October 1999

# Gypsy Moth Egg Mass Surveys for the Woodlot Owner

A gypsy moth egg mass survey is used to estimate the population of gypsy moth in a woodlot.

To find out if gypsy moth is present in a wooded area on your property, you should take a walk in your woodlot and look for gypsy moth egg masses. Egg masses are approximately the size of a quarter, and are covered with tan coloured, fuzzy hairs. They look like a piece of chamois. You can find them on the underside of tree branches, in bark crevices, and on branches, logs, and rocks on the ground.

If you see any egg masses, you can do an egg mass survey to estimate the gypsy moth population. The survey takes a sample of part of your woodlot using Modified Kaladar Plots (MKP). It's quick and simple. The information from the survey will be useful in determining the need for, and planning for, a pest management program.

The following are step by step instructions for doing the survey.

## Equipment needed for an MKP survey

- Datasheet and pencil
- Flagging tape, ribbon, or tree paint
- 10 m (30 feet) measuring tape

## Step 1: Where to conduct the survey

Identify the areas of your property that would be most susceptible to gypsy moth defoliation. Susceptibility can be evaluated by looking at two factors: trees species, and terrain.

Tree species that are very susceptible to gypsy moth include oak, poplar, aspen, birch, and basswood. For help in identifying the type of trees on your property, you can obtain tree identification guides in most book stores and libraries. You can also contact your local Ministry of Natural Resources district office.

Terrain also influences gypsy moth defoliation, with high and dry ridges being most susceptible. Wet sites such as swamps are least susceptible.

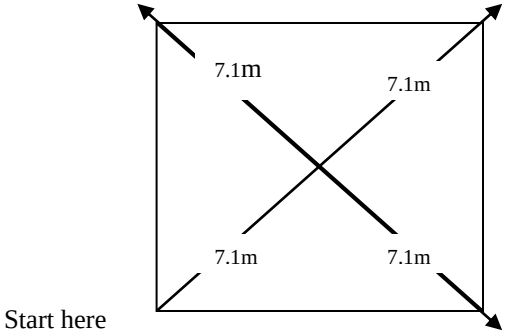
Areas of your property that would be the most susceptible to gypsy moth infestation would be a high ridge covered with oak and poplar. Areas with low susceptibility would

be cedar or balsam swamps. Another good place for the survey is where egg masses have been previously found, or where defoliation has been previously observed. Find the areas of greatest susceptibility and establish your MKPs there.

**Step 2: Plot layout**

Each MKP is 10 metres by 10 metres (0.01 hectares) and should be located away from open areas such as roads or trails to avoid inflated counts. Walk into your woodlot for about 20m, and begin laying out the plot. Mark the first corner of the MKP with flagging tape (or ribbon or tree paint) and run a diagonal line 7.1m to the plot centre. Mark the plot centre with two pieces of flagging tape, and continue to run the diagonal line another 7.1m. Flag this spot as the corner opposite your starting point.

Complete the plot layout by running lines to the two other corners from the centre and flagging them. You now have a 10m x 10m box as shown below:



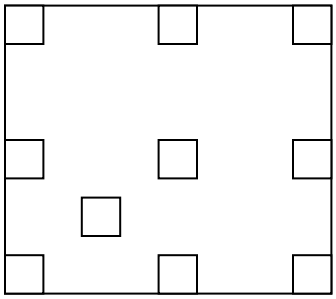

**Step 3: Distinguishing between new and old egg masses**

It is easier to distinguish old from new eggs masses in the fall, because the new ones are generally darker in colour. New egg masses are a tan to brown colour and firm to the touch. If pressed between two hard surfaces, or squeezed between two finger nails, new eggs always "pop." Old egg masses are usually bleached, chalky, and may be frail to the touch. In some cases, old egg masses, especially those on tree boles above the snow line, may be firm if the eggs did not survive the previous winter. However, old eggs do not usually "pop." Only count the new egg masses when doing your survey.

**Step 4: Counting egg masses in the MKPs**

The egg mass count consists of two separate counts, an **Above Ground Count**, and a **Ground Count**. The **Above Ground Count** includes all new egg masses found above the ground surface. This includes egg masses found on all parts of all the trees, shrubs, stumps, large rocks, branches, leaning sticks, etc. in the entire plot. A magnifying tool such as low power binoculars will help in seeing egg masses that are on high branches. Multiply this number by 100 to obtain the number of **egg masses/ha above the ground**.

The **Ground Count** is made using 10 mini-plots within the main plot. Each mini-plot is 1m x 1m. They are arranged in the main plot, one at each corner, one half way down each side, one in the centre, and one at random, as shown below. Search carefully, counting the number of new egg masses found on the ground in each mini-plot. Then add up the number of egg masses from each mini-plot to find the **Ground Count**. Be sure to include all egg masses on the ground, under rocks, sticks, etc. Beware of hazards, such as poison ivy. Multiply the **Ground Count** by 1000 to obtain the number of **egg masses/ha on the ground**.



Add together the **egg masses/ha on the ground**, to the number of **egg masses/ha above the ground**. This final number gives you the **total number of egg masses/ha**.

Egg masses/ha on the ground _____
Egg masses/ha above the ground _____
**Total egg masses/ha** _____

**Step 5: Interpreting the egg mass count**

The MKP provides an estimate of the number of egg masses per hectare (EM/ha). This number can help you plan your management program. The more plots you do in the woodlot, the better idea you will have of the actual gypsy moth population. For example, the average number of EM/ha from 5 MKPs done in a 10ha woodlot should be a more accurate estimate than the result from 1 MKP in the woodlot. Generally, the more variable the gypsy moth population is in the woodlot, the more MKPs are needed to give a good forecast.

Predicting future gypsy moth defoliation is more accurate at the beginning of an infestation, than towards the end. Rates of parasitism and infection by pathogens (e.g. virus or fungi) typically increase the longer an infestation persists in a locale. When this happens, even high counts of egg masses may result in low defoliation the following season, because the parasites or pathogens have caused high gypsy moth mortality.

At the beginning of an infestation, an average of 1250 EM/ha generally indicates a population that will cause 40% or more defoliation the following growing season. Less than 40% defoliation is not readily visible to the untrained eye, and has minimal effect on tree health. Once defoliation exceeds 40% to 50%, defoliation is readily visible, and tree health can be adversely affected. Although trees usually refoliate if they lose more than

50% of their foliage, this is an additional stress on the trees, and uses up their starch reserves for future growth.

If egg mass counts exceed 4000 EM/ha, the population is healthy (low parasitism and infection rates) and the egg masses are large (i.e. quarter size or larger, rather than dime size), defoliation greater than 50% should be expected. If the same healthy populations exist, and there are more than 10,000 EM/ha, 100% defoliation of susceptible trees can be expected.

In most locations in Ontario, gypsy moth populations have not remained high for more than 2 or 3 years. High rates of parasitism, and the fungus *Entomophaga maimaiga*, have usually contributed to the population collapse. Nonetheless, tree impacts have occurred, including loss of aesthetic values, reduced tree growth, tree mortality, and increased vulnerability to other stresses such as drought and other insects (e.g. forest tent caterpillar). Tree mortality has been as high as 50%, and is considered to be associated with other stresses, particularly drought or poor site conditions.

Landowners considering forest pest management programs should contact their local Ministry of Natural Resources and Ministry of the Environment offices.

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