

Douglas-Fir Tussock Moth

Orgyia pseudotsugata (McDunnough)

Lepidoptera: Lymantriidae

Shepherd, R. F.; Otvos, I. S.; Chorney, R. J. 1985. Sequential sampling for Douglas-fir tussock moth egg masses in British Columbia. Joint Rep. 15. *Canadian Forest Service, Pacific Forest Research Centre*. 7 p.

Objective: To develop a sequential sampling plan designed to predict defoliation levels the following summer based on fall egg mass densities.

Abstract: The Douglas-fir tussock moth is a major defoliator of Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco, and true firs, *Abies* spp., in western North America. Defoliation can often be severe and cause tree mortality during the first year of defoliation. This field guide describes an easy-to-use survey for determining egg mass density and predicting defoliation levels.

The use of pheromone traps will provide a warning when *O. pseudotsugata* populations are approaching outbreak levels. However, pheromone traps do not pinpoint the exact location of an outbreak, or the level of expected defoliation. The latter information can be determined by a sequential egg mass sampling program (Shepherd and others 1984). This program is designed to determine the average number of egg masses per tree within 20% of the true mean 95% of the time. Defoliation predictions are based on mean egg mass totals per three lower crown branches, and are classified as either light, moderate, or severe.

Sampling Procedure: In the fall, after pheromone traps have indicated that *O. pseudotsugata* egg masses may be present, examine all susceptible stands with little or no defoliation in the general vicinity of the pheromone traps. Walk through each stand, looking on the lower side of branches for egg masses. Be careful not to confuse old egg masses or cocoons for new, viable egg masses. If egg masses are found, search for the area where egg mass density appears to be highest and mark the center of the infestation.

Select 20 Douglas-fir trees randomly around the center of the infestation with at least three full-sized lower branches close enough to the ground so that new egg masses can be seen easily. Record the number of egg masses on the three lower branches. Calculate the average number of egg masses per tree and determine the predicted defoliation class:

0-0.7 egg masses per three lower branches per tree: No or light defoliation as characterized by less than half of the trees suffering complete defoliation of current foliage in the upper crown and only minor damage to old foliage.

0.7-2.0 egg masses per tree: Noticeable defoliation characterized by most current foliage and almost half of the older foliage being damaged. Usually significant growth loss occurs, but only minor dieback and mortality is observed.

≥2.0 egg masses per tree: Severe defoliation as characterized by most current foliage and more than half of the older foliage consumed. At least 20% of trees will be completely defoliated, and significant growth loss, dieback, and mortality will occur.

Note: It is the point of highest egg mass density within the stand that is surveyed so the resulting defoliation predictions are worst case scenarios and may not reflect stand means.

Reference:

- * Shepherd, R. F.; Otvos, I. S.; Chorney, R. J. 1984. Pest management of Douglas-fir tussock moth (Lepidoptera: Lymantriidae): a sequential sampling method to determine egg mass density. *Canadian Entomologist* 116: 1041-1049.