



## Forest Tent Caterpillar

### INTRODUCTION

The forest tent caterpillar (*Malacosoma disstria*) is an insect defoliator that is native to North America. It has historically caused extensive defoliation of hardwoods throughout Canada, except in Newfoundland, the Northwest Territories, the Yukon, and Nunavut. It feeds primarily on trembling aspen, oak, ash, maple (except red maple) and white birch, as well as many other deciduous trees and shrubs. Widespread outbreaks occur at intervals of 9 - 13 years. When outbreaks occur, they are brief, lasting only 1 or 2 years, but some can endure for up to 6 years, resulting in tree mortality.

### LIFE CYCLE

In late June to mid-July, the female forest tent caterpillar moth lays from 150 to 200 eggs in a 10-15 mm wide band that she deposits around a twig. Each band of eggs is covered with a dark black secretion that protects the eggs and young larvae until they emerge the following spring. The forest tent caterpillar overwinters as a small larva inside its egg, emerging in the spring to begin feeding about the time of bud break, when the leaves unfold. The caterpillars have five growth stages called instars, with each instar lasting 7-10 days. Young larvae often occur in groups of 5–200 individuals feeding together on new leaves, sometimes on a silken feeding mat that they produce. These groups tend to move together through the tree but break apart and begin to disperse as the larvae become older. During this dispersal, the larvae may move between trees or out of the forest in search of food, particularly when populations are large.

Young larvae are 5–10 mm long, black or dark blue in colour with sparse hairs. Mature caterpillars are dark blue with a sparse covering of long brown hairs and a line of white to cream-colored keyhole-shaped spots along their backs. Younger larvae may possess the same spots but these can be difficult to see when larvae are small. These spots can be used to distinguish the forest tent caterpillar from other, related species of tent caterpillars. At maturity, caterpillars are 45–55 mm long. Once feeding has finished, the caterpillar spins a silk cocoon of white to yellow threads in which they pupate. These cocoons are usually located in trees but can be found on buildings, fences and other structures, often when populations are large. Adult moths emerge 7-10 days after entering the silken cocoon. The adult moth is buff colored with a wingspan of 35-45 mm with a broad cream-coloured band across the front wings.

### DAMAGE

Defoliation by the forest tent caterpillar usually causes little permanent damage to tree health, because feeding occurs early in the year, giving trees time to produce enough new leaves to carry on essential photosynthesis. However, defoliation does weaken trees and makes them more susceptible to attack from a variety of other pests, or other stresses such as drought. Two or more years of heavy defoliation can cause a severe reduction in radial growth and may cause considerable branch and twig mortality. A third or fourth year of heavy defoliation will result in tree death and unusually long-lasting outbreaks have been linked to declines of both trembling aspen and sugar maple. Heavy defoliation can affect other members of the forest ecosystem; some species of grouse living in defoliated stands may experience higher predation because of reduced cover.

In a managed sugar bush, one season of heavy defoliation may reduce the quantity and sugar content of the sap in the following year. This effect can become more pronounced when there are multiple, successive years of insect attack.

In urban areas, trees may be impacted more by defoliation as they are often subjected to many other stress factors. However, in the urban forest, forest tent caterpillar populations can be smaller than in forests, and outbreaks may not last as long, which could mitigate these effects.

The caterpillar itself can also become a nuisance to people living or vacationing in forested areas and at the urban-rural interface. During outbreaks, a typical tree can produce in excess of 100,000 larvae, which multiplied over the number of trees in a given area could result in millions of caterpillars per hectare. Young caterpillars spin threads and fall from the trees onto picnic tables, patios, cars, etc. Large, mature caterpillars will disperse in search of food and will move great distances, sometimes across roads and through open areas. When this dispersal occurs, larvae may take refuge and form large clusters of thousands of caterpillars on buildings, trees, and other objects. These aggregations are harmless, but are a significant nuisance to homes and property. Caterpillars often emit a greenish-black fluid when disturbed, which stains paint and cloth.

### NATURAL CONTROL

Natural control mechanisms terminate the outbreaks of forest tent caterpillars. After a year or two of severe defoliation, diseases and parasitic insects act in combination to reduce the size of the caterpillar population. The most common disease is caused by a nucleopolyhedrovirus transmitted among caterpillars and from the mother to her offspring that at high levels kills young caterpillars shortly after they emerge from their egg, and at lower levels may act to reduce the fecundity and dispersal ability of female moths. Several species of flies and wasps parasitize the eggs, larvae and pupae of the forest tent caterpillar. In late-stage infestations, up to 80% of large larvae can be parasitized by another insect. Predatory wasps (e.g., Vespids or 'Yellowjackets') and ants have also been shown to prey on larvae and can significantly reduce the size of individual colonies. Other predators such as beetles, spiders, small birds and mammals also feed on caterpillars and pupae, but the extent to which they contribute to the control of the pest is unknown. Unfavorable weather conditions can sometimes play a role in reducing insect populations. A severe frost shortly after the eggs hatch can kill the new leaves and result in the starvation of many young caterpillars.

### WHAT CAN I DO?

For the forest manager, woodlot owner and sugar bush operator, forest tent caterpillar outbreaks are an occasional event that usually do not require a management response. However, there are insecticides registered in Canada for the control of forest tent caterpillar, including the biopesticide *Bacillus thuringiensis*. If a forest manager is considering treating a forest tent caterpillar outbreak, they are encouraged to consult their provincial forest health authority or a qualified and licensed applicator.

Residents of urban areas can check their trees and shrubs in late winter or early spring for the presence of egg bands and remove these before the caterpillars emerge. However, this is likely to have only a minimal effect and in rural areas and at the urban-rural interface, these tactics are likely to be ineffective, as dispersing caterpillars can infest trees that have been 'cleaned'. Caterpillars that are actively feeding can be removed by hand and disposed of and large aggregations can be removed by spraying with water. If the application of insecticides is warranted, the use of a product registered for use against forest tent caterpillar could be considered. It is important to remember that care in handling insecticides is essential and manufacturer's instructions and all local

regulations should be strictly adhered to at all times. Given the short lifespan of most infestations, the best option is to tolerate the presence of the caterpillars for the short period they cause a nuisance.

Distinguishing FTC from related species

There are three species of tent caterpillar native to North America. Forest tent caterpillar mostly feeds on deciduous trees and occurs throughout most of Canada. Eastern tent caterpillar typically feeds on deciduous bushes and trees and occurs in Canada east of the Rockies. Western tent caterpillar occurs west of the Rockies and feeds on aspen and poplar. The three species can be distinguished by the colour and pattern of spots on the mature larvae and by presence of a tent. Despite its name, forest tent caterpillar does not produce a tent, whereas the other two species do.



Forest tent caterpillar (*Malacosoma disstria*)



Eastern tent caterpillar (*Malacosoma americanum*)



Western tent caterpillar (*Malacosoma californicum*)

The ‘Friendly Fly’

One of the most important natural controls of forest tent caterpillar is a native parasitic flesh fly, *Arachnidomyia aldrichi*. The fly attacks the forest tent caterpillar larvae by laying its egg on the developing insect. The resulting larvae consumes the caterpillar, resulting in an adult fly. The population levels of this large gray fly often increase to the point that it also becomes a nuisance, earning it the nickname ‘The Friendly Fly’. The fly is harmless, but will often land on people, which can make it an unwanted outdoor companion during forest tent caterpillar outbreaks. The occurrence of the fly is often a sign of a waning outbreak, as its numbers peak as those of the caterpillar begin to crash. In parts of northern Ontario the fly is also known as ‘The Government Fly’. The origin of this name is unknown, but it may stem from the mistaken belief that the fly was introduced to Canada by a government agency in an effort to control the forest tent caterpillar.



The “Friendly Fly” (*Arachnidomyia aldrichi*)

CONTACT INFORMATION

Barry Cooke, Jeff Fidgen, Chris MacQuarrie or Amanda Roe

Great Lakes Forestry Centre  
1219 Queen Street East  
Sault Ste. Marie, ON P6A 2E5 Canada  
Tel: 705-949-9461  
E-mail: GLFCWeb@nrcan-rncan.gc.ca  
Web site: nrcan.gc.ca/forests/research-centres/glfc/13459