

Maine Forest Pest Update



Landowner 101 Adult Education Course
June 7, 2021

MFS Insect and Disease Lab Overview

MISSION STATEMENT: The Division of Forest Health & Monitoring was established in 1921 to protect the forest, shade and ornamental tree resources of the state from significant insect and disease damage and to provide pest management and damage prevention for homeowners, municipalities, and forest landowners and managers, thereby preserving the overall health of Maine's forest resources.

WHAT WE DO:

- ▶ Provide pest diagnosis, as well as management and damage prevention information to homeowners, municipalities, and forest landowners and managers
- ▶ Maintain a statewide forest health monitoring system for forest insect pests, forest pathology issues, and certain abiotic factors
- ▶ Report regularly on forest health current events through a variety of media to keep stakeholders informed and up-to-date
- ▶ Oversee forestry-related insect and disease quarantine regulations to prevent pest spread

MFS Insect and Disease Lab Family Tree



Insect and Disease Reporting

Maine Forest Service - Tree Ailment

What is wrong with my tree/shrub/forest report form

Welcome to the Maine Forest Service insect and disease reporting webpage, where you can let us know about any tree health or forest pest issues you're observing. Fill out as much of the information as you can, and if you provide us with your daytime phone or e-mail address, someone will contact you to provide management advice for your particular situation. If you have any questions or have problems completing this form, contact us at 287-2431 or foresthealth@maine.gov.

If your questions are related to indoor, structural, yard, or garden pests, please contact the experts at [University of Maine Cooperative Extension Pest Management Office](#).

- ▶ Start with a pest submission form found on our website
- ▶ Your submission will be directed to the appropriate staff member
 - ▶ Many mysteries can be solved over the phone or email with a good description or photo
 - ▶ A follow-up site visit will sometimes be made if necessary
- ▶ Sign up for our mailing list for press releases and conditions reports that can answer many questions about forest health current events

LIFE CYCLE OF THE EMERALD ASH BORER

1 Female ash borers lay 40 to 70 eggs on the bark of an ash tree.



After hatching, the larvae bore into the tree layers just below the bark to feed. They remain there for 1 or 2 years, then pupate into adults.

2



Adults, which can fly, then seek out new trees, and the process begins again.

4



3

The adults then chew a telltale D-shaped exit hole in the bark.



Emerald Ash Borer
(enlarged view)



Actual size



1/2 in. long
1/8 in. wide

EAB Watchout: Woodpecker Flecking



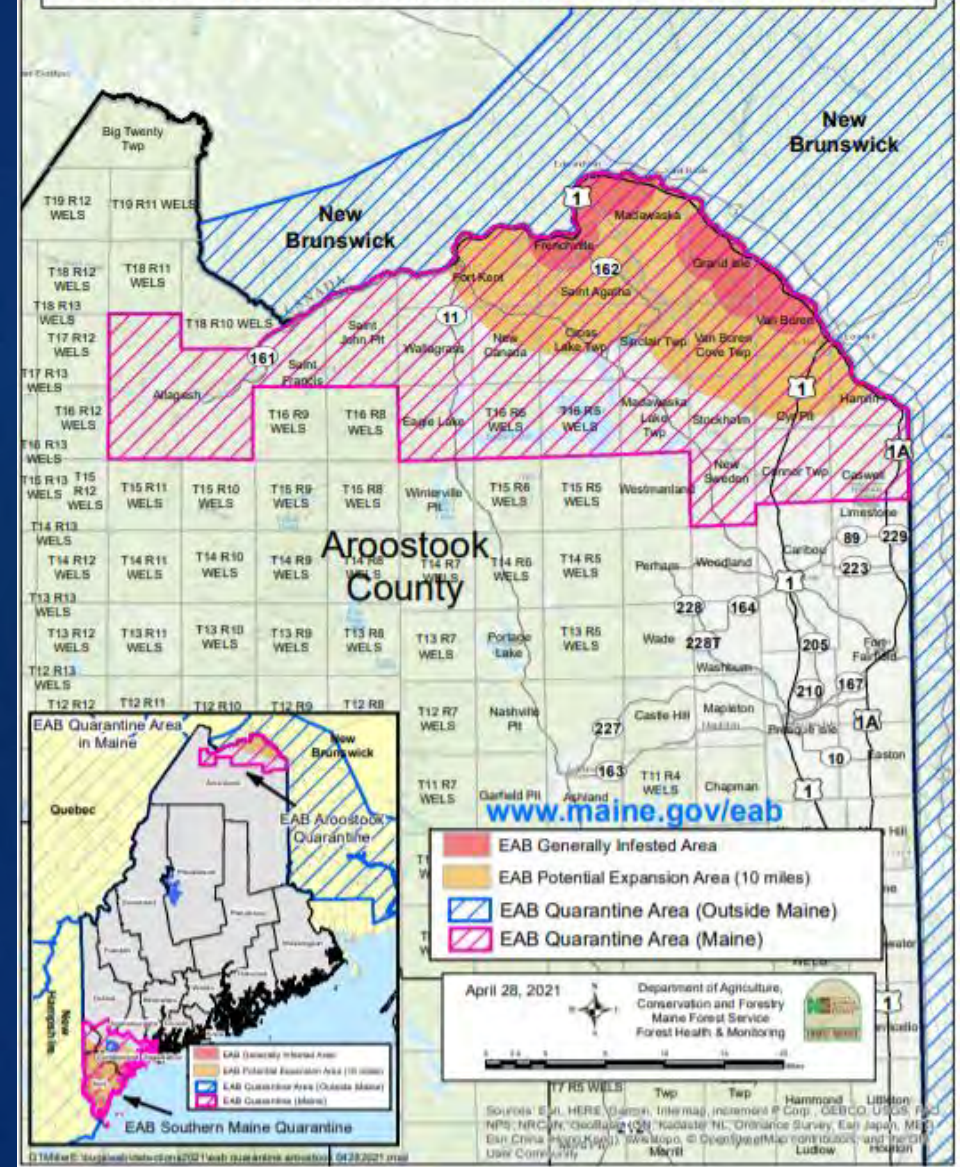




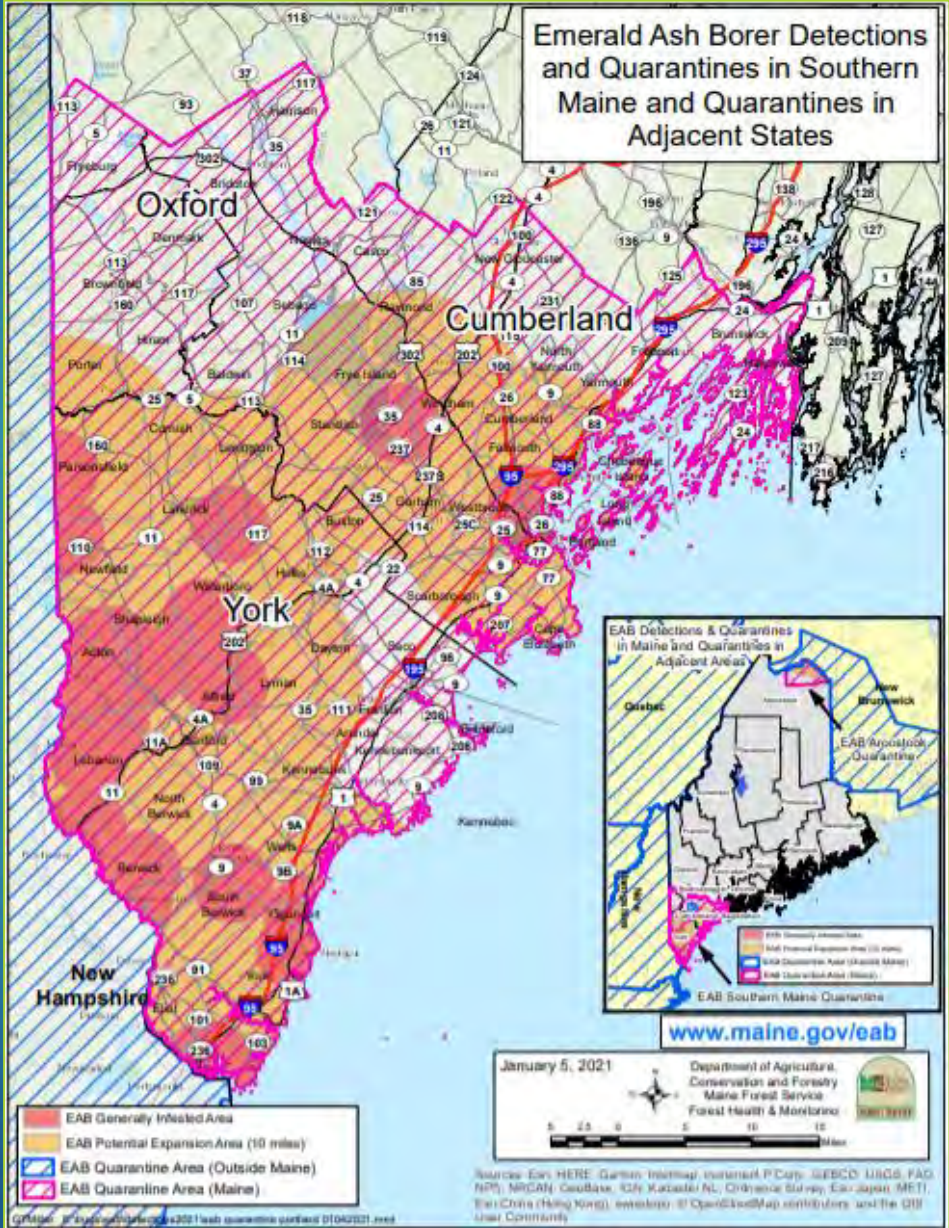


EAB Regulated Areas in Maine

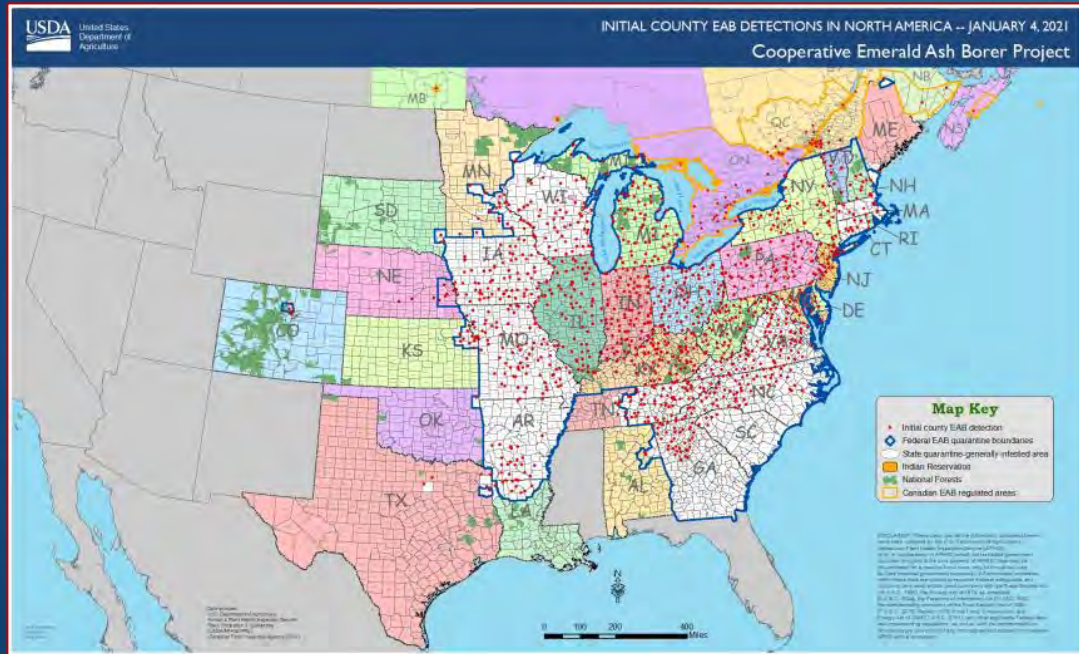
Emerald Ash Borer Quarantine Area in Northern Maine



Emerald Ash Borer Detections and Quarantines in Southern Maine and Quarantines in Adjacent States



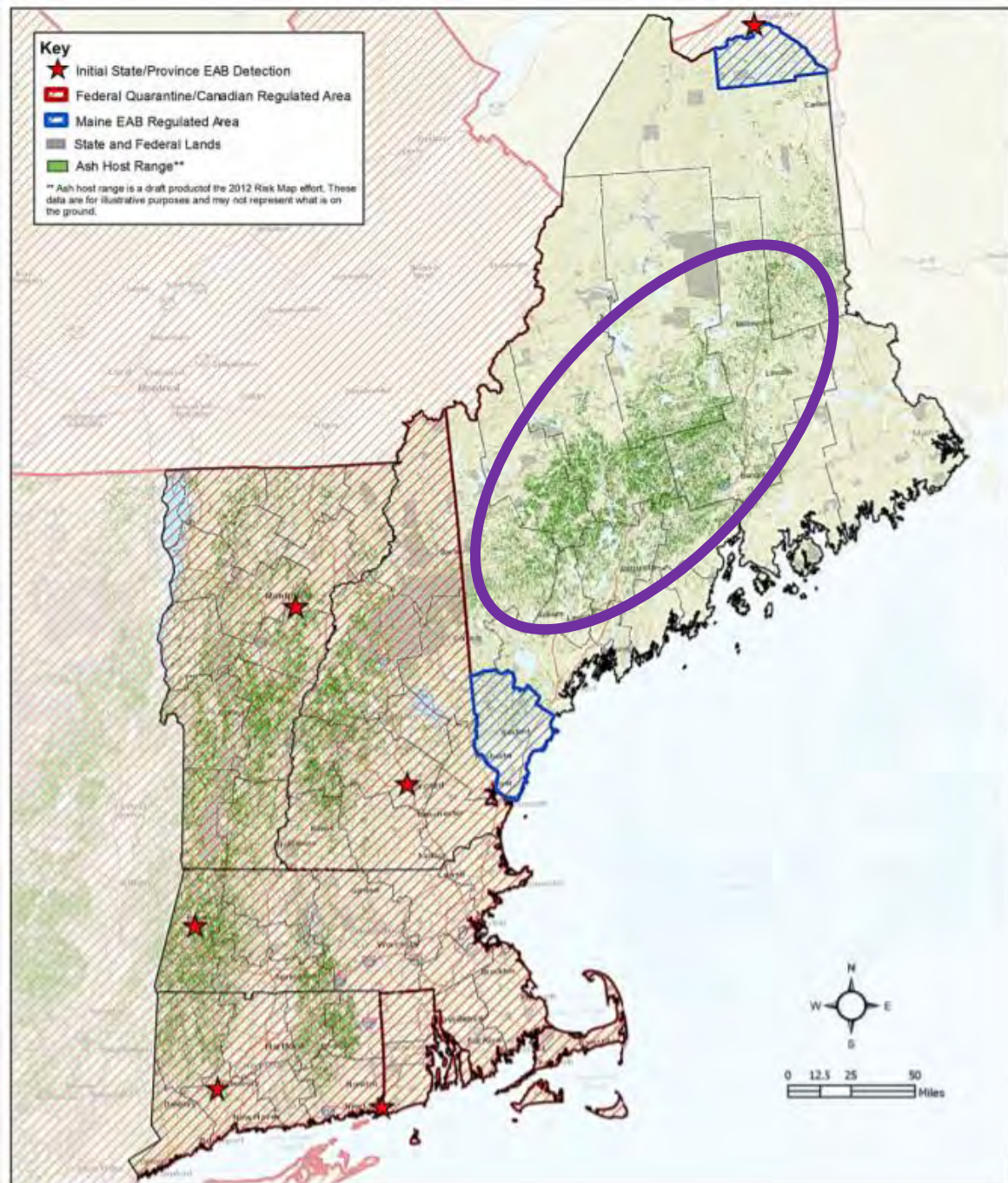
Federal EAB Deregulation: What's Changing?



- ▶ Federal EAB regulations were removed by USDA-APHIS on Jan 14, 2021
- ▶ Areas in Maine formerly under federal regulation included all of York County and northern Maine regulated area
- ▶ Federal quarantine boundary at NH border previously prevented unregulated entry of certain regulated ash articles into Maine from out-of-state
- ▶ Maine has now enacted its own State regulations to take the place of certain federal regulations to regulate certain movements of ash articles

What are we fighting to protect in Maine?

- ▶ ~481,457,542 ash trees over 1" DBH account for ~2% of all trees in Maine
- ▶ Only ~6.1% of all ash trees in Maine are in currently regulated areas in Cumberland/York/Oxford Counties and Aroostook County
- ▶ Right now, the vast majority of Maine is still free of EAB – **let's keep it that way!**

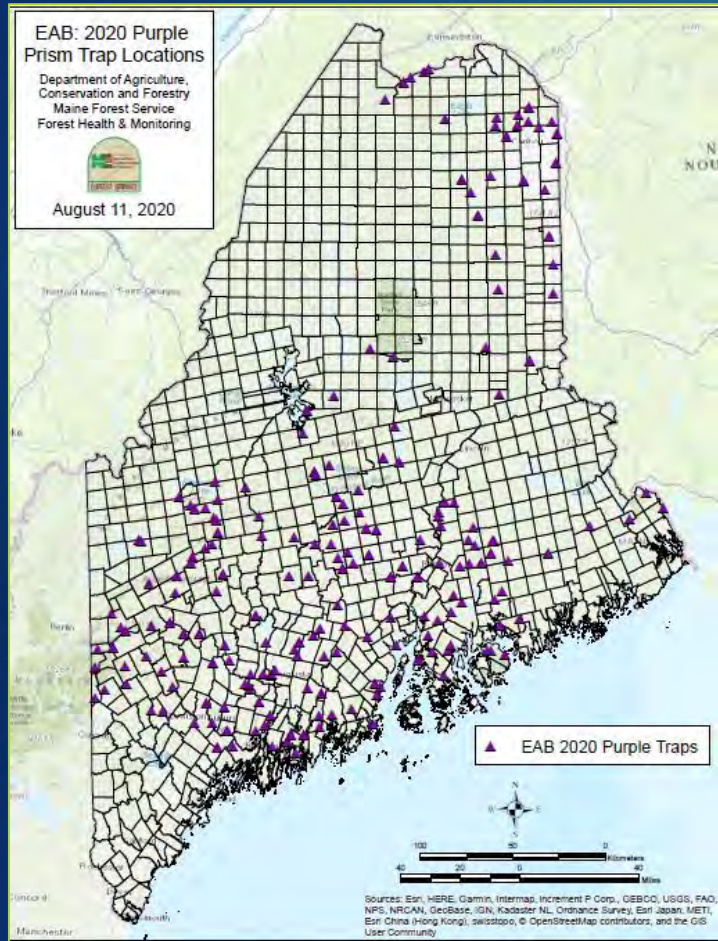


EAB Detections in 2020 – Girdled Trap Tree Program

- ▶ 34 trees were girdled in 2020 as part of the girdled trap tree program
- ▶ All 2020 girdled trap tree detections occurred in areas already regulated for EAB
 - ▶ Northern EAB Zone:
 - ▶ Girdled trap trees detected EAB in Frenchville, two locations in Grand Isle, and Van Buren
 - ▶ Van Buren detection is first for that town
 - ▶ Southern EAB Zone:
 - ▶ Girdled trap trees detected EAB in Gorham, two locations in Portland, and South Berwick
 - ▶ Gorham detection is first for that town
- ▶ Participate in the 2021 girdled trap tree program!
 - ▶ https://www.maine.gov/dacf/mfs/forest_health/documents/MonitoringForEABWithGirdledAsh.pdf



New EAB Detections in 2020



- ▶ 199 purple prism traps were hung in non-regulated areas of Maine in 2020
 - ▶ No EAB were detected during the 2020 PPT survey
- ▶ EAB was detected again in Kittery using bio-surveillance method
- ▶ Landowners reported infested trees in Cape Neddick, Newfield, Ogunquit, Parsonsfield, and Shapleigh
 - ▶ All were first detections in those towns
- ▶ MFS field staff detected EAB in Waterboro during independent survey



Emerald Ash Borer Management Efforts: Biological Control



- ▶ Northern EAB Area
 - ▶ *Oobius agrilli*, *Tetrastichus planipennisi*, and *Spathius galinae* released in the northern EAB zone in 2019
 - ▶ *Tetrastichus planipennisi* and *Spathius galinae* were released in the northern EAB zone again in 2020
 - ▶ Parasitoids will not be released again in northern zone in 2021 but population monitoring will begin
- ▶ Southern EAB Area
 - ▶ *Tetrastichus planipennisi* was released in the southern EAB zone for the first time in 2020
 - ▶ *Oobius agrilli*, *Tetrastichus planipennisi*, and *Spathius galinae* to be released in the southern zone in 2021

Oobius agrili

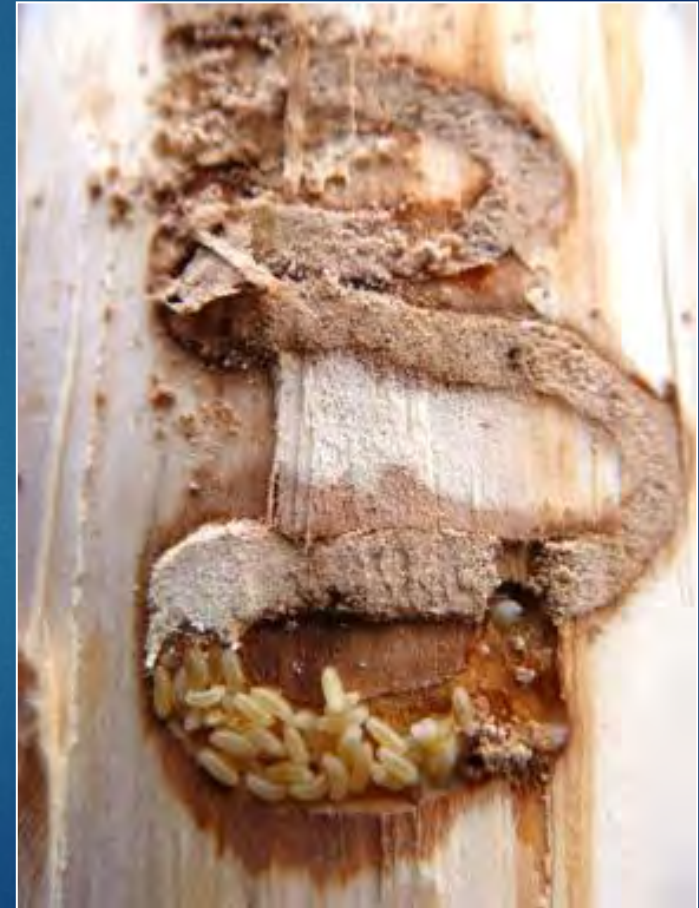


Photo USDA ARS



Photo Jason Hansen

Tetrastichus planipennisi



Spathius spp



Photo USDA ARS



EAB: WHAT TO DO AS A LANDOWNER

- ▶ Know what you have for an ash resource
- ▶ Always be aware of the relation of your land to the nearest EAB infestation
- ▶ If ash is a major component of your forest, have a management plan sooner rather than later
- ▶ Having a plan in place allows you to continue to accumulate volume without cutting pre-emptively
- ▶ If EAB is close and management is already planned, consider removing as during a single stand entry
- ▶ Help MFS by participating in monitoring efforts to track the spread of EAB (e.g. girdled trap tree program)
- ▶ EAB activities for landowners: <https://youtu.be/SawDPmGrTPo>

Browntail Moth Update

- ▶ Browntail moth has continued range expansion in Maine in 2021
- ▶ Fungal pathogens and disease affecting browntail moth populations have been virtually absent in 2020 and 2021 due to unfavorable spring weather conditions
- ▶ BTM activities for landowners: <https://youtu.be/L6VmwsXE3lg>



Browntail Moth Aerial Survey Results

Flight Line Area 2020 Detection Survey

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

September 28, 2020



Flight Coverage
14,791,339 Acres

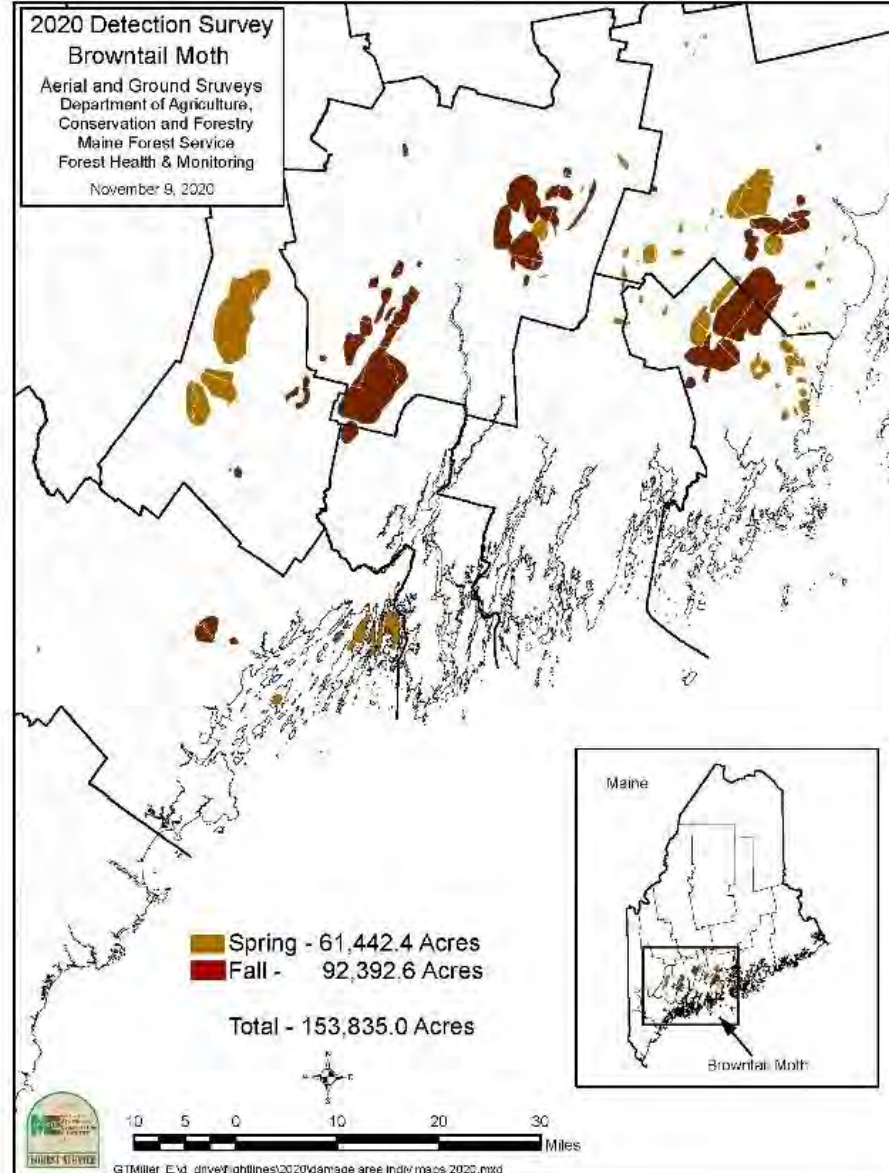
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2020 Detection Survey

Browntail Moth

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

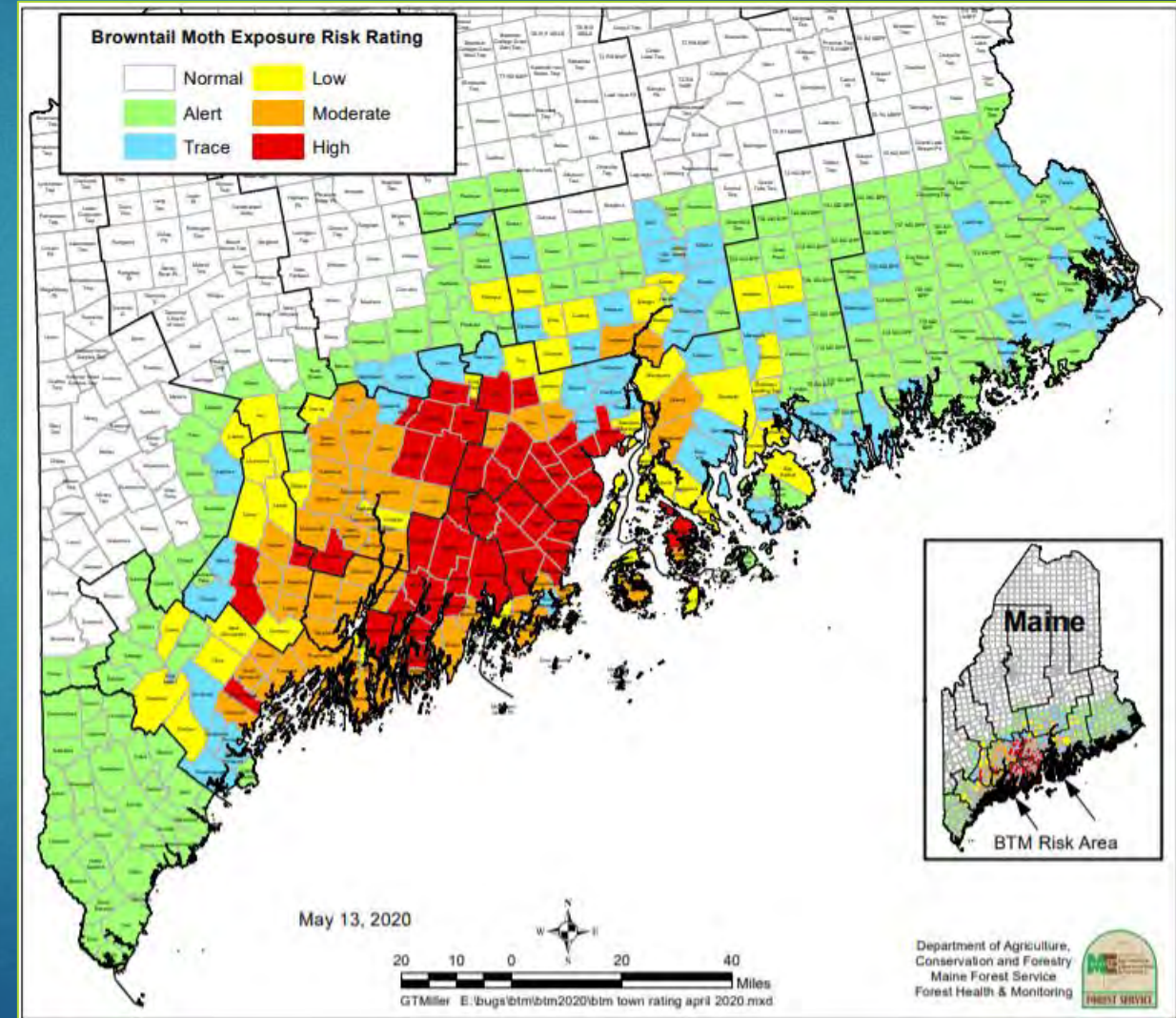
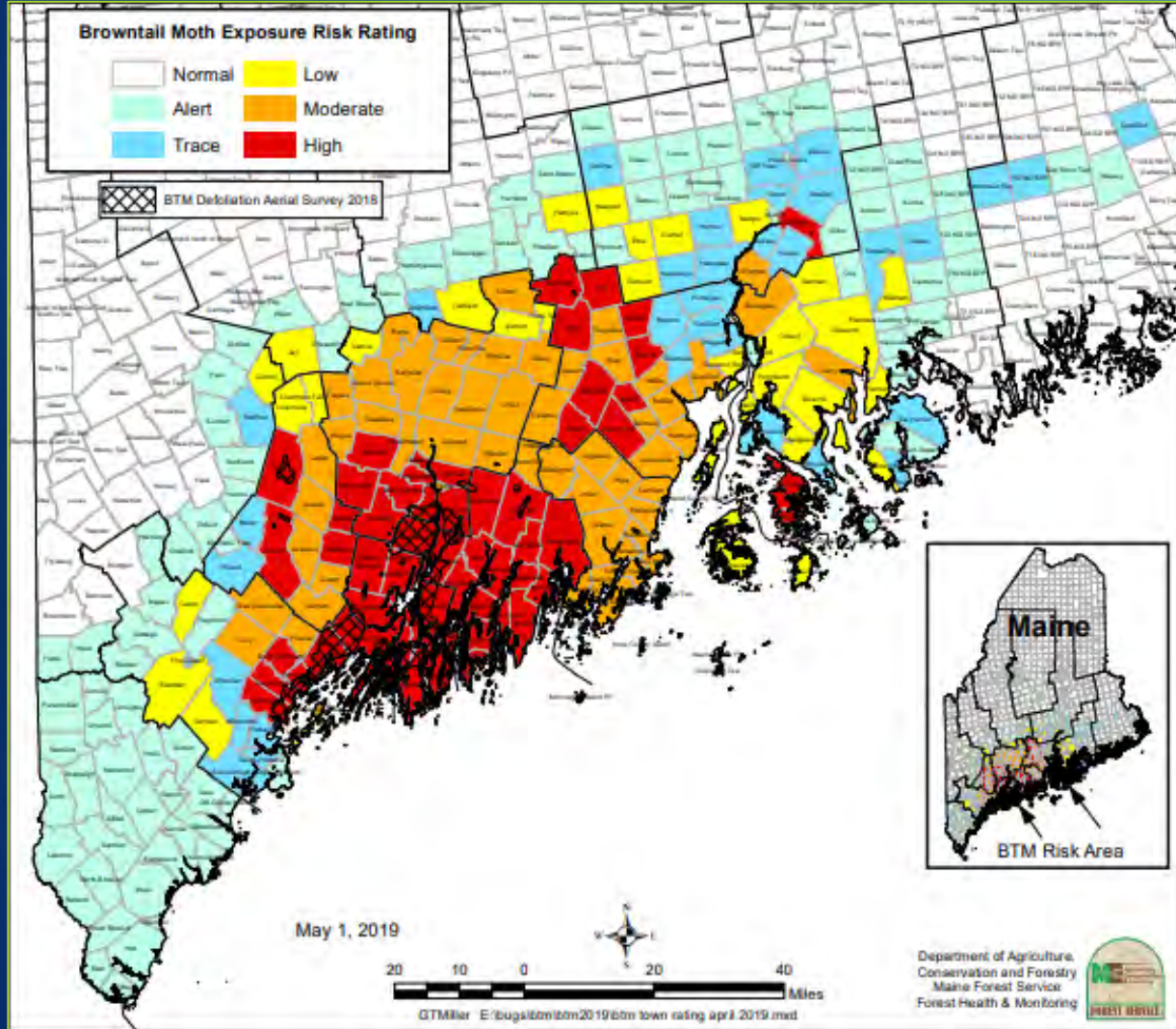
November 9, 2020



Spring - 61,442.4 Acres
Fall - 92,392.6 Acres
Total - 153,835.0 Acres

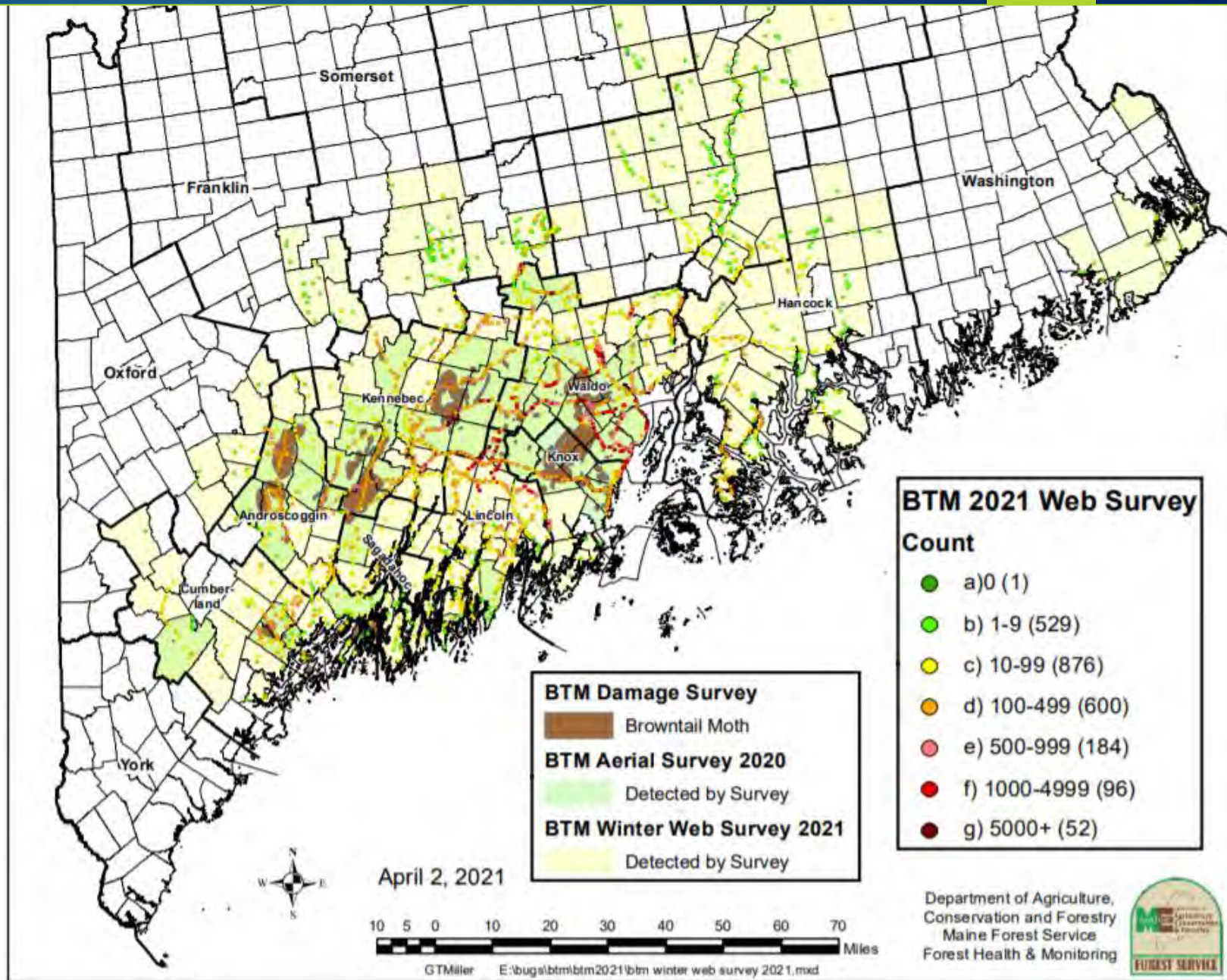
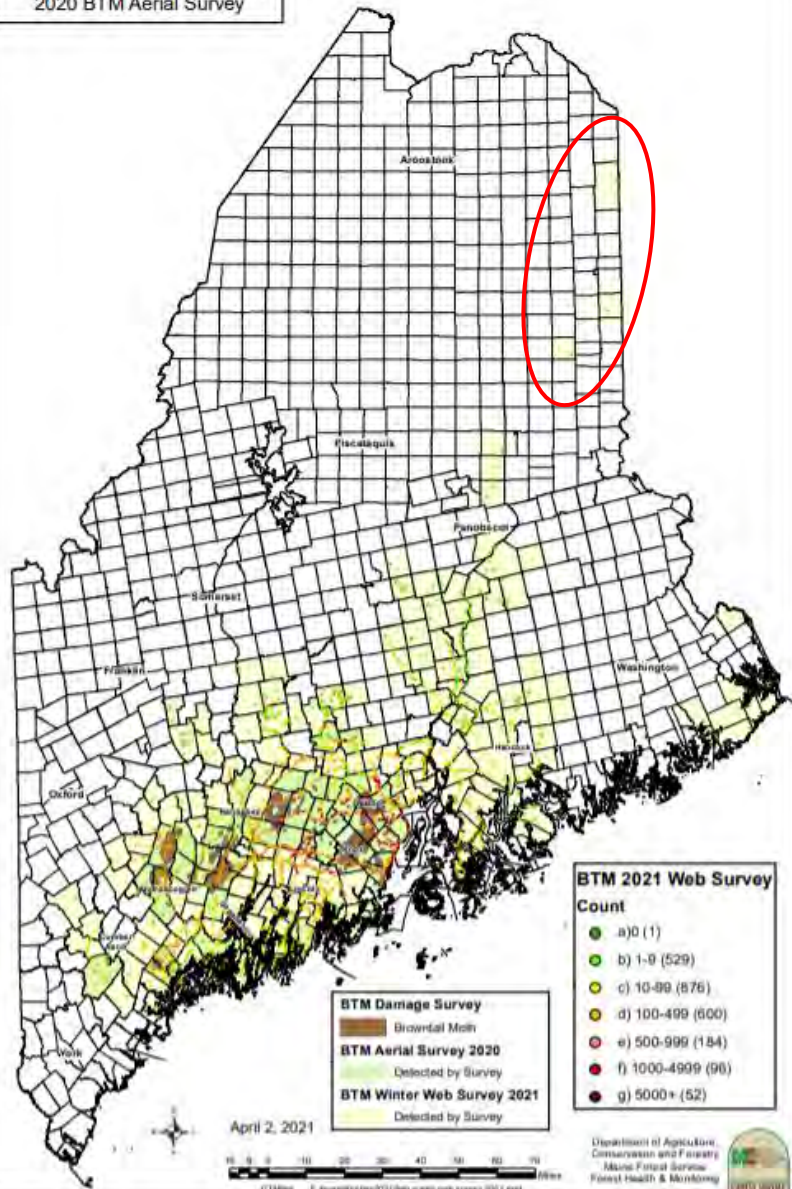
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Browntail Moth Exposure Risk: 2019 - 2020



Browntail Moth

2021 Winter Web Moth Survey
2020 BTM Aerial Survey



Survey, Clip and Destroy Webs before Mid-April, Line up Insecticide Treatment

Insecticide Treatment BEFORE June, Personal Protection Precautions*

Personal Protection Precautions*

Personal Protection Precautions*, Limit Outdoor Lights

Next Year's Problems Appear, Treatment May be Possible (Not Recommended Near Marine Waters)

Winter Webs

Feeding Larvae

Pupae

Adults

Eggs

Feeding Larvae

Highest Exposure Risk for Hairs*

Sept-April

April-June

June-July

July-Aug





July-Aug

Aug-Sept



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.

Other Caterpillars to Know

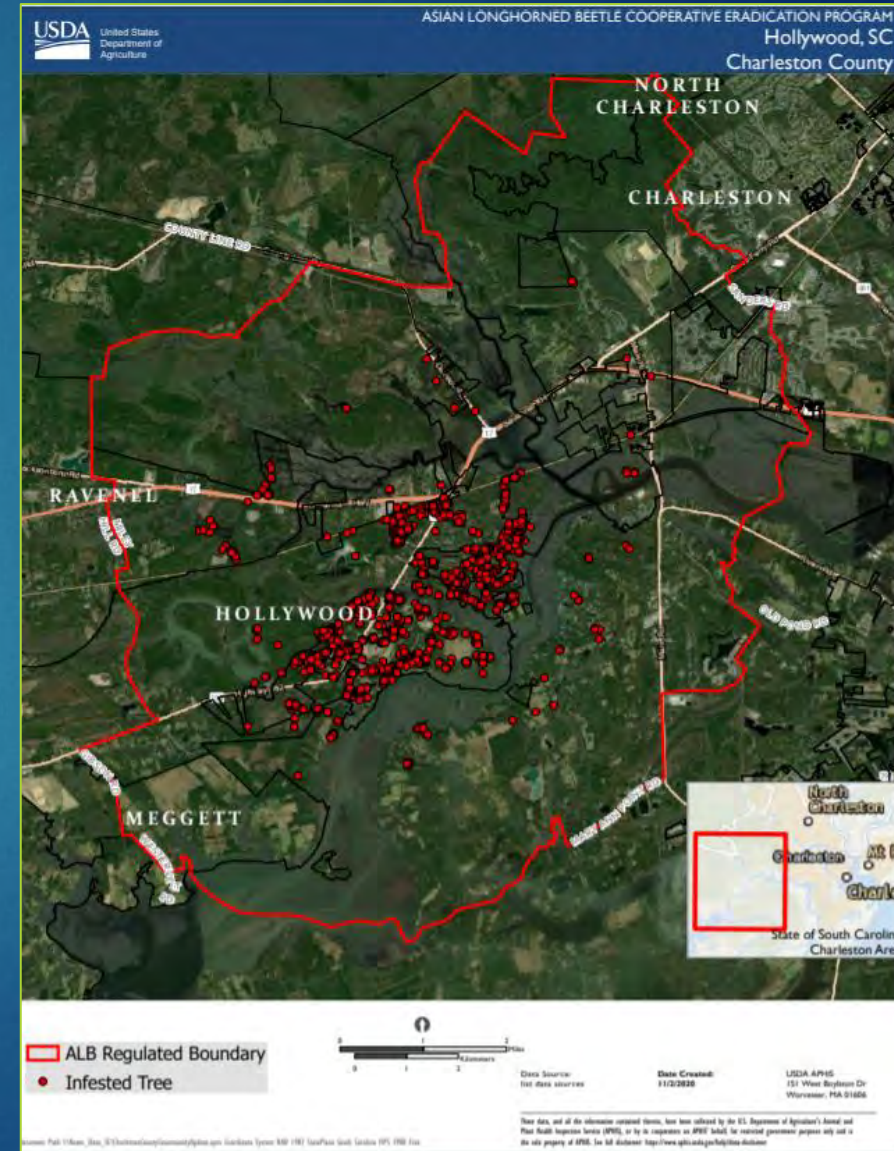
Tent Makers		No Tents	
Browntail Moth	Eastern Tent	Forest Tent	Gypsy Moth
<p>Look for Overall brown color; White tufts along sides; <u>Red-orange dots on tail-end</u></p> <p>DANGER!!</p>	<p>Look for <u>White stripe</u> down center of back Blue spots like the "eye" in peacock feather along each side of stripe</p>	<p>Look for White or <u>off-white footprint-shaped marks</u> down the center of the back Blue body coloration in later instars</p>	<p>Look for Prominent knobs with hairs on each side of head capsule. Five pairs of <u>blue- and six pairs of red- spots along back</u> (larger caterpillars).</p>
			
Invasive Human & Forest Health Impacts	Native Mostly aesthetic impacts	Native Occasional outbreaks	Invasive Forest Health Impacts Quarantined pest

BTM: WHAT TO DO AS A LANDOWNER

- ▶ Management options are often limited in stands with large amounts of mature oaks
- ▶ Know that oaks are able to withstand multiple years of defoliation and usually pull through
 - ▶ The major confounding factors to surviving repeated defoliation events are additional secondary pests and drought
- ▶ Talk to a forester about future plans for oak on your woodlot
- ▶ Know that there are still a lot of unknowns with this most recent, unprecedented BTM outbreak and stay informed

Asian Longhorned Beetle in the News

- ▶ New population of ALB most recently detected in June 2020 in South Carolina
- ▶ Maine has abundant host habitat for ALB



Asian Longhorned Beetle Status



Asian Longhorned Beetle Identification

Exotic longhorned beetles:

Glossy black body
distinct white spots
black and white banded antennae



Citrus longhorned beetle (exotic)



Asian longhorned beetle (exotic)

Native longhorned beetle:

Bronzy-black body
indistinct white spots (if any)
faint banding on antennae

DO NOT REPORT



Whitespotted sawyer (native)

Asian Longhorned Beetle Signs



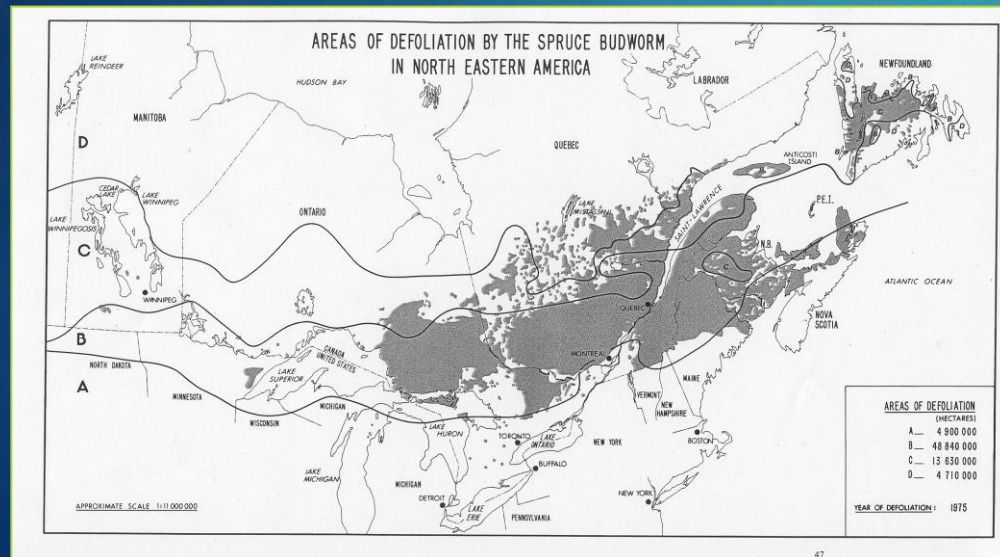
Spruce Budworm in Maine

- ▶ Balsam fir is preferred host
- ▶ Native defoliator with periodic outbreaks every 30-60 years (~40)

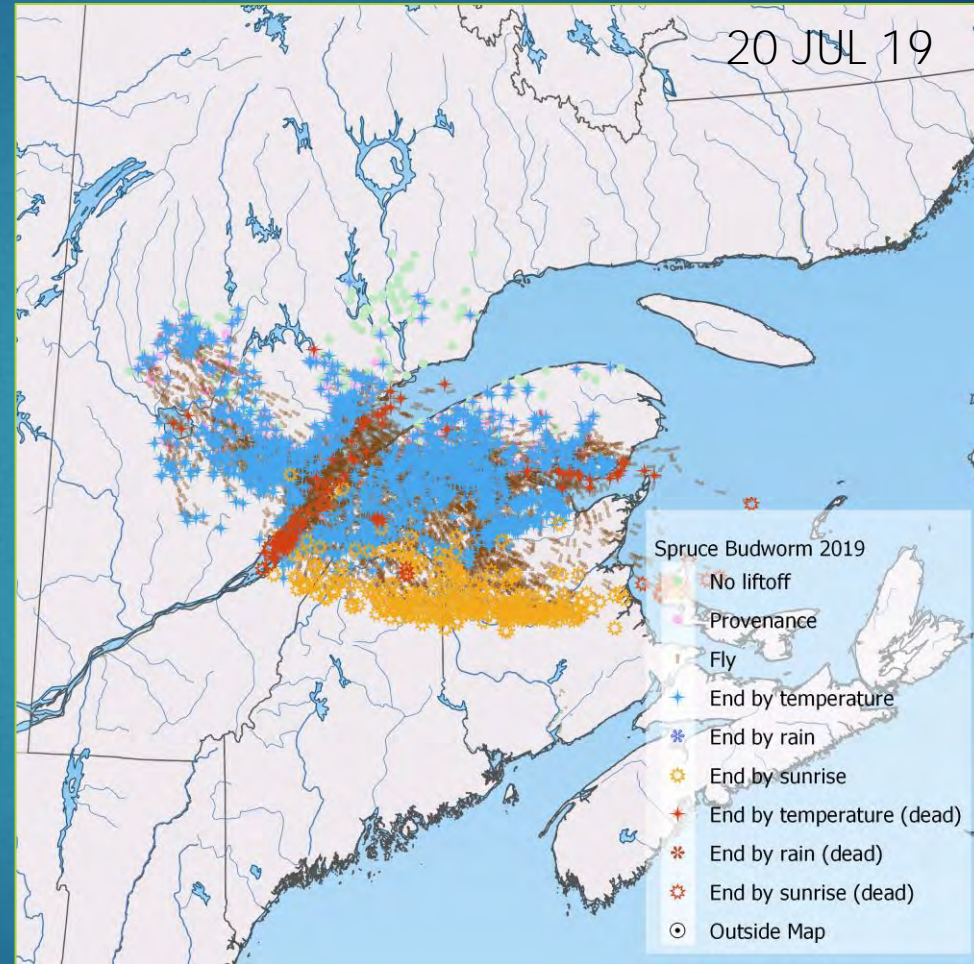
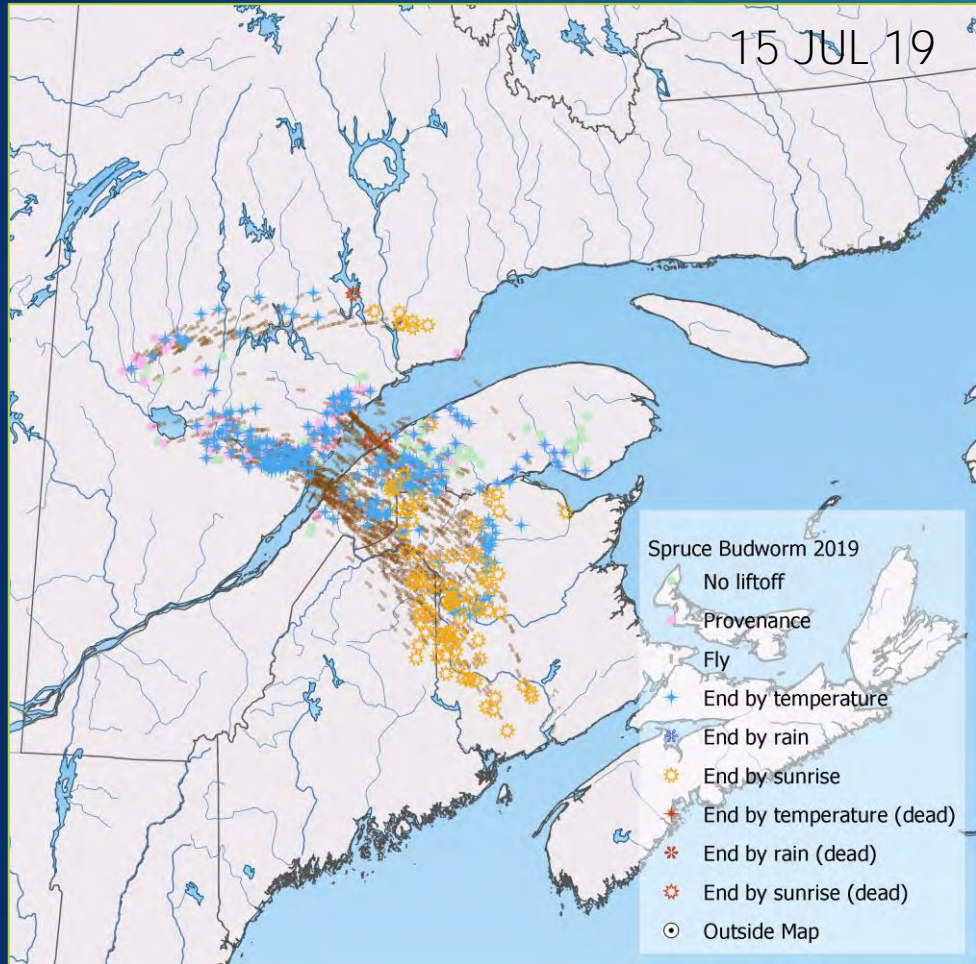


Spruce Budworm in Maine

- ▶ Last major SBW outbreak in Maine spanned roughly from 1967 to 1993
- ▶ Regional outbreak covered ~136 million acres across eastern Canada and Maine
- ▶ Mortality rates for balsam fir reached 84-97%
- ▶ Mortality rates for red spruce reached 30-66%
- ▶ Resulted in an estimated 20-25 million cords of spruce-fir mortality
- ▶ Hundreds of millions of lost revenue to forest industry

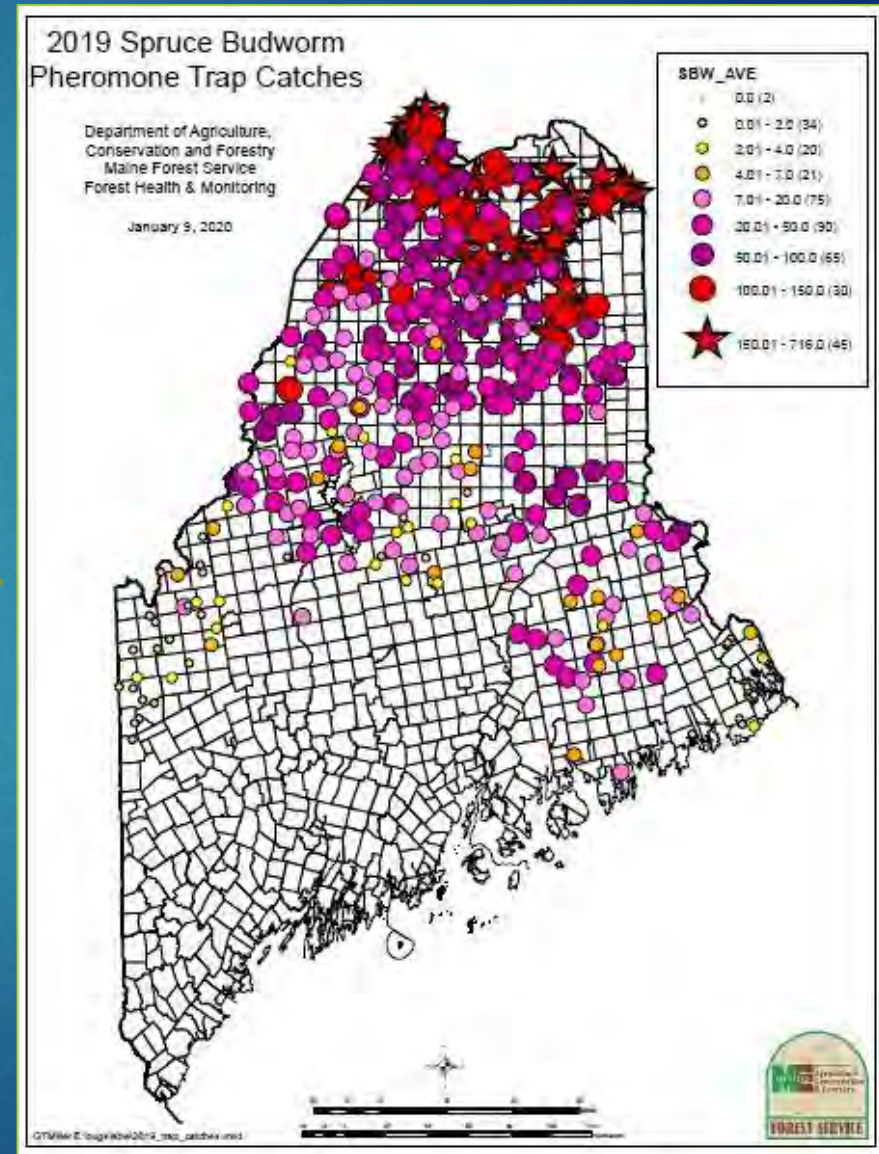
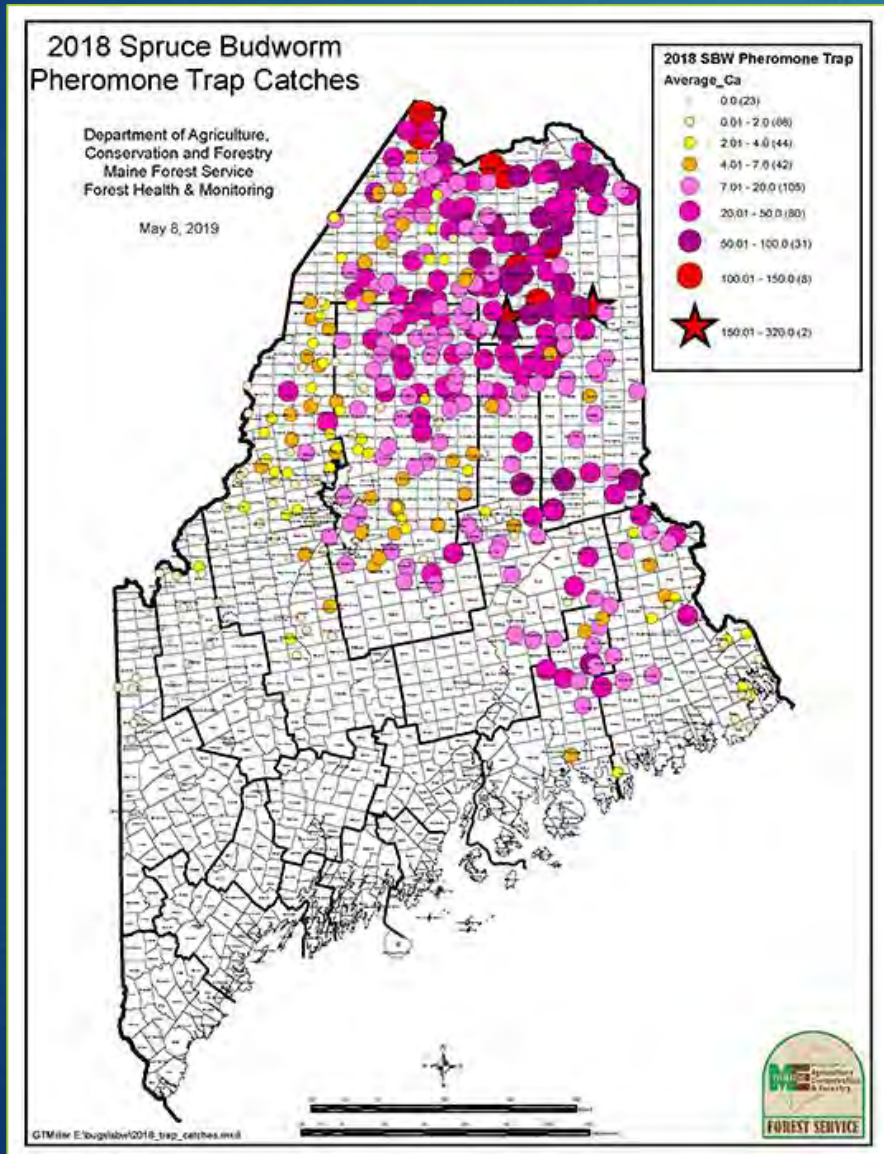


2019 Spruce Budworm Movement

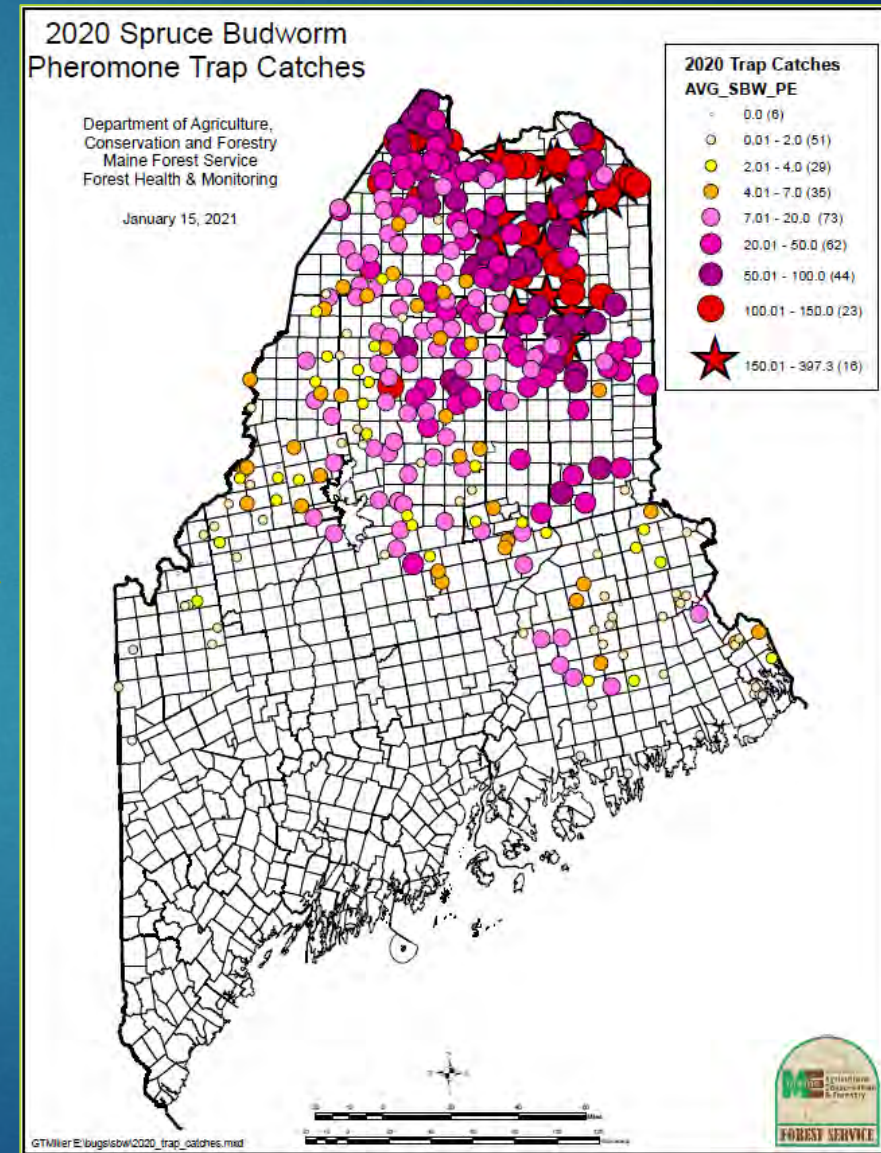
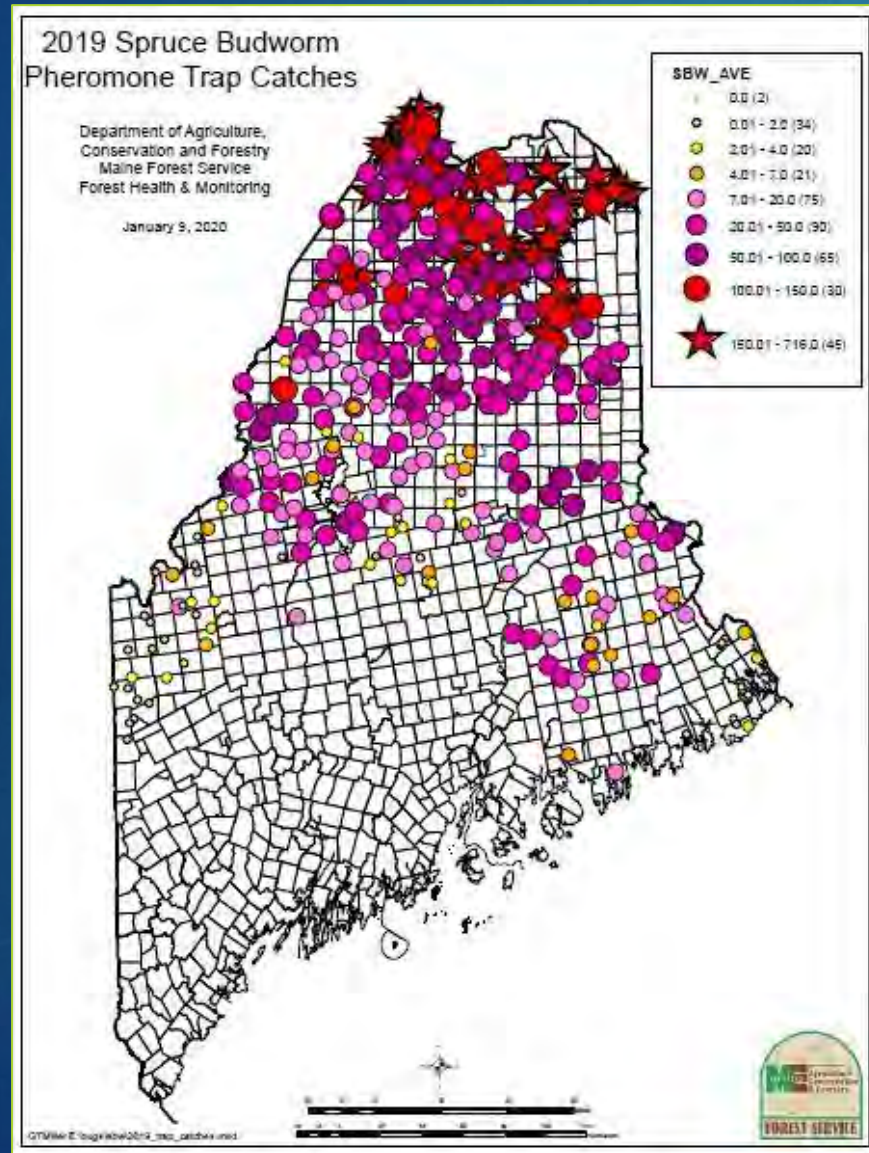


- ▶ Two major SBW in-flights from Quebec into northern Maine in 2019
- ▶ Images generated using BioSIM, R, Saint-Armant, Canadian Forest Service

2018 - 2019 Spruce Budworm Trapping

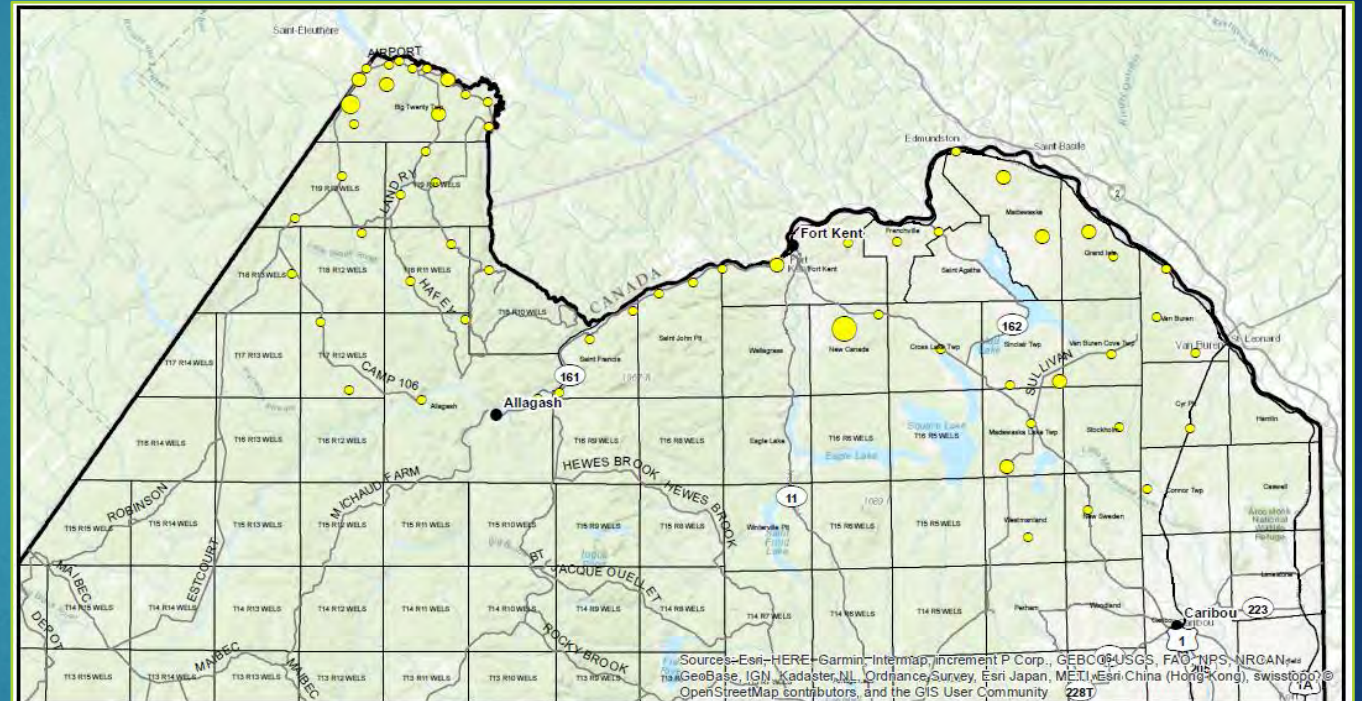


2019 - 2020 Spruce Budworm Trapping



2020 SBW Mid-Season Defoliation Survey

- ▶ SBW larvae and some defoliation observed across northern Maine for the first time since perhaps late 1980s or early 1990s



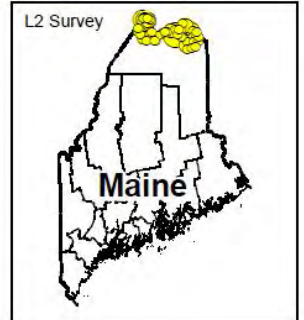
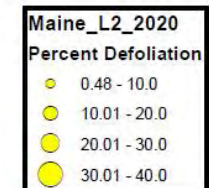
2020 Spruce Budworm Mid-Season Defoliation Survey

October 20, 2020

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



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2019 - 2020 Spruce Budworm Overwintering Larval Survey

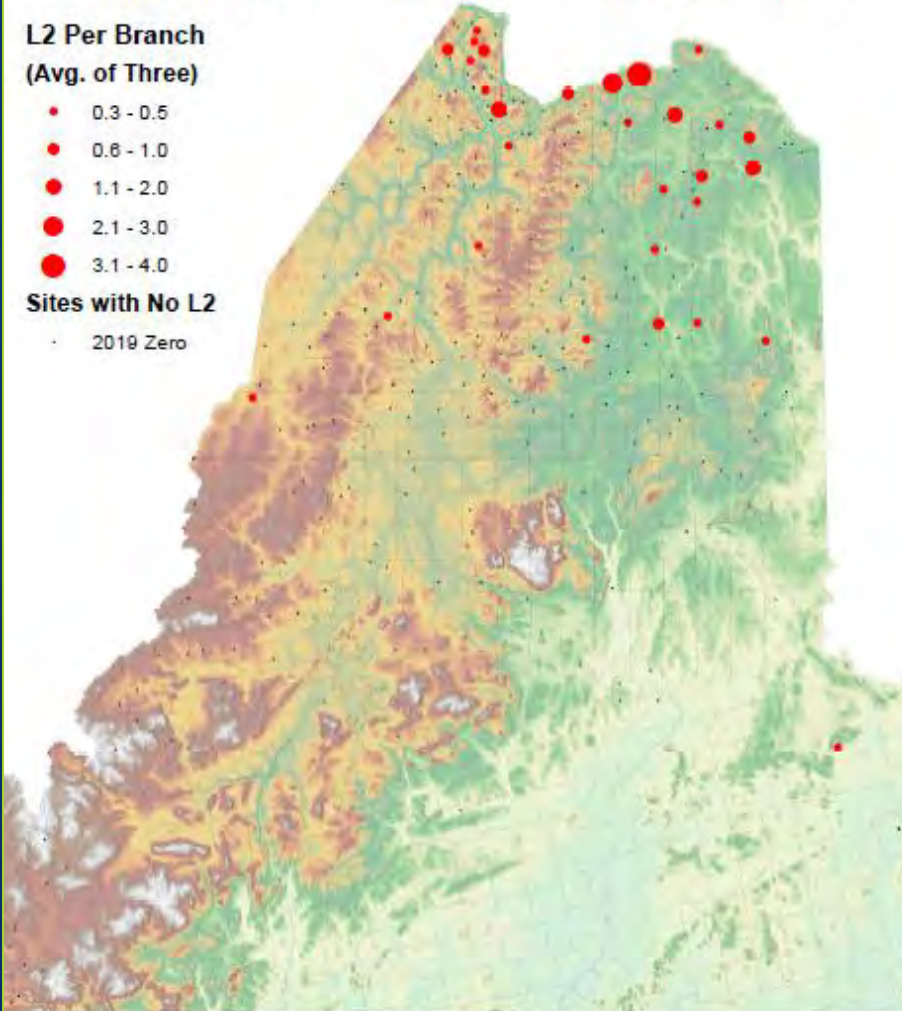
Preliminary 2019 Spruce Budworm L2 Survey

L2 Per Branch (Avg. of Three)

- 0.3 - 0.5
- 0.6 - 1.0
- 1.1 - 2.0
- 2.1 - 3.0
- 3.1 - 4.0

Sites with No L2

- 2019 Zero

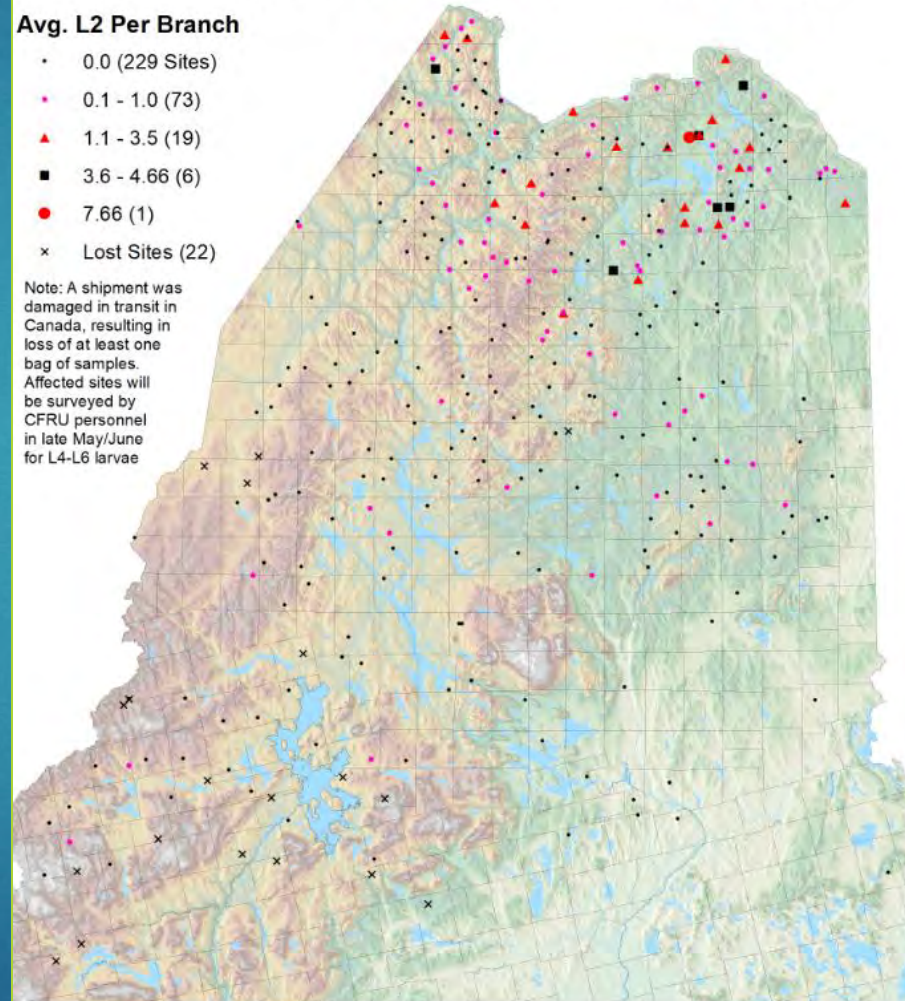


2020 Spruce Budworm L2 Survey

Avg. L2 Per Branch

- 0.0 (229 Sites)
- 0.1 - 1.0 (73)
- ▲ 1.1 - 3.5 (19)
- 3.6 - 4.66 (6)
- 7.66 (1)
- × Lost Sites (22)

Note: A shipment was damaged in transit in Canada, resulting in loss of at least one bag of samples. Affected sites will be surveyed by CFRU personnel in late May/June for L4-L6 larvae



20

Miles

Created by Dr. Neil Thompson, neil.thompson@maine.edu 207-834-7628/207-706-9228
University of Maine at Fort Kent, March 9, 2020, ArcMap 10.6.1, NAD 1983 UTM Zone 19N
Data Courtesy of the Maine Forest Service and Cooperative Forestry Research Unit
Note 1: Sample ID #1004 (0.3) and #1007 (1.0) not mapped due to missing coordinates
Note 2: Positive sites are currently being resampled and additional data will be available in May



20

Miles

Created by Dr. Neil Thompson, neil.thompson@maine.edu 207-834-7628/207-706-9228
University of Maine at Fort Kent, March 22, 2021, ArcMap 10.6.1, NAD 1983 UTM Zone 19N
Data Courtesy of the Maine Forest Service and Cooperative Forestry Research Unit

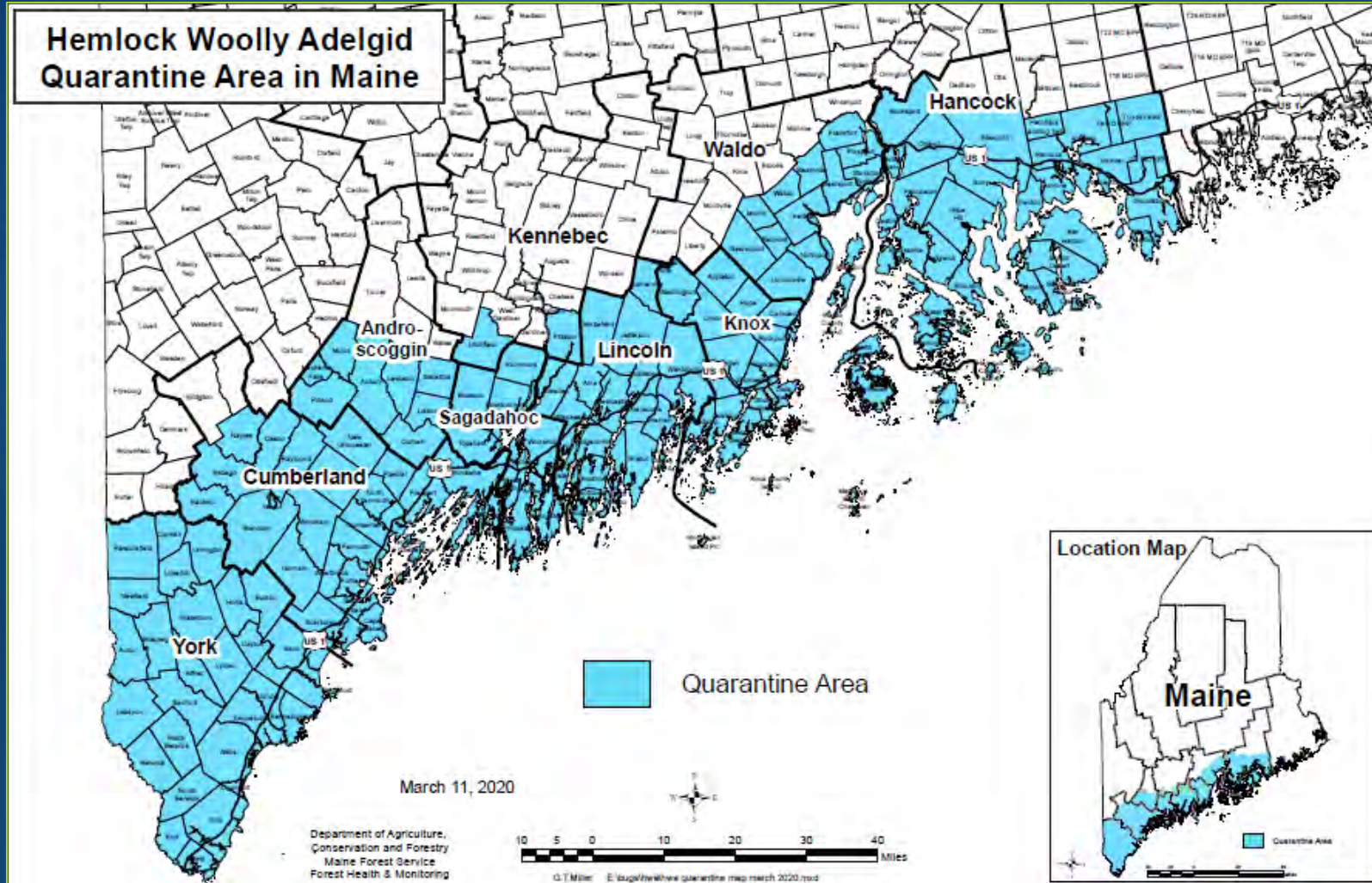


Hemlock Woolly Adelgid



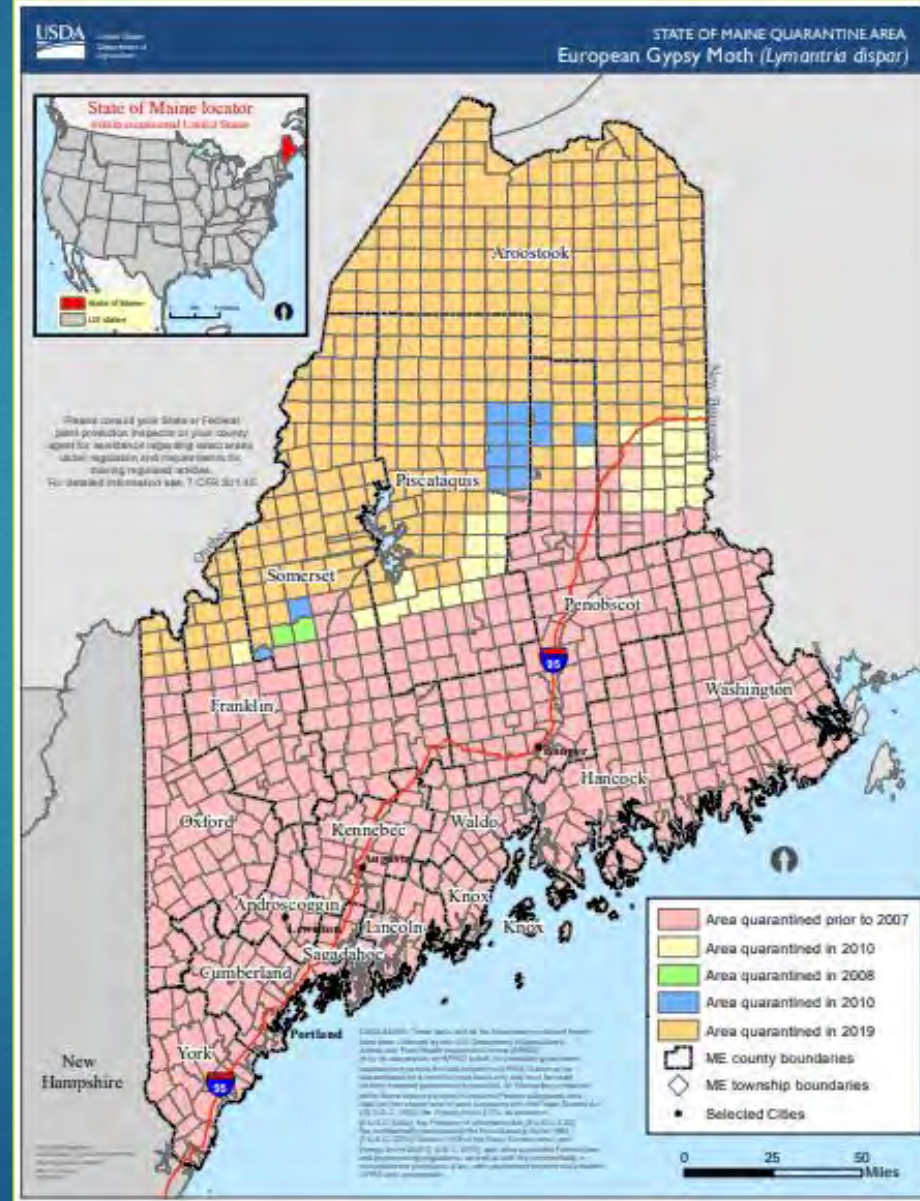
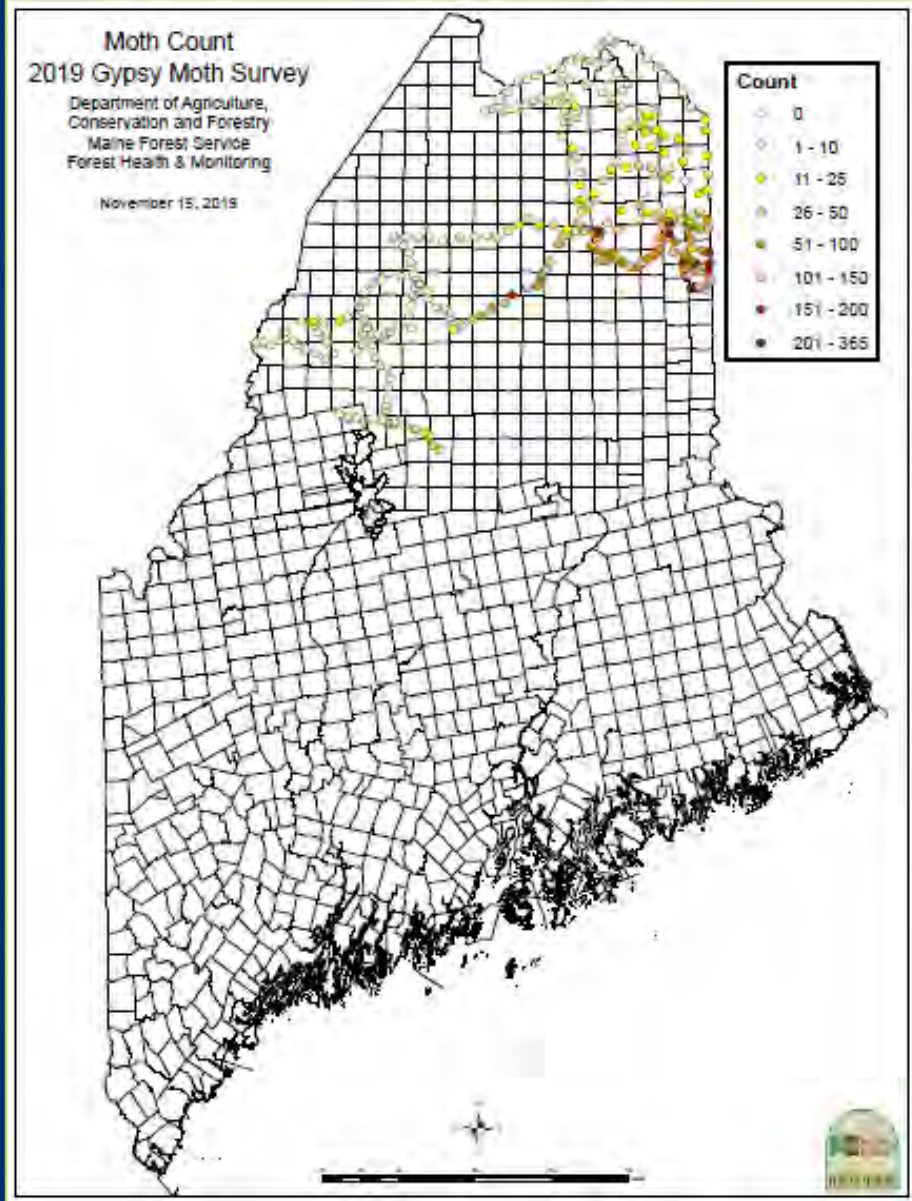
- Crawlers are mobile and most active from mid March through the end of July – avoid hemlock management during these times when possible
- Reproduce asexually and therefore a single insect can establish a new population
- HWA activities for landowners: <https://youtu.be/LiCK8XBtXAU>

2020 HWA Quarantine Zone Revision



Regulates rooted seedlings and nursery stock, hemlock branches and/or needles, chips containing branches and/or needles, and uncomposted bark containing branches and/or needles

2019 Gypsy Moth Quarantine Revision



Federal GM Quarantine



Gypsy Moth in 2021?



Be on the lookout along the U.S. Route 2 corridor and beyond!
GM activities for landowners:

<https://www.youtube.com/watch?v=g5oEWzGIZYI&t=53s>

2020 Spotted Lanternfly Interceptions

- ▶ Remains of SLF egg masses were identified on a shipment of red maple nursery stock imported from Pennsylvania
- ▶ Trees were planted in communities of Boothbay Harbor, Freeport, Northeast Harbor, and Yarmouth
- ▶ Dead adult SLF identified in shipment of hay bales imported from Pennsylvania
- ▶ No living SLF life stages have been found in Maine

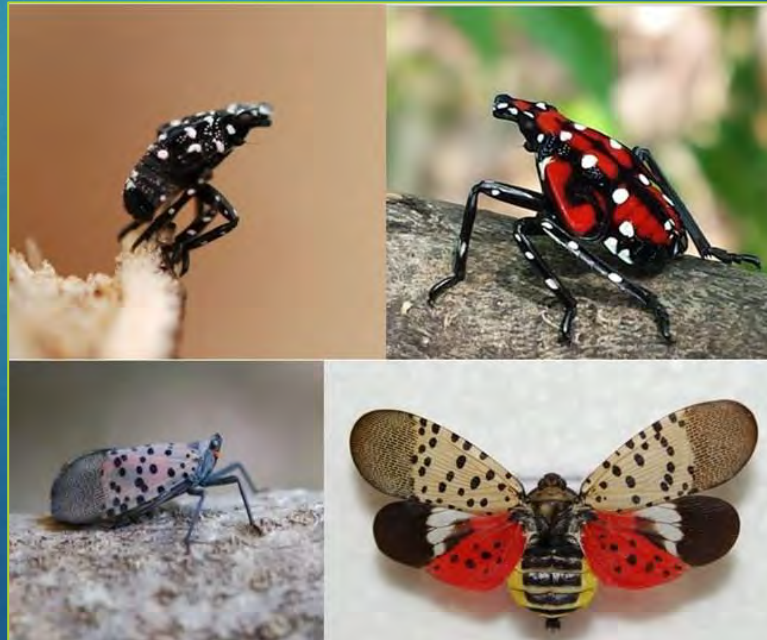
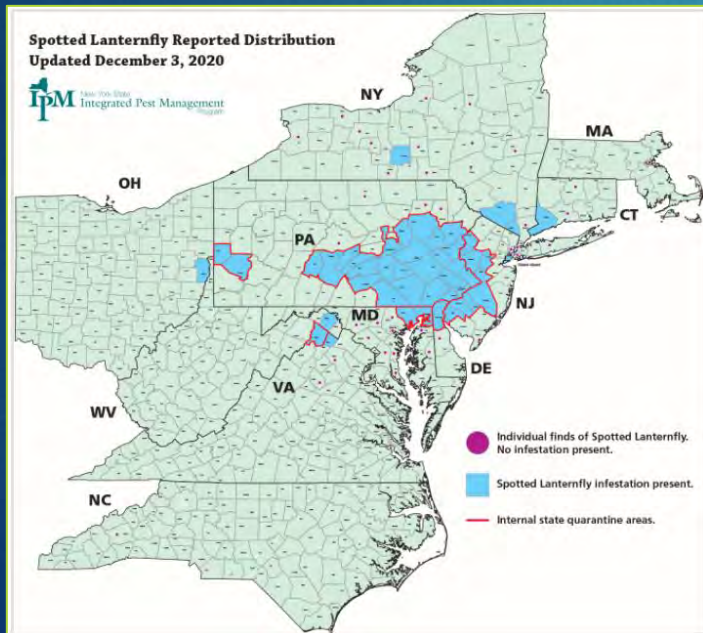


Photo by Karen Coluzzi, Maine Department of Agriculture, Conservation and Forestry

Winter Moth Management Efforts: Biological Control

Location	Year of Release
Harpswell	2013, 2014, 2016
Cape Elizabeth	2013, 2015
Kittery	2014
Vinalhaven	2014
Peaks Island (Portland)	2015
South Portland	2017
Bath	2018
Boothbay Harbor	2020
East Boothbay Harbor	2021



- ▶ Maine continues to perform releases of parasitoid fly *Cyzenis albicans*
- ▶ Parasitized winter moth larvae recovered at release sites from 2016-2020
- ▶ Boothbay Harbor area experienced worst defoliation in 2019
- ▶ East Boothbay Harbor experienced worst defoliation in 2020
- ▶ Low winter moth caterpillars recovering in spring 2020 due to apparent disease

Comments & Questions?



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