Defoliation

The caterpillars of the gypsy moth cause defoliation of the trees when they ingest the leaves. The caterpillars usually will remove almost all, if not all of the foliage. This added stress on a tree will also affect a tree’s physiology. Defoliation of the tree will weaken it and will lower its susceptibility to secondary agents. The secondary agents in oaks may be the root rot fungus Armillara spp. or the two-lined chestnut borer. These secondary agents attack weakened oaks with defoliation and may directly cause the mortality of the tree. Generally mortality of oaks usually occurs after two or three years of defoliation, but may occur in one year if another predisposing condition like, drought or soil compaction exists. Some common host trees across the United States by the gypsy moth are illustrated in figure 3 below.

Tree Survival

Maintaining Good Conditions for Growing Trees

♦ Keep soil conditions favorable for the development and survival of the tree’s fine feeder root system.
♦ In Woodland backyards, or in yards where lawns and forest meet, an attempt should be made to keep the forest floor as natural as possible.
♦ Growth conditions for isolated trees and those in lawns can be enhanced by encircling the trees with mulch or ground cover plants delimited by the outer branches.
♦ In times of drought, stressed individual trees can benefit from watering, fertilizing, and judicious pruning to thin the tree tops and reduce moisture demands on the roots.

Figure 3: The bar graph shows the some of the common host trees across the United States which have been attacked by the gypsy moth.

Figure 4: The picture above shows the impact of defoliation by the gypsy moth on a host tree.
Impacts

- Gypsy moth larvae can feed on at least 500 species of plants that include trees, shrubs, and vines.
- Defoliation of trees may lead to the death of the tree.
- Promotes undergrowth, when it defoliates older overgrown trees.
- Since the turn of the century, millions of dollars have been spent in efforts to control or eliminate gypsy moth populations and to retard natural and artificial spread.

Managing Population

Parasites - Smaller living organisms that make their holes on or in the bodies of other living organisms from which they get nourishment during at least one stage of their life.
- Wasps and flies
- Predators - Usually larger than their prey and consume many host insects during the course of their life.
  - Woodland mammals - white footed mouse, chipmunks, voles, and squirrels
  - Birds - nuthatches, chickadees, towhees, northern orioles, catbirds, robins, blue jays
  - Insects - ants, spiders, beetles, and harvestmen (daddy longlegs)

Pathogens - Diseases caused by bacteria, fungi, or gypsy moth larvae.
- Nucleopolyhedrosis virus (NPV) has had a dramatic effect on suppressing outbreaks of gypsy moth populations frequently resulting in a total collapse.
- Entomophaga maimaiga - fungal pathogen established in most infected states.

Most natural enemies occur after full impact of moth defoliation.

New Project

A new project by the USDA Forest Service, is currently trying to slow the westward spread of the gypsy moth. The negative impacts associated with the gypsy moth are for the most part occurring in high-density areas. The project uses pheromone traps along the projected front in order to detect isolated colonies. The colonies are then eradicated or suppressed with varying methods of either spraying with chemical or biological pesticides, mating disruption, or mass trapping. All of these will in turn help in preventing the moth from having a high-density colonized area. With a low density of the moth, there is less damage of defoliation and a lower rate of mortality. This will then decrease the rate of westward advancement of the gypsy moth.

For more information please visit these websites:
http://www.fs.fed.us/na/morgantown/fhp/gm/gmhb.htm
http://www.fs.fed.us/ne/morgantown/4557/gmoth/