

Homeowner's Guide

to the **Gypsy Moth** in Illinois

Inside

Gypsy Moth Life Cycle	2
Movement of Gypsy Moths	2
Problem Areas Quarantined	3
Gypsy Moth Hotline	3
Protecting Your Trees	3
Frequently Asked Questions	4

C1370

Gypsy Moths Threaten Illinois Trees



James Appleby

Gypsy moths are among the most destructive forest and landscape pests in the United States—and they may soon begin stripping the leaves from oaks, crab apples, poplars, and other trees in your hometown.

Mature females lay their eggs in late summer, but most gypsy moth damage occurs in May and June when the caterpillars feed on leaves. Within the two months it takes the caterpillars to reach maturity, they can defoliate entire neighborhoods.

Defoliation can kill some species of trees within a year. Most of the time, though, gypsy moths kill trees by weakening their resistance to other pests.

Oak trees are most vulnerable to gypsy moth devastation, but the caterpillars will feed on up to 500 other types of trees and shrubs if oak leaves are scarce.

When deciduous trees are stripped of their leaves, many species will try to re-foliate (grow new leaves) during the hot, dry midsummer.

These weakened—and often drought-stressed—trees are vulnerable to insect borers and opportunistic diseases that otherwise would not cause serious damage. When deciduous trees are defoliated in two or three consecutive years, many will die. Evergreen plants may not survive the first year's defoliation.

Why haven't Illinois homeowners heard about gypsy moths before? Until recently,



Michael R. Jeffords

Forest stripped of leaves by gypsy moths.

Illinois had very few gypsy moths. The insects originated in Europe and were brought to New England in the mid to late 1800s. Mature females cannot fly, so it has taken more than a century for large gypsy moth populations to move as far as Illinois.

Although they migrate slowly, gypsy moths are impossible to eradicate once they are established. The moths have few natural predators in North America, and pesticides have proven relatively ineffective at eliminating them.

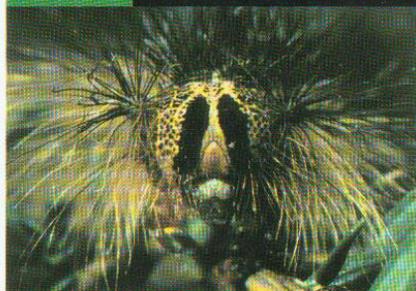
Michigan has had a serious gypsy moth problem since the 1980s, and several

Wisconsin, Indiana, and Illinois counties have also been quarantined in recent years. (For more on quarantines, see page 3.)

The Chicago area has seen Illinois's first "wave" of damaging gypsy moth infestations, but isolated outbreaks have occurred in other parts of the state as well. Gypsy moth populations in any affected area will fluctuate over time.

The initial gypsy moth outbreak is likely to cause the most damage to Illinois trees. After the first infestation runs its course (in perhaps three to four years), subsequent outbreaks may be less severe.

Some Trees More Vulnerable Than Others



Michael R. Jeffords

Oak leaves are gypsy moths' preferred food, but they can "make do" with about 500 other types of trees, shrubs, and landscape plants if oak leaves are in short supply.

SOME OF THE MOST VULNERABLE SPECIES GROWN IN ILLINOIS:

- Oak
- Apple and Crab Apple
- Aspen
- Cherry
- Hawthorn
- Pear
- Plum
- Poplar
- River Birch
- White Birch
- Willow

SOME SPECIES THAT ARE SOMEWHAT VULNERABLE TO GYPSY MOTHS:

- Cottonwood
- Elm
- Hickory
- Maple
- Pine
- Redbud
- Sassafras
- Spruce

SOME SPECIES THAT ARE MORE RESISTANT TO GYPSY MOTH INFESTATION:

- Arborvitae
- Ash
- Balsam Fir
- Black Walnut
- Catalpa
- Locust
- Red Cedar
- Sycamore
- Tulip Poplar
- Walnut

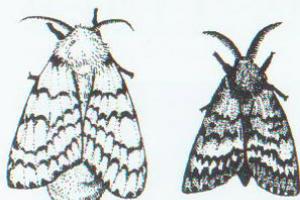
Life Cycle of the Gypsy Moth*



Michael R. Jeffords

Adults

Adult moths emerge from pupal cases and are present in July and August. Females have tan bodies and cream-colored wings, but they cannot fly. Males are smaller, dark brown, and have feathery antennae, and they are good fliers.



female male
(actual size)

Eggs

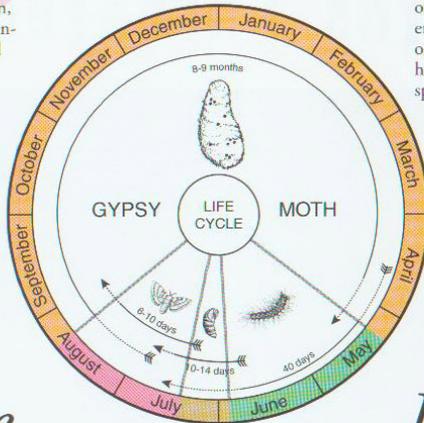
In mid to late summer, female moths lay egg masses on any convenient surface—tree trunks or branches, fences, automobiles, firewood, and so on. The egg mass is covered with tan or buff-colored hairs. Eggs do not hatch until the following spring.



Michael R. Jeffords



(actual size)

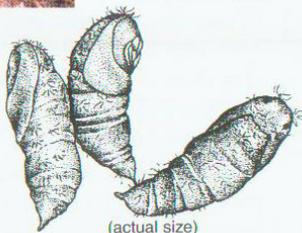


Pupae

In June or early July, caterpillars stop eating foliage and change into pupae, the transition stage between larvae and moths. Pupae usually are found in crevices in the tree trunk or on larger branches. Pupae are dark brown, shell-like cases about 1 to 2 inches long and sparsely covered with hairs.



USDA/APHIS



(actual size)

Larvae

In April and May, the larvae hatch from the eggs. It is during the larval stage that gypsy moths damage trees.

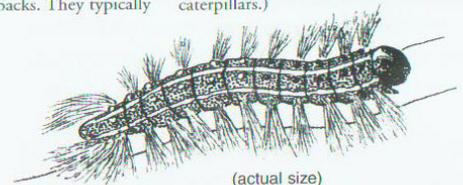
Newly hatched larvae are about 1/8-inch long, hairy, and mostly dark brown to black. The larvae are voracious feeders and can reach up to 3 inches in length.

Larger larvae have blue and rusty red spots on their backs. They typically



Michael R. Jeffords

feed in the treetops at night but migrate down the trunk to the ground each day to protect themselves from heat and birds. (See page 4 for tips on trapping gypsy moth caterpillars.)



(actual size)

* Note. Due to differences in climate, gypsy moths in southern Illinois reach each stage near the beginning of the time period and gypsy moths in northern Illinois reach each stage near the end of the time period indicated in the life cycle chart.

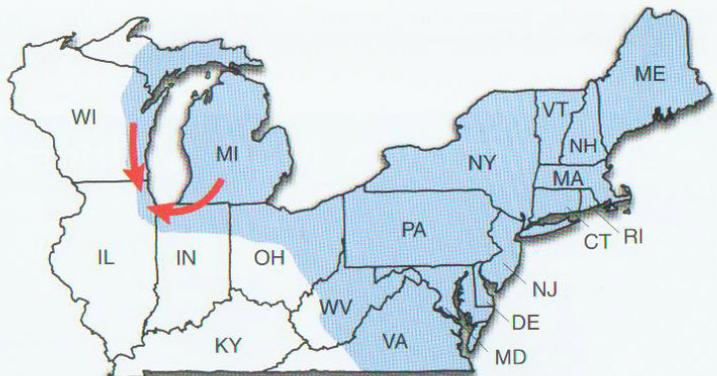
Gypsy Moths Moving into Illinois

Because adult female gypsy moths do not fly, the moths have been slow to spread as far west as Illinois. But they're here now, at least in the northeastern part of the state, and officials are taking steps to slow their spread to the rest of Illinois.

Gypsy moths can easily be carried into Illinois on campers and motor homes that have spent time in infested areas. The most heavily

infested areas are under quarantine, and nursery stock, recreational vehicles, and Christmas trees from these areas should be carefully inspected before they are brought into Illinois.

As of 2000, infested areas included all of lower Michigan, eastern upper Michigan, much of eastern Wisconsin, and parts of northern Indiana and Illinois.



Don't
move
the gypsy moth!



Michael R. Jeffords

If you have been vacationing in an infested area, inspect your vehicle as you re-enter Illinois. Be sure to check wheel wells and other places that are hidden from view. Remove and destroy any egg masses, larvae, or mature moths you may find on the surface of the vehicle.



USDA/APHIS

Problem Areas Put Under Quarantine

When spot infestations of gypsy moths are too large or numerous to be eradicated, counties are quarantined by the Illinois Department of Agriculture (IDOA). Quarantines have little direct effect on homeowners, except to put them on notice that gypsy moths have become a problem in their area.

Lake County was the first area of Illinois to be quarantined, in July of 2000. By 2005, IDOA officials believe most or all of the Chicago area, as well as some downstate counties, will be quarantined. Gypsy moth populations tend to migrate at the rate of about 15 miles per year, but they may move more quickly into downstate areas that are near rivers.

When a spot infestation is reported to IDOA, a state inspector may be sent to assess the extent of the problem. IDOA is monitoring the gypsy moth's movements within the state and is working with local jurisdictions to coordinate treatment efforts. Once a gypsy moth quarantine is issued for a particular county, movements of commercial nursery stock, Christmas trees, and other plant materials outside the quarantined area will be regulated by IDOA.

If you live outside a quarantined area and you find evidence of a gypsy moth infestation, do not try to treat the problem until you have called the IDOA's toll-free hotline at 1-866-296-6684. Hotline staff members will offer guidance on how to capture and dispose of the pests.

IDOA may send an entomologist to your neighborhood to see whether the infestation is localized or more widespread. When the number of gypsy moths

in a particular area exceeds a certain threshold, a quarantine will be issued.

If you live within a quarantined area, insecticides can help you minimize the damage caused by gypsy moths. A soybean oil product, Golden Natur'l Spray Oil, has proven successful in destroying gypsy moth egg masses. *Bacillus thuringiensis kurstaki* (or Btk) is a biological insecticide available in most garden centers that can be used to kill small caterpillars. To be effective, Btk treatments must be applied at just the right stage of the gypsy moth's life cycle (the small larval stage), so it is important to keep an eye out for egg masses. Local pest-control companies can obtain other insecticides, such as *diflubenzuron* (Dimilin) and *tebufenozide* (Mimic), that also kill the caterpillars effectively.

Entomologists recommend that homeowners contract with pest-control professionals to treat infested trees. Professionals have the equipment necessary to apply insecticides to the tops of the trees, where gypsy moth larvae feed. Without the right equipment, homeowners will not be able to apply treatments properly and are not likely to do much good.

While it appears certain that large populations of gypsy moths will eventually damage trees throughout Illinois, homeowners can do a lot to postpone the inevitable. See page 2 for tips on slowing the spread of gypsy moths from areas outside of Illinois, and see below for advice on protecting your trees from gypsy moths and other threats. ■

Gypsy Moth Hotline

If you live outside a quarantined area and you find evidence of a gypsy moth infestation, do not try to treat the problem until you have called the IDOA's toll-free hotline at 1-866-296-MOTH (6684). Hotline staff members will offer guidance on how to capture and dispose of the pests.

How to Protect Your Trees

Although IDOA successfully eradicated hundreds of small gypsy moth infestations since the 1970s, pressure from growing populations in neighboring states has allowed the pest to establish itself in Illinois.

There is no way to eradicate the moths from individual landscapes or neighborhoods, but homeowners can take action to minimize gypsy moth damage even before the moths are sighted in their area.

- Plant trees, shrubs, and landscape plants that are well suited to your location. Consider soil type, drainage, and other factors that will influence the plants' ability to become established and remain healthy when stressed.
- Choose new plants that are disease- and insect-free. Carefully inspect plants before adding them to the landscape.
- Plant a wide variety of species. Trees and shrubs that are resistant to one type of pest frequently are vulnerable to others.
- Thoroughly water trees and shrubs during dry periods.
- Fertilize trees and shrubs as needed, but don't overdo it. Check with a qualified landscape professional to see what type and level of fertilization is right for your trees and shrubs.
- Avoid injury to tree bark. Consider covering the bottom few inches of the trunk with a loose-fitting protective sleeve to protect the tree from damage by mowers and trimmers.
- Selectively prune branches that are dead, dying, or rubbing together.
- Look for egg masses on tree trunks and other outdoor surfaces, such as picnic tables, chairs, eaves, overhangs, and siding.

If you see signs of gypsy moth infestation and are not in a quarantined area, call 1-866-296-6684.

If you are in an area that has already been quarantined by the State of Illinois, hand-pick and destroy egg masses. Destroy the egg masses by burying them under at least 6 to 12 inches of soil, burning them, or wrapping them securely in plastic and putting them in the garbage. You can also kill egg masses with a soybean oil product (Golden Natur'l Spray Oil) available through many local garden centers.



Ken Law, USDA/APHIS

Frequently Asked Questions

■ *There are a lot of mature oaks and other vulnerable trees in my neighborhood. Are they all going to die?*

It's not likely that all of them will die, but some of them probably will.

Many neighborhoods and forests in the eastern United States have had off-and-on gypsy moth infestations for more than 100 years, and they still have plenty of beautiful trees. However, the relative number of oaks and other vulnerable species growing in those areas has declined over time.

■ *I've found some tan egg masses. What's the best way to collect and destroy them?*

If you live in an area that is not yet under quarantine, do *not* scrape off the egg masses right away. Call the Illinois Department of Agriculture's (IDOA's) Gypsy Moth Hotline at 1-866-296-6684, and officials will tell you how to proceed. IDOA may send a staff member to your neighborhood to assess whether the problem is isolated to your yard or has spread within a wider area.

If you live in a quarantined area, use a small trowel to scrape the egg masses off of the tree bark or other surface. Scrape them directly into a sturdy plastic bag, seal it, and throw it in the garbage. If you prefer, egg masses may be burned or buried under 6 to 12 inches of soil. Golden Natur'l Spray Oil, a soybean oil product, can be used to destroy egg masses as well. This product is available at many local garden centers.

■ *I see caterpillars in my yard. How do I know whether they're gypsy moth larvae?*

Gypsy moths are in the caterpillar stage only from April through June. Larger gypsy moth caterpillars will have the distinctive pairs of blue and rusty red dots that are not found on any other species.

■ *I've found some caterpillars that appear to be gypsy moths. What should I do?*

Call the IDOA's Gypsy Moth Hotline at 1-866-296-6684. The Department of Agriculture monitors gypsy moth infestations in Illinois. Hotline staff will ask you some questions about what you have found and give you specific instructions for your particular situation.

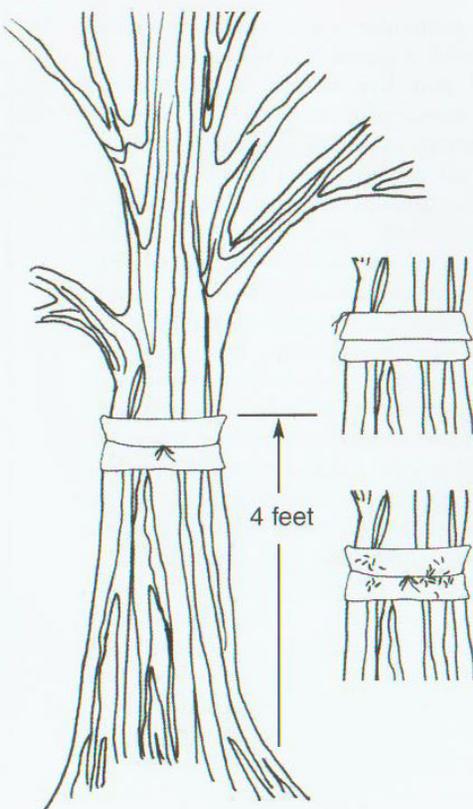
■ *Is there a way to trap gypsy moth caterpillars?*

Gypsy moth larvae feed in the treetops at night, but they crawl down the trunk during the day as they seek out cooler temperatures and protection from birds. Homeowners can make "burlap-band traps" to catch caterpillars. These homemade traps serve two purposes: first, to determine whether your trees are infested by gypsy moth larvae; and second, to reduce the number of caterpillars feeding on your trees.

To make a burlap-band trap, wrap an 18- to 24-inch-high band of burlap or other thick material around the trunks of affected trees. Tie a cord around the middle of the band, and let the upper flap drop down so that it covers the lower half of the band. The middle of the burlap band should be placed 3 to 5 feet off the ground. As larvae crawl down the tree during the day, they hide between the flaps and get trapped.

Burlap-band traps need to be checked every day. Destroy the trapped caterpillars by placing them in soapy water or freezing them.

Remember that if you live in an area that is not yet quarantined for gypsy moths and you find larvae in your trees, the first step is to call the IDOA's Gypsy Moth Hotline at 1-866-296-6684.



■ *Isn't there some kind of spray I can use to get rid of gypsy moths?*

Cultural controls, such as egg-mass collection and hand-picking of caterpillars, should be the homeowner's first line of defense against isolated populations of gypsy moths.

Some insecticides are effective against gypsy moths as well. Timely application of the biological insecticide *Bacillus thuringiensis kurstaki* (commonly referred to as Btk) may kill gypsy moth caterpillars that are less than an inch long. However, Btk will have no effect on eggs, larger caterpillars, pupae, or mature moths. When used, Btk is best applied by a trained, licensed pesticide applicator. Pest-control professionals may also apply other insecticides that have proven effective against gypsy moths. Several are effective, including *diflubenzuron*, sold as Dimilin, and *tebufenozide*, sold as Mimic.

■ *Are there any biological controls that naturally destroy gypsy moth populations?*

One of the most effective natural enemies of the gypsy moth is the fungus *Entomophaga maimaiga* (also known as Em). Em is a safe biological control; while it is very effective against gypsy moth populations, it poses little risk to other insects, and it does not affect animals or humans.

Entomophaga maimaiga's life cycle is similar to that of the gypsy moth. During the winter, Em lies dormant as resting spores in the soil or on tree bark. In the early spring, the spores germinate and release infectious spores, or conidia. Caterpillars can become infected with Em through contact with either the resting spores or the active conidia. Once gypsy moth larvae develop the disease, they usually die within seven to ten days.

Entomophaga maimaiga cannot be artificially introduced into locations but, rather, spreads naturally along with gypsy moth populations. Once Em is established in an area, it can be spread by piling dead caterpillars around tree bases. The dead caterpillars are the source of fungal spores that infect healthy gypsy moth larvae.

Another important biological control is nucleopolyhedrovirus (NPV). Like Em, NPV infects and kills gypsy moth caterpillars but not other pests, animals, or humans. Natural spread is the virus's primary mode of transmission, but NPV is also available to some federal and state authorities for use in gypsy moth control programs. Aerial application of NPV has been partially successful in suppressing large, dense gypsy moth populations.

■ *How can I be sure I'm not buying trouble when I purchase new trees and other landscape plants?*

Buy landscape materials only from reputable nurseries and garden centers, and carefully inspect the materials before you take them home.

IDOA regularly inspects trees sold by nurseries located in quarantined counties of Illinois. Trees from out-of-state nurseries are subject to inspections by plant-health regulators in those states. While regulators in Illinois and neighboring states take the gypsy moth threat seriously, egg masses, caterpillars, or mature moths may find their way into a shipment of trees after the trees have passed inspection. For that reason, it is essential for homeowners to watch for signs of gypsy moths on new plant material, even if the items were recently inspected and approved for sale.

■ *Do I need to worry about gypsy moths if I buy firewood or a live Christmas tree?*

Gypsy moth eggs may be present on firewood, Christmas trees, or other materials that are grown or stored outdoors. Egg masses are tan and fuzzy and are usually about the size of a quarter. Each egg mass may contain up to 1,000 eggs, so it is important to pick and destroy any that you find.

Homeowner's Guide to the Gypsy Moth in Illinois

Charles Helm and Michael Jeffords,
Content Consultants, Illinois Natural History Survey,
Department of Natural Resources and Environmental Sciences

Fredric Miller and Philip Nixon,
Content Consultants,
University of Illinois Extension

Jim Cavanaugh and Stan Smith,
Content Consultants,
Illinois Department of Agriculture

Kathy Reiser, Writer; Joyce Atkinson, Editor; Information
Technology and Communication Services (ITCS), College of
Agricultural, Consumer and Environmental Sciences
at the University of Illinois

Michelle Garland, Graphic Designer,
Illinois Natural History Survey

Printed at Production Press.

Copyright © 2000 by Board of Trustees,
University of Illinois.

Authors and publishers have granted permission for copies of this work or parts of this work to be reproduced, provided that (1) copies are distributed at or below the cost of reproduction; (2) the author, the publication, and the University of Illinois College of Agricultural, Consumer and Environmental Sciences and the relevant division within the College are identified; and (3) proper notice of copyright is affixed to each copy.

To purchase additional copies,
call 1-800-345-6087.

Remember...

If you live outside a quarantined area and you find evidence of a gypsy moth infestation, do not try to treat the problem until you have called the IDOA's toll-free hotline at 1-866-296-MOTH (6684). Hotline staff members will offer guidance on how to capture and dispose of the pests.

UNIVERSITY OF ILLINOIS
EXTENSION
College of Agricultural, Consumer and Environmental Sciences

ILLINOIS
NATURAL
HISTORY
SURVEY