Forest Health Protection and State Forestry Organizations

Management Guide for
Western False Hemlock Looper

Nepytia freemani (Munroe)
(Lepidoptera: Geometridae)

The western false hemlock looper is a native pest of immature Douglas-fir in the northwestern United States (south through Idaho to Utah), southern interior British Columbia, and southwestern Alberta.

**Host:**
Douglas-fir

**Occasional hosts:**
Western hemlock, spruce, alpine fir, larch, ponderosa pine

**Damage**

Larvae are wasteful feeders; eating only parts of needles which they chew off at their base. Partially consumed needles dry out and change color, producing a reddish brown appearance of damaged trees.

Defoliation appears in June in the upper crowns, and by July or August entire trees may be defoliated.

During outbreaks trees may be entirely defoliated in one season. Douglas-fir are seldom killed after only one year of severe defoliation, but repeated attacks may result in top-kill or whole tree mortality.

Eggs are often laid on defoliated twigs and the resulting larvae may quickly consume new, adventitious foliage causing twig mortality.

In late summer the ground beneath heavily defoliated trees may be carpeted with partially eaten needles and frass.

**Life History**

Eggs are laid from August to October, singly or in groups of up to 13, although the average number of eggs is about 4 per group. Eggs are usually laid on the underside of host needles, but when defoliation is severe eggs may be found on bud scales, twigs, or in bark crevices. They hatch the following spring.

Young inch worm larvae begin to feed on new foliage in the upper crowns of trees during late May, progressing to the older foliage when new foliage is depleted.

Key Points

- Larval populations periodically reach epidemic proportions.
- During outbreaks trees may be entirely defoliated in one season.
- Douglas-fir are seldom killed after only one year of severe defoliation.

Figure 1. Late instar larva of western false hemlock looper. Note square head and alternating dark and light stripes. Photo by BC Ministry of Forests
Life History

Larvae drop to lower branches on silken threads. Mature larvae are about 1 inch long, tan with a broad, reddish brown dorsal stripe bordered by narrow yellow stripes outlined with fine black lines. Each side is marked with a wide yellow stripe. The head appears almost square from above and has black dots.

Although the larvae are solitary feeders, they tend to congregate in loosely webbed enclosures to pupate. Pupae are light amber becoming dark red-brown, ½ to ¾ inch long.

Pupation occurs in late July or August and adults emerge from August to October. Adult moths are gray with strong black wing markings. Moths are nocturnal fliers. Females lay an average of 70 eggs.

Identification

Signs of Attack—Defoliation appears in June in the upper crown, and by July or August entire trees may be defoliated.

Look for slim, tan, black and yellow striped larvae June - August. Extensive webbing is evident in heavily infested stands. Look for naked pupae in August. Grey colored moths with strong black wing markings emerge from August through October and fly at night.

Eggs are present in the fall and winter. By fall, the ground beneath heavily defoliated trees may be carpeted with partially eaten needles and insect frass.
Management

Prevention
Preventative treatments can be applied at the planning or prescriptive phase. In areas where the looper has occurred most frequently, management of stands to include a mix of tree species and ages will minimize damage.

Indirect Control
Outbreaks usually last for 1-3 years and collapse rapidly due to exhaustion of the food supply, weather factors, and rapidly building populations of natural enemies such as insect parasites or natural disease agents.

Pheromones
Components of the sex pheromone of the western false hemlock looper have been identified as optical isomers of 3,13-dimethylheptadecane. To date this information has not been translated into management tools.

Pesticides
Insecticides may be used for direct control, particularly where prevention is impossible and when timber or aesthetic values are high. Advice and technical details concerning ground sprays for individual trees should be available from local pesticide control, horticultural or forestry officials. Please follow the label instructions carefully.

Aerial spray operations with synthetic organic insecticides and the bacterial agent *Bacillus thuringiensis kurstaki* (Btk) gave some protection, these experiences did not result in established spray protocols for this insect.

Other Reading


Other Reading

Photo Credits:

Natural Resources Canada - Canadian Forest Service


<table>
<thead>
<tr>
<th>Assistance on State And Private Lands</th>
<th>Assistance on Federal Lands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montana: (406) 542-4300</td>
<td>US Forest Service</td>
</tr>
<tr>
<td>Idaho: (208) 769-1525</td>
<td>Region One</td>
</tr>
<tr>
<td>Utah: (801) 538-5211</td>
<td>Missoula: (406) 329-3605</td>
</tr>
<tr>
<td>Nevada: (775) 684-2513</td>
<td>Coeur d'Alene: (208) 765-</td>
</tr>
<tr>
<td>Wyoming: (307) 777-5659</td>
<td>7342</td>
</tr>
</tbody>
</table>

|                        |                             |
| US Forest Service      | Region Four                 |
|                        | Ogden: (801) 476-9720       |
|                        | Boise: (208) 373-4227       |