THE Journal OF THE AMERICAN CHESTNUT FOUNDATION

SEPTEMBER /OCTOBER 2012 | ISSUE 5 VOL. 26

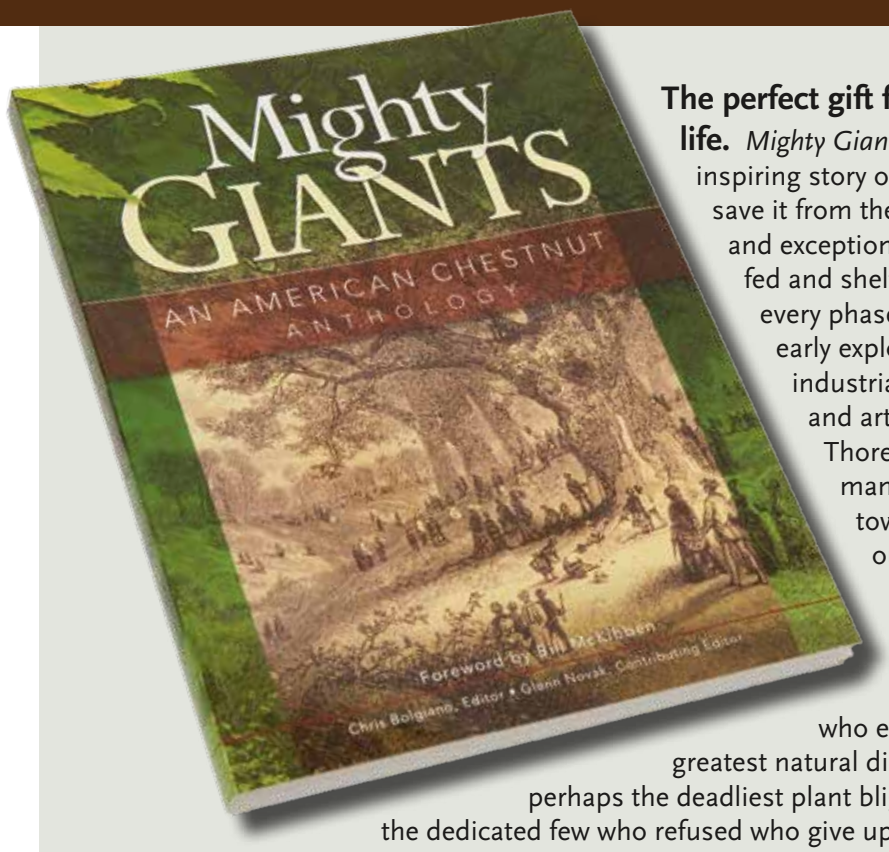
Chestnut Bur Size Variation

Praying Mantids

Chestnuts at the Flight 93 Memorial

Chestnut anthology makes a great gift for nature enthusiasts everywhere

THE AMERICAN CHESTNUT FOUNDATION®



The perfect gift for the nature enthusiast in your life. *Mighty Giants: An American Chestnut Anthology* is the inspiring story of an American symbol and the struggle to save it from the brink of extinction, the saga of a unique and exceptional tree that supported a way of life, that fed and sheltered our ancestors, and "touched almost every phase of our existence." From Indians and early explorers, to colonists, naturalists, loggers, industrialists, and beyond, from presidents, poets, and artists, including Jefferson, Lincoln, Carter, Thoreau, Frost, Homer, Andrew Wyeth, and many more, the story of our once mighty, towering native chestnut tree is a lesson for our times.

The book tells, in images and words, the story of the once mighty monarch of the eastern forests and the scientists who engaged in the struggle against "one of the greatest natural disasters in the history of forest biology"—perhaps the deadliest plant blight ever encountered. It is the story of the dedicated few who refused who give up: the fearless plant explorer who tracked down the blight in war-torn China, the plant pathologists and geneticists who labored long and valiantly to understand the blight and find a way to thwart it. It is also a story of hope, of small but vital triumphs, as the secrets of the American chestnut and its deadly nemesis are gradually revealed.

Notable contributors to the book include former President Jimmy Carter, author Barbara Kingsolver, Nobel Peace Prize laureate Norman Borlaug and Bill McKibben, author of "The End of Nature." The 296-page full color book is available in hardback for $50 and paperback for $25.

TACF hats are back!

Order yours today at www.acf.org or call 828-281-0047.

The baseball hat is tan and made with 100% cotton. The Mossy Oak camouflage hat is made with 60% cotton and 40% poly twill. Both have embroidered TACF logos on the front and adjustable closures in back.

TACF Camo Cap: $16.00 TACF Ball Cap: $14.00

THE AMERICAN CHESTNUT FOUNDATION®

The Mission of The American Chestnut Foundation

Restore the American chestnut tree to our eastern woodlands to benefit our environment, our wildlife, and our society.

We harvested our first potentially blight-resistant nuts in 2005, and the Foundation is beginning reforestation trials with potentially blight-resistant American-type trees. The return of the American chestnut to its former range in the Appalachian hardwood forest ecosystem is a major restoration project that requires a multi-faceted effort involving 6,000 members and volunteers, research, sustained funding, and most important, a sense of the past and a hope for the future.

About Our Cover Image

Three American chestnuts nestle in a bur. This bur was dissected by Dr. Paul Sisco and photographed by Paul Franklin. Dr. Sisco selected this bur among others for his article on bur size variation that starts on page 18. Photo by Paul Franklin

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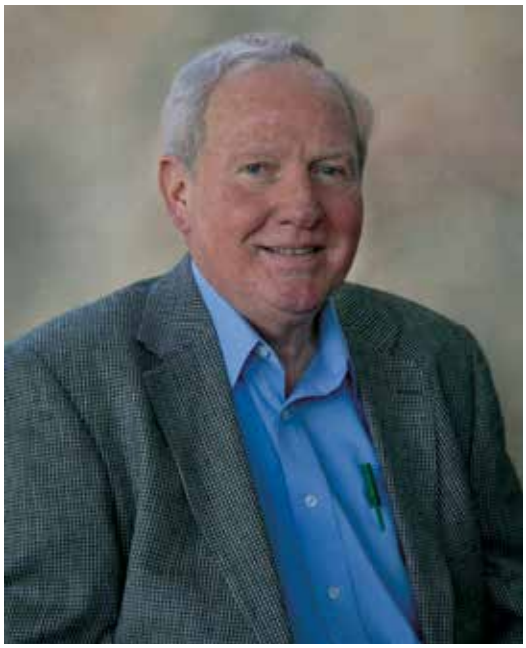
Background photo:
Chestnut burs at the Weber Farm.
Photo by William Weber



Thank You

by Glen Rea, TACF Chairman of the Board

As I look back on the past three years during which I have had the pleasure of serving as your chairman, one particular memory keeps surfacing. In the early 1970s I was living and working in New York City. I was in my first job with a Fortune 500 company and I was taking a postgraduate class at NYU with Dr. Peter Drucker. He was one of the leading business consultants at that time and was in great demand. At the beginning of the semester someone asked what was the first thing he looked at when he was consulting for a business; he replied that was an easy question. The answer was PEOPLE. He would spend the first day interviewing the people in key positions in the company and he could tell quickly where problems were likely to be found.

Three and a half years ago TACF had just moved its headquarters to Asheville and we had a relatively newly hired CEO & President, Bryan Burhans. He agreed with the principles espoused by Dr. Drucker and began a very systematic and thorough staffing process. Economic downturns are never easy, but the timing was actually beneficial to our organization, as we have been able to staff our positions with very competent and enthusiastic people.

The Executive Committee (officers of the Board of Directors) has worked very well with Bryan and it is great to see this teamwork in action. When Bryan needed quick action in a fast-moving personnel market we tried to expedite the process, so as not lose potentially excellent candidates because of slow internal procedures.

Financial problems often arise for non-profit organizations during recessions as people cut back on giving – not because they want to, but because of job losses and other financial demands. We have been fortunate to be able to stay in the black during all three years and this has been with great assistance from Brad and Shelli Stanback, Mary Belle Price and many others too numerous to mention, whose donations are so important to keeping TACF moving forward. I like the statement Mary Belle made when we dedicated the Price Building at Meadowview. She said that after she died she wanted her ashes scattered at Meadowview "so she could keep an eye on things." It made me smile, but it also reflects the deep personal interest and dedication our donors are known for.

And to our volunteers: we could not exist as a viable company if it were not for the tremendous support of those of you who do so much of the work with no monetary compensation, but with the knowledge that your work is important and appreciated. We now have seed orchards established at Meadowview; in Pennsylvania, North Carolina, Massachusetts, Maine, and Indiana; and many more in the planning stage. As you are out toiling in the orchards, when you could easily be doing something else less strenuous, you are doing vital work that will help bring back the American chestnut to its natural range.

I thank you for this opportunity to have been your chairman for the past three years and I look forward to working with you in future years.

Glen Rea

Help Us Plant Tomorrow's Forest

TACF volunteers, partners and scientists have undertaken a project to plant, test and evaluate more than one million potentially blight-resistant American chestnuts within six years.

To succeed, we need your support.

Help us reach our goal to raise over $100,000 by the end of 2012.

Please make a personal financial contribution to TACF today

Three easy ways to donate:

- Fill out and mail the enclosed reply envelope
- Donate online at: www.acf.org
- Call us at (828) 281-0047

The Stanback Challenge

Once again this year, your donation will have twice the impact. Long-term TACF supporters Brad Stanback and Shelli Lodge Stanback will match your gift, doubling its benefit.

THE AMERICAN CHESTNUT FOUNDATION®

The American Chestnut Foundation's mission is to restore the American chestnut to our eastern forests to benefit our environment, our wildlife, and our society

Matt Brinckman with an American chestnut in East Field at Sugarloaf Mountain in Urbana, MD.
Photo Credit: Zach Starsia

TACF Hires Matt Brinckman as Mid-Atlantic Regional Science Coordinator

We are pleased to announce that TACF has hired Matt Brinckman as the Mid-Atlantic Regional Science Coordinator to support the Maryland, Virginia, and West Virginia chapters. Matt earned his BS and MS degrees in forest management from Virginia Tech. Upon graduation, he worked as an extension faculty member in Virginia Tech's Department of Forest Resources and Environmental Conservation where he led multiple initiatives and dealt with academia, youth, and diverse natural resource stakeholders from various levels of industry. He also developed self-paced online tutorials for foresters, loggers, and landowners.

"Matt's extensive background in silviculture, forest ecology, geographic information systems, tree care, and pest management make him an invaluable resource," says TACF President and CEO Bryan Burhans. "He will be an excellent addition to the TACF team."

Though Matt's life passion is to contribute to the sustainability of forestland, he dedicates his spare time to several other worthy causes. He is on the board of directors of Bike the US for MS (multiple sclerosis) and fosters dogs for the Animal Welfare Foster Program in Blacksburg, VA.

Our website "facelift" is complete. If you haven't already, check out www.acf.org to see the new design!

Southern Regional Leadership Meeting Cultivates New Ideas

Representatives from four of the southern chapters of The American Chestnut Foundation (Alabama, Georgia, Carolinas, and Tennessee) met on August 13th in Chattanooga, Tennessee, to discuss several topics of importance, including building strength and resiliency among the southern chapters, recruiting and retaining volunteers, and orchard management.

One strategy the group generated was to organize members into smaller groups called semi-autonomous districts, with more emphasis on proximity to orchards and less emphasis on state boundaries. This approach allows each district to take charge of its own orchards, outreach, data collection, and database management. Adding a sense of ownership and community also increases the fun and sense of achievement that are essential at all levels of an organization.

Another idea that emerged was the creation of a Master Orchard Planter Certification aimed at encouraging participation and facilitating training for volunteers. Participants would receive a year's worth of training in planning and managing orchards, and then be issued a certificate of completion (and a t-shirt). Certified "Master Orchard Planters" would help educate future trainees and represent the organization at tabling events.

"The group was able to come up with some great ideas," reported Southeast Regional Science Coordinator Tom Saielli, who organized the meeting. "We made significant progress towards understanding some of the big issues in the south, and generated solutions for a promising future."

The Meadowview rain garden with the Price Laboratory and Meadowview chestnut orchard in the background.
Photo Credit: Graham Landscape Architecture (Nathan Brown)

New Rain Garden in Meadowview Both Beautiful and Practical

The new rain garden at Meadowview Research Farms is not only beautiful, but it also serves an important ecological function. A rain garden, or bio-retention cell, is a garden bed in a shallow basin that captures the first inch of runoff and filters it through various bed components before releasing it into the subsoil, resulting in a reduction of storm water runoff, increased filtration, and improvement in water quality. Plants such as native grasses and ferns, asters, joe-pye weed, and purple coneflower are utilized because they can tolerate both wet and dry spells, cycle nutrients, and neutralize pollutants.

The garden is the result of collaboration between the Southwest Virginia Restoration Branch of TACF, Virginia Department of Conservation and Recreation, Upper Tennessee River Roundtable, Graham Landscape Architecture, and Washington County Master Gardeners of Virginia Cooperative Extension. The Upper Tennessee River Roundtable received a grant through the Virginia Department of Conservation and Recreation's Water Quality Improvement Fund and the Dominion Foundation to design and construct the garden; TACF and the Master Gardeners provided the labor for excavation, planting and mulching.

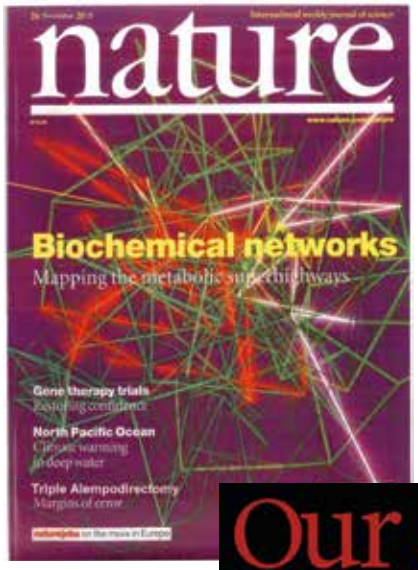
Dolly Parton and her Uncle Bill Owens have recorded a song about the American chestnut.

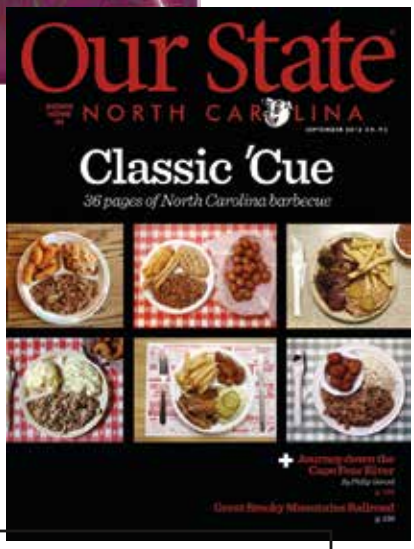
Dolly Parton and Her Uncle Bill Owens Dedicate a Song to the American Chestnut

Now you can download "O Chestnut Tree," the song Dolly and her Uncle Bill wrote to celebrate the majestic American chestnut. All you have to do to get the download is go to TACF's newly designed front page at www.acf.org and click on the link for Dolly's New Song. A window pops up in which you can watch a video of Dolly introducing the song. Type in your e-mail address and voila!

CFC Adds TACF to Its List of Approved Charities

TACF is excited to be included on the National/International part of the 2012 Combined Federal Campaign (CFC) Charity List distributed this fall to federal employees and military personnel in the US and overseas. If you are a federal employee or member of the military, please consider designating The American Chestnut Foundation (donor code 95986) as your beneficiary this year.





Recent Publicity: TACF and Partners Shine in the Limelight

This year, the media have spread the story of chestnut restoration efforts far and wide. Not only were TACF and its partners featured in dozens of local papers, magazines, and television shows across the United States, but three major media outlets published stories as well.

In August, the *Wall Street Journal*, considered the top daily newspaper in the United States, published an article entitled, "Hopes for Chestnut Revival Growing," which went to over 2 million subscribers in the United States. The article highlighted transgenic work being done by scientists at the State University of New York College of Environmental Science and Forestry and the New York Chapter of TACF, as well as the TACF traditional backcross breeding program established in 1983. You can read the article at http://www.acf.org/news_articles.php.

The September issue of *Our State: Down Home in North Carolina* brought its 174,000 readers a beautifully photographed six-page article on the history and present-day status of American chestnuts in North Carolina and the Carolinas Chapter of TACF's work to restore the species. You can find the article on our website at http://www.acf.org/news_articles.php.

And in early October, the weekly journal *Nature* published an article detailing the current status of chestnut restoration. *Nature* is the world's most cited interdisciplinary scientific journal, with a worldwide circulation of 56,000 to scientists and researchers in the United States and internationally.

Credit: Photo courtesy of www.natureexposure.com

TACF'S PLANT A TREE PROGRAM: NOW YOU CAN HAVE A RESTORATION CHESTNUT 1.0 PLANTED IN YOUR NAME

For a $10 donation, TACF will plant a Restoration Chestnut on your behalf, or on the behalf of a recipient that you select. If this is a gift, we will send a personalized card to the recipient, letting him or her know of your generous gift, along with the latest edition of our magazine *The Journal of The American Chestnut Foundation*.

By donating today to our *Plant A Tree Program*, you will be helping TACF fulfill its mission of restoring the American chestnut to our eastern woodlands to benefit our environment, our wildlife, and our society. For more information, call us at (828) 281-0047 or visit http://shop.acf.org/plant-a-tree.aspx.

Michael Egan, Steve Barilovits, IV, and Matthew Egan take a break from their work at Steve and Jane Motsinger's orchard in State Road, North Carolina.
Photo Credit: Paul Sisco

TACF Honors Its Volunteers

Volunteers: Steve Barilovits, IV, Matthew Egan and Michael Egan

Contributed by Tom Saielli, Mila Kirkland and Steve Barilovits, III

If you haven't had the pleasure of working alongside Steve Barilovits, IV, and his cousins, Matthew and Michael Egan, you are missing out. Dr. Fred Hebard, Chief Scientist at the TACF Meadowview Research Farms, couldn't agree more heartily: "This summer, the Price Lab and Meadowview Research Farms were once again enlivened by the presence of Steve, Matthew, and Michael. They efficiently prepared most of our pollens and also assisted in inoculation and pollination. It is a real pleasure for all of us to have such bright and energetic young people gracing us with their youthful zest and humor."

When Steve joined the foundation in 2000, he was 11 and the youngest member of TACF. Now 22, Steve recently graduated *summa cum laude* from The University of North Carolina at Chapel Hill with a major in chemistry/biochemistry and a minor in physics. Steve has volunteered at Meadowview Research Farms and with the Carolinas Chapter for the past 8 summers. Matthew, 18, is a freshman at Georgia Institute of Technology, studying computer engineering. He has volunteered at Meadowview for 4 years. His brother, Michael, 14, is a freshman at Lambert High School, in Suwanee, GA. This was his second year volunteering with the Carolinas Chapter and at Meadowview.

Steve's father, Steve Barilovits, III, who currently serves as TACF Board Treasurer, remembers how his family got involved in TACF. "My son Steve got me interested," he says. "Back when he was 9 years old we started taking hikes in the mountains. Early on, I told him the chestnut story, which really affected him." Before long, the elder Steve and his wife, Jane, began taking their son to TACF meetings and he got involved volunteering.

Matthew and Michael caught the chestnut fever while spending summers with the Barilovits' in Charlotte, NC, and participating in hunts for trees and pollen. First Matthew and then Michael accompanied Steve, IV, to Meadowview, where they are now considered visiting authorities on pollination and inoculation.

Regardless of where their busy lives take them, look for Steve, Matthew, and Michael next summer at Meadowview Research Farms. While you catch their contagious passion, be sure to thank them for their dedication to American chestnut restoration. With volunteers like these three, the future of TACF is bright and promising.

In Memory of our TACF Members July 1 - August 31, 2012

Betty Deets
Michael J. McMahan

Frederick S. Johnston, Jr.
Paul Horgan

Mildred Kerr
Ken and Wendy Weirman

Francis Kohanski
Margaret Dechene
Tom and Frances Demoretcky
Diane Oswald

E.L. Nicholson
Lynn and Peggy Brown
G. Wayne and Pat Clark
Barbara Gallaher
Lawrence Landau
Carolyn Nicholson
J. Daniel Thomas
Catherine Wilson Weaver

William M. Palmer
Wallace and Delores Hulseman

Chestnut Memories

A Country Veterinarian Tends to a Blighted Chestnut

Article and photos by William Weber

My first exposure to chestnuts was when my wife Barbara and I retired to a 64-acre farm in the Big Pine Valley of North Carolina in 1978. Alongside the winding, two-lane track to our future house site, I noticed a tree with a chest-high, rough, brownish swelling on its trunk. The tree's leaves were wilting. "It's a chestnut," my elderly neighbor, Don Wild, told me. "See, it's growing from an old root-stump of the original tree. It's got the blight. It'll die and then another sprout will grow as the tree tries to live." I was intrigued.

Don went on to explain: "We used to have chestnut trees all over this valley. They were big wonderful trees with tasty nuts. Then the blight hit and most died. Dad had a sawmill and we lumbered the standing trees. And when they were gone, we cut the dead trees on the ground into log lengths, loaded them on a horse-drawn wagon and hauled them nine miles to the railroad down at the French Broad River. Everyone called them acid-wood and we were told most were going to tanneries."

At our house site there was another chestnut tree waging its battle with the blight. Don told me he couldn't remember it having any nuts. "If you want to know about chestnuts, talk to Ruby-Noah." Ruby Buckner was another of our neighbors. Since there were three ladies in the valley with the name Ruby, they were identified by their husband's first names. So there was Ruby-Noah, Ruby-Clem and Ruby-Ray.

The first chance we got, Barbara and I visited with Ruby-Noah and her husband. They were good folks, in their 70s and still very active. They raised some cattle in their hillside pasture, grew tobacco as their main cash crop, and ate food they had canned from their large garden. During our visit we covered the weather, the rainfall, the growth of tobacco, pesky bugs, and then I got a chance to ask Ruby about chestnuts.

"We sure do miss them," she started out. "As a girl growing up here in the valley, they were important to us. We had a couple of acres of chestnuts just below the house here. We looked forward to harvesting the nuts when they dropped. I would pick them out of their spiny shells, put the biggest and best in my pocket to eat later, and try to fill a croker-sack (burlap bag) with a peck or so for Dad. My father carried the mail here in the valley. Every day he rode his horse the nine miles to Barnard, where he met the train and picked up the mail. He delivered it to each family as he rode back up the valley and home.

Blighted chestnut on the Weber Farm.

I'm sure my neighbors laughed when they heard that the "retired vet is bandaging a tree." But it seemed to work. By the time the bandage wore off, the blighted area was quiet and showed no signs of growth.

"The chestnut at our home site continued to grow, and while some of its multiple trunks blighted and died, the tree continued to survive." – William Weber

"Dad took my bag of nuts in with him each time I had a sack. The man at the store in Barnard would buy them and dad would bring me back a couple of dimes. Spending money was scarce here in the valley, so chestnuts gave me some cash for birthday and other gifts. After most of the chestnuts were gathered, Dad would turn the hogs into the grove and they harvested the rest. I sure do miss those chestnuts, they were so good to eat."

On the way back home, I stopped to examine the blighted chestnut beside the driveway. It was about 15 feet tall, with a 4- or 5-inch trunk. The blight lesion made the trunk thicker at that spot. The leaves were still green. I wanted to help that tree in its fight.

I remembered reading about a researcher at Michigan State University who was working trying to save the chestnut tree. I wrote to him describing the tree and the lesion and asked if he had any suggestions. He wrote back and told me that they were having some success with earth poultices and described what they were doing. In essence they put 2-3 inches of soil in contact with the lesion. The soil was then held in place with a large bandage wrapped around the trunk about 4 or 5 inches above and below the lesion. In theory, the native fungi and spores in the soil would block the pathogenic blight.

I'm sure my neighbors laughed when they heard that the "retired vet is bandaging a tree." But it seemed to work. By the time the bandage wore off, the blighted area was quiet and showed no signs of growth. The next year, however, the tree developed another lesion higher on the trunk, which I bandaged. It seemed to heal and the tree continued to grow. After a couple more years, the lesions were appearing higher than I could reach with my ladder. I could see I was losing the battle. I quit, and a year or so later the tree died.

Meanwhile the chestnut at our home site continued to grow and while some of its multiple trunks blighted and died, the tree survived. After several years, it even bore some nuts. I ate some, and they were great, but I also saved some to plant and shared some with interested neighbors. That tree bore nuts occasionally for several more years.

After several years, the chestnut by the Weber Farm began to produce burs and seeds.

When we moved from the valley to Florida in 2006 some of the trees I planted were still living. I haven't followed them closely, but I know that one survives to this day.

William Weber is a retired country veterinarian and long-time member of TACF. He lives in Leesburg, Florida.

Artist's rendition of the Flight 93 Memorial Wall of Names and Ceremonial Gateway at the Crash Site.
Image courtesy of :bioLINIA and Paul Murdoch Architects

Healing Work: Planting Chestnuts at the Flight 93 Memorial and Around Appalachia

by Rebecca Hirsch

In the cold hours of an April morning, I stood with my teenage daughter on a coal-mined hilltop overlooking the crash site of United Airlines Flight 93. We had risen before dawn to come here to plant chestnuts.

When I heard The American Chestnut Foundation was looking for volunteers to plant trees at the Flight 93 Memorial, I jumped at the chance. Anna, my oldest, would be turning fourteen and would just meet the minimum age for volunteers. She agreed to spend a Saturday there with me.

Anna was only three on September 11, 2001, too young to remember the attacks. On that day terrorists hijacked four planes including Flight 93, which the hijackers intended to crash into the U.S. Capitol building. But the passengers fought back and instead the plane crashed in a field near Shanksville, Pennsylvania. All of the passengers and crew died, but their valiant actions saved many other lives.

This was our first visit to the site, a 2,220-acre national park featuring the Flight 93 Memorial as its centerpiece. Seventy percent of the parkland is stark, grass-covered landscape: a surface coal mine that had been reclaimed as grassland. With the help of volunteers, the National Park Service (NPS) plans to convert some of this land back to living forest.

After a short opening ceremony, we and the other volunteers tramped to the freshly prepared five-acre hillside. Bulldozer tracks alternated with furrows of churned-up rocks and clods of dirt. An icy wind whipped across the bare hillside but did little to chill the spirits of the roughly one hundred people who fanned out across the hill. Talking, laughing, and occasionally tripping over the rough and rocky ground, we dug holes, tucked in saplings, snapped photos. The work was light with so many hands, and by lunchtime the entire five acres had been planted.

The Flight 93 plantings took place over four spring days in 2012. Roughly 600 people planted thousands of hardwood trees and shrubs, including TACF's potentially blight-resistant chestnuts, on 20 acres. Some volunteers were family members who had lost a loved one in the crash. Some were from BMW and had lost a co-worker. The people I met were college students, retirees, professional foresters, and fellow TACF members. Many came from different states like New Jersey, South Carolina, Ohio, and Kentucky.

The event was organized by the NPS together with the Office of Surface Mining and its Appalachian Regional Reforestation Initiative (ARRI). TACF was involved from the beginning, supplying American chestnuts and volunteers.

Two Volunteers brave the cold to plant trees at the Flight 93 Memorial.
Photo by Mark Banker

Surface mines like the one at Flight 93 are common across the coalfields of Appalachia. ARRI estimates that from Pennsylvania to Alabama there may be a million acres of old mines that have been reclaimed as grasslands. TACF has partnered with ARRI and Norfolk Southern Foundation in an effort to reforest these lands with a mix of hardwoods, including the American chestnut, in several states. Reforestation promotes wildlife diversity, improves water quality, and gives landowners high-value hardwoods. It can also aid the return of the majestic American chestnut to its natural place in the Appalachian forest.

Conventional surface mine reclamation, in which strip-mined land is converted to grassland, offers few benefits to wildlife, landowners, or communities. According to Patrick Angel, a forester and soil scientist with the Office of Surface Mining, the soil at conventionally reclaimed sites tends to be heavily compacted, leading to runoff and sedimentation of nearby streams. The ground is typically covered with a mix of aggressive non-native grasses that offer little to wildlife and choke any trees that try to grow.

Angel points out that grassland is not the normal state of land in the forested Appalachians. "That's really very unnatural. It shouldn't look like a prairie. It should be verdant and forested."

Normally an open field in Appalachia will revert to forest in a sequence of events known as forest succession. First, the wind-blown seeds will arrive, and shrubs and trees will start to grow among the grasses. Later, squirrels and blue jays will bring in the heavier seeds of oaks, hickories, and chestnuts.

But on old surface mines, the aggressive grasses and compacted earth are a lethal combination that grinds the whole sequence to a halt. TACF forester Michael French says these lands stay stuck in a state of arrested succession.

"Wind-blown seeds just sit on top of the grasses and get eaten," he explains. "Or they germinate and rot, or they never germinate." Trees that do manage to find footing have a tough time pushing their roots through the compacted soil, and they end up stunted.

To convert this land to living forests, ARRI champions a different approach, called the Forestry Reclamation Approach (FRA). This innovative method was developed as a way to reforest active mines, but it can be modified to grow living forests at old strip mines like the one at the Flight 93 Memorial. The FRA sustains wildlife, increases biodiversity, stabilizes soil, and improves water quality. Over the long term, it produces forests that give high quality timber and remove large amounts of carbon from the air.

To reforest old mines, foresters must eliminate the two main barriers to tree growth: the choking grasses and the compacted soil. Herbicides are sprayed to kill off the grasses. To create the deep, loose soil that trees

need, a heavy D8 or D9 bulldozer pulls a big metal tooth called a ripping shank four feet deep through the ground. The hillside is ripped first in one direction then another, in a crisscross pattern. After cross-ripping, the ground can better absorb water, preventing run-off and allowing water to be released more slowly into nearby streams.

A newly planted American Chestnut at the Flight 93 Memorial site.
Photo by Mark Banker

"It doesn't look like a golf course," says Michael French. "We want it nice and rough. That's what trees like."

Once the ground has been prepared, the planting begins. Foresters choose a mix of early succession species—such as redbud, dogwood, hackberry, black locust—along with high-value native hardwoods like oaks, yellow poplar, black cherry, sugar maple, and black walnut. Included in the mix is the tree that was once the mighty giant of the Appalachian forest, the American chestnut.

"If you look at the range of chestnut and the range of surface mines, the two overlap almost perfectly," explains French. Old mines often prove ideal for the tree. These sites tend to sit at high elevations and have the dry, rocky soils that American chestnut prefers. "Up high and dry," French says. The trees grow so well on these lands, they can produce nuts in as little as 3 years.

TACF has teamed with ARRI to reforest twelve reclaimed mine sites in a five-state area (Pennsylvania, Ohio, West Virginia, Virginia, and Kentucky). The mixed hardwood plantings will include Restoration Chestnuts 1.0 and represent the largest planting to date of these blight-resistant chestnuts. Each 30-acre planting will serve as a demonstration plot that educates landowners about the process, shows them the possibilities, and encourages them to reforest their own land. The work is funded by a three-year Conservation Innovation Grant from the National Resources Conservation Service.

The first of the demonstration plantings was installed last April in Schuylkill County, Pennsylvania. Dozens of volunteers, led by French and Regional Science Coordinator Sara Fitzsimmons, planted a mix of Restoration Chestnuts 1.0 and other high quality hardwoods on roughly 30 acres. Planted in the center was an acre containing 550 Restoration Chestnuts 1.0. French says this one-acre core will aid dispersal of chestnuts to the surrounding area. "We should get fantastic pollination and a really heavy nut crop. Then the blue jays and squirrels can start to move them out," he says.

Given the many benefits of reforestation, it can be surprising to learn that landowners haven't readily embraced the approach. Several factors have hurt forestry reclamation. One is deeply ingrained: grassland reclamation has been the favored approach for decades, and this old habit can be hard to change. Another is that converting the land to timber costs money and has a long-term return-on-investment.

> Reforestation promotes wildlife diversity, improves water quality, and gives landowners high-value hardwoods. It can also aid the return of the majestic American chestnut to its natural place in the Appalachian forest.

The thing that often overcomes these barriers and helps sell reluctant landowners on reforestation is the American chestnut. Patrick Angel calls the tree "the chrome bumper that sells the car." He explains: "When you mention American chestnut, people in the mountains know the story, the mystique, the magic behind the American chestnut. They will stop you with wide eyes and ask, 'You mean to tell me we can get American chestnut?' That sells them on the idea of planting forests."

Chilly students and a Northern Swatara Creek Watershed Assoc. volunteer working on a mixed hardwood tree planting including advanced backcross and pure American chestnuts at a mine land site in Schuylkill, PA.
Photo by Michael French

Which brings us back to Flight 93. After my daughter and I had finished planting trees for the day, we drove down into the valley where the Flight 93 Memorial sits back from the crash site. We stood in silence and read about the horrific events of September 11th and the heroic actions of the passengers. We looked at pictures of the passengers and crew, and touched their names carved into the wall. It struck me that planting trees, particularly the American chestnut, which is now being restored after a deadly blight, was a particularly fitting addition to the site.

Patrick Angel agrees. He sees planting trees as "a way to not only heal the land, but also to heal the heart, to pay honor to the victims and the families of the victims." The trees that Anna and I and so many other volunteers helped plant will also serve as a windbreak for a dominant feature of the memorial: forty groves of trees surrounding the crash site, one for each of the victims.

The National Park Service plans to plant 150,000 trees on more than 200 acres at the rate of 20 acres a year. Look for opportunities to join the effort. Volunteers will be needed to plant trees each spring for years to come.

The author and her daughter at the Flight 93 Memorial.
Photo by Rebecca Hirsch

Praying Mantids

A TACF Member Encourages "Preying" Mantids Among His Chestnuts

Article and photos by Dan Stiles

This young praying mantid recently emerged from the egg case. The adult female mantid lays between 100-400 eggs in a froth that hardens into a protective egg case.

I have kept an extra sharp eye on my five American Restoration Chestnut 1.0 seedlings this spring. Each one is surrounded with five-foot high heavy concrete reinforcing wire to keep deer from munching on their branches, and also to keep antlered bucks from rubbing against their flexible main stems in the fall. So far, so good. This is their third growing season, and three of the five are now over seven feet tall and continuing to grow at an amazing rate.

Last fall I noticed that a praying mantis had deposited her egg mass around a branch on chestnut seedling number four. A quick bit of research revealed that the mantises are now known as mantids because they belong to the order Mantodea. I've seen these mantid egg masses many times before, and I recognize them right away. The best way I can describe one is that it looks like a short burst of canned insulating foam, except the mass is brown and gray in color and about the size of a small chicken egg. Hidden within this mass of protective material are between one and four hundred praying mantid eggs that are programmed to hatch in the spring.

Much to my surprise, an extra-large adult mantid suddenly caught my attention when she moved a few inches on a branch below the egg mass. She was nicely camouflaged. It seemed reasonable to assume she had recently deposited her eggs, and her swollen abdomen seemed proof positive. At the time I thought perhaps I could gather up several of her mantid youngsters when they hatched next spring, and release them on my other chestnut seedlings.

I suspect most people think of praying mantids as insects that pray, because their two front legs are often seen held together as if in prayer. But, nothing could be further from the truth! Actually, they are also known as "preying" mantids, because they are superb insect predators.

I suspect most people think of praying mantids as insects that pray, because their two front legs are often seen held together as if in prayer. But, nothing could be further from the truth! Actually, they are also known as "preying" mantids, because they are superb insect predators. Mantids eat all manner of insects, large and small, beneficial or harmful. You could say they are living insecticides without chemicals - my idea of the good guys in the insect world!

If you look closely, those front legs contain very sharp spikes that impale their victims, and their mouth parts

The praying mantid averages 3-4 inches in length and is a skilled hunter, often remaining motionless for hours waiting for its next meal to wander by. The barbs on its forearms help it to grasp and hold prey.

A mantid's head can swivel up to 180 degrees, making it possible for it to track prey while remaining otherwise motionless.

are powerful enough to chomp down through the protective outer shell of any insect. Once in a great while, adult mantids have been known to attack, kill and partially consume mice and hummingbirds.

Praying mantids are fascinating for lots of reasons. Their triangular shaped heads carry two large multifaceted eyes, and can turn ninety degrees to the right or left. The adults develop huge wings, so they can fly considerable distances. The praying mantid can also be a cannibal! Females will sometimes devour males during the mating process. Some people buy mantid egg masses and place them in their gardens to alleviate insect damage. Some folks raise praying mantids in cages as pets.

Mantids are ambush hunters. They are usually hard for people (and perhaps insects) to see, because they blend in so well with the colors of the surrounding vegetation. They wait for an insect to approach, and pounce with near lightening speed, grasping their victim between their spike-filled front (praying) limbs. It surely would be good news to know if stink bugs are on their menu. Perhaps emerald ash borers, European hornets, gypsy moths, Japanese beetles and who knows what other undesirable chestnut-damaging insects are included on their preferred prey species. It would be an interesting project to explore!

People have been fascinated with praying mantids for centuries. It is considered a sign of extremely good luck if one lands on you. I let the big female that left her eggs on my chestnut seedlings walk across my hand. I believe she has already brought me and my chestnut seedlings good luck. On May 18, 2012, I watched several mantid youngsters emerge from the egg mass and scurry down the chestnut seedling. I wished them well.

Dan Stiles is a long-term member of TACF. His last article for the Journal was on protecting chestnut seedlings from wildlife, in the September /October 2011 issue.

Natural Variation in American Chestnut Burs and Nuts

By Dr. Paul Sisco

Fig. 1. Burs and nuts from three different American chestnut trees planted near each other in an orchard in Edneyville, Henderson County, North Carolina. The burs and nuts on a single tree were very similar in size, shape, and color. Thus the differences seen here between trees have a genetic basis.
Photo by Paul Franklin

I was impressed this year with the amount of variation in burs and nuts among three pure American chestnut trees planted in a single orchard near Asheville, NC (Fig. 1). The burs and nuts from any one tree were very much alike, but the differences in nuts and burs between trees were striking. Having the trees planted together in a common location and environment allows one to evaluate the effect of genetics versus the effect of environment, and in this case genetics clearly won out. It is a case of genetic determinism, as described in last month's *Journal* article "Chestnut Ecology and Adaptation" (Sisco and Steiner, 2012).

The most common form of bur and nut structure is shown in Fig. 2. The bur itself is an involucre* or cupule,** an anatomical structure unique to chestnut and its close relatives oak and beech. In oak the cupule is the cup in which the acorn sits. In chestnut each bur opens into four parts along two sutures at right angles to each other. The two sutures are clear in each of the three burs in Fig. 1, giving the burs a "hot-cross bun"-like appearance. And each bur usually contains three nuts (Fig. 3). Chestnut's relative, the chinkapin, has a smaller bur that opens into two parts along a single suture, and a chinkapin bur contains only a single nut (Fig. 4). The chestnuts, which are true fruits, are contained within the soft, spongy inner wall of the bur (Figs. 2B and 3). The pointy end of each nut is attached to the remnant styles of the female flower (Fig. 2C) and contains the embryo, while the blunt end of the nut (Fig. 2D) contains most of the starch that is desirable to birds and mammals that feed on chestnuts.

Is there any adaptive significance to these differences in bur and nut size and shape? Unfortunately we can only speculate. Smaller-than-average burs and nuts are common on chestnut trees at high elevations in the Asheville, NC, area, such as those found at a 5,000-foot elevation near Mount Pisgah. Are these burs and nuts small because they do not have much time to develop? The flowers on chestnut trees at 5,000 feet do not get pollinated until early to mid-July, whereas trees at lower elevations are commonly pollinated in mid-June. The burs on both high- and low-elevation trees mature about the same time, however. Thus the growing season for the higher-elevation trees is definitely shorter by several weeks.

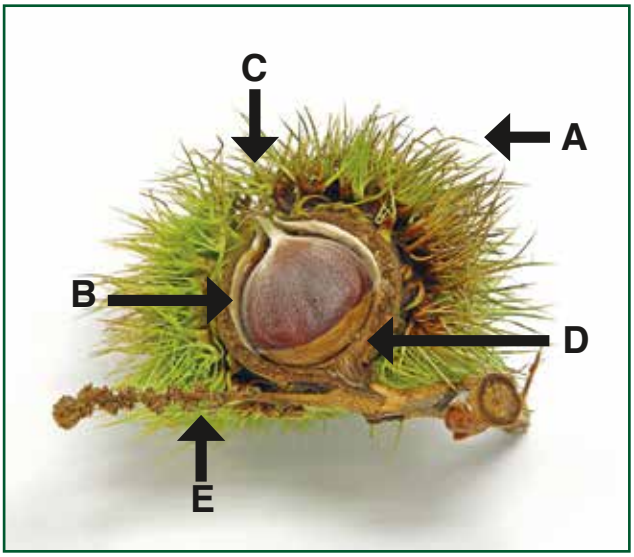


Fig. 2. This bur was part of a bi-sexual catkin. (A) The bur exterior includes spines and a spongy wall. (B) The nuts rest firmly within the bur wall. (C) The styles at the end of the nut are remnants of the female flower. (D) The blunt end of the nut contains starch that can provide food for wildlife and humans. (E) Remnants of the male flowers that were part of the catkin.
Photo by Paul Franklin

Fig. 3. A typical chestnut bur at maturity contains three nuts.
Photo by Paul Franklin

Fig. 4. A chinkapin bur has only one suture and contains a single nut.
Photo by Paul Sisco

The soft, spongy wall of the large bur in Fig. 1 was much thicker than the walls of the burs from the other two trees. Contrast the thickness of the bur wall in Fig. 2 to the thickness of the wall in Fig. 5. And a "plug" in the larger bur provided an additional layer of protection to the end of the nut where the embryo resides, the critical part of the nut for reproduction. Does this added thickness and padding give these nuts a competitive advantage in certain environments? It certainly makes an impressive-looking shield for the nut inside (Fig. 5).

As Restoration Chestnuts 1.0 become established, people will start making selections within the species for particular traits. Those wishing to grow chestnuts for human consumption will likely favor trees with large nuts, because it is easier to peel a few large nuts than many small ones. On the other hand, some wildlife species such as turkeys may favor smaller nuts that are easier to swallow, so small nuts may be preferred for wildlife habitat. And people wishing to have a fast-growing forest tree for lumber production will monitor tree growth itself rather than nut size.

What is exciting is the great amount of natural variability within the American chestnut species that can be preserved, and it is an integral part of the mission of The American Chestnut Foundation to preserve as much of this variability as possible.

Fig. 5. The large bur contained a "plug" of tissue (A) attached to part of the bur wall that detached from the rest of the bur along fissures in the wall (B) as the bur opened at maturity. The detached plug is at right, containing remnants of the bur outer wall (green and brown) along with attached soft tissue (white).
Photos by Paul Franklin

*in'-vuh-lew-ker **kew'-pewl'

Sisco, P. and K. Steiner. 2012. Chestnut ecology and adaptation: how the tree interacts with its environment. *Jour. Amer. Chestnut Fndtn.* 26(4):23-26.

Hugh says, "This soup marries three flavors I love: chestnuts, sherry and porcini. They just work brilliantly together. If you cannot find fresh porcini, use frozen; if you cannot find frozen use dried; if you cannot find dried, use shiitakes; if you can't find shiitakes you should consider lobbying for better shopping in your neighborhood."

Photo credit: Sarah Dorio

Chestnut & Porcini Soup

Recipe by Hugh Acheson, chef and owner of Georgia restaurants Five & Ten, The National, and Empire State South. This recipe was published in the Nov/Dec 2011 issue of *Spenser Magazine*, along with an article on The American Chestnut Foundation. Read the article on the web at http://www.spensermag.com/spensermag-past-issues.html

Ingredients

2 tablespoons unsalted butter

1 medium yellow onion, peeled and minced

4 branches celery, peeled and minced

1 russet potato, peeled and diced to 1 inch

½ pound fresh porcinis, brushed of any dirt and cut into 1 inch pieces

½ pound fresh button mushrooms, thinly sliced

1 cup dry sherry

1 ½ quarts chicken stock

1 cup (about 12) chestnuts, roasted, peeled and chopped

bouquet of 8 sprigs of thyme and 5 sprigs of flat leaf parsley

2 bay leaves

1 cup heavy cream

Salt and pepper to taste

Directions

1. Place a heavy soup pot or stock pot over medium heat. Add the butter to the pot and when the butter begins to bubble and froth, add the onions and celery and sweat down for 10 minutes.
2. Add the mushrooms and sauté for 10 minutes. Once the mushrooms are sautéed down a fair bit add the sherry and reduce for 5 minutes.
3. Add potato and chestnuts to pan and cook for 10 more minutes. At this point add the chicken stock, the bouquet and bay leaves. Cover and cook until potato is tender, about 15 minutes.
4. While still on heat add the cream, and immediately remove bouquet and bay leaves using a slotted spoon or tongs. Then remove pot from heat.
5. Season the soup and then carefully puree it in a blender. Pass through a fine chinois for a smoother texture.

Serves 8

Chestnut Moments

Photo by William Weber

From bristly foliage

you fell

complete, polished wood,
gleaming mahogany,

as perfect

as a violin newly

born of the treetops,

that falling

offers its sealed-in gifts,

the hidden sweetness

that grew in secret

amid birds and leaves,

a model of form,

kin to wood and flour,

an oval instrument

that holds within it

intact delight, an edible rose

From
Ode To a Chestnut
on the Ground
by Pablo Neruda

http://www.fs.fed.us/r8/chestnut/