

Morton Township, Mecosta County
Report of Recommended Gypsy Moth Spray Areas 2021

Aquatic Consulting Services LLC
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Block #	Acres	Reason for Spray
Mort01	115	An established population in very good habitat. Nuisance and tree damage thresholds have been reached. History of damaging defoliation is evident in some areas of the block and residential complaints confirm observations. Population is continuous with a population in untreated Martiny Township, so reinfestation is a concern. Egg mass densities are very high on several trees along 90 th Ave. Spray mitigate tree damage, reduce nuisance, suppress population growth, and inhibit spreading.
Mort02	44	An established population in very good habitat. Tree damage is evident along 80 th Ave and tree mortality is a possible in 2-3 years if treatment is delayed. Nuisance does not appear to be as high as in other areas, but tree damage is a concern primarily due to tree proximity to roadway. Spray to suppress population growth and limit further tree damage.
Mort03	27	A rising population in very good habitat. Nuisance threshold has been surpassed. Tree damage is also evident, with several trees in the block heavily infested with potential for tree mortality in 2-3 seasons if left untreated. Population is relatively isolated in terms of inhabited parcels, but surrounding habitat has the potential to hinder suppression gains. Spray to suppress population and reduce nuisance.
Mort04	20	A rising population in good habitat. Population is isolated with regard to human population. Egg mass densities are very high on several trees and tree damage and future mortality are primary concerns. Block does share border with untreated Austin Township, so reinfestation is a concern. Spray to limit future tree damage and spreading.
Mort05	54	A rising population in prime habitat. Nuisance level is high, particularly in southern portion of the block. Tree damage is a concern in coming seasons. Adjacent habitat to east also contains elevated gypsy moth populations, so potential for prolonged infestation is higher. Spray to reduce nuisance, limit future tree damage, suppress growth.
Mort06	13	A rising population in very good habitat. Lower residential population likely shows lower nuisance level, but several trees in the block are heavily infested and may sustain significant tree damage in coming seasons. Spray to limit tree damage and potential nuisance.
Mort07	40	A rising population in prime habitat. Habitat conditions are similar to Block Mort05, but residential population density appears slightly lower. Uninhabited areas are less heavily infested but do pose a source of reinfestation. Nuisance level is high along Lake Mecosta. Spray to reduce nuisance, suppress population growth, and forestall future tree damage.

Mort08	7	A rising population in good habitat. The population is adjacent to a fairly high activity area directly to the east on M-20. The population likely does not present significant nuisance to included parcels but will likely serve as a source of reinfestation to adjacent Block Mort09. Also, habitat to south of block is less infested, so spreading into this area is a concern. Spray to suppress population and contain future spreading.
Mort09	31	A rising population in prime habitat. Nuisance is likely very high throughout the area and is confirmed on Doyle Dr. Significant tree damage is likely and will cause nuisance in high human activity area. Spray to limit nuisance and future tree damage.
Mort10	28	An established population in very good habitat. Given observed egg mass densities, tree mortality is a concern in some trees within 2-3 seasons. Nuisance does not appear to be particularly high, but potential for nuisance in coming years is a concern. Spray to suppress population growth, limit further tree damage and potential nuisance.
Mort11	89	A rising population in prime habitat. Nuisance level is very high throughout. Egg mass densities imply significant tree damage in 1-2 seasons with some mortality of stressed trees. Surrounding habitat also presents a source of reinfestation, so several years of spray will likely be needed. Spray to reduce nuisance, limit further tree damage, and suppress further population growth.
Mort12	23	Conditions are similar to Mort11, but habitat quality is slightly lower. Residential population is lower, so nuisance level is likely lower as well. Area borders heavily infested Mort11 to the east and continuous forest to the west, so potential for reinfestation and spreading are higher. Spray to limit tree damage and inhibit spreading.
Mort13	27	An established population in good habitat. Egg mass densities are extremely high in several trees in this block. Tree damage is primary concern with tree mortality possible in stressed trees in 2-3 seasons. Spray to limit further tree damage and reduce any nuisance.
Mort14	36	An established population in prime habitat. Nuisance level is very high, particularly in the northern portion of the block. Block borders lower residential density area to the north, so robust population cycle is possible. Egg mass densities are very high on several trees, so tree damage is of high concern as well. Spray to reduce nuisance, limit further tree damage, and suppress population.
Mort15	32	See Mort14 above. Conditions are very similar to Mort14, but egg mass densities are even higher on a few trees. Nuisance is very high throughout. Spray to reduce nuisance and further tree damage.
Mort16	37	A rising population in very good habitat. Nuisance does not seem as high in this area, but high tree damage is likely in coming seasons, as well as increased nuisance. Block is bordered on west by continuous forest, so likelihood of reinfestation is higher. Spray to limit future tree damage and nuisance and suppress population.
Mort17	21	Conditions are similar to Mort16, although residential population density is lower. Habitat quality is similar as well, but block borders heavily travelled Buchanan Rd. Several trees adjacent to Buchanan Rd are heavily infested, so tree damage could become a greater hazard. Spray to limit tree damage and suppress population growth.

Mort18	17	A rising population in good habitat. Population is probably not producing high nuisance at this time but will likely start to cause nuisance in summer 2021. Area is also continuous with more heavily infested area of Mort 17 to the northwest. Block also borders a busy intersection. Spray to suppress population and limit future nuisance and tree damage.
Mort19	8	A rising population in good habitat. Block encompasses a popular golf course clubhouse area, so nuisance and visibility will likely be high. A few trees may be in danger of high tree damage as well. Spray to limit nuisance and tree damage.
Mort20	8	A rising population in good habitat. Circumstances are almost identical to Mort19. This high use area also borders a busy road and intersection. One large tree very near road is heavily infested. Spray to limit nuisance and tree damage.
Mort21	31	An established population in prime habitat. Nuisance is likely quite high, especially along lakeshore. A large woodlot in southern portion of block borders as yet, uninfested housing development. Spray to reduce nuisance and contain any spreading to uninfested areas.
Mort22	94	A rising population in good habitat. A large, densely forested area, but with sparse residential population. Nuisance is likely lower than in other areas, but large, dense woodlot may serve as refuge habitat and source of more prolonged infestation of neighboring areas. Spray to limit future nuisance and inhibit future spreading.
Mort23	14	An established population in very good habitat. Area includes a highly used boat launch area and a busy intersection. Nuisance is likely high during peak recreation season in June, July, and August. Spray to reduce potential nuisance and tree damage.
Mort24	65	A rising population in very good habitat. Nuisance is likely high, particularly along lakeshore. Habitat quality is variable in the western portion of block, where tree damage is of greater concern. Spray to reduce nuisance and tree damage.
Mort25	17	A rising population in good habitat. Nuisance was likely not overly high in 2020, but potential nuisance in 2021 is a concern. Most heavily infested area where higher tree damage is likely is separated from houses. Spray to limit future nuisance and tree damage.
Mort26	186	An established population in prime habitat. Population has potential to spread to surrounding habitat as well. Nuisance and tree damage thresholds have been reached throughout block and tree mortality is a concern in numerous trees within the next 2-3 seasons. Spray to reduce nuisance, limit further tree damage, suppress further population growth, and contain spreading.
Mort27	50	A rising population in very good habitat. Nuisance threshold has already been reached and tree damage has been reported. Spray to reduce nuisance and limit further tree damage.
Mort28	74	A rising population in very good habitat. Tree damage is likely in the coming seasons. Population is continuous with a population in the untreated Austin Township. Spray to limit future tree damage and inhibit spreading.
Mort29	64	Conditions in this block are similar to Mort28, but egg mass densities are slightly higher on average, particularly in the southern portion of the block. Habitat quality is also slightly better. Population is continuous with

		a population in the untreated Austin Township, so reinfestation is a concern. Spray to suppress population growth and inhibit spreading.
Mort30	8	See block 31 below. Area is continuous with untreated Austin Township. Spray to reduce nuisance tree damage and inhibit spreading.
Mort31	61	Similar to block Mort32 below. Habitat quality is very good, but residential population is slightly lower than some surrounding areas of the golf course. Nuisance is still likely quite high given observed egg mass densities. Tree damage is a concern in coming seasons and a robust population cycle is likely. Population is continuous with untreated Austin Township, so reinfestation is a concern. Spray to reduce nuisance, tree damage, and inhibit spreading.
Mort32	111	A rising population in very good habitat. Habitat is encompassed by a golf course, so some isolation of habitat is resultant, due to open fairway areas. Many trees within this block show potential for tree damage in coming seasons. Nuisance is likely elevated and is confirmed in a few areas. Spray to limit future tree damage and reduce nuisance.

Total Acreage = **1,452 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 gypsy 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 very good, good, 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, all areas initially designated as problem areas by township officials and residents did in fact support robust infestations of gypsy moths. Habitat quality throughout much of the township will likely support prolonged infestation if suppression efforts are not enacted. The level of damage and/or nuisance can be difficult to predict given the interaction of unpredictable environmental factors. All recommended areas contain potentially damaging gypsy moth egg mass numbers. Accordingly, all spray areas are highly recommended for *Bacillus thuringiensis var. kurstaki* (B.t.k.) treatment in spring 2021. There is significant risk of potential tree damage and high nuisance levels if recommended areas are left untreated for another cycle. Some areas showed

evidence of several successive years of infestation (particularly eastern Blue Lake (Mort11 and Mort12), northern School Section Lake (Mort14 and Mort15), and east of Lake of the Clouds (Mort 26)), which often proves much more challenging to suppress. Under these circumstances, several years of treatment are often necessary. It is not possible to completely eliminate gypsy moth populations, so this should never be the expectation. With 2-3 years of treatment and monitoring, an acceptable level of control is attainable.

Spray areas are recommended based on habitat suitability, population dynamics, historical data, and field experience in gypsy moth management. Other areas within the township may also contain some level of gypsy moth infestation, but such areas were not included in the agreed upon survey area of known defoliation and nuisance. That said, within the designated survey area, egg masses were observed in the vast majority of areas. The Michigan State University Extension is a primary environmental information resource available to the public in Michigan and offers management advice on a variety of invasive species [Gypsy Moth - Integrated Pest Management \(msu.edu\)](http://msu.edu). While we hold the survey methodology we employ as proprietary, the [MSU Extension published a 1/40-acre survey protocol that designates 200-250 egg masses/acre as having potential for high defoliation and nuisance. At the high end of this range \$250/40 = 6.25\$ egg masses in a 1/40-acre survey plot. A 1/40-acre survey plot is a circle with a radius of 18' 7" where all visible egg masses are counted. In many of the areas we observed at least 10 egg masses on a single tree with several areas showing several hundred egg masses/tree \(See attached Photos 1-4\).](http://msu.edu) By these standards we could recommend treatment of large continuous areas of forest, but this would not be cost effective given that some of the area is only sparsely populated and would not provide high visibility of return on expense.

Gypsy moth suppression program managers are often tasked with balancing high potential for damaging gypsy 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 of the objection "Why did you treat them and not me?" Sometimes the situation is: the disgruntled property owner lives in an isolated plot set back on 10 forested acres. It might cost the township \$1,000 to treat this individual's property while 10 one-acre parcels could be treated for the same cost. 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 gypsy moths. We cannot offer any advice on this consideration and take no responsibility for the concluded spray acreage.

Gypsy 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 Morton Township maintains a monitoring program for the next 2-3 years at least.



Photo 1: Numerous egg masses on one side of a single white pine, block: Mort11.



Photo 2: Cluster of egg masses on red oak, block: Mort11.



Photo 3: Numerous egg masses on several trunks of red oak, block: Mort12.



Photo 4: Numerous egg masses on trunk and limb of red oak, block: Mort15.