

The Hemlocks- Hope for The Future

Walking through our forests we are surrounded by many forms of flora and fauna. One of my personal favorites fills the air with the seasonal smell of sweet evergreen, reminding me of an oncoming winter. This tree is notoriously abundant and is found throughout this region, but more often than not, many of the older trees are skeletons that line the landscape.

The Eastern Hemlock (*Tsuga canadensis*) is a tree native to western North Carolina and the eastern United States. We also have our very own hemlock; the Carolina Hemlock, *Tsuga carolinensis*, which has a taproot and can grow in extremely rocky areas. Hemlocks have the ability to grow up to 800 years, but usually take 250 to 350 years to reach maturity. Being shade tolerant, hemlocks make up a large portion of the understory, replacing the older generations of Hemlocks that tower over the young as a cycling regeneration process. Living in all layers of the canopy, they are one of the most common trees in our region, and are considered a 'keystone' species.

Unfortunately, many of these trees are struggling to survive a non-native invasive insect known as the Hemlock woolly adelgid (*Adelges tsugae*). This non-native Japanese insect was found in Virginia in 1924, and later in North Carolina by 1995. By 2005, it had established in portions of 16 states from Maine to Georgia. The Hemlock woolly adelgid (HWA) is a small aphid-like, burgundy insect that reproduces twice per year. Within the eastern United States there are no local or natural enemies, and as a result, HWA was able to spread throughout forested landscapes at an alarming rate. Once the insect settles at the base of the Hemlock's needles, it inserts its feeding tube into the tree and sucks out the sap. This causes dieback in the new growth of the Hemlock trees, and can kill the tree within 4 to 7 years. The Hemlock woolly adelgid can be seen from late fall through early spring as a cotton-like mass that forms around the base of the hemlock needles. These wool bundles provide protection for their eggs and from the outside elements and prevent them from drying out.



Having no native natural predators on the east coast, this pest was able to spread with ease through the forests from tree to tree. Out west,

HWA also exists but trees seem to do just fine; even transplanted eastern hemlocks. So why does this happen?

Richard McDonald with Symbiont Biological Pest Management company stated that, “A shocking discovery (to us, anyway) was made in 2006 by researchers with the Forest Service. Using DNA analysis, the scientist Dr. Nathan Havill discovered that the HWA was native to the Pacific Northwest of the United States. A small group of folks including Stan Steury of the Blue Ridge Resource Conservation and Development and DrMcBug (Richard McDonald) understood the significance of this finding. It meant, just like in Asia, we had native summer and winter predators of our very own that we could collect and ship back east to control the HWA. It was time for us mountain folks to take care of our own. Knowledge is what saved the trees, and not just the hemlocks.”

Our west, hemlock trees have HWA but not at levels that harm the trees. A major HWA predator is the shiny black beetle called *Laricobius nigrinus* or “Lari”. This tiny black beetle effectively controls HWA and has been released on the east coast since 2003. The Lari beetle has adapted to western NC and both the adult and the larvae feed on HWA from October to May. The adult beetles can eat 6 or more adelgids per day before laying 200-400 eggs singly in HWA sacs. Each larva can consume 200-250 HWA eggs or crawlers before they pupate in June.

A great Lari success story is happening at The Grandfather Golf and Country Club (GGCC) and the rest of the seven county “High Country” counties of Avery, Ashe, Alleghany, Mitchell, Yancey, Watauga, and Wilkes. GGCC stopped using chemical treatment in 2007; and has only used the Lari beetle to control HWA since then. Some trees have died of other causes like drought, but 95% of the big trees are healthy and showing excellent regrowth.

Beetles are not cheap however, they breed and spread once released. Slowly, Lari populations have increased over the years and they are being found further and further from original release sites. The oldest release sites like GGCC, who began releasing *L. nigrinus* beetles in 2008, have robust populations of beetles everywhere. For individual trees, forestry specialists still recommend chemical treatments to be cost effective, but on larger landscapes, native predators are a long-term solution. Have you noticed that some of your hemlock trees are doing better over the years and have not been treated? It is possible that the Lari beetle is in your neighborhood. HWA is here to stay, but if we can reduce HWA infestation to a level that does not harm the tree then our hemlocks will grow, reproduce, and thrive.

Blue Ridge RC&D has been active in hemlock bio-control since 2003 and fully supports restoration efforts using native predatory beetles. Blue Ridge RC&D created a “Beetles Save Needles” guide sheet for landowners interested in the program, and has worked with local community partners to learn how to release, collect, and monitor Lari beetle insectaries through the “Beetles Save Needles” program.

For more information on Hemlock restoration efforts and chemical treatment recommendations, please visit <http://savehemlocksncc.org/>. For more information on the “Beetles Save Needles” program, please visit www.blueridgercd.com.

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Lauren Street
Toe-Cane Watershed Coordinator
Blue Ridge RC&D
404-414-6261

