Gypsy Moth
Lymantria dispar (Linnaeus)
Lepidoptera: Lymantriidae

Wilson, R. W. Jr.; Fontaine, G. A. 1978. Gypsy moth egg mass sampling with fixed-and-variable-radius plots. Agric. Handb. 523. Washington, DC: *U.S. Department of Agriculture*; 46 p.

Objective: To provide detailed procedures for sampling *L. dispar* egg masses.

Abstract: The gypsy moth was introduced into Medford, Massachusetts in 1869, and is now a major defoliator of hardwoods throughout the northeastern USA and Canada. Defoliation reduces tree growth and vigor, and in combination with other stress factors can cause excessive tree mortality. Two methods: sampling with fixed- and variable-radius plots (FVP) are intended for forested areas greater than 5 hectares in area with egg mass densities greater than 250 per hectare. Fixed-radius plots of 20 m^2 are first sampled to determine the mean number of egg masses per hectare on all objects in the understory (EM_x). The variable-radius plot is taken from the center of the fixed-radius plot to estimate the mean number of egg masses per hectare on overstory trees (EM_y). The mean number of total egg masses per hectare (EM) is then determined by the formula $EM = EM_x + EM_y$. Topics discussed in this handbook include the description, organization, and execution of this survey technique, and compilation of the associated data.

Sampling Procedure: The sampling unit consists of variable-radius plots (BAF 20) for sampling overstory trees, and a fixed-radius plot (20 m^2) for sampling the understory. Lay out 30 sample points systematically, with a 30-m spacing between plots. The authors provide considerable detail on sample size derivations, sample point locations, and crew organization for which we refer you to the original publication.

Fixed-radius plots: Sample fixed-radius plots first before the understory is disturbed. Locate and record the number of egg masses per plot. Examine all objects for egg masses except overstory trees (dominant, codominant, and intermediate). To determine the mean number of egg masses per acre, multiply the number of egg masses found by 200.

Variable-radius (prism) plots: The prism point is the center of the fixed-radius plot. If the tree is not alive or is receiving direct skylight on its crown, then do not include it in the sample. Record the tree species, d.b.h., and proceed with the egg mass census. To determine the egg mass count corrected for tree size, divide it by the d.b.h.^{2} (inches) and then sum for each tree sampled. Then to determine the number of egg masses per acre, divide the sum of the weighted egg counts by the total number of trees sampled and multiply by 3,667.

To estimate the mean total number of egg masses per acre, add the average counts for the overstory and understory samples.