



# SILVICULTURE FIELD TIP

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## MINIMIZING GYPSY MOTH DAMAGE

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Gypsy moths are exotic, defoliating insects whose feeding can contribute to significant tree mortality. Currently, the moths are well established in eastern Wisconsin and are moving westward. The moth is not yet established in Minnesota largely because of the eradication efforts of the Minnesota Department of Agriculture. However, it is just a matter of time, perhaps five to ten years, before the moth becomes permanently established in Minnesota.

Landowners can minimize the impact of gypsy moth through active forest management. Because trees are long lived and slow growing, forest management practices are most effective when applied well in advance of gypsy moth defoliation. Forest managers are advised to begin now.

Once the moth becomes established, the most important factor affecting a forest's susceptibility to defoliation is the proportion of the forest made up of tree species that gypsy moth caterpillars prefer to eat (see table). Stands dominated by preferred species are defoliated at higher rates, more often, and for longer periods of time than stands composed of avoided species.

Site conditions and individual tree vigor play a role in how much tree mortality occurs after defoliation. Only a portion of those trees defoliated is at risk of mortality. A stand of trees that has a high proportion of preferred species and trees under stress or of low vigor, are at risk of significant mortality. Vulnerable sites are characterized by frequent droughts, slow growth



and low amounts of foliage in the crowns. Ridge tops, and sites with shallow or overly dry sandy soils are examples of vulnerable sites.

### Table of Gypsy Moth Host Preference

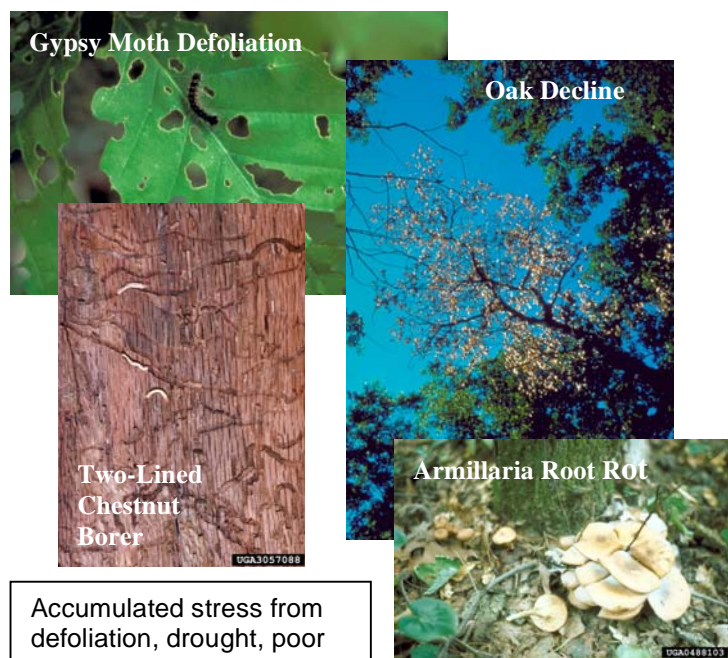
| Preferred:  | Less preferred:      | Avoided:     |
|-------------|----------------------|--------------|
| oak         | yellow birch         | ash          |
| aspen       | box elder            | red cedar    |
| basswood    | walnut               | balsam fir   |
| paper birch | spruce               | silver maple |
| tamarack    | cottonwood           |              |
|             | red and sugar maples |              |
|             | pine                 |              |

The greatest single indicator of the likelihood of tree mortality is a tree's physical condition at the time of defoliation. A tree with a full crown and

only a few dead branches has a good chance of surviving defoliation. A tree with a small crown and 50 percent or more dead branches has a poor chance of survival.

There is a similar correlation with a tree's crown class or its position in the canopy. A dominant tree that gets lots of sunlight has a good chance of survival. A suppressed tree that gets little direct sunlight has a poor chance of survival.

When gypsy moths become established in Minnesota and defoliate large areas, the repeated defoliation and tree mortality will likely shift susceptible stand composition away from oaks and other preferred species toward non-preferred species. On rich, good sites, species such as red maple, sugar maple and green ash may replace lost oaks. On drier, nutrient-poor sites, where seed sources occur, red and white pines may replace the oaks. In northern Minnesota, balsam fir will likely increase in number.



Accumulated stress from defoliation, drought, poor growing conditions and secondary pests contribute to tree mortality.

**What can you do to minimize the impact?**

There are two primary strategies in forest management that can help mitigate future damage due to gypsy moth defoliation. The first strategy involves reducing the likelihood of defoliation by reducing the percent of preferred host species through selective thinning. While reducing the

component of preferred hosts won't prevent defoliation, it can lessen the severity and shorten insect outbreaks. The second strategy aims to reduce tree mortality following gypsy moth defoliation by increasing tree and stand vigor. This can also be done through thinning. Remove damaged and suppressed trees and encourage non-preferred species where appropriate. Maintain host stand diversity and healthy preferred host species as an important component of the stand.

- Make sure you have an up-to-date stand inventory before you begin. Effective gypsy moth management can only be done with a thorough understanding of the site and the stand on it.
- Determine if your forest stand is at moderately-high to high risk of damage.
- Determine if the likely damage levels have the potential to affect land-use objectives.
- Where appropriate, increase the component of less-preferred or avoided tree species. However, maintain existing healthy oak trees in your stand as a valuable wildlife resource.
- Consider thinning crowded stands or those with a history of stress and/or disturbance. Remove trees that are suppressed or have weak, thin crowns.
- Determine if your trees are “overmature.” Old trees are more vulnerable to damage. Consider harvesting them - where that is appropriate.
- If you have hardwood stumps that have sprouted, remove all of the sprouts except one or two, where that's appropriate. A single sprout will develop a large, healthy crown less vulnerable to gypsy moth.
- When reforesting an area, plant a mixture of tree species with  $\geq 50\%$  avoided or less-preferred species. Avoid monocultures of any species.
- When planting trees, always match the tree species to the site. If you plant a tree where it doesn't belong, it will be stressed and vulnerable to mortality.
- When in doubt, check with a resource professional. They can help you determine the potential risk of damage and help you develop a management plan where that's needed.