



# The Uncertain Future of HEMLOCKS in Alabama

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The eastern hemlock (*Tsuga canadensis*), a majestic specimen commonly found along streams from the Southern Appalachians to Canada, is now in peril. Having the ability to survive under heavy canopies receiving very little sunlight, some have flourished in the remote canyons of North Alabama up to 300 years of age. Their presence on streambanks creates abundant shade which keeps water temperatures cool enough for certain fish such as trout

to survive. This makes the hemlock a keystone species, and losing it could cause a rippling effect. Unfortunately we have already lost a large portion of our hemlocks in the states to the north. For those unaware of the situation, there is a tiny insect that has been killing these trees and it is slowly making its way toward Alabama.

The hemlock woolly adelgid (HWA) is a sap-sucking insect not native to the eastern United States. It is believed to have

been introduced from Japan and was first noticed in Virginia in 1951. Since then, the pest has spread up and down the East Coast, devastating hemlock forests from Maine to the Great Smoky Mountains. Although it can be spread by wind and humans, birds are thought to be the biggest means of spread. The lack of a native predator to control its population has allowed the adelgid to feed unabated on hemlocks.

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# HEMLOCKS

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The HWA has a very complex life cycle. As the insect matures, it produces a white cottony ovisac. This substance makes it very identifiable and in turn gives it its name. Adelgids feed at the base of hemlock needles by sucking sap. This affects the tree's ability to obtain nutrients, thus causing die-back and eventually death.

Currently there have been no reports of HWA in Alabama. Separated from most other populations, their isolation has somewhat protected them so far. However, it's only a matter of time before the insect finds its way here. Over the past decade, the rate of spread has averaged around 20 miles per year, with its range already reaching southern Tennessee and Northeast Georgia. With Alabama having the southernmost natural stands of hemlock, it's a race against time to find a way to protect them. In the South, once a tree becomes infested it can reach mortality in as little as three to six years. This is much quicker than in the North due to several factors, but mostly the difference in climate.

In June of 2012, a symposium was held at Samford University to discuss what can be done to protect the hemlocks in Alabama from this almost inevitable threat. The objective was to bring together everyone who can help play a role in preserving the isolated stands of hemlock in the state and develop a strategy while there is still time. On hand to speak were researchers, educators, and professionals who have been dealing with this problem further north for nearly a decade. As the threat draws nearer, it is the hope that we can learn as much as possible from their knowledge and be ready when this pest reaches our backyard.

In the effort to control the HWA, there are two methods in use: chemical and biological. Foliar treatments, the least expensive chemical option, work by using truck-mounted high-pressure pumps to spray insecticidal soaps or horticultural oils into the canopies of infested trees. Concentration is usually on the underside of needles where the adelgids prefer to feed. For this treatment to be effective, the insects must be on the tree at the time of application. It kills the insects by smothering and drying them out. Each treatment lasts only 6-12 months before re-treatment

*Eastern hemlocks, some up to 300 years old, flourish in remote canyons of North Alabama at the southern-most boundary of the trees' native range.*

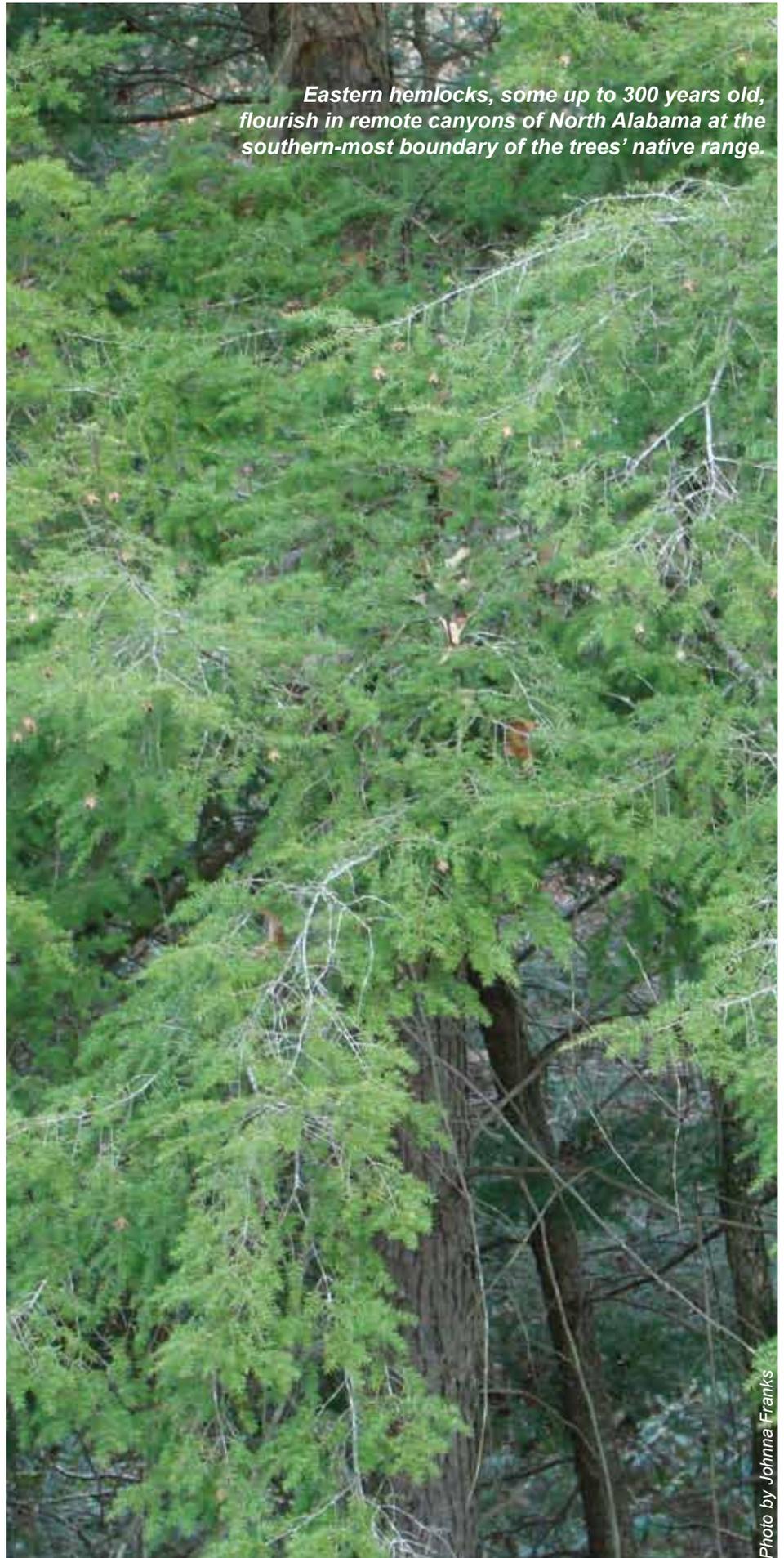


Photo by Johanna Franks



Photo by Bill Cook, Michigan State University, Bugwood.org

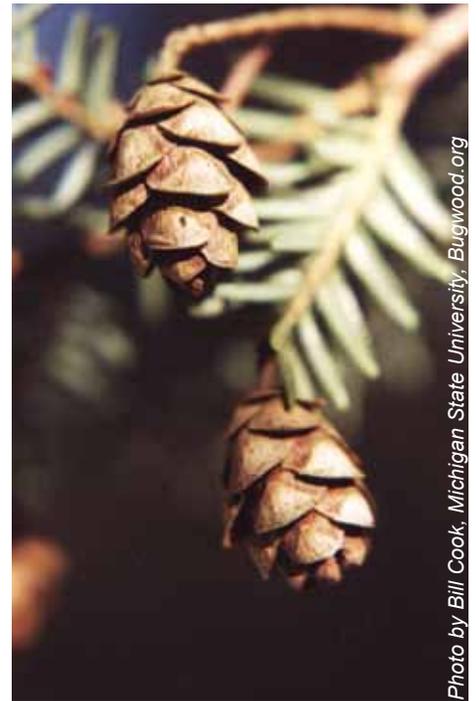


Photo by Bill Cook, Michigan State University, Bugwood.org

*Native to our state, the unique botanical treasure of Alabama's hemlock forests is now in peril.*

is necessary. This method is also limited to easily-accessible areas and smaller trees.

For larger trees, the best option is the use of systemic insecticides. The most effective products contain the active ingredient *imidacloprid*. This chemical must be either added to the soil and taken up by the roots, or injected into the stem of the tree. This is a more expensive method. However, each treatment can last up to three to five years. This still isn't a viable solution to protecting an entire forest; it is only practical for individual or small groups of trees, and is limited to accessible areas.

Clearly, the use of chemicals is not a solution to the problem as it only buys time. Our best bet at controlling the HWA on a large scale is biological control.

Since the adelgid was accidentally imported from Asia, it has no native predators to keep its numbers under control. Biological control essentially involves finding a natural predator and introducing it to infested areas. A great deal of research is being done on the use and effectiveness of predator beetles to control HWA. Before a new beetle can be released, it must go through a quar-

antine to make sure it will not have any unintended effects on the environment. Once approved for use, they can be bred in a lab. Clemson University has one of a few beetle-rearing labs that researches and breeds predator beetles to be released into hemlock forests. Rearing beetles in the lab is a complex and costly process. It's not yet known how big of an impact the predator beetles will make, but it is our best hope at this time. The goal is for the beetles to at least control the HWA population to a point where hemlock trees can still survive.

Although the loss of our eastern hemlocks in Alabama probably would not have as much of an ecological impact here as it may have in the North, losing them would definitely take away from the diversity and beauty of our state. It's

unknown when or if the hemlock woolly adelgid will reach Alabama, but if it does, hopefully we'll be prepared and the magnificent hemlocks can be preserved. 🌲



Photo by Lorraine Graney, Bartlett Tree Experts, Bugwood.org

***The tiny non-native insect, hemlock woolly adelgid (HWA) has been devastating hemlock forests up and down the East Coast.***



Photo by USDA Forest Service Southern Research Station Archive, Bugwood.org