



Hemlock Woolly Adelgid (HWA) (& Balsam Woolly Adelgid) now found at multiple Lake George locations

Impact- The Eastern Hemlock is a vital component of our forest system. NY has more hemlocks than any other state in the nation and are concentrated (10 % of our forest) in the SE Adirondacks. It is the fourth most common tree in NY forests. Growing on steep terrain, they provide erosion protection along stream banks, food and shelter for deer and wildlife. Major changes in eco-system structure, function and hydrologic processes are expected with the loss of hemlocks. The understory of a hemlock forest is characterized as dark, damp and cool and is an ideal habitat for organisms such as amphibian species, plants and maintain a suitable environment for cold-water species such as brook trout. Vulnerable animal populations are expected to diminish as a result of hemlock habitat loss. Well suited for growing on steep slopes where not many other species can grow, hemlocks stabilize shallow soils and provide erosion control. HWA could kill most of the region's hemlock trees within the next decade if not controlled.



Effect of HWA- Dead Hemlocks in mixed forest. (1)

What is HWA? This introduced tiny aphid-like insect from Asia, first observed in the eastern US and was first found in Lake George in 2017. It feeds on Eastern Hemlock of all ages causing extensive decline. It does not affect pine, spruce, fir or other conifers. Tree injury occurs as a result of the insect sucking sap while feeding causing the needles on infested branches to dry and drop. Buds are killed so little new growth is produced on infested branches. Mortality typically occurs within 4 to 10 years of infestation. Trees weakened by HWA often succumb to diseases and wood boring insects.

During March and April, adults of the overwintering generation each lay up to 300 eggs within a “woolly” covering. Crawlers hatch from April thru May settling on the twigs near the needle base where they insert their piercing and sucking mouthparts feeding through-out their development. The spring generation matures by the middle of June with crawlers hatching in early July and settle on new growth becoming dormant till Mid October when feeding resumes and the characteristic woolly covering begins to develop. Nymphs feed during the winter and mature by spring. It spends most of its life attached to the twig. Eggs and crawlers - the only stage that are unattached - are present from March through July and are readily spread by wind, birds and other mammals including people. HWA is only mobile from mid- April thru mid-June.

How to identify HWA -The most obvious sign of HWA is the covering of white wool-like wax filaments produced as the insect matures which cling to the underside of branches. These woolly masses generally range from 1/16” to 1/8” in diameter and can be seen where the needle attaches to the twig. **They are most visible from late fall to early summer on the undersides of the outermost branch tips of hemlocks.** The insects will have little wool in November and by March the “wool” will be well developed. As they feed, their woolly covering expands resembling the tip of a cotton swab. This “wool” covers the insect in all but its earliest life stages. Trees that have been impacted for years will also display: 1. off color needles, often with a grayish-cast, 2. thinning crowns, 3. premature needle loss. In late May and early June, look for lighter green new needle growth (see Pic below). If branches do not have this new growth, examine closer for possible HWA.

See New York State Hemlock Initiative-- <https://blogs.cornell.edu/nyshemlockinitiative>

Below- “Wool” sacks on underside of branches (2)

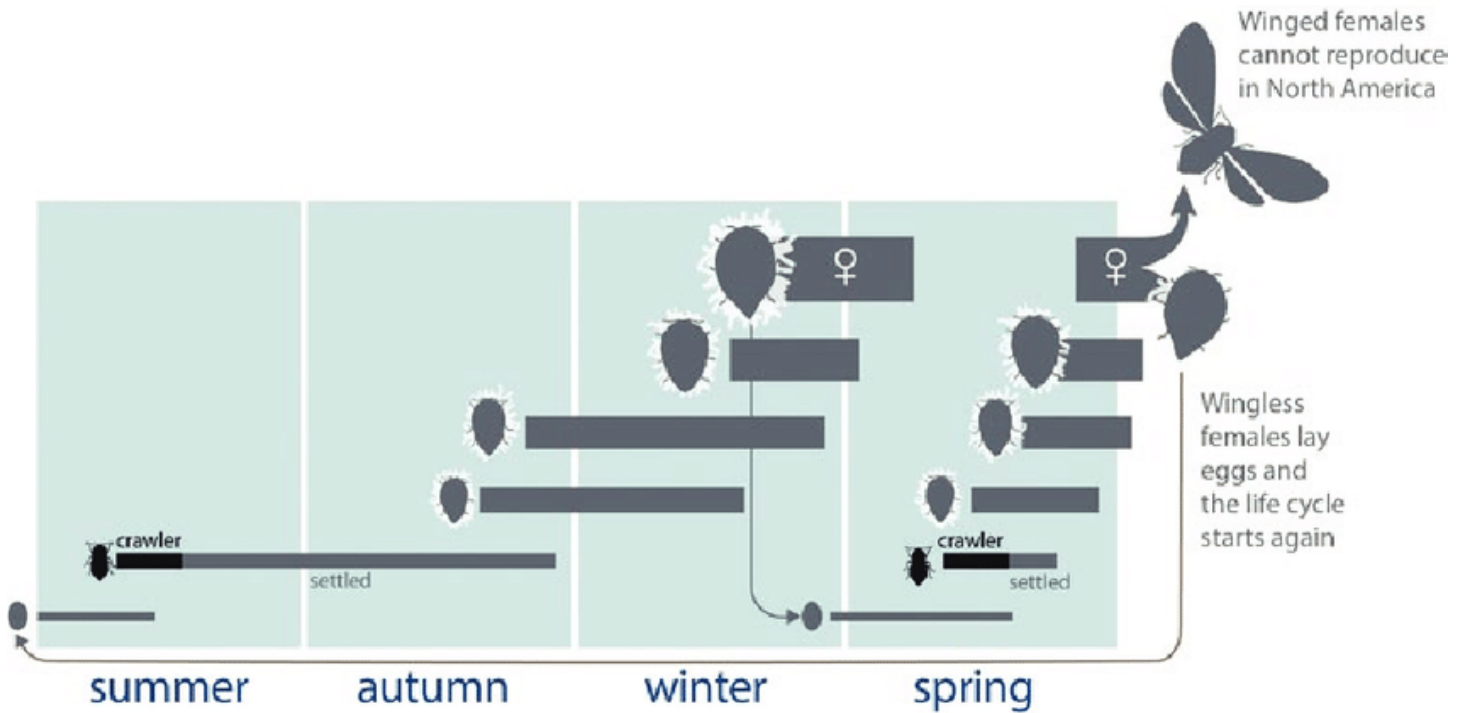


Dormant HWA, very small and wool starting to develop (3)



New lighter green growth (late May thru early June) indicates healthy tree.

HWA Life cycle



Note; HWA Imposters- You may see these look-a-likes on hemlock trees including Spittle bug (wet mass of bubbles, not harmful), Spider egg sacs (larger balls of webbing connecting needles and twigs – not harmful), Elongate Hemlock Scale- (white or brown ovals on underside of needles (invasive insect- report to DEC).



Spittlebug on pine (4)



Elongate Hemlock Scale (invasive) (6)

How to identify hemlock trees__Hemlocks have flat evergreen needles ranging from 1/3 to 2/3 inch long with two white parallel lines on the undersides of needles. Cones are about ½ inch long and green when immature. Bark is gray brown with wide ridges and furrows.



Hemlock needles, note white lines on underside (6)



Hemlock needles/cones, see note next page (7)



Balsam fir branches and cones (see note next pg.) (8)

HWA Management It is important to detect HWA early to maximize management options. In addition to winter when the white sacs are most visible, inspections twice a year (beginning and end of daylight savings time) of the underside of branches is the best way to tell if a hemlock is infested.

Hemlocks growing in landscapes can be managed through an integrated approach including monitoring, practices to enhance tree vigor and pesticides. Control of forest trees are limited except for early detection and subsequent management. NYS DEC and AIPPP is aggressively addressing this threat. DEC crews are using bark applications of the chemicals imidacloprid and dinotefuran to treat infested hemlock. Direct injections are used for ecologically sensitive areas.

Clipping heavily infested twigs from branches will reduce populations. Burn any clippings. When a tree becomes heavily infested, the tree should be removed in the fall or winter.



Biological controls studies are underway with beetles which feed on the adelgid are showing some promise. Two species of silver flies that feed on the eggs and are natural enemies of adelgid species are being studied by DEC and partners.

Chemical control is most effective option for managing infested hemlocks. Infested trees usually decline rapidly in the absence of chemical control. Periodic treatments are necessary. There are two systemic pesticides that are used to treat HWA in NY- Imidacloprid (available to landowners only as a soil drench, a certified applicator is required for other methods) and Dinotefuran. Imidacloprid is available at garden stores and the most common name is Bayer Advance Tree & Shrub. Treatments with one of the several formulations of Imidacloprid (active ingredient) registered in NY have been found to be effective up to 7 years with just one treatment. Imidacloprid can be applied by soil drench, soil injection, time-release soil tablets, trunk injection, or basal bark spray.

Always read the label and follow its directions carefully for any pesticide application. For the soil drench, pull the leaves and other organic material 2 feet away from the base of the tree, then pour the correct amount onto the soil. Homeowners should be aware that a soil drench can move through porous soil into waterways; it's best not to use a soil drench within 75 feet of any body of water. Soil drench and soil injection work best when the soil is moistened after a rainstorm, not when it is dry. Hemlocks prefer wet soils and are usually found around waterbodies, so this may not be the best option.

What to do /Help / Report- The 2017 find in Lake George was treated with an insecticide and eliminated by DEC, but it was again found in multiple location in 2020. DEC treated 2700 trees in this outbreak. More info- <https://blogs.cornell.edu/nyschemlockinitiative>

Contact DEC- Email report and photos to DEC Forest Health at foresthealth@dec.ny.gov. Or call the Forest Health Information Line at 1 866-640-0652.

Contact- APIPP (Adirondack Park Invasive Plant Program) 518 576 2082 or [HTTP://adkinvasives.com](http://adkinvasives.com) PO Box 65, Keene Valley NY 12943.

BWA- Note; there is also a ***Balsam Woolly Adelgid*** but while it has been reported in the northeast, there is not much literature on it as a threat. The trees can be differentiated by the needles and cones which are upright while the cones of the hemlock are smaller and pendant. See pictures above.



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