



Vermont/New Hampshire Chestnut Notes

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Early Restoration Efforts of American Chestnut on the Fairlee Town Forest

By Yurij Bihun

It was early January 2016. There was a dusting of snow on the frozen ground of the Fairlee Town Forest in Fairlee, Vermont, when I first met with Markus Bradley, forester and partner of Redstart Natural Resource Management based in Corinth, Vermont and two members of the Fairlee Forest Board – Chair Dave Matthews and Peter Lange, a local forest landowner. They had contacted me because they were interested in working on a possible demonstration planting at the site of a recent cut on the town forest.



16-year-old Rivendell Academy student Allison Collins, Yurij Bihun, and former UVM graduate student and Redstart forester Andrea Urbano *Photo courtesy JP Powers*

The Fairlee Town Forest consists of approximately 1,500 acres and is used mostly for recreation, watershed protection, and timber management. The parcel we visited was perched above Lake Morey at about 1,200 feet. The forest is a mix of northern hardwood and hemlock with a significant red oak component, as well as scattered larger pine typical of the Upper Connecticut Valley. Redstart manages the woodlands. In 2015, they harvested about four acres of timber in three patch cuts of approximately an acre each. Most of the timber was removed except for a small amount of residual basal area in large pole-timber oak, legacy trees, and beech snags. The three south-facing sites exhibited prolific beech sprouting. Some down-woody debris was left on the site to prevent excessive browsing of the more valuable species. Based on the site index, soils, and quality of the adjoining stand, it looked like it could be a reasonably productive site. Because of the aspect, presence of oak, and reports of

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JOIN US FOR OUR NINTH ANNUAL MEETING

Join us for our Ninth Annual Meeting on **Saturday, April 29, 2017** at the **Vermont Institute of Natural Science (VINS)** in Quechee, Vermont. Coffee, water, and snacks will be provided. Lunch is available (\$12, pay at the door, cash or check) or bring your own bag lunch. See www.acf.org/vt-nh/ for more about the meeting. Directions: VINS is at 6565 Woodstock Road/Route 4 in Quechee, Vermont. From I-89 take Exit 1 for US 4/Woodstock/Quechee. Follow Route 4 west for about 3 miles. VINS is on the right.

PRESIDENT'S CORNER

By Yurij Bihun, Vermont/New Hampshire Chapter President



Yurij Bihun,
VT/NH Chapter
President
Photo courtesy Yurij Bihun

Each year, as I reflect on our Chapter's accomplishments, the words *milestones* and *crosswords* invariably grace the page. This year, however, I think we have turned the corner and are on the right track to reach tangible goals in the restoration of the American chestnut to our eastern woodlands.

The Chapter has been steadily moving toward its goal of developing a locally-adapted, blight-resistant chestnut through a backcross breeding program. First, we identified remaining "wild" American chestnut trees in Vermont and New Hampshire and established breeding orchards in the two states. Now we started inoculating the breeding orchards and harvesting nuts for trials in seed orchards. In 2015, the Valley View breeding orchard in Shelburne, Vermont, was the first inoculated by Kendra Gurney, Regional Science Coordinator. After selections were made, the least resistant trees were culled. The remaining trees were left to produce seed for the first round of seed orchards. As other breeding orchards mature, we will follow the same process. Over the next five years, the focus will be on selecting, establishing, and managing seed orchards to produce B₃F₃ seed.

In May 2016, the first seed orchard was planted. It is one block of 600 nuts at the Fox Research Forest in Hillsboro New Hampshire. Due to an unusually dry summer, survival was lower than expected but replanting this spring with seedlings will fill in the mortality. We have another promising site for a seed orchard in the works at the West Street

office of State of Vermont Department of Forests, Parks, and Recreation in Essex Junction, Vermont.

To date, most research has been carried out in a field or horticultural setting. In concert with the breeding program, several re-introduction and silvicultural trials were started using possibly blight-resistant seedlings in forested settings. We will watch how they develop, grow, and compete with other forest vegetation.

Last year, Board member Doug McLane and volunteer Curt Laffin developed demonstration planting guidelines and are setting up small nurseries to grow chestnut seedlings for demonstration and ceremonial plantings in New Hampshire and Vermont.

The Board of Directors is developing as well. Two new Board members, Jim Talbot and Daane Cook, are acting as Secretary and Treasurer, respectively. Long time board members Spencer Brookes and Paul Schaberg departed in 2016. Spring 2017 will see Board members Steve Giglio and Janet Robertson stepping down.

I invite you to get involved—in committee work, the Board of Directors, or volunteer activities. If you've never attended a national meeting, this year is your chance. In early October, the Maine Chapter will host national meeting in Portland. It will be a great opportunity to hear the latest developments in chestnut research, participate in site visits, and meet members from all over. Think about joining us!

EARLY RESTORATION EFFORTS (continued from page 1)

chestnut in the Upper Valley, the site looked like a suitable trial site for planting American chestnut.

The timing and access to germplasm was also right to try a demonstration or reintroduction planting in a forest setting. Kendra Collins, New England Science Coordinator, provided some possibly blight resistant* chestnuts. The seedlings were two-year-old B₃F₃ seedlings grown and tended by volunteer Hope Yandell on her Vermont farm nursery. They were grown in RootMaker® grow bags that contributed to good root pruning and also facilitated lifting and planting of the relatively large seedlings. The type of planting we settled on for demonstration planting is referred to as enrichment planting in forestry parlance. Enrichment because northern hardwood silviculture relies primarily on natural regeneration but the site is being enriched by planting species that are either missing from the site – like oak – or introducing species that will provide additional value or wildlife benefit to the stand – like chestnut. “One of my main motivations was to find a species that would compete

with the hardwood coppice or sprouts, primarily beech, which, otherwise, totally dominate the regeneration and growth for years to come.” noted Markus.

In early May 2016, a few dozen students from the ninth grade biology class of Rivendell Academy in Orford, New Hampshire, helped with the planting. Markus worked with Rivendell Academy instructors Dr. Kerry Browne and Lazlo Bardos to tell the chestnut story and talk about its biology and restoration challenges. With the help of Roxanne and Dave Matthews, Terry Lewis, and Peter Lange of the Fairlee Forest Board, plus other community members, the planting operation was like a well-oiled machine with ATVs shuttling equipment and seedlings up the steep slopes of the cutover area. Kerry and Lazlo supervised the students. After a demonstration of onsite preparation and planting, the students were responsible for randomly planting seedlings on a 20- to 30-foot spacing in the three openings. With the advent of spring weather and the chance to work outdoors, the excitement and interest of the students was palpable.

Protection measures for the precious seedlings were at the platinum level. In addition to a two-foot plastic tree shelter, the seedlings were surrounded by mesh hardware cloth to protect the root collar from rodent predation. Mesh fencing was put around each seedling to protect from deer browse. Landscape fabric and dri-water gel tablets were also used to provide sufficient moisture to get them through the early stages of root establishment. This precaution was justified as it turned out to be a very dry summer. Of course, this type of protection in a reintroduction or enrichment planting would be untenable on a larger scale, however, for a small demonstration project, it was manageable. In any case, all the TLC worked. Markus visited the site late last summer and despite the drought conditions, there was good growth and no mortality or dieback visible.

This spring, the same class of students – now tenth graders – will visit the planting, measure the growth, and do some vegetation management, primarily manual clipping of the very aggressive sprouting of aspen (*aka* popple)

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**The term “restoration 1.0” chestnut for the TACF backcross hybrids with the highest level of resistance has proved confusing and is being supplanted by “possibly blight resistant” (PBR) chestnuts.*

Vermont Chestnut Grower Supports Local Restoration Efforts with Windfall Gift By Yurij Bihun and Douglas McLane



Markus Bradley and Andrea Urbano of Redstart Forestry with Roxanne Matthews laying out 21 American chestnut trees to be planted in the Fairlee Town Forest in Vermont.
Photo courtesy Yurij Bihun

Hope Yandell is no newcomer to chestnut culture. For many years on her farm in northwest Vermont, she has raised both wild and disease-resistant American chestnuts, as well as European, Chinese, and hybrid varieties. Over the last several years, she has worked with New England

Regional Coordinator Kendra Gurney to grow some B₃F₃ stock. Hope adopted an innovative planting method using Rootmaker[®] grow bags to facilitate the lifting and transplanting of large seedlings.

Last year, the Chapter used some of these trees for stock at two demonstration plantings – one at the Fairlee Town Forest in Vermont (see page 1) and the other at the McLane Audubon Center in Concord, New Hampshire.

Hope inherited her picturesque old farmstead, but the farmhouse was in

dire need of upkeep and repairs. To raise funds, Hope turned to the idea of auctioning a painting passed down from her grandmother. Unbeknownst to her, the painting by Japanese artist Leonard Tsuguharu Foujita, who lived in Paris in the 1920s and 1930s, would set off a bidding war at Christie's. With the unexpected windfall, Hope decided to support numerous environmental groups, including TACF with a gift of \$10,000 to our Vermont/New Hampshire Chapter to be used for orchard establishment. As Hope herself expressed, "It would be so cool if every taxpayer got to give a percent of what they owe to something that would help the land or humans or creatures."

Our Vermont/New Hampshire Chapter gives Hope Yandell a BIG thank you for supporting the re-establishment of blight resistant American chestnuts in our forests.

May they one day grace her Vermont farmstead.

EARLY RESTORATION EFFORTS (continued from page 3)

and beech that threaten to overtop the seedlings, using hand shears and loppers. There is no guarantee these chestnuts will survive the blight, but they are genetically much more resistant than their pure American counterparts and are part of the long-term process of selection of a resistant hybrid with American characteristics. Rachel Sanders, the tenth grade biology teacher at Rivendell Academy is taking the project to heart, "I am planning to have my classes learn about the silvics of chestnut, monitor the tree growth, and survival on an annual basis as part of the tenth grade curriculum. The students will be, in essence, community stewards, who will watch over the trees. Added Markus, "The decline of American chestnut is a cautionary tale, but the restoration of American chestnut is good way to look at the long-term challenges of restoration ecology as well as an opportunity to bring the community together and do some hands-on work to help the environment."

THE RUMNEY CHESTNUT By Douglas McLane

My own interest in chestnuts started when I was young as I watched my uncle in Milford, New Hampshire, splitting chestnut wood to heat his house. While these chestnut trees died when he was young, their rot resistant trunks were still standing years later.

In 1975, my family and I lived in West Rumney, New Hampshire and I was teaching biology at Plymouth High School. I befriended a local trapper named Francis Burnham. I enjoyed hanging out watching him skin some of the many animals he trapped. I would sometimes take the carcasses to class to show my students how interesting a real mammal dissection could be, in contrast to a preserved frog.

One day, Francis took a friend and me to see an interesting tree he had discovered in the woods off Old Route 25. He showed us a large American chestnut tree with some chestnut saplings near its base. My friend and I each dug up and took one sapling home. Mine did not survive the winter. My friend's tree did survive and is still alive in Cornish, New Hampshire; it is fully blighted, but continues to sprout from the base.

Ten years ago, I learned of an organization called The American Chestnut Foundation, which has been working for 34 years to breed a genetically resistant strain of chestnut trees. I was a bit haunted knowing I had seen a healthy survivor, but couldn't



remember exactly where it was. Knowing Francis had passed away, I tracked down his son, Roger Burnham, who is himself a trapper of nuisance animals. Sadly, he told me the big old chestnut tree I remembered had been mistakenly cut down in a logging operation.

But, Roger said, his Dad had dug up some of the saplings and planted them on his vacant field off Buffalo Road. I was skeptical we would find a non-blighted survivor 35 or so years later. But to my amazement, on the edge of the field were two magnificent chestnut trees. They were healthy and one was covered with thousands of burs! They had survived many years without infection since they live on the northern edge of the chestnut's natural range, where blight load is greatly reduced. The larger tree was about 16 inches in diameter and the other about ten. The larger is likely the largest healthy chestnut tree in New Hampshire. An American chestnut only flowers and fruits if exposed to full sunlight. The smaller shaded tree was healthy, but produced no flowers to cross-pollinate its field mate. We hired an arborist to open up the area to more sunlight, "releasing" the tree; soon there were male flowers. In 2016, there were female flowers as well.

In a quirk of fate, the large healthy chestnut tree on Buffalo Road was discovered while the Vermont/New Hampshire Chapter was searching for such mother trees to pollinate with blight resistance pollen. Roger Burnham kindly gave us permission to access his property. In 2014 and 2015, the New Hampshire Electric Co-op donated a bucket lift several



times each season to facilitate this work. First, when the tree flowers in June, the tree is prepared for "controlled pollination" by removing the male flowers from about 60 selected bisexual flower clusters. The remaining female flowers are enclosed tightly in paper bags to prevent accidental pollination. Then, in about two weeks, when the female flowers become receptive, the bucket lift is again used when we hand pollinate the female flowers with pollen containing blight resistant genes from Meadowbrook, TACF's Virginia research farm. Finally, in September the bags are harvested, and with luck, the burs have viable nuts! In summer 2016, almost 300 nuts from the 2015 harvest, which were held over winter in cold storage, were planted at breeding orchards in Vermont and New Hampshire. In fall 2016, the Co-op helped TACF harvest 144 "open pollinated nuts" from the two now naturally reproducing American trees on Buffalo Road.

It is my hope that in the near future, we may bring a new improved scion of the Rumney chestnut back to its original home.

Marshal Case Stepping Forward By Yurij Bihun

Vermont/New Hampshire TACF Chapter founding member, former National TACF Executive Director and President Emeritus, and our own chestnut elder statesman, Marshal Case is calling it a day. For the first time in 20 years he will shoulder no official responsibilities with The American Chestnut Foundation. Marshal has spent his entire professional career as a wildlife biologist and educator. “From an early age,” Marshal noted, “I was interested in birds and wildlife. At one time, I was considering going to veterinary school but chose instead to study wildlife biology at Cornell University.” After completing his studies, he directed and helped build the Cape Cod Museum of Natural History. Later, he became involved with the National Audubon Society, first as executive director of Connecticut Audubon, then as a Senior VP of Education at National Audubon.



Joanne and Marshal Case on Cape Cod
Photo courtesy Marshal Case

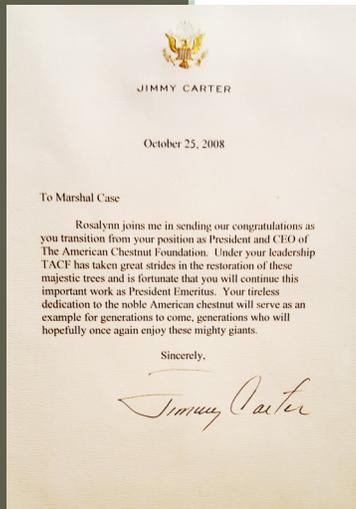
To demonstrate the humble beginnings of TACF, Marshal likes to recount the story of how he came to be Executive Director in 1997.

At the time, he was working as Deputy Director of the International Crane Foundation in Baraboo, Wisconsin, when the application for Executive Director of TACF crossed his desk. There were more than 200 applicants. After he submitted his own application, he was invited to fly to Pittsburgh, Pennsylvania, where the interview was held at the airport Red Roof Inn. “The interview setting was so bare bones there were only two chairs in an upstairs bedroom and half the Board of Directors present were sitting on the bed!” recalls Marshal with a laugh. Before he left, however, he had impressed the Board enough that they offered him the job. With a modest budget and only one scientist, Dr. Fred Hebard at the Meadowview, Virginia nursery and two support staff at headquarters in Bennington, Vermont – Marshal had his work cut out for him. As Vice President of the Northeast Region of Audubon, Marshal was the first regional VP to create state offices. When he took the helm, he chose this model to strengthen the organization and build local chapters.

Marshal had a small home on the west end of Bennington when he left for the position in Wisconsin and planned to return to Vermont someday. When starting as the Executive Director of TACF he returned to Vermont. For the next ten years, almost all TACF activities were directed from offices on Main Street in Bennington. While it was based in Vermont, Marshal, first as Executive Director, and then as President and CEO, dramatically advanced the vision and programs of TACF. The non-profit grew from three state chapters to 16 in less than 13 years. Maine was the first in New England to get started while the Vermont/New Hampshire Chapter was one of the last chapters to start. When asked why this was so, Marshal replied, “At one time I had five chapters starting in the heart of the chestnut range and with Vermont and New Hampshire at the northern limit of the species, I did not want to show preferential treatment.” Nonetheless, in 2007, he worked with local conservationists and chestnut devotees to found the Vermont/New Hampshire Chapter with Ed Metcalfe as the first Chapter President. Marshal also put together a partnership with U.S. Forest Service Northern Research Station at the University of Vermont, in the Rubenstein School of Environment and Natural Resources. A campus office was opened to coordinate chestnut research and restoration efforts in New England. From the beginning of his tenure, there was a discussion to move the offices closer to the heart of the chestnut range in the Appalachians. Marshal paved the way for the move to Asheville, North Carolina, before he stepped down in 2009.

In reflecting on a lifetime of work in conservation and wildlife protection, Marshal treasures most the fact that he has inspired over 100 students who have gone on to be professors of natural sciences, wildlife biologists,

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ornithologists, practitioners, and conservationists. He has mentored students, established wildlife sanctuaries, created interpretive nature trails, and created networks of volunteers, bringing communities together. With increasing loss of farms, he used his own 100-acre parcel of land – Bobolink Meadows Farm purchased as bare land in 2001 – to practice wildlife conservation and provide young people new opportunities to think about farms for the future.

Marshal continues to energize new leaders for protection of biodiversity and wildlife habitat. In summer 2016, he had both knee joints replaced. That temporary setback did not stop him and his wife Joanne from continuing their work with The Trust for Wildlife, a Vermont-based non-profit he founded in 1983 to preserve wildlife and wildlife habitat through environmental education. They also collaborate with other environmental foundations to build institutional capacity for organizations working to save neo-tropical migratory birds.

In addition to being both former Executive Director and President and CEO of TACF, Marshal will become an Honorary Director in the Vermont/New Hampshire Chapter while he also continues to oversee the breeding orchard at Lake St. Catherine State Park. He will also continue working with Mount Anthony Union Middle School students in Bennington. Throughout his career, Marshal has exhibited commitment, perseverance, creativity, and determination both on behalf of the American chestnut and the protection of natural ecosystems. He sees no reason to change now.

COOKING WITH CHESTNUT: Chestnut Fettuccini with Pumpkin and Bacon By James Talbot

For the pasta dough:

120 gr ($\frac{1}{2}$ cup – 4 oz.) chestnut flour
 180 gr (0.8 cup - 6.4 oz.) Semolina flour
 3 eggs

For the dressing:

180 gr (0.8 cup - 6.4 oz) cubed pumpkin (you can use roasted butternut squash)
 150 gr (0.66 cup - 5.3 oz) diced smoked bacon
 Sage (6 to 7 large leaves thinly sliced)
 Butter (2 tbsp.)

Mix together chestnut, Semolina flour, and eggs. Let dough rest for half an hour. Roll dough out with the pasta machine or a rolling pin. Cut it with the machine's fettuccine accessory; otherwise, roll dough into a tube and slice into 1 cm rounds. Shake out with your hands to free the strands. Set pasta to dry on a rack for a few hours. This wider type of pasta is called tagliatelle.

For the sauce, fry bacon in a large pan and set aside. In the same pan, melt butter and brown the pumpkin with the sage over medium heat for no more than 10 minutes, stirring often. Bring to boil salted water in a large pot. Cook the tagliatelle for 6 to 7 minutes. Drain in a colander and transfer to the saucepan, stirring well, and cooking for two more minutes. Eventually add more butter. Serve hot. Serves 3 to 4.

“I picked up this yummy recipe at a cooking class in Vicenza, Italy, in April 2016. If you have ever made pasta dough at home, this will be an easy feat. In Europe they weigh everything, but the amounts in cups/ounces are also noted. Chestnut is gluten-free so you'll need the wheat flour to bind the pasta.”



Vermont/New Hampshire
Chapter of The American
Chestnut Foundation

Care of:
Kendra Collins
TACF Regional Science Coordinator
705 Spear Street
South Burlington, VT 05403

Visit our new website:

<https://www.acf.org/vt-nh/>

New Strategic Plan Guides Future Goals By James Talbot



**Saturday,
April 29, 2017**

**NINTH
ANNUAL
MEETING**

9:30 am

Vermont
Institute of
Natural Science
Route 4
Quechee, VT

Please join us!

On November 19, 2016, the Board of Directors of the Vermont/New Hampshire Chapter of the American Chestnut Foundation conducted a strategic planning workshop at the Marsh Billings Rockefeller National Historic Park in Woodstock, Vermont. Three non-Board member volunteers, Forrest Hammond, Daane Crook, and Carol Wallace, and Regional Science Coordinator Kendra Collins also participated. The workshop was organized by Chapter Acting Secretary Jim Talbot and facilitated by volunteer Curt Laffin with Jim Talbot.

A Chapter goal and five objectives had been established prior to the workshop so participants could focus on strategy development. Participants were divided into two groups — one was for Orchard Establishment and Management and the other was for Membership and Volunteer Management. In summary, the five objectives are:

- Manage nine existing breeding orchards to produce BC3F2 chestnuts for seed orchards.
- Identify seed orchard sites to use to produce sixth generation (B3F3) chestnuts.
- Establish and manage between three and nine one-acre seed orchards.
- Sign up 20 additional Vermont/New Hampshire Chapter members annually.
- Build and maintain a volunteer team with capability to manage Vermont/New Hampshire Chapter breeding and seed orchards and contribute to membership growth.

The Board of Directors approved this plan on March 8, 2017, and will work to implement it. The sequence of implementation will be guided by priorities set by the Board and through consideration of available resources and opportunities to facilitate actions. Continuous interaction with the Regional Science Coordinator will be crucial to effective implementation.

Strategic Plan copies are available to TACF members upon request to the Chapter Secretary Jim Talbot, at jtalbot9172@gmail.com or <https://www.acf.org/vt-nh/>