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Range Research, Genetic Work Spell Hope For Chestnut Comeback

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Location, location, location. It's the mantra of Realtors everywhere. But it may also be the reason a mighty tree long since gone from most of the Georgia landscape may get another chance to thrive.

Georgia Department of Natural Resources biologist Nathan Klaus made national headlines in 2006 after discovering a stand of American chestnut trees near President Franklin D. Roosevelt's Little White House at Warm Springs, Ga. Once a fairly dominant species, the majestic chestnut was virtually wiped out by a fast-spreading fungal blight that swept through Georgia in the 1920s.

A long-time supporter of efforts to bring back the nearly extinct tree, Klaus recently began working on research that could continue to help restore the chestnut to its native range.

A few months ago, Klaus began looking at land lottery maps and using GIS (Geographic Information Systems) to plug in historic locations of American chestnuts. He hoped to develop a map showing the range and density of the trees in Georgia before the blight.

Researchers with The American Chestnut Foundation are working to develop blight-resistant chestnut sprouts, using an established program known as backcross breeding to create American chestnuts that are 1/16th Chinese chestnut, a hardier cousin. The goal is to have a tree that has enough of the Chinese species genes to resist blight but mostly is the tall,



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hardy American species once known and loved in the U.S.

Klaus' research is important in helping determine the best place to plant the genetically strengthened trees. Old land lottery maps show where chestnut trees once were. Klaus scanned the paper maps into a computer-modeling program and has been able to determine which areas had a higher density of chestnuts trees and what species occurred with them.

The Georgia chapter of the American Chestnut Foundation has been working for 25 years with the national organization's backcross-breeding program. The chapter is now using pollen found in the wild to pollinate orchard-grown chestnuts. The hope is that using the information from Klaus' work, the American chestnut will have a higher degree of success as the seeds or seedlings are brought back to the South for planting.

Pollinating trees in the wild can be a difficult process, according to Martin Cipollini, the chapter's breeding program coordinator.

"It relatively easy to collect the pollen from wild trees in Georgia and use it to pollinate hybrid trees in orchards. This 'father tree' approach is easier than trying to pollinate flowers on wild trees that are often in rather inaccessible locations on steep slopes," Cipollini said.

"In the past 25 years, The American Chestnut Foundation has made considerable progress toward breeding blight-resistant trees. But, its ultimate goal of reintroducing these trees to the wild in large numbers requires knowledge of proper habitat requirements and planting techniques."

The American Chestnut Foundation, working with its state chapters, has created hundreds of lines of trees that are well advanced through the backcross-breeding process. In the next few years, thousands of "final" generation nuts will be ready for testing in the wild.

So far, the Georgia chapter has created three lines using surviving Georgia trees as "fathers." These lines are in orchard test sites. This past summer, the chapter produced four more lines using Georgia trees. These will go into test orchards next spring. The chapter wants to produce at least 20 lines using different Georgia chestnuts and including genetic diversity from throughout the tree's historical range in the state.

But the question remains, just where is that range?

"Where do they belong and where will they thrive today? What was their true historical range? Did they grow near creeks or up on ridges, and if so, in what type of soils? These are answers we need before we

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begin to restore this species," said Klaus, a senior wildlife biologist with the DNR's Wildlife Resources Division.

Klaus is using property line records from the early 1800s to develop mathematical models that look at factors such as slope, soil composition, landforms, geology and aspect and elevation. An accurate description of the tree's native range is needed as most institutional knowledge has been gone for several generations and the anecdotal knowledge available is not always accurate or reliable. The hope is that these new models can be applied to modern maps to show the actual historic range for the trees.

For instance, Klaus says chestnuts were not everywhere in the mountains, although anecdotally it has been suggested the trees were dominant in the Blue Ridge. An elevation map will show where best to plant the trees since they have different relationships to elevation depending on the region.

"There was definitely a well-defined niche in the world for these trees," Klaus said. "The tree's range extended well down into the Coastal Plain. Many people do not realize that the trees were in the Piedmont and Coastal Plain regions of Georgia."

Hybrid trees for blight resistance testing are being planted in orchard sites around the state, including Berry College and the Georgia Mountain Research & Education Center, operated by the University of Georgia.

Georgians can help conserve rare plants such as the American chestnut as well as animals not legally hunted, fished for or trapped and their habitats, through buying wildlife license plates featuring a bald eagle or a ruby-throated hummingbird. They can also donate to the Give Wildlife a Chance state income tax checkoff. Both programs are vital to the Nongame Conservation Section, which receives no state funds.

Visit www.georgiawildlife.com for more information, or call Nongame Conservation offices in Social Circle (770-761-3035), Forsyth (478-994-1438) or Brunswick (912-264-7218).

To find out more about the Georgia chapter of The American Chestnut Foundation, visit www.gatacf.org

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