Forest Health

Pest Information Note 1 of 2021

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

Hemlock looper (*Lambdina fiscellaria*)

Summary

The hemlock looper (*Lambdina fiscellaria*) is a North American moth, which due to its wasteful feeding and rapid population growth, make it a serious defoliator of conifer tree species. The caterpillar feeds on a large range of tree species, including broadleaves. The pest is not present in the EU. A recent Pest Risk Analysis of *Lambdina fiscellaria* for Ireland identified a previously unknown pathway for introduction into the EU: the trade of mosses and lichens for ornamental displays. As a result of this Pest Risk Analysis, *Lambdina fiscellaria* has been added to the Alert List of the European and Mediterranean Plant Protection Organisation.

Description and damage

Note: *Lambdina fiscellaria* consists of three subspecies, which are catagorised based on the feeding preferences of the larva, but which have no morphological differences. These are: *Lambdina fiscellaria fiscellaria* – eastern hemlock looper, *Lambdina fiscellaria lugubrosa* – western hemlock looper, *Lambdina fiscellaria somniaria* – western oak looper (EPPO).

The hemlock looper is a moth, found in North America, whose larval (catapillar) stage is a polyphagus defoliator. The larvae are described as wasteful feeders, that is, the insect only eats a small portion of individual leaves / needles, but causes enough damage for the entire leaf / needle to die. Because of this, the insect may be more damaging than other pests which consume the entire leaf (Natural Resources Canada).

Eggs (over wintering stage) are laid within moss and lichens on the bark of trees, or stumps / logs. During the larval stages, the insect feeds on needles and leaves. As the larvae grow, they become highly active, causing defoliation, and can be seen dropping from trees onto the ground via silk threads, and ascending the trunks of nearby trees irrespective of size or species. The insect pupates in dry, decayed stumps, bark crevices, and among lichens on trees. Adults emerge in late August and early September (Carroll 1956).

Populations of the pest can increase rapidly in an area when climatic conditions allow (known as an outbreak year) and can cause tree mortality in a single year (USDA).

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Identification

The adults are delicate moths with a wingspan of 35 mm and a body length of 12 mm. Wings are mottled light tan to gray. There are two dark, wavy stripes outlined with yellow across the forewings and one similar stripe on the hindwings. There is one small, dark spot near the front edge of each forewing between the two stripes (USDA).

Adult moth. Photo credit: Jerald E. Dewey, USDA Forest Service, Bugwood.org.

Front page photo: Caterpillar stage. Photo credit: Connecticut Agricultural Experiment Station , Connecticut Agricultural Experiment Station, Bugwood.org

Larvae grow from 3 mm up to 33 mm during their growth period, and have the characteristic inchworm / looper movement. Their appearance changes throughout their development into the following forms:

- Black heads and a black and light gray banding pattern on the abdomen
- Yellow-brown, mottled bodies and black and brown head capsules with no pairs of spots on the head
- Addition of paired spots on body segments
- Yellow-brown to gray-brown, have two pairs of dark spots on the top of the head capsule and each abdominal segment, and a variegated pattern of lines that give the general impression of longitudinal stripes (USDA).

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Distribution

Europe: Absent

North America: Canada (British Columbia, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, Quebec), USA (Alaska, California, Connecticut, Georgia, Idaho, Maine, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont, Washington, Wisconsin) (EPPO).

Hosts

The hemlock looper is very polyphagous, and its known hosts include both coniferous and deciduous trees. Major hosts include *Picea sitchensis* (Sitka spruce), *Abies balsamea* (balsam fir), *Picea glauca* (white spruce), *Tsuga spp*. (hemlock), *Acer spp*. and *Quercus garryana*. During outbreak years, larvae can be found feeding on a significant number of tree species as well as understorey plants (EPPO).

Status

A Rapid Pest Risk Analysis of *Lambdina fiscellaria* for Ireland was conducted by Tuffen (2018), which identified a previously unknown pathway of entry. Whilst it was identified that existing phytosanitary measures on the import of wood and wood products from North America mitigate the risk of introduction, it was identified that the trade of mosses and lichens (where the insect lays its eggs) for ornamental displays from USA to EU has recently increased and is not covered by any phytosanitary regulation.

As a result of Tuffen's Rapid Pest Risk Analysis, the European and Mediterranean Plant Protection Organisation (EPPO) has added *Lambdina fiscellaria* to the EPPO alert list: https://gd.eppo.int/reporting/article-7000

EPPO Reporting Service no. 03 - 2021 Num. article: 2021/061

Natural Resources Canada: https://tidcf.nrcan.gc.ca/en/insects/factsheet/8846

USDA Forest Insect and Disease Leaflet 186 2020

Carroll WJ (1956) *History of the Hemlock looper, Lambdina fiscellaria fiscellaria (Guen.) (Lepidoptera: Geometridae) in Newfoundland, and notes on its biology*. Canadian Entomologist 88: 587-599. Cited in Tuffen (2018)

Tuffen, M, G. 2018 *Rapid Pest Risk Analysis (PRA) for Lambdina fiscellaria*. Teagasc, DAFM.