Restoring Georgia's MIGHTY GIANTS

Three of the state's native trees are in danger of disappearing forever, but hope has taken root

BY AMBER LANIER NAGLE

They were spectacular. Rising 100 feet above the horizon and boasting mammoth trunks with diameters exceeding 6 feet, American chestnut trees once dominated Georgia's forests, but a blight in the early 20th century pushed them to the edge of extinction.

Other native trees are dying off as well. Colossal Eastern hemlocks are under attack in the northern reaches of the state, and only a tiny population of longleaf pines remains in South Georgia.

But as some folks prepared to say goodbye to these species, others joined forces to share knowledge, experiment and save these beloved trees. Georgia's longleaf pines, American chestnuts and Eastern hemlocks aren't out of the woods yet, but thanks to the efforts of tree-loving advocates and organizations, things are looking up.

Lingering in a longleaf forest

Janisse Ray navigates the sandy footpaths that wind through the Moody Forest Natural Area, a 4,400-acre wilderness in Appling County. She pauses, listens to the laughing call of a pileated woodpecker and admires the glistening needles of a stand of ancient longleaf pines.

"There was a time when much of the Southern landscape looked like this—longleaf pines of all maturity levels standing in deep coverings of wiregrass and pine needles," says Ray, a writer, naturalist and activist, who grew up just a few miles from the forest. "Longleaf forests stretched from Virginia to South Florida and west to East Texas. There were about 93 million acres of longleaf at one time, but by 1930, almost all of the virgin longleaf had been felled."

Many trees were harvested by early settlers who required building materials and preferred the longleaf's straight, strong timbers. Others were cut to make way for large expanses of agricultural crops and sprawling urban communities.

And there were other contributors to the longleaf decline. Hogs roaming through the forests consumed longleaf seedlings, which interfered with the forests' natural regenerative process. Property owners replaced large stands of longleaf pines with faster-growing species, such as slash and loblolly pines.

Even Georgia forest managers who initiated longleaf restoration projects made mistakes that thwarted its revival, such as suppressing naturally occurring fires.

"People want to protect forests from fire, but they are wrong when it comes to longleaf," Ray says. "Longleaf evolved with fire and is completely dependent on it. Their seeds need a clear seed bed to take root. And fires prevent other species of trees from creeping into the forest and choking out the longleaf's unique ecosystem."

Georgia's remaining longleaf forests host an array of diverse plants and wildlife—bushy wiregrass, carnivorous pitcher plants, liatris, deer, wild turkeys, gopher tortoises, Eastern indigo snakes, quail and endangered

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Left: Janisse Ray cradles a large longleaf pine cone. ***Right:*** A baby longleaf pine emerges from the grassy terrain of Southeast Georgia.

COURTESY UNITED STATES FOREST SERVICE-ASHEVILLE

COURTESY BERRY COLLEGE

Above left: Chestnut logs like these were harvested in what is now the Great Smoky Mountains National Park in the early 1900s. ***Above:*** After hand-pollinating a chestnut tree, students at Berry College in Mount Berry wrap bags around the tree's flowers to ensure controlled pollination.

red-cockaded woodpeckers.

"That's a red-cockaded woodpecker cavity," Ray says, pointing to a hole about 30 feet up a longleaf trunk. "See the dried white resin underneath the hole that looks like dripping candle wax? That's why a lot of people refer to cavity trees as 'candle trees.' The birds peck around the cavity entrance, causing sap to ooze down the tree. The resin flow prevents rat snakes and other predators from moving up the tree."

COURTESY TIM CHESNUT

Tim Chesnut

As the longleaf pine forests declined, so did the red-cockaded woodpeckers and so many other species dependent on the longleaf habitat, she explains.

"Everything is connected," Ray says. "We need to re-establish nature's delicate balance so our grandchildren's grandchildren can experience a longleaf forest."

The Longleaf Alliance and other groups are promoting research, education and management of the longleaf pine. The alliance conducts longleaf workshops throughout the South, provides landowner assistance with forest management, gathers and distributes information, and raises awareness. Their efforts are working: Longleaf pine acreage numbers are creeping up.

"I encourage landowners to plant longleaf instead of non-native species of pine," Ray says. "Even homeowners can plant one or two trees in their yards."

King of the Appalachian forest

American chestnut trees once towered over Eastern forests from Maine to Georgia and over into Mississippi. These monstrous deciduous trees were as tall as water towers, with trunks growing beyond 6 feet in diameter.

"They were the redwoods of the Appalachians," remarks Tim Chesnut, a northwest Georgia forester who has worked with the Georgia chapter of The American Chestnut Foundation (TACF) for 10 years. "And there were billions of them. Some experts say chestnut trees made up a quarter of all the trees in the Appalachian forests."

American chestnut trees provided abundant food for wildlife and served as an economic staple for humans.

"The nuts are sweet and nutritious," Chesnut says. "Folks fattened hogs with them, made meal from them and ate them when times were hard. Chestnuts were used as currency in bartering transactions. And the wood of chestnuts is strong and rot-resistant, so it was used to build houses and furniture."

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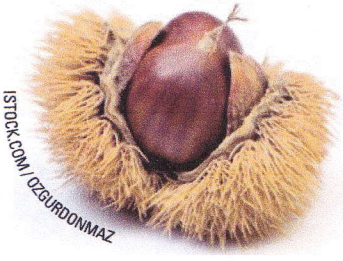

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Then in 1904, the fungal pathogen responsible for chestnut blight was accidentally imported into the United States from Asia. By 1950, blight had destroyed nearly every mature chestnut tree in the country.

"It gets into the tree where the bark is split and sucks the life out," he says. "But the blight doesn't kill the roots, so

saplings emerge from the root system. When the trees are a few years old, the blight attacks them, too."

But a comeback may be on the horizon. In 1983, a committed group of scientists and laypeople formed TACF to initiate a complex breeding program (back-crossing) to transfer disease-resistant genes from Asian chestnut species to the American chestnut.

"The best we can do is a chestnut tree that is 15/16 American and 1/16 Chinese," notes Chesnut. "These have been planted in orchards, and we've managed them, tracked their family lines and shared information. We've even inoculated them with blight. The trees that have survived are our hope for the future."

Chestnut orchards and demonstration plantings are thriving at Berry College in Mount Berry, Callaway Gardens Preserve in Pine Mountain, the Governor's Mansion and the Carter Center in Atlanta, Reinhardt University in Waleska, Vogel State Park in Blairsville, and many other locations.

"By selectively breeding the trees showing the greatest resistance to blight, we believe we will eventually produce a chestnut capable of restoring the species to its natural glory," Chesnut says. "We've had some setbacks, but we are very optimistic."

Hemlocks under attack

Not long after Donna Shearer and her husband, Mark, moved to Lumpkin County, they noticed that some of their hemlock trees were dying.

"They were under attack by the hemlock woolly adelgid, a tiny aphid-like insect," Shearer says. "This invasive insect is native to Asia and doesn't have any natural predators in the eastern United States."

Above: **Hemlock woolly adelgid egg sacs are visible along branches.** ***Right:*** **Donna Shearer is passionate about saving hemlock trees.**

The hemlock woolly adelgid (HWA) makes its home at the base of a needle; inserts its long, slender mouth-parts into the tissue; and sucks out the starches in the tree's branches and twigs that are essential to new growth. Deprived of nutrition, the needles dry up and fall off. New growth slows down and then stops altogether. Eventually, the tree dies.

The once-full evergreens become skeleton-like, allowing more sunlight to reach the forest floor. Light-sensitive plants die, and different plants take their places, changing both the plant and wildlife composition of the ecosystem.

"Hemlocks are a keystone species in the ecological system, and they are threatened," Shearer says. "Woolly adelgids can kill hemlock trees in just a few years, unless someone intervenes and treats the trees."

The tall and the small of **Georgia's endangered trees**

Tree: **Longleaf pine** *(Pinus palustris)*

- **Physical description:** Pines with long, dark-green needles (8 to 18 inches), flattened crowns, a reddish tint to the trunk, heights of 98 to 120 feet, diameters up to 3 feet.
- **Growth:** Longleaf pines take 100 to 150 years to reach full size and can live more than 500 years.
- **Availability:** The Longleaf Alliance has a list of Georgia nurseries that carry longleaf pine seedlings.
- **Learn more:** The Longleaf Alliance, *longleafalliance.org*, (334) 427-1029; America's Longleaf Restoration Initiative, *americaslongleaf.org*, (404) 679-4016.

Tree: **American chestnut** *(Castanea dentata)*

- **Physical description:** Gigantic member of the beech family, heights of 98 to 110 feet, diameters exceeding 6 feet.
- **Availability:** Restoration Chestnut 1.0 seeds can be acquired with a $300 annual TACF sponsorship.
- **Learn more:** The American Chestnut Foundation, *acf.org*, (828) 281-0047.

Tree: **Eastern hemlock** *(Tsuga canadensis)*

- **Physical description:** Large evergreens with wispy, flattened branches, short needles and straight trunks. Can exceed 100 feet in height. Trunk diameters of mature trees can exceed 5 feet.
- **Growth:** Hemlocks may take 250 to 300 years to reach maturity and can live hundreds of years.
- **Availability:** Many nurseries carry Eastern hemlocks as well as their cousins, Carolina hemlocks. Save Georgia's Hemlocks offers hemlock seedlings for a suggested donation.
- **Learn more:** Save Georgia's Hemlocks, *savegeorgiashemlocks.org*, (706) 429-8010.

The Shearers treated 400 trees on their property with chemicals in 2005. It worked, and two years later, Mark obtained a professional pesticide-application license and began helping other landowners save their trees.

"Systemic chemicals can be applied to save the trees," Shearer says. "They are absorbed through the roots and distributed throughout the entire tree. Insects that feed on the tree following treatment die."

Treating hemlocks with chemicals is a Band-Aid fix, but it's a vital tool for preserving some of the hemlocks while other, long-term solutions—like predator beetles—are being developed.

In 2009, Shearer founded Save Georgia's Hemlocks, a 100 percent volunteer-driven nonprofit organization devoted to saving endangered hemlocks through education and volunteer service. The organization works with the U.S. Forest Service, Georgia Forestry Commission, Georgia Department of Natural Resources, landowners and others to save these majestic trees.

"We are launching a new initiative with Trout Unlimited to replant hemlock saplings along North Georgia's trout streams," she says. "We need volunteers to help us with that effort and others, and, if you can't volunteer, we can always use donations. We have to work together if we are going to save the hemlocks and the other threatened trees in Georgia. Together, we will be successful."

Amber Lanier Nagle is a freelance writer who lives in Adairsville.

HemlockFest will celebrate its 12th year of providing education and entertainment to help save Georgia's disappearing hemlock trees Nov. 4–6 at Starbridge Sanctuary near Dahlonega. The event will showcase musicians performing folk, funk, blues and Americana and will feature homegrown artists from North Georgia's rich musical tradition.

Proceeds from HemlockFest aid efforts to minimize the impact of the non-native hemlock woolly adelgid, a parasite that is devastating the hemlock trees of North Georgia at an alarming rate. HemlockFest has raised hundreds of thousands of dollars to support lab efforts at area colleges and universities to raise predator beetles. Introducing predator beetles, which feed on hemlock woolly adelgids and are a safe and effective biological control, may help to save Georgia's native forests and wildlife.

Day and weekend passes are available online and at the gate. Follow HemlockFest on Facebook, visit *hemlockfest.org* or call the Hemlock Hotline at (706) 867-5157 for more information about the festival and the effort to save the trees.