

THE
JOURNAL
OF THE AMERICAN CHESTNUT FOUNDATION

JULY / AUGUST 2014 | ISSUE 4 VOL. 28

The background of the cover is a photograph of several people, including a man in a black t-shirt and glasses in the foreground, and a woman in a pink and white striped shirt in the middle ground. They are gathered around a chestnut tree, examining long, green, drooping catkins. Some of the catkins are enclosed in brown paper bags. The scene is set outdoors in a grassy field with trees in the background.

Special Issue: Chestnut Outreach and Education Projects

American Chestnut Habitat Modeling in Shenandoah National Park

How to Involve the Next Generation in Chestnut Restoration



Enter to Win!

TACF's 2014 Chestnut Photo Contest



Submit your photos to win great prizes and see your images in print!

Send your best chestnut-related photos to TACF! Contest voting will take place online through the www.acf.org website. The winning photo will be featured on an upcoming cover of *The Journal of The American Chestnut Foundation*. The winner will receive a TACF T-shirt, a copy of *Mighty Giants, An American Chestnut Anthology*, and a complimentary one-year TACF membership.

How to Enter and Contest Terms

- Photos should be sent digitally (submitted on disk or flash drive, or via e-mail or Drop Box) by September 1, 2014.
- Include your name, address, and telephone number with your submission, as well as the words: "Entry for TACF Photo Contest."
- All photos must have been taken by you and not previously published or submitted to any other contest.
- All entries must be submitted with caption information including names of subjects, locations, etc.
- All photos must in some way relate to the American chestnut.
- Entries must be at least 2500 x 3430 pixels and in a .jpeg or a .tiff format.
- If a person in the photo is recognizable, you must secure a model release from the subject or, in the case of a minor, from a parent or guardian, and enclose it with your entry.

Send entries to:
The American Chestnut Foundation
 50 North Merrimon Avenue, Suite 115, Asheville, NC 28804
 Attn: Ruth Gregory Goodridge (e-mail: ruth@acf.org)

All photos on this page are by 2013 TACF Photo Contest entrants.
 Photo credits from top to bottom: Carolyn Hill; Brian Fox;
 2013 winning photo by Jon Taylor; Anshpreet Parmar

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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 suitable for widespread testing 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

This June, students from Brevard and Olympic high schools spent a morning working at the Carolina Chapter's Pryor Orchard near Hendersonville, North Carolina. Sarah Branagan (far left), Brevard High School; Ingrid Findlay (center), Brevard High School; and Tripp Stender (right), Olympic High School, bag female chestnut flowers in preparation for pollination. This issue of *The Journal* features a variety of outreach and education projects led by TACF volunteers. The photo was taken by Jennifer Williams.

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Bagged chestnut burs at Meadowview Research Farms. Background photo by Ruth Gregory Goodridge

Fond Farewell

By Bryan Burhans, TACF President & CEO

As I conclude my tenure at The American Chestnut Foundation (TACF), I want to share my deep appreciation for your involvement in and support of our work. I am excited about the progress of TACF, and I have every confidence that the organization will succeed in its mission to restore the American chestnut to our eastern forests.

I have accepted a leadership position with Pennsylvania's state wildlife agency, the Pennsylvania Game Commission. This new position was an unexpected professional opportunity that will allow me to pursue my passion for wildlife as a certified wildlife biologist, while also being better able to support my aging parents who reside there in my home state.

In my five years with TACF the organization has accomplished so much, thanks to our dedicated board, donors, volunteers, state chapters, and talented staff. During this time we built a laboratory at Meadowview and purchased critical equipment to do our science. We brought in Jeff Donahue as director of operations of Meadowview Research Farms, and added two professional foresters. We filled the Southern Regional Science Coordinator position with the highly energetic Tom Saielli, and created a new Mid-Atlantic Regional Science Coordinator position filled by Matt Brinkman. We also reorganized our field scientists and placed them under the skilled and experienced leadership of Sara Fitzsimmons. And, recently, we added Michael French as our forester working on restoring chestnut to reclaimed mine land.

TACF is currently stronger than ever. Thanks to the work of so many, the organization has developed a solid restoration plan and has adopted a new board governance structure that builds capacity and further prepares TACF for the next phase of its work. The board of directors is finalizing the organization's strategic plan with a bold vision for the next few years, and they will be recruiting a new leader to build on current success and dynamically address new opportunities for accomplishing TACF's mission.

During this transition, our current Vice President of Operations, Betsy Gamber, will serve as interim CEO. You may already be familiar with her, as she has been an integral part of our management team for more than five years, working closely with TACF's board and staff.

I can define TACF with three words: vision, integrity, and compassion. These words generally describe "leadership." TACF is a leader. To you supporters, donors, volunteers, and active state chapter members: thank you. The privilege to serve this organization has been humbling, and was truly a gift in my life. Now, I will join the volunteer ranks of TACF, and I look forward to working alongside you to contribute to the greatest conservation success story ever: the restoration of the American chestnut.



Bryan Burhans (right) plants a Restoration Chestnut 1.0 with TACF Board members Brad Stanback (left) and Paul Sisco (center) at OM Sanctuary in Asheville, NC. Photo by Taylor Taz Johnson



Meadowview Research Farms celebrates its 25th year anniversary this year.

Join Us in Celebrating Meadowview Research Farms' 25th Anniversary

The Southwest Virginia Restoration Branch of TACF will host the 25th anniversary of the chestnut restoration program at Meadowview Research Farms on Saturday, October 11, 2014, from 2-6 pm at the Glenn C. Price Research Laboratory in Meadowview, Virginia. The event will honor the farms' 25 years of American chestnut research as well as the numerous donors and volunteers who have made this research possible.

This is a unique, firsthand opportunity to see the progress that has been made at Meadowview Research Farms and to enjoy an autumn afternoon of food, live music, and fun. Those individuals who have contributed to the research at Meadowview Research Farms over the past 25 years are especially encouraged to attend.

All are invited to tour the Glenn C. Price Research Farm starting at 2:30 pm. The wagon tours through the chestnut orchards will be led by Dr. Fred Hebard. Visitors can also tour the lab where TACF advanced genetic research is being conducted.

There will also be activities for children, roasted chestnuts, light snacks with a chestnut theme, and chestnut beer brewed by The Damascus Brewery. Potentially blight-resistant Restoration Chestnut 1.0 seedlings and merchandise contributed by local merchants will be included in the raffle. We hope to see you there to help celebrate the accomplishments of the past 25 years!

Allegheny Chinquapin



Chestnut Oak



Beech



Chinese



American



The Tree Identification Sheet on the TACF website is a helpful resource to print and keep in your backpack while out on the trail.

Identifying American Chestnut Trees

TACF is charged with identifying, recording, mapping, and analyzing chestnut trees across the native range. This is a big job, and we rely heavily on our members and volunteers for assistance. That's why we like to periodically remind folks about the identification resources available on the TACF website. To get started, simply visit www.acf.org/find_a_tree.php.

If you're a beginner, we suggest you start by comparing American and Chinese chestnuts, which are pictured at the right side of our Find a Tree page. More than 80% of the leaves sent to TACF each year for identification are either from Chinese chestnuts or Chinese/American hybrids, because these trees are resistant to the chestnut blight. Also compare true American chestnut with three trees often confused with it: chestnut oak, beech, and horse chestnut.

If you think you've found an American chestnut, send us a leaf and twig sample along with a completed Tree Locator Form so that we may identify it for you. Spring and summer are the best times of year to collect samples for identification purposes. TACF scientists perform an analysis of the macro and microscopic characteristics of all samples submitted according to the online specifications. The results of the analysis are sent back to the submitter within approximately 3-6 weeks.

To read more about American chestnut tree identification and how to mail samples to TACF for analysis, please visit TACF's Find a Tree webpage at: www.acf.org/find_a_tree.php. Check out the tutorial that guides you through preparing samples and filling out the tree locator form.



Several of the students who presented their research at the 30th Annual Meeting poster session in Herndon, Virginia, last year. From left to right: Elise Elwood, College of William and Mary; Hannah Angel, University of Kentucky; Kathryn Vescio, Penn State, Harrisburg; Taylor Cochran, Miami University; Caleb Cochran, Miami University; Jennifer Santoro, Duke University; and Michael McCampbell, Frostburg State University. Photo by Jon Taylor

universities," said Kendra. "Interest in American chestnut restoration is gaining momentum and TACF is thrilled to provide a venue for bringing more of that work into the spotlight."

For this year's 31st Annual Meeting, TACF is again seeking research posters and student presentations. To be considered, please submit an abstract by August 15, 2014, to Kendra at kendra@acf.org. More information about the Poster Session and Student Research Presentations can be found online at www.acf.org/annualmeeting31.php.

Poster Session and Student Research Presentations Bring a New Perspective to Annual Meetings

TACF annual meetings forever changed when the planning committee implemented the highly popular Poster Session and Student Research Presentations. Over the past two years, TACF has invited researchers to our annual meetings to present posters relevant to American chestnut restoration. The turnout has been significant, particularly among young students, who take advantage of the opportunity to display their research to TACF members and the science community. Student research presentations were added to the line-up last year with a similar outpouring of interest. These sessions offer students the opportunity to gain experience presenting their personal research to large groups.

TACF New England Regional Science Coordinator Kendra Gurney organizes both sessions and looks forward to them every year. "These sessions offer our members and collaborators the opportunity to learn more about the wide range of chestnut-related research conducted at colleges and



Volunteers pose for a group photo after direct seeding the 1-acre progeny test in Clinton County, PA. This project site is within the Chesapeake Bay watershed and a focal area for golden-winged warbler habitat enhancement. Photo by Michael French

Mined Land Reforestation Plantings in 2014

By Michael French, TACF Forester

TACF is proud to report on its ongoing work with mined land reforestation plantings in 2014. Thanks to a continued partnership with the Appalachian Regional Reforestation Initiative and Green Forests Work, this important collaboration focuses on the reforestation of mine lands throughout the Appalachian region. In 2014, TACF members and volunteers planted trees on reclaimed mines in KY, MD, OH, PA, TN, VA, and WV.

In addition, 2014 is the third year of TACF's Conservation Innovation Grant (CIG). The CIG is awarded by the USDA Natural Resources Conservation Service to establish mixed chestnut/hardwood plantings on 12 reclaimed mine sites in five states over three years. This year, volunteers have successfully installed five 30-acre restoration plantings as part of this grant.

TACF is also proud to announce its third year supporting the reforestation efforts of the National Park Service at the Flight 93 National Memorial. Planting Restoration Chestnuts 1.0 is part of a much larger reforestation

continued

TACF Welcomes Our New Members May-June 2014

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Michael Ambrisco
 Lee Atlas
 John Avault
 Gary Bahlken
 Paul Boberg
 Paul and Leslie Bosse
 Joseph Bressi
 John T. Buck
 Edward L. Burgess
 Paul Busse
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 Russell Caluri
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 Chris Mihok
 Charles Miller
 Mark Miller
 Martha J. Mills
 Darren Morris

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 Christopher Narvaez
 National Road Zane Grey Museum
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 Paul Simington
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 Charles and Janice Spritz
 Mary Louise Stanford
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 Stefanie Rinza
 David C. Ryder
 Dr. Warren Strittmatter
 Diana Varga
 Aubrey Watts

Mined Land Reforestation *continued*

effort that is taking place at the memorial site to honor victims of the terrorist attacks on September 11, 2001. The memorial was constructed on a reclaimed coal mine that surrounds the crash site of United Airlines Flight 93 near Stoystown, PA.

One important component of these reforestation events is education. Each volunteer planting event educates landowners, students, and the public on the need for better reforestation of mined lands, on the benefits of native species and reforestation efforts, on American chestnut restoration, as well as the technical skills required to properly plant trees. Volunteers are instructed on the proper techniques to plant bare root seedlings and how to direct-seed, protect, and record locations of chestnuts for progeny testing, which ensures that volunteers leave knowing their hard work will be successful.

TACF would like to thank its many partners for their tireless support in these critical reforestation projects: USDA Natural Resources Conservation Service, Appalachian Regional Reforestation Initiative, Green Forests Work, Norfolk Southern Foundation, Colcom Foundation, Richard King Mellon Foundation, Foundation for Pennsylvania Watersheds, as well as numerous state and federal agencies, universities and colleges, and countless volunteers who worked to make the plantings a success.



Volunteer tree planters share some family time while planting at the Flight 93 Memorial. Photo by Michael French

In Memory of and In Honor of Our TACF Members May-June 2014

In Memory of

Nicholas Berger

Haddon and Ethel Carryer

Richard Coker

Sima Cooperman and Janet Habas

Edward D. Fegert

Barbara Songer

Norman Hochella

Wellesley Symphony Orchestra

George M. Knebel, Jr.

*Robert Borucki
James Forrester, Sr.
Robert Mills*

Clyde A. Morris

Martin Schulman

Katherine Tilson

Murray

Gail Kinney and John Murray

Ruth Masters Porter

*Judith Denning
Helen Kemp*

Auden Orion Rafert

*Sandra Dennison-James
Emilia Tata*

In Honor of

Irene Burgess

Joel Burgess

Bruce Levine

Charlotte MacDonald

TACF'S 31ST ANNUAL MEETING OCTOBER 17 - 19, 2014

at the Northern Virginia 4-H Educational Conference Center
600 4-H Center Drive, Front Royal, VA 22630

31st Annual Meeting Registration Fees

Full Registration: \$125 per person (*Lodging not included*)

Includes:

- Friday Welcome Reception
- Friday Barbeque Dinner – Sponsored by the Virginia Chapter
- Saturday Breakfast, Lunch, and Snacks
- Saturday Opening Sessions
- Saturday Afternoon Sessions
- Saturday Dinner and Program
- Sunday Continental Breakfast

Saturday Day Pass: \$49 per person

Includes:

- Saturday Breakfast, Lunch, and Snacks
- Saturday Opening Sessions
- Saturday Afternoon Sessions

Student Registration: \$35 per person (must show student ID)

Includes:

- Saturday Breakfast, Lunch, and Snacks
- Saturday Opening Sessions
- Saturday Afternoon Sessions

Optional: Friday Barbeque Dinner: \$25 per person

Saturday Dinner/Program: \$35 per person

Sunday Continental Breakfast: \$10 per person

 Register online at www.acf.org/annualmeeting31.php
or call The American Chestnut Foundation at (828)281-0047

Accommodations

There are a limited number of rooms available at the 4-H Center. Reservations can **only** be made through TACF by calling 828-281-0047.

For other accommodations, visit the Front Royal, VA, Visitor's Center website at: www.discoverfrontroyal.com

31ST ANNUAL MEETING SCHEDULE



Friday October 17

- 4:00 PM - 6:00 PM Registration Open
- 5:00 PM - 6:00 PM Welcome Reception
- 6:00 PM - 9:00 PM Barbeque Dinner - Sponsored by the VA Chapter of TACF

Saturday October 18

- 7:30 AM - 8:30 AM Breakfast
- 8:30 AM - 6:30 PM Poster Session

8:30 AM - 12:00 PM Opening Sessions

8:30 AM - 8:40 AM Official Welcome
Dr. Kim Steiner, TACF

8:45 AM - 9:30 AM Keynote Address - Identification of Chestnut Blight Fungus Genes that Restrict Hypovirus Transmission Provide New Options for Unleashing Hypovirulence
Dr. Donald L. Nuss, University of Maryland

9:30 AM - 10:15 AM The Effects of Plant-animal Interactions on American Chestnut Restoration
Dr. Harmony J. Dagleish, College of William and Mary

10:15 AM - 10:30 AM Break

10:30 AM - 11:15 AM Reforestation of Surface Mines: Applications of the Forestry Reclamation Approach for TACF's Conservation Innovation Grant
Michael French, TACF

11:15 AM - 12:00 PM TACF External Grants Program: Solidifying Research Partnerships
Sara Fitzsimmons, TACF

12:00 PM - 1:00 PM Lunch

1:00 PM-5:00 PM Afternoon Sessions

1:00 PM - 1:50 PM Session 1: Forestry Skills
Matt Brinckman, TACF

Session 2: Creating Interactive and Engaging Presentations for Audiences of All Ages
Lois Breault Melican, MA/RI Chapter of TACF and Doug Gillis, Carolinas Chapter of TACF

1:50 PM - 2:40 PM Session 1: Forestry Skills
Matt Brinckman, TACF

Session 2: Creating Interactive and Engaging Presentations for Audiences of All Ages
Lois Breault Melican, MA/RI Chapter of TACF and Doug Gillis, Carolinas Chapter of TACF

2:40 PM - 3:30 PM Session 3: How Chestnut Acquired and Lost Keystone Species Status
Dr. John Scrivani, VA Chapter of TACF

3:30 PM - 4:00 PM Break

4:00 PM - 5:00 PM Student Research Presentations

5:30 PM - 6:30 PM Poster Session Reception and Social Gathering

6:30 PM - 8:30 PM Dinner/Program - Program TBD

Sunday October 19

7:30 AM - 9:00 AM Breakfast

10:00 AM - 12:00 PM Guided Appalachian Trail Hike to Compton Peak
Meet at Compton Gap parking area at 10:00 am (see program description)

10:00 AM - 12:00 PM Smithsonian Conservation Biology Institute Tour I
Cost is \$10; space limited; pre-register by calling 828-281-0047 (see program description)

1:00 PM - 3:00 PM Smithsonian Conservation Biology Institute Tour II
Cost is \$10; space limited; pre-register by calling 828-281-0047 (see program description)

Schedule subject to change.

KEYNOTE ADDRESS

Identification of Chestnut Blight Fungus Genes that Restrict Hypovirus Transmission Provide New Options for Unleashing Hypovirulence

Dr. Donald L. Nuss, Professor and Director, Institute for Bioscience and Biotechnology Research, University of Maryland

Transmission of the viruses, called hypoviruses, that cause reduced virulence (hypovirulence) of the chestnut blight fungus is restricted by a fungal genetic non-self recognition system called vegetative incompatibility (vic). This restriction complicates the use of hypovirulent fungal strains to treat individual blight cankers, as practiced by many TACF Chapters, and the spread of hypovirulence through chestnut blight fungus populations in forest settings. This talk will review the restrictions to hypovirus transmission, describe the recent identification of the vic genes, and discuss the options that this advance provides for simplifying hypovirulence treatment of individual cankers and for potential utility in American chestnut restoration.

The Effects of Plant-animal Interactions on American Chestnut Restoration

Dr. Harmony J. Dalglish, Assistant Professor of Biology, College of William and Mary

Before the introduction of the chestnut blight, American chestnut was a dominant species in many eastern forests. Recent analysis of Forest Inventory and Analysis data indicate that approximately 10% of the original population remains, with the vast majority of these trees being seedling-sized (shorter than breast height or dbh < 1 in). Modern forests have changed dramatically since chestnut was extirpated from the canopy, including reduced frequency of fires and increased deer populations. The presentation will examine the plant-animal interactions that affect chestnut population growth and spread. Dr. Dalglish's research uses mathematical population models based on field-collected data to compare the effects of dispersers, seed predators, and herbivores. Such knowledge will be critical for forecasting the establishment and spread of blight-resistant chestnut populations.

Reforestation of Surface Mines: Applications of the Forestry Reclamation Approach for TACF's Conservation Innovation Grant

Michael French, Forester, The American Chestnut Foundation

This talk will inform attendees about TACF's pioneering reforestation work with the Appalachian Regional Reforestation Initiative and Green Forests Work which utilizes the Forestry Reclamation Approach (FRA). This approach was implemented for the Natural Resources Conservation Service (NRCS) Conservation Innovation Grant, received by TACF in 2011. Michael French will discuss objectives for plantings and show techniques applied, as well as preliminary survival and growth data.

TACF External Grants Program: Solidifying Research Partnerships

Sara Fitzsimmons, North Central Regional Science Coordinator, The American Chestnut Foundation

Since 1989, TACF has been providing small monetary awards to cooperating researchers. TACF External Grants Program was enacted as a way to attract new research partners to TACF's mission as well as to provide seed monies that can be

used to help garner larger awards to assist the ongoing work toward American chestnut restoration. As the current chair of the External Grants committee, Sara Fitzsimmons will provide a program overview and highlight its achievements over the past 25 years.

Forestry Skills

Matt Brinckman, Mid-Atlantic Regional Science Coordinator, The American Chestnut Foundation

Led by Matt Brinckman, with assistance from other TACF forestry professionals, this workshop will briefly cover some basic forest management skills involved in either orchard management or American chestnut restoration. Three to four topics will be covered including basic forest measurements, American chestnut silviculture, and basic tips and tricks for managing data using Microsoft Excel. Participants are encouraged to come prepared with questions for our expert leaders.

Creating Interactive and Engaging Presentations for Audiences of All Ages

Lois Breault Melican, Massachusetts/Rhode Island Chapter of The American Chestnut Foundation

Doug Gillis, Carolinas Chapter of The American Chestnut Foundation

This session will provide participants with the resources and templates needed to create and deliver professional presentations to audiences of all ages, without the need to learn new software skills. Participants will learn to structure and deliver presentations so audiences appreciate and emotionally connect with the rich cultural heritage of the American chestnut, interactively learn about the restoration of the American chestnut, and seek to further investigate and participate in restoration efforts.

Student Research Presentations

Attendees at this session will learn about the wide range of chestnut-related research being conducted by students at colleges and universities. Interest in American chestnut restoration is gaining momentum and the student research presentations provide a venue for bringing their work into the spotlight.

Poster Session

The Poster Session gives attendees the opportunity to explore a wide range of research topics related to American chestnut restoration. Posters will be on exhibit all day Saturday beginning at 8:30 AM and researchers will be available for questions during the reception from 5:30 to 6:30 PM.

Smithsonian Conservation Biology Institute Tours

This is a driving/walking tour of the Smithsonian Conservation Biology Institute (SCBI) property with the opportunity to see several of the endangered species housed at the facility including maned wolves, Przewalski's horses, tufted deer, and white-naped cranes. Attendees will learn about research being conducted at the SCBI, the National Zoological Park, and around the world, as well as the unique history of the property. The tour lasts about two hours and is led by trained volunteer guides.

Guided Appalachian Trail Hike to Compton Peak

We know you love trees, but do you love rocks, too? Rocks determine everything—from where things will grow to where trails will go. This hike takes us south on the Appalachian Trail to a spectacular rock formation on Compton Peak and showcases the trail-building skills—using rock—of a Potomac Appalachian Trail Club volunteer trail crew. The hike is out-and-back, 1.8 miles, with 500 feet of elevation gain. Meet at Compton Gap parking area at 10 am, milepost 10 on Skyline Drive (if traveling south on Skyline Drive from Front Royal, the parking area is on the left). Parking is limited so ride-sharing is recommended. Mark and Betty Gatewood of the Virginia Chapter will lead the hike.

Book Review

Hemlock – A Forest Giant on the Edge,
David Foster, editor

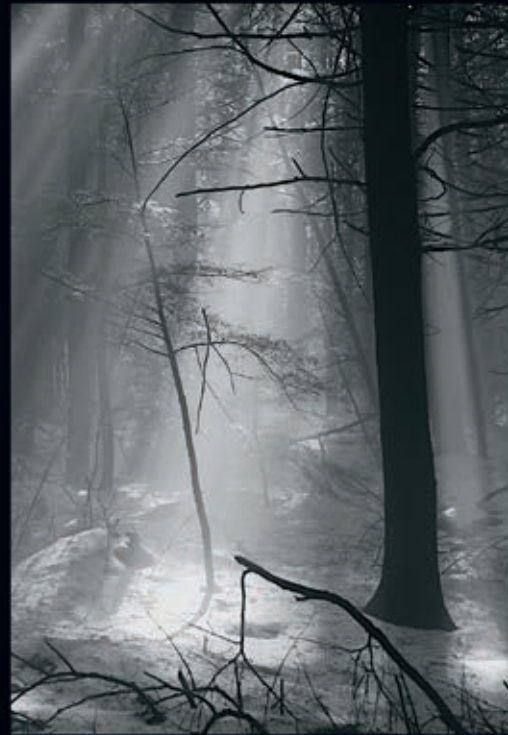
(Yale University Press, 2014),
336 pages, \$40.

By Dr. Fred Paillet

Hemlock – A Forest Giant on the Edge, edited by David Foster, is an insightful collection of essays on the history, ecology, and social significance of Eastern hemlock in New England in the context of its ongoing demise at the hands of the hemlock woolly adelgid. More important for TACF members, the essays repeatedly present the many ecological parallels between the Eastern hemlock (*Tsuga canadensis*) and the American chestnut (*Castanea dentata*) in the New England landscape, as well as their unfortunate encounters with introduced alien pathogens. The book is well illustrated with black and white photographs and presents some of the more colorful characters who appear in the course of forest ecology studies of the past.

The severe suppression of hemlock pollen 5,500 years ago and identified in fossil pollen studies is used as the prototype for loss and recovery of a species in the forest ecosystem. It is argued that the parallel with chestnut blight may not be so close after all, with the temporary hemlock loss being more complicated than the simple introduction of a novel pathogen from west coast hemlocks, as once insightfully proposed by paleoecologist Margaret Davis. There is even the suggestion that the temporary replacement of hemlock by nut-bearing trees such as chestnut may have been a boon for wildlife and aboriginal humans.

The more recent historic association of chestnut and hemlock in southern New England is related to past land use history, and the loss of chestnut is characterized



HEMLOCK

A Forest Giant on the Edge

DAVID R. FOSTER, Editor

Photo courtesy of Yale University Press

as a major factor influencing the establishment of hemlock-dominated stands. One essay extols the landmark study in forensic forestry, conducted as a PhD thesis by Earl Stephens, which involved investigation of blight-killed chestnut and stands out as one of the most referenced analyses in forest ecology literature. A central conundrum throughout the book is dealing with the loss of a low-value wood resource where the loss actually leads to a significant increase in local ecosystem diversity. This is in many ways the exact inverse of the case for chestnut blight.

Still, the best part of this delightful little book is the walk through the history of forestry with hemlock in the foreground, but with chestnut as a companion—sometimes hidden in the background and sometimes an active participant in the unfolding story. The book is available at www.yalebooks.com or from your favorite bookseller.

American Chestnut Habitat Modeling: Identifying Suitable Sites for Restoration in Shenandoah National Park

By Jennifer Santoro

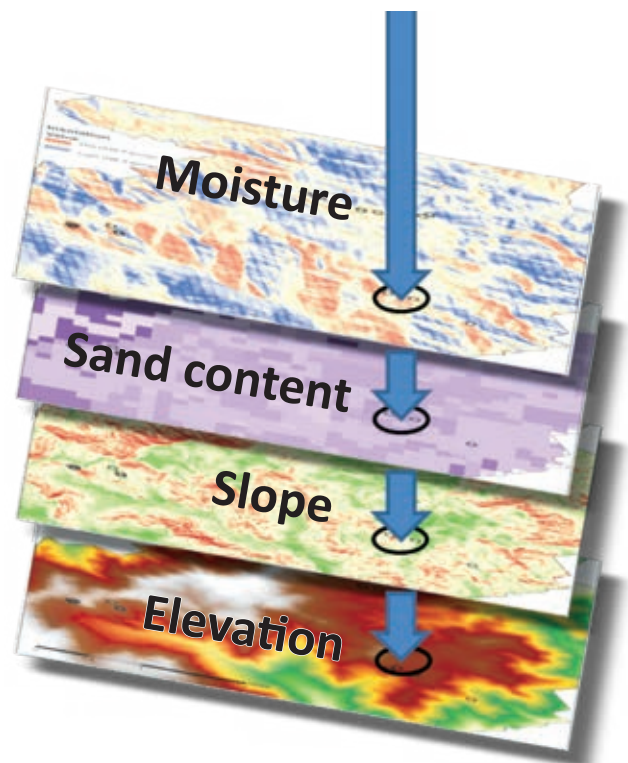
Since 2008, TACF's Appalachian Trail (AT) MEGA-Transect Chestnut Project has engaged citizen scientists to collect American chestnut occurrence data over the length of the Appalachian Trail. These data serve two main purposes: First, they help TACF to locate surviving trees for use in their breeding program. Second, and the primary goal of this research, is to model the presence and absence of chestnuts across the native range in order to better understand biotic and abiotic criteria that might dictate chestnut establishment.

However, this dataset is limiting in some areas where only certain ecotypes are sampled. Although across the entirety of the AT a wide variety of terrain is sampled, in areas like Shenandoah National Park (SNP), the AT stays primarily on the ridgeline. To study more diverse elevational and habitat gradients within the park, we conducted an extensive sampling of side trails there. Large surviving American chestnuts over 13 inches in circumference were singled out for this study. The GPS locations of these trees were recorded in the field and input into ESRI's ArcGIS software. Expanding the dataset from the AT allows us to draw more informed conclusions about habitat for surviving American chestnuts.

To map the best chestnut habitat locations in SNP, I developed a series of species distribution models based on field observations. Species distribution models are important in modeling a species' habitat because they consider a suite of environmental variables, such as elevation, topography, and soil moisture, in addition to actual occurrences of species in that environment. The model looks at each recorded chestnut location and reads the values of the identified environmental variables at that point (see image illustration). For example, one chestnut might be located at an elevation of 1,000 meters on a 20% slope in soils that contain 45% sand.

Once the model iterates for all chestnut locations, it uses the values of the environmental data to determine which variables are the best predictors of chestnut habitat. In these models, elevation, sand content in soil, and slope were the best predictors in SNP: this means that all recorded chestnut points had similar values for

elevation, sand, and slope. Then, the model looks at the rest of SNP and highlights the areas that have similar favorable environmental values. In this way, the model uses known chestnut points to predict other potentially good sites for trees.



This image illustrates how the model captures the environmental variable value at a point.

To make my chestnut distribution model more robust, I ran three different predictive models and combined the resulting maps to generate a more confident habitat prediction in SNP (Figure 1). Overall, the three models tended to agree on location, but not quantity, of suitable habitat for surviving chestnuts. One model predicted very little habitat while another predicted a more expanded habitat. But since all models agreed that elevation, sand, and slope were the most significant habitat predictors for chestnut, I considered my results to be plausible.

Additionally, I ran a climate prediction model on American chestnut habitat to the year 2070 to see if habitat for surviving trees might shift in the face of climate warming. Climate change models produced only subtle range shifts; as a generalist species, American chestnuts may not face adverse effects of future climate warming. However, it is important to note that climate prediction models rely on temperature extrapolation and are less accurate than models using actual recorded data. Overall, there appeared to be a subtle northward shift in chestnut distribution between the present and 2070 (Figure 2).

In conclusion, models are important tools for predicting American chestnut habitat both in the present and future. Although models are not the ultimate answer to saving the American chestnut, they can help to point us in the right direction by highlighting new locations where surviving trees might live or the best areas for progeny tests. When multiple models agree that elevation, sand, and slope are good predictors of chestnut habitat, we can focus our efforts on finding areas that meet that definition for future research.

However, environmental models are only one piece of the puzzle. Modeling does not take tree genetics, competition, or *Cryphonectria parasitica* biology into consideration. These are all important factors in determining whether a chestnut tree will survive to reproductive maturity or succumb to the blight at a young age. But regardless of whether these models show true chestnut habitat preferences or simply locations where trees have survived to maturity, they are still important in pinpointing locations where chestnut reintroduction could be successful. Finally, mapping these results provides valuable information to both Shenandoah National Park and TACF as they continue to search for, study, and restore the American chestnut to the Appalachian forest.

Jennifer Santoro interned for the Virginia Chapter of TACF during the summer of 2013 while she was completing her Masters of Forestry and Masters of Environmental Management degrees at Duke University's Nicholas School of the Environment; the modeling results presented here were part of her master's thesis on American chestnut habitat restoration.



Figure 1. Predicted chestnut habitat in Shenandoah National Park from one model output.

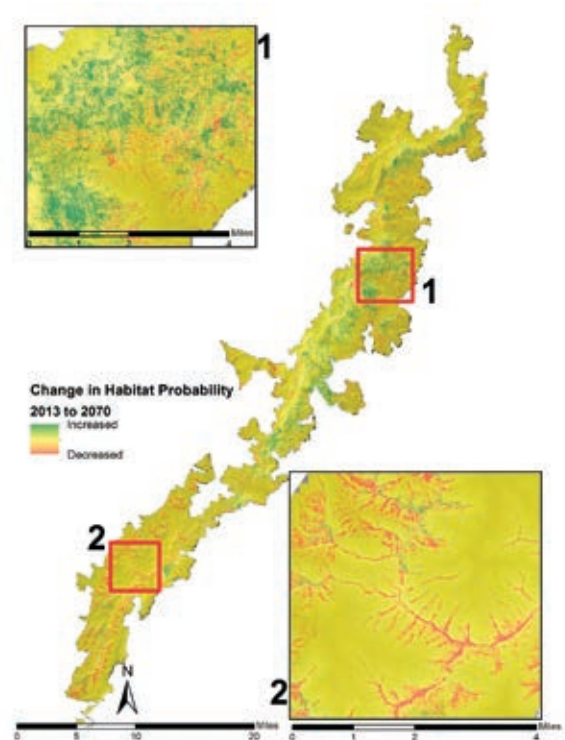


Figure 2. Change in chestnut habitat probability from the present until 2070 as predicted by a climate projection model. Red indicates decreased probability of good habitat in the future while green indicates increased probability of good habitat in the future. Yellow indicates little to no change in habitat probability. Changes are subtle but indicate a slightly northward shift.

Restoration Branches: Building Our Ranks

By Bryan Burhans



As annual sponsor members, Tom and Elaine Baum from Lancaster, Pennsylvania, take home Restoration Chestnut 1.0 seedlings after the 2013 Raystown Lake Restoration Branch event at the C. Barton McCann School of Art in Petersburg. Photo by Stephanie Bailey

The success of The American Chestnut Foundation (TACF) pivots on our army of volunteers. They carry out our breeding program from Maine to Alabama, but their work is not limited to the breeding project. Our volunteers also spread our mission by contributing to our education programs, by actively participating in our science, and by sharing our conservation message in their local communities.

The Restoration Branch Program was started several years ago to provide our state chapters the opportunity to build their volunteer base. The concept is simple: a Restoration Branch is a group of volunteers working at the community level to focus on implementing the mission of TACF in their own backyard.

From Tennessee and Central Pennsylvania to Indiana, North Carolina, Massachusetts, and Maine, our volunteers have been actively organizing. One of the first Restoration Branches was created several years ago in Meadowview, Virginia. This Branch is an astounding success. In this issue of *The Journal* you can read the Southwest Virginia Restoration Branch members' great article sharing what they have learned over the past several years.

One common activity that all of our Branches organize is an outreach event. These events provide the opportunity to build membership, recruit volunteers, and educate local communities about the mission of The American Chestnut Foundation. The structure of these events is diverse.

The Raystown Lake, Pennsylvania, Branch, led by TACF members Jeff and Lori Krause, has had a succession of packed-out events, due in part to their innovative structure. The one I attended took place on a Sunday afternoon and offered participants three classes to rotate through: cooking with chestnuts, a seminar on the history and restoration of the American chestnut, and a class on winetasting featuring offerings from a local vineyard. Between each class, participants took advantage of some great food and tasty adult beverages. Afterwards, the Branch held a live auction to raise money to support chestnut restoration projects in their local community.

The ticket price to attend the event covered the cost of the food and the facility rental, and included membership in TACF. By including the event costs in the ticket price, they did not risk having an event that lost money. On top of that, the Branch was able to get 30 of the attendees to sign up as annual sponsor members. The affair was a tremendous success; they expanded their base of volunteers, shared the work of TACF with the local community, and raised critical funding to support local projects.

However, the activities of a Branch do not stop with just an annual outreach event. Our Restoration Branch members have been very effective working at the local community level. For example, our Nashville, Tennessee, Branch has taken on projects such as establishing demonstration plantings, providing speakers to local

garden clubs and other civic groups, and helping with chestnut plantings to support our science programs. In reality, the work of the Branch volunteers goes on all year long.

If you are interested in creating a Restoration Branch in your community to support the return of the American chestnut, contact your local regional science coordinator or call our headquarters in Asheville, North Carolina.



Last fall Nashville Branch members hiked through Taylor Hollow Natural Area in Sumner County, Tennessee, to learn to identify chestnut trees and their habitat preferences. Pictured left to right: an unidentified hiker, Vicki Turner, Linda Doochin, Jack Torkelson, Michael Doochin, James Davidson, and Will Schibig. Photo by Joe Schibig

Lessons learned from hosting outreach events:

- It takes a committed and fairly large committee to pull off a successful outreach event. A typical committee size is 8 to 12 people. Committee members must be willing to reach out to their contacts to sell tickets. Direct mail, email, hanging posters and other passive methods typically do not result in many ticket sales. People attend these types of events because someone asked them.
- A lower ticket price will not increase attendance. This has been demonstrated repeatedly, not only within TACF but by other nonprofits as well. The key to high attendance is the ability of the Branch to network in the community and personally ask individuals to attend. And remember, not everyone who is interested in participating in on-the-ground activities will be interested in attending an outreach event. That's OK. TACF offers opportunities for everyone to become involved.
- Give yourself several months to plan before hosting your event. Part of the planning process is to recruit volunteers who are willing to help sell tickets.
- Outreach events do not necessarily need to include a fundraising component. However, we strongly urge Branches to offer TACF membership as part of the ticket price to help strengthen the State Chapters. In addition, this membership will allow TACF to communicate with the new members through *The Journal of The American Chestnut Foundation*.
- For Branches that do fundraise at their events, 100% of the net income (after event cost and membership fee is taken out) stays in the state. The Branch keeps 50% of the net revenue to support local projects, 25% goes to support state-level projects, and 25% supports the Regional Science Coordinator who works in your state.
- For more information on developing a Restoration Branch in your community and hosting an outreach event, check out our Restoration Branch brochure at www.acf.org/pdfs/branch_brochure.pdf.

Southwest Virginia Restoration Branch Makes a Difference

By the Southwest Virginia Restoration Branch:
Monica Appleby, Laura Georgi, Fred Hebard, Doug Levin,
Stacey Levin, Dick Olson, Gail Olson, Tommie Pratt,
Dale Sargent, Joneen Sargent, and Dayle Zanzinger

More than twenty-five enthusiastic and anxious volunteers gathered in the crowded central room of the old farmhouse at Meadowview Research Farms' Wagner Farm in early 2009. Although most of us probably didn't know much about The American Chestnut Foundation (TACF) and the breeding program at the Farm, Bryan Burhans, the Foundation's enthusiastic CEO, was about to educate us on how to start a Restoration Branch and plan our first fundraising celebration as the Southwest Virginia Restoration Branch. High expectations were laid before the group, and five years later we're still pursuing the goals that Bryan set out for us. We've sure learned some lessons along the way.



Southwest Virginia Restoration Branch member Monica Appleby shucks chestnuts during harvest at the Glenn C. Price Laboratory. Photo by Dick Olson

Goals of TACF Restoration Branches (specific goals depend on state objectives)

- Provide support for your TACF State Chapter to build and assist local breeding efforts
- Support testing and evaluation of Restoration Chestnut 1.0 plantings, including progeny testing, field testing, and future restoration plantings
- Share the story of the American chestnut with your local community through outreach to schools, establishing educational plantings, etc.
- Recruit new members to help work on local restoration and breeding projects
- Provide opportunity for your community to become involved locally with TACF conservation efforts
- Support germplasm conservation by planting pure stands of American chestnuts
- Raise funds to support local, state, and national goals



A tour of the Price Farm is an integral part of the Southwest Virginia Restoration Branch's annual celebrations. Photo by Dick Olson

Prominent among the initial group was Mila Wilmoth, with her special kind of enthusiasm, friendly smile, and determination. She had recently completed time with the Peace Corps and had been hired by TACF as a technician at the Farm with part of her assigned duties to help coordinate volunteers. As many readers may realize, this is the same Mila—now Kirkland—who moved south, married, and is now editor of *The Journal*.

Another unique aspect of the Southwest Virginia Restoration Branch is our association with the Meadowview Research Farms. We recognize that the farms are the nucleus of the TACF chestnut restoration program, and a special part of the Farms is the talented staff who keeps them going. Staff is always willing to help identify a weed in the rain garden or discuss the breeding program—they create an atmosphere of making us feel welcome and appreciated. One of the aims of a Branch is the establishment and long-term ownership of chestnut plantings by the volunteers—including ceremonial plantings, progeny tests, and orchards. We are fortunate to have had strong beginnings—over the span of five years we have recruited over 170 volunteers for local projects and expanded the public's appreciation of TACF in our region.

Event Venue

Restoration branches are encouraged to have an annual outreach event to educate, increase membership, recruit

volunteers, and raise money. Our annual Restoration Branch celebrations have changed formats over the years as we have sought the best setting for our event. Our first two were held at the Glenn C. Price Laboratory in April. The first celebration included the dedication of the laboratory and coincided with a national board of directors meeting. Both events were financially successful and recruited members but with relatively high costs due to catering and tent and porta-potty rentals. In our third year we switched to a fall meeting and changed the venue to the Heartwood Artisan Center in Abingdon, Virginia, which has the advantages of an indoor setting and easy food service, and is a well-known site. We reduced the ticket price by using the \$10 Plant-a-Tree program instead of membership. However, that event had the lowest attendance and lost money.

In 2013 we returned to the Glenn C. Price Farm, which we now feel is the right venue for us, and hosted a fun day for the local community. We included a hay ride tour of the orchards, roasted chestnuts on site, had a local brewery make chestnut beer, and prepared fascinating foods using chestnut ingredients. More importantly, we did not sell tickets; instead we relied on sponsors, raffles, and beer sales to raise money and promoted TACF membership to attendees. Branch President Doug Levin summarized, "We were gratified to offer a free family event to area residents. Thanks to

generous local sponsors we were still able to raise money for the Branch. We hope to fine-tune and build upon what seems like a good formula for our area.”

Key to our successful celebrations is the link to chestnuts and restoration activities. In our case, the big draw is Meadowview Research Farms, but a chestnut orchard or planting may also attract people. Incorporating a chestnut theme, such as roasting chestnuts, chestnut beer, or chestnut food, also generates interest—especially the chestnut beer! We have found local businesses are willing to provide items for raffling or cash sponsorships. To date, we have raised about \$10,000, with half going to the Virginia Chapter and the national program. This fall, the Branch will have a unique opportunity to host the 25th anniversary celebration of the TACF breeding program at the Meadowview Farms, (see news article on page 4 for more details).

Engaging Youth

To build lasting support for restoration activities we must engage our youth in the chestnut story, and the Branch recently experienced how one small such effort can blossom into something much larger. For three consecutive summers, Branch member Tommie Pratt has organized teacher in-service trainings at the Farms. At the 2013 workshop the Branch donated a Learning Box to be shared among county schools. Although we stay in contact with the schools, it can be difficult to measure the benefit of these efforts. However, a middle school teacher who participated in the 2013 workshop contacted us seeking help with a project for her students to enter in a national competition. She had coached students in previous years and decided that the chestnut story would be the perfect topic.

Her student groups created two projects—a research summary with a large display for one event category and a short animated video for another. The display took first place in the regional competition, which allowed the students to move on to the national



In 2013, science teachers from Washington County, Virginia, gathered for an in-service training at TACF Meadowview Farms. For many, this experience brought the story of American chestnut restoration to life for the first time. Photo by Mila Kirkland

competition; the animated video took fifth place. “We are very pleased to have been the stimulus for a tangible student learning project about chestnuts,” remarked Tommie. “The students gained recognition, the chestnut story reached a wider audience, and as a bonus, their efforts will be presented to the Branch as a new educational tool.”

A Branch can offer volunteers local opportunities to directly

educate youth. For example, Tommie Pratt and Stacey Levin present the chestnut story to sixth graders in Washington County, Virginia, at Farm Field Days. One year they tried to use colored marshmallows on a string to explain the breeding program. After the event, Stacey commented, “While the students were enthusiastic about the marshmallows, they had not yet learned genetics so their interest was more in eating them than in understanding what they represented. Given the number of students who handled them during the event, we did not indulge them. We were able to expose a large number of students to the chestnut story, thereby planting seeds for the next generation of volunteers.”

Recruiting Volunteers

We have found that often the best recruits for our Branch are those individuals already active with other volunteer groups, such as Master Naturalists, Master Gardeners, or garden clubs. Gail and Dick Olson are active Master Gardeners and brought that interest with them to the Branch. The Branch and Master Gardeners combined time and talents to plan and plant native gardens to landscape the entrance to the Glenn C. Price Lab. “The gardens have exceeded our expectations,” said Gail. “I have been surprised by the amount of interest they have drawn from visitors to the Farms.”

Our Branch officers typically meet on a monthly basis to plan activities. We have a Facebook page (Southwest Virginia Restoration Branch of The American Chestnut Foundation), a Google Group for communicating within the Branch, and an email group that local volunteers



Planted and maintained by local Master Naturalists, the native plant gardens outside the Glenn C. Price Lab create a pleasant environment for visitors and staff. Photo by Nathan Brown

can join to receive information about upcoming events. Fortunately, we have the Meadowview Research Farms to provide ample opportunities for us to volunteer and learn. In addition, we have helped establish a number

of ceremonial plantings, four plantings on restored surface mines as part of the Conservation Innovation Grant with TACF, and a test planting on a National Forest.

With restoration activities spread over a big state such as Virginia, Restoration Branches are an efficient and gratifying way to support the TACF restoration program at the local level. Based on our experience, here are some of the key points we believe could help others to establish Branches:

- Identify a few key individuals to learn about creating a Branch and becoming responsible for the initial organization;
- Identify local environmental groups for potentially interested individuals for the Branch, such as Master Naturalists, Master Gardeners, friends of a local park, etc.;
- Adopt a local focus, such as an orchard or ceremonial planting;
- Plan an event appropriate to the local situation;
- Ask for help from the national office, your State Chapter, or other Branches; and
- Accept the fact that while the restoration of the American chestnut may be of broad interest, there really are only a limited number of folks who will commit time to the process – but they are passionate!



Pictured left, author Kathy Marmet examines American chestnut flowers with young chestnut scientists at the Smithsonian Conservation Biology Institute's EcoBioGeo Day Camp. Photo by Kelly Shen

Planting American Chestnut Seeds of Learning

By Kathy Marmet

On a steamy June morning, I watched as middle school students and their summer camp leaders, assisted by Duke Stanback intern Kelly Shen, embraced the role of citizen scientists, measuring diameters of American chestnut mother trees at the Smithsonian Conservation Biology Institute (SCBI) in Front Royal, Virginia. Their faces were lit up with enthusiasm. The palpable energy from these students engaged with living American chestnut trees was a reminder that our chestnut education work benefits young people by motivating them to learn; it also builds a sustainable base of support for continuing the work of TACF into the future.

TACF's Education Committee has grown from a small group of volunteers to become a committee of the Board of Directors with strong staff support, widespread recognition that education is a key aspect of TACF's work, and growing numbers of Chapter volunteers who are initiating local outreach programs. We have only just begun the task of educating future generations of American chestnut restoration scientists and citizen scientists; yet we have reason to feel proud of our significant progress toward developing a TACF educational program.

I invite you to explore this article and the accompanying sidebars that summarize the development of our program

and outline the direction in which we are headed. The sidebars are just a sampling of the kinds of activities that have emerged. We hope they will inspire you to share your ideas for building a TACF education program for young people. Please email educational activities and photos related to American chestnut restoration to education@acf.org.

Strengthening Chapter Outreach

Support for State Chapter educational outreach activities is a priority for the Education Committee. Recently, an Education Committee task group, led by Doug Gillis of the Carolinas Chapter and Lois Breault Melican of the Massachusetts/Rhode Island Chapter, formed to focus on collecting and organizing presentation resources used by scientists and volunteers. The intention is to make these resources more available throughout TACF. They are also working with staff to create templates to facilitate customization of presentations to fit audience needs, and to share techniques for effective storytelling to empower volunteers who wish to help tell the American chestnut story. I highly encourage you to attend the workshop the Education Committee task group will be presenting at the 31st Annual Meeting in Front Royal, Virginia, this fall.

Student Interns Enhance TACF Programs

Student interns have provided both manpower and scientific expertise to TACF and have been a source of skilled employees, including Regional Science Coordinator Sara Fitzsimmons and Forester Michael French. The Stanback program at Duke University has funded internships that expand limited TACF and State Chapter science budgets. Developing a more coordinated internship program may become a key educational component of the TACF Restoration Plan in the future. Here, we've collected reflections from two Duke Stanback interns about their experiences this summer.



Kelly Shen, Duke Stanback Intern

Interning with The American Chestnut Foundation has been an amazing learning experience. Based out of Charlottesville, Virginia, with Regional Science Coordinator Matt Brinckman, I have traveled to orchards far and wide in an effort to understand what TACF is all about. Starting with basic chestnut identification and the details of TACF's backcross breeding program to the intricacies of chestnut inoculation and problem pest assessment, I hit the ground running on day one—and am still going! By being immersed in the world of chestnuts as an intern, I have experienced first-hand the crazy passion of chestnut enthusiasts and the incredible task that lies ahead. Incredible. Not impossible or unattainable, or straightforward or easy... simply incredible.

TACF Intern Kelly Shen and Virginia Department of Forestry's Jerre Creighton pollinate chestnuts from a bucket truck. Photo by Matt Brinckman

Erin Vining, Duke Stanback Intern

Interning with The American Chestnut Foundation this summer has been an enlightening and engaging experience. As the biotechnology intern at the Glenn C. Price Research Laboratory in Meadowview, Virginia, I've been working on screening genetic markers in an effort to better understand and map genes potentially linked to blight resistance. I am gaining an understanding of both the value and the challenges of incorporating genotypic evaluations into a restorative breeding program. My exposure to the genetic research conducted at the lab and my understanding of the mechanics behind the breeding program have given me new perspectives on forest restoration and what it takes to restore a species in the face of various environmental pressures. These are perspectives that I will carry with me as I begin to study environmental management in graduate school this fall. I am enjoying every moment of working alongside wonderful people, in a beautiful setting, towards a meaningful goal!



Dr. Laura Georgi (left) and Erin Vining (right) work together in the Glenn C. Price Research Lab at Meadowview Research Farms. Photo by David Bevins

Increasingly, Chapter outreach has included program activities for school classes and gatherings of educators. Individual students and classes have helped plant, monitor, measure, and inoculate backcross orchards. Interns from high school to graduate school have helped advance Chapter efforts. As State Chapter volunteers have seen the benefits of telling the American chestnut story to young people, they have also learned that volunteer time is too limited to meet the growing demand. Volunteers have initiated programs and partnerships with public school teachers and other professional educators to include American chestnut restoration content in their curriculum:

- Several years ago, Dr. Carolyn Howes Keiffer obtained grant funding to offer a summer botany workshop for elementary school teachers that included lesson plans from the Charlie Chestnut curriculum, which can be found at www.charliechestnut.org/Phase1/Teachers/Teachers.html.
- The Maryland Chapter developed educational partnerships with the University of Maryland Biotechnology Institute and Carroll County, Maryland, Public Schools that catalyzed development of both the Carroll County middle school and high school chestnut curriculum and the Maryland Loaner Lab's Chestnut Tree Lab in restriction enzyme analysis. More information can be found at www.towson.edu/cse/beop/mdll.
- Each summer for the past three years, the Southwest Virginia Restoration Branch has worked with TACF staff to offer a teacher workshop with continuing education credit at the TACF Glenn C. Price Lab and Meadowview Research Farms.

TACF's American Chestnut Learning Box

The American Chestnut Learning Box has been a major focus of Education Committee efforts in recent years. It was launched on a small scale, initially targeted to meet the needs of chapter volunteers and educators in informal education settings such as museums and nature centers. The long-term intention has always been to develop a tool that can provide a hands-on American chestnut learning experience that can be widely used by classroom educators.

The first American Chestnut Learning Box was produced by the New York Chapter. It was created by professionals, designed to address New York standards of learning,

and funded by the New York Chapter. This excellent package of materials includes Charlie Chestnut (www.charliechestnut.org). Although Charlie's user interface is showing its age, the included curriculum package continues to inspire educators to teach about American chestnut.

Gary Carver displayed the prototype for the current Learning Box, which he had developed for use in Maryland, to the Education Committee at the 2009 Annual Meeting. In the enthusiastic discussion that followed, the Education Committee set a goal of providing an American Chestnut Learning Box to each TACF Chapter by the 2010 Annual Meeting. Chapters were asked to use their Learning Box in any way that worked for them, and to provide feedback for improvement.

Assembly of Learning Boxes is now in the capable hands of a group of dedicated volunteers at the TACF Meadowview Laboratory, coordinated by volunteer Tommie Pratt of the Southwest Virginia Restoration Branch, and supported in a variety of ways by TACF staff. Since the project's inception, 78 American Chestnut Learning Boxes have been sent out into the world, and we are learning from the many ways that these materials have been put to use by creative educators. Version 2.0, launched in early 2013, added pages covering key scientific topics and cultural history. For information on purchasing a learning box, visit www.acf.org/learningbox.php.

Progress through Partnerships

A more programmatic approach to bringing American chestnut education into classrooms will leverage the educational tools TACF has developed by working with partners who have the expertise and program resources to deliver quality educational programing.

Outdoor education specialist Betty Gatewood reached this conclusion after she reviewed the curriculum materials packaged with the Learning Box:

I've been very impressed with all the chestnut educational materials available and really cannot see how to improve it...except to organize teacher workshops. I am so in awe of the Maryland Loaner Lab . . . the Learning Box, the Charlie Chestnut curriculum, and everything else. I think we just need to do teacher workshops.

Brad Yohe of Pennsylvania, who recently retired as Science Supervisor with Carroll County Public Schools,



Students instructing other students can be a powerful teaching strategy. Lindsay Spurrier's Environmental Resources students Caleb Keefer and Trevor Page (standing, far right) are shown teaching 9th grade participants in Mifflinburg Area High School's annual Earth Day program.

Two TACF Members Build Educational Partnerships in Central Pennsylvania

By Kathy Marmet

Blair Carbaugh is a stalwart of the Pennsylvania Chapter of TACF. The first time I became acquainted with him was in 2008, when I arranged for two interns to travel to Pennsylvania to help Regional Science Coordinator Sara Fitzsimmons with inoculations. The interns spent a night at the Carbaugh home and helped inoculate the backcross orchard that Blair and his wife Mary host on their property.

Recently, Carbaugh told me of how he met William Cole. The two were introduced through a professional forester, and Carbaugh promptly recruited Cole to the cause of American chestnut restoration. Carbaugh describes Cole as someone who owns hardware stores, has a well-managed woodlot, is a great supporter of community endeavors, and is very interested in education.

After reading an article in *The Journal* about the Carroll County, Maryland, American chestnut curriculum and TACF's American Chestnut Learning Box, Cole called Carbaugh to ask: "Why aren't we doing that here?" After some discussion, Cole ended the conversation by saying, "You find the schools, and I'll buy the boxes."

To date, Carbaugh has recruited interested educators at five schools and one nature preserve. Not only has the Cole-Carbaugh team provided each of these educators with a Learning Box, they have also purchased TACF memberships for them. With Carbaugh's help, I was able to contact some of these dedicated Pennsylvania educators to learn how they use American chestnut to help their students succeed.

Kristen Vitkauskas uses the Learning Box provided by Carbaugh and Cole for teaching environmental science in the Southern Columbia Area School District in the Susquehanna Valley. She has visited Carbaugh's chestnut orchard, and her students have helped plant trees on reclaimed mine land sites. Vitkauskas likes to help students link ecology with local history when teaching about watersheds, which works well with American chestnut, historically an important economic resource in central Pennsylvania. "When students discover these connections," she says, "they care more about the health of local watersheds." Vitkauskas hopes to collaborate with a language arts or history teacher to enhance this type of cross-disciplinary connection.

Van Wagner uses the American Chestnut Learning Box for several labs in his advanced placement environmental science class at the Lewisburg Area School District. He has found the Learning Box very helpful, and was thrilled this year when one of his students chose the chestnut restoration effort for a speech in the students' public speaking class. Wagner has been working with his principal and Carbaugh to construct an outdoor classroom that will include a chestnut planting.

Lindsay Spurrier teaches vocational agriculture at Mifflinburg Area High School. Her school has a longstanding Earth Day program that involves all 9th grade students spending a day learning about soils, forestry, wildlife, and survival at a state park nearby. During this event, students in Spurrier's Environmental Resources class use materials from the Learning Box to prepare and teach Earth Day sessions for the 9th graders. Students work in teams to create hands-on lessons to teach the younger students skills such as recognizing types of wood and tree diseases, including the blight that infects American chestnut.

This article can be read in its entirety online at www.acf.org/pdfs/pa_learning_box.pdf.



Olympic High student Meilee Zhou and TACF's Steve Barilovits III examine a chestnut leaf under the microscope. Photo courtesy of Jennifer Weller

The American Chestnut Learning Box

Carolinas Chapter volunteer Steve Barilovits III uses the Learning Box when he introduces students at Olympic High School in Charlotte, North Carolina, to the American chestnut and explains the backcross breeding program. "When we break for lunch, the students are still looking into the box," he says. The 25 Olympic students in the B3 Science Summer Camp (Biotechnology, Biodiversity and Bioinformatics) spend one day at a Carolinas Chapter breeding orchard near Bat Cave, North Carolina, helping with inoculations and orchard maintenance. The following day, they hike a mountain and collect American chestnut leaf samples from which they will extract DNA over the next week. The program has been funded for three years by the Burroughs-Welcome Fund. Check out the photos and blog entries on the website created by the B3 students to see their day-to-day adventures in the field and lab. Visit http://webpages.uncc.edu/~jweller2/pages/SummerCamp2014/SummerCamp2014_Pictures.html.

The American Chestnut Learning Box Version 2 is available for \$300. To order a box from TACF, visit www.acf.org/learningbox.php or call 828-281-0047.

Maryland, also sees teacher training as a key to utilizing authentic American chestnut learning experiences to engage students in basic and advanced science topics. Yohe's experience in curriculum leadership also directs him to the conclusion that TACF needs a high-quality package of curriculum materials designed to increase success for students in science and math classes using research-based teaching strategies developed by the National Academy of Science and the National Science Teachers Association. Yohe heads an Education Committee task group that has begun building educational partnerships to develop funding proposals to create such a product and to fund teacher workshops to promote effective implementation of the lessons.

Furthermore, an Education Committee task group lead by Ben Finegan of the Indiana Chapter has worked with TACF staff and representatives of The Morton Arboretum's ArbNet to develop American chestnut packages designed to help small arboreta include TACF's Restoration Chestnut 1.0 trees in their plant collections and educate the public about restoration. Nine arboreta participated in the initial piloting of this partnership program, which will be evaluated to determine next steps at the end of this first growing season.

The ArbNet partnership model has great potential to increase awareness of TACF's mission while enhancing ArbNet's outreach effort. Although there are costs associated with providing support to these institutions,

TACF benefits from their resulting education and outreach programs. If successful, the ArbNet partnership project may provide a model for future partnerships with other organizations whose missions include educating the public about trees and forests.

Meeting the Challenge Ahead

The proposed charter for the Education Committee states its purpose: "To recommend policy for and oversee the planning and implementation of educational aspects of restoration of the American chestnut."

The committee will continue to nurture and promote coordination of educational efforts initiated by volunteers within the State Chapters. With its new charter, the committee now bears responsibility for developing the expertise to advise the TACF Board of Directors with respect to policies and programs in the area of education that are foreseeably necessary to successfully implement strategies and accomplish goals set out in TACF's evolving Restoration Plan. I invite you to think of yourself as a member of the TACF education team, and to email your insights, ideas, and activities to education@acf.org as we undertake this important work together.

Kathy Marmet has been an active TACF volunteer for more than ten years. She currently serves on the TACF Board of Directors as Chair of the Education Committee and on the Virginia Chapter Board as Vice President for Education.

Involve the Next Generation: Chestnut Games and Teachable Moments

As many of the members of TACF are aging, our Pennsylvania/New Jersey Chapter has renewed its focus on education for children, especially those in elementary school. We have been working with Project Learning Tree, the American Forest Foundation's educational outreach program for teachers and nature center leaders, to create activities about the American chestnut.

The following activities were developed by Johanna Jackson at Shaver's Creek Environmental Center. They worked well for school-aged kids, with some variation between older and younger kids. Shaver's Creek used them at family festivals, but they could also be adapted for school field trips to an orchard, or outreach programs at schools. *Have fun and adapt as you wish!*

The Chestnut Spoon Race

Age: 4-12 years old

Time: About 10-15 minutes, depending on the age group

Materials:

- (2) 20-foot ropes for a starting and finish line
- Stopwatch
- Seeds of American chestnut and Chinese chestnut, one chestnut per child
- About 30 feet of open lawn space (check for protruding roots and rocks)
- Teaspoons
- Ice cream scoops
- Measuring cups, such as quarter cups
- Ladles
- Large serving spoons
- Whisks
- Other kitchen implements that are safe for kids
- Bandanas, one for every two participants (optional)
- Small clay pots or planters for the finish line (optional)



Ready...set...go! Children of all ages line up to play the Chestnut Spoon Race during Shaver's Creek Environmental Center's Family Day event. Photo courtesy of Johanna Jackson

Set-up:

With the 20-foot ropes, create a starting and finish line. Place clay pots or planters at the finish line for kids to deposit their chestnuts for "planting." Spread the kitchen implements on a table for everyone to have access to.

Description:

This game becomes inviting if you set it up to be fun. Explain to the kids that they will be racing with a chestnut from the starting line to the finish line. Invite them to check out the kitchen implements—spoons, scoops, and various cups—over on a table, and let the kids each choose the one they want to use. Try to have duplicates of every tool so that each kid has the opportunity for a choice. Older kids will have fun with this part, and deciding how much challenge they want to take on. (Can you really carry a chestnut inside of a whisk? What



HOW-TO

happens if you try?) You can steer younger kids toward success by encouraging them to use tools that seem easier, such as the ice cream scoop.

Ask kids to line up behind the starting line and hand out a chestnut to each one. You might offer some variety with Chinese and American chestnuts. This is a good time to get familiar with the chestnut seeds. Ask kids to feel if it is fuzzy or smooth, and ask them to compare it to a neighbor's. Are they different sizes? Why might that be?

From where they stand, ask the kids to look out on the racetrack for any roots and rocks. Children will be more invested in being safe if you recruit their help in identifying what's safe/unsafe. You might describe how the kids are just like volunteers working in the chestnut orchards, taking care of saplings. Have them flex their muscles, do a special finger stretch, whatever they'd like to do to get ready. Remember, each person wins, as long as they deliver the chestnut seed safely to its home. Then, start the race!

As the coach, you might call out times as they cross the line. Encourage kids to cheer on the younger ones who finish last. If they're having fun, offer the option of a second race. Kids can exchange their kitchen implement for another if they'd like.

Variations:

You can continue with a "three-legged" race, using bandanas to tie together two participants at the knees. Pull the bandanas tight if possible.

If you are working with a variety of ages, you might create separate heats, one for older kids and one for younger kids.

If you are at a family event with parents or camp counselors on the sidelines, you can create another round that includes the adults. Let the parents know that their kids may come to recruit them to join the race. You might pull out a "secret stock" of supplies from the kitchen—forks, cheese graters, and anything that would be hard to use to carry a chestnut. In some cases the children choose the tool for their parents and race along with them. Older elementary kids may enjoy having this power over their parents for a bit. If you run this version, be mindful of the adults' comfort level. Some parents may feel self-conscious. You can make it easier for them by making it a race with both kids and adults; then they won't feel foolish.

Debrief:

After the game, gather older kids together for a "team huddle" and talk about the race. This works best for older kids, ages 8-12. Debrief by asking questions such as:

- Did you choose a hard tool or an easy tool?
- Which tools worked best?
- What was it like to deliver the nut to its planter?
- What was it like to watch your parents race too?

Then discuss ways that people help the American chestnut in real life. Brainstorm a list with the youth. This could include planting seeds, volunteering at a local orchard, or watching the health of chestnut trees. If there is a local TACF chapter in your community, talk about what's happening locally.



In this variation of the Chestnut Spoon Race, participants' legs are tied together with bandanas for a "three-legged" race. Photo courtesy of Johanna Jackson

Chestnut Leaf Rubbings

Age: 4-8 years old

Time: This activity fits well into short stations or in a festival setting

Materials:

- Chestnut leaves, laminated, of different varieties (American chestnut, Chinese chestnut, etc.)
- A bucket of crayons with the papers peeled off
- Scrap paper cut in half

Description:

This activity can help to develop awareness for leaf shape and a delight in creating one's own art. Demonstrate to each child how to put the leaf below the page, and use the side of a crayon to rub over the top. Don't expect children to be immersed in the science of chestnut trees, however. Keep your questions simple. Can you see the veins on the leaf? What are those for? Can you see the jagged line on the edge?

Helpful Tips:

The activity works best when you demonstrate to the child how to use the side of the crayon. The crayon papers must be peeled off.

Variations:

Start with a leaves that look like American chestnut leaves. The Allegheny chinkapin, chestnut oak, and beech trees are good examples to use. Then build up from those leaves to the one that is a "special artifact," the American chestnut. You can describe how these trees once covered the hillsides, that there are very few left, but we have a special one saved for today. If you are with an older child, you might label each drawing and look at the differences between species. Most children, however, will practice using a crayon to make their picture and move on.

At Shaver's Creek Environmental Center, we have used this station twice for festivals, where families are milling around. We built a tree trunk out of cardboard and posted it next to our booth. When kids finished their leaf rubbings, we invited them to staple their leaves on the tree and "help rebuild" the American chestnut. This helps to transform the abstract concepts — chestnut blight and the loss of a species — into something small, visually apparent, and collective. Start with a few leaves on the tree and ask kids to add their own.

We have also found that this activity is a great time to talk with the children's parents. While their kids are coloring, the parents may have questions about the trees, like: When are they coming back? Can I buy a chestnut for my yard? Have props ready from the Learning Box, and consider having two people to staff the booth-- one for children and one for parents.

Note: The American Chestnut Learning Box includes samples of the chinkapin, chestnut, and beech leaves. You can also collect your own and laminate them. We would recommend thinner lamination pages (3 mm) rather than the thicker pages (5 mm) for this.



Chestnut leaf rubbings give younger children an opportunity to learn about the American chestnut while creating art. Photo courtesy of Johanna Jackson

Hungarian Chestnut Ice Cream

Recipe and photo
courtesy of Karin Hung,
www.52scoops.com



Ingredients

(Makes about 1 1/3 quarts)

2 eggs

3/4 cup white sugar

3 cups half and half

3 tablespoons rum, divided

8.8 ounces sweetened chestnut
puree

2 tablespoons half and half

1/2 cup grated dark chocolate

Directions

In a heavy saucepan, lightly whisk together the eggs and sugar. Add 2 cups of the half and half. Cook over medium-low heat, stirring constantly, until the mixture is thick enough to coat the back of a wooden spoon (170°F / 77°C). Remove from heat immediately and add the remaining cup of half and half to stop the cooking. Place the saucepan into an ice bath to cool the custard rapidly. Stir in 1 tablespoon of rum. Cover, and chill overnight in the fridge.

Pour the custard into an ice cream maker and prepare according to the manufacturer's instructions. Set aside.

Thoroughly mix the chestnut puree with the remaining 2 tablespoons of rum and the 2 tablespoons of half and half. Spread a quarter of the ice cream into a chilled dish. Using a potato ricer, press about 1/3 of the chestnut puree over the ice cream. Try to spread the strands of the puree thinly and evenly over the ice cream and avoid any big clumps. (If you don't have a potato ricer, you can spread thin layers of chestnut puree between the layers of ice cream.) Sprinkle with 1/3 of the grated chocolate. Repeat two more times. Top with the remaining quarter of the ice cream. In total, you will have three layers of chestnut/chocolate between four layers of ice cream. Draw a metal spatula or knife through all the layers a few times to marble.

Cover, and chill thoroughly in the freezer until firm. If you're planning on storing this ice cream for more than a few hours, give it a chance to warm up before you scoop and enjoy—this will give the chestnut puree a chance to soften and for its nutty flavor to be more pronounced.

April 15, 1989

A Few Serious Words for the First Tree Planting
at Our New Meadowview Research Farm

By Philip A. Rutter

Dearly Beloved!

We are gathered here today, in the sight of the rain and the wind, the mountains and the trees, to join with each other and with this land in a bond of holy determination.

We are determined that these trees we plant will survive, and grow, and flower. We are determined that this farm shall succeed in its goal, which is: to grow chestnut trees, in the face of wind and sun, flood and drought, lack of funds, and blight; until chestnut trees are found which can once again grow free on these hills.

Why are we determined? We could talk about economics, and ecological necessities, but way down deep, we are determined because, for better or worse, we humans now hold the future of all life on the Earth in our hands. We must care for it, and nurture it. The chestnut is especially deserving, because we caused its current plight. It is only fair for us to restore its health.

Today we place our feet firmly on the trail that will lead to the restoration of the American Chestnut Tree.

Let Us Plant!



An original planting of chestnut trees at TACF's Wagner Research Farm, circa 1990

Editor's note: This benediction, written and delivered by TACF's first president, Philip A. Rutter, was published in *The Journal of The American Chestnut Foundation*, Volume IV, Number 1, Fall/Winter 1989-1990. In 2014, we are celebrating Meadowview Research Farms' 25th anniversary and honoring all the donors, volunteers, and staff who have made a lasting impact on chestnut restoration.



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The background of the advertisement is a scenic landscape photograph. In the foreground, there are several pine branches with green needles and small pine cones, extending from the left side. The middle ground shows a calm lake reflecting the sky and the surrounding landscape. In the background, there are rolling mountains under a cloudy sky. The overall tone is natural and serene.

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