

Save Georgia's Hemlocks

Part 1: What's happening to our Hemlocks?

By Donna Shearer, Chairman

Think of the most beautiful place you know in the north Georgia mountains -- richly forested with evergreens, freshly scented, cool and quiet, punctuated with warbler songs – a place for relaxation, recreation, or retreat for you and your family, perhaps also a place of solace for your soul. What a gift such places are!

Now envision that same place a few years hence – the woods gray with the standing ghosts, trails cluttered with fallen hulks, streams silted and clogged with debris, no longer as cool but deathly quiet. Is this what paradise lost looks like?



This tragic transition is neither far-fetched nor far-off if we lose our Hemlocks, those graceful giants that for centuries have characterized the Appalachian Mountains, contributed to their health and beauty, and created the special sense of place that residents and visitors alike have long treasured. One has only to drive into parts of North Carolina or Tennessee to see what may be in store for us in the very near future.

The Eastern Hemlock, also called Canada Hemlock (*Tsuga canadensis*), is the dominant or co-dominant evergreen in Appalachian coniferous and mixed-hardwood forests stretching from Maine through the mid-Atlantic states to Georgia and even into northern Alabama. Most often found along streams, in sheltered coves and cool moist valleys, and on north- or east-facing slopes up to 5,000 feet in elevation, it is easily identified by its tall pyramidal shape, its deep-green feathery foliage, and its small smooth light-brown cones.

A slow-growing, long-lived tree that thrives in shade, the Hemlock typically achieves a height of 60 to 80 feet with a diameter of two to three feet and a life span of 250 to 300 years. In old-growth stands, however, ages approaching 400 years, diameters of 35 to 40 inches, and heights in excess of 100 feet are most common. A Hemlock measuring 76 inches in diameter and 175 feet tall and thought to be over 900 years old is one of the largest on record, according to the U. S. Forest Service. Imagine the history such trees have lived through!



What's happening to our Hemlocks? The Eastern Hemlock and the Carolina Hemlock (*Tsuga caroliniana*), a closely related species limited to the slopes of the Appalachians from Virginia and West Virginia into Georgia, are being devastated by a tiny aphid-like insect (*Adelges tsugae*) called the Hemlock woolly adelgid (HWA). Without active intervention, scientists predict that 80 to 90% of these trees will be dead within five to ten years.

Native to Asia where the spread and damage are checked by beetles that prey on adelgids, the HWA was first observed in the eastern U. S. during the 1950s in Virginia, where it was accidentally imported. With no naturally occurring predators here and no natural resistance as is found in western U. S. species of Hemlock, the infestation has spread to virtually the entire length of the Appalachians and wreaked havoc, leaving great swaths of dead and dying Hemlocks along the way.

According to an Environmental Assessment performed by the U. S. Forest Service, the adelgid arrived in Georgia in the Chattooga River gorge along the South Carolina-Georgia border in 2002. Since then, it has spread southward and westward across the Blue Ridge Divide crest into the Little Tennessee, Hiwassee, and Chattahoochee River drainages. Tree decline and mortality are already occurring in the northeast part of the state.

What are the signs of infestation? In the spring (and again in the fall to a lesser extent), the most easily recognizable sign is white woolly egg sacs about the size of a peppercorn on the underside of the branches. Infested trees show an increasingly grayish tint to the foliage, a gradual decline in needle density, and finally, if left untreated, complete defoliation and death.



Woolly adelgid egg sacs on infested tree. Photo by Larry Winslett.

How do adelgids kill the tree? Smaller than a grain of pepper, the adelgid is a prolific breeder, producing two generations a year. In one year, the offspring of a single adelgid can multiply to as many as 90,000, and with thousands of them infesting a tree, one can easily see how they can quickly overwhelm it. An adelgid begins its journey as a tiny reddish-brown egg protected inside a white cottony egg sac that may contain 100 to 300 siblings. Upon hatching, the crawler travels a short distance along the branch, selects a home site at the base of the needles, inserts its long slender mouth-part called a stylet into the tissue, and begins consuming the starches in the tree's branches and twigs that are essential to new growth and, it is thought, injecting a coagulant that prevents sap from reaching the needles. While in the northern states this results in tree death within five to ten years after infestation, the progression is much faster in the south with many trees succumbing in as few as two to four years.



Why should we care? Aesthetically, these beautiful trees contribute greatly to the enjoyment of those who live, work, and play among them, as well as the many people who come to north Georgia for tourism and recreation (which incidentally support thousands of related jobs and bring over a million dollars of revenue to the state annually). Environmentally, Hemlock loss dramatically affects the diversity and health of eastern forests. These trees are vital in providing food and habitat for about 120 species of vertebrates and over 90 species of birds, shade for native plants, cool temperatures for trout streams, and protection for watersheds and water quality. And economically, healthy mature trees such as Hemlocks can add 7-10% to homeowners' property values, provide the net cooling effect of 10 room-sized air conditioners running 20 hours a day, perform as much as \$4,000 dollars worth of water purification per mature tree along our waterways, and save billions of dollars a year by filtering CO₂ and other pollutants from the air as they produce oxygen for us to breathe.

Can anything be done? Absolutely! Government organizations such as the U. S. Forest Service, the Georgia Forestry Commission, and the National Park Service are working on ways to combat the HWA and reduce its impact using a multi-pronged program of cultural, chemical, and biological control methods. In Georgia, in over 100 key Hemlock stands on public lands, the protocol includes the selective treatment of individual trees with insecticides, the release of several species of predator beetles, and in some cases a combination. University-based research labs such as Clemson University, Young Harris College, the University of Georgia, and North Georgia College and State University are raising predator beetles which they supply to the government agencies for release on public lands and evaluating the effectiveness of beetle releases. But given the thousands of acres and millions of Hemlocks involved, their goal is not to save all the Hemlocks but to preserve significant Hemlock stands, maintain genetic material for diversity and reforestation, and establish a long-term viable solution that will allow Hemlocks to survive and even thrive in the future. A daunting task, to be sure.

Homeowners, however, are in a unique position to save as many Hemlocks on their own property as they choose. The good news is that it's neither difficult nor expensive to do, and – even better news – help is available! Part 2 of this series will provide information on specific steps homeowners can take to save their Hemlocks. In the meantime, please visit www.savegeorgiashemlocks.org to learn more.

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