



TO: Mayor and City Council
FROM: Howard S. Lazarus, City Administrator
DATE: July 13, 2018
SUBJECT: Response to City Council Action R-18-276: Resolution to Direct City to Assess and Monitor Extent of Gypsy Moth Infestation and Develop Treatment Plan and Budget

On July 2, 2018 City Council approved resolution R-18-276, *Resolution to Direct City to Assess and Monitor Extent of Gypsy Moth Infestation and Develop a Treatment Plan and budget.*

Gypsy moth infestations are cyclical, occurring every 10-20 years. The last infestation in Ann Arbor was in the late 1990s. Gypsy moths have many natural predators, including, mammals, birds, insects, parasitoid wasps, fungal pathogens and diseases. These natural predators help to control the population during outbreaks and maintain low levels of the population between outbreaks. Two of the most important natural predators during outbreak years are the nuclear polyhedrosis virus (NPV) and *Entomophaga maimagia*, a fungus that can help reduce populations during outbreak years. Gypsy moth caterpillars infected with the fungus, which has been spurred by this year's wet spring, die hanging upside down on the trunk. The dead caterpillars become "mushrooms" eventually falling to the base of the tree. They will spread the fungus to next year's spring gypsy moth larvae. While the fungus is weather dependent, the virus (NPV) is not. NPV is naturally present in the environment and spreads to gypsy moth caterpillars who feed on foliage contaminated with the virus. The caterpillars that die from NPV serves as hosts for the virus and help it to spread. The virus also persists in the soil. NPV builds up when there is a high density of gypsy moth and is the most common cause of gypsy moth population collapse, which usually occurs within 3 years of an outbreak. Caterpillars infected by the virus hang from the trunk in an upside down "V".

City staff contacted two experts on gypsy moth and pheromone trapping programs, Michigan State University's forest entomologist Dr. Deb McCullough, and entomologist Dr. Dave Smitley, seeking guidance on developing a pheromone trapping program. Drs. McCullough and Smitley each stated that pheromone traps would not provide useful information about the population density or distribution of gypsy moth in Ann Arbor for the following reasons:

- 1) The Gypsy moth population has been established in the City for more than 20 years. Pheromone traps are useful for detecting new populations of gypsy moth where it has not been previously established, they do not provide any useful information in areas where the population is already established;
- 2) Pheromone traps can lure male gypsy moth from long distances, so their presence in a pheromone trap does not necessarily indicate that the moth originated from that location or that there is a population present at the trapping site.

Both entomologists stated the City should not pursue pheromone traps to monitor gypsy moth populations and recommended counting egg masses in late summer/fall as a better method for monitoring populations. According to Dr. McCullough, if egg masses are at a density of 200 egg masses per acre, expect high defoliation next year. If they are small (size of a quarter), the females were not healthy and most likely killed by the nuclear polyhedrosis virus (NPV), and the population should collapse next year.

The City has also spoken with the University of Michigan's Campus Arborist about actions they are taking in response to infestations on campus. An email received from the University of Michigan Campus Arborist on July 10, 2018, stated they plan to monitor and remove egg masses in the fall. "We've seen evidence that *Entomophaga* and NPV have caused significant mortality in the population. At this point, we do not plan on treating with Bt in the spring but will continue to monitor and collaborate with the city on the issue."

City staff has been monitoring the population of gypsy moth throughout the city this spring and have identified areas with gypsy moth populations. The areas are very localized throughout the city - the attached map identifies these areas and the level of infestation. Areas with heavy infestation had partially or completely defoliated trees, and areas with light infestation had feeding by gypsy moth caterpillars but no defoliation. Since gypsy moth are always present in the city, an area with a light infestation this year will not necessarily see an increase in gypsy moth populations next year. Staff has seen evidence of caterpillars that have been killed by both the *Entomophaga* fungus and NPV, in the gypsy moth impacted areas throughout the City. The Gypsy moth population may not be eliminated in 2019, and there may be localized outbreaks, however, all signs indicate the natural predators are present and the population is beginning to crash.

STAFF RECOMMENDATION

Based on the information provided above staff proposes the following gypsy moth plan:

- Develop a gypsy moth communications plan - **estimated budget: \$5000.00**
 - Provide Gypsy moth information and ways private property owners can help manage the population on their property.
 - Gypsy moth webpage is at a2gov.org/forestry
- Continue coordination with the University of Michigan and Michigan State University Extension on gypsy moth management and monitoring activities.
- Continue monitoring areas with gypsy moth populations.
- If needed, develop a program with Michigan State University Extension to train the City's Citizen Pruner volunteers on monitoring and removing egg masses on public property.

Due to the cyclical nature of gypsy moth populations, the localized populations throughout the city, the natural predators of gypsy moth present in Ann Arbor, the impact on other butterfly/moth caterpillars and consultation with entomology and other urban forest professionals, staff does not recommend an aerial spraying of Btk (*Bacillus thuringiensis* var. *kurstaki*) on public property trees in the spring.

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