

## State group trying to help hemlocks

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*Hemlocks at Fall Creek Falls State Park are susceptible but have not yet been infested with deadly woolly adelgids.*

*Photo by [Dan Henry](#).*

Contemplate the manpower-intensive task of trying to save 90,000 hemlocks in the 16,181-acre Fall Creek Falls State Park. Then multiply that labor by hemlock stands in most of the 55 other Tennessee public parks, in at least 20 North Georgia state parks, in two national forests in each state, in the Great Smoky Mountains National Park and in about 100 wildlife management areas operated by the Tennessee Wildlife Resources Agency.

"We can't save them all," said Stuart Carroll, an interpretive specialist at Fall Creek Falls State Park. "Best case scenario? We save 20 percent. Worst case: We lose 99 percent of them."

Why all this work? To prevent the hemlocks from turning into bleached, skeletonized snags of wood, denuded and sucked dry of sap by a pinhead-sized invader, a bug called hemlock woolly adelgid. The sap-sucking bugs drain the life from hemlocks in a matter of five to 10 years, according to experts.

For several years, Carroll has been herding a group of officials from several Tennessee, federal and nonprofit organizations, all trying to plan for the adelgids' onslaught. Already the Asia-native bug is attacking hemlocks on the eastern edges of Tennessee and on the Cumberland Plateau's eastern-most escarpments of Lookout Mountain and Walden's Ridge. In North Georgia, the invader has moved through the Blue Ridge area eastward into Fannin, Murray and Gilmer counties. As a non-native pest, the adelgid has no natural predators here.

The bug's telltale cottony puffs haven't yet been detected at Fall Creek Falls, but foresters know it eventually will make a dreaded entrance. When it does arrive, the impact could be devastating.

"When you stand on the overlook, looking down into the canyon at Fall Creek Falls, you're looking at centuries-old hemlocks," Carroll said. "If they die, it's going to be a real blight on the landscape. But it's also going to have some real severe ecological implementations. The creek will be exposed to the sun. Shade and cool-water species [fish and plant] will lose habitat. The trees will be falling across the creek and across the trails, and they will be eyesores."

### **Triaging trees**

The only preventive step officials and foresters can take is to plan a defense. "We're developing priority areas for salvation, which means we're also leaving areas where we'll allow the rest of the hemlocks to die," Carroll said. The planning began two years ago by mapping stands of hemlocks with a geographic information system, or GIS. It continued last week at a two-day forestry and ranger workshop at Fall Creek Falls.



One priority area is along stream banks, where the hemlocks create special habitats for cool-water fish such as trout and migratory birds. Another priority area is in public spaces such as the falls overlooks or campgrounds, where the hemlocks have special scenic value, as well as high liability should they die and become safety and fire hazards. The areas where the rangers and foresters will try to treat trees to save them are called hemlock conservation areas.

Brant Miller, wildlife forestry program coordinator for the Tennessee Wildlife Resources Agency, said there are 200,000 acres of public land, including about 10,000 acres where hemlock is a predominant or important part of the forest or habitat. "We're concerned about losing hemlocks, and we want to do what we can to save them," he said. "Each agency's priorities for saving the trees may differ. TWRA may have more interest in wildlife and fish habitat, while the parks may have more interest in aesthetic and ecological interests. But we all have the same goal."

### **Tallying conservation**

In Georgia, about \$70,000 of the Chattahoochee National Forest's \$3.3 million in stimulus money was allocated to fight the nearly invisible bug. In Tennessee, the Nature Conservancy is helping with the bulk of costs, Carroll said. Friends groups of both Fall Creek Falls and South Cumberland state parks also have helped, throwing in \$4,000 each for GIS mapping of mature hemlocks to show where the trees predominate in those parks.

The Nature Conservancy extended the effort to map hemlocks on the entire Cumberland Plateau, though Trisha Johnson, the Conservancy's East Tennessee Conservation Coordinator, declined to divulge the total. "We really want to help be a catalyst for the public lands [treatment] and help them out. We've also spent some money on our property in the Obed River area" just west of Wartburg, Tenn., Johnson said.

Using the maps -- prepared by Nick Hollingsworth who began the project at the Landscape Analysis Lab at Sewanee: University of the South -- foresters can determine how to prioritize treatment areas and make estimates of what's needed. In Fall Creek Falls alone, Hollingsworth said he found that 2,330 acres contain hemlocks. On 1,455 acres, hemlocks are the dominant component of the forest canopy.

After park and TWRA officials decide where to save trees, treatment can begin as soon as the bug is detected. The chemical of choice is imidacloprid, a systemic pesticide best known as a flea treatment for pets under the trade name of Advantage.

At the workshop last week, Rusty Rhea with the USDA Forest Service demonstrated treatment methods. He explained the best ways of mixing the chemical and applying it, either as a drench or with root injections, which get into the sap and kill the bugs when they drink it. "The reality is we don't have the resources to save every tree in the park," he told the group. "Even in your priority areas, ask yourselves, 'If this tree [a broken or stunted or unhealthy one] was gone, would it matter?' If your answer is 'no,' don't waste time and energy and money treating it."

Initially officials plan to use only agency labor to apply the chemical. But eventually, especially if a tablet form of the chemical is approved for use here, volunteers and friends groups may be allowed to help. University of Tennessee laboratories continue to breed and supply predator beetles that eat the adelgids, but until enough beetles have been raised, the chemicals must help slow the adelgid, Carroll and Johnson said.

"They are finding some beneficial effects from beetles, but it takes a whole lot of beetles," Johnson said. Carroll said there is not enough time to wait. The adelgid, carried by wind, migratory birds, deer and humans, already has been detected on hemlocks 20 miles from Fall Creek Falls. "This likely will be the biggest potential die-off Fall Creek has seen," he said.