

Chapter 8: Promoting Forest Health

Insects and Diseases

Fifty years ago, tree-infesting insects and diseases were seen as enemies of forests. Today we recognize that some of the living things we once called pests are an important part of the forest ecosystem. Many provide food and shelter for other forest residents.

But not all, and not in all cases. Some insects and diseases are invaders from other places. They work against, rather than as part of, the natural balance. And in some cases we choose to control even “natural” pests to minimize damage that interferes with timber production, aesthetics, and other benefits we derive from trees and forests.

Forest Health Specialists

DNR Forestry’s four regional forest health specialists advise DNR field foresters and other public and private forest managers around the state on how to deal with forest health issues. They balance the economic and ecological considerations involved to identify strategies that are cost-effective, represent good stewardship of the forest resource, and are environmentally sound.

In recent years we have seen many changes in forest health practices. Where once our goal was healthy trees, today it is healthy forests. Where once we concentrated on problems as they arose, today we try to anticipate and prevent them by managing the composition, vigor, and configuration of forests. Where biological controls were once a novelty, today they are a major component of our pest-fighting arsenal.

Unwelcome Invaders

Of major concern today is the threat posed to forests by nonnative species. Because these animals and plants are not native to the area, they do not have natural enemies to help keep them in check, and our native trees have not built up mechanisms for coexisting with them. DNR Forestry and other agencies develop and carry out strategies for controlling these invaders.

One nonnative insect that poses a potential threat to Minnesota’s forests is the **gypsy moth**. A native of Europe and

Asia, this pest was introduced to the Boston area in the late 1860s and has gradually been working its way westward. It feeds largely on oaks and aspen trees, reducing productivity and sometimes killing them. Although no populations have become established in Minnesota, gypsy moths have been trapped here.

The **emerald ash borer** is another nonnative pest that could harm Minnesota trees and forests in the years ahead. A native of Asia, this insect was found in Michigan in 2002. It attacks and kills ash trees, and can be transported from one area to another on firewood and nursery stock. If this insect invades Minnesota it could cause major damage because ash is one of the most common hardwood trees in the state’s forests, and is also found in large numbers in residential areas.

A fungus-caused disease known as **sudden oak death** is also of concern to Minnesota forest health specialists. Originally discovered on the West Coast, this disease can travel on nursery plants such as rhododendrons and



Gypsy Moth

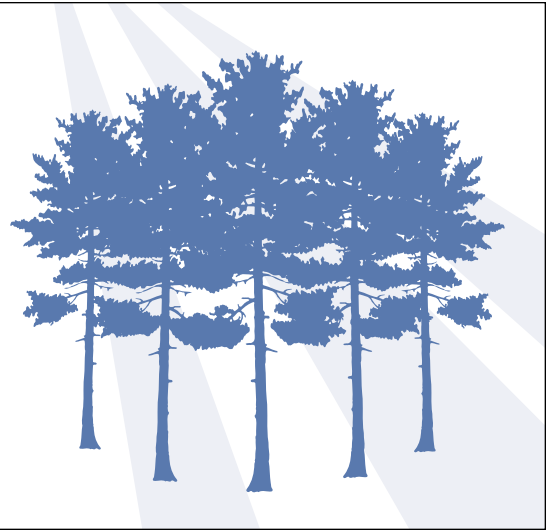
Photo: Peter Dziuk

Common Pests. Insects, diseases, animals, and weather all can harm trees and forests. Among the more common tree pests in Minnesota are spruce budworm, forest tent caterpillar, oak wilt, two-lined chestnut borer, jack pine budworm, and white pine blister rust.

Integrated Pest Management. DNR Forestry maximizes forest health and productivity using an approach to insects and diseases known as integrated pest management (IPM). IPM combines biological, chemical, mechanical, and other control techniques to achieve the most economically and environmentally appropriate level of control. With IPM, pests are a consideration in all aspects of forest management. Integrated pest management means planting insect- and disease-resistant trees. It means watching a growing forest and removing or treating problem spots promptly. It means pruning, thinning, and carrying out other management with the goal of maintaining a healthy forest. It also means using chemical pesticides when appropriate. Under IPM, regeneration plans consider previous pest problems as well as which mix of tree species will be the healthiest on the site.

Changing Climate

Scientists expect Minnesota's climate to change in the years to come because of atmospheric changes caused largely by combustion of fossil fuels. This change will have implications for Minnesota's forests. Although there is much uncertainty regarding actual impacts, changing climate is expected to alter forest composition, tree growth, pest distribution, and populations of mammals and birds inhabiting the forest.



azaleas. It has not yet spread to Minnesota. If it does, it could devastate our oak populations.

Buckthorn was introduced into Minnesota as an ornamental plant. It has spread rapidly through the state, carried by birds that eat its berries and deposit its seeds in their droppings. Buckthorn crowds out native species.

Garlic mustard was imported from Europe. It spreads through the understory of forests, crowding out native plants and altering the habitat for other living things.

Earthworms, which are not native to Minnesota forests, eat the rich layer of organic materials on the forest floor, harming habitat for wildflowers and altering the conditions tree seeds need to sprout.

DNR Forestry works with the Minnesota Department of Agriculture and federal regulatory organizations to help address the threats posed by invasive species. The problem will likely grow in years to come as our increasingly global economy and mobile population enhance the chances for troublesome organisms to move into Minnesota. Controlling problems caused by invasive species will likely become a bigger issue in the future. For more information visit www.dnr.state.mn.us/invasives.

Soil Protection

Healthy soil is the foundation of a healthy forest. Soils can be harmed by erosion and by compaction and rutting from large vehicles such as those used in logging. We protect soils on state forest lands by following recommendations in the Voluntary Site-Level Timber Harvesting and Forest Management Guidelines (see page 38). Through individual contact, meetings, and publications, we teach managers how to use soil-related information to make environmentally sound choices for their land.

For more information on forest health check out the *Forest Insect and Disease Newsletter*, available online at www.dnr.state.mn.us/fid (or contact the DNR Information Center at 651-296-6157 or 888-646-6367). Information and advice for managing specific pests is available through links listed at www.dnr.state.mn.us/treecare.