

Hello Jack's Lakers

Recently a member of our lake community wrote to the JLA with information about aerial spraying of Btk to control the Gypsy Moth population and to inquire about interest in sharing the cost.

Although Health Canada states that Btk and its formulants pose no significant health risk to humans or warm-blooded animals, it is lethal to all moths and butterflies.

The JLA board reached out to experts in this field of study to obtain their opinions on the application of Btk for the control of Gypsy Moths and would like to share this information with you all. These experts include Dr. David Beresford, Ph.D. Trent University; Christian Schmidt, Ph.D. Canadian National Collection of Insects; Dr. Doug Tallamy Ph.D. University of Delaware, Naturalist and Moth expert Basil Conlin; Bob Bowles (Field Naturalist).

What is BTK?

Bacillus thuringiensis is a bacterium that is isolated from the soil. There are various strains; Btk (*Bacillus thuringiensis kurstaki*) is the one used to target the order *Lepidoptera* (moths and butterflies) in their larval stage, as caterpillars. To be clear, Btk kills all members of the *Lepidoptera* order at their caterpillar life stage, but it does not affect adult moths and butterflies. It does not kill on contact; Btk must be ingested from the host plants it has been applied to. The bacterium kills by producing proteins that 'punch' holes into the wall of the caterpillar's gut.

Is it Effective?

Spraying Btk from an airplane is a very broad, not to mention costly, method. Spraying produces variable results for its intended purpose of eliminating Gypsy Moths. It is difficult to time because the insect life cycle is temperature-dependent. Therefore the larval stage can come at a different time depending on the spring. There is no way to predict or know the actual impact an aerial application of Btk has on the Gypsy Moth population without extensive trapping and study over multiple years.

There is evidence that spraying with Btk will likely extend the Gypsy Moth population outbreak. Gypsy Moths normally outbreak, reaching high-density, then natural predators and disease knock their numbers back down. Applying Btk will broadly disrupt insect populations and prevent natural control from taking place, which could extend the Gypsy Moth outbreak.

Do we need to use pesticides to protect trees?

Trees face insect infestations throughout their lifetimes and have adapted by developing various defence mechanisms. While the growth rate of the tree may be reduced by infestation,

the tree rarely dies. The fall-out effect from spraying with Btk could, in fact, put stress onto healthy trees.

How the Gypsy Moth functions in the Ecosystem

It is important to understand that although the Gypsy Moth is an invasive species, it is now established in areas of Ontario, and many believe that its migration north is a consequence of climate change. This means that it is now part of the natural biodiversity, and to attempt to eliminate it would be disruptive to the entire ecosystem. It is impossible to manage one species without having unintended impacts on other species due to the interconnectedness of an ecosystem. Biodiversity is more critical than ever to preserve as the natural fauna struggles to adapt to various environmental stressors.

Natural regulators/predators of the Gypsy Moth, such as parasitic wasps, target the eggs making many of them unviable. Local field naturalists have documented these parasite sightings, meaning that this year's population may decline without the use of Btk. The black-capped chickadee, one of many songbirds protected under the Migratory Birds Convention Act (MBCA), relies on the Gypsy Moth caterpillars as a food source for them and their nestlings each spring.

Btk will also target Monarch Larvae

The Monarch butterfly has the status of 'special concern' on Ontario's Species At Risk list. Monarchs have been documented to arrive in our part of the province by the end of May and will lay eggs immediately that hatch in approximately four days. Depending on the timing of the Btk spray, there is the potential to coincide with the presence of Monarch larvae, which could have a devastating effect on the population.

The Jack's Lake area provides a vibrant habitat for many species of butterflies and moths. So much so that every year it is part of the Petroglyph Butterfly Count, data collected by the Peterborough Field Naturalist's and combined with other counts in the US and Mexico. The Monarch and other butterfly species' count numbers have risen considerably in the last four years. Butterfly and moth observations by cottagers are also recorded in our Jack's Lake atlas project, led by JLA board member Steve Kerr. The nature of an aerial application of Btk is not selective, and it would affect the larvae of many species of moth or butterfly.

What steps can cottagers take that deter the Gypsy Moth?

- Keep cottage lots wooded, avoid removing healthy trees
- Maintain the natural tree canopy as much as possible
- Plant only native species of trees, avoid ornamental non-native species
- Maintain natural shoreline; avoid lawns
- Avoid the use of pesticides/herbicides/synthetic fertilizers
- Continue advocacy against logging

JLA Recommends

After reviewing the information, the JLA recommends against aerial spraying of Btk to control the Gypsy Moth because it does not provide enough benefit to outweigh the risk.

A quote from David Beresford from Trent University: "At the very least, if it were me, I would not pay just to help kill wildlife at my cottage in order to solve a problem that solves itself."

JLA Board

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