

Small beetles spell good news for High Country hemlock trees

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HIGH COUNTRY — A small bug has been attacking the High Country's hallowed Hemlock trees, but a familiar hero has recently emerged to turn the tide to keep the sap-sucking pest at bay, according to local entomologists.

Research from the Watauga County Agricultural Extension Office and a local entomologist has revealed that a small black beetle — known as the *Laricobius nigrinus* — is literally eating away at the pest, the hemlock woolly adelgid (HWA) in a large number of locations.

In 36 of 43 locations surveyed in the Watauga County area, researchers have found the little black beetles. Their presence is saving hemlock trees from being savaged by HWA, which can and will injure trees.

Blake Williams, a sustainable development senior at App State and intern for the Watauga County Agricultural Extension Office, completed the study with extension director Jim Hamilton to see how widespread the *Laricobius* beetle is throughout the High Country.

Landowners started introducing the beetle to properties in the High Country in the early 2000's after noticing the impact of HWA on their trees. The aphid-like bugs suck sap from and kill needles, shoots and branches on hemlocks. HWA gets its name from laying white bundles of eggs on the underside of the needles, giving them a woolly appearance.

Preserving the trees isn't just for conservation's sake, though. Williams said that hemlocks fulfill an important niche in the environment, growing along waterways and helping regulate water quality and temperature, flooding and even trout populations.

Williams and Hamilton took convenience samples by using a standard one meter by one meter cloth, shaking the trees and counting how many beetles they found. According to Williams, finding one to a couple beetles on a tree almost always means there is an established population in that area.

Williams did note that there are some areas he and Hamilton didn't check. Since the entomologist, Richard McDonald, who has worked with the agricultural extension office has released beetles and regularly seen them



Richard McDonald inspects a cloth designed for insect research for *Laricobius nigrinus* beetles behind the Watauga County Agricultural Extension Office.

in the border area between Watauga and Avery counties, they did not look around the Banner Elk, Seven Devils and Avery County areas where the beetles are anecdotally known to be well populated.

Using the mapping software ArcGIS, Williams created a map of where the bugs were released, where they were located during convenience surveys, and estimated the range the beetles were able to travel from their original dropping locations.

"It was kind of surprising to find them all over the place," Williams said.

At one point, he and Hamilton got permission from a landowner to check out his small stand of hemlocks that was isolated up on a hill, and even there Williams said they were able to find the beetles. In areas of high elevation as well, such as Beech Mountain, Williams and Hamilton found the beetles where there were hemlocks.

The beetles are not only more natural than using insecticides, but Williams said that they are also more realistic for management. Many hemlocks are difficult to reach and deep in the forest, and treating trees is time-intensive, difficult and not as easily manageable as having a consistent beetle presence that doesn't need to be maintained.

Williams said he thinks the results will be surprising to many people working in hemlock management. There haven't been many

studies published investigating the prevalence of the beetle in the High Country, and Williams said part of what he and Hamilton were doing was trying to fact check and confirm the belief of the entomologist who was integral in introducing the *Laricobius* beetles into the High Country.

Richard McDonald, a Ph.D entomologist affectionately known as "Dr. McBug" by those who work with him, is one of the longtime believers in the *Laricobius* beetles. Driving through the High Country, he often lets out loud woops and shouts while honking his car's horn when he sees a large, healthy hemlock.

McDonald said that he got involved with the beetles after attending conferences where Canadian entomologists discussed their regular practice of using the beetles to manage HWA.

McDonald oversaw the first release of the beetles in the High Country, which was only the eighth time the *Laricobius* beetle had been released in the U.S. for HWA management. That release was on Dec. 31, 2003 at Hemlock Hill in Banner Elk. Since then, McDonald has released them in cooperation with private landowners all over the High Country.

"The first seven or so years were hell," McDonald said. He said it felt like a race against time as landowners reported quickly dying hemlocks, and the

beetles didn't seem to be working.

At first, introducing the beetles was challenging since they had not been introduced widely on the East Coast before, and McDonald and his cohorts didn't know all of the best conditions for the bug.

After trial and error, McDonald said he, land owners and researchers he worked with realized that the beetles prefer the sunny sides of trees, are active during the winter months when HWA is most prevalent and accumulated better information on where it is best to spread the beetles.

According to McDonald, one *Laricobius* beetle can eat around six to eight woolly adelgids per day. There's also a spillover effect to introducing the beetles for HWA management: other trees in the area, like Fraser firs, get a variety of woolly adelgid the beetles will also eat.

In 2008, Grandfather Golf and Country Club was the first country club in the area to partner with McDonald and release the beetles. Golf course superintendent Pete Gerdon said that not only have the hemlocks at Grandfather Golf and Country Club been growing well and the HWA has been managed, but the club has saved tens of thousands of dollars a year on hemlock management.

In the years since 2008, McDonald said many other golf courses and clubs have worked with him as well to



PHOTO COURTESY OF BLAKE WILLIAMS
Blake Williams points to a *Laricobius nigrinus* beetle next to the needles of a hemlock tree on a white collection cloth.



PHOTO COURTESY OF BLAKE WILLIAMS
Blake Williams and Jim Hamilton inspect a cloth for *Laricobius nigrinus*.

use the beetles to manage their hemlocks.

The goal with *Laricobius nigrinus* is stability, according to McDonald. HWA isn't unnatural, and having some of it on the hemlocks keeps beetle populations alive and moving throughout the trees, keeping the HWA at a controlled level and the hemlocks healthy.

Hemlocks that are "off-location," growing near asphalt or on top of rocks or in otherwise unideal circumstances, are more likely to struggle with adelgid and could benefit from chemical treatment according to McDonald. But healthy trees are supposed to have a little bit of adelgid, McDonald said, and the *Laricobius* beetles keep that quantity of the pest in check and rotate through the trees as they eat through the supplies of hemlock woolly adelgid.

"I'm not anti-chemical, there's just a time and a place," McDonald said. Up until 2006, when hemlock survival had a poor outlook, McDonald said he was totally pro-chemical. But he

and many others have concerns about the insecticides used to treat hemlocks, arguing that they biodegrade into harmful chemicals and have negative impacts on environmental health for overall ecosystems. For trees that are off-location, though, McDonald said insecticides can be the best option.

Looking forward, McDonald said he is looking to continue partnering with landowners and researchers to improve *Laricobius nigrinus* releases in the High Country. He's planning to make himself a "Meet the Beetle" T-shirt to wear to match the informational binder he puts together for community partners, and is continuing to travel all over the region to conduct beetle releases.

Marisa Mecke is a Report for America corps member for Mountain Times Publications. Report for America is a national nonprofit service program which places journalists in local newsrooms to report on under covered issues.

Ribbon-cutting ceremony at Appalachian Apothekary



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A Grand Opening ribbon cutting ceremony was held on Dec. 10 for Appalachian Apothekary, located at 10543 Hwy 105 S., Unit 2 in Banner Elk. Pictured from left to right are Adam Deal, Robin Morgan, Anne Bolyea and Anne Winkelman.

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