

Fire may be key to reviving dogwood trees in Eastern forests

8 June 2010, by Brian Wallheimer

Proper and timely burning of some Eastern U.S. forests could help revitalize flowering dogwood trees, which benefits a wide range of species, a Purdue University report shows.

Dogwood trees act as a calcium pump, pulling the nutrient from deep in the soil and depositing it on the forest floor with their fallen leaves each autumn. It's an important source of nutrition for a variety of species in a forest ecosystem, said Michael Jenkins, assistant professor of forestry and natural resources. Fungi, insects, [snails](#) and other organisms that live on the forest floor feed on the calcium-rich leaves, and many birds and mammals consume the protein-rich berries.

"During fall migrations, these berries are an important [food source](#) for many [songbirds](#)," Jenkins said.

But *Discula destructiva*, a fungus thought to have been unknowingly brought to the United States from Asia, has caused a serious decline in dogwood populations in recent decades. The fungus kills a tree's foliage and then girdles the tree by creating cankers on the trunk.

"The disease has expanded across much of the flowering dogwood's range in North America," said Jenkins, who co-authored an article published in the journal *Forest Ecology and Management* with Eric Holzmueller of Southern Illinois University and Shibu Jose of the University of Missouri. "It pretty much decimates dogwood populations. In some cases, we have seen more than 90 percent mortality."

Jenkins and his colleagues studied the effect fire has on revitalizing the dogwood population in the Great Smoky Mountains of Tennessee and North Carolina. He said in forests where there have been two fires over a 20-year period, dogwoods have survived the disease.

Jenkins said the *Discula destructiva* fungus likes cool, moist areas with little air movement. Undisturbed forests provide that, but occasional burning opens up forests, increases the sunlight that reaches the forest floor and allows greater air movement.

In areas that haven't experienced burns, Jenkins said eastern hemlock trees have moved in and replaced dogwood. The hemlocks create a lower canopy that increases shading and moisture, establishing ideal conditions for the fungus and further reducing dogwoods and potential food sources for wildlife.

"You have these waves of species loss and replacement that alter the stability and function of [forest ecosystems](#)," Jenkins said.

Jenkins said prescribed burning on an approximately 10-year rotation might offer a way to maintain dogwood populations in infected forests where eastern hemlock has taken over.

Jenkins and his colleagues next plan to monitor new burn sites to see how dogwood responds and hope to test the direct effects of heat and smoke on the *Discula destructiva* fungus. The National Park Service Southeast Region Natural Resources Preservation Program, the Great Smoky Mountains Association and the University Florida College of Agriculture and Life Sciences funded the study.

Provided by Purdue University

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