

Douglas-Fir Tussock Moth

Defoliates Douglas-fir, true firs, and spruce

Name and Description—*Orgyia pseudotsugata* (McDunnough) [Lepidoptera: Lymantriidae]

The Douglas-fir tussock moth is a common defoliator of Douglas-fir and true firs. Adult male moths are a non-descript, gray-brown moth with feathery antennae and a wingspread of 1-1 1/4 inches (25-32 mm) (fig. 1). The female is flightless and notably different from the male in that it has rudimentary wings and a large abdomen, usually about 3/4 inch (19 mm) long. Young larvae possess fine hairs; older larvae have two tufts behind the head, one posterior tuft, and four dense tussocks located along the back (fig. 2). Larvae grow up to 1 1/4 inches (32 mm). Eggs are laid in a mass on top of the cocoon from which the female moth emerged (fig. 3).

Hosts—In forested settings, the Douglas-fir tussock moth prefers Douglas-fir. It is also occasionally found on true firs or spruce. Forest infestations can be intense, and other species of conifers surrounding Douglas-fir trees are often also defoliated. In urban settings, blue spruce is attacked. Urban infestations are often confined to individual trees, and the same trees may be attacked year after year, which can cause considerable damage or mortality.

Life Cycle—Douglas-fir tussock moth has a 1-year life cycle and overwinters as eggs. Egg hatch coincides with bud burst. Larvae pass through four to six molts. Pupation occurs any time from late July to the end of August inside a thin cocoon of silken webbing mixed with larval hairs. Adults appear from late July into November, depending on the location. The female moth emits a sex pheromone that attracts males.

Damage—The first sign of attack appears in late spring as young larvae feed on current year's foliage, causing it to shrivel and turn reddish brown (fig. 4). As larvae mature, they feed on older needles. Defoliation occurs first at tops of trees and outer branches and then, as the season progresses, on lower crowns and inner branches of the host tree. During a severe defoliation event, trees will appear as skeletons once the damaged needles have fallen off, and cocoons and egg masses will be visible year-round in the lower tree canopy. Damage from severe defoliation can lead to tree death or predispose trees to subsequent bark beetle attack. Douglas-fir tussock moth can be one of the most damaging of western defoliators.

Management—Natural controls, including predators, parasitoids, and a nuclear polyhedrosis virus (NPV), keep the tussock moth populations low most of the time. The natural controls, especially the NPV, also act to bring populations back under control during an outbreak. Douglas-fir tussock moth populations seem to follow a cyclical outbreak pattern, with outbreaks occurring every 8-12 years and lasting for 2-4 years. If applied control is desired, there are registered insecticides that might be used to reduce outbreak populations. The NPV has been made into a biocontrol (under the name TM-Biocontrol) and has been used in areas where rare Lepidoptera co-occur



Figure 1. Douglas-fir tussock moth adults: male (left) and female (right). Photo: Rocky Mountain Region, USDA Forest Service.



Figure 2. Douglas-fir tussock moth larva. Photo: Rocky Mountain Region, USDA Forest Service.



Figure 3. Tussock moth female, egg mass, and cocoon (from left to right). Photo: William M. Ciesla, Forest Health International, Bugwood.org.

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with the tussock moth. Availability of this product is limited. The microbial pesticide *Bacillus thuringiensis* var. *kurstaki* (B.t.k.) is not hazardous to most beneficial insects, birds, small mammals, and aquatic systems. However, B.t.k. results against the tussock moth have not been consistent. Other contact chemical insecticides are also available for tussock moth management.

Tussockosis—Hairs on the tussock moth larvae can cause an allergic reaction in humans. The most common reaction is a skin irritation. Rashes, watery eyes, and sneezing are common symptoms. Avoid handling the larvae, and wash after exposure.



Figure 4. Tussock moth damage on Douglas-fir tree. Photo: William M. Ciesla, Forest Health International, Bugwood.org.

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1. Furniss, R.L.; Carolin, V.M. 1977. Western forest insects. Misc. Publ. 1339. Washington, DC: U.S. Department of Agriculture, Forest Service. 654 p.
 2. Wickman, B.E.; Mason, R.R; Trestle, G.C. 1981. Douglas-fir tussock moth. Forest Insect and Disease Leaflet 86. Washington, DC: U.S. Department of Agriculture, Forest Service. 10 p.