

Forest Health Factsheet

Gypsy Moth

Gypsy moth, *Lymantria dispar* (L.), is an important pest of hardwoods in the northeastern U.S. since its introduction from Europe to Massachusetts in 1869. It is now established in 19 states from Maine to Wisconsin and extends to northeastern North Carolina. In Pennsylvania it was first discovered in Luzerne and Lackawanna counties in 1932. A total of 4.3 million acres were defoliated in the state during the historical peak year of 1990. Suppression programs have been carried out by the Pennsylvania Bureau of Forestry since 1968 to minimize its impacts on the forests.

Hosts

Gypsy moth is a spring defoliator with more than 300 host species. Oaks, especially white oaks, are preferred by feeding caterpillars. Older larvae will also feed on conifers such as hemlock, pines, spruces and southern white cedar. Non-hosts include ash, yellow-poplar, sycamore, black walnut, catalpa, locust, American holly, and shrubs such as mountain laurel, rhododendron and arborvitae.



Mature larva

Life History

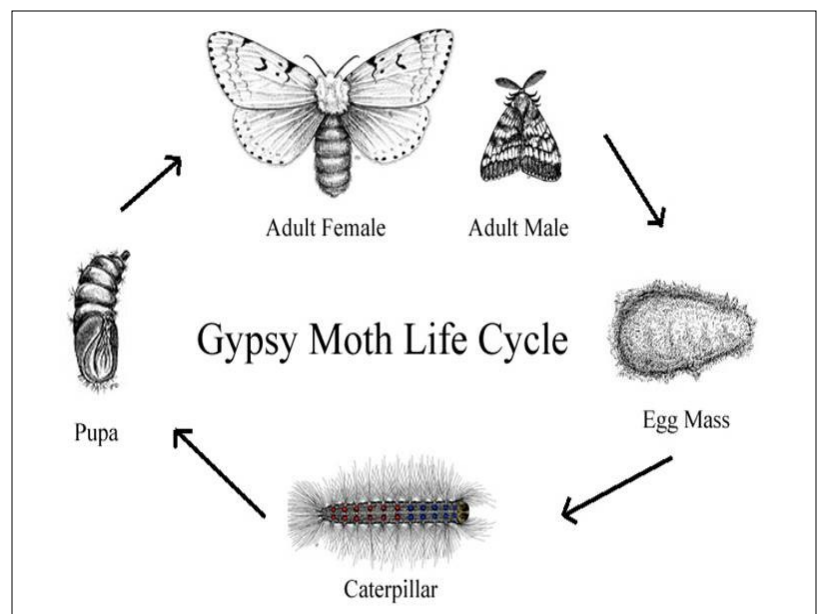
Gypsy moth has one generation per year in Pennsylvania. Females lay their eggs as light tan egg masses (400-600 eggs) on trees, stones and other substrates during July to overwinter. Eggs hatch from late April to early May the following spring. Small 1st instar larvae move in search of suitable food sources by floating in the wind on silken threads. Early instars feed on foliage and remain on hosts, whereas half-grown larvae usually feed in the canopy at night and move down from the tree to seek shelter in bark crevices and other protected sites during the day. Larvae mature by mid-June. Late instars are marked by five pairs of dark blue spots and six pairs of red spots along the back. Pupation takes place in late June or early July in places such as tree trunks, stone surfaces and building exteriors. Adults start to emerge two weeks later and reach peak emergence by mid-July.



Adult female and egg mass

Natural Enemies

Natural enemies (predators, parasitoids, and pathogens) play an important role in regulating gypsy moth populations. Birds, mammals, and predaceous insects such as the Calosoma beetle feed on eggs, larvae and adults. Parasitoids of gypsy moth include *Ooencyrtus kuvanae* for eggs, and *Cotesia melanoscelus* and *Parasetigena agilis* for larvae. There are also two pathogens that greatly affect gypsy moth caterpillars: the nucleopolyhedrosis virus (NPV), and the fungus *Entomophaga maimaiga*. Gypsy moth larvae die of viral infection hanging from trees in an inverted V position; while those killed by the fungus remain mummified head-down on the tree.



Management

The Pennsylvania Bureau of Forestry conducts annual egg mass surveys to monitor gypsy moth populations. A suppression program is planned when populations exceed threshold levels. Treatments are only conducted at the request of the landowner and if the area meets the program requirements. Treatment is applied when 50% of the caterpillars are in their second instar in the spring so timing is critical. If you believe that you have a need for a gypsy moth suppression treatment you should contact your gypsy moth county coordinator during the summer. Contact numbers and additional information on program requirements can be found at the [PA Bureau of Forestry Gypsy Moth Site](#).

Mechanical

Tactics for mechanical removal of gypsy moth egg masses can be effective for individual yard trees but are not effective as a forest-wide control method. Methods include removal of egg masses before they hatch and removal of objects where egg masses can be hidden by females. Another control tactic is wrapping burlap around the trunks of trees where gypsy moth larvae can hide during the day. The larvae hiding under the burlap are then scraped into a can of soapy water, killing the larvae. Sticky tape around the trees can also be used to entrap larvae as they move down the trees to hide during the day.



Burlap wrap

Insecticides

The principal insecticide used by the Pennsylvania Bureau of Forestry for gypsy moth suppression contains the bacteria *Bacillus thuringiensis* var. *kurstaki* (Btk). This insecticide must be ingested by the early instar larvae and is more effective on the first three instars of gypsy moth. There are several chemical insecticides that can be used for gypsy moth control. Diflubenzuron is an insect growth regulator that must be ingested by the caterpillar and acts on the juvenile stages of invertebrates by preventing the formation of a new exoskeleton when the organism molts. It is effective against gypsy moth larvae. Another insecticide used in forestry applications is tebufenozide, an insect growth regulator which causes a premature molt in the caterpillars of butterflies and moths that feed on foliage treated with the insecticide. There is a biological insecticide containing the nucleopolyhedrosis virus registered under the name GYPCHEK. Since this virus specifically attacks gypsy moth, GYPCHEK is used in areas where rare and endangered butterflies and moths are believed to be present. This insecticide is produced in limited amounts by the USDA Forest Service.

References

1. [Woody Ornamental Insect, Mite, and Disease Management](#)

For More Information

[Gypsy Moth in North America](#)
[PSU Ext Gypsy Moth Factsheet](#)
[Gypsy Moth USDA FS Forest Insect and Disease Leaflet 162](#)
[Gypsy Moth in Wisconsin / Biological Controls](#)
[Homeowner's Guide to Gypsy Moth Management](#)

For more information contact:

Division of Forest Pest
Management @ 717-783-2066

<http://www.dcnr.state.pa.us/forestry/insectsdisease/index.htm>



pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES