

A close-up photograph of a hand holding a green leaf. The leaf has several small holes, indicating it has been eaten. Two small, light green caterpillars are visible on the leaf. One is curled into a tight ball, and the other is partially visible, appearing to be in the process of eating the leaf. The background is a blurred forest floor with brown leaves and green plants.

Winter Moth In Maine

An overview of winter moth and its impact in Maine

Tom Schmeelk, Forest Entomologist, Maine Forest Service

Native Range

- Native to Northern and Central Europe
- Southern range extends to Northern Italy, eastward to the Caucasus Mtns and Asia Minor and north to the Baltics.



Life Cycle

- Geometridae
- Apterous females, use call pheromones
- Adults active November-January
- Pupate in the soil
- Caterpillars present April- Late May/ Early June
- Young larvae will also produce silk strands to 'balloon' to other trees



Larva



Adult Male



Adult Female

Winter Moth

- Defoliates hardwood trees and shrubs in early spring
- Favored hosts:
 - oak
 - maple
 - birch
 - apple
 - basswood
 - blueberry
 - And others

Most trees can withstand a few years of defoliation and be fine, other factors can complicate this however



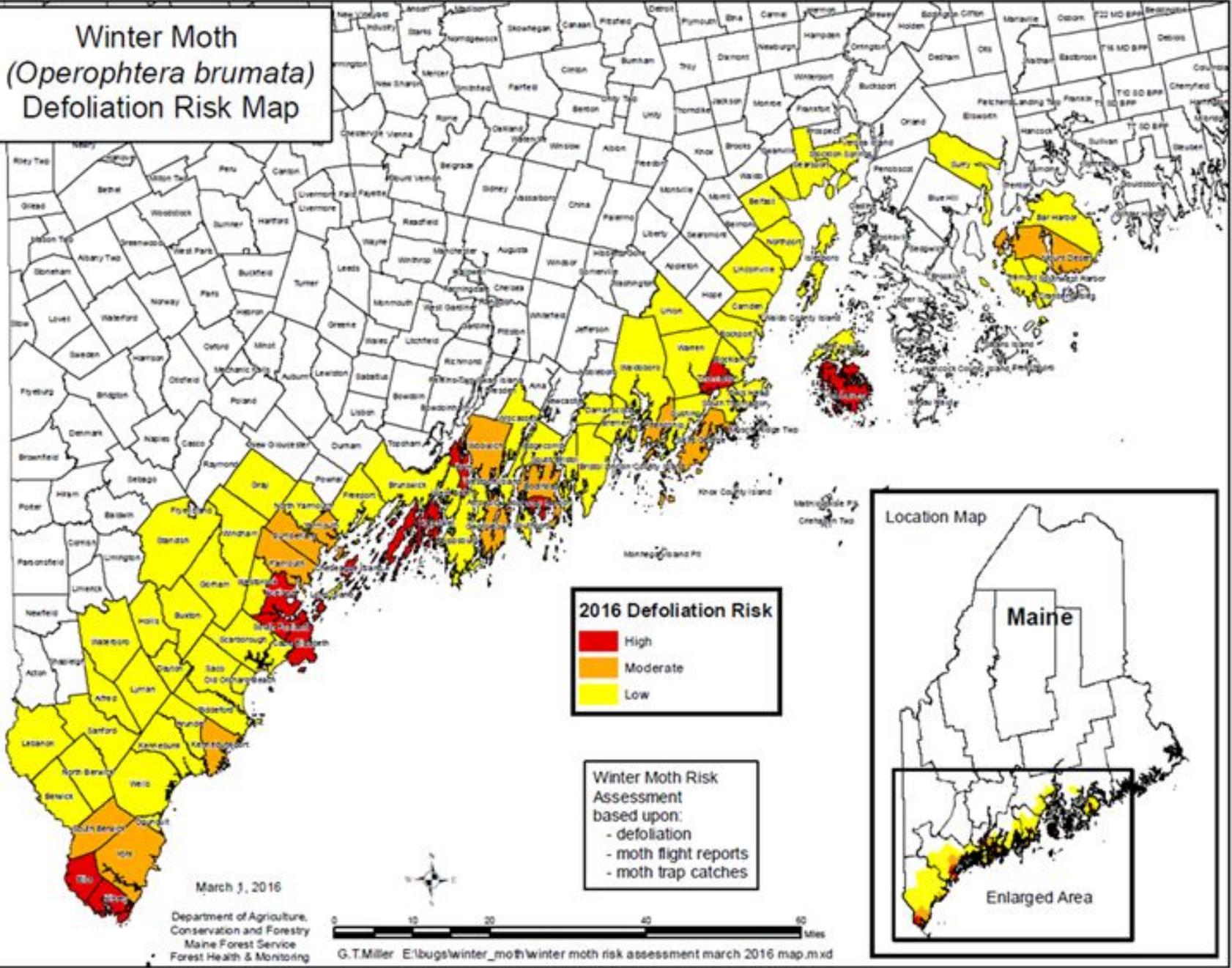
Winter Moth

Spread

- Nova Scotia: first confirmed infestations in the 1930s.
- Oregon in the 1950s
- Vancouver BC around 1970.
- Southern NE late 1990s
- Maine since at least 2012

Moved in plant material with associated soil





Biocontrol: *Cyzenis albicans*

- No common name
- Tachinidae (8,200 species) (1,300 species in N.A.)
- All are parasitoids of arthropods, usually other insects.
- Microtype eggs: minute size in relation to the body of the parent female. range from 0.02 to 0.2 mm. in length. (fine sand, thickness of sheet of paper)
- Many tachinid eggs hatch quickly, having partly developed inside the mother's uterus, which is long and often coiled for retaining developing eggs.
- Synovigenic
- Specific to winter moth



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Biocontrol: *Cyzenis albicans*

- Started releases in 2013 and have released every year, working our way up the coast to other infested areas
- Unfortunately, we are limited in the amount of biocontrol available to us as it is not commercially available, and we must rely solely on our previous release sites in Maine







- Two day mobilization in June
- Maine, Rhode Island, New Hampshire and Vermont represented.
- 11,267 caterpillars collected total, 7,649 from ME
- 1,541 *Cyzenis* from Maine + 95 from RI = grand total of 1,636 *Cyzenis*



Cyzenis Release Sites

Bath
Boothbay harbor
Cape Elizabeth
East Boothbay Harbor
Harpswell
Kittery (Ft McClary)
Kittery (Braveboat Harbor) *No Release*
Portland
South Bristol
South Portland
Vinalhaven *No Recapture*
West Bath
Phippsburg

MDI *Found with no release nearby*



PLEASE DO NOT TOUCH

Per CITY OF

Boothbay Harbor

And MAINE FOREST SERVICE

Winter Moth Management Project

287-2431

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Other Biocontrol

- *Agrypon flaveolatum*: Released in Nova Scotia in the 1930's.
- Likely to accompany WM to new locations and may reduce the rate at which it spreads



- Research has shown soil predators like ground beetles and other arthropods contribute significantly to winter moth mortality

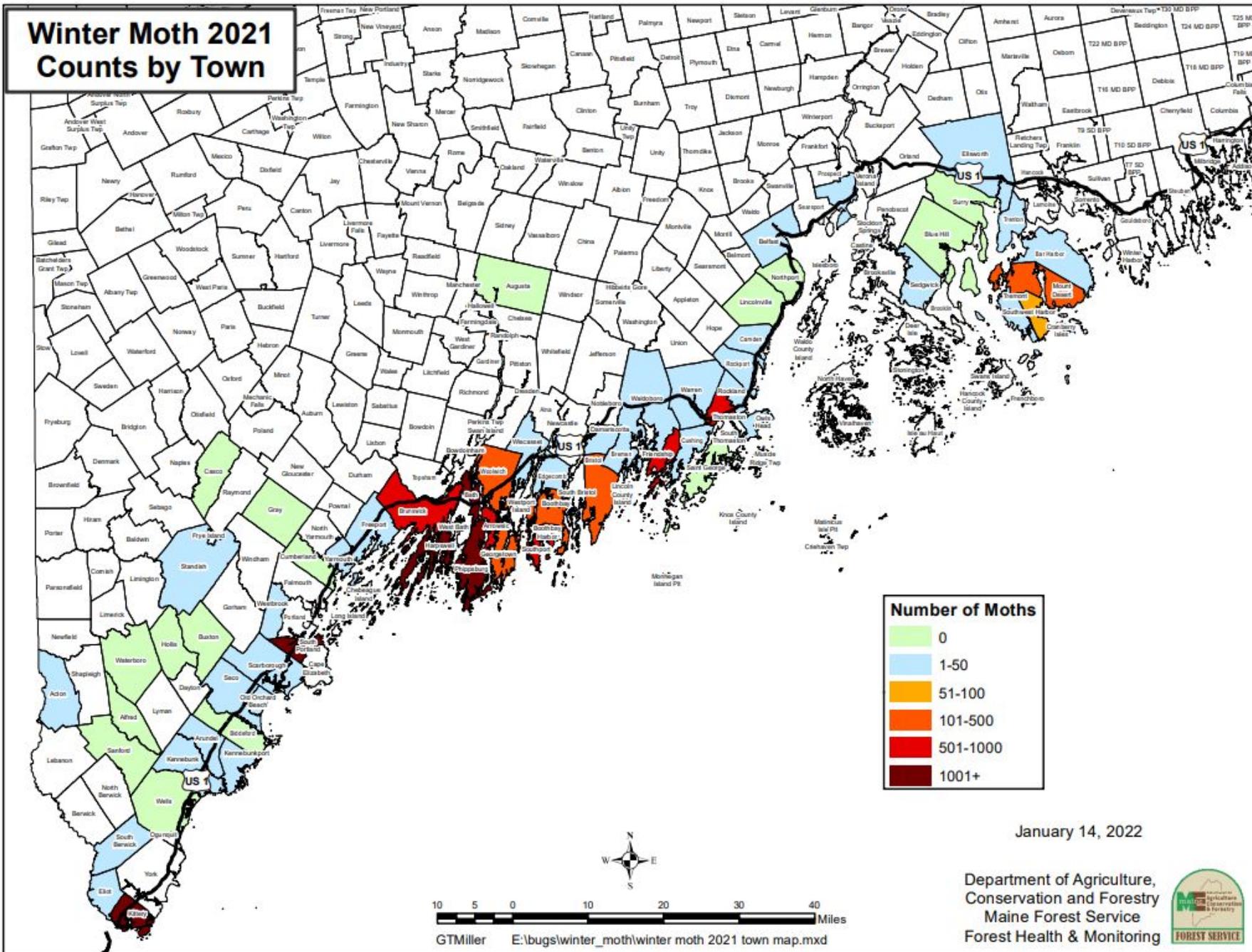


Monitoring for Winter Moth

- Program was more robust ~70 traps up and down the coast.
- Lure manufacturer problems
- Collaborating with UMASS Amherst in research



Winter Moth 2021 Counts by Town



January 14, 2022

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



Management

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- During the late fall and early winter, a dormant oil spray can be used to suffocate the eggs.
- When the eggs are newly hatched in late March and early April Bt (*Bacillus thuringiensis*) is a safe and effective way to control caterpillars.
- As the caterpillars get bigger, spinosad is also effective.

Tree bands:

- Install in late October
- Cotton batting under the band
- Multiple bands in high density populations



Management

DO NOT MOVE LANDSCAPE MATERIAL from infested areas as the cocoons of winter moth are in the soil from June through November.

Landscape material hastens wintermoth spread

- Plant sales
- Gifting plants
- Moving plants



Photo: Maine Forest Service

Questions?



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