

Hemlock Sawfly

Neodiprion tsugae Middleton

Hymenoptera: Diprionidae

Hard, J. S. 1971. Sequential sampling of hemlock sawfly eggs in southeast Alaska. Res. Note PNW-142. Portland, OR: U.S. Department of Agriculture, Forest Service; 9 p.

Objectives: To classify population densities of *N. tsugae* quickly and with known confidence, and to enable intergeneration comparisons of density.

Abstract: The hemlock sawfly, *Neodiprion tsugae* Middleton, is an important defoliator of western hemlock, *Tsuga heterophylla* (Raf.), in southeast Alaska. Females insert eggs singly into the edges of hemlock needles in the fall. Following a lengthy overwintering period, larvae emerge the following June. The period from October through June provides an opportunity for estimating population levels of *N. tsugae* based on egg density.

Neodiprion tsugae egg densities are classified rapidly through examination of branch samples from the upper crowns of intermediate-sized western hemlock trees. Branch samples are examined until a single egg is found, which reduces greatly the amount of time spent sampling. A tree is classified as infested if the sample yields one or more eggs, and uninfested if it yields none. The percentage of infested trees is used to classify populations as light ($\leq 33.3\%$ infested) or moderate to heavy ($\geq 50\%$ infested).

Sampling Procedure: Select trees and plots randomly within the area of concern. Climb or fell the nearest intermediate crown class western hemlock and remove four 46-cm branch tips from the midpoint of the upper crown. Examine each sample for eggs. If a single egg is found, record as infested, discontinue sampling, and disregard the rest of the sample from that tree. If after examining all four branches, no eggs are found, the tree is classified as uninfested. Using the sequential sampling form (Fig. 3), and beginning at the origin of the graph, draw a line up one square for an infested tree or a line right one square for a uninfested tree. Discontinue sampling once a decision threshold is crossed (Fig. 3). If a decision is not met, sampling should be discontinued at 15 trees and the plot considered a borderline case. Stands are classified as light populations if $\leq 33.3\%$ of sample trees have eggs and moderate to heavy if $\geq 50\%$ of sample trees have eggs.

Notes: Only eggs deposited during the current generation are counted. Eggs from the previous generation, which appear brown, may still be found but should not be considered. If the infested area is relatively large, a single plot may not be adequate to provide a useful population index.

Figure:

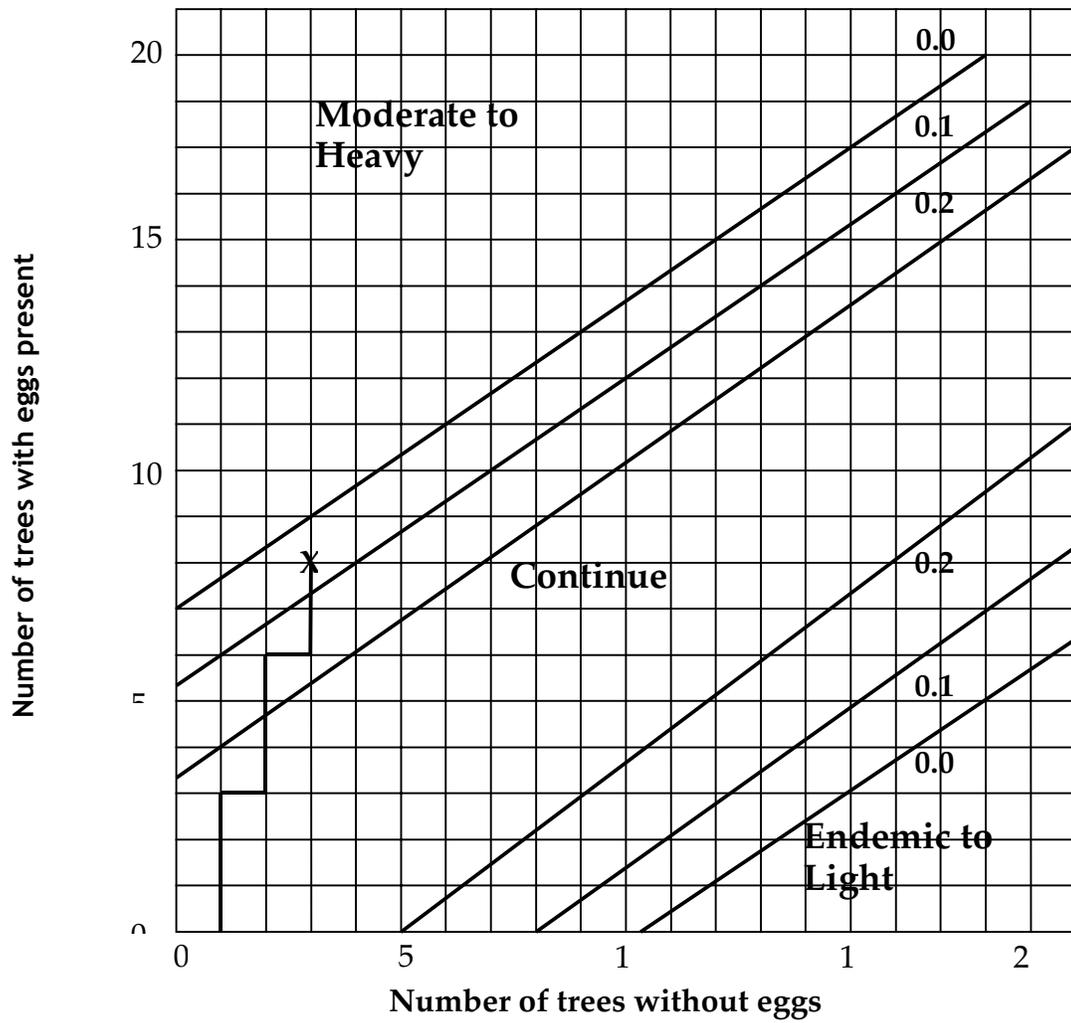


Figure 3. Hemlock sawfly egg sequential sampling.