

Vermont Forest Health

Lymantria dispar update

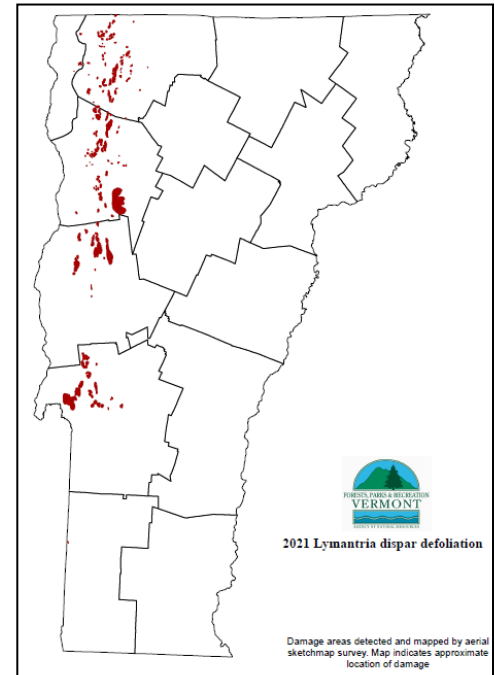
Department of Forests, Parks & Recreation
December, 2021
vtforest.com

A *Lymantria dispar* (formerly known as gypsy moth) outbreak is underway in Vermont. The invasive insect is not native to the region but has been here since the late 1800s. The most commonly defoliated trees in Vermont are oaks, but the caterpillars will feed on many deciduous species, including sugar maple.

Current Status

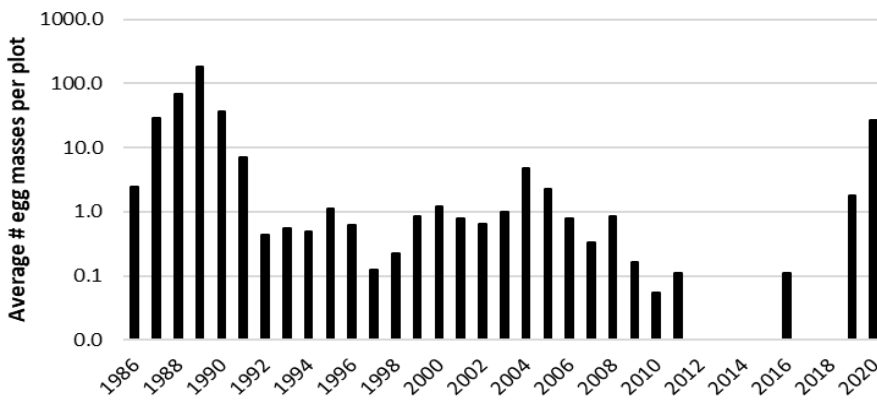
In 2021, 50,945 acres of defoliation were mapped during statewide aerial surveys. This was the first time since the early 1990s where significant defoliation from the insect was mapped. Most defoliation occurred in oak and maple forests in the Champlain Valley, extending east to the foothills of the Green Mountains. Most trees will recover, but defoliation is a stressor on affected trees and can incite tree decline if other stresses are present.

In 2021, 50,945 acres of defoliation were mapped during aerial surveys. Map and data: FPR.



Life Cycle

***Lymantria dispar* Egg Mass Counts**

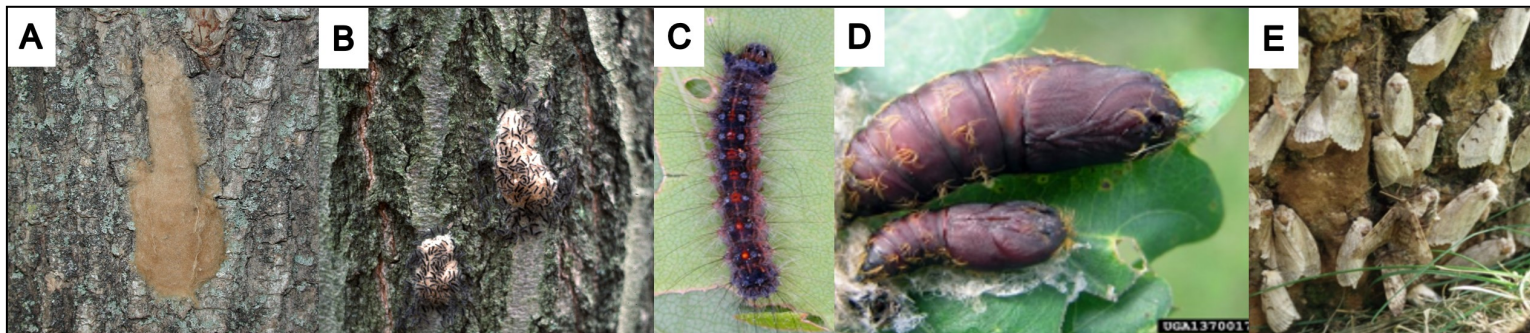


Lymantria dispar egg masses counted at long-term monitoring plots since 1986. Counts in 2020 were the highest recorded in 30 years. Data is currently being collect from these plots for 2021. Data: FPR.

Lymantria dispar caterpillars emerge from egg masses in late April-June. They feed in groups on expanding leaves when they are young. Young caterpillars can spread by "ballooning" from long threads, which break in the wind and carry caterpillars to a new location. As they grow, they molt 5-6 times, leaving cast skins behind. Defoliation increases quickly as they mature.

Feeding is complete by early July. Caterpillars then begin to pupate, where skins are shed and a new purplish-brown shell forms around the larva. After 1-2 weeks, an adult moth emerges from the pupal shell. Moths mate and lay eggs on bark fissures and crevices in August.

These egg masses are yellowish-tan in color and in outbreaks can number in the hundreds on individual trees. Outbreaks occur when caterpillar growth outpaces natural enemies, such as during periods of dry weather or drought. The fungus *Entomophaga maimaiga* typically keeps caterpillar populations in check when sufficient moisture is present, but fungal activity is greatly reduced during drought. Outbreaks collapse from a combination of factors: starvation, malnutrition, viral or fungal diseases, and high rates of parasitism. Outbreaks may also collapse if eggs hatch early and a frost occurs.



Life stages of *Lymantria dispar*. **A:** Intact egg masses found in fall/winter. Photo: FPR. **B:** Hatched egg mass found in spring. Photo: FPR. First instar caterpillars are quite small, but molt multiple times by June and can cause substantial defoliation when numbers are high. **C:** Late instar caterpillar. Photo: FPR. **D:** Pupal cases. Photo: USDA Forest Service. **E:** Adult moths laying eggs. Photo: FPR.

Impact

Most trees will recover, but defoliation reduces a tree's ability to produce and store carbohydrates. This affects wood production and growth next year. Trees on sites rich in calcium and magnesium are better able to recover from stress. Site factors that increase the risk of tree decline include acidic soils, ridgetops, rocky ledges, and wet areas.

There is always a risk that defoliation could lead to dieback or even tree mortality. In addition to drought, consecutive years of defoliation, severe winters, and other disturbances magnify the impact. After multiple defoliations, or if other stressors are present, food reserves may be depleted so that a tree's ability to survive the winter, defend itself from secondary pests, and maintain its living cells are impaired.

"My property was impacted in 2021. What can I do to assess the risk in 2022?"

You can estimate the risk of defoliation next year by doing an egg mass survey this winter.

Egg Mass Survey instructions:

- Pick a location on your property that is of concern or was defoliated in 2021
- Walk towards the center of the stand for 5 minutes, tallying the number of new egg masses in view without turning your head or looking behind.
- After 5 minutes, turn around and repeat the process (for another 5 minutes) until you return to your starting point.
- If less than 10 egg masses are counted there is minimal risk of defoliation
- If the count of egg masses is between 10-40, some defoliation may occur
- If more than 40 egg masses are counted notable defoliation is likely

Chemical Treatment Options

If you have determined that your property will likely be defoliated in 2022 and want to consider applying for an aerial application permit from the Agency of Agriculture, there are several items to be aware of. The full cost of the treatment will be incurred by the landowner and prices and acreage should be discussed with the aerial applicator (recommendations on next page). Minimum acreage for treatment should be discussed with the applicator as well. There will be required buffers to property lines and sensitive areas.

Currently, FPR's recommended treatment for aerial control of caterpillars is the biological insecticide Btk. Btk products come in both OMRI (Organic Materials Review Institute) certified for use in organic

production and non-OMRI formulations. Even if a property is treated, some defoliation will occur. The caterpillars need to be actively feeding to consume lethal doses of Btk. Aerial applications can be delayed by weather or other operational constraints, and there may be missed areas.



Lymantria dispar defoliation. Photo: FPR.

To apply for an aerial treatment permit, an application will need to be submitted to the Agency of Agriculture between January 1, 2022, and **no later than** March 15, 2022. At a minimum, an Agency of Agriculture permit and a VTrans Air permit will be needed. There are no costs for these permit applications. The Agency of Agriculture will help coordinate the VTrans aerial permit for the aerial applicator(s).

The Agency of Agriculture permit application will require:

- Treatment proposal details (product, rates);
- Surveillance data demonstrating the pest pressure and economic impacts considerations;
- Geospatial files (GIS) for the proposed treatment area, with buffers delineated for surface waters, drinking water sources, and other sensitive sites;
- A notification plan detailing how the applicant will notify all abutting landowners of the proposed treatment;
- A site access control plan detailing how the applicant will prevent unauthorized access to the site during treatment

For forest canopy control greater than 6,400 acres, additional permits from the Agency of Natural Resources may be needed and should be discussed prior to March of 2022.

If interested in an application for aerial treatment, please contact Morgan Griffith at morgan.griffith@vermont.gov.

Aerial Applicators

Business Name	City	State	Phone
Duflo Spray Chemical Inc	Lowville	NY	(315) 376-2155
Joe Brigham Inc	Pembroke	NH	(603) 225-3134
Rebecca Lynn Flying Service Inc	Livingston	NY	(518) 537-7433
North Fork Helicopter's LTD	Cutchogue	NY	(631) 734-5515
M G Carmichael Crop Duster	Presque Isle	ME	(207) 551-6883

Citation: Vermont Dept. of Forests, Parks and Recreation. 2021. *Lymantria dispar* Update. Vermont Forest Health leaflet 2021-8. 3 pp. Available at vtforest.com.



<p>For more information, contact the Forest Biology Laboratory at 802-565-1585 or:</p>	Windsor & Windham Counties.....	Springfield (802) 289-0613
	Bennington & Rutland Counties.....	Rutland (802) 786-0060
Addison, Chittenden, Franklin & Grand Isle Counties.....	Essex Junction (802) 879-6565	
Lamoille, Orange & Washington Counties.....	Barre (802) 476-0170	
Caledonia, Orleans & Essex Counties.....	St. Johnsbury (802) 751-0110	

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