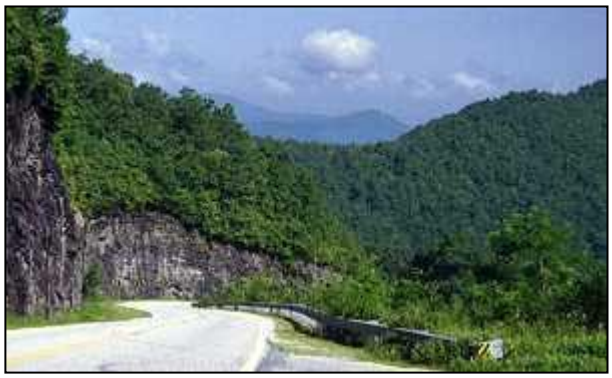
Save Georgia's Hemlocks
Part 3: Hope for Hemlocks in the Forest

By Donna Shearer, Chairman

Picture yourself standing on top of a mountain and gazing over a seemingly endless sea of deep green rolling hills and lush valleys – hundreds of thousands of acres populated by millions of Hemlock trees (among others). Now suppose something bad is out there quietly killing the Hemlocks, and you desperately want to save as many of them as possible.

Would you have enough manpower and money to tackle such a problem? Would you be able to reach into the vast expanses of inaccessible, rugged terrain? Would you be able to treat all the Hemlocks? And would you be able to do any of this before time runs out for them? Tough questions, and the answers are far from easy.



Richard B. Russell Scenic Highway
Photo – About North Georgia

The managers of our national forests and state lands and other scientific experts agree that it is not possible to completely eradicate the Hemlock woolly adelgid (HWA). The goal, instead, is to control this pest to the point that Hemlocks can survive and hopefully thrive again in the future. And basic math makes it clear that there simply aren't enough resources and time to help every Hemlock tree. Therefore, the approach must be one of immediate triage and long-range planning.

Let's talk triage. Fortunately for the state of Georgia, our public land managers – the U. S. Forest Service, GA Forestry Commission, and GA Department of Natural Resources – have had the benefit of seeing the HWA problem even before it actually arrived here and took immediate action when it did. One of the important steps taken in the national forest was to identify 144 key stands of Hemlocks, called Hemlock Conservation Areas (HCAs) covering 19,710 acres, with the goal of preserving a sufficiently diverse genetic population of these valuable trees. Each area has been designated for chemical treatment and/or the release of bio-control agents. Please see http://www.savegeorgiashemlocks.org/Hemlock_Conservation_Areas.htm for a map of these areas and their treatment plans.

Chemical treatment by soil injection
Photo – U. S. Forest Service

Chemical controls. The primary type of chemical treatment involves the careful application of a pesticide containing the active ingredient Imidacloprid, a mild nicotine-based derivative, to individual trees by means of soil injection, soil drench, foliar spray, or water soluble tablets placed in the soil. These methods have proven to be highly effective, provide a residual protection period averaging five years or longer, do not harm local wildlife, and based on a two-year study performed by the U.S. Forest Service are safe to use even close to waterways.

Bio controls. The main bio-control agents being used in Georgia at present are several species of predatory beetles that feed only on adelgids – *Laricobius nigrinus (Ln), Scymnus sinuanodulus (Ss), and Sasajiscymnus tsuga (St)*. These beetles are being reared by four university-based labs in the southeast – Young Harris College, UGA, North Georgia College and State University, and Clemson University. They are released on selected trees and then migrate and multiply throughout the forest, feasting on adelgids as they go. So what's the problem? In Asia where the adelgids originated, the Hemlocks and beetles and adelgids have evolved together over thousands of years; the beetles there exist in sufficient quantity that a predator-prey balance keeps the adelgids from doing serious harm to the Hemlocks, and possible tree resistance may have evolved as well. In the U. S., however, the adelgids have proven to be an incredibly prolific pest, with one adelgid able to multiple into 90,000 offspring in a single year. There aren't enough predator beetles in our forests yet to control this menace, and rearing them is scientifically demanding,

Clip dish for beetle release.
Photo - Young Harris College

time-consuming, and very expensive ($2 – $4 per beetle), but our southeastern beetle labs are working hard in hopes of turning this situation around over time.

Other efforts. A number of other long-term efforts are ongoing. One being conducted by Raleigh-based Camcore, through a cooperative agreement with the USDA Forest Service, includes seed banking and the establishment of conservation reserves (seed orchards) in regions of the world suitable for growing hemlock but where HWA does not occur. The overall goal of the project is to preserve hemlock gene pools in perpetuity until a time when effective HWA management strategies are in place and conserved seed resources can be utilized to repopulate depleted hemlock ecosystems. Should adelgid control remain elusive, the seed banks and conservation reserves will serve as a genetic base for breeding HWA resistant stock for reforestation. For more, please visit http://www.camcore.org/projects/hemlock.php.

Collected Eastern Hemlock cones. Photo - Camcore

Progress report. The chemical treatments in the HCAs are going well and showing good results, and about 800,000 beetles have been released so far on 54 sites in 27 HCAs. Perhaps the most exciting event for 2009 was the documented field recovery of beetles – *Ln* (larvae) and *St* (larvae and adults) – from 7 of 10 areas sampled by foliage sampling. This is the first systematic recovery of the F1 generation for these predators in Georgia. And while it does not represent establishment, it does indicate a positive sign of reproduction in the field.

Plans for the future. As 2009 draws to a close, all of the beetle-rearing labs indicate they are expecting increased beetle production and releases of more adults, larvae, and eggs next year. UGA's lab has added a third incubator, and the labs at YHC and NGCSU have both moved into different facilities with greater rearing space and/or improved work space. Additional efforts will include bringing in wild-caught beetles from the Pacific northwest (as these are generally more robust and fecund than their lab-reared siblings), beetle recovery in the HCAs where beetles have been released in prior years, and more systematic monitoring of hemlock health and forest conditions over time. Jim Wentworth of the U.S. Forest Service reports that their plans for next year are to continue with the beetle releases and chemical treatments on all 3 Districts with the goal of completing the initial chemical treatments on the Chattooga River and Blue Ridge Ranger Districts in 2010; they also will be treating 5,000 - 6,000 trees in our recreation areas in early 2010.


Inspecting beetles in the lab Photo – Clemson University

How you can help our public lands. The YHC Hemlock Project has ongoing funding needs primarily to hire additional student workers required to support increased beetle production. The NGCSU Beetle Lab is hoping to become completely self-sustaining in terms of funding and is exploring options to achieve this. Mark Dalusky of the UGA Beetle Lab asks the public's tolerance for the various colored flagging that they will likely encounter in numerous beetle release sites; this flagging is a result of many hours spent scouting the release areas before predators are actually brought to the field, indicates a potential release site on a branch, and serves to greatly increase efficiency during the actual release process.

If you'd like to make a monetary donation to support the work of the labs that rear beetles for release in Georgia, please visit http://www.savegeorgiashemlocks.org/Biological_Controls.htm for their contact names and mailing addresses. And if you're interested in helping as a volunteer on public lands, please contact either the U. S. Forest Service or the GA Forestry Commission to learn about any specific needs or upcoming opportunities.

The final part of this series will focus on the theme of stewardship, the duty and privilege of caring for our natural world, and some suggestions for instilling and exercising these values in our families. In the meantime, please visit www.savegeorgiashemlocks.org to learn more or call the Hemlock Help Line 706-429-8010 to get help for your trees.

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