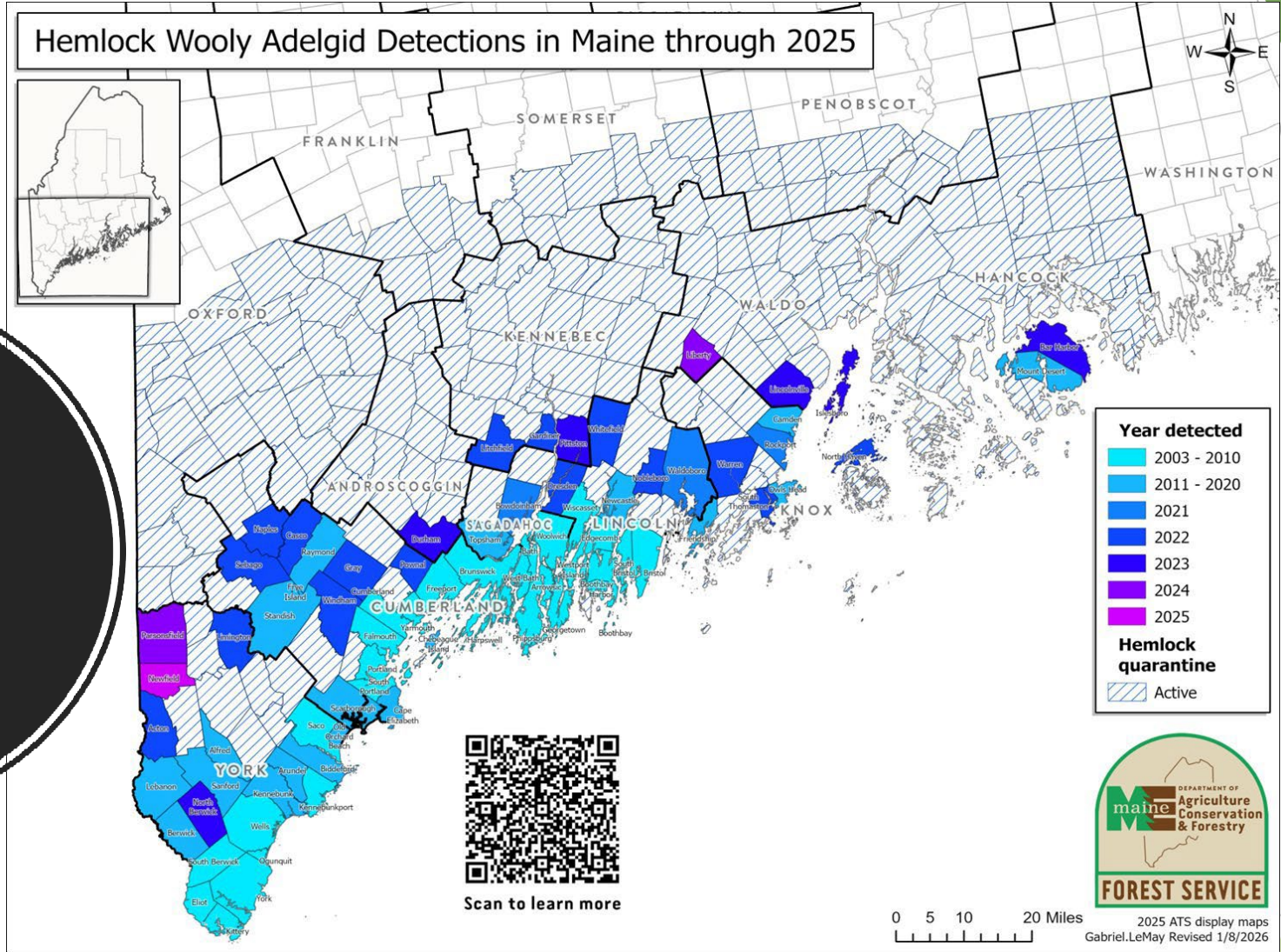
- Annual winter web ground survey currently underway
  - So far fairly quiet
  - Elevated near Sebago Lake





# Hemlock Woolly Adelgid Detections

**Quarantine  
Adopted  
November 1, 2023**



- 15 new detections in 2022 - 2023
- Expanding east and inland
- 12 Counties now have towns within the HWA quarantine area

# Hemlock Woolly Adelgid

Look at undersides of HEMLOCK twigs



- Discrete white cottony balls at BASE of needles
- found in newer growth
- most visible November thru July

# 1 – 2 punch for hemlocks

## Hemlock Woolly Adelgid



Hemlock tree infested with  
Hemlock Woolly Adelgid



Look for white cottony masses  
on the undersides of branches

## Elongate Hemlock Scale



Hemlock tree infested with  
Elongate Hemlock Scale



Hemlock tree infested with Elongate  
Hemlock Scale and Hemlock Woolly Adelgid

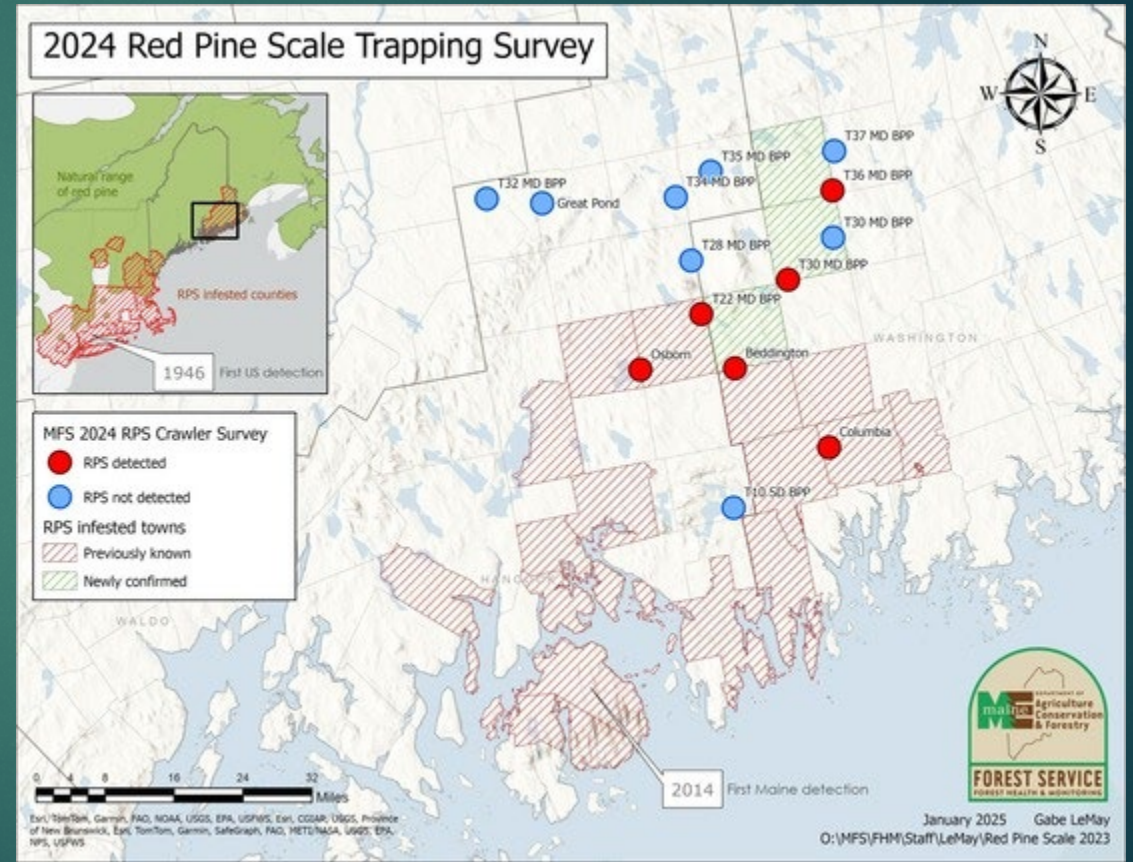
# Red pine scale

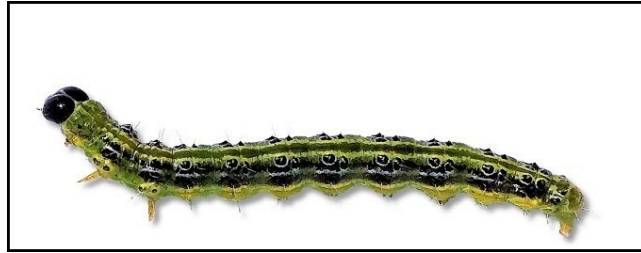


G. LeMay - MFS

G. LeMay - MFS

A. Kanoti - Maine Forest Service

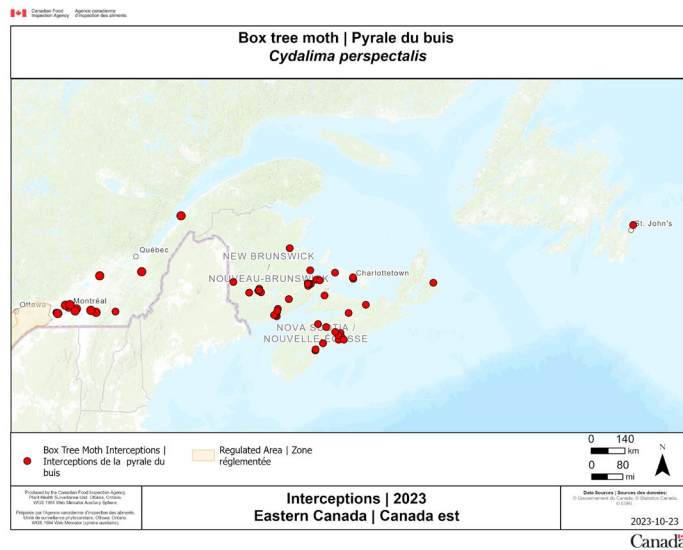




# Box tree moth



# Box tree moth is surrounding US.



Firewood is a major source of deadly forest insects & diseases

Don't Move Firewood!

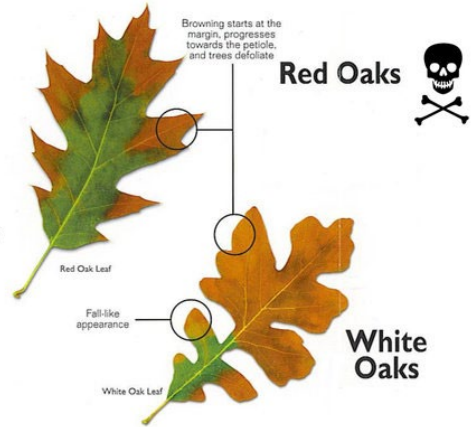
Signs at border crossings & visitor centers



- Pointed v. Rounded Lobes

## Oak Wilt is:

- **DEADLY** for Red Oak Family
  - Northern Red
  - Northern Pin
  - Black
  - Scarlet, etc.
- Slow Kill for **White** Oak Family
  - White
  - Swamp White
  - Bur
  - Chinquapin
  - English, etc.



# Two species that easily move with firewood not yet in Maine



# Help Slow the Spread of **Invasive Pests** in Maine Forests

- ▶ **Forests cover 89 % of the land in Maine. They provide:**
- ▶ **Environmental benefits...**
  - Clean water and air
  - Provide habitat and food
  - Stabilize soil
  - Remove CO<sub>2</sub> from atmosphere
- ▶ **...and economic benefits.**
  - \$8.5 billion and 33,500 jobs in the forest economy
  - Additional jobs and \$ in Maine agriculture, tourism, and recreation economies



- ▶ **What can you do?**
  - ✓ Use local or heat-treated firewood
  - ✓ Check trees for signs of pests and diseases
  - ✓ Report signs of invasive pests to [Bugwatch@maine.gov](mailto:Bugwatch@maine.gov)
  - ✓ Visit [www.maine.gov/firewood](http://www.maine.gov/firewood) to learn more
- ▶ **What *else* can you do?**
  - ✓ Use native, locally grown planting material
  - ✓ Don't move soil/compost with pests (winter moth, jumping worms)
  - ✓ Use an integrated approach to pest management, reduce use of pesticides
  - Use pollinator-friendly practices
  - ✓ **Spread the word, not the pests!** Letters at [www.maine.gov/foresthealth](http://www.maine.gov/foresthealth)

# What is SLF

A “true bug”; Fulgoridae = **planthopper**

- 1 generation/year
- Adults are large – 1” long
- Nymphs have 4 stages
- Eggs overwinter under a protective coating



*Egg mass*  
**SEEN: October-June**



*1st instar nymph*  
**May-July**



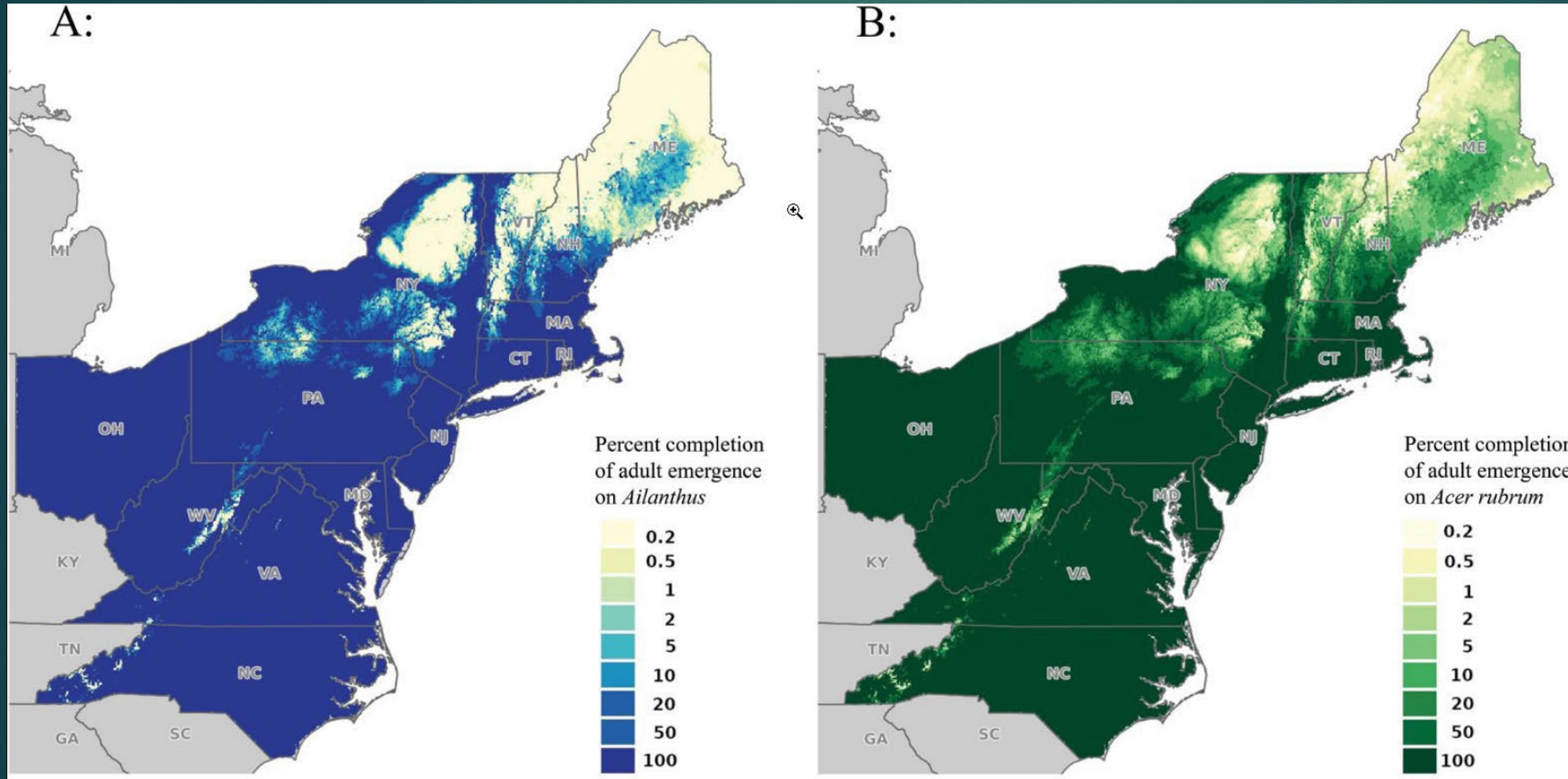
*4th instar nymph*  
**July-September**



*Adult*  
**August-November**



# SLF risk in Maine



# Tree of Heaven (*Ailanthus altissima*)

Feeding on TOH improves female maturity



Firewood  
is a major  
source of  
deadly  
forest  
insects &  
diseases

Don't  
Move  
Firewood!

Signs at border crossings  
& visitor centers



# Help Slow the Spread of **Invasive Pests** in Maine Forests

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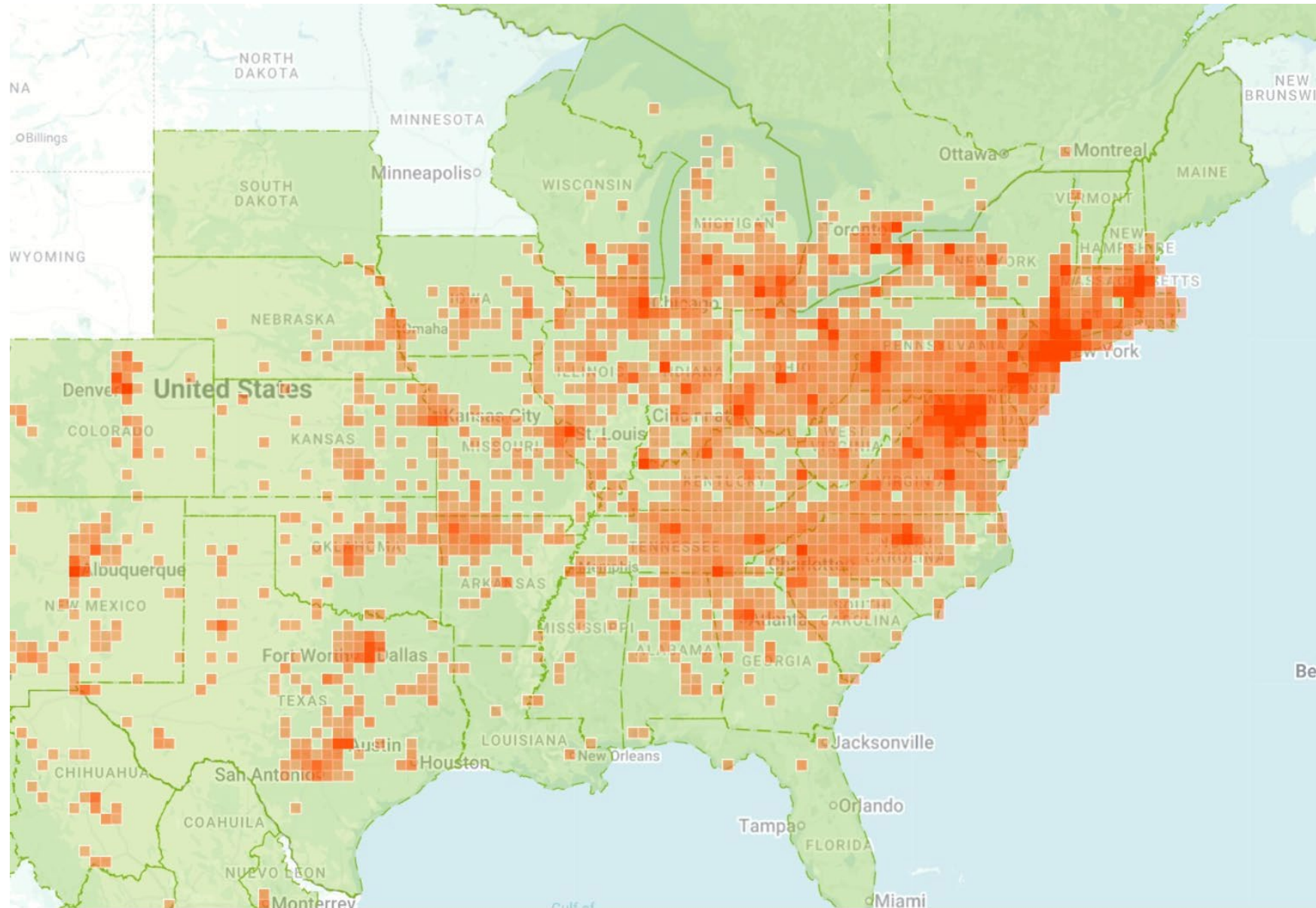
## What can **you** do?

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- ✓ Report signs of invasive pests to [Bugwatch@maine.gov](mailto:Bugwatch@maine.gov)
- ✓ Visit [www.maine.gov/firewood](http://www.maine.gov/firewood) to learn more

## What **else** can **you** do?

- ✓ Use native, locally grown planting material
- ✓ Don't move soil/compost with pests (winter moth, jumping worms)
- ✓ Use an integrated approach to pest management, reduce use of pesticides
- ✓ Use pollinator-friendly practices
- ✓ Learn more, sign up for our newsletters at [www.maine.gov/foresthealth](http://www.maine.gov/foresthealth)
- ✓ **Spread the word, not the pests!**

# U.S. Distribution of *Ailanthus altissima* (Tree-of-Heaven)



# What could SLF damage?

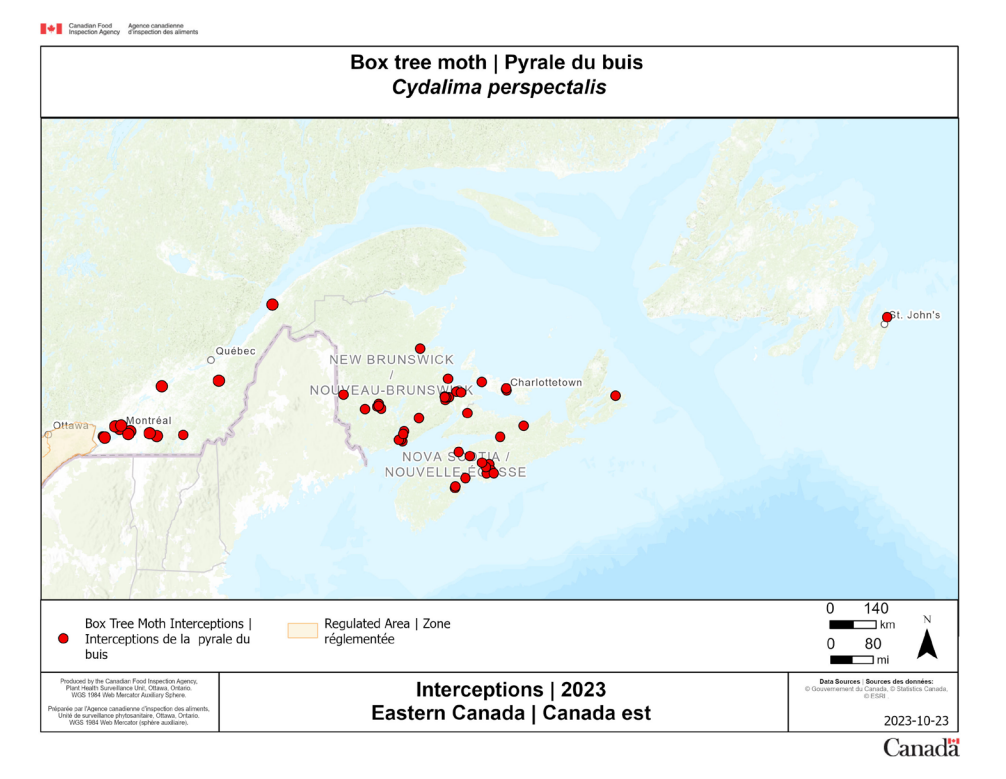
1. Vineyards - highest known risk
2. Apples
3. Nurseries
4. Maple syrup production
5. Structures



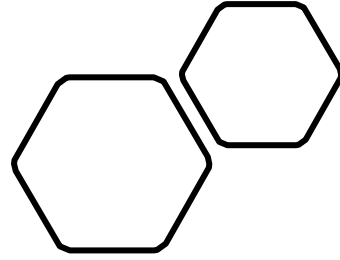
*Spotted lanternflies. Photo by Erica Smyers.*

Report any potential sightings to [bugwatch@maine.gov](mailto:bugwatch@maine.gov)

# Box Tree Moth

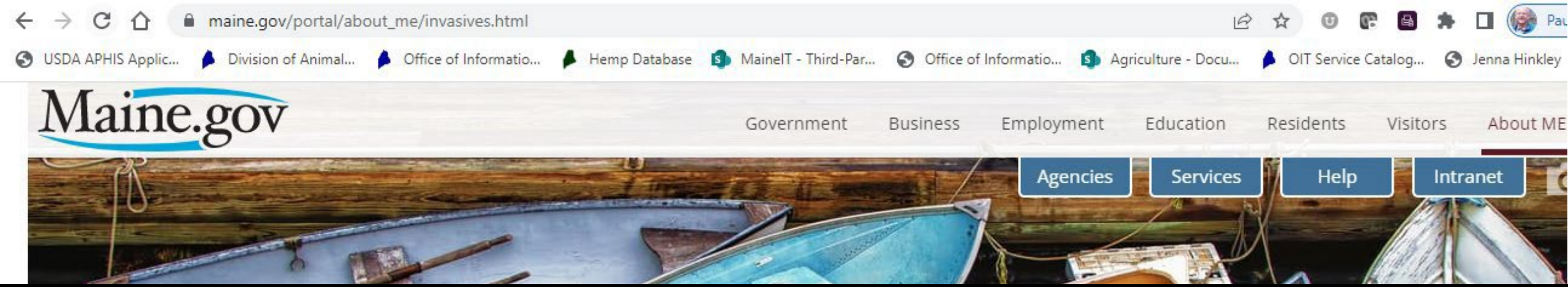


What you can  
do!



## Report invasive species

- [bugwatch@maine.gov](mailto:bugwatch@maine.gov)
- <https://appengine.egov.com/apps/m/e/dacf/mfs-tree-ailment>
- [invasives.mnap@maine.gov](mailto:invasives.mnap@maine.gov)
- [milfoil@maine.gov](mailto:milfoil@maine.gov)
- <https://www.maineogt.org/>
- <https://survey123.arcgis.com/share/da099be43ba642799f9c359345257b2f>



# Resources

## INVASIVE SPECIES

### What is an invasive species?

An invasive species is a non-native species (including seeds, eggs, spores, or other propagules) whose introduction causes or is likely to cause economic harm, environmental harm, or harm to human health. The term "invasive" is used for the most aggressive non-native species. These species grow and reproduce rapidly, and can spread with or without human help, causing major disturbances to the areas where they are present.

[Birth, Marriage, & Death Record Searches](#)

[Public Criminal History Records](#)

[Ask a Maine Reference Librarian](#)

[Ask a Law or Legislative Reference](#)

# Pest management resources

<https://www.maine.gov/dacf/php/gotpests/index.shtml>

<https://www.maine.gov/dacf/php/gotpests/index.shtml>

<https://extension.umaine.edu/home-and-garden-ipm/>

<https://extension.umaine.edu/home-and-garden-ipm/>



# Questions?

Gary Fish

Maine State  
Horticulturist

[gary.fish@maine.gov](mailto:gary.fish@maine.gov)

207-287-7545



# Questions

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Use this QR to download a copy of the slides.

