



CITY OF
EAST GRAND RAPIDS

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DOUG LAFAVE
DEPUTY CITY MANAGER

MEMORANDUM

TO: Honorable Mayor and City Commissioners
FROM: Doug La Fave, Deputy City Manager
DATE: April 8, 2021

RE: Gypsy Moth Management Program for 2021

Action Requested: That the City Commission consider approval of a Gypsy moth management strategy for 2021 comprised of any combination of Options 1-3 noted below.

Background: 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.

During the summers of 2017 and 2018, the City saw the Gypsy moth population in areas of the City (see included map) reach elevated levels leading to significant defoliation of trees. In 2019 the City Commission approved a three-part strategy in accordance with Options 1, 2 and 3 below based on tree defoliation and health. Due to the aerial spraying treatment of bacillus thuringiensis kurstaki (BtK) in 2019 and spread of natural disease pressure, the population was determined to be in decline in 2020 from surveys. As the population was noted in decline, it was not recommended that the City move forward with an aerial application of BtK in 2020. The City Commission proceeded with Options 1 and 2, with Option 2 being provided at no costs to residents in the impacted areas.

The City forestry consultant recently completed surveys of Gypsy moth egg masses in select infestation pockets in the City to estimate the population and impact this year. As is noted in the forestry consultant's report, which is included with materials, recent hot and dry summers have limited how quickly disease spreads in the population so it is expected that in 2021 the Gypsy moth population will be somewhat elevated, however it is not expected to substantially impact tree health. The forestry consultant provides recommendations based on the impact of Gypsy moth to tree health with respect to the impact of defoliation, not based on general nuisance.

Residents within the impacted areas were mailed a notice for the April 19 meeting and were provided with the consultant report. The notification advised that the City Commission would consider multiple options at the meeting as provided for in this memorandum.

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, 2017 and warm summer of 2020 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 of 2020 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 moth, 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). In 2019 and 2020 the City provided two rolls of “slippery banding tape” per property in the impacted areas. With the leftover supply and additional order to provide two rolls for the approximately 123 properties in the impacted area. With low resident participation in 2020, the City has adequate stocked supply to offer slippery tape to residents in 2021. Slippery tape is recommended because it does not require the level of maintenance as sticky tape options. Sticky tape options require removing caterpillars that have been stuck on the adhesive. If they are not removed other caterpillars bridge across those who are stuck so they can continue their travel to the tree canopy to feed. Slippery tape minimizes traction and therefore does not allow for the “bridge” effect. Proper installation of tree band products is crucial as well. Loosely applied tapes or tapes with gaps in bark beneath them are ineffective and permit unimpeded migration up the tree trunk.

Information of slippery band product available:

- 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.

Video of slippery bands:

[Climbing Caterpillars stopped by Slippery Caterpillar Barrier Tape - YouTube](#)

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

BtK 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. BtK 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 BtK application, the bacteria can wash off the leaves and the Gypsy moth caterpillars won't ingest the bacteria while feeding. BtK 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. BtK is considered safe to people and has limited impacts to non-target species.

In 2019 the City contracted with Hamilton Helicopter Inc. and sprayed the target area that consisted of approximately 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 \$80.50 per acre (it was \$77.50 per acre in 2019 and \$79.20 per acre in 2020), for a cost of \$3,075.10. If approved the City will schedule with the application vendor to coordinate permitting with the FAA.

Information related to the aerial application of BtK:

- Aerial application of BtK can be divisive and polarizing within the community.
- BtK is a naturally occurring bacterium common in soils throughout the world.
- BtK 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 2021/2022 to evaluate conditions and re-evaluate management options for the following year.

REVIEWED & APPROVED FOR SUBMISSION:



Shea Charles
City Manager