About Gypsy Moths

Gypsy moths are a species of non-native invasive caterpillar that can be damaging to oaks and dozens of other hardwood and some coniferous trees. Originally found in Europe, gypsy moths were brought to the US in the 1860’s. The European caterpillars quickly escaped into the North American ecosystem and were an immediate threat. North American predators and parasites did not recognize the caterpillars as food and the North American trees did not have the defenses to protect themselves from this new species. The caterpillars expanded their territory by moving from tree to tree, either along the ground or letting the wind carry newly hatched caterpillars on strands of silk. One of the biggest contributors to the spread of gypsy moths is humans; through the movement of eggs that are on firewood, vehicles, lawn furniture, etc. By the 1980s, they had arrived in Michigan.

Gypsy moth caterpillars harm trees by eating their leaves, preventing the tree from photosynthesizing food. A tree stripped of all its leaves will certainly be hungry, but a healthy tree will have spent years storing resources in its roots for hard times. Some trees will regrow their leaves after gypsy moth caterpillars are done feeding. But growing leaves twice in one year uses up a lot of the tree’s spare resources. If the tree is defoliated two or three years in a row, it may not survive. The most helpful thing you can do for your trees is to make sure they have enough water and food (nutrients). Trees need water to help make more food, so having the right amount of water lets them recover and prepare for the next threat. Some trees have nutrient deficiencies, root problems, or other preexisting diseases that lead to poor health and make them more vulnerable to gypsy moth damage. If your tree was struggling before the caterpillars came, it might be worth talking to a local arborist.

Life Cycle

Gypsy moth caterpillars emerge in mid-May from egg masses that were laid by females the previous summer. After they emerge, the caterpillars eat a significant amount of foliage throughout the spring. The caterpillars (larvae) will then pupate in July and after a couple weeks, emerge as adults. The adult moths then mate and the flightless females lay beige/tan egg masses that can contain from 50 to 1500 eggs in each one.
Natures Defense against Gypsy Moths

Today, gypsy moths are still a threat to both our forests and urban trees. However, there have been important changes to our native ecosystems that greatly reduce the long-term damage of the caterpillars. Our greatest ally in controlling gypsy moths is a fungus called Entomophaga maimaiga.

The fungus can wait in soil for over a decade, until a gypsy moth caterpillar crawls over it and becomes infected. Inside the caterpillar, the fungus quickly grows until it kills the caterpillar and releases spores to nearby caterpillars. Entomophaga thrives in cool, moist weather. 2016 and 2017 were particularly dry, leading to the higher numbers of gypsy moths observed in 2018.

Another important ally is a “nucleopolyhedrosis virus”, or NPV. NPV infects gypsy moth caterpillars and within two weeks of infection, the caterpillars are killed and spread the virus onto the leaves below them. It is easy to observe caterpillars that have been killed by NPV, as they die in a distinct V shape. Because of the way the virus is spread, it is most effective where gypsy moths are present in high numbers.

Several species of wasps and flies act as parasites of gypsy moths. Some will lay eggs within the caterpillars, others are so small that they lay eggs within the eggs of gypsy moths. Deer mice and blue jays are examples of a few larger animals that will eat the caterpillars and can play important roles in controlling low populations of gypsy moths.

What can you do as a Homeowner?

The citizens of Rochester Hills can play an important part in our efforts to reduce the gypsy moth population within the city. Since natural enemies often significantly reduce Gypsy Moth populations, human action is not always necessary. However, even when levels are low, Gypsy Moths can be quite the nuisance to homeowners. Here are some actions any homeowner can take:

- In later winter to early spring, you can scrape egg masses into a bucket of soapy water or bury them several inches in the dirt. Egg masses can still hatch if they are just left on top of the ground. Most of the egg laying has occurred by the end of August. It is at this point that homeowners may choose to remove the egg masses – remember there are 50 -1500 eggs in each!! However, consider allowing the introduced parasites a chance to build their populations by parasitizing the egg before removing them.
- Throughout the spring and summer, loosely attach a flap of burlap onto the trunk of the tree where you can easily reach it. The caterpillars will retreat under the burlap to hide from predators and the heat, allowing you to brush them into soapy water periodically. Once the caterpillars pupate and become moths, the females will sometimes hide under the burlap to lay their eggs.
- Throughout the summer, if you see significant defoliation from Gypsy Moths, keep your trees healthy by keeping them watered, mulched, and fertilized.
The Last Line of Defense: Spraying

There are no readily available pesticides that target only gypsy moths. The most targeting pesticide for gypsy moths is called B.t.-k, short for the bacteria Bacillus thuringiensis var. kurstaki. Historically, it is used in aerial sprays when many acres of oak canopy are at risk of mortality. Local tree care companies can spray B.t. on individual trees from the ground. B.t. is an organic product that is naturally found in soils. It specifically effects caterpillars and is considered harmless to humans, pets, and other non-targeted animals.

There are also systemic pesticides that are applied as a soil drench or injection. Either type of application carries the pesticide throughout the tree and into its leaves. There are several types of systemic pesticides that are effective against gypsy moth caterpillars, but typically they affect a broader range of insects. We recommend systemic pesticides only be used as a last resort because of their potential to harm beneficial insects that play important roles in our ecosystem. Many systemic pesticides require a licensed professional for application.

For more information, please contact the Parks & Natural Resources Department at 248-656-4673.