Douglas-Fir Tussock Moth

Orgyia pseudotsugata (McDunnough)
Lepidoptera: Lymantriidae

Mason, R. R. 1978. Detecting suboutbreak populations of the Douglas-fir tussock moth by sequential sampling of early larvae in the lower tree crown. Res. Pap. PNW-238. Portland, OR: *U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station*; 9 p.

Objective: To develop a sequential sampling plan for classifying *O. pseudotsugata* infestations based on the occurrence of first instar larvae in the lower crown.

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. Outbreaks occur quite unexpectedly so that large numbers of trees are often defoliated before direct control measures can be applied. Growth loss, top-kill and tree mortality are common during outbreaks. The early recognition of impending outbreak conditions is essential for managing this insect.

A sequential sampling plan was described for identifying the outbreak potential of *O. pseudotsugata* populations. The plan uses a technique for sampling early instar larvae by non-destructive examination of lower crown foliage (Mason 1977). After each tree is sampled, the sequential sampling plan is referenced (Figs. 2, 4), and sampling is continued until a decision is reached. Infestations are classified as either low level or suboutbreak, which indicates a population capable of reaching outbreak levels within one generation. The sampling plan is applied independently on individual plots to classify the density of each plot. It is an appropriate method for screening populations quickly in evaluation surveys, but is not intended as a single evaluation of large forested areas.

Sampling Procedure: Trees are sampled randomly within each 2 ha plot. Sampling techniques are described in detail by Mason (1977). Beat three branches selected randomly from the lower crown of Douglas-fir against a portable drop cloth, and record the presence or absence of larvae in each sample. If a larva is found on the first branch, it is unnecessary to sample the remaining branches. After each tree is sampled, reference the sequential sampling plan (Fig. 2), and continue sampling until a decision threshold is met (i.e., infestations are classified as either low level or capable of outbreak levels within one year). If no decision is reached after sampling 20 trees, the infestation is classified as intermediate.

Notes: Sampling must be conducted after egg hatch when the majority of larvae are first instar, and new shoot growth is at least 2.5-5 cm in length.

Reference:

*Mason, R. R. 1977. Sampling low-density populations of the Douglas-fir tussock moth by frequency of occurrence in the lower tree crown. Res. Pap. PNW-216. Portland, OR: *U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station*; 8 p.

Figure:

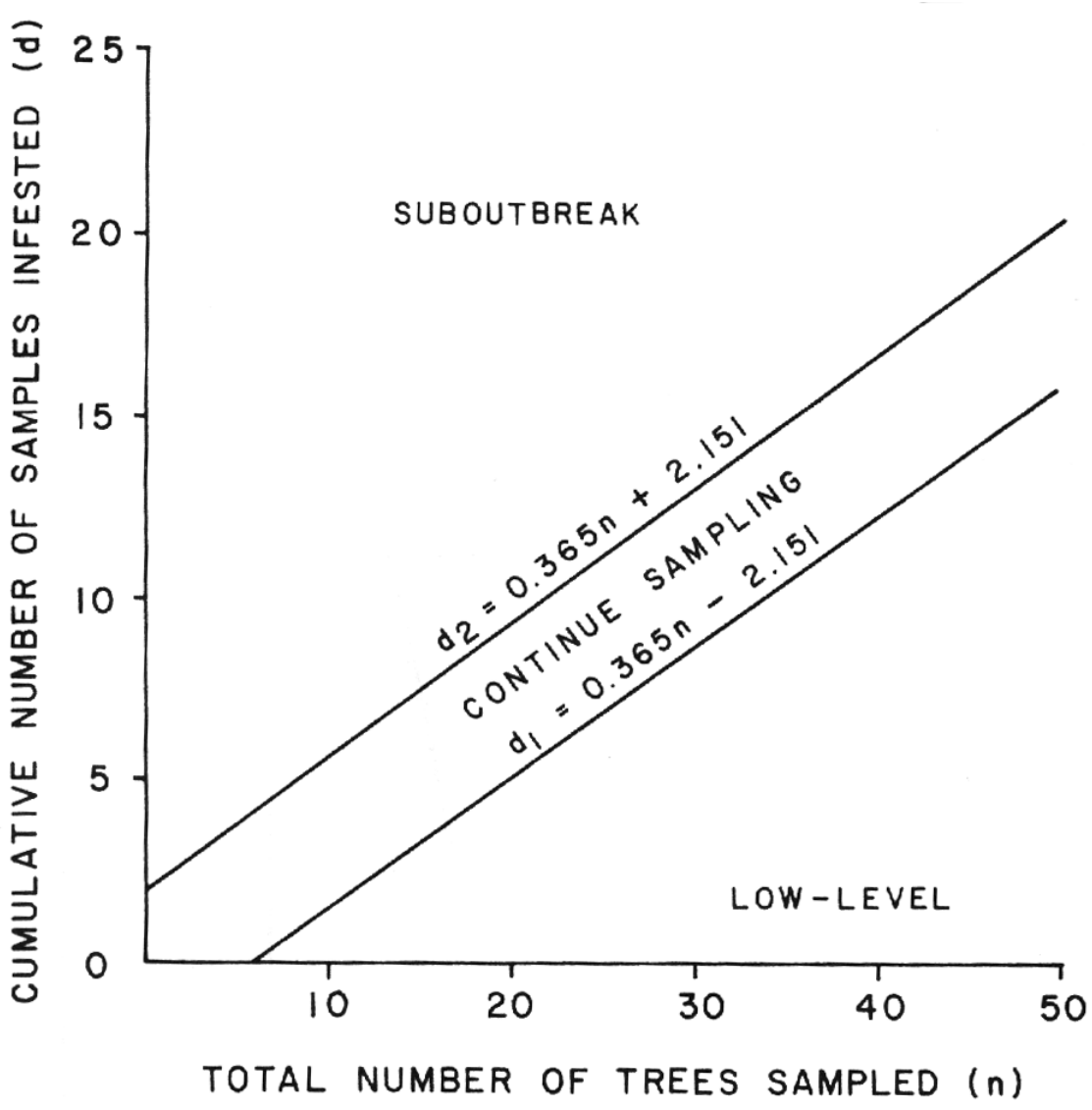

Figure 2.--Sequential graph for sampling early larvae of the Douglas-fir tussock moth in the lower tree crown.