



Aquatic Consulting Services

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989-689-0223

December 6, 2023

Mr. Ray Daniels, Supervisor
Moffatt Township
PO Box 58
Alger, MI 48610

Dear Mr. Daniels:

We have completed the spongy moth surveys, maps, and report for the 2024 season in Moffatt Township, Arenac County. I have included JPG and PDF map files of the results for you to review and to post on the township website as needed. Both JPG and PDF files are printable for your purposes although the PDF file will likely be more user friendly on a website. I will provide your GIS personnel with SHP files for use in a GIS mapping system. I have also included a short report on the conditions in each recommended spray block. An 18 x 24 inch map can be mailed in a separate package for display purposes, if requested.

I am pleased to report that, during our survey, we found spongy moth populations in all of the previously infested areas were significantly reduced. In some areas, we found no new egg masses with many areas seeing >80% reduction. This result is certainly the goal of spongy moth suppression programs, but I do need to explain the factors I suspect may have been at play in this reduction. The application of *Bacillus thuringiensis kurstaki* (Btk) was definitely a driving force in the observed reduction, but complete eradication is usually not possible with Btk application alone. When we see this type of reduction, there are often interacting factors that combine to cause population collapse, especially latent environmental factors. There are three major environmental controls that limit spongy moth population buildups; a fungus called *E. maimaiga*, a spongy moth virus called NPV, and a class of egg parasitoid wasps. We suspect that these factors combined with suppressive spray has caused the observed population collapse. This comes with a caveat; we are still seeing potentially damaging spongy moth populations in other areas in Michigan. In fact, we took on new clients this season experiencing higher infestations than we ever observed in Moffatt Township. We have also seen nearly eradicated remnant spongy moth populations rebound to problem levels within 2 years. The total acreage recommended for spray in spring 2024 is 409 acres. There are a few areas with highly suppressed infestations that were not recommended but should definitely be monitored. Overall, I anticipate we will make further gains next season, but encourage Moffatt Township to continue with a monitoring program of some kind.

I will hold off on digitizing the spray blocks for the pilot's use until you have had a chance to review the maps. Once we get closer to spray time and you have selected an aerial applicator, I will provide the pilot with spray maps and digitized files.

Thank you for the opportunity to work for Moffatt Township again this season. Please let me know if I can help you with anything further at this time. 989-689-0223 or spongymoth@aquaticremedies.com.

Sincerely,

Neal Swanson
Owner/Biologist

Moffatt Township, Arenac County Recommended Spongy Moth Spray Areas 2024

Aquatic Consulting Services II LLC
December 2023

Block #	Acres	Reason for Spray
MoffTwp01	36	A sustained population in suitable habitat. Historical tree damage is evident on a few trees in the area. Nuisance is elevated, as confirmed by homeowner interaction. Egg mass residues were quite high on several trees, so further tree damage is also a concern. Spray to reduce nuisance and limit further tree damage.
MoffTwp02	45	A sustained population in favorable habitat. Egg mass residues are high on several trees within the block, so future tree damage is the primary concern. Nuisance was also quite high in this area at the population peak 2 years prior. Area is also surrounded by continuous forest, so reinfestation post-spray is possible. Spray limit further tree damage, mitigate potential nuisance, and inhibit reinfestation.
MoffTwp03	206	An established population in suitable habitat. Habitat is not ideal to support a robust infestation, but egg mass densities are likely sufficient to cause localized nuisance. Egg mass residues are primarily from the 2023 season, so population has growth potential. Spray to limit potential nuisance and suppress population growth.
MoffTwp04	122	A sustained population in favorable habitat. Nuisance is elevated in the area, as confirmed by homeowner interaction. Population is continuous into untreated Clayton Township, so reinfestation is possible. Spray to mitigate nuisance and inhibit reinfestation.

Total Acreage = **409 acres**

The term “nuisance” is subjective and relates to the likelihood that the feeding behavior and number of caterpillars in the area will impact a property owner’s quality of life. Some property owners may experience heavy infestation yet go unbothered. Other property owners may view 5-10 caterpillars visible on a barn door as a nuisance. Field experience during spongy moth infestation suggests that the number of egg masses found in an area may yield a widespread nuisance situation. The term “tree damage” is more literal, but relative to environmental and historical factors as well. Any level of defoliation should be considered damaging, but otherwise healthy trees are generally much more resilient, even after consecutive years of defoliation. Other environmental stressors such as drought or disease are additive factors that will contribute to greater risk of tree degradation and/or mortality. Defoliation levels of >60% are also very stressful to trees, although most trees can survive 3+ years of >60% defoliation if few other stressors are present. Habitat quality relates to tree species composition, density, distribution, understory, and topography of an area. Mixed forest type consisting primarily of oaks, neatly groomed understory, mixed age-class, and low topographic variability are the ideal conditions for persistent infestation, and so this habitat is designated as “prime” with favorable, suitable, and marginal habitat in decreasing suitability. Trends in populations are designated by the egg

mass residues in the area. Rising populations show a high new/old egg mass ratio, with established, sustained, and remnant populations extending toward a high old/new egg mass ratio.

Overall, the vast majority of infested areas are showing >80% reduction in egg mass densities with some areas showing 90-100% reduction. Sustained and remnant population classes both refer to higher proportions of old egg masses, implying that the population is declining notably. Generally, this trend will continue, and suppressive spray will increase the likelihood of decline. Be advised that this is not always the case, and we have seen population rebounds from remnant classes in other areas in Michigan. Also be advised that the level of damage and/or nuisance can be difficult to predict given the interaction of unpredictable environmental factors. Accordingly, all spray areas are highly recommended for *Bacillus thuringiensis var. kurstaki* (B.t.k.) treatment in spring 2024. It is not possible to completely eliminate spongy moth populations, so this should never be the expectation. Often with 2-3 years of treatment and monitoring, an acceptable level of control is attainable.

Spongy moth suppression programs often are tasked with balancing high potential for damaging spongy moth numbers with high community benefit. Areas where these considerations overlap are generally the areas that are treated first with available funds and areas of diminishing return are treated as funds are depleted. Our treatment recommendations take this into account, and we try to limit recommended spray areas to these top-tier areas. There is always some risk the objection of “Why did you treat them and not me?” Given this trade-off, some of our broadly infested clients decide that the best use of available funds is to treat areas of high residential population density that are also generally infested with spongy moths. We cannot offer any guidance on this consideration and take no responsibility for the concluded spray acreage. It is solely the decision of the municipality to treat all, some, or none of the recommended treatment area.

Spongy moth suppression programs in Michigan generally follow an Integrated Pest Management (IPM) strategy which is focused on low environmental impact and economic awareness. Further, an IPM strategy intends to mitigate exponential population growth with treatment only until latent environmental controls begin to limit populations sufficiently. In order to efficiently determine when treatment is no longer advisable, monitoring is imperative. Accordingly, we strongly advise Moffatt Township maintain some sort of monitoring program in upcoming years.



Photo 1: Mixture of old and new egg masses on red oak tree, block MoffTwp02

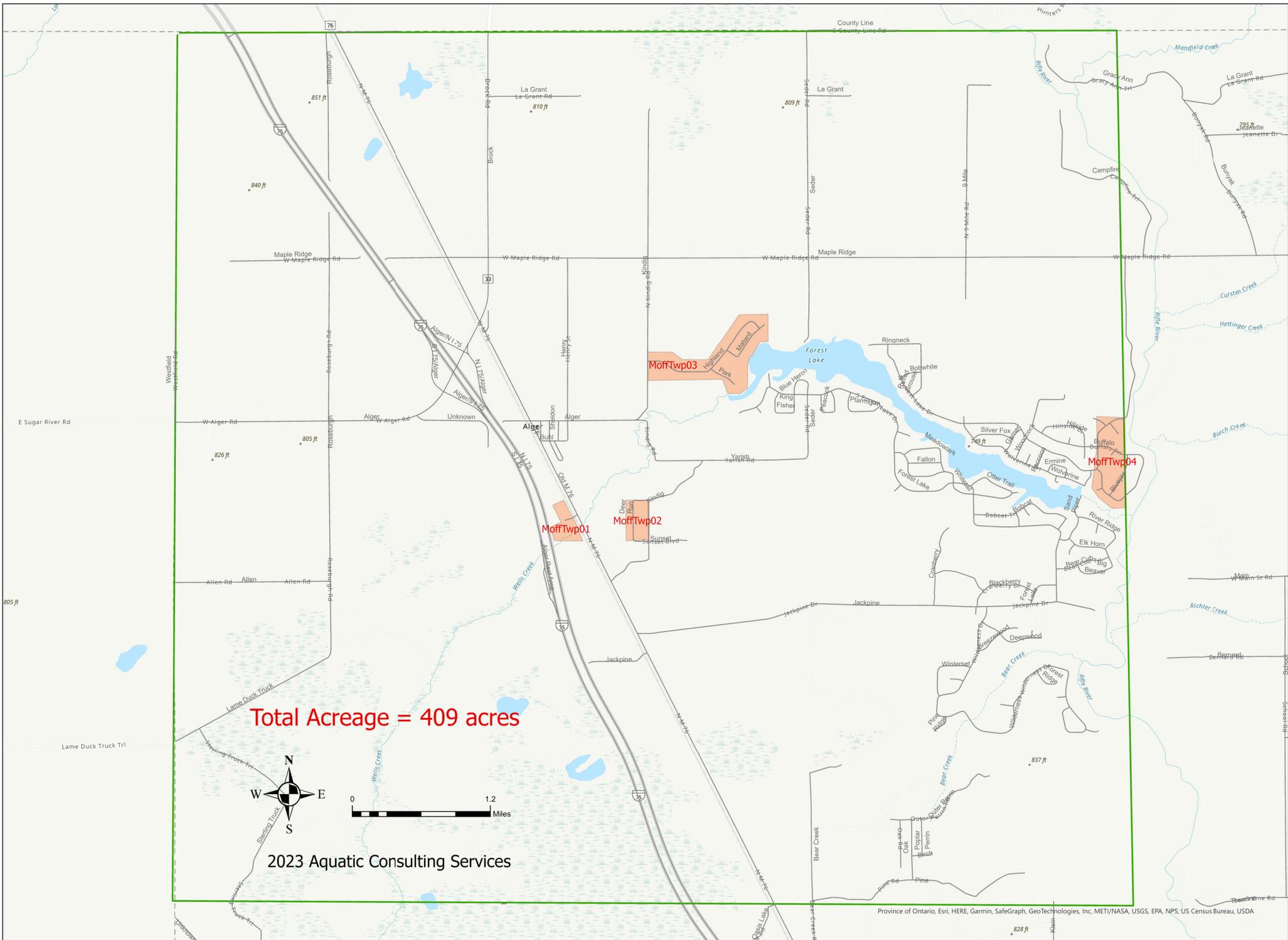


Photo 2: Several new egg masses on trunk of aspen tree, block MoffTwp03



Photo 3: A few new and a few old egg masses on trunk of white pine tree, block: MoffTwp04

Moffatt Township Spongy Moth Survey Report 2024



Total Acreage = 409 acres



0 1.2 Miles

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