





larvae should be destroyed. The presence of spongy moth larvae in such traps indicates that a population may be developing in the vicinity of the trap site and that other survey methods should be used to determine whether treatment is required. Tar-paper wrappings and plastic tree flaps can be used instead of burlap.

**Egg mass counting:** Several methods have been developed for determining the number of spongy moth egg masses in an infested area. Egg mass counts can be done from the time of oviposition, usually June-August, until egg hatch the following April or May. Counts are easier and probably more accurate, after the leaves have dropped from deciduous trees. The walks generally follow an "M"-shaped pattern through the area to be sampled, which helps to eliminate an edge effect. In forest situations, edge trees have found to have more egg masses than interior trees.

## Non-Chemical Control of Spongy Moths

**Egg mass destruction:** Scraping and removing egg masses is one of the oldest methods used against the spongy moth in North America. In residential areas, where up to half or more of the egg masses may occur within reach of the ground, this approach may destroy a significant portion of the population. However, because of the tendency of larvae to migrate in from adjacent areas, scraping should not be relied upon for effective control. Vegetable oils have been shown to be effective ovicides when applied to egg masses in the fall and a soybean oil product is registered for use on spongy moth egg masses.

**Barrier bands:** Sticky barrier bands placed on tree trunks can prevent larvae from traveling between trees. They also may reduce the defoliation on isolated trees. However, they are not totally reliable. Sticky barrier bands are available commercially or can be made from duct tape and Tree Tanglefoot. Tanglefoot should be applied to the tape and not the surface of the tree because it can damage bark. Since they can reduce larval populations somewhat, and because of their low cost, sticky barrier band use may be advisable on high value, individual trees when no other treatment will be used. However, sticky barrier bands alone should never be relied upon to prevent defoliation.

## Natural Enemies of Spongy Moth

Naturally occurring predators and parasitoids of the spongy moth, while numerous and abundant, are not capable of preventing outbreaks. Efforts to control spongy moths by rearing and releasing large numbers of parasitoids have not been successful. A good alternative is to use management techniques that will not adversely affect the natural predators.

## Pathogens

**Bacteria:** The naturally-occurring bacteria *Streptococcus faecalis* and *Pseudomonas spp.* occasionally cause high levels of mortality (up to 60%) under outbreak conditions (Podgwaite 1981).

**Nucleopolyhedrosis virus:** A virus of the genus *Baculovirus* is closely associated with all North American spongy moth populations. Its effects are most often seen under outbreak conditions, when a large proportion of the larval population may be killed. For more information on this disease, see the full chapter on spongy moth management listed below.

**Entomophaga fungus:** For the first time in 1989, the fungal disease *Entomophaga maimaiga* was reported causing widespread mortality to North American spongy moth populations (Hajek and Soper 1992). This disease was known to cause extensive mortality in Japan. It is now known to occur in 13 states from Maine to Virginia (Elkinton et al. 1991). The appearance of larvae killed by *Entomophaga* is similar to that of virus-killed larvae, and definitive identification requires examination by an expert.

## Predators

**Invertebrate predators:** Ground beetles, ants, and spiders are known to feed on spongy moth larvae and pupae. One predatory beetle, *Calosoma sycophanta*, was successfully introduced into North America from Europe. This ground beetle sometimes becomes abundant in outbreak spongy moth populations, but usually lags one to three years behind (Weseloh 1985).

**Birds:** Many species of birds feed on spongy moths, but they are not a major diet item for any of the common species (Elkinton and Liebhold 1990). Most birds are deterred by the long hairs on larvae. Nuthatches, chickadees, towhees, vireos, orioles, catbirds, robins, and blue jays are probably the most important species in innocuous-phase spongy moth populations. Cuckoos and flocking species such as starlings, grackles, red-winged blackbirds and crows may be attracted to outbreak populations (Smith and Lautenschlager 1978).

**Mammals:** Shrews and white-footed mice eat larvae and pupae and may be a major factor in the maintenance of low spongy moth populations (Elkinton and Liebhold 1990). There is some evidence that regional changes in small mammal density may account for the region-wide onset of spongy moth outbreaks (Liebhold and Elkinton 1989).

## Favored-Host Removal

Since the demise of the American chestnut as the dominant overstory tree in the eastern United States deciduous forests, oaks have become a dominant species. Unfortunately, oaks are also the favored hosts of the spongy moth throughout its range. In the absence of external control measures, repeated defoliation of favored trees may result in a shift of dominance to nonhosts and less favored hosts, such as maples. This will ultimately reduce the magnitude of the spongy moth problem in these areas. While selective removal of favored spongy moth hosts is an impractical solution for most park sites, selection of planting material for areas under development (e.g. urban schools) to exclude favored hosts is definitely feasible and should be strongly encouraged.

*Information from this page can be found on the National Park Service's IPM Manual:*

<http://www.nature.nps.gov/biology/ipm/manual/gypsymth.cfm>.

## Additional Resources

[Gypsy Moth](#) [Minnesota DNR Invasive Species Page]

[Gypsy Moth Fact Sheet](#) [PA State Entomology Extension]

[Gypsy Moth in North America](#) [US Forest Service]

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