

HOW AND WHY GYPSY MOTH TREATMENT SITES ARE SELECTED

Wisconsin gypsy moth management is administered by two agencies and two different, complimentary programs.

Slow the Spread Program

The Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) runs Wisconsin's Slow the Spread program (STS). This program is active in counties that are not yet quarantined for gypsy moth because gypsy moth populations are still very low and isolated. This includes most of the western half of Wisconsin. The goal of STS is to eradicate small and isolated populations of gypsy moth to slow their spread westward. The program includes spraying, trapping, and egg mass surveys.

How DATCP chooses potential spray sites for STS program

Spray sites in the STS program are determined on the basis of trapping and egg mass survey data collected the previous year. The STS program works to prevent establishment of gypsy moth by detecting populations just as they get started, and then treating them to prevent further growth or spread. The populations are typically low to where they are detectable only using pheromone baited traps. Traps are set in the summer in western and central Wisconsin. Results of moth catches are examined each fall, followed by an egg mass survey. Trapping is not used as a population control method. Instead, it is used to determine the size and location of gypsy moth populations and where they are spreading to. Egg mass surveys help identify areas where gypsy moths are reproducing. Areas with high moth counts and egg masses are considered for treatment. Additionally, the current data are compared to the data from previous years. The factors influencing the risk of establishment and spread also are considered when deciding spray sites. However, not all populations can be treated; those that pose the greatest risk are prioritized for treatment.



Gypsy moth trap on a tree.

Environmental assessment and public input

This is the beginning of local involvement. Roughly three months before we begin treatments in May, we notify local officials and media of our proposal and conduct public meetings in spray areas as part of the Environmental Assessment process. These public meetings not only allow us to explain what we propose and why, but allow citizens to have their comments included in the assessment. We emphasize that we are presenting a

proposal. The final decision on treatments comes at the end of this process, in the form of an Environmental Assessment signed by representatives from the U.S. Forest Service, U.S. Animal and Plant Health Inspection Service, and the Wisconsin Department of Agriculture, Trade and Consumer Protection.

When we have our final list of treatment areas, we again mail notification to everyone living in a spray area. Because treatment is weather dependent, we cannot give precise dates when we will begin spraying, but we do announce the start date as soon as we know -- via local media, on our toll-free telephone line, and on our Web site. Once we begin, we decide where we will spray from day to day, based on local weather conditions and the stage of caterpillar development. We notify local media the day before we plan to spray. People can call our toll-free line to find out where we plan to spray each day, and leave messages if they would like to have us call them back. We return every one of these calls, usually the same day we receive them. We also notify local law enforcement, health departments, schools, private campgrounds, hospitals, and other health care facilities, and residents who request to be notified when spray will occur in their area.

Suppression Program

The Wisconsin Department of Natural Resources (DNR) runs Wisconsin's Gypsy Moth Suppression Program. This program serves areas in counties that are quarantined for gypsy moth and are experiencing very high "outbreak" populations. The eastern half of Wisconsin is quarantined because gypsy moth is established there. That does not mean that gypsy moth is a threat every year in the entire eastern half of Wisconsin, but that gypsy moth populations have the potential to grow to "outbreak" levels in those areas. The goal of the Suppression Program is to maintain woodland and urban forest health by reducing gypsy moth populations to below the level where they can cause significant stress to trees. Trees can tolerate up to 50% defoliation so the goal of the Suppression Program is to keep feeding damage below that level, though typically, foliage protection is much better. This is NOT an eradication program – some caterpillars will survive but foliage and tree health is protected. In addition to the spray program, property owners can make a significant contribution to gypsy moth control. In extreme outbreaks these additional measures are especially important. Therefore, the Suppression Program includes a spray program, but also education and outreach regarding physical controls to supplement spraying for best results.

How potential spray sites are chosen for the Suppression Program

The Suppression Program, unlike the STS program, is done at the landowner's request; the DNR does not decide where to spray. Individual landowners, communities, lake or other property associations, and counties may request treatment. Typically, treatments are paid for by the person or group making the request. To qualify for Suppression Program treatments a property must be located in a county that agrees to participate in the program and has designated a County Coordinator. The coordinator serves as a contact person for landowners, communities, and the DNR throughout the application, treatment, and follow-up process. Properties also must have a certain density of egg masses and

percentage of canopy coverage by gypsy moth's preferred hosts to qualify. Payment for the cost of treatment must be covered prior to spray. Landowners and municipalities experiencing high gypsy moth populations can contact their [county coordinators and local contacts](#) for the program to request treatments.

Requests for treatment should be made to [County Coordinators, local gypsy moth contacts](#), or in the absence of either in your area – local government, by August or early September of each year for spraying the following spring. Surveys to determine eligibility are done in autumn and applications are due to DNR with proposed spray blocks by early December.

Once counties have submitted their applications, DNR staff review the proposed spray blocks to ensure that they can be safely and effectively sprayed by planes and that there are no rare species present that might be affected by the bacterial insecticide used. If a problem is found the shape of a spray block may be changed or a viral insecticide that only affects gypsy moth may be used instead. If the problem cannot be addressed, the spray block may need to be removed from the treatment plan.

Environmental assessment and public input

Roughly three months before we begin treatments in May, we notify local officials and media of our proposal and conduct public meetings in spray areas as part of the Environmental Assessment process. These public meetings not only allow us to explain the spraying that is proposed and why, but allow citizens to have their comments included in the assessment. We emphasize that we are presenting a proposal. The final decision on treatments comes at the end of this process, in the form of an Environmental Assessment signed by representatives from the U.S. Forest Service, U.S. Animal and Plant Health Inspection Service, and the Wisconsin Department of Agriculture, Trade and Consumer Protection.

Because the Suppression Program is voluntary, property owners have an opportunity to object to treatment on their property. For example, they and their neighbors may have high gypsy moth populations on their properties and a neighbor requested treatment. Due to egg mass surveys in the area, all of the properties were included on a proposed treatment plan, even though each property owner did not directly request treatment. If such a property owner prefers that their property not be treated, they can object, in writing, to their [County Coordinator](#) by a February deadline set by the county.

The timing of treatment is dependent on weather and the development of leaves and caterpillars. We cannot give precise dates when spraying will occur at a particular site weeks in advance. However, during spray season the DNR does provide two options for staying updated on the areas scheduled for spraying the following morning: our toll-free telephone line and direct email updates. The toll-free line provides a recorded message announcing the spray blocks scheduled for treatment the next morning and a list of completed spray blocks. Callers can also get answers to questions live from DNR staff via the toll-free line every day from 7:30 a.m. – 10 p.m. Whenever the message on the

toll-free line is updated an email with the same information is sent out to all who are subscribed to the email notification list serve. Anyone can sign up for the email notification online at <http://gypsymoth.wi.gov>. That website also provides a wealth of information on gypsy moth management options and detailed maps of every spray site. The DNR also notifies local law enforcement, health departments, schools, hospitals, and other health care facilities to ensure that they are signed up for the email notifications and are aware of the toll-free information line.

Consequences of not treating

We don't undertake this process lightly. The gypsy moth is a serious environmental, economic and quality-of-life issue. This insect pest is not native to North America, and so has few natural enemies to keep its population low. Its native range is Europe, Asia, Siberia and northern Africa; it can thrive in harsh climates. Urban neighborhoods and rural forests in the northeastern United States, much of the Atlantic Seaboard, Lower Michigan, and Wisconsin have been stripped of leaves during gypsy moth outbreaks. While many trees will recover from this damage, some will die. Tree death is particularly high for trees near homes or along streets (because those trees are often under chronic stress) and when drought occurs in the year before, during or after defoliation.

The following scenario is an example of what to expect when gypsy moth populations are allowed to reach outbreak levels and are not treated by a combination of spray efforts and physical controls. Beginning around Mother's Day, caterpillar numbers in a backyard will reach into the thousands or even millions during May and June. Oak trees will be bare by the end of June. Many or most other species of trees and shrubs will also be completely or partially defoliated. Healthy trees can grow a second set of leaves in July but this is very stressful for them – taking up valuable stored energy. Trees that are already stressed, as many urban trees are, may die. Trees defoliated for a second or third summer in a row typically die even if they started out healthy because the stress makes them more susceptible to attack from bark borers and disease. The cost of removing dead trees around a house can range from several hundred to over one thousand dollars and the loss of mature trees will decrease property values and increase cooling costs in summer.



Gypsy moth defoliated trees at campground. Credit: Mark Guthmiller, WDNR

As the caterpillars feed, it will sound like rain. This is the caterpillar droppings falling to the ground and piling up. Like any other excess nutrient, the droppings get into runoff water and into the local watershed. Each caterpillar sheds its very bristly skin four or five times during the five- six weeks it is growing. Bristles from the cast skins can become airborne and irritate eyes, skin and the respiratory system. In fact, many or most people develop a rash if they come in contact with the bristles. People will find it extremely disagreeable to work or play in their yards because of the caterpillars. They will also crawl on houses, and if there are unscreened windows or doors, they will get inside. There is respite when the caterpillars go into the pupal stage in July. But then the moths emerge and the males flutter everywhere in the afternoon searching for females clinging to tree trunks and the sides of buildings (female gypsy moths don't fly). After mating, the moths will die and decay where they fall. And there will be thousands of unsightly egg masses, visible and hidden, reachable and out of reach, waiting through the winter to start the cycle over. After a summer or two, the population of the pest will crash and it will take 5 – 10 years before it can build up to outbreak levels again. Some areas of eastern Wisconsin have experienced this kind of infestation already. In western Wisconsin, the Slow the Spread Program buys time before this scenario can become a possibility there.



Skin rash caused by gypsy moth hairs



Gypsy moth frass on picnic table

Those are the effects on individuals. There are also broader implications for businesses. When gypsy moths become established in a county, a quarantine is imposed. This means products that could transport gypsy moth to uninfested areas of the state must be inspected and found free of gypsy moths before they can be shipped. The quarantine includes businesses such as nursery stock and Christmas tree growers, timber and pulp harvesters and processors and even individuals moving to new places who must ensure that they are not taking gypsy moth egg masses on outdoor furniture to uninfested counties or states. This costs businesses money and flexibility. We have a responsibility to our uninfested counties and neighboring states to slow down the spread of this insidious pest. Not treating does not mean that we are letting nature take its course; the gypsy moth is not part of nature in Wisconsin. It is a serious but manageable threat to our environment.

Why we choose Btk and aerial application

We use *Bacillus thuringiensis v. kurstaki*, the least toxic pesticide that is generally available and effective. It is a pesticide used by organic vegetable farmers up to the day of harvest. It harms only some species of moth and butterfly caterpillars, and only then if they feed on treated leaves within 10 days of when the leaves were sprayed. Gypsy moths, tent caterpillars, and cankerworms will be affected. Species that feed in meadows like most butterflies and moths, and butterflies that feed on trees later in the spring and summer will not be affected. Btk breaks down within days, so later-feeding species are not harmed. Btk's active ingredient is a protein produced by bacteria that occur naturally in the soil worldwide. It is cultured using foods such as organic corn as a growth medium; it is not a synthetic or a petrochemical.

Aerial application assures that the pesticide lands on the canopy where it is effective, as opposed to falling back to the earth as ground-sprayed pesticides can. Spraying from the ground is suitable for treating a few trees but it is prohibitively expensive on a larger scale. The aerial applicator we hire uses global positioning technology to assure precise aerial application and has extensive experience nationwide and an excellent safety record. We hire the contractor who meets the high standards we demand; we are not obligated to accept the lowest bid.

What happens during spraying

Spray planes normally arrive at urban sites at sunrise or shortly after. A 640-acre block will take about a half hour or less to spray. The plane sweeps over each property as many times as it takes to treat the entire acreage planned one time. Planes will be very low – about 50 feet above the treetops. They will be very loud. The spray is an extremely fine mist, with an application rate of only about 3 quarts per acre, 90% of which is water. It smells yeasty, like stale beer. If a person should happen to be sprayed, it will be faintly smelly, but not dangerous. The spray can be slightly sticky, which allows it to effectively stay in place on tree leaves.

The bacteria is applied as spores, a dormant form, and has not been found to be a pathogen in humans. Some people with extreme food allergies may react to the inactive ingredients of the spray, but this can be limited by staying indoors during the spray and for half-hour afterwards, to give the formula time to fully settle and dry on the trees. Btk will not harm pets or livestock, although people may want to keep them inside because the plane may frighten them. Btk does not affect plants or trees, other than protecting their leaves from gypsy moths. Spray that lands on vehicles will not damage the finish. If it is washed off very soon after spraying, it will come right off. If you wait and it bakes on a bit, soaking with warm water before washing will make it come off more easily.

We spray in early to mid-May, when the caterpillars hatch. Of course, an early or late spring affects this timing. DATCP sprays twice in some areas, about a week apart, to catch late-hatching caterpillars. DNR sprays only once. Spraying takes place early in the day because that is when we have the low winds and high humidity that assure the spray lands where it will be effective, and because that is when few people are out and about. However, if weather conditions allow, spraying will continue into the afternoon. We

attempt to schedule urban sites near schools to be finished before children are walking to school or on recess. This is not because the spray is dangerous, but because people may perceive it as dangerous and be alarmed.



Gypsy moth aerial spray treatment.

For more information

We have a toll-free line with a recording providing either general information about gypsy moths or about the spray program in season. People can also opt to speak with a DNR staff person Monday to Friday from 7:30 a.m. – 10 p.m. or leave their names and numbers for a DATCP staff person and the call will normally be returned on the same day or the next business day. The number is **1-800-642-6684**. Automatic, daily email notification of spray activities is available to anyone who subscribes to the email list serve. You may do so online at <http://gypsymoth.wi.gov>.