

Approaching Hemlock Woolly Adelgid Management

If your woodlot is in a region within or in proximity to a known infestation of HWA, it is best to start planning to manage the pest right away. While HWA does not spread as quickly as other forest invasives, detection can be difficult at first and a large hemlock stand can be ravaged in under a decade. Inspect your trees for new infestations in winter when woolly masses of HWA are most easily identified.



Aspects to Consider:

Financial | Consider the value of what can be lost as the result of an infestation. Do you rely on your hemlock forest for income? Can you afford chemical treatment of a large population of hemlock trees?

Aesthetics | How will the forest look after a HWA invasion? Hemlock can be found in both mixed forests and as dense stands

that may provide essential habitat for certain wildlife. Removal of hemlock may affect your own enjoyment of your land.

Forest Health | What does a loss of hemlock mean for your local ecosystem? As a keystone species, hemlock trees provide a habitat for birds, deer, small mammals and even amphibians - which can be severely reduced with their absence from the forest.

Liability and Safety | Do you own hemlock abutting neighboring properties or buildings? While border trees might not be important to you, they may have significance or cause a detrimental impact on neighboring property owners.

Future of your Forest | Do you have a forest management plan in place for future generations? Creating a management plan for hemlock trees infested with Hemlock Woolly Adelgid can be the first step towards developing a management plan for all of your forested property.

For more information on research, management and outreach efforts to conserve NY's hemlock resources, visit the NYS Hemlock Initiative website: nyshemlockinitiative.info.

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Managing Forests for Hemlock Woolly Adelgid



A watershed management approach to controlling hemlock woolly adelgid populations



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Onondaga County

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WHAT IS HEMLOCK WOOLLY ADELGID?

Hemlock Woolly Adelgid (*Adelges tsugae*, HWA) is a small, aphid-like insect that feeds on sap at the base of hemlock needles. HWA are less than a millimeter in length making them nearly invisible to the naked eye. Their identification is based on small, white woolly masses clustered around the underside base of hemlock needles, where the insects feed. The woolly masses are secreted by HWA in order to create a hospitable microclimate and protection from predators. HWA nymphs can be seen as tiny black specks on or around the cottony masses. HWA in the US are dispersed by wind, birds, small mammals, and transport of infected nursery stock.



HWA up-close.

IMPORTANCE OF HEMLOCK TREES

Eastern hemlocks (*Tsuga canadensis*) are a keystone species in the Finger Lakes Region and provide habitat for native species, shade for temperature-sensitive tributaries, insulation for wildlife in winter months, and provide stabilization for the steep slopes common within the Finger Lakes Region. Hemlocks serve as the foundation for microclimates and facilitate the diversity of wildlife in riparian habitats. Once infested, HWA can kill a mature hemlock tree within three to twelve years. The potential loss of forest canopy and destabilization of slopes has a detrimental impact on water quality, and long-term forest health.

When the trees die and roots fail, soils will erode and cause excess sediment and suspended solids in tributaries and eventually surface waters. The loss of soil also prevents establishment of new trees and vegetation. These changes decrease the survivability of macroinvertebrates and fish in small streams by limiting respiration and food sources.

As the tree canopy declines, increased sunlight will reach the forest floor, and create opportunities for other vegetation to establish, often undesirable invasive species. More light raises the surface temperature of the small tributaries of the watershed, allowing less dissolved oxygen to be stored in the water, stressing fish such as trout and the macroinvertebrates they feed on.



Hemlock trees infested with HWA hold the slope of a camp road adjacent to the Skaneateles Lake shoreline.

MONITORING

Early detection of HWA allows land managers to act quickly to save their hemlocks. Winter is the ideal time to see the cottony masses under hemlock twigs, and the faded green appearance of infested needles is obvious in the summer.



Hemispherical photos help reveal the rate of canopy decline.

INSECTICIDAL CONTROLS

HWA can be successfully treated with pesticides, but pesticide applications should be evaluated on a case-by-case basis. Considerations should include the severity of the local HWA infestation, the tree's value to the ecosystem, for aesthetic or other cultural values, as habitat, and proximity to protected drinking water supplies or regulated wetlands. Systemic insecticides, those taken up by the roots and distributed throughout the tree, can control HWA for several years. However, applicators must follow all state and protected watershed pesticide guidelines when treating hemlock trees. The Cornell Cooperative Extension Pesticide Management Education Program (PMEP) website contains a searchable list of pesticide products registered for use in New York State. You can visit that site at <http://pmep.cce.cornell.edu>.

BIOLOGICAL CONTROLS

Biological controls involve introducing predators to control the population of HWA. "Bio-controls" have been introduced into the Finger Lakes region by way of field insectaries and research-based releases. Field insectaries create habitat for HWA, then the bio-control is introduced to feed on the HWA. The control reproduces to levels that they can be captured and released elsewhere, or naturally disperse to infested locations nearby. The process is slow, and access to biological controls is still limited to research purposes. *Laricobius nigrinus* beetles and *Leucopius* flies have already been released in the Finger Lakes Region, but their populations are yet to rise to levels capable of controlling hemlock woolly adelgid on a watershed scale.

Management of HWA is important in forested and landscaped settings. As no natural predators for HWA exist within the Finger Lakes region, an integrated pest management approach must be taken in order to save hemlock trees. A mix of chemical and biological controls, coupled with monitoring, tree removal and replanting is often the most effective response to rapid hemlock forest health decline.



Cornell University researchers release predatory beetles on Skaneateles Lake.