



North Carolina Forest Stewardship News Fall 2013

Herndon Property Recognized As a Certified Forest Landbird Legacy Habitat



From left- Susan Miller (USFWS), John Ann Shearer (USFWS), Don Temple, Terry Herndon, Deanna Noble (NCWRC), and Scott Anderson (NCWRC).

By Deanna Noble, Forest Stewardship Biologist and John Ann Shearer, Partners for Fish & Wildlife Coordinator

On March 5, 2013 Mr. Terry Herndon was certified by the Forest Landbird Legacy Program for his management accomplishments on his 400 acre tract just west of Bunnlevel in Harnett Co. The property includes upland longleaf pine stands, mixed pine stands, mixed bottomland hardwoods, agricultural fields, several ponds, and the family home. The property is also certified by the Forest Stewardship Program.

Mr. Herndon's objectives for the property have largely been met. First and perhaps foremost, the property serves as a beautiful place for he and his family to work and enjoy recreationally. He has generated income from timber thinnings and a minimal amount of pine

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The Stewardship Coordinator's Corner

Fall in North Carolina is a busy time of year. People are making their travel plans to see the [fall leaf colors in the western end of the state](#). The [North Carolina State Fair](#) runs October 17 - 27. [Fall fishing](#) has already begun on the coast. Farmers are bringing in their harvest and preparing fields for winter. If you are a forest landowner preparing to plant trees on your woodlot, be sure to check out the [North Carolina Forest Service Tree Seedling Catalog](#). The [North Carolina Forest Service](#) can help determine the best trees to plant on your land and how to plant them. Under the [Forest Development Program](#), qualifying landowners may be eligible for funding to help pay for tree planting and forest stand improvement.



If you received this from a friend or colleague and would like to be on our email list, please send me your email address. I can be reached at les.hunter@ncagr.gov and my phone number is (919) 857-4833.

Thank you,

Les Hunter

Stewardship Coordinator

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straw raking. He also ran a popular hunting preserve for several years. Herndon, known for training bird dogs, proudly produced a national champion and national futurity champion in 1997, and a national champion and national amateur champion in 1998. It is evident that he and his family love the land and the wildlife it supports.

The single most outstanding management strategy Mr. Herndon has employed is prescribed burning. He rotationally burns his property so that all the forested lands, including the bottomlands are burned nearly every other year. Many of these burns take place during the growing season. He has a series of subtle, but effective fire breaks through the property that provide options for safe burns and facilitate travel with all-terrain vehicles. The firelines are not deep furrows, thus do not channel or impede water flow. Using prescribed fire as his number one management tool, Mr. Herndon demonstrates an excellent example of how to manage fire dependent habitats without using herbicide.

Shortly after he purchased the land, Mr. Herndon used a bulldozer to remove the furrows that had been created from a bedding operation to plant loblolly pine years earlier. After the land was smoothed, he planted longleaf pine and began a fire rotation. The 30+ year old trees have been thinned and the ground cover has naturally regenerated. Wiregrass and other herbaceous plants form a dense layer of cover creating excellent wildlife habitat.

An approximately 8 year old longleaf stand on the east side of Nick McLean Road has also been managed with fire. It has a lush understory. That site offers a panoramic view of the rolling hills in the area. Mature longleaf pine areas have a moderate basal area and include a few large oaks. Fox squirrels are frequently sited on the property. The bottomland areas near McLean Creek, a tributary to the Little River and Cape Fear River, have a low understory of cane and other grassy and herbaceous vegetation. Because of management with fire, there is an open park-like view.

In addition to its value for Northern Bobwhite Quail and Wild Turkey, there are many conservation values to forest interior species, especially neotropical songbirds. Birds that we would expect to find using the property include upland pine species such as Brown-headed Nuthatch, Pine Warbler, Red-headed Woodpecker, Yellow-throated Warbler, Summer Tanager, and Screech Owl. Because of the frequent prescribed burning management that created and maintains an open pine savanna, Loggerhead Shrike, American Kestrel, Henslow's Sparrow and even Bachman's Sparrow are not out of the question here. Within the streamheads and bottomland hardwood habitat, species such as Wood Thrush, Black-throated Green Warbler, American Woodcock, Prothonotary Warbler, Kentucky Warbler, Swainson's Warbler, and Wood Ducks find refuge. Many edge species such as Northern Parula, Rufous-sided Towhee, Gray Catbirds, and Brown Thrasher benefit from food and cover the land provides. Large tracts of land, such as this, provide necessary important quality habitat for a myriad of migrants that stop over during the fall and spring migrations.

Based on the high quality bird habitat on the tract, the intensive habitat management, and the conservation values of the owner, the FLLP group therefore recognizes the Herndon property as Certified by the Forest Landbird Legacy Program. This recognition will honor Mr. Terry Herndon with a plaque and a sign to display on the property.

It is evident that Mr. Herndon and his family maximize the use of Natural Resource Conservation Service and other cost share programs to create effective wildlife benefits on their property. By following the example set forth by Mr. Herndon, other landowners can enjoy the abundance of wildlife that best management practices produce.

For more information on the many programs that are available to North Carolina landowners, contact the North Carolina Wildlife Resources Commission at 919-707-0050.

PEOPLE

2013 State Forester Prescribed Burning Award Recipient

Rob Shackelford – Dare County Ranger

Rob completed 1700 acres in burning on 2 CWPP projects in coastal marshland on cooperator property in Dare County. He partnered with The Nature Conservancy, US Forest Service, North Carolina Wildlife Resources Commission, Dare County Emergency Management, and the US Air Force to complete the projects. The burns were used as an educational outreach for the hundreds of thousands of visitors to the Outer Banks through a video produced by Dare County. This may be viewed at <http://www.youtube.com/watch?v=aDcqlCwwGLY>.



The first burn was on NC Wildlife Resource land on Roanoke Island. The large marsh presents a significant fire hazard to the towns of Manteo and Wanchese. Marsh fires have the ability to move quickly when started and threaten many structures. The marsh is recommended to be burned every 3-4 years. It had not been burned in several years due to the difficulty of coordinating resources and securing funds. Completing the burn took several attempts due to weather and a large portion was done through very difficult ground and boat work due to the unavailability of aerial resources.

The second burn was in Nags Head Woods, managed by The Nature Conservancy. Nags Head woods is one of the few remaining Maritime Forests on the NC Coast. It is an endangered ecosystem that is quickly disappearing due to developmental pressure. Nags Head Woods is also a significant WUI threat due to the large number of homes that border the woods. NCFS responds to several woods fires in this area due to power lines and children. The burn that was conducted was the first prescribed burn executed in Nags Head Woods. Completing the marsh burn, adjacent to the wooded area, was the first step in re-introducing fire into the wooded tract. This coming season the NCFS and TNC will conduct the first in-stand burn in Nags Head Woods. This is a major accomplishment to reintroduce fire into this unique natural area.

Rob Shackelford does not have an Assistant County Ranger. He is a one man county. He coordinated these burns by following through the entire CWPP process, and working to implement the recommendations. These burns are in high profile locations in areas that are not regularly burned. Rob gained the trust and confidence of local agencies and managers to support these projects. His continued efforts, working over several years, were the sole reason these projects came to fruition.

Eddie Bridges Wins Prestigious Wildlife Conservation Award

RALEIGH, N.C. — Eddie Bridges, a long-time conservationist and advocate of North Carolina’s wildlife and wild places, recently received the Thomas L. Quay Wildlife Diversity Award, one of the most prestigious awards given by the N.C. Wildlife Resources Commission.

The Commission presents the award annually to individuals who make outstanding contributions to wildlife diversity in North Carolina and who are considered leaders in wildlife resources conservation.

Bridges, of Greensboro, accepted the award, along with plaque and a framed print of a Sandhills longleaf pine forest, from Commission Executive Director Gordon Myers at the agency’s business meeting in Raleigh.

“It is an honor and a privilege to present this distinguished award today to Eddie — a true conservationist who has worked tirelessly to ensure that future generations of North Carolinians have opportunities to enjoy the abundance and diversity of wildlife and wildlife habitats that we enjoy today,” Myers said.

Bridges, who founded and voluntarily serves as the executive director of the [North Carolina Wildlife Habitat Foundation](#), is well known in conservation circles for his dedication and enthusiasm to conserve and protect wildlife habitat in the Tar Heel state. Under Bridges’ leadership, the Foundation has raised nearly \$4 million in donations and has funded more than \$1 million of wildlife conservation programs and projects, such as rebuilding quail populations, enhancing fish habitat around piers and restoring Willow Pond, a public waterfowl-viewing site located in Harkers Island. Through its Adopt-An-Acre Program, the Foundation has purchased more than 200 acres of prime wildlife habitat that will be added to the Commission’s North Carolina Game Land Program.

Bridges is a former Wildlife Commissioner, appointed by Gov. James B. Hunt in 1977. He served on the Commission board for 12 years, during which time he created the N.C. Wildlife Endowment Fund, also known as the “Eddie Bridges Fund.” Since its inception in 1981, the endowment fund has generated nearly \$150 million for wildlife conservation work across the state. It is a “401(k)” for wildlife that has been duplicated by more than 30 states across the nation and has provided the Commission with money to fund critical projects that enhance hunting, fishing, trapping and other outdoor recreational pursuits.

Bridges also was instrumental in the creation of two other programs that have benefited North Carolina’s wildlife and habitats — the North Carolina Waterfowl Conservation Stamp and Print Program and the North Carolina Tax Check-off for Nongame and Endangered Wildlife. Funds from the stamp and print program help conserve, protect and enhance waterfowl habitat in North Carolina while donations to the North Carolina tax check-off fund projects that conserve and



Commission Chairman David Hoyle (left) and Commission Executive Director Gordon Myers (right) present Eddie Bridges with the prestigious Thomas L. Quay Wildlife Diversity Award.

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protect nongame wildlife and their habitats.

The Thomas L. Quay Wildlife Diversity Award is the latest in a long line of prestigious awards given to Bridges over the years. These include the Chevron Conservation Award in 1989; the Sol Feinstone Environmental Award in 1991; the N.C. Wildlife Federation's Governor's Award of Excellence in 1993 as the North Carolina Conservationist of the Year; the National Budweiser Conservationist of the year; the Wildlife Federation's Hall of Fame in 2004; Field & Stream magazine's Conservation Hero of the Year in 2012; and most recently, the Governor's Order of the Long Leaf Pine in 2013.

"I appreciate being the recipient of this award," Bridges said. "Not because of anything I may have accomplished, but because of the namesake of this award, a man who was a true conservationist, someone who believed in giving back, who provided so much for future generations and wildlife."

Bridges is the eighth person to receive the honor. The first recipient was Dr. Quay himself, a former professor of zoology at N.C. State University and self-described "full-time volunteer and unpaid environmental activist." Quay, who passed away in April 2012, served on a variety of conservation boards while lobbying state agencies for various environmental causes.

For more information about wildlife conservation in North Carolina, visit the Commission's [Conserving](#) page.

Kids in the Streams at Coweeta Summer Camp

by Sarah Farmer

Thanks to a partnership among the U.S. Forest Service, Macon County Schools, the University of Georgia, and the Coweeta Long-Term Ecological Research (LTER) Program, 30 young people in rural North Carolina recently enjoyed a week-long summer camp that had them searching under rocks for crawdads and salamanders, making animated podcasts, and testing stream waters for phosphate, nitrogen, and dissolved oxygen.



Camp attendees learn about stream ecology at Coweeta. Photo by Jennifer Love

The camp was hosted at the [Coweeta Hydrologic Laboratory](#) (Coweeta) in Otto, North Carolina, and was geared towards rising 5th to 7th graders. Jason Love, site manager of the LTER program, supervised the outdoor activities and Macon County educators Jennifer Love, Sara Shook and Katy Huscusson organized the camp.

"The camp was a nice balance between hands-on outdoor learning and classroom activities," says Love. "Going out to a clear mountain stream, turning over rocks and catching aquatic insects, and then going inside to look at the live

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specimens under a microscope gives the students a much more meaningful educational experience than simply reading about these insects in a textbook.”

The camp wasn't just about acquiring new information. “It's important for students to explore creative ways of communicating what they learn,” says Love. On the first day of each week, campers met with Katie Gregg, a graduate student at the University of Georgia School of Art, to learn how to produce animated podcasts. Using iPads provided by Mountain View Intermediate School, students synthesized some of the topics that they learned about into video format, using an animation technique called “stop motion.”

The camp represents just one of the many opportunities for public and youth engagement in the research taking place at the Coweeta Hydrologic Laboratory. Funded by the National Science Foundation, the **Coweeta Schoolyard LTER Program** is yet another way the Coweeta LTER is promoting direct learning experiences about long-term ecological studies to elementary, middle, and high school students, as well as their instructors. Because of the presence of the Coweeta Hydrologic Laboratory, Macon County youth get the opportunity to learn more about the unique area they live in as well as explore the possibilities of careers in science, technology, engineering, and math.

-Adapted from information supplied by Ben Woodward and article published July 5 in the Franklin Press.

For more information about the camp, or about the Coweeta Long-Term Ecological Research Program, email Jason Love at jplove@uga.edu

For more information about Coweeta Hydrological Laboratory, email Cheley Ford Miniati at cfminiat@fs.fed.us.

Students ditch electronics for the great outdoors

By NANCY TANKER
Times-News Staff Writer

“People come from all over the world to visit the Blue Ridge Mountains, but lots of Henderson County school kids have never even been on the Blue Ridge Parkway,” John “Dock” Dockendorf, director of Camp Pinnacle in Flat Rock, said on a sunny Thursday morning.

Behind him, about two dozen sixth-graders from Hendersonville's only charter school, Mountain Community School, laughed and cheered on each other at the camp's climbing wall.

In addition to being an overnight camp, Camp Pinnacle has a special three-day program for sixth-, seventh- and eighth-graders operated through its sister organization, Adventure Treks. The program serves 13 private schools from Florida to Ohio, as well as Mountain Community.

Dockendorf is on a mission to give school children a solid outdoor education while instilling self-reliance, resilience and “a sense of their place in our nature world,” he said. “If kids aren't outside, how do they know how our planet works? How do they know about the natural resources in our county? How do they know where their water comes from? Lots of kids know about the rainforest, but they don't know about the forest out their back door.”

Sixth-grader Angelica Hernandez said she had never been on the Blue Ridge Parkway until Wednesday, when she

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and her fellow classmates hiked to the top of Black Balsam, a 6,200-foot peak.

“You feel like you can touch the clouds!” she said. “My favorite part was the view. We would stand on this rock and see all of the mountains and the shadows the clouds made. I think nature is so pretty.”

Fellow sixth-grader Preston Jacko said it was “great just to get out into nature and enjoy what it has to offer.” It also was his first time on the Parkway, he said. “When you reach the peak of the mountains, you can see everything.”

After climbing Black Balsam, the sixth-graders visited Sliding Rock, a natural rock slide with a 6-foot deep pool at its base.

“At Sliding Rock, we got to hang out with the counselors and friends” between dips in the mountain water, said sixth-grader Torrie Hall. “The counselors taught us that you always need to be safe, and they taught us a lot about plants and nature. They taught us which plants were poisonous and which weren't.”

On Thursday the group met at Camp Pinnacle's climbing wall for confidence-building and team-building exercises. On Friday, a rafting trip down the Nantahala River was scheduled.

The trips are more than just outdoor fun, Dockendorf said. “On a deeper level, we're building non-cognitive skills ... including communication, collaboration, creativity, critical thinking and leadership,” he said. “These are all skills that are better taught outdoors. Kids learn how to lead on a trail, set up a meal, and control a raft together.”

The Adventure Treks curriculum varies depending on the grade level, he explained. Sixth-graders enjoy three days of science-based outdoor education including an overnight camping trip at Camp Pinnacle. Seventh-graders also enjoy those three days of outdoor learning but camp off-site one night along the Blue Ridge Parkway. Eighth-graders enjoy a three-day backpack trip from the Fish Hatchery to Black Balsam (or vice-versa) along the Art Loeb Trail.

Jacko made it three-quarters of the way to the top of the climbing wall on Thursday. “It made me feel like I can do a little more than I thought,” he said. “I thought if I can climb this wall, then how hard can a research project (at school) really be? Plus, I saw a deer at Black Balsam. That was pretty cool.” Jacko said he didn't know how the kids were all “surviving without our electronics. Electronics have taken over. It definitely feels weird not to have them with us.”

Scout Westphal agreed, adding that Adventure Treks was “all about getting to know each other” without the distractions of digital devices. “I got barely any sleep last night” during overnight camping at Camp Pinnacle. “I heard like six owls. We made pancakes, too.” His favorite part was Sliding Rock, where “it was really fun, and after a while you got used to the water and forgot how cold it was.” At the peak of Black Balsam, Westphal was stunned at the views. “And I saw a hawk!” he added. “It felt like I was on top of the world.”

That's music to the ears of Neil Rudis, Adventure Treks' educational program director. “The most important thing is that these kids get to see their backyard in a different way,” he said. “It gives them a sense of place.”

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Mountain Community School students enjoy camp activities at Camp Pinnacle Thursday.

Photo by Patrick Sullivan/Times-News



Annual Upland Hardwood Silviculture Course at Bent Creek Over 20 Years of Science Delivery to Foresters in Upland Hardwood Forest Management

by Julia Kirschman

Foresters and resource managers from five states attended the annual **Upland Hardwood Silviculture Course** at the **Bent Creek Forestry Research and Training Center** in Asheville, North Carolina this July.

The Southern Research Station (SRS) **Upland Hardwood Ecology and Management unit** offers this course to foresters, land managers and other natural resource professionals to convey the latest information on practices and research results needed to manage upland hardwood forests.

Thirty participants from five different State Forestry Agencies, U.S. Army Corps of Engineers, USDA Natural Resources Conservation Service and one university attended the workshop. This year's workshop was a pared down version of the week-long workshop offered for over 20 years. By shortening the workshop length and keeping costs within state agency budgets, more participants were able to attend.

Practicing foresters and natural resource managers learned about current research and methods to practice science-based forest management in upland hardwood forests. Five SRS research foresters and ecologists, professors from Clemson and Kentucky, and one technology transfer specialist assisted in the 3-day program. A combination of indoor lectures, field tours to research areas in the **Bent Creek Experimental Forest** and state Game Land, and field exercises encompassed topics including: the purpose of silviculture, silviculture terminology, forest site classification, environmental gradients and forest composition, silvicultural systems, regeneration ecology, forest food resources for wildlife, markets and economic constraints, artificial regeneration and American chestnut restoration, low quality stands, REGEN model, effects of fire on wildlife and forest vegetation and fuels.

Participants were also treated to a special forestry tour of the Biltmore Estate by the Biltmore Company's Bill Alexander.

What began as a request from state agencies for training on upland hardwood forest silviculture and management continues to educate professional foresters more than 20 years later, giving them current knowledge and methods to meet their land management and restoration goals.

For more information, email Julia Kirschman at jekirschman@fs.fed.us.



*Participants at recent upland hardwoods course at Bent Creek Experimental Forest.
Photo by Julia Kirschman.*

Bent Creek Experimental Forest

First in the East

After World War I, when the Forest Service sought to establish an experimental station on a site that represented the diversity of the Southern Appalachian Mountains, the Bent Creek area of western North Carolina seemed the logical choice. Named for a bend in the creek near the French Broad River, Bent Creek typified the upland hardwood forests that spread across much of the region. In 1925, the Forest Service established the area that officially became the **Bent Creek Experimental Forest** (Bent Creek) on 150 acres set aside from the **Pisgah National Forest** to conduct research on forest regeneration, erosion control, and to demonstrate forest management practices.

In 1927, the Forest Service expanded the experimental forest from 150 to 1,100 acres, and in 1935, shifted another 5,200 acres of national forest land to Bent Creek, bringing the acreage to about 6,300. In the 1940s and 1960s, parts of the experimental forest were removed for recreational use and a major road project, bringing today's total to almost 6,000 acres.

In the early 1930s, the Civilian Conservation Corps, a New Deal work relief program, built the 4-mile Hardtimes Road that still winds through the experimental forest. At the same time, other New Deal workers constructed 13 buildings including 4 laboratories, a bunkhouse, 2 garages, a rangers house, and an insectory. These now rustic buildings were built with hand-hewn chestnut beams and white oak shingles. Nearly all of Bent Creek's original buildings still stand today.



Frothingham at Biltmore.

Earl H. Frothingham, the first director of the **Appalachian Forest Experiment Station**

that predated the **Southern Research Station**, played an important role in establishing Bent Creek and guided its early research on rehabilitating and regenerating degraded hardwood stands. He divided Bent Creek into dozens of “research compartments” with boundary markers and plans for managing and studying each. Researchers also established 40 plots to conduct research ranging from reforestation planting to the effects of prescribed burning. Besides forest management and timber production, research began on erosion control, insects (southern pine beetle), and diseases such as chestnut blight.

Like scientists at other Forest Service stations across the country, Bent Creek researchers sought methods for preventing and eliminating forest fires. Bent Creek scientists developed a fire danger measurement rating system that, by the late 1940s, was used at 420 stations in 24 eastern and southern states.

Around 1960, research at Bent Creek expanded to build on a more ecological approach to forest systems. Rising concerns about the environment in general meant that social acceptance of timber management methods, whether even-aged, two-aged, and uneven-aged (group selection), would become more important. Research on growth and yield in-

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cluded effects of thinning on understory plants and wildlife food sources.

While Bent Creek scientists studied some artificial regeneration, research on natural regeneration methods dominated the program. Much of the regeneration research turned to even-aged methods, but some uneven-aged hardwood regeneration research continued. Research on smaller plots replaced tests on large-scale sites because larger areas did not provide the detail required to understand site-specific ecology. Regenerating red oak on high-quality sites, growth and yield of yellow-poplar stands, and other long-term studies began. By the 1960s, it was clear to researchers that yellow-poplar would almost always outgrow oak on good-quality sites. The challenges of regenerating oaks on good or excellent sites became the focal point of most of the regeneration research at Bent Creek.

Since 2007, **Katie Greenberg** has served as project leader of the **SRS Upland Hardwood Ecology and Management Research** unit that includes Bent Creek and subteams in Arkansas, South Carolina, and Tennessee. The unit has positioned itself to expand Bent Creeks research on upland hardwood ecosystems to the regional level.

Shortleaf Pine: A Species Slipping Away?

by **Sarah Farmer**, *SRS Science Delivery Group*



Shortleaf pines crooked root collar (right) protects it from fire. Loblolly doesn't have a crook (left), and shortleaf-loblolly hybrids have an inconspicuous crook that doesn't confer fire tolerance.

Photo by Curtis Lilly.

Rodney Will and **Curtis Lilly** led the study, which was partially funded by the Forest Service Southern Research Station (SRS). SRS scientists **James M. Guldin** and **C. Dana Nelson** also contributed to the study and to the [article reporting the results published in *The Journal of Forestry*](#).

Both shortleaf and loblolly pine are native to the southeastern United States, where the two species have coexisted and occasionally hybridized for millennia. Historically, hybrids were rare. In the 1950s hybrids made up just 3 percent of the pines in shortleaf stands, but since then their numbers have skyrocketed. Today, just two or so generations later, shortleaf stands contain on average 45 percent hybrids.

Scientists from the U.S. Forest Service and **Oklahoma State University** recently collaborated to review decades of research about the causes and implications of shortleaf-loblolly hybridization. University researchers **Charles Tauer**, **John Stewart**,

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The researchers found that hybridization is threatening both species, but especially shortleaf pine. When hybrid offspring cross with their parents over generations, the genetic identity of one or both original species begins to change. Hybrids may look similar to a parental species, and under some environmental conditions may thrive, but they may also compromise the unique ecological attributes that allowed the parental species to survive. In essence, hybridization averages the traits of the parent species in the hybrid progeny, which means some of the genetic uniqueness of the parent species is lost across generations.

For example, shortleaf-loblolly pine hybrids may not be as tolerant of fire as pure shortleaf pines. Shortleaf pine seedlings have a crooked root collar that grows below ground and protects dormant buds from fire, enabling young trees to re-sprout even if the top part is killed. Loblolly pine seedlings, which are vulnerable to fire, do not have this crook at all; loblolly-shortleaf hybrids have inconspicuous crooks, and are not able to resprout after fire like pure shortleaf.

On the other hand, loblolly has more rapid early growth rates than shortleaf, as do hybrids. Loblolly pine's fast growth and versatility have made it the backbone of the South's timber industry since the 1930s and the focus of southern pine tree improvement programs for over 50 years. Loblolly pine has been intensively managed and widely planted, and is now far more common than shortleaf pine. There was a time when shortleaf pine was actually more abundant than loblolly pine, but those days are gone. By some estimates, the acreage of shortleaf pine in southern forests fell by more than 40 percent in the 20th century. The shrinking shortleaf population may have already lost genetic diversity, making further study of genetic diversity and population structure an urgent priority.

Fortunately, managers who want to maintain the original genetics of shortleaf pine have several options. Prescribed fire can reconnect isolated shortleaf pine stands, increase regeneration success, and under certain conditions kill young shortleaf-loblolly pine hybrids. Additionally, a distance of just a few miles between shortleaf pine stands and loblolly stands or plantations can drastically lower hybridization. "Shortleaf pine is a species worth protecting," says Guldin. It's a beautiful native tree, and we anticipate that it will be more resistant and resilient than loblolly pine under the hot, dry weather that tomorrow's climate may bring us."

For more information, contact James M. Guldin at jguldin@fs.fed.us

Upcoming Events

2013 NCFA Annual Meeting

October 2-4, 2013 - Doubletree Hilton Riverfront in New Bern. The room rate for NCFA members is \$139.

NC Tree Farm Annual Meeting, November 2, 2013 at Batts Family Tree Farm, Macclesfield, NC.

North Carolina Wood Exports Conference, November 13-15, 2013 at New Bern Riverfront Convention Center, New Bern, NC.

CONSERVATION

Mixed Results For Land Conservation at N.C. Legislature

Posted by Reid Wilson

The state budget and tax reform legislation, passed by the N.C. General Assembly this summer, produced a mix of good news and discouraging news for land conservation. In the biennial budget, legislators provided roughly stable funding for the state's four conservation trust funds, and merged two of the trust funds into one. However, the budget eliminates the longstanding dedicated revenue source (a small portion of the deed stamp tax) for conservation projects. And, the tax reform measure repeals the state income tax credit for landowners who donate land or easements for conservation purposes, as of December 31, 2013.



As a member of the Land for Tomorrow coalition steering committee, Conservation Trust for North Carolina (CTNC) took a lead role in educating legislators about the health, economic, and environmental benefits of land conservation. Without Land for Tomorrow's concerted efforts, the budget bill in particular could have been significantly less positive for conservation. CTNC thanks all of those who communicated with their legislators as part of this effort. The details are as follows:

- Provides \$24 million to the Clean Water Management Trust Fund (CWMTF), \$24 million to the Parks and Recreation Trust Fund (PRTF), and \$3.4 million for the Agricultural Development and Farmland Preservation Trust Fund (ADFPTF) over the two-year budget cycle.
- Eliminates the dedicated source of revenue (a small portion of the deed stamp tax) for land conservation. This reliable source of funding helped create and expand numerous state parks and conserve other natural areas.
- The tax reform bill repeals the N.C. Conservation Tax Credit. North Carolina was the first state to create a conservation tax credit, and during its existence it helped conserve over 230,000 acres of forests, stream banks, farms, wetlands, wildlife habitat, and other natural areas. It leveraged considerable outside funding, protecting properties at a fraction of the cost of outright land purchases. PLEASE NOTE: If you are a landowner considering donating land or a conservation easement, please contact your local land trust immediately because the tax credit expires December 31, 2013!
- Streamlines the state's trust funds by merging the Natural Heritage Trust Fund (NHTF) into CWMTF, and increases the focus of the newly combined fund on land conservation projects.
- Removes operating costs for parks from PRTF and assigns those costs to the state's general fund, allowing PRTF to use more dollars to support its mission.

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- Further increases funding available for conservation by allocating to the general fund the repayment of previously incurred debt by CWMTF, (former) NHTF, and PRTF.
- The tax reform measure preserves the complete deductibility for charitable contributions, which had been at risk.

CTNC is also encouraging people to help build on this budget next year by educating legislators about why they care about conservation and support increased funding and tax incentives. You can sign up for their action alerts and e-newsletter to stay up-to-date on conservation policy and make your voice heard. There are more budget details below:

The Clean Water Management Trust Fund

- Receives \$10.4M (recurring) in FY 2013-2014, and \$13.7M (recurring) in FY 2014-2015. In last year's budget CWMTF was a non-recurring item.
- Receives the revenue from license plates that was going to NHTF, approximately \$4M per year.
- CWMTF and NHTF combined annual debt service of \$6M is not paid out of the trust fund, and is instead paid out of the state's General Fund.
- The cap on land acquisition inserted in the House version of the budget has been removed; meaning all of the available funds can be used for acquisition.
- \$1.3M in the first year and \$300K in the second year is diverted for a "pilot project" exploring aeration technology on Jordan Lake.

The following purposes from the NHTF have been added to the CWMTF purposes

- To provide buffers around military bases or for State matching funds for the Readiness and Environmental Protection Initiative, a federal funding initiative that provides funds for military buffers.
- To acquire land that represents the ecological diversity of North Carolina, including natural features such as riverine, montane, coastal, and geologic systems and other natural areas to ensure their preservation and conservation for recreational, scientific, educational, cultural, and aesthetic purposes.
- To acquire land that contributes to the development of a balanced State program of historic properties.
- Wastewater infrastructure projects, which have historically received about one-third of the available CWMTF money, have been removed from the CWMTF purposes, freeing up more money for the remaining functions (mostly land conservation and stream restoration).
- The existing 21 CWMTF trustees are all dismissed, and a new board of 9 members is created.
- CWMTF, which has operated quasi-independently from the Department of Environment and Natural Re-

(Continued on page 15)

sources, is now moved entirely within the department. Among other changes, this means the DENR Secretary, rather than the CWMTF board, will hire and fire the Executive Director.

- The Natural Heritage Program, which received no funding in the House budget, receives \$750,000 of the funds appropriated to the CWMTF.
- Non-profit conservation organizations are eligible to apply directly to CWMTF (which had been the case with CWMTF before, but had not been the case with NHTF, so now land trusts can apply directly for projects that fulfill NHTF functions within CWMTF).

The Parks and Recreation Trust Fund (PARTF):

- Receives \$11M (recurring) in FY 2013-2014, and \$13M (recurring) in FY 2014-2015.
- PARTF's annual debt service of approximately \$7M will not be paid out of the trust fund, and is instead paid out of the state's General Fund.
- PARTF will no longer have to cover the \$6M in Parks operating expenses that was taken out of the trust fund in recent years.
- The PARTF board is reduced from 15 members to 9 members.
- The Agricultural Development and Farmland Preservation Trust Fund:
- A non-recurring \$1M reduction is offset by an additional \$1M in Tennessee Valley Authority (TVA) settlement funds, maintaining the current funding level at \$1.7M per year. The \$1M from TVA must be spent in mountain counties.

The Wildlife Resources Commission

- General Fund support is reduced by \$4M recurring in both FY 2013-2014 and 2014-2015, plus an additional non-recurring reduction of \$2M in FY 2013-2014 (for a total of \$6M reduction in 2013-2014).

Certification System Looks To Expand Acreage In North Carolina

The American Tree Farm System (ATFS) is working on-the-ground with local partners to expand ATFS certified forest acreage in North Carolina. Some of North Carolina's preeminent forest companies have joined together to support the state's sustainably managed family-owned forests. The partnership comes at a critical time when threats to private forestland are growing.

Thanks to the contributions of the companies now involved, an outreach campaign is now being conducted to inform Forest Stewardship Program participants about the opportunities and benefits associated with ATFS certification. "North Carolina's forest products industry contributes over 67,500 jobs to the economy. The expansion of the certified family forest base supports local jobs in the green economy and also serves as a source of sustainable local wood for building and other materials," said Tome Martin, President and CEO of the American Forest Foundation. Read more here: <http://www.prweb.com/releases/2013/9/prweb11090135.htm>.

Pesticide Risk Assessment for Pollinators: Summary of a Society of Environmental Toxicology and Chemistry (SETAC) Pellston Workshop

Worldwide declines in native and managed pollinators have led to an increased global dialogue and focus concerning the potential factors that may be causing these declines. Although a number of factors have been hypothesized as potential contributors to pollinator declines, at this time, no single factor has been identified as the cause. The available science suggests that pollinator declines are a result of multiple factors that may be acting in various combinations. Research by Bayer CropScience LP, Research Triangle Park, North Carolina, USA is being directed at identifying the individual and combined stressors that are most strongly associated with pollinator declines.



To see the whole assessment: http://c.ymcdn.com/sites/www.setac.org/resource/resmgr/publications_and_resources/executivesummarypollinators_.pdf?hhSearchTerms=SETAC+and+Pellston+and+Workshop

Wildlife Commission Maps Armadillos' Expanding Range in North Carolina

RALEIGH, N.C. — The N.C. Wildlife Resources Commission is asking the public to help document observations of nine-banded armadillos, as the bony-plated mammals expand their range in this state.

The public may report observations of armadillos by contacting Extension Wildlife Biologist Ann May at 919-707-0068 or ann.may@ncwildlife.org.

The nine-banded armadillo is about the size of a house cat or opossum and it has a gray to brownish-gray body with narrow, jointed armor bands on its midsection. It feeds primarily on invertebrates, including insects, snails and earthworms. Depending on temperatures, the armadillo can be nocturnal, crepuscular or even active during the day.

The first confirmed armadillo sighting in North Carolina occurred in 2008. The Wildlife Resources Commission allows armadillos to be hunted year-round **with no bag limit**. Armadillos can be trapped during the **regulated trapping season**.

“Whether armadillos continue spreading beyond their current range will be largely determined by climate,” said Colleen Olfenbuttel, a Commission wildlife biologist. “Mild temperature conditions are good for armadillos. Since they lack thick insulation and must dig for most foods, freezing conditions can cause them to starve or freeze to death.”

Native to Central and South America, armadillos were first recorded in Texas in 1849 and have since expanded their range north and east, crossing the Mississippi River sometime in the early 1940s,



An armadillo reacts to danger primarily by springing into the air and fleeing rapidly — it cannot roll into a ball, as some have imagined. This reaction tends to be fatal to the armadillo when the danger is an oncoming vehicle. Armadillos' primary predators are feral pigs, black bears, bobcats, coyotes, dogs, foxes and raccoons.



(Continued from page 16)

appearing in western Tennessee in 1980.

Armadillos can carry - and transmit - leprosy. Although the number of armadillo-to-human transmitted cases is quite low, according to the [U.S. Centers for Disease Control and Prevention](#), Olfenbuttel recommends minimizing exposure.

“Just as you should wear gloves when handling any wild animal, you should wear gloves if you are handling a

live or dead armadillo, or gardening in an area frequented by one, since its waste carries the bacteria that leads to leprosy,” Olfenbuttel said. “Other than the slight disease risk, an armadillo is not dangerous.”

North Carolina's Emerging Forest Threats ***Management Options for Healthy Forests***

Forest landowners are seeing increased pressure from threats like fire, insects, disease, extreme weather, and drought on their land and resources. The last decade has brought record droughts to North Carolina, increasing wildfires, expanding insect and plant invasions, and more intense hurricane and tornado events. Scientists predict increases in temperature and changes in rainfall patterns that can make these threats occur more often, with more intensity, and/or for longer durations. However, there are forest management strategies that can be used to decrease the risk from these threats.

FOR MORE information on management options for your woodlands:

Contact your County Ranger or the N.C. Forest Service Central Office at 919-857-4801

<http://ncforestservice.gov>

http://ncforestservice.gov/Managing_your_forest/pdf/

[EmergingThreatsHealthyForestMngtOptionsNC.pdf](#)



AMERICAN HIKING SOCIETY'S

National Trails Fund

Apply Nov 1 - Dec 13

Learn how your hiking club can apply for a trail building grant.

American Hiking Society's National Trails Fund is the only privately funded, national grants program dedicated solely to building and protecting hiking trails. Created in response to the growing backlog of trail maintenance projects, the National Trails Fund has helped hundreds of grassroots organizations acquire the resources needed to protect America's cherished hiking trails. To date, American Hiking Society has funded **174 trail projects** by awarding over \$500,000 in National Trails Fund grants.

Prerequisites for application

- Only non-profits with 501(c)(3) designations are eligible to apply.
- Only AHS Alliance Members are **ELIGIBLE** to apply - click here to join/renew your Alliance Membership.
- Your organization must submit its application by 4:00 PM (EST) on December 17, 2013. Late submissions will not be accepted under any circumstance.

Instructions

Please follow all instructions in the following weblinks before submitting a National Trails Fund grant application on behalf of your organization.

- [Read & Download Grant Guidelines](#)
- [Read & Download Grant Checklist](#)
- [Preview Application Questions](#)
- [Apply](#)

Case Studies

- [NTF 2013 Grant Winners](#)
- [Previous Grant Winners](#)
- [Grant Recipients 2012 - Fill Out Final Report](#)

Help & Support

- [Frequently Asked Questions](#)
- [Contact us about Organizational Membership or the National Trails Fund](#)

National Trails Fund awards are made possible by generous support from [L.L.Bean](#), [MSR](#) and [Therm-a-Rest](#), the program's charter sponsors.



Vintage Firefighting: Taming the Flames



Circa 1955: Group of fire fighters pose with N.C. Forest Service pickup truck in front of an agricultural field with smoky woods behind it. Men have water packs, pitchforks and other hand tools. (USDA Soil Conservation Service)



August 1936: Part of the fire-ridden area where CCC boys from the Lo poc, Arroyo Grande and Pinto Lake camps fought to control a fire which blackened and laid bare 2430 acres of mountain land adjacent to the Santa Lucia National Park. (USDA Soil Conservation Service)



May 1939: The fire guard in the observatory on Mount Hale reporting fire to headquarters by telephone in White Mountain National Forest, N.H. (Bluford W. Muir/U.S. Forest Service)



July 1912: A lookout man on the peak of Black Butte using heliograph in California. (D.P. Godwin/U.S. Forest Service)

“People have always paid attention to fire,” said fire historian Stephen J. Pyne in an interview with Weather.com. “We’ve always needed to start fires and needed to control them.” Our ideas about suppressing wildfires have changed — in particular the use of controlled burns to prevent larger conflagrations — but how we suppress them has changed surprisingly little since the early 20th century.

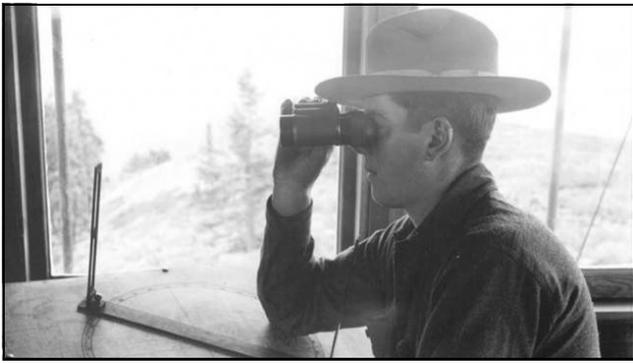
That’s when the United States got serious about fire management, Pyne said, with the 1905 creation of the [U.S. Forest Service](#). A series of big blazes of that century’s first decade, in particular the 1910 fires in the Rockies in which more than 80 firefighters died, spurred the country into action. “[The agency’s] response is really what begins the modern era of fire protection,” Pyne added.

For some perspective, this process began in Britain several centuries earlier, after the Great Fire of London in 1666. However, the [first formal Fire Brigade](#), according to U.K. Fire and Rescue, didn’t come about until 1824.

The British Empire was a something of a model for fighting fires, said Lincoln Bramwell, chief historian for the U.S. Forest Service, to Weather.com. But even more so, determining proper techniques for battling blazes was about trial and error. “It’s pretty daunting. A wildfire by its name is something that’s wild,” he added. “To this day, we don’t have anything that can really stop a large wildfire. We just try to direct it or sometimes just get out of the way.”

Advances in equipment and policy have helped.

In the 1800s, everything was done by hand. “They didn’t have any motorized stuff,” Kenneth F. Soderbeck, a fire apparatus restorer, told Weather.com. “They would have a hand pumper and usually a hand-drawn hose reel, which would carry the hose for the pumper.” Horse-drawn trucks gave way to steam engines, which lead to motorized vehicles. Today’s fire trucks can pump 2,000 gallons of water per minute; back then, it was 500 gallons per minute, max.



September 1933: A Civilian Conservation Corps boy serving as relief lookout at Peg Leg Lookout Station, Lassen National Forest, Calif. (Daniel Sheehan/U.S. Forest Service)



Circa 1933: A fire-suppression crew on a California National forest. (Daniel Sheehan/U.S. Forest Service)



July 1922: Fighting fires near Camp Angeles at Angeles National Forest, Calif. (L. A. Barret/U.S. Forest Service)



May 1938: Training for the one-lick fire method in California. Using this system, a fire line is created to prevent a wildfire from spreading. (U.S. Forest Service)

January 1959: New fire lookout on Mount Bigelow, Santa Catalinas, Coronado National Forest, Ariz. (Starr Jenkins/Forest History Society)



August 1920: A forest ranger holding a messenger pigeon used for fire messages on Deschutes National Forest in Oregon. (F.W. Cleator/U.S. Forest Service)



June 1940: Smokejumper soon after leaving plane with the pilot parachute completely distended at Lolo National Forest, Mont. (K. D. Swan/Forest History Society)



May 1938: One man fire practice in California. (U.S. Forest Service)



Firefighters getting ready to go out on fire line in the San Bernardino National Forest, Calif. (U.S. Forest Service/S. A. Nash-Boulden)



Circa 1930: Use of the knapsack hand pump in suppressing a fire at the Bent Creek Experiment Station in North Carolina. (C. F. Korstian/U.S. Forest Service)



August 1959: A TBM Torpedo Bomber releases 450 gallons of chemicals on a fire in White Mountain National Forest, N.H. (R.L. Strickenberg/Forest History Society)



Circa 1947: Railroad fire patrol at Kenai Lake Ranger Station, Ala. (Forest History Society)

(Continued from page 19)

There wasn't much by way of gear, either. Early uniforms were mostly for distinguishing firefighters in parades, Soderbeck said.

"Helmets were developed in the 1800s. And things like breathing apparatus, basic breathing apparatus were developed in the late 1800s," he added. "Those developed into better filtered masks in the 1900s." The end result is similar to what firefighters today use.

Fire management best practices, on the other hand, are still evolving. In the beginning of the 20th century, it was all about suppression. "Fire was not a good thing," Bramwell said. "Fire was something to be kept out of the woods." That was OK because back then it was wetter. During the past 50 years — and accelerated the past decade — it's stayed drier for longer periods of time, and there's less rainfall. "So what might have been a routine fire 10 years ago," Bramwell added, "has the potential to become a really large conflagration."

A National Cohesive Wildland Fire Management Strategy is in the works, Pyne said.

"It should clarify where are we putting our resources and money, and for what purposes." Even so, it won't change that we're looking at longer fire seasons or that we're putting much more money toward fire management and suppression (Bramwell said 50 percent of the U.S. Forest Service budget goes toward the latter).

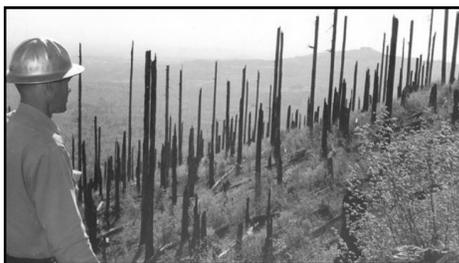
That's par for the course, according to Pyne, who said we'll never stop thinking about these burners. "We have a species monopoly over fire," he said. "Fire's what we do."



September 1908: Riding the trail on fire patrol, south of Bear Creek, Ore. (W.J. Lubken/Forest History Society)



Typical tree landing encountered by Forest Service smokejumpers. (Forest History Society)



A fire control administrative assistant and former Yacolt Burn project forester looks out over the sweeping panorama of devastation where trees will someday replace snags. (Forest History Society)



Circa 1896: Surface fire in Rock Pine near Hill City, S.D. (Henry Solon Graves/U.S. Forest Service)



June 1941: Smokejumpers about to bail out over Six-Mile Creek. (K. D. Swan/Forest History Society)



Circa 1923: Crew of men en route to fire at Pisgah National Forest, N.C. (E. S. Shipp/Forest History Society)



Circa 1916: Diagram to show how location of forest fires is determined by means of alidade protract. (C. L. Taylor/Forest History Society)



Circa 1938: A firefighter inspecting fire damage in the San Bernardino National Forest, Calif. (U.S. Forest Service)



Circa 1938: Fire Crew Practice in the San Bernardino National Forest in California. (U.S. Forest Service)



A ranger instructing Fire Control Foreman School in the San Bernardino National Forest, Calif. (U.S. Forest Service)

Culture

First in Forestry: Carl Schenck and The Biltmore Forest School Film Project

The Forest History Society is excited to announce we're co-developing a new documentary film about Carl Schenck and the Biltmore Forest School. *First in Forestry: Carl Schenck and the Biltmore Forest School* will be the first documentary film to examine the pivotal role that the Biltmore Estate's chief forester Carl Schenck and America's first school of forestry played in American conservation history. We hope you will consider supporting the production of this documentary film with a [donation](#).

The Story

In 1898 Dr. Carl Schenck, chief forester for George Vanderbilt's Biltmore Estate, established the first forestry school in America – the Biltmore Forest School. During its 15 years of operation, the Biltmore Forest School turned out nearly 400 graduates. Students spent a year in the woods studying forestry while doing hands-on, practical work to restore the Biltmore Estate's 100,000 worn-out acres. As Schenck noted with pride, "My boys worked continuously in the woods, while those at other schools saw wood only on their desks." Many of the school's alumni went on to play substantial and significant roles in shaping forestry in America by working as government or industry foresters or educating the next generation of foresters. Every graduate of the Biltmore Forest School credited their beloved Dr. Schenck with giving them the education and skills needed to succeed in the new science of forestry.

In addition to teaching the first generation of American foresters, Schenck wrote some of the first forestry textbooks ever used in America, advised other private landowners about forest management, and developed the Biltmore stick for measuring tree dimensions, a simple tool still in use today. Schenck's accomplishments were considered important enough by the federal government that it preserved the school's buildings



and grounds as the Cradle of Forestry in America National Historic Site. Yet Schenck and his contributions to American forestry and conservation tends to be overshadowed by his contemporaries Gifford Pinchot, Teddy Roosevelt, and John Muir. We feel that the best way to reach the largest number of people possible about Schenck and the Biltmore Forest School is with a PBS-quality documentary film.

The Film

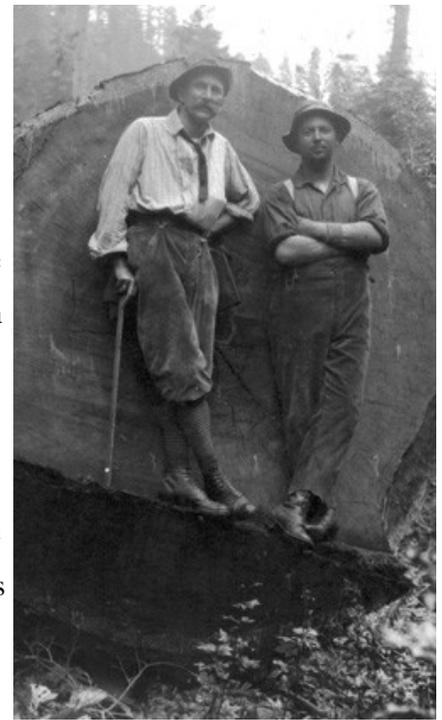
The Forest History Society, in collaboration with UNC-TV and the Cradle of Forestry Interpretive Association, proposes to organize, produce, and distribute a documentary film on Carl Schenck and the Biltmore Forest School. The

(Continued on page 23)

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film will provide a window onto American environmental history from roughly the 1880s through the 1920s, and conclude with a look at the Cradle of Forestry National Historic Site today.

At the heart of any good film is tension and drama, and the history of the Biltmore Forest School and its founder is a story spilling over with both: Schenck was a German forester trying to introduce a new science in America; he worked for forward-thinking men who sometimes couldn't rise above their petty grievances; he conducted operations at a place built by Industrial Revolution money yet run like a medieval fiefdom; and Schenck, the recent immigrant, battled with national conservation leaders over the future of America's forests. Schenck didn't shy away from a fight if he felt his principles and vision for under attack. This is a man who so angered Gifford Pinchot that Pinchot denounced him as an antichrist!



But every good documentary has larger themes and ideas. Some of those include:

- the Biltmore Estate and the birth of forestry in America;
- environmental restoration efforts on the Biltmore Estate and what became the Pisgah National Forest;
- philosophical differences regarding forestry education and forest management between Schenck, Gifford Pinchot, and Bernhard Fernow;
- Schenck's eventual dismissal by George Vanderbilt and Schenck's decision to take the forestry school on the road nationwide;
- Schenck's return to Germany in 1913 and service in the German army;
- Schenck's return to the United States in the 1950s and recognition of his role in developing the profession of forestry here.

In addition to being entertaining and informative, this film will serve many audiences and purposes. It's an effective way to educate the general public about the topic through PBS-sponsored broadcasts in North Carolina and beyond. It'll provide a basis for an online educational module in K-12 classrooms, or it can be used in college classrooms or for public screenings. Once completed, a shortened version of the film can be shown to visitors at the Cradle of Forestry Discovery Center on the Pisgah National Forest before they tour the school grounds. In sum, the film will be enjoyed for years to come in many different ways.

[How Can I Help?](#)

To help kick-start our fundraising for the documentary film, our historian Jamie Lewis ran the inaugural [From the Cradle to the Grave 30K Trail Race](#) on May 18, 2013, and then the next day ran the [Biltmore Estate 15K](#)—a total of 45 kilometers. Jamie called this effort "The Dash for the 'Stache" in honor of Carl Schenck's famous mustache.

Each of these races took place on the land where Carl Schenck worked and made history. We're suggesting a minimum donation of \$45—that's a dollar for every kilometer he ran—with all proceeds going to the production of the film.

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We have a donor who has pledged to match every dollar donated at a 1:1 ratio, so the more you give, the sooner we can begin production of *First in Forestry*: Carl Schenck and the Biltmore Forest School. So please tell your friends and help spread the word. Of course, any donation is welcome and appreciated.



To become a supporter of the film, visit our [Donation page](#). As a thank-you for giving at certain levels, we've established a few incentives.

- Those giving at the \$45 level will have their names listed on the film's Supporter web page;
- Those giving at the \$90 level or above will receive the above and have their name listed in the film's closing credits;
- Those giving at the \$180 level or above will receive the above and a complimentary copy of Carl Schenck's wonderful memoir *The Cradle of Forestry: The Biltmore Forest School 1898-1913*;
- Those giving at the \$360 level or above will receive the above and a complimentary copy of the film on DVD once it's produced.

We're very excited about showcasing Carl Schenck and his seminal work at the Biltmore, sharing it with you and other viewers in North Carolina and across the country, and introducing this important history to students of all ages.

[Thank you to our generous supporters.](#)

[About the Forest History Society and Documentary Films](#)

Established in 1946, the Forest History Society is the foremost library and archives in the world focused on forest and conservation history. We have a strong track record of research and publication in forest history and service providing access to our rich store of historical documents. The Society holds moving footage in its collections that is sought after by those doing documentaries, including the History Channel, PBS's *The American Experience* series, the Discovery Channel, and a variety of independent and public filmmakers. Some of this footage was used by the Society to produce two award-winning documentaries on forest history, [Timber on the Move](#) and [Up in Flames](#). More recently, the Forest History Society advised on and assisted in the production and distribution of [The Greatest Good: A Centennial History](#), the award-winning film about the history of the U.S. Forest Service that has enjoyed more than 8,000 showings on PBS stations around the country.

Many resources already exist to support the development and production of the film. These include the original memoirs of Carl Schenck held by the Forest History Society, which the Society has published as [The Cradle of Forestry: The Biltmore Forest School 1898-1913](#), as well as archival records of students and visitors to the Biltmore Forest School. A wealth of still photographs taken by Schenck and his students are held at the Forest History Society and at the N.C. State University Library. These resources were digitized with the help of two NC ECHO grants that funded a [collaborative project](#) between the Forest History Society, N.C. State University, UNC-Asheville, and the Biltmore Estate. The Forest History Society has a librarian (Cheryl Oakes), archivist (Eben Lehman), and historian (James Lewis) who can provide support to the project. James Lewis has published extensively on the topic.

Bio-Fuels

N.C. University Wins Grant for Biofuel, Biochar Project

By Chris Hanson



Researchers at Appalachian State University received \$45,000 from the North Carolina Agriculture Foundation to economically convert biomass to biofuel and biochar.

Professors David Domermuth and Ok-Youn Yu aim to develop the sustainable energy source to use in the absence of solar or wind power in addition to providing a potential revenue stream for farmers and forest owners. Yu, the co-principal investigator, explained the system is designed to be as simple as possible so farmers can easily adopt the technology.

The system is designed around three large vessels and currently uses propane gas to heat woodchips to produce pyrolysis oil, fuel gas and biochar. However, Yu noted they Plan on trying to use wood as a fuel source in future methods. The fuel gas produced by the technology is used to power a small engine, which can be used for electricity generation.

Yu explained one of the challenges of the study at the campus involves the logistics of securing feedstock. He said when the project is running low on woodchips, they have to work with a supplier to provide the material and wait for it to arrive, whereas farmers may already have waste wood or other material on-site.

Currently, the college plans to use bio volatilization technology's waste heat to warm its greenhouse at the Watauga County Landfill. Furthermore, the produced fuel gas will run a generator to produce electricity to illuminate the greenhouse during shorter daylight periods in winter. Research is set to continue throughout the upcoming months, with the goal of providing a sustainable energy source that can be used in the absence of sunlight for solar power or wind for turbine power. Once the process is optimized, the campus will host workshops to introduce and educate local farmers to the technology.



In addition to producing biofuel gas, the project also generates biochar, which can be used for soil management, and pyrolysis oil which usefulness will be studied later.

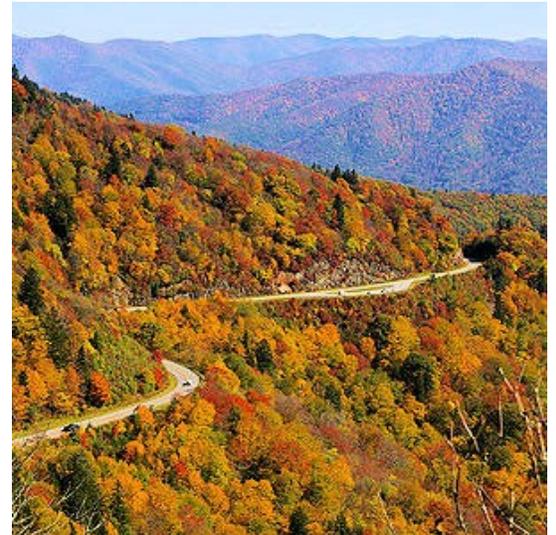
Ok-Youn Yu, Appalachian State University

Aesthetics

NORTH CAROLINA MOUNTAINS FALL LEAF COLOR FORECAST 2013

The number one question is: "When is the peak color?" No matter when you plan an autumn visit in October or early November, you can take a short drive on the [Blue Ridge Parkway](#) to find the best color of fall leaves. Elevation and weather are the biggest factors in the color show. Leaves begin their color change on the highest peaks and gradually work down to the lowest elevations. An early frost speeds up the show and warm weather prolongs it. Below is our best guess of the progression of the color show:

- **October 3-12:** Highest elevations north of Asheville above 5,000 feet show the most color, especially in the Mount Mitchell, Craggy Gardens, Grandfather Mountain, Beech Mountain and Rough Ridge areas.
- **October 9-18:** Color will increase in elevations greater than 4,000 feet, including the Mount Pisgah, Black Balsam, Devil's Courthouse, Waterrock Knob and Graveyard Fields, southwest of Asheville on the Blue Ridge Parkway. It will also be peak color in the Highlands area, including Whiteside Mountain, with plenty of waterfalls to enjoy, and the Great Smoky Mountains National Park, including hikes to Alum Cave and Chimney Tops.
- **October 15-23:** Many of the surrounding mountains around Asheville show plenty of color, especially in the 3,000-4,000 foot elevation range. Take the Parkway north or south from Asheville. A great hike in Pisgah National Forest would be Looking Glass Rock or Cradle of Forestry. North of Asheville, head to Linville Gorge with hikes to the top of Table Rock and Hawksbill Mountain.
- **October 20-29:** The city of Asheville (2,000 feet elevation) shows the brightest colors, along with areas around Hendersonville and Brevard. This is the perfect time for a waterfall hike in DuPont State Forest or leisurely walk at the NC Arboretum. This is also the peak leaf color for Biltmore Estate.
- **October 25-November 4:** The color show concludes in the Chimney Rock area (elevation of 1,300 feet). Ride to the top of Chimney Rock or take a boat tour on Lake Lure.



See our mile-by-mile [Blue Ridge Parkway Guide](#).



Whitewater rafting offers a unique experience for viewing autumn leaves deep within river gorges that flow through national forests. See our [Asheville Whitewater Rafting Guide](#).



Hike to DuPont State Forest waterfalls. See our [Top 40 Waterfalls](#). Click to see a glimpse of Fall colors along the Blue Ridge Parkway at [Linn Cove Viaduct](#) and [Rough Ridge](#). See more of our [YouTube Asheville videos](#).

- Also see our favorite [Scenic Drives](#), [Motorcycle Drives](#), [Mountain Views](#), and [Pet-Friendly](#) guides.
- Take your camera. The warm light of the early morning or late afternoon can create especially dramatic images. [Find the best mountain views](#).
- Bring binoculars for bird watching to bringing a distant picturesque view a bit closer.
- For ideas on outings to combine with your leaf watching, see our [20 Romantic Outings](#).

THE SCIENCE BEHIND THE LEAVES COLOR CHANGE

Provided by [Nantahala Outdoor Center](#)

Our bioregion in the North Carolina mountains is scientifically known as a ‘temperate broadleaf mixed’ forest. This is one of the most diverse ecosystems on earth. When enjoying the seasonal spectacle known as fall color, you can thank the deciduous trees—those with green leaves—as opposed to ‘evergreens’ or conifers with green needles that tend to stay on the tree year-round. In these deciduous trees’ leaves, a pigment called chlorophyll acts as the food factory for the tree, capturing the sun’s rays and converting them into vital nutrients into stored energy. When days become shorter and nights longer and cooler, the leaves begin to rein in food production, in attempt to shut down all but the most vital survival functions for the coming winter. Chlorophyll production halts, allowing the ‘real’ color pigments in the leaves to show through their waxy surfaces. In a typical southern hardwood forest, you can expect to see the following colors from the trees that make up this ecosystem:

- Dogwood: red
- Sweetgum: red to purple
- Red Maple: red to orange
- Oaks: red to brown
- Poplars: yellow
- Birches: yellow
- Mountain Ash: yellow



I am a forest landowner interested in Forest Stewardship on my property. Please have a representative call me.

PLEASE REMOVE THIS PORTION AND MAIL TO: State Stewardship Coordinator, 1616 Mail Service Center, Raleigh, NC 27699-1616
(or contact one of the cooperating agencies listed on this brochure)

Name: _____

Address: _____

Phone: _____

County where property is located: _____

Tract Size: _____ **% Forested** _____

Do you have a forest management plan?

YES	NO
-----	----

Are you currently receiving technical assistance?

YES	NO	If yes, by whom -
-----	----	-------------------

Organization _____

I am specifically interested in

- aesthetics
- recreation
- soil
- non-game species
- wildlife
- timber
- water quality
- rare plants
- other



For more information on Forest Stewardship in North Carolina fill out the attached form and send to us or contact the N.C. Forest Service Stewardship Coordinator Les Hunter at (919) 857-4833 or via email at les.hunter@ncagr.gov.