WINTER 2022 ~ ISSUE 1 VOL. 36

# Chestnut

THE JOURNAL OF THE AMERICAN CHESTNUT FOUNDATION

A BENEFIT TO MEMBERS

THE AMERICAN CHESTNUT FOUNDATION

***Phytophthora*-resistant Chestnuts ~ Look About Lodge ~ Filming the American Chestnut ~ Genetic Diversity**

WINTER 2022 ~ ISSUE 1 VOL. 36

# Chestnut

THE JOURNAL OF THE AMERICAN CHESTNUT FOUNDATION

Lisa Thomson

**President and CEO**

# DEAR CHESTNUT FRIENDS,

As we embark on yet another year with lingering uncertainty on returning to "normal," it is helpful to reflect on why The American Chestnut Foundation remains strong and our board, staff, volunteers, and partners stay so focused and resolute. It truly is remarkable.

Some obvious adjectives come to mind: patience, passion, resilience, and grit. I have the distinct privilege of working alongside, and learning from, so many of you. I often ask why you continue to stay involved, generous, and active in a decades-long mission to return a singular species, albeit a critical one, for healthier forests. I get a variety of answers but many are consistently optimistic and positive. You enjoy being part of this grand experiment to bring back a tree which was once a dominant feature, both economically and ecologically, of the eastern portion of our vast country. You are proud TACF is a leader in de-extinction and how we represent the hope for other species struggling to survive using cutting edge science and an army of supporters.

You are our best ambassadors, telling family and friends why you support us; in 2021 alone, we gained 1,250 new members. Many stories are rooted in nostalgia. "My grandfather told me about the tree's loss and how it was a collective national tragedy." "We had two huge trees in our yard growing up and when they died, it was like we lost members of the family." For indigenous people, like our partners at the Qualla Boundary lands of the Eastern Band of Cherokee Indians (EBCI), losing the chestnut eliminated a main staple and sustainable future of a wild, bountiful forest. This fall, we were thrilled to work alongside the EBCI to plant our first orchard at the Qualla.

It is my great hope we can gather together this year as a collective chestnut family, to share such stories in person, celebrate successes, and recharge for the hard work and diligence it will require to continue this bold mission. If you need some inspiration that this mission will endure beyond our lifetimes, take a moment to watch a brief testimonial from one of our youngest enthusiasts on our YouTube channel, 9-year-old Russel Boyer. He mentions how his great-grandmother "tried to save the chestnut" and why he wants to carry on her love for the tree. Russel represents the next generation of passionate chestnutters. When you hear his sincere words, you will be reassured our future is indeed bright!

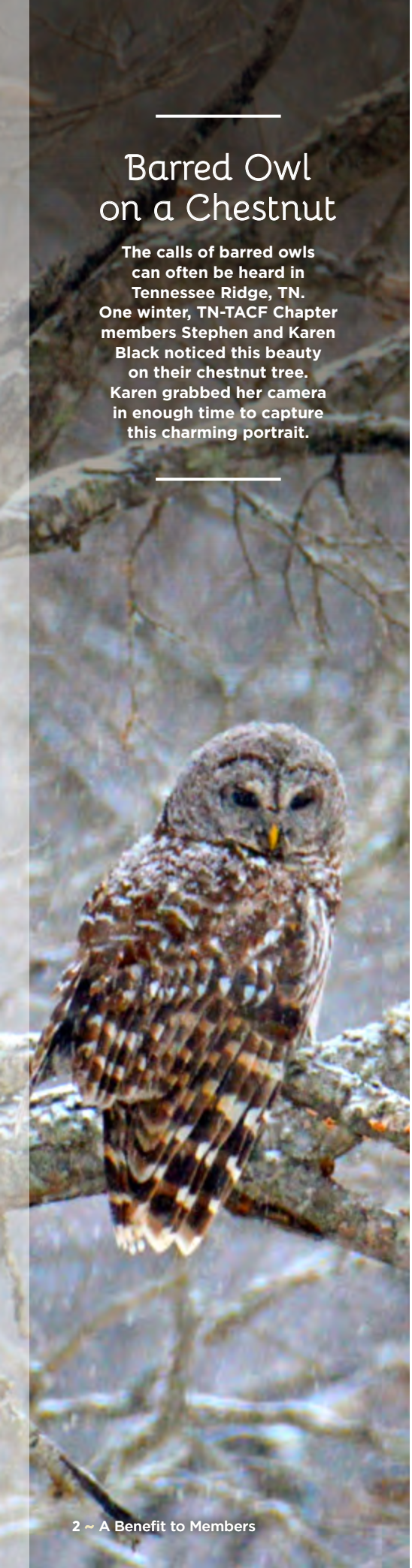
With gratitude,

Lisa Thomson

Lisa Thomson, President and CEO
The American Chestnut Foundation

**Russel Boyer,
TACF's youngest member**

**Watch a brief testimonial from Russel on our YouTube channel: https://bit.ly/TACF_YouTube**



## Barred Owl on a Chestnut

**The calls of barred owls can often be heard in Tennessee Ridge, TN. One winter, TN-TACF Chapter members Stephen and Karen Black noticed this beauty on their chestnut tree. Karen grabbed her camera in enough time to capture this charming portrait.**

THE AMERICAN CHESTNUT FOUNDATION™

## WHAT WE DO

The mission of The American Chestnut Foundation is to return the iconic American chestnut to its native range.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# *Phytophthora*-resistant Chestnuts

## ESTABLISHED AT THE BELTSVILLE AGRICULTURE RESEARCH CENTER IN MARYLAND

**By Tom Saielli, Mid-Atlantic Regional Science Coordinator; Peggy MacDonald, USDA Biological Science Laboratory Technician; Katie McKeever, Director, USDA Bent Creek Resistance Screening Center**

**Dark staining on chestnut roots infected with *P. cinnamomi*. Photo by Steve Jeffers.**

*Phytophthora cinnamomi*, also known as *Phytophthora* root rot (PRR) or ink disease, affects the roots of American chestnut and usually results in tree mortality. *P. cinnamomi* is a soilborne plant pathogen that is part of a group of microorganisms known as Oomycetes, which are fungus-like organisms but not true fungi. It is thought that *P. cinnamomi* was introduced to North America in the late 1700s or early 1800s.

For nearly a decade, The American Chestnut Foundation (TACF) has been committed to developing chestnut trees that are resistant to *P. cinnamomi*, using the same backcross breeding methods that have been used to breed resistance to chestnut blight (*Cryphonectria parasitica*). This involves crossing American and Asian species of chestnut and screening progeny for resistance. The hybrid chestnut trees with demonstrated resistance to *P. cinnamomi* will eventually be crossed with transgenic Darling 58 (or other transgenic sources, if available) to produce hybrid chestnuts with resistance to both *P. cinnamomi* and *C. parasitica*.

PRR was first identified as a serious pathogen which threatened the long-term restoration of the American chestnut by tree breeder and dedicated volunteer Joe James at his Chestnut Returns Farm in Seneca, SC. He ensured that PRR resistance became an integral part of TACF's breeding program. The ongoing program to breed *Phytophthora*-resistant chestnut trees is now a collaborative effort between TACF, Clemson University, the U.S. Forest Service, and others. Sources of resistance that are used for this effort include advanced hybrid chestnuts from TACF's Meadowview Research Farms, as well as new selections from different chestnut-growing regions. Selected progeny are pre-screened for resistance to *P. cinnamomi* before being transferred to orchards to evaluate for long-term field performance. This year 4,164 hybrid chestnut seedlings were screened for resistance to *P. cinnamomi*, and in November the MD Chapter planted the 400 most promising, potentially resistant seedlings in an orchard at the Beltsville Agriculture Research Center (BARC) in Beltsville, MD.

### USDA Resistance Screening Center (RSC)

Pre-screening chestnut seedlings takes place at the RSC in Asheville, NC. This year more than 110 hybrid chestnut

TACF Director of Science Jared Westbrook (right), retired USDA Plant Pathologist Steve Oak, and USDA Bent Creek Resistance Screening Center Director Katie McKeever, unpot surviving chestnuts to prepare for visual root assessments. Photo by Jamie Van Clief.

A classic case of ***Phytophthora*** root rot – this small tree went from healthy, to chlorotic, to dead over the course of one growing season. Photo by Scott Laseter.

families were screened. Multiple seedlings from each family were infected with *P. cinnamomi* cultures grown on nutrient-enriched vermiculite that was spooned directly into pots of 12-week-old plants. The cultures that were used in this year's experiment were sourced from soil samples collected from the BARC Orchard in Maryland and isolated at Clemson University's lab. Throughout the course of the 16-week experiment, dead trees were observed and recorded weekly to determine frequency of mortality among selected families. More than 35% of the total trees from all families died during this assessment period. At the conclusion of the experiment, all surviving trees were unpotted and the severity of decay on the roots was scored visually on a 0 to 3 scale with higher ratings corresponding to greater decay. Those seedlings that displayed the best root condition after 16 weeks were transplanted to the BARC Orchard in November 2021. This is an ideal location to plant these seedlings since *P. cinnamomi* is already present at this site, eliminating the chance of spreading *P. cinnamomi*, and the trees can be evaluated for growth and survival under variable site characteristics.

### Beltsville Agriculture Research Center (BARC)

*Phytophthora* was first identified at BARC one year after the orchard was established as a backcross orchard in 2016. The Musick family line of hybrid seedlings began dying within a few years. Infected trees were taken for diagnosis to Karen Rane, director of the Maryland Plant Diagnostic Laboratory at University of Maryland. Rane found lesions on the root crowns and suspected *Phytophthora*. She cultured the pathogen on PARPH medium and conducted an Adgia immunostrip serological assay to determine the genus of the pathogen. This assay came back positive for *Phytophthora*. She then extracted DNA, amplified a

Seedlings are assessed and sorted at the RSC. The best seedlings are prepped for field planting at BARC. Photo by Jamie Van Clief.

Proud MD Chapter volunteers pose in front of 400 newly planted seedlings at BARC. Photo by Jamie Van Clief.

Yellowing, chlorotic leaves are an early sign of root rot on these seedlings planted at the BARC Orchard. Photo by Peggy MacDonald.

beta tubulin gene portion with PCR and sequenced the region of the *Phytophthora* culture's DNA to determine the species of the pathogen causing the disease. *Phytophthora cinnamomi* was confirmed. It is uncertain how or when *P. cinnamomi* was first introduced to this site, but it was likely due to accidental movement decades ago.

### The original backcross orchard at BARC

A notable strategy of the MD Chapter to save the few original backcross trees established in 2016 involved treatments with a fungicide, per recommendations from TACF's fact sheet, *Phytophthora* Root Rot[1]. Today, several dozen of the original trees are still alive at the top of the orchard, while the lower half of the orchard was recently planted with the pre-screened seedlings from the RSC. Note that the recently planted *Phytophthora*-resistant seedlings will not be treated with fungicides since long-term exposure to the soil pathogen is needed to confirm disease resistance.

Long-term goals include monitoring and managing the orchard over the next several years or decades; tree vigor will be assessed annually and susceptible seedlings will be culled. With rigorous long-term phenotyping we will identify the "best" potentially resistant trees, which will then be crossed with Darling 58 pollen – adding blight resistance to each of the best performing families. We are optimistic that those few successful trees will provide chestnut progeny with high levels of resistance to both pathogens, which will then be established in regional seed orchards.

[1]Fact sheets can be found on TACF's website under the Resources tab.

# NE-1833 Meetings

## HELD VIRTUALLY IN 2020 & 2021

**Tom Saielli, TACF Mid-Atlantic Regional Science Coordinator**

**Every year TACF members, science staff, and researchers from universities and public agencies converge to discuss the latest chestnut research and emerging technologies. The practice began in 1982 as *NE-140*, which was initiated by the discovery of hypovirulent strains of the chestnut blight fungus. (Hypovirulence is a viral infection of the blight fungus, which can weaken the fungus and allow the chestnut tree to recover.)**

The original NE collaboration included researchers from various U.S. Forest Service (USFS) experiment stations. However, in short time the meetings evolved to include multiple researchers and expanded into other areas of chestnut science. Today, topics range from genome sequencing, transgenics, *Phytophthora* research, traditional breeding, and more.

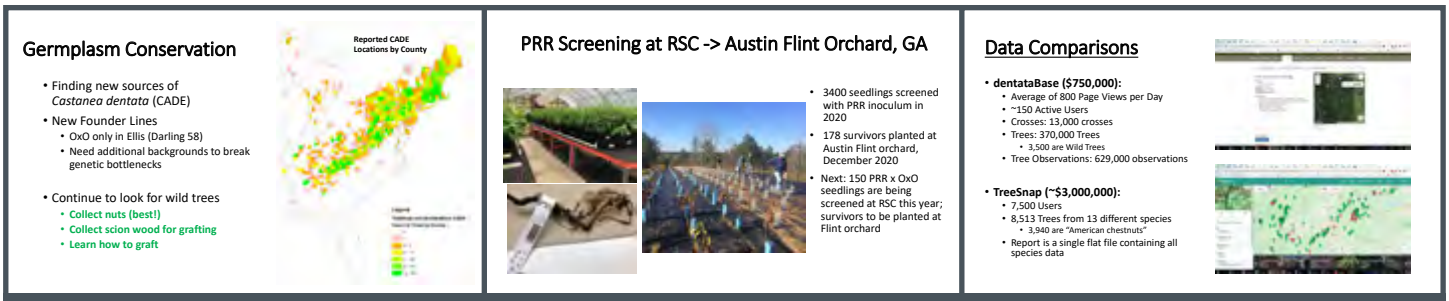
NE conferences are held at different locations each year, with members taking turns planning and hosting the events. However, the 2020 and 2021 conferences were held virtually due to the COVID-19 pandemic. No doubt, the in-person format was greatly missed. The virtual format could not rival in-person opportunities for engagement. There is no replacement for loitering around the coffee station, after-meeting dinner chats, or late-night socials where innovative ideas are born, and some debates ensue. However, web conferencing allowed the meetings to continue. Zoom was the forum, and though it lacked the *esprit de corps* of gathering in person, turnout rivaled that of physically attended meetings, permitting those who could not travel to attend.


**Screenshot of PowerPoint presentation given by TACF Director of Restoration Sara Fitzsimmons.**

The conferences began with talks on hypovirulence. Bradley Hillman, NE Multistate Research Projects chair and Rutgers University professor, presented ongoing research on *Cryphonectria parasitica* mapping and virus discovery. Amy Metheny of West Virginia University presented on Super Donor 3.0, and Soum Kundu, Ph.D. candidate working with Angus Dawe at Mississippi State University, presented research on identifying *C. parasitica* genes associated with pathogenicity and virulence.

Laurel Rogers of Shenandoah University compared fungal microbiomes identified between chestnut species and shared potential implications. Steve Jeffers of Clemson University gave an update on his research of *Phytophthora* root rot. Monique Sakalidis of Michigan State University presented her work on the fungal pathogen *Gnomoniopsis smithogilvyi*, or Brown rot, a potentially devastating nut disease.

Tom Klak of the University of New England provided an update on transgenic research, high-light growth chambers and pollen production. Erik Carlson and Andy Newhouse of SUNY's College of Environmental Science and Forestry provided updates on Darling 58 deregulation status and exciting new research on transgenic lines utilizing a wound and pathogen inducible promoter from poplar to drive OxO expression.




**Screenshots from the various NE-1833 presentations.**

Dana Nelson of USFS, TACF's Jared Westbrook, and Fred Hebard, retired director of science at TACF, gave presentations on the various findings of chestnut genetics, backcross breeding, and the need to balance American traits with blight resistance, likely requiring better selections among backcross trees and potentially higher than expected Chinese germplasm in final hybrid selections.

Alex Sandercock, Ph.D. candidate at Virginia Tech, gave an update on landscape genomics, and Taylor Perkins, University of Tennessee, Chattanooga, discussed his research on chinquapin genetics.

Chestnut ecology and restoration talks included updates from Stacy Clark of USFS on her collaborative work with Scott Sclarbaum and Leila Pinchot to study chestnut restoration efforts throughout the Appalachians. TACF's Tom Saielli and Sara Fitzsimmons discussed the need to study hybrid chestnut ecological fitness. Chuck Ray of Penn State gave an update on chestnut wood studies. Ellen Crocker of the University of Kentucky described the usefulness of the TreeSnap app and the importance of recruiting citizen scientists to search for wild-type chestnuts, and Hill Craddock presented on a mountain of research and activities taking place at the University of Tennessee, Chattanooga. As is clearly indicated, this online forum continued to provide a wealth of information and learning opportunities!

PLANNED GIVING

# FOR A BETTER FUTURE

**Winter can be a time when the world seems to get a little quieter. The stillness of snow, the warmth of a fire, and some peace to dream and ponder. To dream of eastern forests dominated by robust American chestnut, and to ponder a healthier environment for generations to come. By making a planned gift to TACF, you can help guide that dream toward reality.**

There are many ways to make a planned gift. This type of charitable giving (wills, trusts, annuities, life insurance policies, and other retirement assets) often come with tax benefits as well. Whether you contribute a set amount or a percentage of your estate, your gift will have a positive impact on the restoration of this beloved species.

- Your assets remain in your control and are adjustable
- Your privacy preferences are of utmost regard
- There are advantageous tax outcomes for your estate, some of which are taxed more favorably if left to a nonprofit
- Donors who have remembered TACF as a beneficiary of a planned gift are recognized as members of The Chestnut Society

TACF encourages you to meet with your estate planner, financial advisor, or accountant to choose the option that works best for you. Questions? You or your advisors are welcome to email Donor Relations Manager Shana Zimnoch at shana@acf.org or call (828) 281-0047 x1111.

# Plant a Tradition: Create a Living Legacy

**By Clark Beebe, PA/NJ-TACF Chapter**

As we age, we think of our children, our grandchildren, our legacy. Many of us yearn to create family traditions and intergenerational bonds that will continue long after we are gone.

I was staffing The American Chestnut Foundation's booth at the New Jersey State Fair when a five-year-old boy approached, eager to talk about trees. He was not interested in hearing about chestnut trees, though. Rather, he wanted to tell me about his tree – the one he had planted himself. As I listened, he provided details on the species, its growth rate, and its eventual full size.

PA/NJ Chapter's Russel Boyer plants an American chestnut seedling with his grandfather. Photo by Kelly Boyer.

His excitement and pride of ownership were palpable and contagious. Inspired, I suggested that his parents start a tradition of photographing the boy and his tree every year, gradually building a photo album that will document their mutual growth.

I now encourage you to do the same. When children and grandchildren in your family reach age five or six, start a tradition of planting trees together. Plant two or three to be safe, as trees do not always survive and thrive. If you have adequate land, let the trees become a grove as generations carry on the tradition. Allow the space to become a family gathering site; even when a trees' planter is no longer around. Make it an outdoor refuge of peace – a space to grieve and mourn, and eventually to celebrate and reminisce.

Empower the child's involvement by letting him/her help choose the species and the site. Take time together to discuss the pros and cons of different species, such as beautiful fall colors or seeds creating a mess on the lawn beneath. Make sure they get their hands in the dirt while planting. Let them take ownership. Teach them about such trees. Pique their interest in nature, and create a mutual bond with the earth.

Do your homework and ensure you plant trees that can thrive. Ask a forester for site-specific native tree recommendations. Consider what type of seeds or fruit you would like the tree to produce, whether you hope to attract a particular animal species, and whether the tree's pollen will be an issue. Always avoid non-

native invasive plants, many of which you may find available for purchase by nurseries and landscape suppliers.

Prepare to do some further research to ensure a successful planting. Pay close attention to soil suitability, including moisture levels and whether its composition is of clay or sand. Test the pH of the soil and learn what trees perform best in the acidity of your chosen site. Determine whether the tree will interfere with your lawn or garden, and be mindful of septic lines which can be destroyed by tree roots. Appropriate sunlight is also crucial; while some trees require direct sunlight, others cannot tolerate such conditions.

Allow the tree sufficient space to grow. Remember that the small root ball you plant might grow to have a canopy of 30 feet or more. Avoid planting too close to your house by taking the tree's projected final height, crown diameter, and rate of growth into consideration. Evaluate the life expectancy of your chosen tree. Some species, such as birch or aspen, start to die after 50 to 60 years. You will want your legacy tree(s) to stand a greater test of time than that.

Throughout the journey, allow yourself to grow, too. Watch young minds open as you work together to create a special, intergenerational place in nature. Make educated decisions, and set forth to plant a tradition; a living legacy.

MA/RI Chapter's Michele Cooke and her daughter Robin alongside chestnut seedlings grown from TACF seeds. Photo by Michele Cooke.

Russel Boyer and his parents pose proudly after planting an American chestnut seedling together.

If you do not have sufficient land to plant a tree, talk to your local parks commission, school, church, or university. Rally interest among your community, and collaborate with your local open spaces authority to create a program for individuals to plant appropriate trees on public land.

Eagle Scout Timothy Lorandeau of the PA/NJ Chapter gets help planting an American chestnut seedling. Photo by Kimberly Van Haitsma.

2021
# Photo Contest Winner
## JACOB PEASE
"GOLD LEAF AND FILM"
Western KY

2021
# 2nd Place
## FLORIAN CARLE
"CATKINS ABOVE THE TREES"
Hamden, CT

**ABOUT THE JUDGES:** Founded in 1901, the Society for the Protection of New Hampshire Forests is a nonprofit forestry association seeking to perpetuate New Hampshire forests through wise use and complete reservation in places of special scenic beauty. We thank the Society for their great work and willingness to judge our contest!

Thanks to all those who participated in TACF's 2021 Chestnut Photo Contest! Every year chestnut enthusiasts put their photography skills to the test, creatively capturing this magnificent tree in its splendor. We congratulate our finalists on their excellent submissions, including catkins from a bird's eye view and Chaga, the chestnut modelling dog.

This year's winner is
"GOLD LEAF AND FILM"
by Jacob Pease of Murray, KY.

As he describes it, "Film provides a nostalgia that modern sensors cannot replicate: grain and imperfections convey the scene as it would reside in one's memory. Golden, warm, imperfect, but beautiful." Congratulations, Jacob!

2021
3rd Place
CHRIS CARTIER
"CHAGA THE DOG WITH CHESTNUT BURS"
Rutland, VT

2021
Honorable Mention
EMELIA FLECK
"WARBLER ON A CHINESE CHESTNUT"
Sandwich, NH

# SAVE THE DATE

## TACF'S 2022 CHESTNUT SYMPOSIUM: A RESILIENT FOREST

### Crowne Plaza Resort
### Asheville, NC
### September 30 – October 2, 2022

What better place to hold the return of our hopeful in-person meetings, than in the heart of Appalachia and the native range of the American chestnut, Asheville, North Carolina? Be captivated by the natural beauty, history, and amazing local cuisine during this anticipated reunion with TACF.

Celebrate "**A Resilient Forest**" with us as we welcome expert speakers in fields such as assisted migration, climate change, wildlife, birds and pollinators, and much more.

We are honored to welcome Joey Owle, Secretary of Agriculture and Natural Resources, Eastern Band of Cherokee Indians, as keynote speaker at our Saturday evening event.

Online registration and hotel reservations will begin in June 2021. Watch for future details and updates in e*Sprout*, social media, and TACF's website.

# Bruce Levine

## TREES – AND PEOPLE – TAKE TIME TO GROW

**By Scott Carlberg, Contributing Author**

Bruce Levine gets lost in the alchemy of an American chestnut leaf. Lost in something small even though he's lived on a big stage: Taiwan, Singapore, Cambodia, China, and France.

Levine is the president of the MD-TACF Chapter. The orchards of Montgomery County are much of his world now. He is among the small group who have checked chestnut habitats in the U.S. and China.


**Bruce Levine with wife Laura, and children Leo and Lily at a chestnut planting, November 2021.**

His career has been in the Foreign Service, a vastly different world from Levine's youth in Smithtown, Long Island. His neighborhood sowed his interest in trees. "I was raised beside a lot of nature near a huge county park. I remember that gypsy moths in the 1970s denuded the forest. Even then I was appalled at what happened," he says.

Concerns about his local forest were set aside as Levine went to college, took Chinese among his classes, and ventured off to Taiwan.

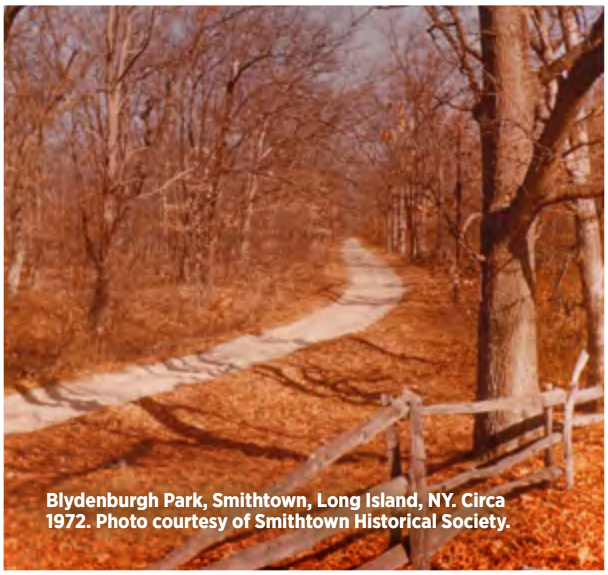
World travel sparked something. He applied for a job with the State Department, got the call, and a career in the Foreign Service. "It was a lot of fun and often really tough. Lots of moving parts to figure out," he says.

A seed had taken root in him, though, from the woods near his boyhood home. Levine recalled, "A hike in 1995 on the Blue Ridge, and I found interesting sprouts. I took the leaves and checked what they were; American chestnuts. Then I discovered TACF and volunteered."

The trouble – in the Foreign Service he would disappear for years at a time. Tough for local volunteering.

His time in Asia crossed paths with chestnuts, though. "I took a week off to see chestnuts in the wild in NW Hubei province, China. The reason is that the Chinese chestnuts we use in our program are imported orchard trees, bred for nut production. No one was clear how tall and straight Chinese trees grow in the wild."

Curiosity led to results of a sort. A chestnut researcher friend made China



Blydenburgh Park, Smithtown, Long Island, NY. Circa 1972. Photo courtesy of Smithtown Historical Society.

On July 10, 2021, MD Chapter members and volunteers inoculated about 950 chestnut seedlings, originally started in the adjacent Baltimore County Agricultural Center greenhouse.

On a chilly November day, volunteers at the Central Maryland Research and Education Center (CMREC) Seed Orchard culled trees that did not meet our requirements for blight resistance. This amazing crew cut down and stacked more than 200 trees in less than two hours.

Bruce Levine among wild, timber-type Chinese chestnuts in northwest Hubei province, 2005.

In February 2021, MD Chapter members planted 1,300 chestnut seeds in the greenhouse at the Center for Maryland Agriculture and Farm Park. This is the third year the chapter has grown seedlings here to test for blight resistance using small stem assays.

Bruce Levine takes a selfie with a group of volunteers during a clean-up day in December 2021 at Thorpewood Orchard.

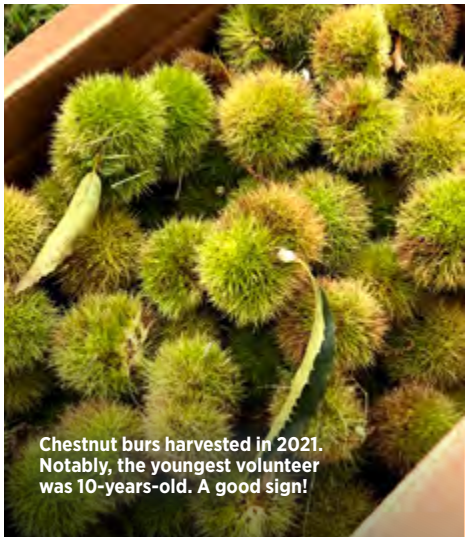
contacts who showed Levine where to go in the nearby mountains. "I saw lots of relatively tall timber-type trees." Here is where it got sticky. "I collected nuts for my researcher friend to try to grow in Beijing. Somehow the local Public Security Bureau was aware of what I was doing and told my local friend, in intimidating terms, that he had to get me to give back the nuts. Which I did."

Levine had an itch, though. There should be something more. "I thought that if I had the time to do foreign service, why not pursue a passion? I wished I could retire early and have a job that matches my passion."

So, he retired and went back to school, 30 years older than his classmates who did not know what to make of him. His aim is a Ph.D. in plant science. He feels at home in the lab at the University of Maryland.

His horizon is now scientific, not geographic. Specifically, CRISPR, a technology to make genetically engineered organisms. "In my case, I am trying to genetically engineer the chestnut blight fungus." Defusing the disease is his aim.

It's not all science. More trees and more screenings are needed.



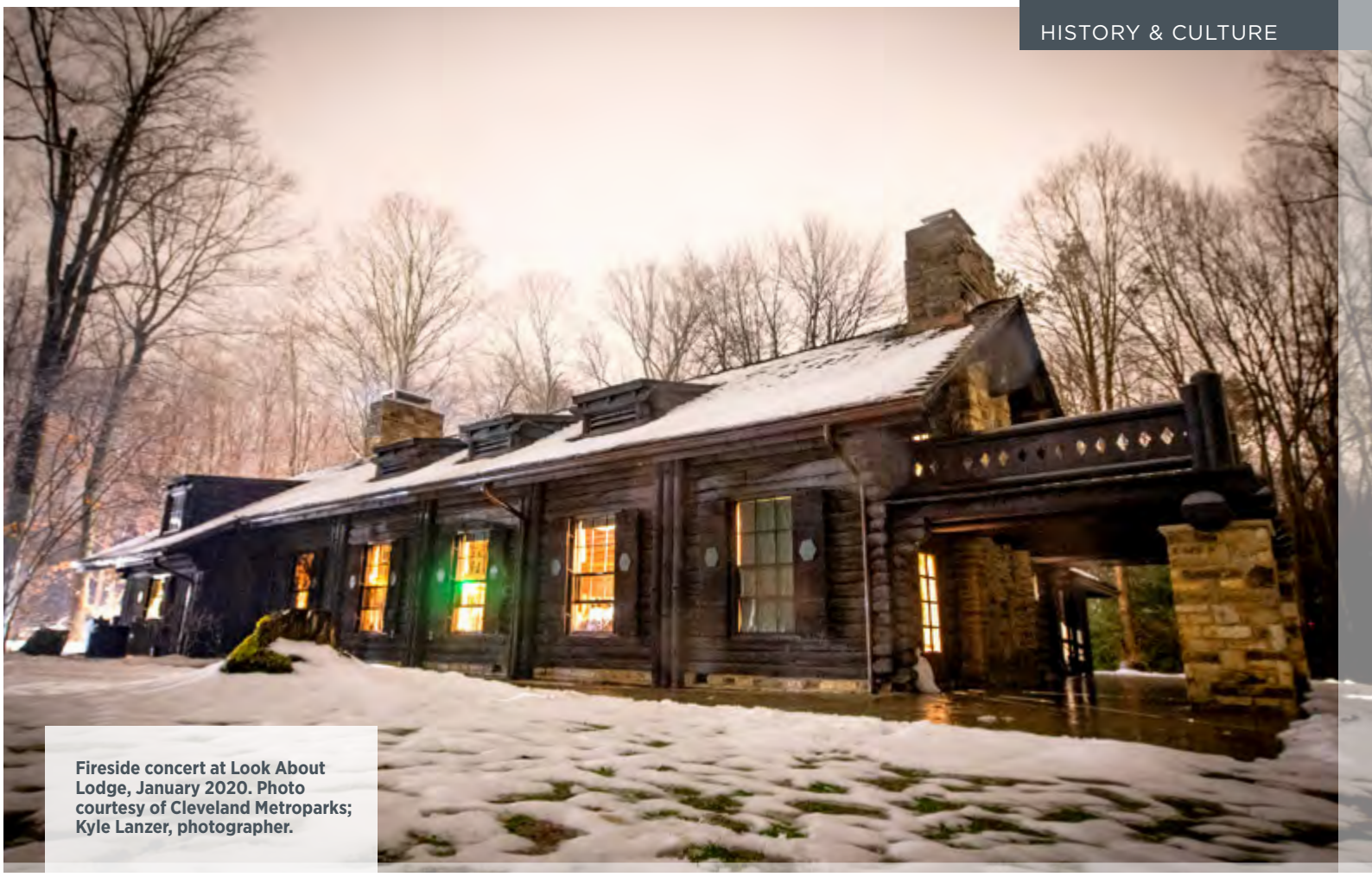
Chestnut burs harvested in 2021. Notably, the youngest volunteer was 10-years-old. A good sign!

Greenhouses help. "We are not producing the quality of trees we need. We must plant more trees, yet there is a limit on volunteers, labor, and land. Since we could not increase the number of trees outside, we now inoculate in pots."

Time is a litmus test of patience, as TACF volunteers know. "One thing they tell you about the scientific method is true – you don't know until the data is in." Levine says that makes it tough to keep volunteers excited.

Patience and optimism are the core of a hard-core chestnut researcher, though. "An orchard I was involved in had different phases of development, and a few years ago nothing looked good. Last spring, I was collecting samples and one tree in the orchard was spectacularly better than the others. It was almost cut down at one point. It had a little blight on it. It now is 15 years since it was planted. The system worked. We tested its progeny by small stem assay this year. We'll cross it with some strong performers from Virginia."

"Trees take time," says Levine. Yes, the same way some people take time to find their real passion in life.



Fireside concert at Look About Lodge, January 2020. Photo courtesy of Cleveland Metroparks; Kyle Lanzer, photographer.

# Look About Lodge:

## A WEALTH OF AMERICAN CHESTNUT BEAUTY AND HISTORY

**By James S. Koch, OH-TACF Chapter**

The Cleveland Metroparks' "Emerald Necklace," a chain of 18 nature preserves encircling the city, is one of Northeast Ohio's great assets.

Although there are only small numbers of American chestnut trees surviving within 23,000 acres of preserves, the tree plays a role in the park's history. Look About Lodge, one of the park's treasures, is located in the South Chagrin Reservation. A meeting place, classroom and conference center, and constructed largely of American chestnut logs, the Lodge has been welcoming generations of visitors for 83 years.

Early in the last century, conservationists realized there was a general need for a greater understanding of the natural sciences, the natural world, and our place in it, and in 1924, Western Reserve University student teachers founded the Cleveland Natural Science Club.

Initially the club gathered in a farmhouse and members were recruited by local public and private school teachers. All participated in classes, tree plantings, trail cutting, and other essential tasks in what was then a new park reservation. School teachers continued to constitute a large portion of the club's membership when my family joined forty years later in 1965. We were invited by a retired teacher friend of my mother.

Ten years after its founding, during a building boom in the National Parks system, the Natural Science Club proposed building a Lodge on the reservation, replacing the farmhouse, now too small for its growing membership and needs. The Metroparks provided the land, retaining partial ownership, and the club raised necessary funds for the building and ongoing maintenance. In return, the Club obtained perpetual

# American Chestnut Restoration: A Multigenerational Movement

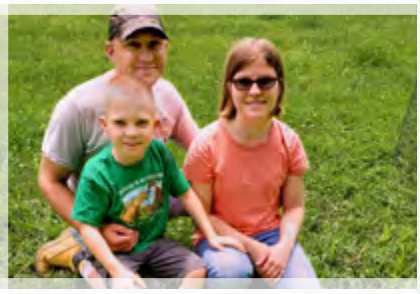
For generations, committed researchers and citizen scientists have been gaining ground in an unwavering charge to rescue the American chestnut, and for good reason. In addition to its sheer beauty, the tree provided a multitude of benefits: Pollinators consumed nectar from the flowers, wildlife and people relied on its nutritious nut, and chestnut lumber was straight, strong, and rot-resistant. This tree is an economically and ecologically significant foundation species, and its restoration matters.

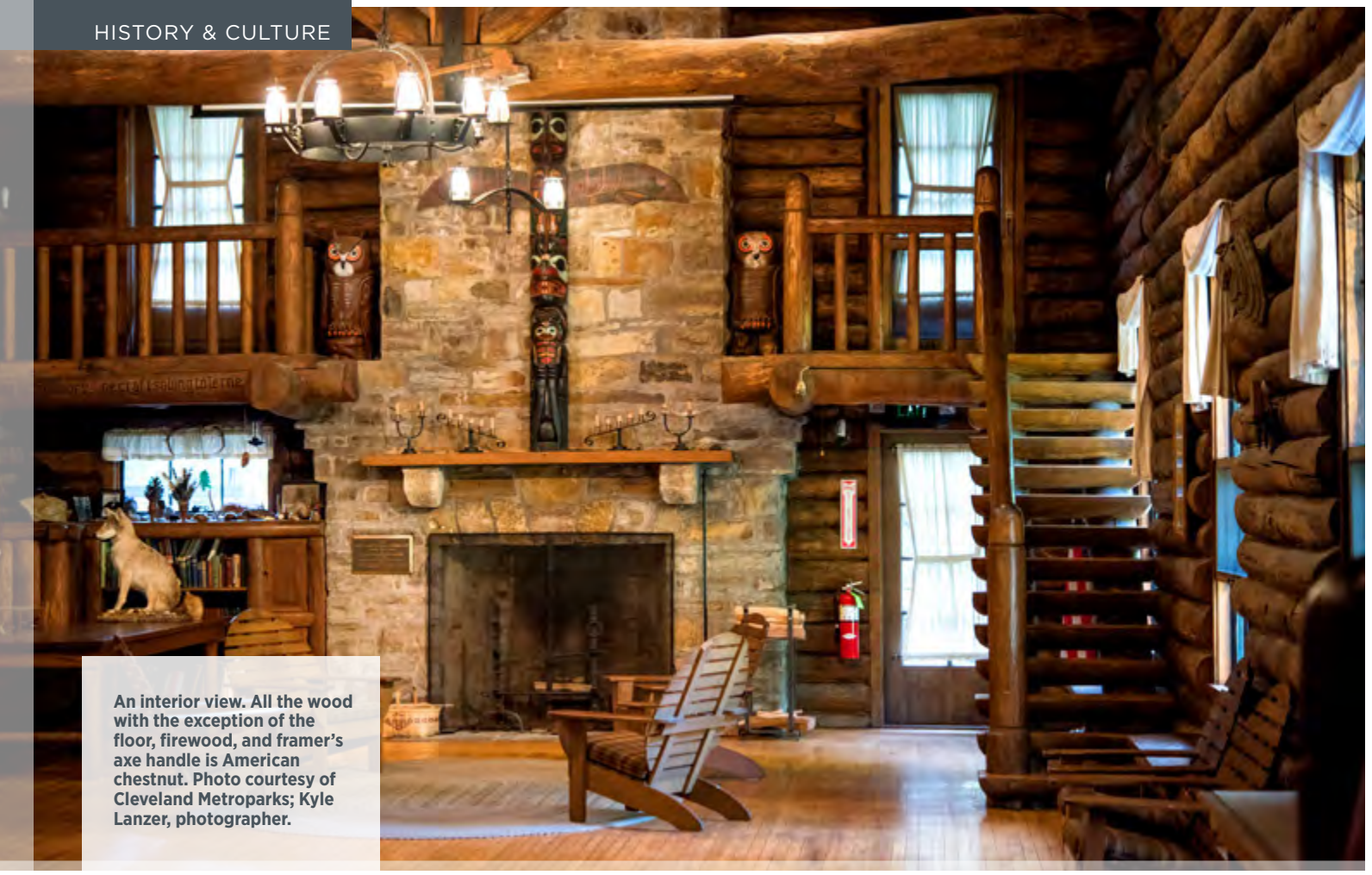
THE AMERICAN CHESTNUT FOUNDATION®

Generations of members and supporters are at the core of The American Chestnut Foundation (TACF). One of the reasons TACF continues to advance our mission is due to multigenerational support – love of the tree that is handed down to younger generations who carry on the work. There are several examples in this issue of *Chestnut*: Plant a Tradition (page 8), Volunteer Spotlight (page 12), Reflections (page 29), and a special tribute (page 31).

Does your American chestnut story span generations? Have you passed along your commitment to younger folks in your family or community? Or, maybe that torch has been handed down to you? We want to learn about your story of tradition, which is undoubtedly a key component toward the restoration of this magnificent tree!

Contact TACF Director of Communications Jules Smith at jules.smith@acf.org and include “My chestnut story” in the subject line.





An interior view. All the wood with the exception of the floor, firewood, and framer's axe handle is American chestnut. Photo courtesy of Cleveland Metroparks; Kyle Lanzer, photographer.

use of the facility for meetings and educational programs.

Planning began in 1935. Labor for construction was obtained from the Works Progress Administration (WPA), which reduced costs and allowed for a much larger and more ornate structure than originally envisioned. The WPA was also able to provide skilled artisans, timber framers, wood carvers, blacksmiths, and stone masons.

Several wood types were considered, including pine and red cedar. Eventually a source of mature American chestnut trees was found nearby in Loudonville, Ohio, and was obtained cheaply due to the low demand for construction materials during the Great Depression. The 309 chestnut logs found offered greater durability while being knot-free and easy to work.

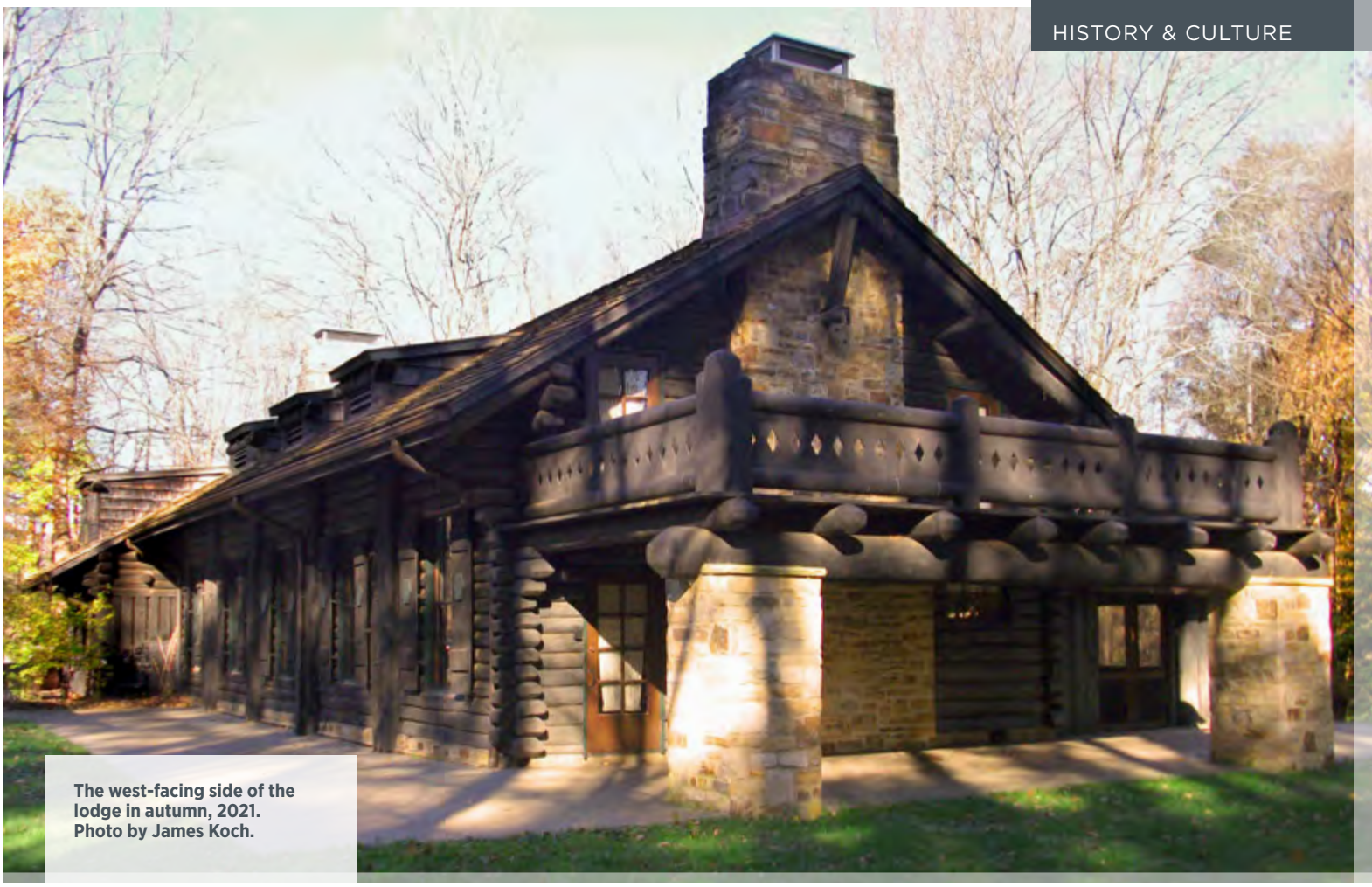
The walls were constructed of both horizontal and vertical chestnut logs with traditional oakum chinking.

A view of the Lodge upon arrival with the main entrance to the left and the kitchen door to the right. Photo by James Koch.

Chestnut was also used to create beams, split log stairs, rails, cabinets, shelves, benches, tables, posts, gates, and the carved gargoyles and totem poles which adorned the roof. Stone masons built the fireplaces, exterior floors, walks, and support columns. Blacksmiths forged the fireplace irons, chandeliers, and hardware.

In the spring of 1938, following two years of construction, Look About Lodge opened. The Lodge is 95 feet long by 56 feet wide. The north end of the building holds the large kitchen and restroom on the first floor. Above this was a museum filled with amazing collections of stuffed birds and photos, and today is used as the park office. The entry door sits adjacent to a large screened porch that extends along the length of the hall.

The southern end of the building has a stone patio topped by a large open balcony supported by stone



The west-facing side of the lodge in autumn, 2021. Photo by James Koch.

columns, while the western wall of the hall features tall windows to admit the afternoon sunlight.

The main room is a two-story, exposed log great hall, measuring 25 feet wide by 60 feet long. The hall includes the large North and South stone fireplaces, still used for warmth today during our winter monthly club meetings. The north wall fireplace, known as the "Memory Stone" fireplace, is made in part using stones donated by original club members collected in all the 48 contiguous states.

As a young boy, I was fascinated by a large axe hanging from a tie beam near the south fireplace. The axe was used by timber framers to trim and square logs for construction and was left by the builders as a reminder of their contribution. If you look closely at the photo of the south fireplace, you can see the broad axe still hanging from the chestnut beam where it was placed 83 years ago.

From 1938 until 1992, the Cleveland Natural Science Club maintained and improved the Lodge, but nature has taken her toll. Annual rainfall and humid summers combined with the freezing and thawing of Northern Ohio winters left the original slate roof and main beam in need of repair and replacement.

The Club lacked the necessary membership and funds to undertake expensive repairs, and eventually voted to turn over the remaining ownership to Metroparks. I, like most members, was saddened that we were unable to keep the founder's promise to maintain the Lodge in perpetuity. However, regular club meetings are still held there, and educational programs are largely park-run. The roof was replaced with wooden shakes, the porch beams with oak, and the totem poles and other remaining exterior decorations are now inside for safe keeping.

The surrounding 1,521 acres of ravines and forest are still home to a small number of surviving American chestnut trees. It is my sincere hope and intent that the Lodge will serve as one of thousands of facilities across the eastern United States providing education about, and support toward the restoration of the grand American chestnut.

**ABOUT THE AUTHOR: JAMES S. KOCH** is a former IT professional, current business owner, TACF and Cleveland Natural Science Club member and planter of trees. James says, "I may not live long enough to see visitors to the Lodge shaded by American chestnut, but I do hope to live long enough to help plant them."

**SPECIAL THANKS** to Judy MacKeigan, Metroparks Historian/Archivist for providing photos and assistance in researching this article.

PART 2
OF A 2-PART SERIES

# Nontarget Injury Due to Herbicide Translocation

## VIA ROOT GRAFTS IN CLOSELY PLANTED AMERICAN CHESTNUT ORCHARD PLOTS

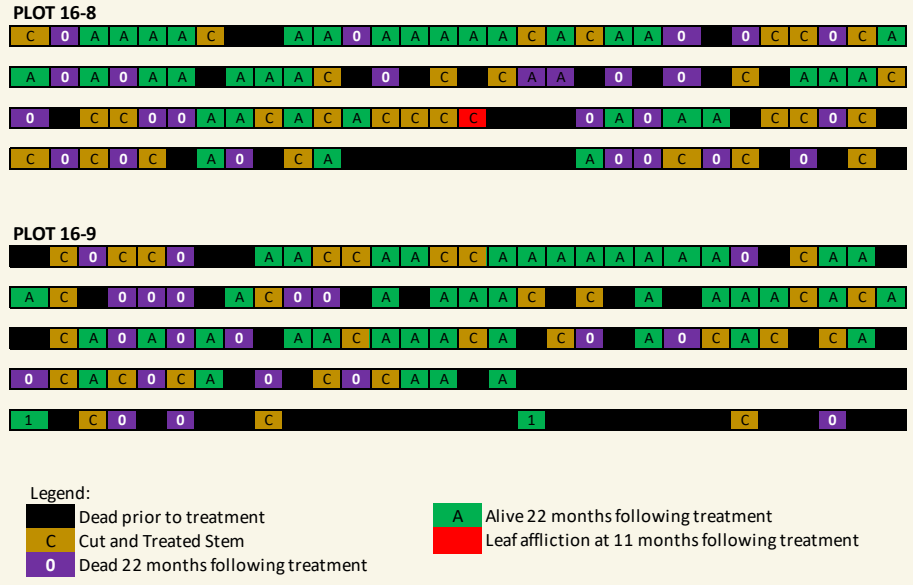
## RESULTS AND DISCUSSION

By Sara Fern Fitzsimmons, TACF Director of Restoration and Stephen Hoy, Penn State Orchard Manager

During the growing season of 2019, 564 advance backcross American chestnut trees ($B_3F_2$s) were included in a study of herbicide translocation. A product containing highly concentrated (41%) glyphosate was applied to a randomized assortment of cut stumps in the previously inoculated plots (16-15 and 16-16) and to all cut stumps in the non-inoculated plots (16-8 and 16-9).

The 564 trees involved were planted in a series of four plots: 16-8, 16-9, 16-15, and 16-16. Prior to treatment, all the trees in plots 16-15 and 16-16 were inoculated with chestnut blight fungus, and only those trees deemed to have the highest blight resistance were not cut down. Plots 16-8 and 16-9 were not inoculated, and therefore a random sampling of trees within those plots were cut and treated with herbicide. In this way, our experiment could reveal any differences in how stress (inoculation) might affect the ability of a tree to neutralize the effects of herbicide translocation.

**Figure 1: Plots 16-8 and 16-9**




**The trees in these plots were not inoculated with the chestnut blight fungus. A randomized selection of trees were assigned to be cut, and all trees cut in these plots were treated with concentrated glyphosate (C).**

**Table 1: Results of treatments to plots 16-8 and 16-9. Total Cut-Stump Treated Trees – 58.**

| Distance to Treated Tree (ft) | Number Alive 2019 | 2020 | 2021 | Percent Survival 2020 | 2021 | Growth 2020 | 2021 |
|---|---|---|---|---|---|---|---|
| 1 | 54 | 51 | 34 | 94% | 63% | 5.07 | 13.29 |
| 2 | 33 | 32 | 22 | 97% | 67% | 4.42 | 17.25 |
| 3 | 14 | 13 | 10 | 93% | 71% | 6.47 | 19.11 |
| 4 | 11 | 10 | 6 | 91% | 55% | 3.64 | 2.86 |
| 5 | 9 | 9 | 8 | 100% | 89% | 3.14 | 8.92 |
| | 121 | 117 | 81 | 97% | 67% | 4.55 | 12.28 |

## Results

No significant relationship between distance to treated tree and survival or growth could be determined from this study (**Tables 1 and 2**). Somewhat contradictory, the trees in close proximity to treated trees appear to grow larger than those farther away from treated trees. The release from competition seemed to overcome possible deleterious effects of being near a treated tree.

Twenty-two months after treatment, survival was slightly lower closer to treated trees than farther away, but again, this relationship was not significant. In the inoculated and selected plots (16-15 and 16-16), there was more mortality of non-target trees as the number of surrounding treated trees increased but, again, this relationship was not significant, possibly due to a low sample size per number of surrounding treated trees.

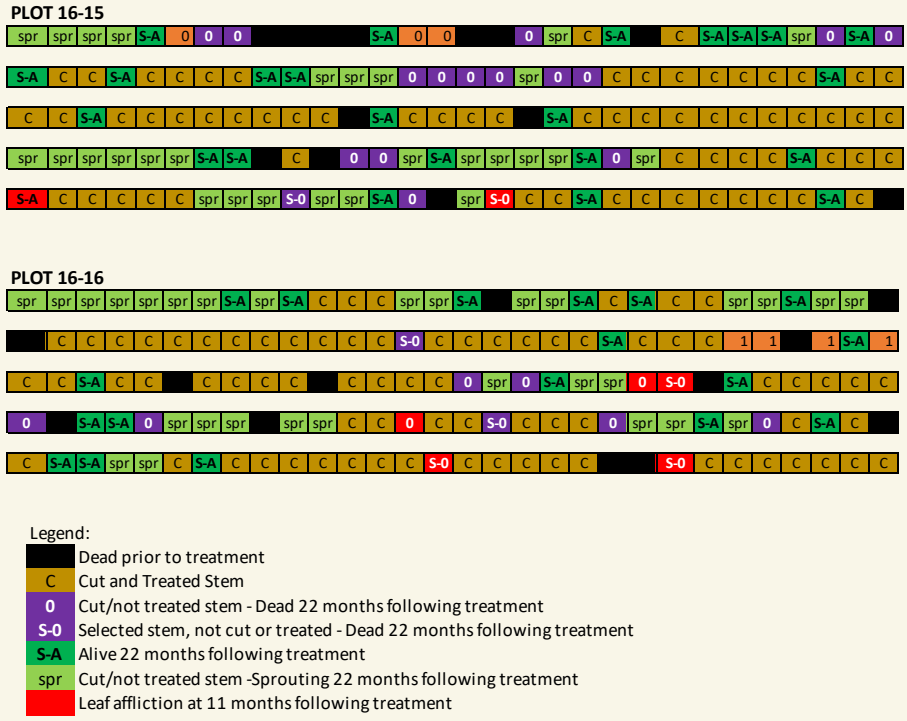
Distinctive herbicide damage on eight total individuals was observed (**Figures 1 and 2**). Samples from four of the trees exhibiting distinctive herbicide damage were sent to the Bartlett Tree Experts Laboratory for analysis of residual glyphosate activity, and all four showed some concentration of the herbicide product (**Table 3, Figure 3**).

## Discussion

This is the first report of herbicide translocation to non-target chestnut trees, presumably through root grafts. Our hypothesis was that as the number of herbicide-treated trees surrounding non-target trees increased, the possible concentration of herbicide product would increase, and that we would see an increase in mortality and decrease in growth in neighboring, non-target trees. Neither of those responses were clear from our results, and some of the observations seem to contradict that hypothesis.

For chestnut trees in Pennsylvania, autumnal senescence should be starting in August, which is the reasoning for the timing of treatment in this study. It is possible that more non-target herbicide injury would be seen if the cut-stump method were applied later in the fall. Similarly, it is also possible that no injury on adjacent trees would be seen if this method is applied in the spring when metabolites are being pushed up from the roots; however, spring applied cut-stump treatment for

**Figure 2: Plots 16-15 and 16-16**




**All the trees in these plots were inoculated with the chestnut blight fungus. Those trees with the highest blight-resistance were retained (S-A), a total of 42 trees. All non-selected trees were cut. A randomized selection of cut trees were assigned to be treated with concentrated glyphosate (C) while others remained cut but untreated (0).**

**Table 2: Results of treatments to plots 16-15 and 16-16.**

| Number of Surrounding Treated Trees | Ground Line Diameter (GLD) 2019 | Trees Alive 2019 | Trees Alive 2021 | GLD Growth 2021 |
|---|---|---|---|---|
| 0 | 67.20 | 10 | 8 | 11.50 |
| 1 | 63.45 | 2 | 2 | 7.70 |
| 2 | 46.00 | 1 | 1 | 7.60 |
| 3 | 67.00 | 2 | 2 | 7.00 |
| 5 | 79.60 | 1 | 1 | 12.80 |
| 7 | 96.00 | 1 | 0 | — |
| 8 | 71.95 | 2 | 1 | 1.70 |
| 9 | 66.00 | 1 | 1 | 12.50 |
| 12 | 70.10 | 1 | 0 | — |
| 20 | 52.70 | 1 | 0 | — |

**Table 3: List of trees showing leaf afflictions indicative of herbicide damage. Four trees from this study were tested for presence of glyphosate in fall 2020. Two trees in this study showcased herbicide damage.**

| TreeID | Cross | Glyphosate Concentration (mg/kg) | Distance to Treated Tree (ft) | 2019 GLD* (mm) | 2021 Survival | Sprouts? |
|---|---|---|---|---|---|---|
| 16-8-3-76 | ku00-14-29 | 1.90 | 1 | 64.6 | Dead | No |

| TreeID | Cross | Glyphosate Concentration (mg/kg) | Number of Surrounding Treated Trees | 2019 GLD* (mm) | 2021 Survival | Sprouts? |
|---|---|---|---|---|---|---|
| 16-15-5-137 | re00-098 | — | 2 | 83.5 | Dead | Yes, afflicted |
| 16-15-5-121 | re00-098 | 0.09 | 5 | 58.9 | Alive | Yes, normal |
| 16-16-5-135 | ku00-17-40 | 0.41 | 12 | 70.1 | Dead | Yes, afflicted |
| 16-16-5-143 | ku00-17-40 | 1.90 | 7 | 96 | Dead | No |
| 16-16-3-82 | ku00-17-40 | — | 0 | 45.4 | Dead | No |
| 16-16-3-83 | ku00-17-40 | — | 0 | 85.1 | Dead | No |
| 16-16-2-42 | ku00-17-40 | — | Treated | 37.5 | Dead | Yes, normal |

*GLD = Ground Line Diameter

**Figure 3**

**Distinctive foliar injury due to herbicide damage. These pictures were taken from non-target trees 11 months following treatment, July 17, 2020.**

woody vegetation control is generally less effective than when applied in the fall for the same reasons.

One important thing to note is that root grafts are unlikely to occur between dissimilar species. Cut stump method is often used in chestnut orchards to treat non-chestnut woody competitors such as cherry, sumac, tulip poplar, etc. In these instances, no damage to adjacent chestnuts has been observed. One clear result is that plots which had been previously inoculated and selected showed greater affectation by herbicide.

The risk of herbicide translocation to non-target trees when applied to different species in a plot is minimal to non-existent. The risk to non-target trees of the same species with healthy individuals and at wide spacing is also minimal, but not zero. The risk to non-target trees which are suffering from other diseases or stress, and which are nearby or adjacent to treated trees of the same species is moderate and appears to depend in factors not entirely clear from this initial study. Aspects such as the time of year of application, type of herbicide product used, and extent of within species root grafting should be carefully evaluated prior to treatment.

As advised by product labels themselves, when valuable, non-target specimen trees are located in close-proximity to an herbicide treatment, especially a treatment using high product concentrations, alternative mechanical treatments should be considered for targets of the same species.

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# Filming the American Chestnut

## AT MEADOWVIEW RESEARCH FARMS

**By Cody Huff, Multimedia Artist and Supporter of American Chestnut Restoration**

In my mind, the American chestnut has always existed in the realm of myths and legends. The first time I heard the story of the chestnut tree it was told to me simply; another tale of something great that was here but is now lost. Tragically, this is not an uncommon story. Many plant and animal species have been lost to the expansion of the modern age. But the story of the American chestnut is different. Unlike the stories of other ecological disasters, the plight of the American chestnut is still unfolding. Through a concerted effort to change course, it might still be possible to return these giants to Appalachia. And given the grandeur of the story, I feel the restoration of this tree makes an incredible subject for a film.

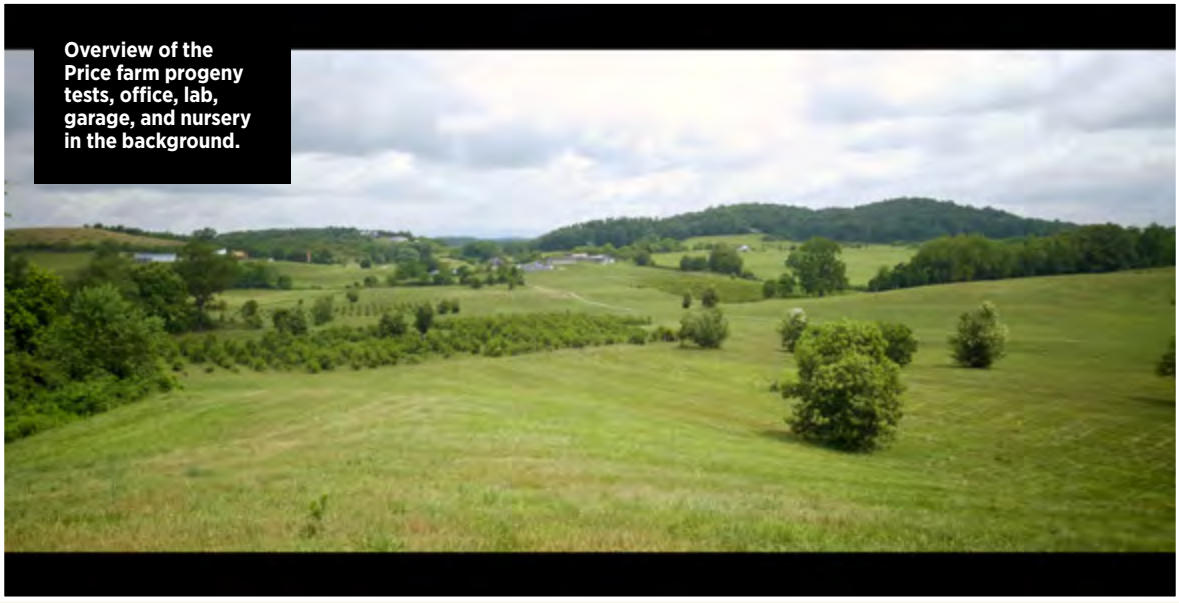
I was raised in Southwest Virginia, home to The American Chestnut Foundation's (TACF) Meadowview Research Farms, and for many years I have wanted to produce a film about the region. There are a myriad of stories to tell about the area, but I was searching for a subject that emphasized two main ideas: land and labor. Prior to beginning my work on the American chestnut film, I had developed a concept for a series of short, nonfiction films, exploring different relationships between land and labor in Southwest Virginia. My aim is to present these stories in an immersive and nontraditional format that I am currently calling "meditation films." This new format is one that utilizes sound and image to craft a unique experience allowing the viewer to witness moments and information unfold in time, yet not attaching the subject to a traditional narrative structure. In doing so, I hope to impart on the viewer a more personal experience of the landscape, of the work taking place within the landscape, and the intersection between the two.

**A cluster of catkins on one of the large surviving American chestnuts at the Glenn C. Price Farm.**

MEADOWVIEW

Tree Breeding Coordinator Eric Jenkins, and Director of Land Management Dan Mckinnon, pollinate a large surviving American chestnut from the bucket lift.

A hybrid chestnut tree showing "cruddy bark" symptoms and healed cankers.



Overview of the Price farm progeny tests, office, lab, garage, and nursery in the background.

TACF Director of Land Management Dan Mckinnon takes a picture from the bucket truck as Cody captures video footage of Dan pollinating a tree.

This project is still in the early stages, but production has been incredible. I am currently collaborating with painter and filmmaker Shannon Roulet, who is helping craft the visual aesthetic of the film. So far, we have been able to document the summer pollination process, as well as the fall harvest and seed processing. While winter and spring processes are still in the works, the current strategy has been to break the production schedule into seasons; a break which may ultimately yield a compelling framing device for the completed film. In addition to the visuals, Shannon and I have been collecting field recordings of the Meadowview orchards, which I intend to combine with audio interviews of crew members working the farm. And while there is more work to be done, it has been a joyous and immensely gratifying experience.

I am grateful to TACF and everyone at Meadowview Farms, all of whom have been extraordinarily generous with their time and efforts to help with this project. I remember the first day of filming: It was early July and the catkins were in bloom. A staff member drove me out to see a large surviving American chestnut. Up to that point I had never seen one before. As I stood there observing the tree, I felt a much deeper emotional experience than expected. Despite all the odds stacked against it, this tree continues to stretch out its roots and to blossom. That single experience of seeing this one tree set film in motion. It teaches lessons in strength and vulnerability. Its perseverance advances a long and important history, offering an opportunity to cultivate a healthier environment. We do not walk in the same woods as our ancestors, but with the help and dedication of TACF members, volunteers, and staff, one day we will. And I, for one, cannot wait for those first steps.

**ABOUT THE AUTHOR: CODY HUFF** is a multimedia artist currently based in Charlottesville, Virginia.

# TACF Achieves 4-star Charity Navigator Rating 8th Straight Year!

**Charity Navigator rates hundreds of non-profit organizations in the United States by evaluating financial health and commitment to accountability and transparency. Their ratings are a resource for donors on how efficiently a charity will use their support and how well it has sustained its programs and services over time.**

## CHARITY NAVIGATOR COMMENDED TACF BY STATING:

*Attaining a 4-star rating verifies that TACF exceeds industry standards and outperforms most charities in your area of work. Only 6% of charities we evaluate have received at least eight consecutive 4-star evaluations, indicating that TACF outperforms most other charities in America. This exceptional designation from Charity Navigator sets TACF apart from its peers and demonstrates to the public its trustworthiness.*

President and CEO Lisa Thomson said in response to this year's rating, "This designation is due much in part to our dedicated staff, their high level of integrity, and their ability to create efficiencies with limited resources. That, along with oversight from a highly engaged board of directors and hard-working chapter leaders, makes this designation possible."

CHARITY NAVIGATOR
Four Star Charity

THE HISTORY AND LANDSCAPE OF

# Genetic Diversity in American Chestnut

**By Alexander Sandercock, Virginia Tech; Jared Westbrook, TACF Director of Science; and Jason Holliday, Virginia Tech**

The climate has changed since the introduction of chestnut blight to North America in the early 20th century. Yet because of blight, American chestnuts have not been able to reproduce, migrate, and evolve in response to the changing world. As we begin to plant blight resistant American chestnuts across a large geographic range, it becomes increasingly important to understand how genetic diversity will enable the blight resistant trees to adapt to environmental change. Our practical aim with this research is to make specific recommendations on where to plant locally adapted subpopulations of American chestnut so that they have the greatest chance of thriving and reproducing.

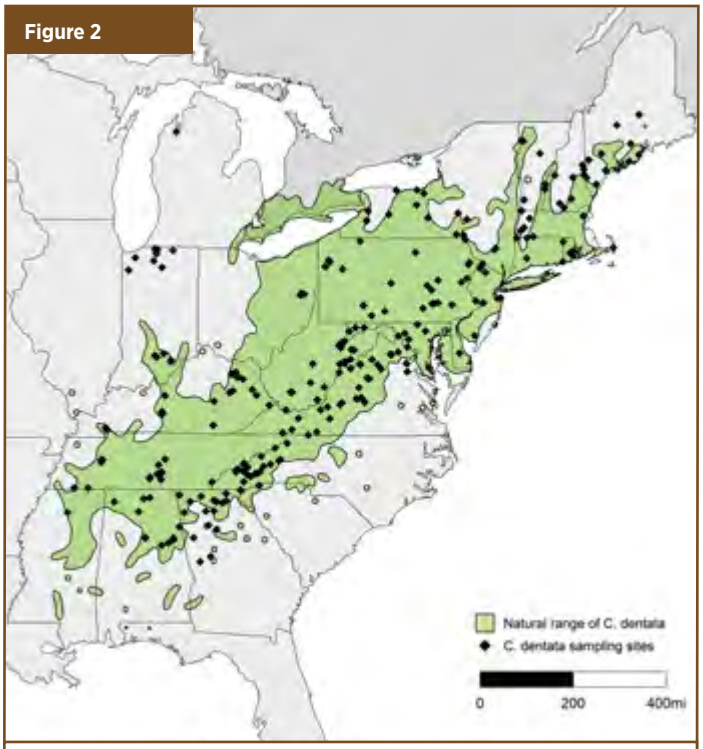
**A wild-type American chestnut in Linville Gorge, NC.**

In collaboration with TACF, we are working to identify genetic adaptations to local climate conditions within wild American chestnut populations. The steps to accomplish this goal are to: 1) Sequence the DNA of a range-wide sample of American chestnut trees, 2) determine if and how the historical range of American chestnut can be divided into distinct populations, evaluate genetic diversity, and estimate how these populations changed over time, 3) identify the genes related to local climate adaptation, and 4) use the results of the previous steps to develop a conservation and breeding strategy for wild American chestnut with blight-resistant populations. Thus far, we have completed steps 1 and 2.

For step 1, we first needed to obtain leaf samples from trees from different environmental conditions throughout the chestnut's natural range. In 2018 through 2020, TACF staff and volunteers collected leaf samples from over 700 trees and sent them to us at Virginia Tech for DNA extraction (**Figure 1**). In total, we selected 384 American chestnut trees for DNA sequencing (**Figure 2**). We sent these DNA samples to the HudsonAlpha Institute for Biotechnology for sequencing. After removing 18 samples with low-quality DNA sequences and 10 samples that were identified as hybrids from comparison to the genomes of other *Castanea* species, we obtained high quality DNA sequence data from 356 American chestnut trees.

With the genomic data in hand, we then wanted to describe the population structure of wild American chestnut (step 2). Population structure analysis essentially asks whether a species range can be divided into two or more groups, where within-group mating is historically more common than between-group mating. We used two statistical methods to address this question. The first method preferred a two population model for American chestnut, with a distinct southwestern population. The second method defined a three population model, with a southwest, central, and northeastern population (**Figure 3**). Both analyses agreed with a distinct southwestern population. The identification of distinct separate populations within wild American chestnut is in agreement with earlier genetic studies (Spriggs & Fertakos, 2021; Müller et al., 2018;

**Figure 2**

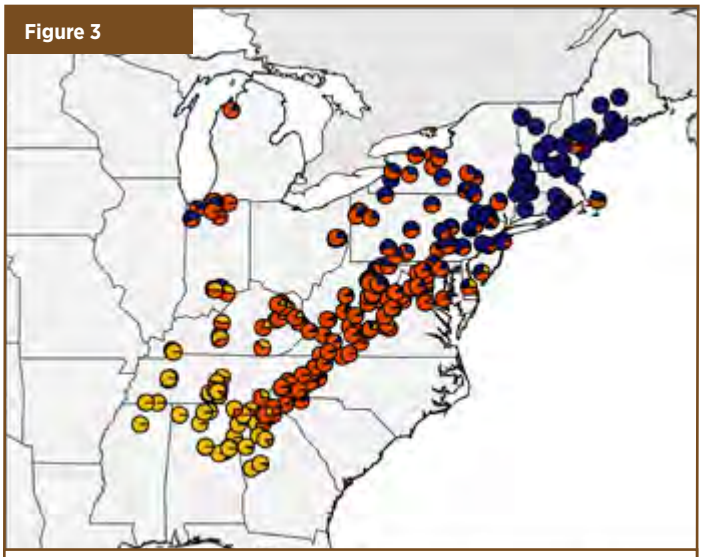



**Sampling locations of surviving American chestnut trees (black). The natural range of the American chestnut from Little's (1977) range map is shaded in green.**

**Figure 1**

**Volunteers collecting American chestnut samples for the landscape genomics project. From left to right: Roger Smith, Susan Smith, Jim McKenna, and Deni Ranguelova.**

**Figure 3**



**Population structure of wild American chestnut. Each pie chart is an individual sample, and the color, or combination of colors represents population membership. Yellow = southwestern, orange = central, and dark blue = northeastern.**

Gailing & Nelson, 2017). The three populations identified here will be the focus of germplasm conservation efforts.

In addition to defining current patterns of genetic diversity, historical climate events may have influenced American chestnut populations. Approximately 2.7 million years ago, the Quaternary glaciation began, leading to ice sheets that extended throughout much of northern North America as recently as 13,000 years ago – the last glacial maximum. We used a demographic history analysis to identify if past glacial events influenced current patterns of diversity. We found that all chestnut populations declined around two million years ago, followed by further declines within the past 400,000 years. These declines were correlated with glaciation events in North America. The populations expanded northward ~12,000 years ago, following the last glacial maximum and warming of North America. We estimated the locations of these postglacial migration routes and found that the Appalachian Mountains form a barrier to migration. These results suggest that American chestnut populations migrated northward on either side of the mountain range from the southern region.

Lastly, we estimated genomic diversity for each population. Genomic diversity measures the proportion of different DNA sequences at a given location in the chestnut genome. If a population has a high level of genomic diversity, they have the potential to harbor adaptations to survive future threats. Additionally, the population with the highest levels of genomic diversity usually represents the oldest population. The southwestern population had the highest levels of genomic diversity, followed by the central population, and the northeastern population with the least. Previous studies also found that American chestnuts in the southern portion of the range harbored the highest levels of genetic diversity; leading to their conclusion that the southern region was a glacial refugium (Spriggs & Fertakos, 2021; Müller et al., 2018; Gailing & Nelson, 2017; Kubisiak & Roberds, 2006). This pattern of decreasing genetic diversity as latitude increases is seen in temperate and boreal tree species, which underwent northward postglacial migrations from their southern range (Holliday et al., 2010).

In summary, we have completed a range-wide sampling of American chestnut trees in the eastern U.S. Population structure, demographic history, and genomic diversity analyses were completed and revealed that past glaciation events influenced current patterns of genetic diversity in North America. Our next steps will be to identify the genes related to local adaptation within each chestnut population (step 3) and develop a conservation and breeding program to create blight-resistant chestnut trees that are adapted to their replanting site (step 4). Our preliminary results for step 3 suggest that thousands of genes are associated with different climate conditions (i.e., cold temperature and drought). It will be essential to ensure that these genes are preserved and bred into blight-resistant populations to survive current and future climate conditions.

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## AUTHOR BIO


**ALEXANDER SANDERCOCK** is a Ph.D. student and Doctoral Scholar at Virginia Tech in the Genetics, Bioinformatics, and Computational Biology program, with Jason Holliday as his advisor. He was previously at Millersville University where he completed a B.S. in Biology. His research interests are in the population genomics of species of conservation concern and understanding how climate change impacts these species. His current dissertation work focuses on describing the landscape genomics of American chestnut.

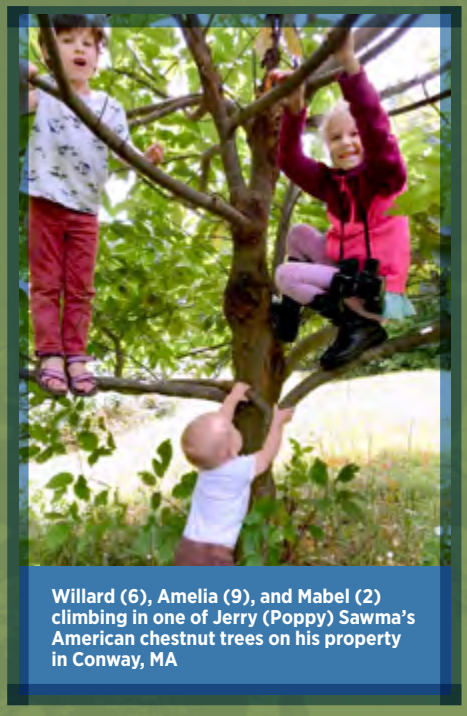
Jerry Sawma planting American chestnut in the late 90s.

# A Daughter's Letter to Her Late Father, Jerry Sawma

By Maggy Sawma, MA/RI-TACF Chapter

Dear Dad,

You have been gone for nearly five years. You are so deeply missed, but you left us with some amazing gifts, one of which are your American chestnut trees.



Willard (6), Amelia (9), and Mabel (2) climbing in one of Jerry (Poppy) Sawma's American chestnut trees on his property in Conway, MA

Dad, you were such a lover of nature. You never took anything on this earth for granted and I strive to do the same for my children. Just like you, enjoying nature is part of our daily lives. Years ago, you planted two very small American chestnut saplings northwest of your shop, high on the hill. I watched as you worked meticulously to keep them protected. You never needed to speak about your process as I watched on. Without words, it was clear how very much you cared. Each year the trees grew and showed signs of promise. Your extensive book collection taught me about the history of the American chestnut and its significant role in the forests. You allowed me to ask questions and participate in your passion.

In late spring, following your passing, the trees you planted exploded with bright green burs. Thrilled, I rushed into the house, calling the kids to come outside and celebrate with me!

Because of your passion, these trees became part of my life just as much as they had been yours. I am delighted that your grandchildren are just as thrilled to check on the trees each season, observing their growth. They are now big enough to climb through the branches or read in the shade of this grand tree. What a beautiful gift you left them, and me. Your love of American chestnut has come full circle and is inspiring this younger generation!

You would be so proud of your grandchildren and trees that are thriving together, because of you.

# Caramel Chicken with Chestnuts

Serves 4 to 6

**This savory recipe is a perfect meal to prepare and serve on a cold winter evening. It comes from the cookbook, *Chinese Heritage Cooking from My American Kitchen*, by Chef Shirley Chung.**

## Ingredients

2 TBSP cornstarch
1 2 ½ lb whole chicken, cut into chunks
6 dry shiitake mushrooms
2 TBSP canola oil
2 thumb-size pieces of whole ginger
1 head garlic, peeled
3 shallots, cut in half
¼ cup sugar
1 cup Shaoxing wine
¼ cup soy sauce
1 TBSP dark soy sauce
1 star anise
½ cup chicken stock
12 peeled chestnuts
Salt, to taste

## Method

Sprinkle cornstarch over the chunks of chicken and massage them together. Soak the dry shiitake mushrooms in water for one hour to rehydrate them.

Heat the canola oil in a Dutch oven over medium heat. Add the ginger, garlic and shallots, and sauté for one minute. Push all the vegetables to the side and add the sugar to the middle of the pot. Allow the sugar to caramelize to a dark amber color, about three minutes, then add the chicken into the pot and stir-fry quickly for one minute. Add the Shaoxing wine, and stir and scrape the pot to allow all the caramel to melt into the liquid.

Cook off the alcohol for one minute, then add the soy sauce, dark soy, and star anise to the pot. When it comes to a simmer, turn the heat to low and add the chicken stock. Skim the surface of the braising liquid by removing the floating protein gunk, then add the shiitake mushrooms and chestnuts. Cover the pot with a lid and simmer for 25 minutes. Adjust seasoning with salt before serving.

# Generations

We have almost entirely lost the generation of people who experienced the grandeur of the American chestnut first-hand. Since the blight was first introduced to the forests of the eastern U.S., six generations of people have been born, some of whom have already been lost to the march of time.

**Hans, Violet, and Kristy stand behind Chandis Klinger in a photo taken on October 2, 2021. The family gathered to plant chestnut trees around their home, not knowing it would be the last time they were all together.**

Generations of researchers have given their entire careers toward the restoration of the American chestnut. Frank Myer (1875-1918) dedicated his work to plant exploration and was the first to import Chinese chestnuts into the U.S. as a method to replace the American chestnut. Arthur Graves (1879-1962) worked at the Connecticut Agricultural Experiment Station (CAES) and was succeeded by Sandra Anagnostakis, who recently retired but still devotes much of her time to chestnuts (and other nuts, too!). Now, Susanna Keiro continues to shepherd the chestnut work at CAES.

Chandis Klinger dedicated his time of retirement to working with TACF: control-pollinating, planting, and serving on the Board and as president of the PA/NJ Chapter. After protracted health challenges, Chandis passed away on November 18, 2021. His daughter, Kristy, had recently shared his chestnut story on the "This is Love" podcast, the episode of which aired on the day her father passed. https://thisislovepodcast.com/episode-40-grandfather-of-the-forest/

His wife, Violet, suddenly passed away on December 4, 2021. Their devoted work will now be shepherded by children, Hans and Kristy.

Forestry takes time and patience, and a vision to imagine a culmination we will likely never witness ourselves. The work of forest tree restoration takes generations of trees and people. New scientific developments will allow TACF and affiliated partners to deploy ongoing improvements over the coming decades. Future trees must inherit and contribute the genetic knowledge for disease resistance, while future generations of people receive and pass along a love and passion for sustaining forest ecosystems.

# IN MEMORY OF OUR TACF MEMBERS

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*Melanie Fay Johnson*

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*Dr. J. Steve Oliver*

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*From:*
*Ray Pawlisch*

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*Elizabeth Schousek*

**Jenny Seibert**
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**We regret any errors or omissions and hope you will bring them to our attention.**

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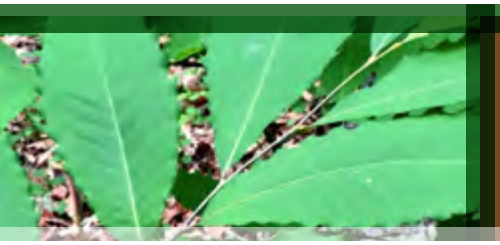

**Beginning this March, The American Chestnut Foundation will once again be selling wild-type American chestnut bareroot seedlings in bundles of 5, 10, and 25.**

# TACF's Wild-Type American Program


Members will receive an email Sunday, March 6 for advance notice of the sale, including a link to the order form, which will be live March 8. Those without email may place their order by calling the national office at (828) 281-0047. The sale will open to the public on Monday, March 21 (while supplies last).

Growing wild-type American chestnut trees is a wonderful learning experience and helps preserve genetic diversity for future breeding and diversification. They will succumb to the blight if exposed but can thrive for years and produce seed for harvest and consumption.

This is a very popular program and the seedlings sell out quickly. Due to the limited supply and high demand, customers are restricted to a maximum order of 25 seedlings. Distribution range is only available to states east of the Mississippi. Orders will be mailed by mid-April.

**PRICING FOR WILD-TYPE AMERICAN SEEDLINGS:**

Only sold in quantities of
5, 10, 25 – includes shipping

5 seedlings – $35.00

10 seedlings – $70.00

25 seedlings – $175.00

**Proceeds from this program help fund research to restore the American chestnut.**