

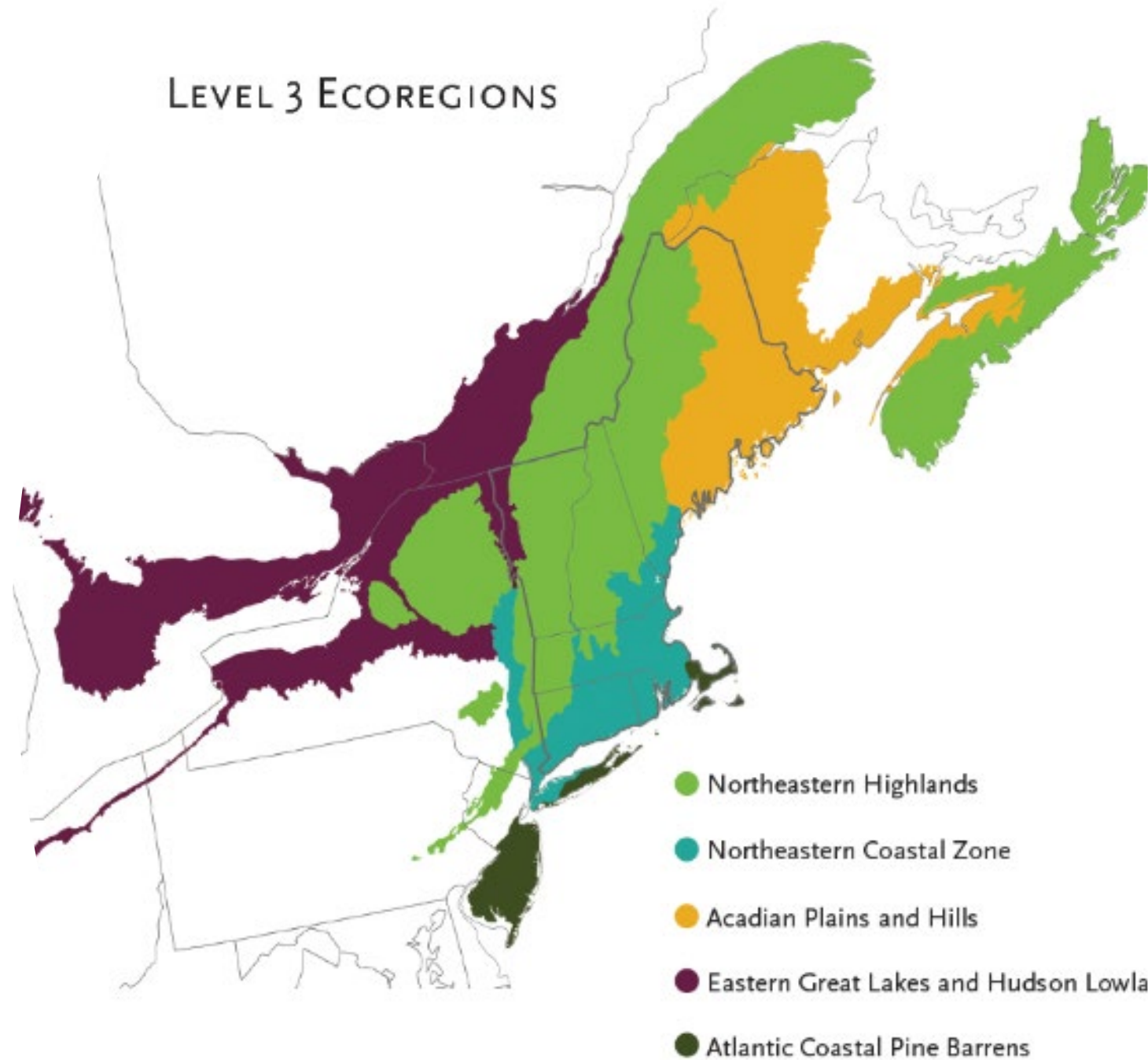


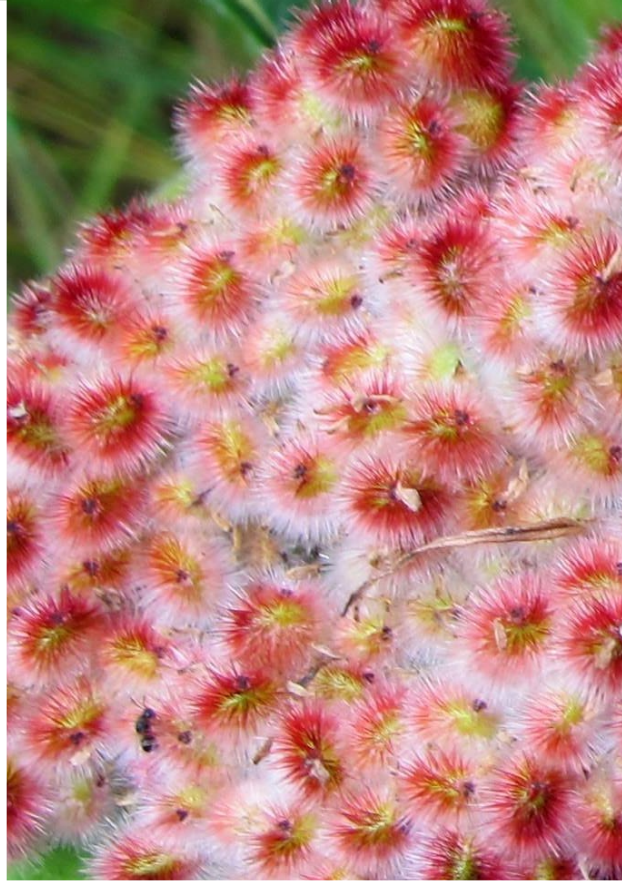
When will it stop?

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



Why be concerned about
invasive species?

Because we
love Maine!



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

No xenophobia here

Invasion ecologists, biologists and other scientists are trying to be careful about language

Spongy Moth

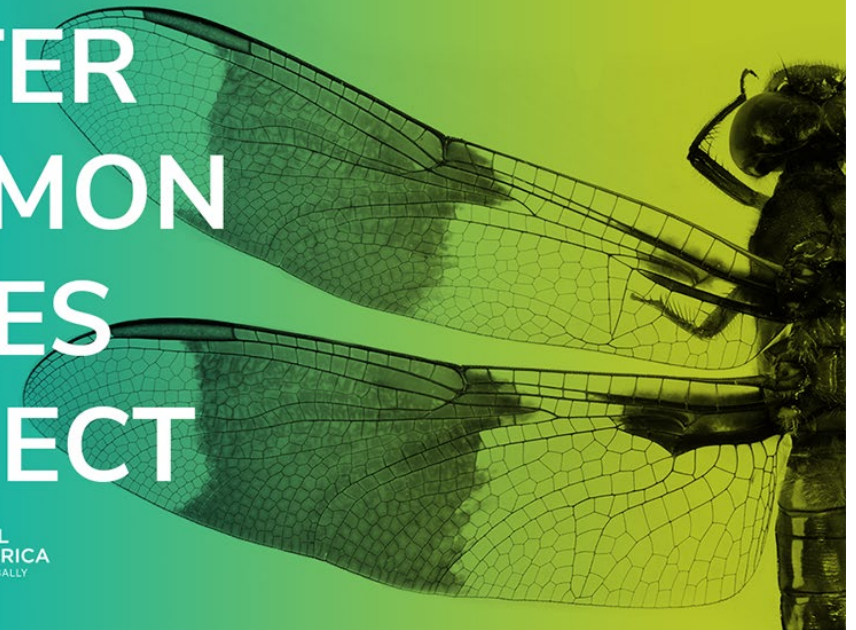


© Shutterstock / Pedro Luna

BETTER
COMMON
NAMES
PROJECT



ENTOMOLOGICAL
SOCIETY OF AMERICA
SHARING INSECT SCIENCE GLOBALLY





Terrestrial invasive plants

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/plant/horticulture/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
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



<https://greatplainsnursery.com/product/black-alder-alnus-glutinosa/>

Commonly
Sold Species
Banned
1/1/2024

Alnus glutinosa
European alder



<https://www.houseofbeautifulgardens.com/>

Commonly Sold Species Banned 1/1/2024

Elaeagnus angustifolia

Russian Olive



EddMapS Photo

Commonly
Sold Species
Banned
1/1/2024

Euonymus fortunei

Wintercreeper



Sarah Scally, Maine DACF

Commonly Sold Species Banned 1/1/2024

Glechoma hederacea
Creeping Charlie



Leslie Mehrhoff, University of Connecticut

Commonly
Sold Species
Banned
1/1/2024

Ligustrum obtusifolium

Border Privet



Photo by Paul Erdmann

Commonly
Sold Species
Banned
1/1/2024

Miscanthus sacchariflorus
Amur silvergrass



Pat Grover, Mason County, Invasive Control Board

Commonly Sold Species Banned 1/1/2024

Petasites japonicus

Giant butterbur, Fuki



John Rutter, University of Georgia

Commonly
Sold Species
Banned
1/1/2024

Photinia villosa

Christmas berry



Britt Slattery, US FWS

Commonly
Sold Species
Banned
1/1/2024

Pyrus calleryana

Callery “Bradford” Pear



Gary Fish, Maine DACF

Commonly Sold Species Banned 1/1/2024

Sorbus aucuparia

European Mountain-ash



Leslie Mehrhoff, University of Connecticut

Commonly
Sold Species
Banned
1/1/2024

Valeriana officinalis
Common valerian

Other plants banned on 1/1/2024

- ▶ *Angelica sylvestris*
- ▶ *Anthriscus sylvestris*
- ▶ *Aralia elata*
- ▶ *Butomus umbellatus*
- ▶ *Festuca filiformis*
- ▶ *Ficaria verna*
- ▶ *Glaucium flavum*
- ▶ *Glyceria maxima*
- ▶ *Hippophae rhamnoides*
- ▶ *Lonicera xylosteum*
- ▶ *Lythrum vigatum*
- ▶ *Phalaris arundinacea*
- ▶ *Phyllostachys aurea*
- ▶ *Phyllostachys aureosulcata*
- ▶ *Phragmites australis*

Other plants banned on 1/1/2024

- ▶ *Ranunculus repens*
- ▶ *Rubus phoenicolasius*
- ▶ *Silphium perfoliatum*
- ▶ *Tussilago farfara*

Plants on the “Watch List”

- ▶ *Actinidia argula*
- ▶ *Akebia quinata*
- ▶ *Arum italicum*
- ▶ *Broussonetia papyrifera*
- ▶ *Buddelja davidii*
- ▶ *Clematis ternifolia*
- ▶ *Dioscorea oppositifolia*
- ▶ *Dioscorea polystachya*
- ▶ *Eragrostis curvula*
- ▶ *Filipendula ulmaria*
- ▶ *Lespedeza bicolor*
- ▶ *Ligustrum ovalifolium*
- ▶ *Lonicera caerulea*
- ▶ *Lychnis flos-cuculi*
- ▶ *Morus alba*
- ▶ *Quercus acutissima*

Plants on the “Watch List”

- ▶ *Saccharum ravennae*
- ▶ *Salvia glutinosa*
- ▶ *Silybum marianum*
- ▶ *Spiraea japonica*
- ▶ *Symplocos paniculate*
- ▶ *Syringa japonica*
- ▶ *Toona sinensis*
- ▶ *Ulmus pumila*
- ▶ *Viburnum dilatatum*
- ▶ *Viburnum sieboldii*
- ▶ *Wisteria floribunda*
- ▶ *Wisteria sinensis*

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.

Change to the variance section

C. Varieties, cultivars, hybrids and/or subspecies that have been shown not to be invasive through scientific research and analysis may be considered exempt from this rule after review by a committee established by the Department.

1. Data submitted must include sources with no financial interest in the species, such as universities, agricultural experiment stations, cooperative extension, USDA or botanical gardens; and
2. Regulatory status in nearby states shall also be considered.



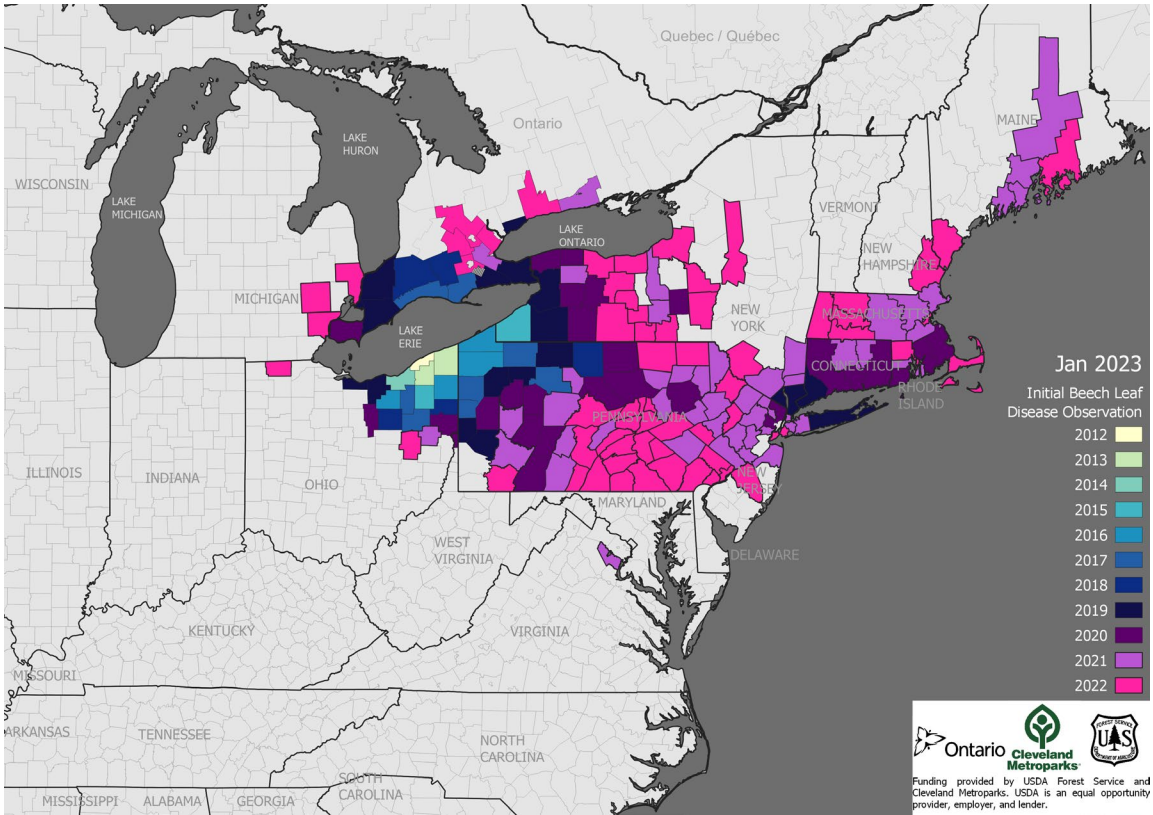
Biological control may tame black swallowwort



Tree, Forest & Ornamental Insects and Diseases



Beech Leaf Disease – an expanding concern



BEECH LEAF DISEASE

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

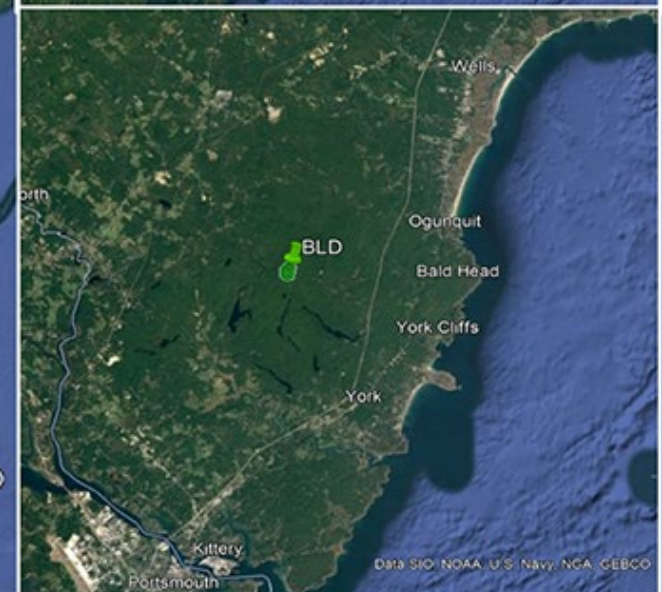
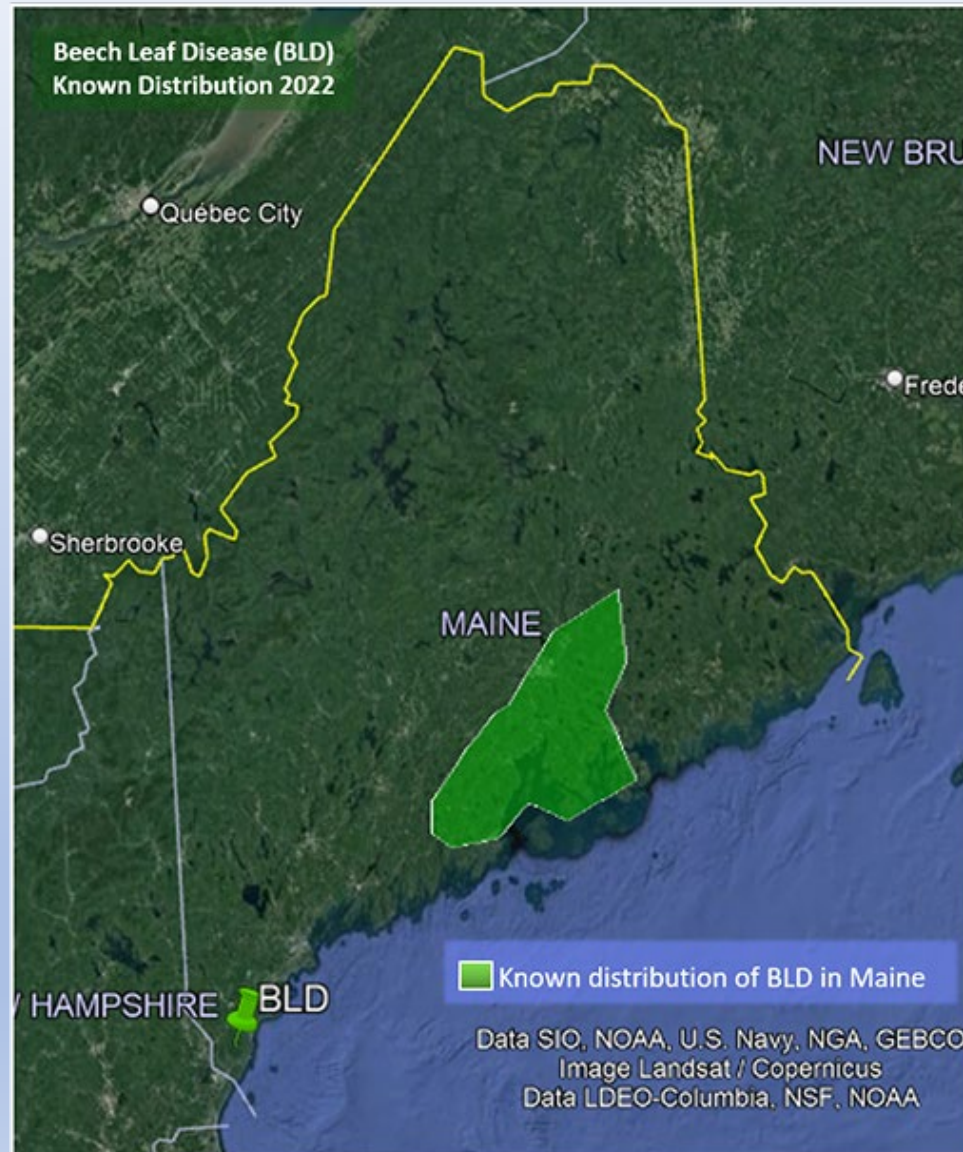


- Perhaps caused by a foliar nematode, *litylenchus crenatae*



First reported in Maine – June 2021

- Hancock Co.
- Knox Co.
- Lincoln Co.
- Penobscot Co.
- Waldo Co.
- York Co.



Beech leaf
disease
symptoms





BLD SYMPTOMS

- Early symptoms - dark bands between lateral veins of leaves
 - Evident when leaves emerge (spring)
- Later stages – leaves become thickened, shriveled and curled
- Reduced bud and leaf production
- Mortality
 - 2-5 years – saplings
 - ~6 years – mature trees



May be 2 years in
Maine for both



Emerald ash borer – new counties infested?

Well over 100 million ash trees killed to date

Recognizing EAB

Up close

Bark splitting

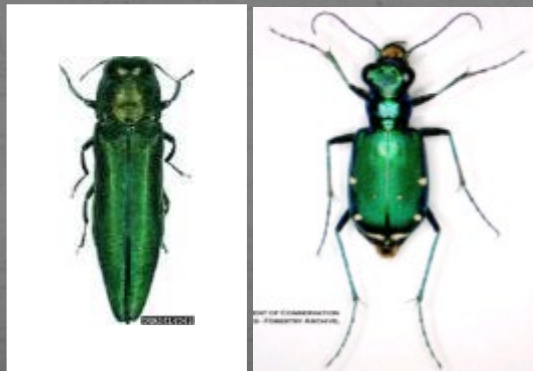


S-shaped galleries under bark



EAB

NOT EAB



D-shaped exit holes

Recognizing EAB

From afar

Woodpecker activity!!!



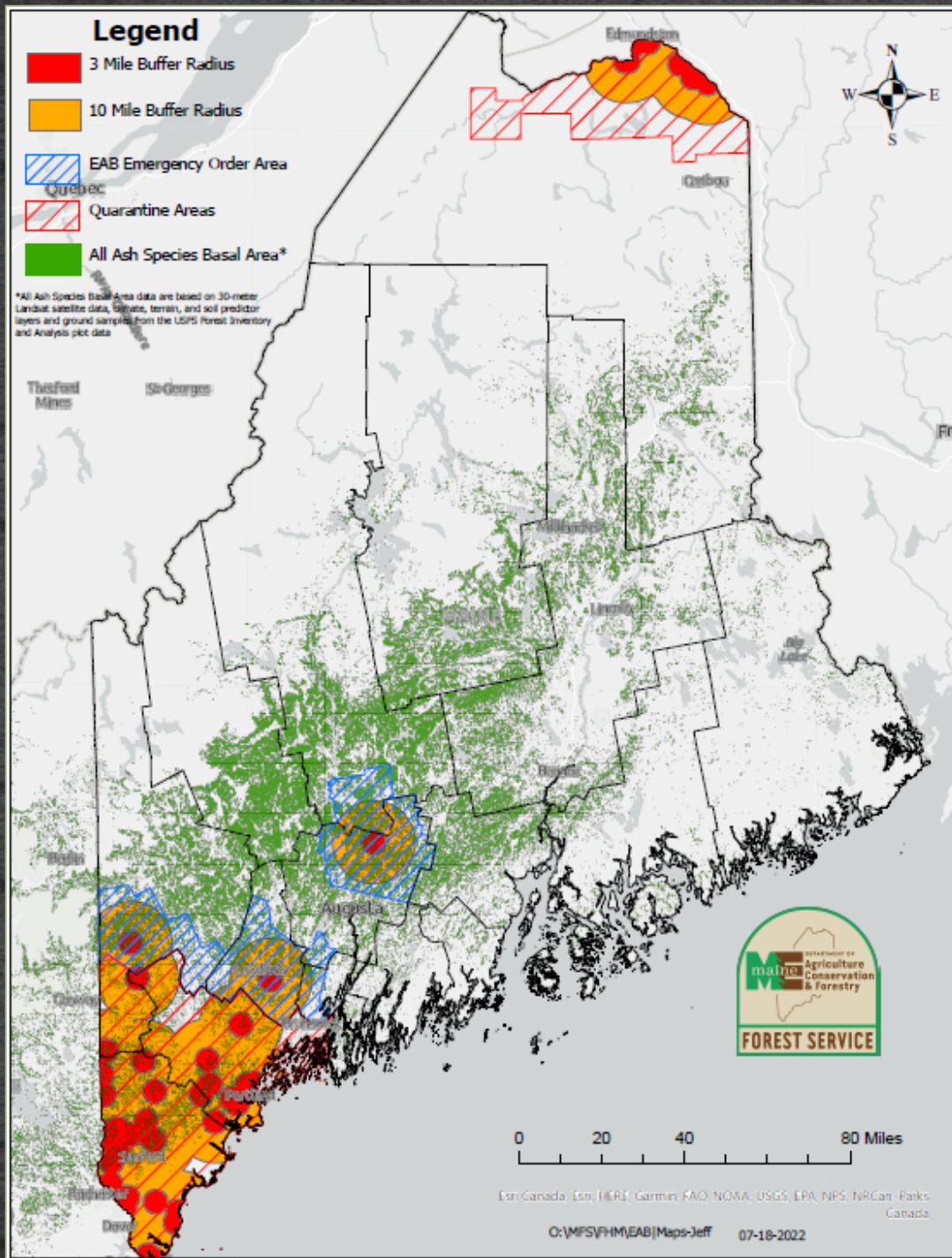
Crown dieback



Bark on snow



Epicormic shoots



Why Quarantine and Monitor?

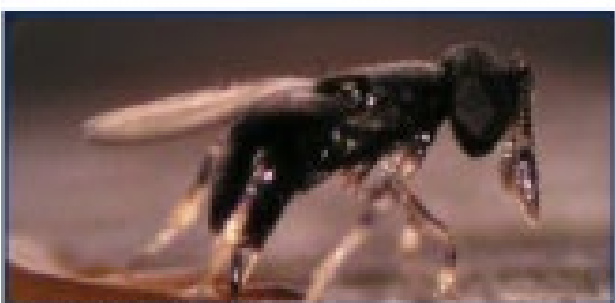
- ~481,457,542 ash trees over 1" DBH account for ~2% of all trees in Maine
- Presently ~16% of Maine's ash are in regulated areas
- Right now, the vast majority of Maine ash are still presumed EAB-free
 - **EVEN WITHIN REGULATED AREAS**



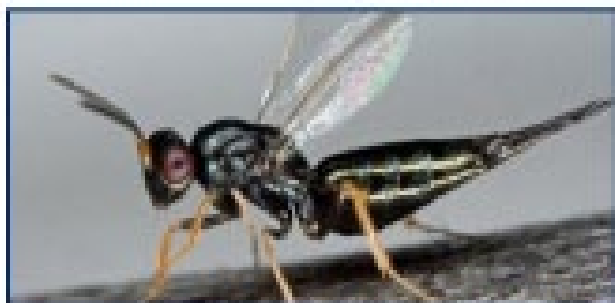
SPATHIUS GALINAE



SPATHIUS AGRILI



OObIUS AGRILI



TETRASTICHUS PLANIPENNISI

Biological controls may save the next generation of ash

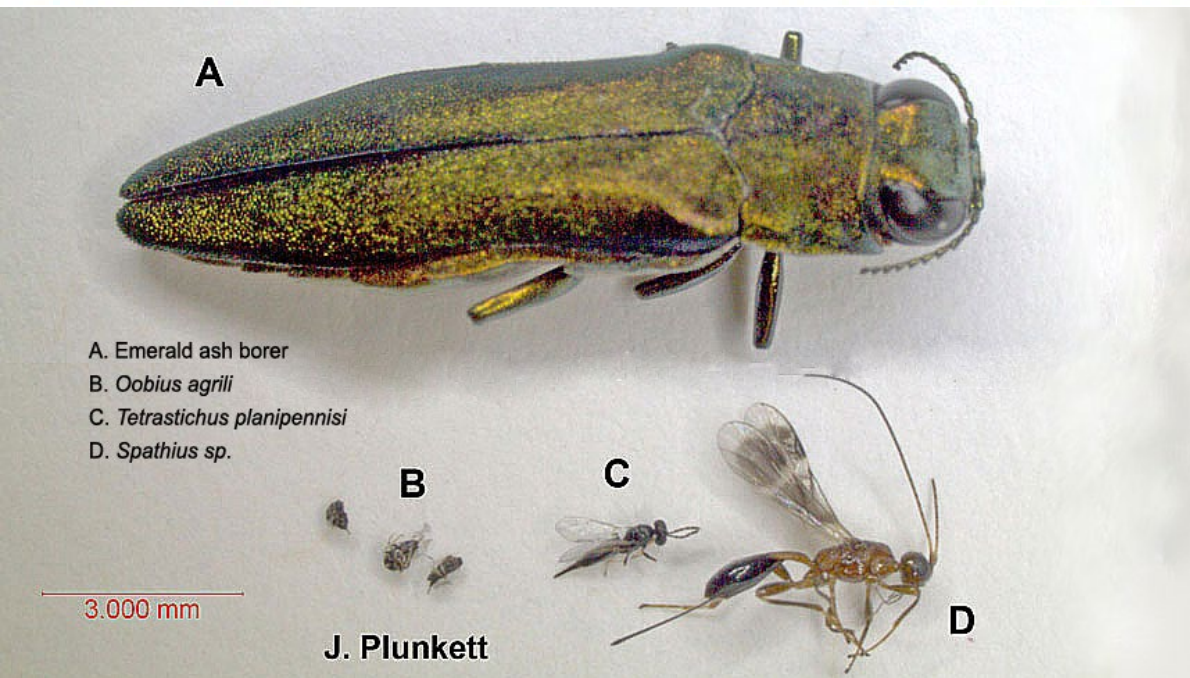
Is it safe to release wasps since they are non-native insects?

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

You can read the documents and public comments by visiting

<https://www.regulations.gov/docket?D=APHIS2014-0094>

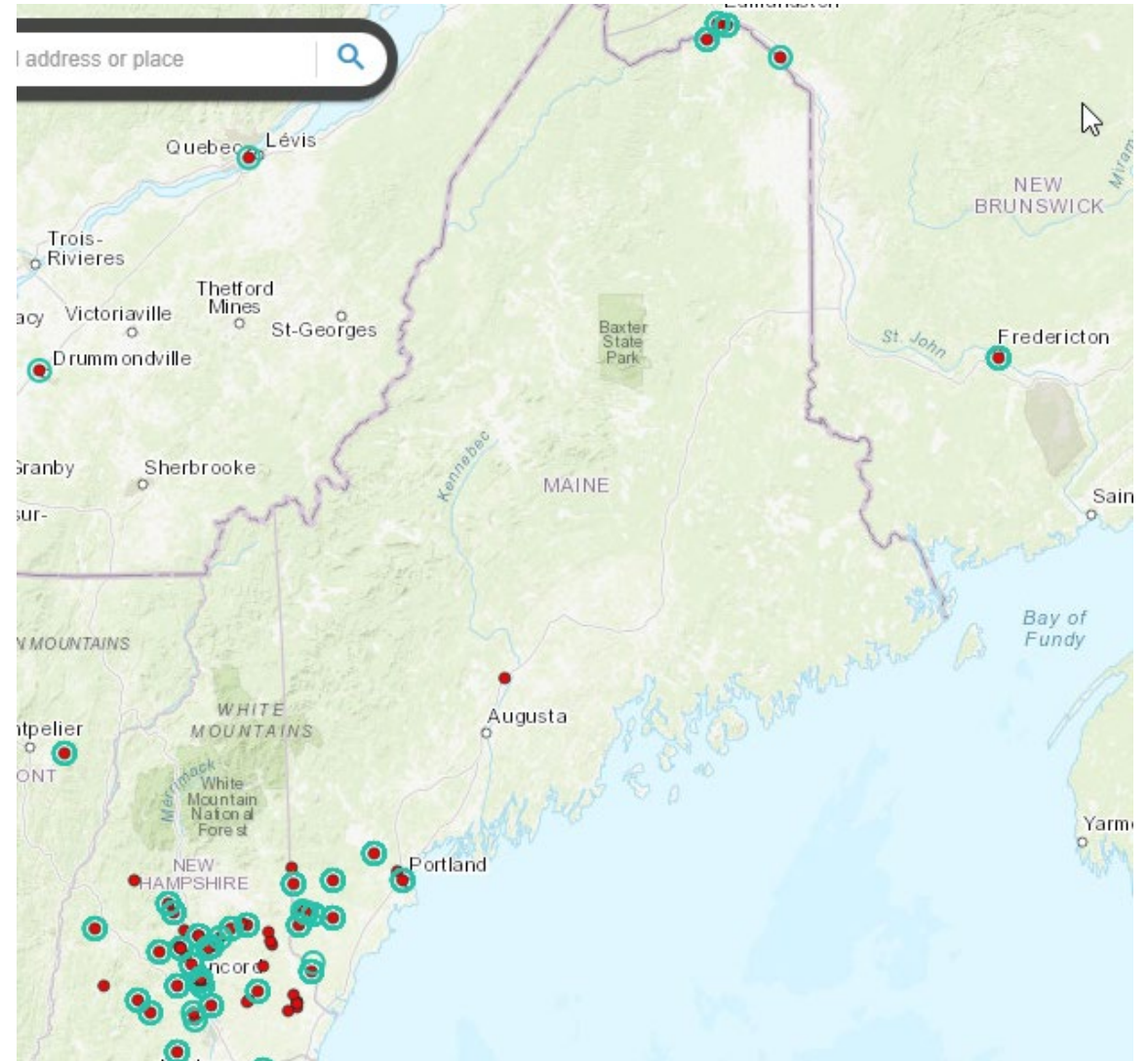


- A. Emerald ash borer
- B. *Oobius agrili*
- C. *Tetrastichus planipennis*
- D. *Spathius sp.*

3.000 mm

J. Plunkett

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



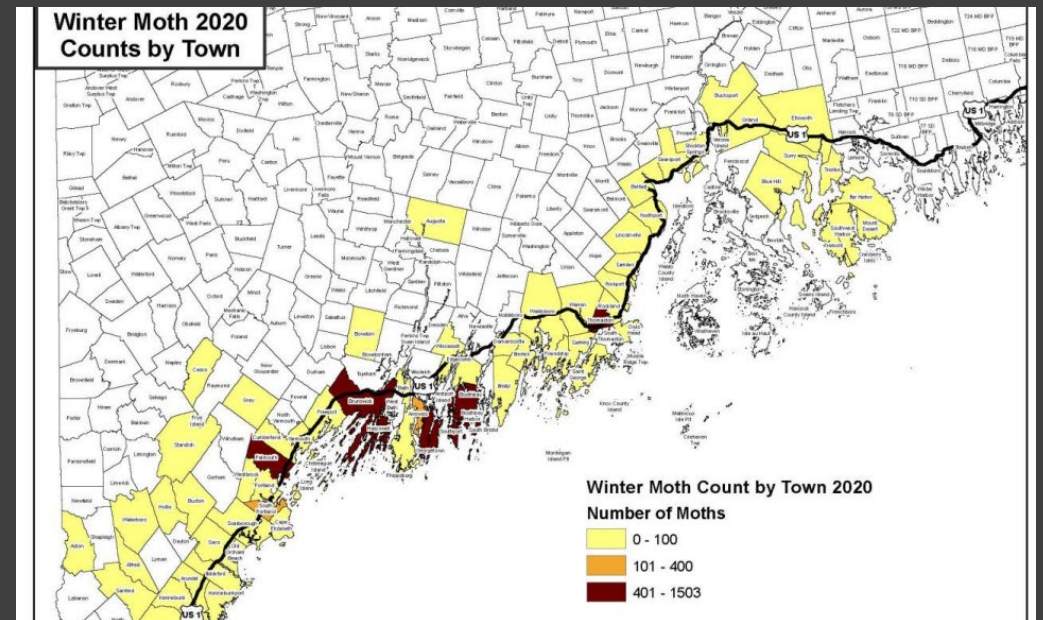
Cape Cod Times/Steve Heaslip

Apr - Jun

Caterpillars
chew leaves

Winter Moth

- Damage reported in coastal locations from Kittery to MDI
- **DO NOT MOVE LANDSCAPE MATERIAL**
- from infested areas as the cocoons of winter moth are in the soil from June through November



Winter moth



Cyzenis albicans



Biological control for winter moth

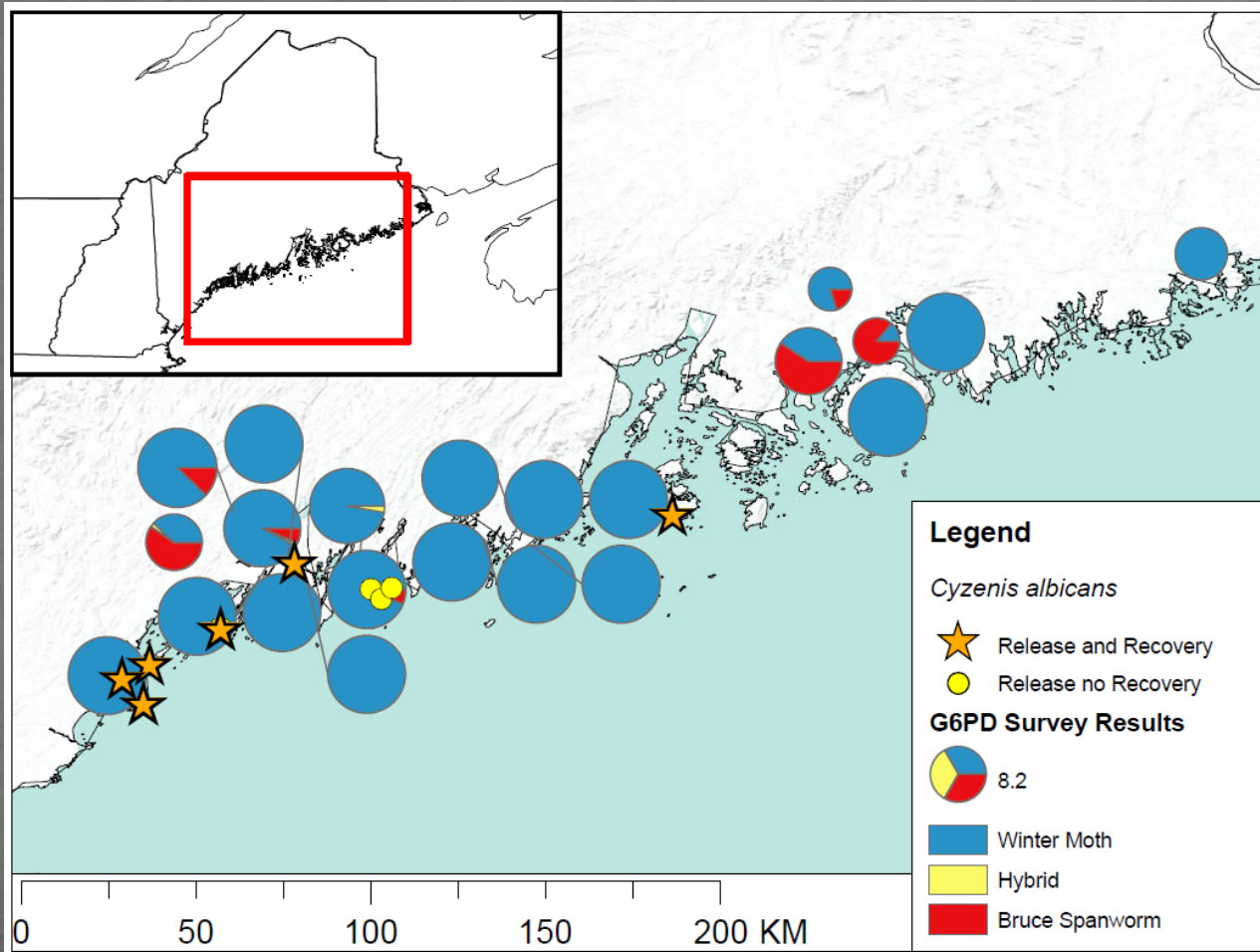
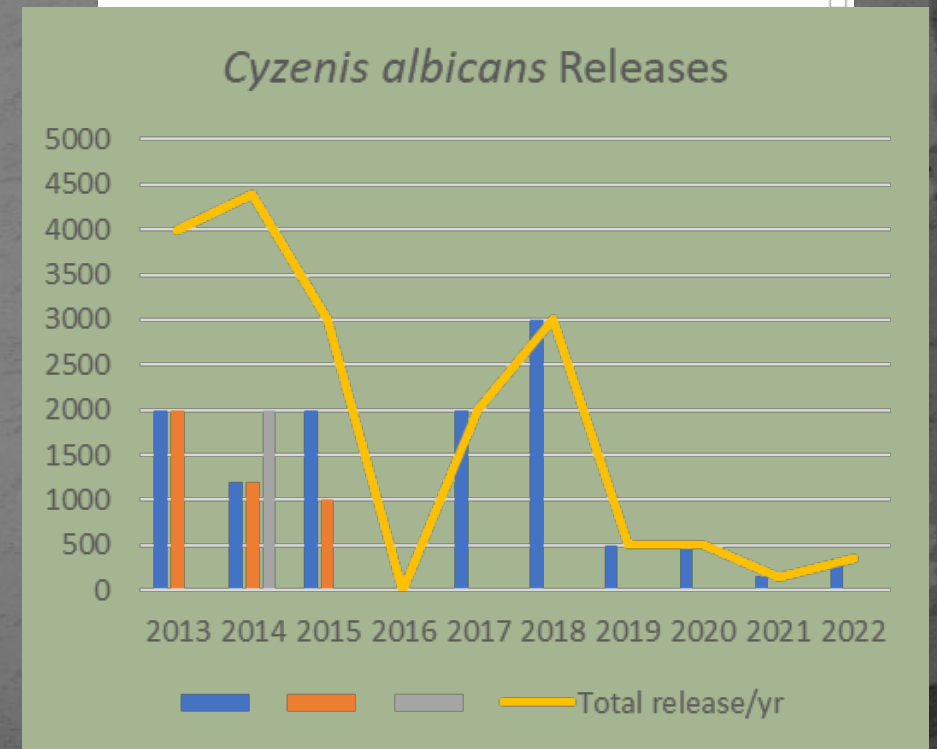


Table 3. Release and recovery of parasitic flies, *Cyzenis albicans*, in Maine

Town	County	Dates	Number of <i>Cyzenis albicans</i> Released	Comments
Harpswell	Cumberland	1-May-13	2000	Survival not good
Cape Elizabeth	Cumberland	1-May-13	2000	First recovery 2016
Kittery	York	16 & 23-May-14	1200	First recovery 2016
Harpswell	Cumberland	16 & 22-May-14	1200	
Vinalhaven	Knox	21-May-14	2000	First recovery in 2018
Portland	Cumberland	15-May-15	2000	First recovery in 2018
Cape Elizabeth	Cumberland	15-May-15	1000	In 2018 parasitism rates at 20%
Harpswell	Cumberland	15-Nov-16	2000	caged cocoons set out for release in spring 2017
South Portland	Cumberland	29-Nov-17	3000	caged cocoons set out for release in spring 2018
Bath	Sagadahoc	12-Sep-18	500	caged cocoons set out for release in spring 2019
Boothbay Harbor	Lincoln	21-Oct-19	500	caged cocoons set out for release in spring 2020



FEBRUARY
BROWNTAIL
MOTH

AWARENESS
MONTH

maine.gov/dacf/knockoutbtm

Where is Browntail Moth in Maine

arcgis.com/apps/dashboards/8f2931a691374ac9853636e71cbb1f40

USDA APHIS Applic... Division of Animal... Office of Informatio... Hemp Database MaineIT - Third-Par... Office of Informatio... Agriculture - Docu... OIT Service Catalog...

Browntail Moth (BTM) Dashboard

The Department of Agriculture, Conservation and Forestry's [Maine Forest Service](#) has assembled this browntail moth (BTM) monitoring dashboard to provide information about where we know BTM is located in Maine. If you see BTM in other areas of Maine, please help us improve this information and report your detection to the Maine Forest Service by going to [this online form](#). You can find more information about BTM on our [website](#).

BTM Aerial Survey

Aerial surveys (mapping of damaged areas from a fixed-wing plane) provide a coarse overview of areas with moderate to high BTM caterpillar populations. This survey takes place up to two times a year:

BTM Map Tools

Use the layer tools in the upper right corner of the map to

- display the

BTM Winter Web Surveys

These surveys help predict the intensity of BTM infestations for the following spring over a broad area. Between December and April, teams of two drive some of the major roads within and near areas known to have BTM. The passenger collects

BTM 2022 Town List

(Aerial Survey)

Select town for detail

Unselect town to clear selection

- Albion
- Appleton
- Arrowsmith
- Auburn
- Augusta
- Bangor
- Bath
- Belfast
- Belgrade

Percentage by Web Survey Count (2022) Category

Each data point in the winter web survey is assigned a range of numbers based on how many webs are estimated to be in a given area

Last update: 2 hours ago

2022

Esri, USGS | Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS | MaineIT GIS, Maine GeoLibrary, MaineDOT, ... Powered by Esri

2022 BTM

151.1k

- 2021 - Aerial survey – 200,000 acres
- 2022- Aerial survey – 152,000 acres
- Winners – Cumberland, Kennebec and Sagadahoc Counties
- Losers – Androscoggin, Penobscot and Waldo Counties
- LD 1181 Provided funds to assist municipalities severely infested with BTM caterpillars
- BTM Bulletin – Subscribe on the MFS website – maine.gov/dacf/knockoutbtm

• <https://www.arcgis.com/apps/dashboards/8f2931a691374ac9853636e71cbb1f40>

RECOGNIZE

Learn to **recognize** if the trees where you live, work, and play have browntail [winter webs](#).



Winter webs

Browntail moth
management
of adults and
egg masses-
July to August



Adult BTMs are attracted to lights!

- ▶ Reduce outdoor lighting
- ▶ Do not store plants underneath lights
- ▶ Use a hose to wash large infestations of moths off plants and buildings then vacuum them up with a wet/dry shop vac with a HEPA filter



<https://www.pinestatepest.com/blog/post/adult-browntail-moths-in-maine>

Train staff to recognize all life stages of browntail moth.



Toxin in hairs is extremely stable (3+ yr); exposure most likely in dry conditions. In infested areas use PPP whenever conducting activities that might stir up hairs.



Photos by MFS except: Adult: Anne Burton, Egg mass: Bath Division of Forestry

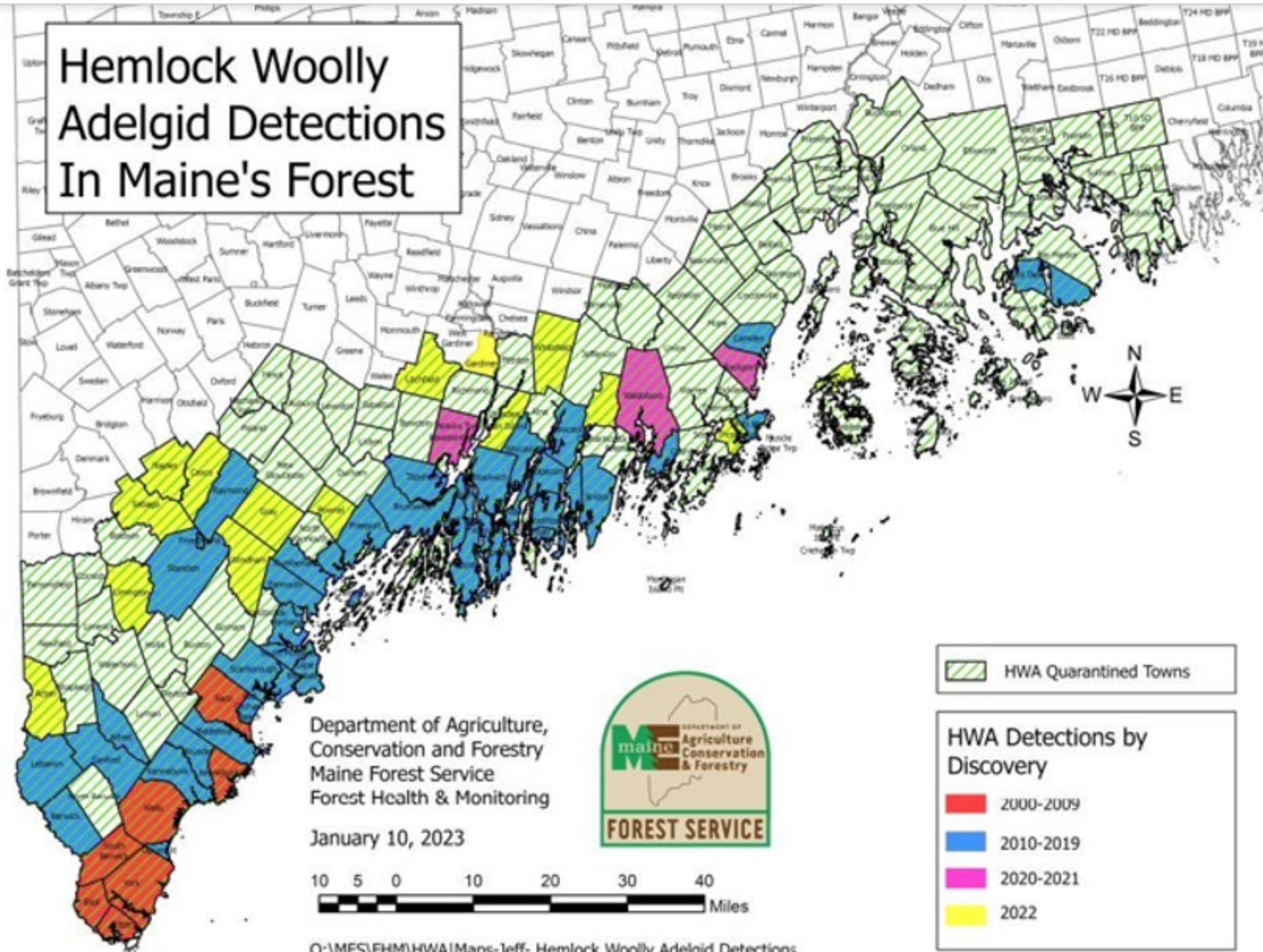
Hemlock Woolly Adelgid

Look at undersides of HEMLOCK twigs



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

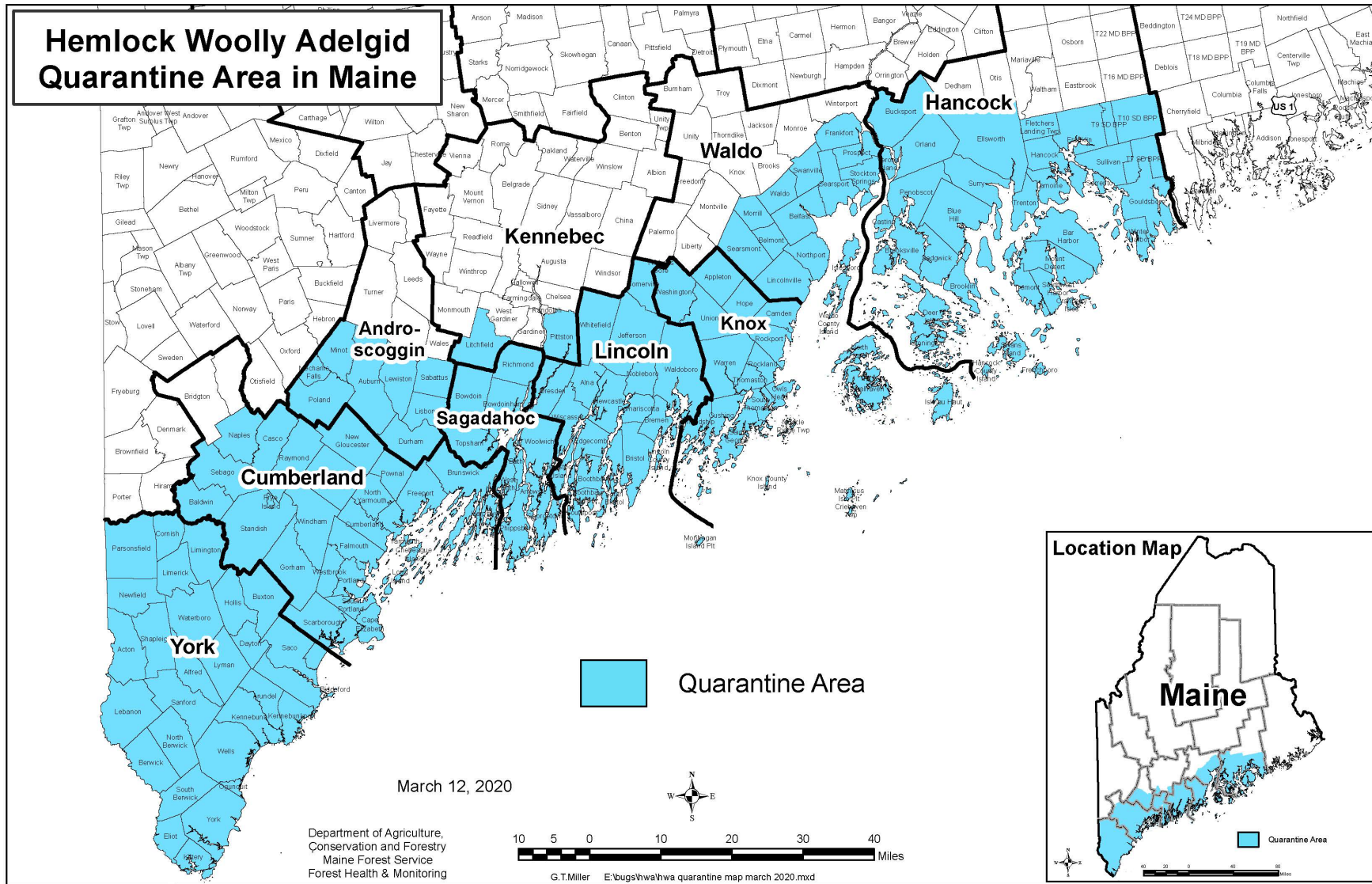
Hemlock Woolly Adelgid Detections In Maine's Forest



Department of Agriculture,
Conservation and Forestry
Maine Forest Service
Forest Health & Monitoring



Hemlock Woolly Adelgid Quarantine Area in Maine



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

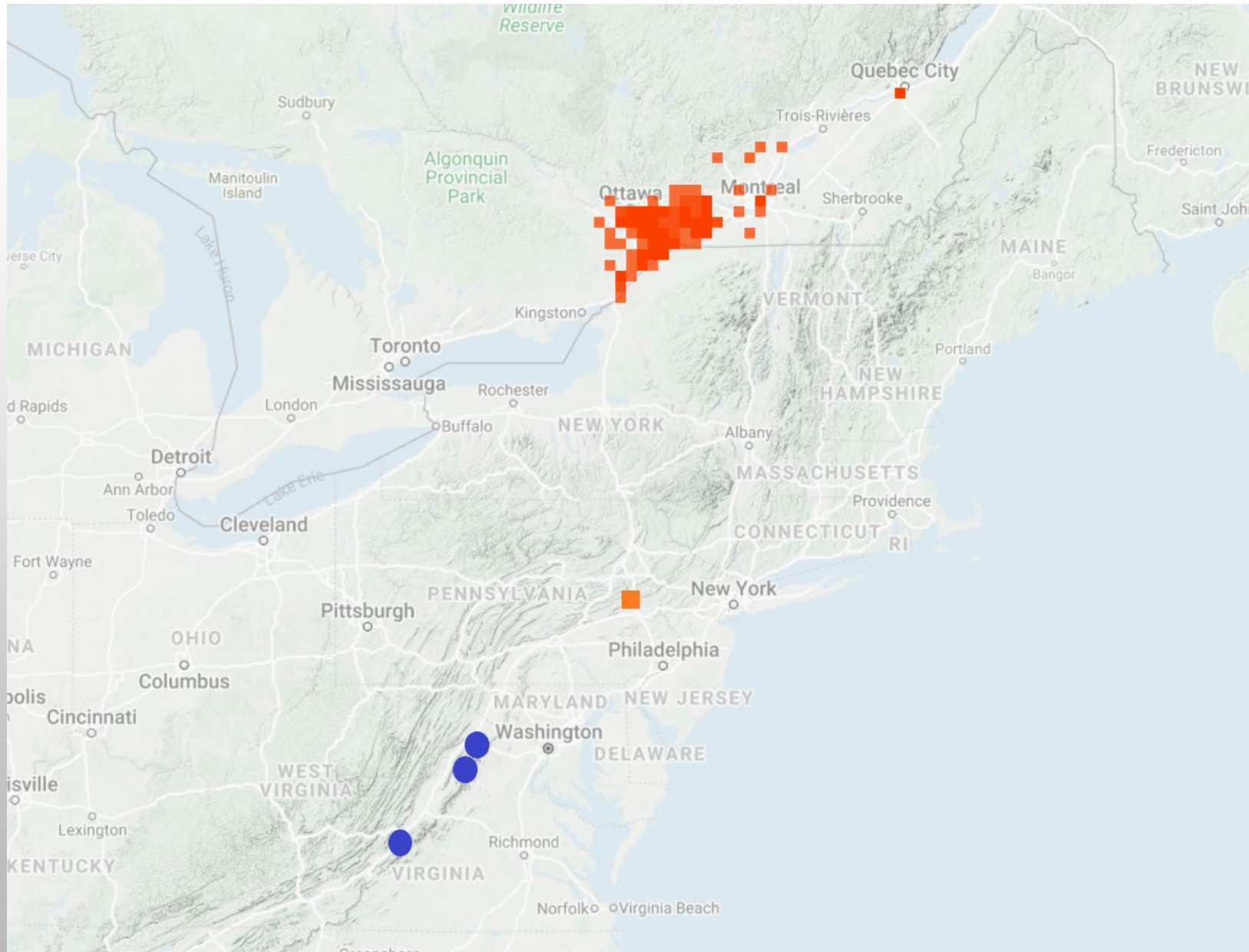


Hemlock tree infested with Elongate
Hemlock Scale and Hemlock Woolly Adelgid



Elm Zig Zag
Sawfly






Elm zig zag sawfly

- Native to Asia
- 2020 – found in Quebec
- 2021 – found in 9 counties in VA

 Reported by public in iNaturalist

 Found by state



Elm zig zag sawfly only attacks elm trees

- Alternate leaf formation
- Leaves have serrated edges
- Leaves are asymmetrical at base



American Elm

Slippery Elm

Rock Elm

What is a sawfly?

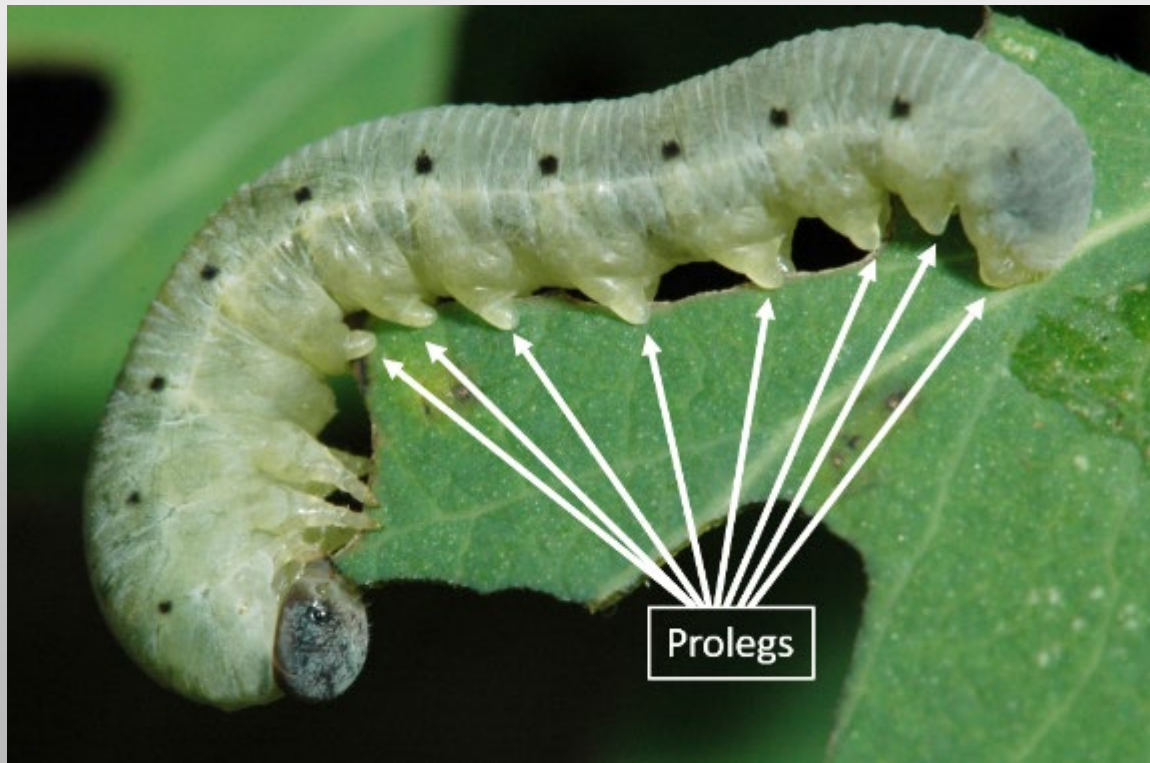
- Sawflies are related to wasps! (Hymenoptera)
- Sawflies DO NOT have a “pinched” waist, like other wasps and hornets.



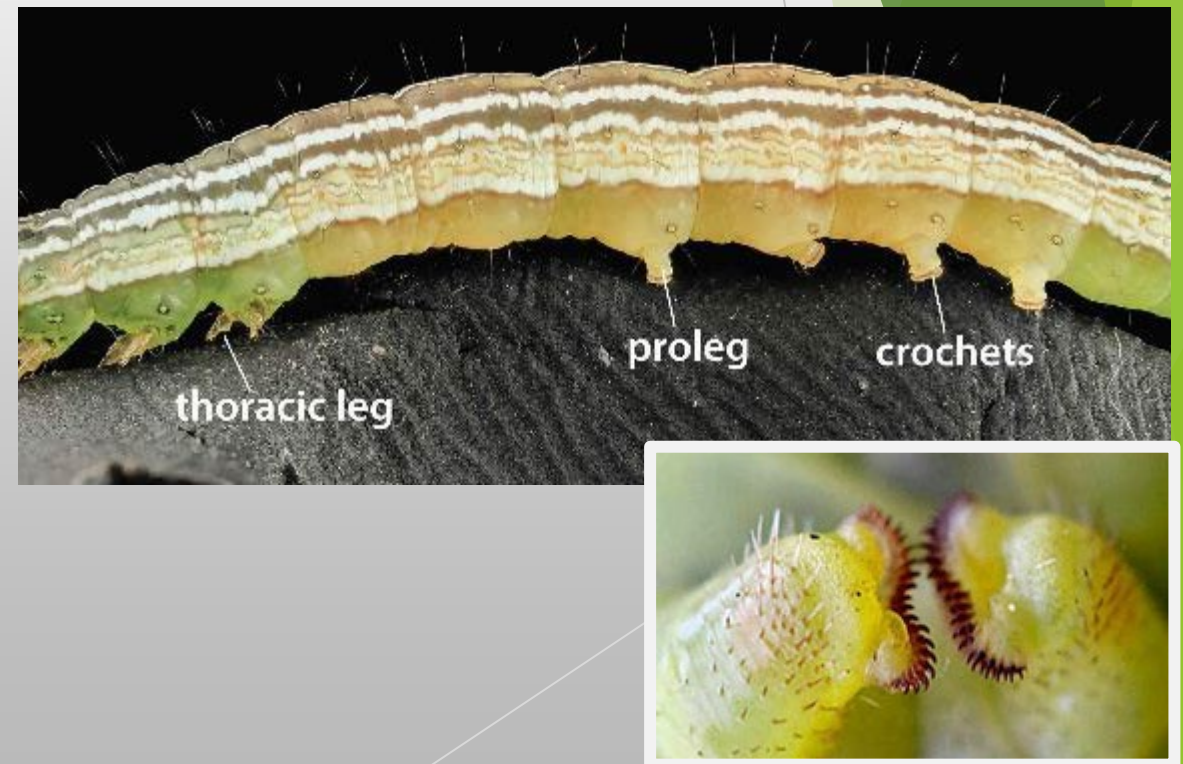
Sawfly larvae look like caterpillars!

- Sawfly larvae have more than 6 pairs of prolegs, caterpillars have 5 or fewer
- Sawfly larvae DO NOT have crochets (hooks) on bottom of prolegs

sawfly larva



caterpillar



Look for zig zag feeding in elm leaves



Spotted lanternfly



- 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

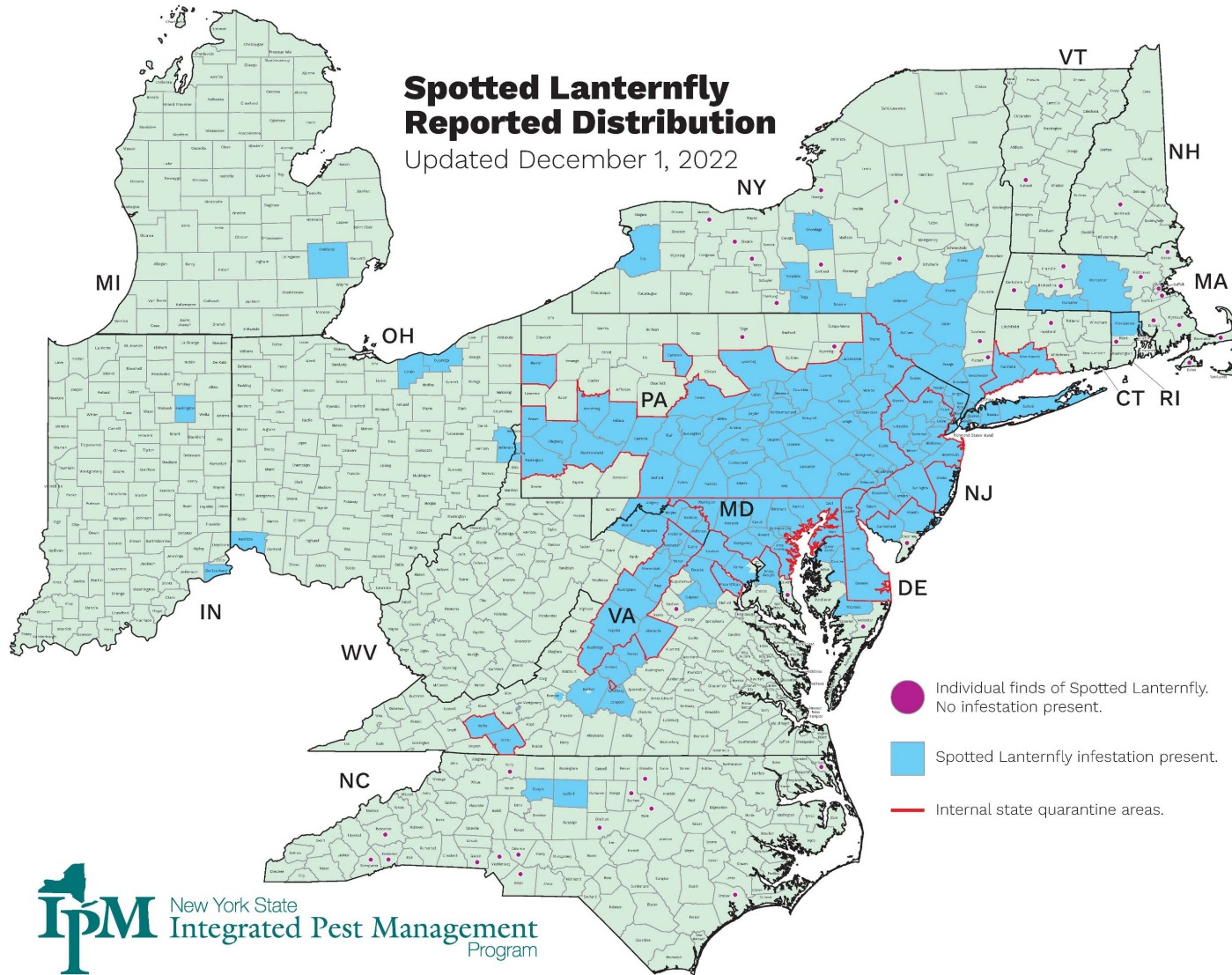
How SLF Spreads:

Egg masses are cryptic and laid on different surfaces

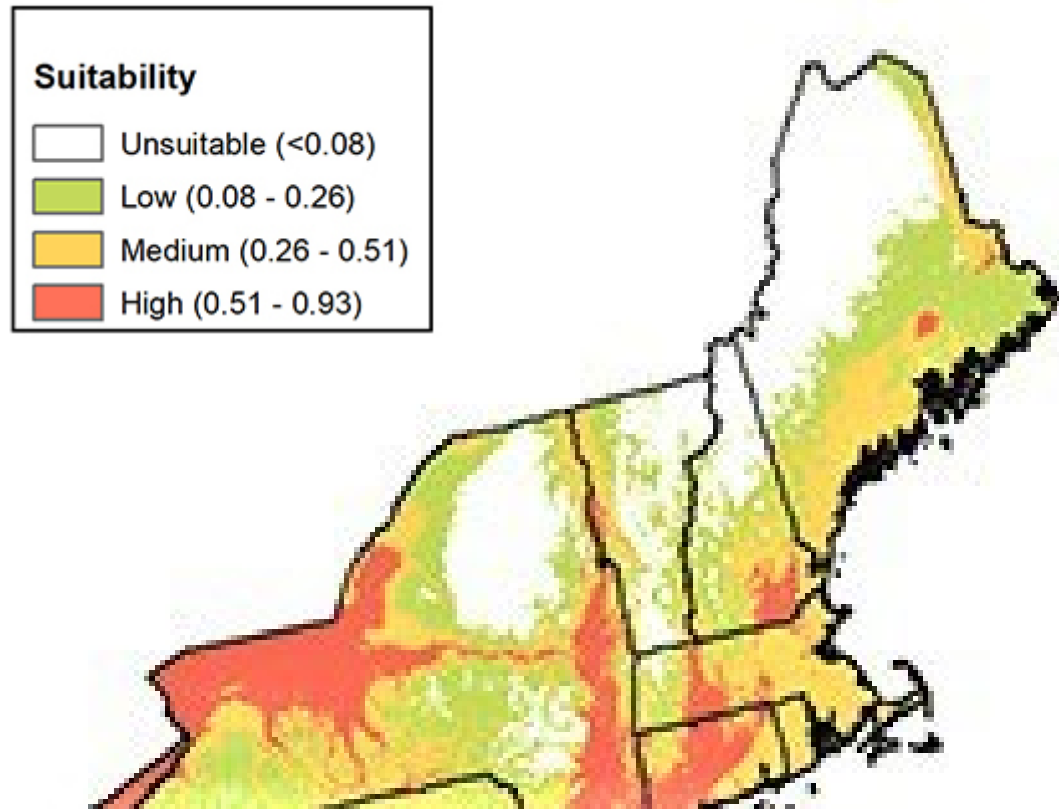


Spotted Lanternfly Reported Distribution

Updated December 1, 2022



SLF risk in Maine



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

Tree of Heaven (*Ailanthus altissima*)

Feeding on TOH improves female maturity





Arion vulgaris (from Dänisch Nienhof, Germany: photo courtesy I. Richling)

CREEPY CRAWLIES

Amyntas worm spp.

Jumping Worm, Crazy Worm, Snake Worm, Alabama Jumper

Characteristics

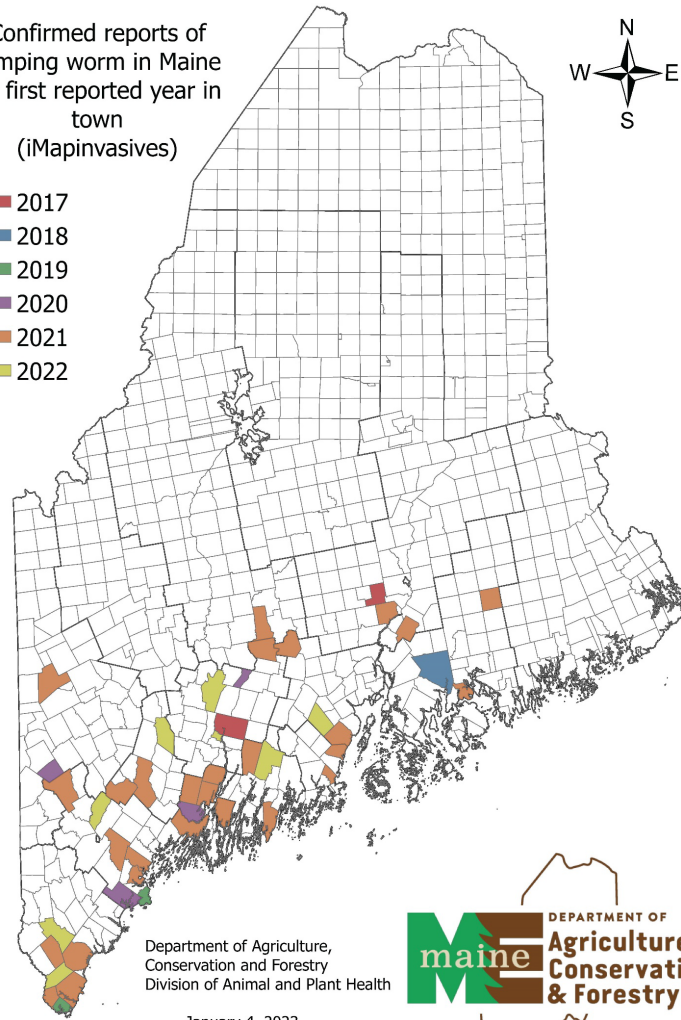
- Darker in color – appearing almost gray
- Glossy smooth skin
- Light milky white clitellum smooth to the body
- Very active, thrashing and jumping
- Moves like a snake
- Sheds its tail when handled
- Parthenogenic – asexual reproduction so it only takes one worm to start a family.



Confirmed reports of
jumping worm in Maine
by first reported year in
town
(iMapinvasives)



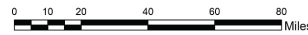
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022



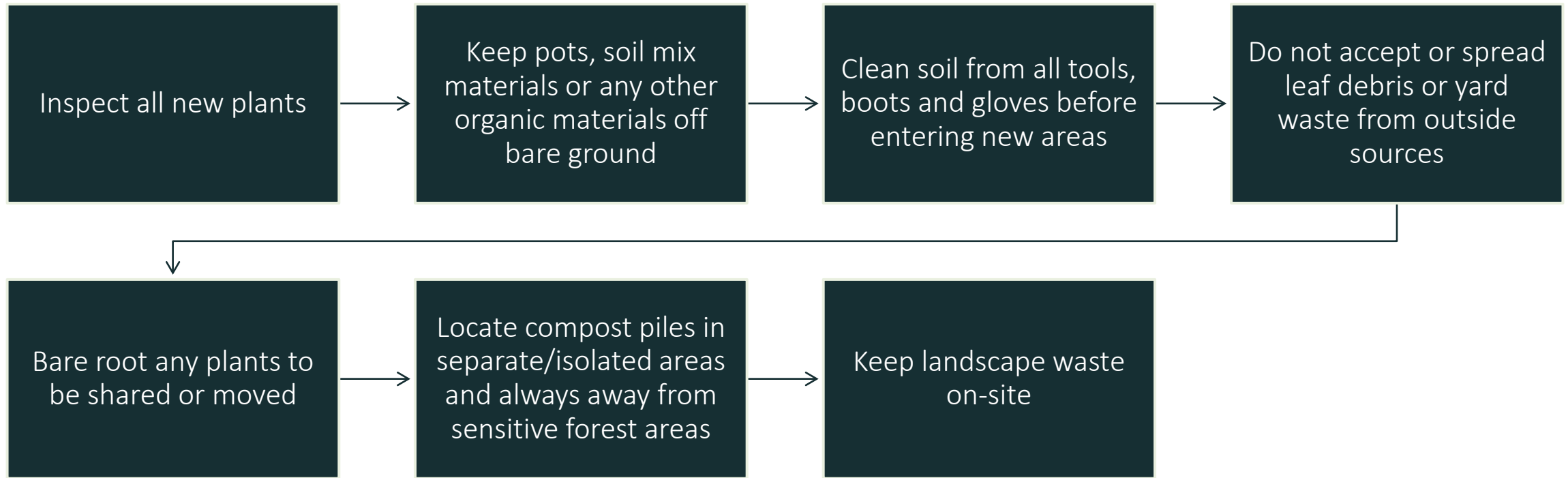
Department of Agriculture,
Conservation and Forestry
Division of Animal and Plant Health



January 4, 2023



Jeff.Harriman Path: O:\MFS\FHM\Asain Jumping Worm\Armyntas Worms in Maine.aprx



BMPs to slow the spread of *Amynthas* worms

BOLO for slugs

- ❖ *Arion vulgaris* – in Quebec City and Toronto
- ❖ *Arion ater* – only on Vinalhaven
- ❖ *Vulgaris* – considered a severe vegetable pest
- ❖ *Ater* – Appears to mainly feed on dead vegetation in the forest
- ❖ *Vulgaris* and *ater* – known to hybridize



Arion vulgaris (from Dänisch Nienhof, Germany: photo courtesy I. Richling)



Arion ater - Photo by Karen Coluzzi

Arion vulgaris



- ❖ It has spread widely in Europe
- ❖ May be partially due to its hybridization with the two other members of the *Arion ater/rufus/vulgaris* complex (ARVC)
- ❖ The hybrids are aggressive and highly adaptable to new environments
- ❖ It should be emphasized that “pure” *Arion vulgaris* is a serious pest; hybridization with *A. ater* and *A. rufus* just increases its potential to spread to new environments

Invasive Species Investigators

WE NEED YOU

Exotic Snail & Slug Scavenger Hunt

You Found It!

- How Many Were There?

- What Did You Find It On (e.g. plant, soil)?

- What Was It Doing (e.g. eating, crawling)?

- Where Did You Find It? (address? coordinates?)

PLACE
STAMP
HERE

To:

Maine Bug Watch
28 State House Station
Augusta, ME 04333



Please email a photo to bugwatch@maine.gov, or collect one and let us know!

Black slugs & other exotic mollusks



These invasive species are considered major agricultural threats.



Black slugs (*Arion ater*, *Arion rufus*, and *Arion vulgaris*). LARGE (adults > 3"). Color may be black, brown, orange, or yellow. Prefer cool, moist habitats. Often found near campgrounds, parks, trails, and roads.



Other invasive mollusks (L to R): Chinese slug (*Meghimatium pictum*), hygromiid snails (*Cernuella spp.* and *Monacha spp.*), cochlicellid snails (*Cochlicella spp.*).

Have you seen any of these in Maine? Please take photos, record the exact location, and email Bugwatch@maine.gov!



Photo credits: (1) © A.J. Silverside, lastdragon.org; (2) © J. Herder, www.digitalnature.org; (3) Paulo Lenhard, Project AM, <http://terrrslugs.lifedesks.org/pages/31164>; (4) © L. Kolouch, www.biolib.cz; (5) Vmenkov, Wikipedia; (6) L. Poggiani, HU www.lavalle.delmetauro.it; (7) © Dr. Roy Anderson, MolluscIreland; (8) <https://www.maine.gov/dacf/php/caps/Arion/index.shtml>

Should Maine Develop a More Comprehensive
Approach to Invasive Species Management?
A 2022 Survey of Likely Invasive Species Managers in Maine and
Policy Recommendations Based on Their Responses

Gary Fish

Capstone paper for
Master of Policy, Planning, and Management Program
Muskie School of Public Service
University of Southern Maine

December 2022
Professor Yuseung Kim, Capstone Advisor

Recent
invasive
species
survey

Quick
Summary

Quick survey summary

- This paper analyzes the status of Maine's public and private invasive species management efforts and attempts to answer the question, “Should Maine develop a more comprehensive approach to invasive species management?”
- 197 respondents (sent to approximately 600 IS representatives)
- Top 3 impediments to effective IS management
 - *Public knowledge*
 - *Funding*
 - *Staffing*

Summary Continued

- Top regional species of concern
 - *Invasive terrestrial plants*
 - *Forest insects*
 - *Invasive aquatic plants*
 - *Ticks*
- Species currently managed or of concern
 - *9 Invasive terrestrial plants*
 - *3 invasive aquatic plants*
 - *3 forest insects*

Summary Continued

- Suggestions for improvement
 - *Increased funding*
 - *Education & outreach*
 - *Agency coordination & partnerships*
 - *Increased staffing*

- Alternative policy models suggested
 - *Partnerships like New York PRISMs*
 - *Contingency plans*
 - *Rapid response teams*
 - *Landowner cost share programs*

Summary Continued

- Staffing and budgets
 - *Total staffing for all organizations 120 FTE*
 - *Total budgets for all organizations \$3.2 million*
 - *Lake associations employ the most staff and have the largest collective budgets*
 - *Followed by*
 - *State agencies*
 - *Forestry organizations*
 - *National parks & lands*
 - *Land trusts*
- *Numbers do not include all state agency staff or budgets*

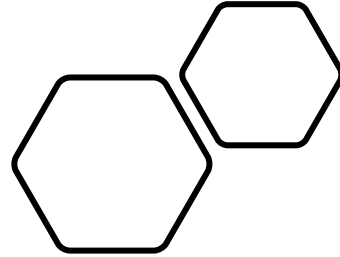
Summary Continued

- Current invasive aquatic plant management programs provide a good example
 - *Strong partnerships*
 - *Consistent funding from the “milfoil sticker”*
 - *Interagency task force*
 - *Rapid response capabilities*
 - *Strong feedback loop to the legislature*

Summary Continued

- Policy options
 - *Do nothing seems imprudent*
 - *Develop ongoing, dedicated funding sources*
 - *Add state agency staff to continue this research (Senior Planner?)*
- Conclusions
 - *Consider new legislation like MA and PA*
 - *Put aside a robust rapid response fund*
 - *Develop partnerships (PRISMs?)*
 - *Increase funding, staffing, outreach*
 - *Improve coordination with abutting landowners*

What you can
do!



Report invasive species

- bugwatch@maine.gov
- <https://appengine.egov.com/apps/me/dacf/mfs-tree-ailment>
- invasives.mnap@maine.gov
- milfoil@maine.gov
- <https://survey123.arcgis.com/share/da099be43ba642799f9c359345257b2f>

Report

Tree of Heaven



Spotted Lanternfly



Bugwatch@maine.gov

Stay Updated
Join Maine Bug Watch



Firewood
is a major
source of
deadly
forest
insects &
diseases

Don't
Move
Firewood!

Signs at border crossings
& visitor centers





What you can do

Boot brushes can help!

- Research found 39 different species growing in mounds of dirt under a boot brush, including 14 exotic plant species.
- Among the exotic species, **found growing under boot brushes**, was garlic mustard (*Alliaria petiolata*) and stiltgrass (*Microstegium vimineum*)!
- **Based on this data, it was determined these brushes removed a lot of seeds from boots.**
- They may also help with jumping worm cocoons.

12th Maine Invasive Species Network Annual Meeting

Live, face-to-face and in living color

Thursday, March 23, 2023

University of Maine, Wells Conference Center

Orono, ME

MISN meeting
March 23 @
Wells
Conference
Center U-Maine,
Orono

8:00-8:30	Registration, coffee, refreshments, and visit sponsor tables
8:30-8:45	Welcome
8:45-9:45	State of the State Roundtable by taxa, part 1 (20 minutes each incl. Q&A) <ul style="list-style-type: none">▪ Agricultural Pests — David Handley, University of Maine Cooperative Ext.▪ Forest Pests – Colleen Teerling, Maine DACF - MFS▪ Aquatic Plants – Denise Blanchette or John McPhedran, Maine DEP
9:45-10:15	Spotted winged drosophila biocontrol research update, Phillip Fanning, University of Maine
10:15 – 10:45	Browntail moth research update, Angela Mech, University of Maine
10:45-11:00	Morning Break Refreshments Provided
11:00 –12:00	Invasive species Messaging and Framing: A Discussion – Facilitated by Nancy Olmstead (TNC), Catherine Spolarich, (DACF-MNAP) Rebecca Jacobs (Knox-Lincoln SWCD)
12:00-1:00	Lunch (provided)—Lunch buffet Gluten Free and Vegetarian Options
1:00-2:30	State of the State Roundtable by taxa, part 2 (20 minutes each, incl. Q&A) <ul style="list-style-type: none">▪ Freshwater Invasive Fish—Jason Seiders, Maine IF&W▪ Terrestrial Plants – Catherine Spolarich & Gary Fish, Maine DACF - MNAP▪ Marine Invasive Species – Jeremy Miller, Wells Reserve▪ Terrestrial Vertebrates – Robin Dyer, USDA-APHIS Wildlife Services (30 mins)
2:30-3:00	Zebra Mussels in the Saint John River watershed – early detection – Denise Blanchette, Maine DEP & Alison Watts, University of New Hampshire
3:00-3:15	Morning Break Refreshments Provided
3:15-3:45	Black swallowwort biocontrol research update, Hillary Peterson, Maine DACF
3:45 – 4:15	Should Maine consider a more comprehensive approach to invasive species management? Review of the recent survey and capstone paper, Gary Fish, Maine DACF
4:15-4:30	Wrap Up MISN announcements—goals, upcoming meetings, online forum, etc.
4:30	Adjourn



Questions?

Gary Fish

Maine State Horticulturist

gary.fish@maine.gov

207-287-7545