



CITY OF
EAST GRAND RAPIDS

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DOUG LAFAVE
ASSISTANT CITY MANAGER

MEMORANDUM

TO: Honorable Mayor and City Commissioners
FROM: Doug La Fave, Interim City Manager
DATE: May 1, 2020

RE: Gypsy Moth Management Program for 2020

Action Requested: That the City Commission consider approval of a Gypsy moth management strategy for 2020 comprised of any variation or combination of options 1-3 noted below.

Background: During the summers of 2017 and 2018, the City saw the Gypsy moth population in an area of the City (see attached map) reach elevated levels leading to significant defoliation of trees. In 2019 the City Commission approved and executed a three-part strategy noted as options 1, 2 and 3 below. The City forestry consultant recently completed surveys of Gypsy moth egg masses in select infestation pockets in the City to estimate this year's population. Based on the results of this survey, Gypsy moth populations are expected to decline in 2020 and with the decline and tree health consideration the City consultant has not recommended aerial spraying for this year (see attached report).

Gypsy moth (*Lymantria dispar*) is an invasive pest, native to Europe and Asia, which was accidentally introduced into Massachusetts in the late 1800s. Since its introduction, it has made its way west and is now well-established in Michigan. Gypsy moth produce one generation per year, with a female moth laying eggs in early summer. The eggs overwinter on tree trunks and buildings and hatch into caterpillars the following spring. These caterpillars then move into tree canopies to start feeding. The caterpillar stage feed on trees while adult moths do not. Gypsy moth caterpillars can feed on over 300 tree species however, their preferred species are oak. Gypsy moth caterpillars are primarily a nuisance pest. When populations are low their impact is not generally noticeable, however, when populations are high caterpillars can completely defoliate trees. Most trees will survive a single or isolated defoliation, but multiple years of heavy defoliation along with other stresses (e.g. drought) can cause tree mortality.

An additional resource for gypsy moth information is Michigan State University Extension. Visit the following link to access their gypsy moth webpage:

https://www.canr.msu.edu/ipm/invasive_species/Gypsy-Moth/index

Option 1- Relying on natural fungus/virus to reduce population.

This requires no action as well as no cost to the City but is noted within the strategy. This approach is recommended by both Michigan State University and the Michigan Department of Natural Resources. Heavy Gypsy moth infestations are cyclical, occurring approximately every 15-20 years. Normally

their populations are kept in check by natural predators, specifically a fungus (*Entomophaga maimagia*) and virus (Nuclear Polyhedrosis Virus (NPV) that are naturally found in the environment. The fungus and/or virus infect the caterpillars leading to death.

The current spike in the Gypsy moth population is due, in large part, to dry springs in 2016 and 2017 that impacted the ability of the *Entomophaga* fungus to spread and infect caterpillars. The *Entomophaga* fungus is the primary natural predator that keeps the population under control. The wet springs of 2018 and 2019 have helped spread the fungus to the Gypsy moth population, however, dry weather over the summer may have limited its effectiveness and further stressed some trees. While the *Entomophaga* fungus is weather dependent, the virus, NPV, is not. NPV builds up if there is a high density of Gypsy moth and typically leads to the Gypsy moth population crashing within a few years. Caterpillars that are infected by NPV hang from the trunk in an upside down “V.”

As populations grow and Gypsy moths come in greater contact with one another, the virus and fungus can rapidly spread, causing populations to collapse. The City Forestry consultant found evidence of both natural predators present in the Gypsy moth population. The fungus needs wet spring conditions and the virus requires high populations to be effective, so can take some time for the population to be controlled by natural predators.

Option 2-Provide tree band barriers

For isolated populations of Gypsy moths, individualized treatment or mitigation strategies such as insecticide implants, tree bands can be effective, if applied appropriately.

Tree tape products create a barrier to caterpillars climbing that climb trees to feed on leaves. The tape has an adhesive on one side, to attach to the tree trunk, and is slippery on the other side to prevent upward migration of Gypsy Moth (caterpillar phase), Eastern Tent, Walnut Caterpillars, and Bagworms, Oak worms and Cankerworms. Last year the City selected this option to provide two rolls or “slippery banding tape” per property in the impacted area. The resident/property owner participation rate in 2019 was 68.7%. With the leftover supply and additional order to provide two rolls for the 123 properties in the impacted area, the cost would be \$800 for this year. Additional product information is noted below.

- Non-Chemical 2" x 30 ft roll protects 25 four-inch trees.
- Applied to the trunk of the tree as a slippery barrier.
- The barrier is too slippery for caterpillars to climb across.
- Stops defoliation from migrating caterpillars.

Option 3- Aerial spray application of *Bacillus thuringiensis* (Bt).

Bacillus thuringiensis (Bt) is a bacteria that when ingested by any Lepidoptera insect (moth and butterflies) leads to death. This is a naturally occurring bacterial disease of insects and is the active ingredient in the insecticide spraying treatment method. Bt is commonly applied by aerial (e.g. helicopter) or ground-based spray programs for the management of Gypsy moth. Because it is extremely weather and time dependent for it to be effective, the bacteria must be applied when the Gypsy moth caterpillar is in a specific growth stage and when it is not windy and rain is not in the forecast. If it rains soon after a Bt application, the bacteria can wash off the leaves and the Gypsy moth caterpillars won't ingest the bacteria while feeding. Bt can be effective when applied appropriately and afforded the right weather window. It is non-selective and affects the caterpillars of all butterflies and moths, not just Gypsy moth caterpillars. Bt is considered safe to people and has limited impacts to non-target species. Last year the City contracted with Hamilton Helicopter Inc. and sprayed the target area

that consisted of 38.2 acres in the City. They also spray for other Grand Rapids metro area communities and would coordinate an application with neighboring jurisdictions. The cost to spray the target area is \$79.20 per acre (it was \$77.50 per acre last year), for a cost of \$3,025.44. Additional product information is noted below. The City has already scheduled this option so that a permit from the FAA could be secured given scheduling delays from the current COVID-19 situation. If this option is not approved, the cancellation fee is \$573.

- Bacillus thuringiensis (Bt) is a naturally occurring bacterium common in soils throughout the world.
- Bt insecticides are commonly used to manage leaf and needle feeding caterpillars.
- It is considered safe for people and has limited impacts to non-target species.
- The product would be applied from a helicopter instead of a plane to help mitigate some of the expected overspray that occurs during the application.
- Application would be in late June.

The City will follow up with additional surveys in 2020/2021 to evaluate conditions and re-evaluate management options for the following year.