



December 2018

The [Forest Restoration Alliance](http://threatenedforests.com/) is restoring healthy forests and landscapes in eastern America by researching and addressing invasive pest threats to hemlocks, firs and other native trees.

View our website at <http://threatenedforests.com/> Expect frequent updates. Also like us on Facebook.

Quest for Adelgid-Resistant Hemlocks

Dr. Ben Smith, Research Scholar with the Forest Restoration Alliance at North Carolina State University was this year's keynote speaker at the Hemlock Camp meeting of Save Georgia's Hemlocks. The title of Ben's presentation was "The Quest for Adelgid-Resistant Hemlocks." Here is an excerpt from an interview with Ben. Q: What got you interested in hemlock research? The plight of hemlock and the hemlock woolly adelgid wasn't really even on my radar until I was nearing completion of grad school at NC State in 2010. I found out that the Forest Restoration Alliance was looking for a person to help start a selection and breeding program for host resistance to HWA, and it was a perfect fit for me. I was really excited about getting to be involved with a tree improvement program from the very beginning, and getting to work with species like eastern and

Carolina hemlock made it even better. Q: What are you hoping to accomplish through your research? We have several major goals for our research. One is to produce trees resistant to adelgids that are suitable for restoration of impacted hemlock ecosystems— so trees are a very close replacement for what was lost, and whose offspring are also resistant to adelgids. The other major goal is to produce adelgid-resistant trees that will be available to the nursery industry as a suitable replacement for hemlocks in ornamental uses. These trees may not produce offspring that are resistant, and may differ slightly in appearance from the eastern and Carolina hemlocks they replace, but be able to fill the same unique niche that hemlocks formerly occupied. We are still probably a fairly long way off from the restoration goal, but are much closer to being able to impact the nursery and landscape industries

Q: What is the greatest challenge in your hemlock work? Probably the greatest challenge for our work, and many tree breeding programs in general, is the relatively long generation times for hemlock. It takes a significant amount of time to propagate a tree for resistance screening, conduct the screening, propagate the trees selected from the screening to reproductive age (producing cones and/or pollen), then propagating the offspring for screening as well. The entire process can easily take over a decade.

Q: How can individuals and organizations support your work? One way people can help us is by reporting trees that could be potentially resistant or tolerant. Reporting is most easily done through the TreeSnap app, which can be found at treesnap.org. Both individuals and organizations can also participate as volunteers. We have periodic volunteer days that are scheduled and coordinated by the Hemlock Restoration Initiative (savehemlocksnrc.org).

Individuals interested in more regular volunteer involvement may also contact us directly. And of course, we always welcome financial support through donations.

Please consider a year-end tax deductible donation to the Forest Restoration Alliance by clicking the "Donate Here" button below.

Report a Survivor Tree

By locating surviving Fraser firs, Eastern and Carolina Hemlocks, the Forest Restoration Alliance learns more about adelgid resistance and can take cuttings to propagate adelgid-resistant plants. If you know of a hemlock or a fir that appears healthy, even if infested go to;

<http://threatenedforests.com/locate-a-survivor/>

Donate Here |

Your gift to the Forest Restoration Alliance (FRA) Fund will support our research and outreach activities. FRA fundraising operates under the auspices of the NC Agricultural Foundation, Inc., and all donations are tax deductible.

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Giving Tuesday November 27 2018

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Rebuilding Hemlocks

With your help the Forest Restoration Alliance (FRA) is rebuilding hemlock stands, giants of the eastern forests. Consider:

- 2880 cuttings from surviving hemlocks in propagation.
- Several hundred hybrids of Carolina x Chinese, Carolina x Japanese, and Eastern x Chinese hemlocks germinated and in containers.
- Resistance screening facility at the Mountain Research Station, Waynesville, NC is fully functional.
- Screening tests for resistance to hemlock woolly adelgid (HWA) are in progress.
- The NC Forest Service (NCFS) has successfully produced approximately 8,000 Eastern Hemlock and 3,500 Carolina Hemlock seedlings. They are all container grown as 1-0 plugs and are around 8 to 10 inches tall. These are not to be considered HWA resistant. The seed were produced as a test run of production techniques before the NCFS moves into germplasm that may exhibit some degree of tolerance to HWA.

Please consider continuing your support of FRA by making a donation today. Simply click on the "Donate Here" button below. Thank you!!

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Volunteer to Help Save the Hemlocks

Looking for a fun Friday activity? Join us on Friday, Nov. 9 volunteering at the Forest Restoration Alliance (FRA) research facility!

The work day will be from 10 am to 4 pm at the Mountain Research Station in Waynesville, NC. Please register by Friday, Nov. 2 by completing the volunteer sign up form on our website at <http://savehemlocksncc.org/volunteer/> and be sure to indicate that you are signing up for the work day on the 9th.

FRA Members Honored by NC Wildlife Federation

Bill Holman, Chair of the FRA Board of Advisers, was inducted into the NC Wildlife Federation Conservation Hall of Fame at their annual banquet September 28, 2018. "Holman exemplifies the passion and dedication of a lifelong conservationist. He served as director of the State Policy Program at Duke University's Nicholas Institute, as executive director of the state's Clean Water Management Trust Fund, and as Secretary of the Department of Environment & Natural Resources. He is the current state director of The Conservation Fund."

Also at the NCWF banquet, FRA Director Fred Hain was named Forest Conservationist of the Year. "An accomplished forest entomologist at N.C. State University, Dr. Hain founded the Forest Restoration Alliance in 2007 with the goal of restoring healthy forests and landscapes by addressing invasive pest threats to native trees. Hain has dedicated his research to observing and breeding adelgid-resistant hemlock trees to promote forest regrowth."

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