

Browntail Moth

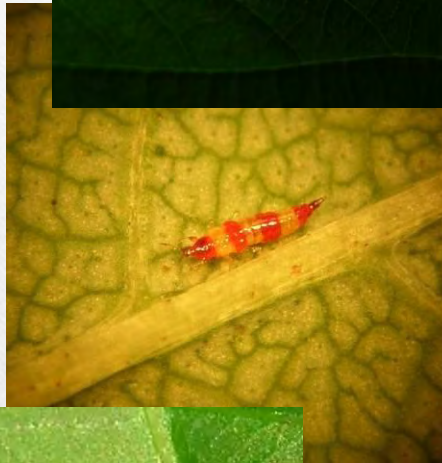
History, Background, Conditions in ME

Department of Agriculture, Conservation & Forestry

Maine Forest Service



Lots of Insects Do No Harm or Are Beneficial



> 20,000 species of insects in Maine



Some Cause Problems



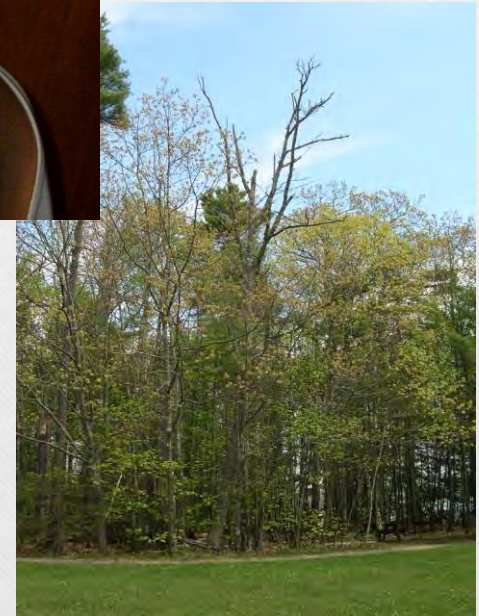
Browntail Moth Caterpillar

Browntail Moth

- Caterpillars have toxic hairs that cause:
 - Rash
 - Respiratory distress
- Caterpillar feeding causes
 - branch dieback
 - tree mortality



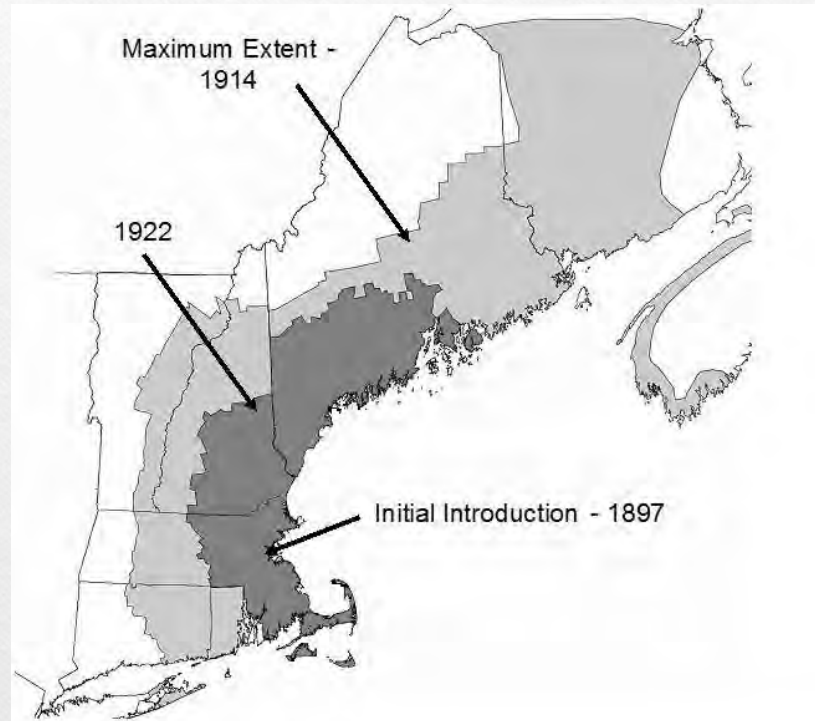
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<https://commons.wikimedia.org/w/index.php?curid=6887721>



Browntail Moth - History

Euproctis chrysorrhoea

- First established in Somerville, Massachusetts in 1897
- By 1914 found from Vermont and Connecticut to New Brunswick and Nova Scotia



Browntail Moth Expansion by Year
(From Elkinton *et al.* 2006)

Browntail Moth - History

- **Extensive efforts were made during the early 1900's to control BTM:**
- Winter webs clipped and burned by the 10,000's
- Spray projects initiated
- Apple trees cut down
- A federal quarantine imposed
- A huge biological control program instituted
 - Parasatoids & predators released



Pupils of Farm School, Thompson's Island, destroying winter webs of brown-tail moth, Dec., 1902.
From photo kindly loaned by Chas. Bradley. Smit.

Browntail Moth - History

- The Browntail Moth population collapsed in the 1920's
- Possibly due to a combination of weather and a fungus, *Entomophaga aulicae*



Infected browntail moth caterpillar

Browntail Moth - History

Population retreated to:

- a few islands in Casco Bay, ME
- and
- Cape Cod, MA

- Occasional outbreaks over next 60 years

Browntail Moth - History

- Population began expanding on Little Diamond Island in 1988.
- Numbers continued to rise
- Spread from Kittery to Gouldsboro inland to Augusta by 1999

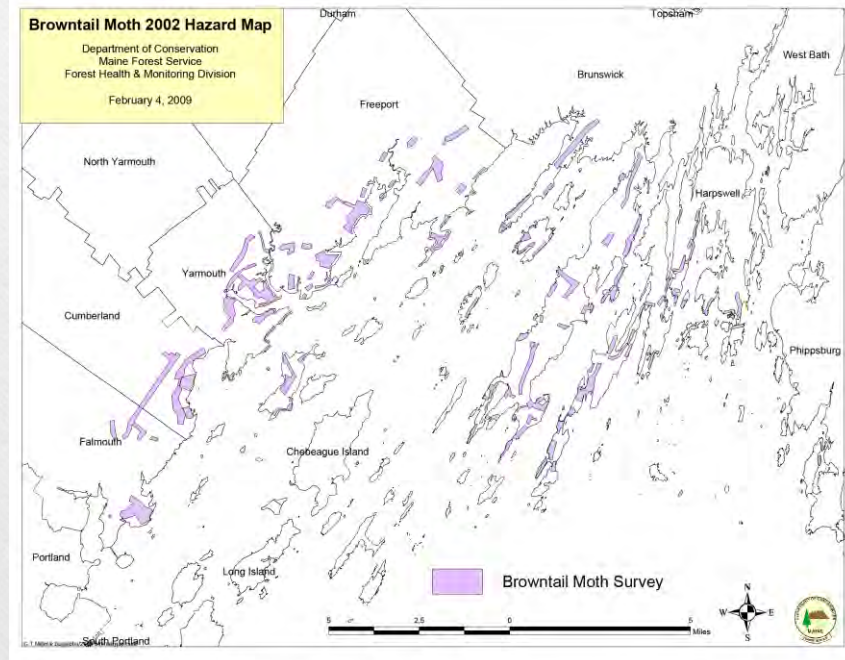


Browntail Moth - History

- Public Health
 - In 1997 legislation passed to allow BTM to be declared a public health nuisance on the municipal level by Bureau of Health Director
 - This facilitates municipalities' abilities to conduct and coordinate control projects
 - See Me CDC page on Browntail Moth:
 - <http://www.maine.gov/dhhs/mecdc/infectious-disease/epi/vector-borne/browntail-moth/index.shtml>

Browntail Moth - History

- Municipal aerial control projects 1992-2002
 - Peak acreage of 5120 A. sprayed in 1999
 - Casco Bay Region from Portland to Harpswell
 - Insect Growth Regulators used
 - B.t. – a bacterial insecticide ineffective
 - Became highly controversial
- Private ground projects continue



Browntail Moth - History

Population crashed in 2004-2005 over most of infested area

- Cool wet springs in 2004 & 2005
- Caterpillars huddle together, did not feed
- Caught a fungal disease and died
- Parasitoids and predators took advantage of sick caterpillars and further reduced population



Browntail Moth - History

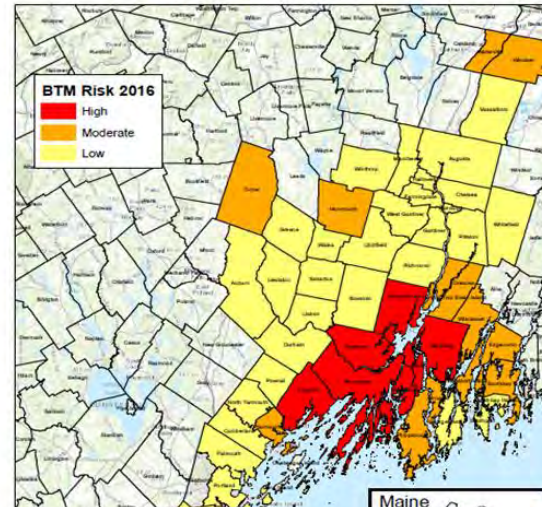
- Remnant remained in Brunswick area
- Population increasing again
- Falmouth, Turner, Kennebunkport in 2010



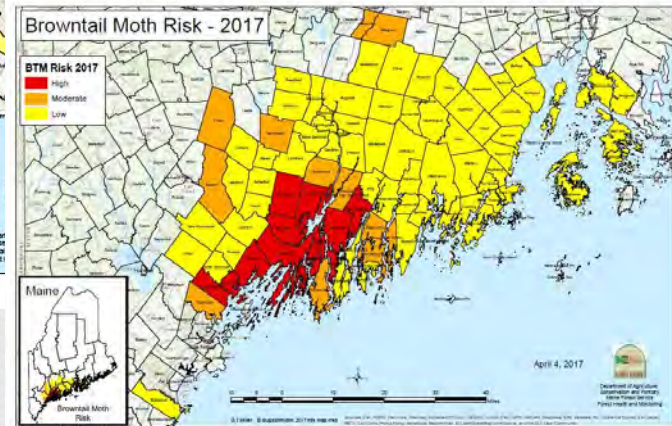
Browntail Moth History

- 2015-2017 continued increase in population
- Aerial survey data ↑↑ acres
- Outlying patches of defoliation
- Winter web survey: continued expansion eastward and inland from center

Browntail Moth Risk - 2016

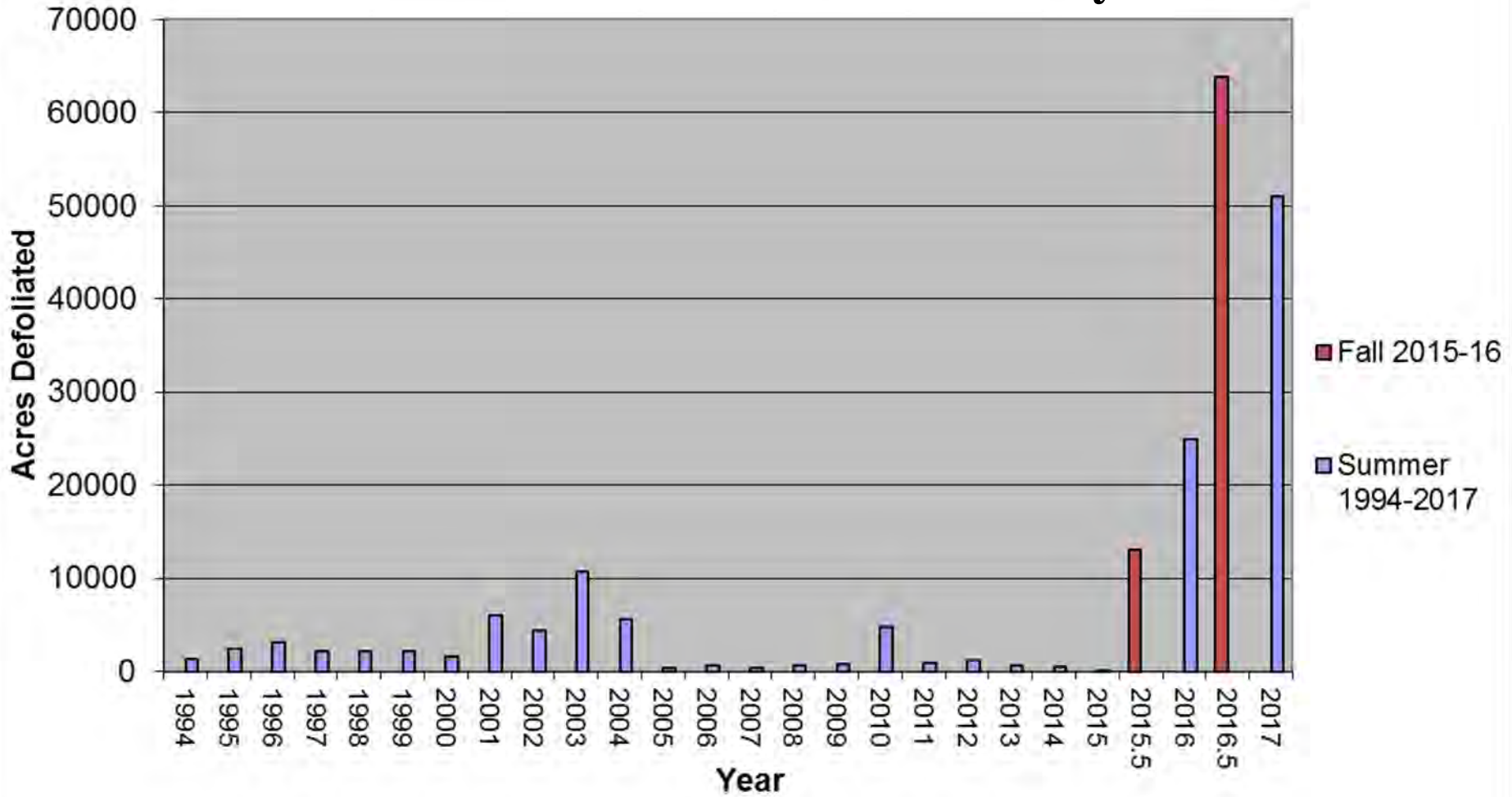


Browntail Moth Risk - 2017

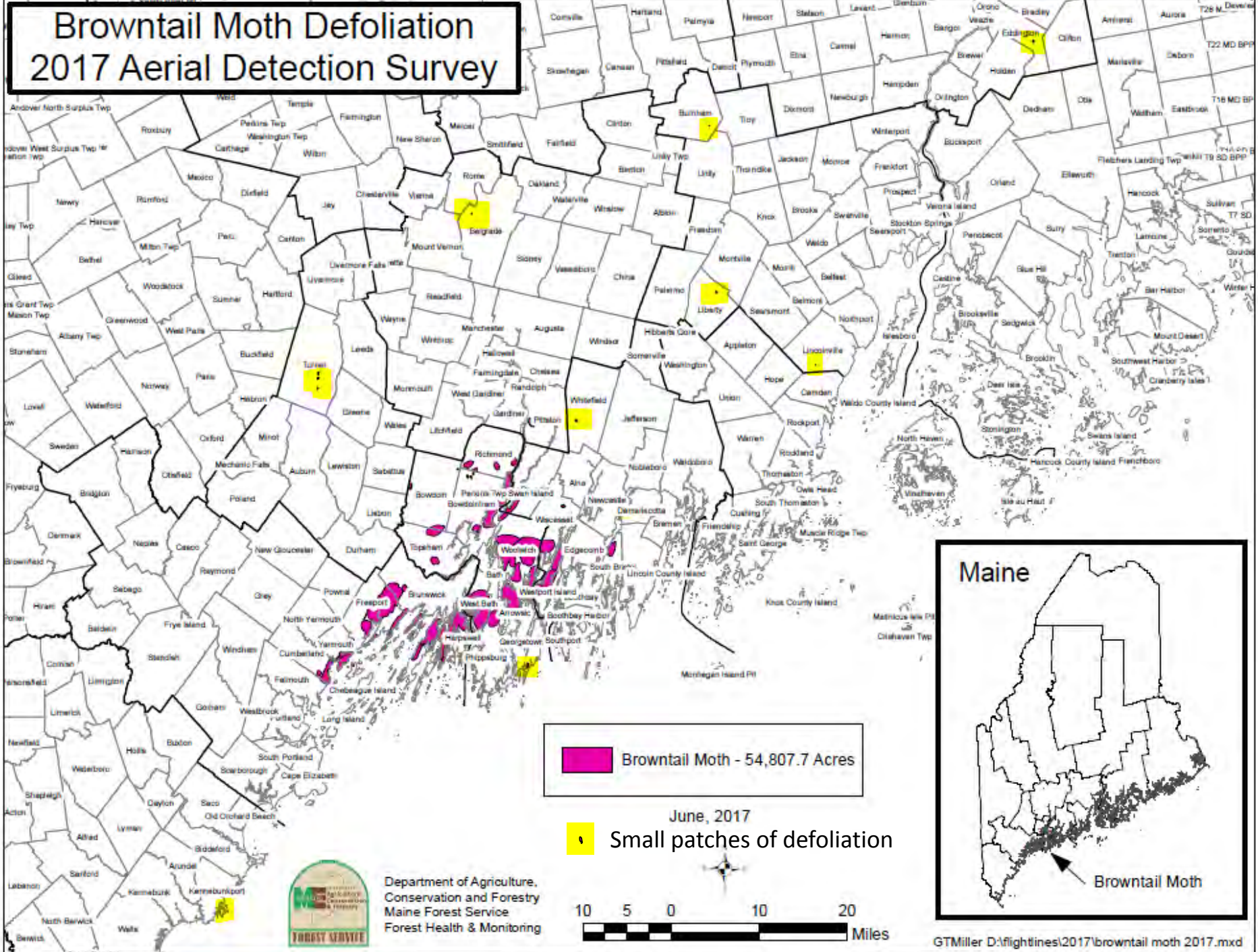



Browntail Moth Defoliation in Maine


Maine Forest Service Aerial Survey



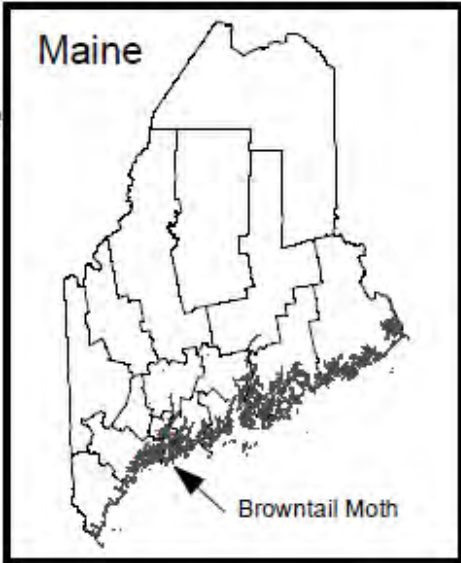
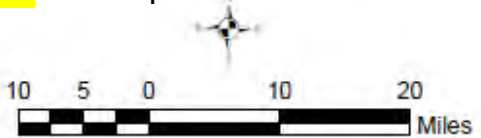
Browntail Moth Defoliation 2017 Aerial Detection Survey



 Browntail Moth - 54,807.7 Acres

 Small patches of defoliation

June, 2017



Browntail Moth Forecast 2018

- Preliminary & Imperfect
 - Winter web surveys: on-going
 - Weather, traffic and other factors impact detection/evaluation
 - Cannot survey everywhere
 - Guided by past detections, aerial survey; additional isolated spots likely
- This is a guide for planning & decision making at town/individual level
 - Towns, especially in heavily infested areas, may want to conduct or contract for more detailed surveys; especially if considering town-coordinated treatments

Browntail Moth Forecast 2018

- May be decreasing in areas previously hit hard. But not enough for significant town-wide relief.
- Seem to be increasing in outlying areas:

Webs detected (so far, Feb. 2018):

- Along the coast from Kittery to Trenton
- Inland locations: Raymond, Turner, Rome, Smithfield, Burnham, Eddington

Outlying Defoliation Detected 2017 Aerial Survey:

- Belgrade, Burnham, Eddington, Liberty, Lincolnville, Turner, Whitefield

Browntail Moth - Life Cycle

- Caterpillars emerge from webs in late April and May
- Feed on foliage until late June
- Molt five times
- Cast skins have toxic hairs on them



Tent Makers

No Tents

Browntail Moth

Eastern Tent

Forest Tent

Gypsy Moth

Look for

Overall brown color;
White tufts along
sides;
Red-orange dots on
tail-end

Look for

White stripe down
center of back
Blue spots like the
“eye” in peacock
feather along each
side of stripe

Look for

White or off-white
footprint-shaped
marks down the
center of the back
Blue body coloration
in later instars

Look for

Prominent knobs with
hairs on each side of
head capsule.
Five pairs of blue- and
six pairs of red- spots
along back (larger
caterpillars).

DANGER!!



Invasive
Human & Forest
Health Impacts

Native
Mostly aesthetic
impacts

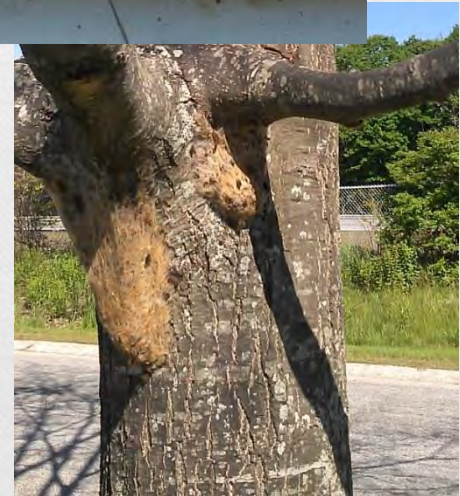
Native
Occasional outbreaks

Invasive
Forest Health Impacts
Quarantined pest

Browntail Moth - Life Cycle

Pupation: Late June-Early July

- Move around looking for a good place to build a cocoon
- Make cocoons in leaves, on branches, buildings, under eaves, and in boats and other protected areas
- Cocoons are full of toxic hairs!
- Often pupate in masses



Browntail Moth - Life Cycle

- Moths emerge from cocoons in July
- Lay eggs on leaves of host trees
 - Oak, birch, apple other hardwoods & shrubs
 - 200-400 eggs
 - Covered with toxic hairs
- Eggs hatch in August



(c) Anne Burton

Browntail Moth - Life Cycle

- Caterpillars skeletonize leaves
- Tie leaves together with silk
- Spend winter in webs
- 25-400 caterpillars/web



Browntail Moth - Problem

- Hairs are on caterpillars, cast skins and cocoons
 - Microscopic
 - Blow around in the air
 - Stay toxic for 1-3 years
 - On leaves and brush in fall and spring
 - Stirred up during mowing, raking, sweeping and other activities

Browntail Moth - Precautions

- June through August:
 - **Avoid places heavily infested by caterpillars.** Campers should plan their stays on un-infested islands.
 - **Take a cool shower and change clothes** after any activity that might involve contact with browntail moth hairs.
(Tip: Prior to shower, use duct tape to remove hairs from exposed skin)
 - **Dry laundry inside** during June and July to avoid having the hairs become impregnated in clothing.

Browntail Moth - Precautions

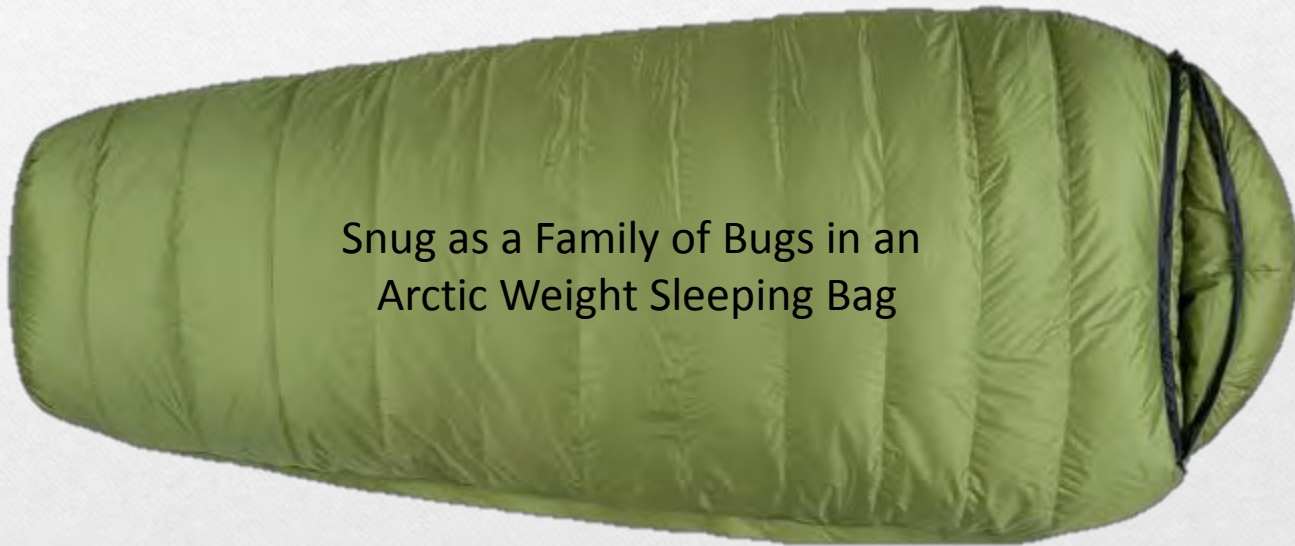
- Use caution cleaning debris left by caterpillars.
 - **The toxin is extremely stable and remains a hazard for a number of years.**
 - Summer residents should bear this in mind when opening cottages that have been closed all winter. Wet mopping prior to vacuuming or dusting is advised.
- **Consult your physician** if you develop a severe reaction to the browntail moth.

Browntail Moth - Precautions

- **Wear respirator, goggles and coveralls** tightly closed at neck, wrists and ankles when performing activities that stir up caterpillar hairs such as:
 - mowing
 - raking
 - weed whacking
 - sweeping
 - removing pupal webbing from eaves and boats
- **Perform the above tasks above on damp days or wet down material** with a hose as moisture helps keep the hairs from becoming airborne there by minimizing contact.

Browntail Moth - Control

- NOTE: Cold winter temperatures along the coast do not reduce browntail numbers enough to provide relief.
 - Wet, cool springs, with higher populations allow diseases to develop and spread.



Snug as a Family of Bugs in an
Arctic Weight Sleeping Bag

Browntail Moth - Control

Winter web clipping:

- Before mid-April:
- Clip low winter webs and put in soapy water or burn

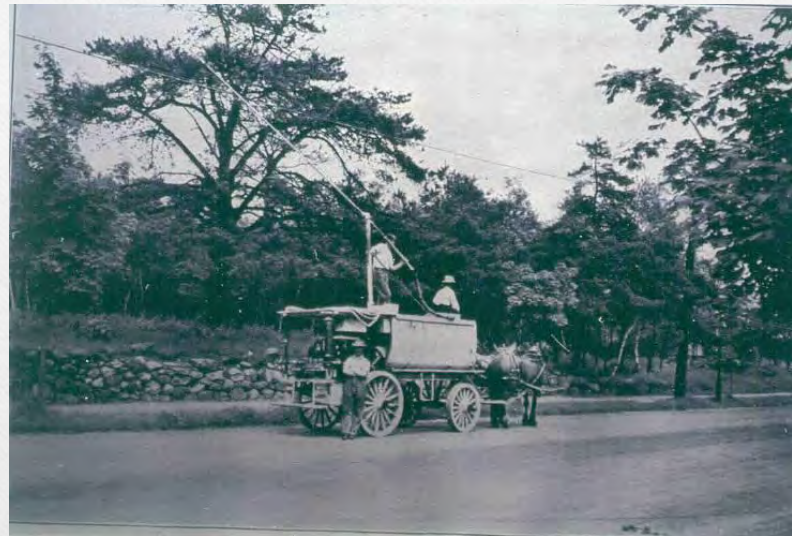


Silk holdfast tying nest to branch



Chemical control of larvae

- Chemical control in the spring – **BEFORE** the end of May
 - **Later spraying DOES NOT reduce exposure to hairs**
 - Hire a licensed pesticide applicator
- More effective if control is widespread



List of arborists willing to do this work available from Maine Forest Service

Control options

- Spray
 - Spinosad and permethrin most common choices
 - Bt in sensitive areas IF APPLIED EARLY
 - Reduces but does not eliminate problem
 - Double applications probably more effective
- Injection
- August-September if BTM persists
 - Problem determining if trees are infested

Browntail Moth - Control

- Protection for lobsters
 - Lobstermen became concerned about BTM spraying
 - Board of Pesticide Control regulation passed in 2008 restricts BTM spray near coastal waters

Browntail Moth – Control

Coastal Waters

Pesticide applications for control of browntail moths **within 250 feet** of the mean high tide mark adjacent to **coastal waters** and extending upriver or upstream to the first bridge are subject to the requirements of this section

The prohibitions and restrictions do **not** apply to:

- biological pesticides
- injection of pesticides directly into the soil or trees
- application of pesticides by licensed commercial pesticide applicators using **non-powered** equipment.

Browntail Moth – Control

fmi: www.thinkfirstspraylast.org

Prohibitions and Restrictions

- A person may not apply a pesticide to control browntail moths on shade or ornamental trees within 50 feet of the mean high water mark.
- A person may not apply a pesticide to control browntail moths on shade or ornamental trees in coastal areas located between 50 and 250 feet from the mean high water mark except in accordance with this subsection.
 - Only products with active ingredients specifically approved by the Board for this purpose may be applied. Applications may be performed only with a hydraulic hand-held spray gun or air-assisted sprayers.
 - Applications may be performed only in a manner in which the applicator directs the spray away from marine waters.
 - Applications may not be made when the wind is blowing toward marine waters.
 - Applications may be performed only when the wind is equal to or greater than 2 miles per hour and blowing away from marine waters.

Browntail Moth - Control

- Research by Maine Forest Service and Partners
 - Chemical control
 - Biological pesticide control
 - Biological control
 - Mating disruptant control
 - Mechanical control
 - Numbers of webs that cause rash
 - Numbers of webs that affect tree health
 - Precautionary measures to reduce exposure to hairs

Contact Information

- Maine Forest Service: (207) 287-2431,
allison.m.kanoti@maine.gov
www.maineforestservice.gov
- Maine Board of Pesticides Control (207) 287-2731
www.thinkfirstspraylast.org
pesticides@maine.gov
- Maine Center For Disease Control 1-800-821-5821
<http://www.maine.gov/dhhs/mecdc/infectious-disease/epi/vector-borne/browntail-moth/index.shtml>