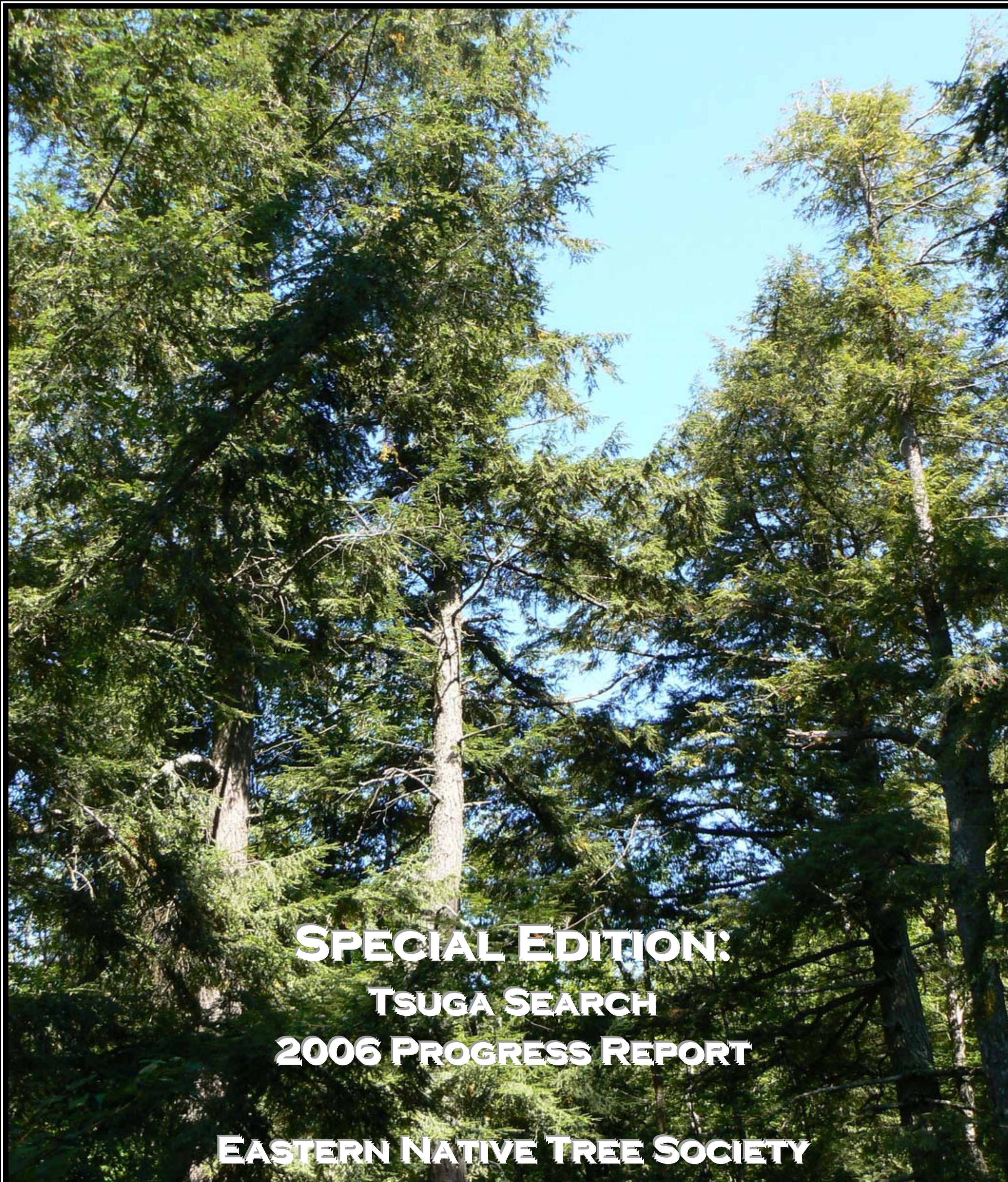
Bulletin of the Eastern Native Tree Society

Volume 1 Fall 2006 Issue 2



Bulletin of the Eastern Native Tree Society
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Eastern Native Tree Society
http://www.nativetreesociety.org/

Special Issue: Tsuga Search 2006 Progress Report

Volume 1, Issue 2
Fall 2006

Mission Statement:

The Eastern Native Tree Society (ENTS) is a cyberspace interest group devoted to the celebration of trees of eastern North America through art, poetry, music, mythology, science, medicine, and woodcrafts. ENTS is also intended as an archive for information on specific trees and stands of trees, and ENTS will store data on accurately measured trees for historical documentation, scientific research, and to resolve big tree disputes.

ENTS Officers:

Editorial Board, *Bulletin of the Eastern Native Tree Society*:

Membership and Website Submissions:

Membership in ENTS is FREE and automatic. Simply sign up for membership in our discussion list, ENTSTrees, at: http://lists.topica.com or send an e-mail to ENTSTrees-subscribe@topica.com. Submissions to the ENTS website in terms of information, art, etc. should be made to Edward Frank at: ed_frank@hotmail.com

The *Bulletin of the Eastern Native Tree Society* is provided as a free download in Adobe™ PDF format (optimized for version 5 or newer) through the ENTS website. The Eastern Native Tree Society and the *Bulletin of the Eastern Native Tree Society* editorial staff are solely responsible for its content.

COVER: Old-growth eastern hemlock stands, once common across the range of the species, are increasingly threatened in eastern North America by development, pollution, and the hemlock woolly adelgid. Photo by Don C. Bragg.

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A SPECIAL THANK-YOU FROM THE EDITOR

Notwithstanding any last-minute glitches, I rather immodestly proclaim the first *Bulletin of the Eastern Native Tree Society* a success! We set out with the intention of providing the Eastern Native Tree Society (ENTS) an effective organ to transmit its objectives to the public, and with a slew of top-notch submissions for the first issue, we achieved that goal—and then some! Let's keep the momentum going with this and future issues.

I would really like to thank those whose work helped fill the first pages, and whose dedication helped to show why ENTS is the premiere precision tree-measuring organization. Will Blozan, Jess Riddle, Bob Leverett, Ed Frank, Michael Davie, and Pamela Briggs all made significant contributions to this issue. Pamela Briggs (our new production editor) really boosted the effort with her keen proof-reading skills, catching many of the errors my eyes missed. None of this would have been possible without any of their efforts.

You may notice some slight changes to the appearance of this issue. I would tell you to expect the look and content of the *Bulletin* to receive fairly frequent "tweakings," especially early in its run. As we search for a consistent look, we will play with the margins or fonts or spacing, but the content will remain as high in quality as possible. Your continued contributions will help make that possible. Also, feel free to continue to make suggestions as to the content and offerings of the *Bulletin*.

Don C. Bragg
Editor-in-Chief

One of the massive loblolly pines that can be found in the Congaree Swamp in South Carolina. This picture was taken in the spring of the year, with the river up. Photo by Don C. Bragg.

ANNOUNCEMENTS AND SOCIETY ACTIONS

Tsuga Search Funding Mechanism Announced

The Tsuga Search Project is now under way. Tsuga Search is a join effort between the Great Smoky Mountains National Park (GSMNP) and the Eastern Native Tree Society (ENTS) to locate, climb, measure, document, and treat (for hemlock woolly adelgid) the greatest of the remaining live eastern hemlocks in the Park. With limited time and funding, Will Blozan and Jess Riddle are the ENTS members who will do the actual work. Part of the funding for this work will come through the GSMNP, and the rest will have to be raised through donations to ENTS.

The fiscal agent for ENTS is Friends of Mohawk Trail State Forest (FMTSF), hence, please send your contributions for the Tsuga Search Project to:

Friends of Mohawk Trail State Forest
106 Morningside Drive
Florence, MA 01062

The check should be made out to the "Friends of Mohawk Trail State Forest" and show "Tsuga Search Project" on the memo line. Periodic reports on the progress of the project will be issued to Ed Frank for posting on the ENTS website and for reporting in the *Bulletin of the Eastern Native Tree Society*, including financial summaries of the disposition of project funds (donors can remain anonymous to the Society as a whole).

Tsuga Search is a major accomplishment for ENTS and one that could very well make the difference between the loss and survival of our remaining greatest eastern hemlocks. We need your support now!

ENTS Has a New Website

As of the end of August 2006, the Eastern Native Tree Society has officially moved its web presence from the long-time host at the University of Arkansas to a commercial service provider. Although we are eternally grateful for the assistance of the University of Arkansas, Matt Terrell, and Dave Stahle in sponsoring the website for all of these years, growing amounts of content and usage necessitated the move to a host that provided more storage space, bandwidth, and webmaster accessibility. The official website of the Eastern Native Tree Society is now:

http://www.nativetreesociety.org/

Edward Frank is still the webmaster, and the site has been ported almost exactly as before. As with Tsuga Search, ENTS members can contribute to the long-term financial support of the website by making a donation to the Friends of Mohawk Trail State Forest (address provided above) and by writing "ENTS website" on the memo line.

OLDLIST Database v1.0 Now Online

Dr. Neil Pederson of Eastern Kentucky University recently announced the availability of the OLDLIST Database (version 1.0) over the internet at:

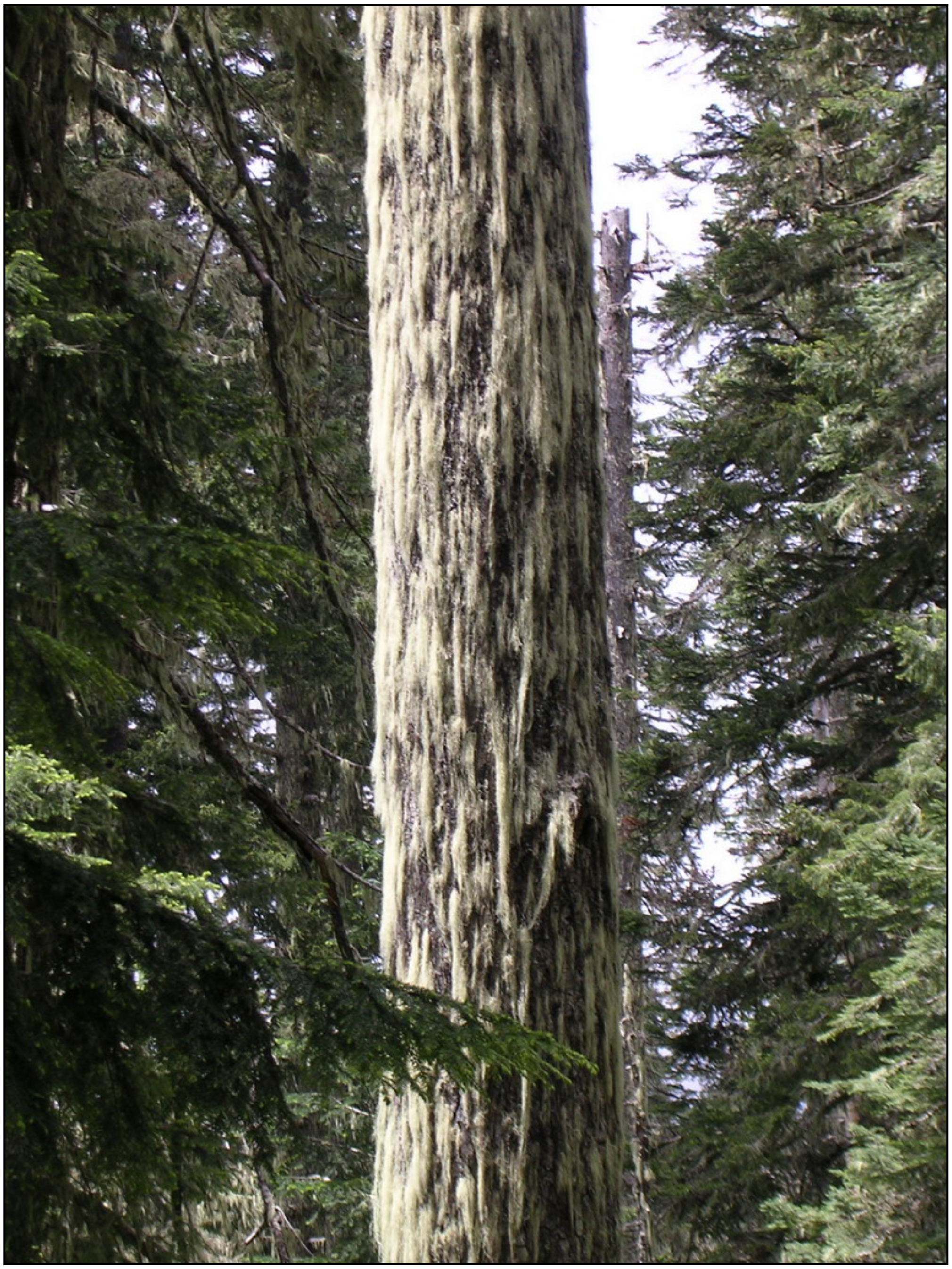
http://people.eku.edu/pedersonn/oldlisteast/

According to Dr. Pederson, the objective of the OLDLIST is to report maximum tree ages for species in eastern North America as documented through dendrochronological investigations. This database was prompted by a discussion in the tree ring forum nearly one year ago, and the Eastern OLDLIST is a "franchise" of Peter Brown's OLDLIST. Currently, the Eastern OLDLIST has more than 40 species and several species pages showing the geographical distribution of old trees for certain species. This list will grow with time, and Dr. Pederson requests interested parties to consider submitting ages and pictures for old trees and forests.

World's Tallest Trees Discovered…Again and Again!

Dr. Robert Van Pelt, affiliate assistant professor at the University of Washington, has cheerfully reported to ENTS that new representatives of the tallest tree known on earth have been identified in northern California. According to his email, Chris Atkins and Michael Taylor have been searching old-growth redwood forests for tall trees over the last few years, and have measured 131 trees over 350 ft tall, including one called the "Stratosphere Giant" that towered over the 370-ft level.

On July 1, 2006, while scouting a remote area in Redwood National Park, they found a grove of what they thought were tall trees—but had only a laser and no tripods due to the arduous hike. Undeterred, a return party (now including Dr. Van Pelt) brought multiple lasers and tripods and proceeded to bushwack their way to the grove. Setting up on one side of a ravine to gain a clear view of the largest of the trees they spotted, they scanned the giant redwood on this steep slope (finding it to have a live, vigorous top) and the tree (called Helios) measured in at 374.3 ft tall! Nearby were two dead-topped trees, scaling in at 371.2 ft (Icarus) and 363.4 ft (Daedalus) tall.



Thus, in a single day, the two tallest known trees in the world were measured, shattering the previous height record by 4 ft! Beyond the novelty of finding not one, but two giant redwoods, Dr. Van Pelt was "completely baffled" that these trees were so tall on a steep slope high above a creek, while all of the other tall redwoods were found on flats! This has opened many new areas for searching that were once considered incapable of producing really tall trees.

More recently (August 26, 2006), Dr. Van Pelt emailed ENTS to again report that Chris Atkins and Michael Taylor have found a NEW champion redwood in Redwood National Park on a steep slope that was at least 4 ft taller than the Helios Redwood located just a couple months before. They were able to laser the tree to at least 378.1 ft, but report that this height was not of the highest point, and plan to do a climb and a tape drop to confirm the giant's height.

Not every tree is notable for its height—this silver fir in Oregon, though relatively old and large, sports an impressive coverage of lichens and moss, highlighting some of the significance of these ancient trees on the landscape. Photo by Don C. Bragg.

2006 ENTS Rendezvous and 4th Holyoke Community College Forest Summit October 27-29, 2006

From October 27-29, 2006, ENTS will hold its annual Fall Rendezvous in western Massachusetts. Friday evening, from 6:30 p.m. to 9:30 p.m., will be devoted to lectures of the 3rd Forest Summit at Holyoke Community College in Holyoke, Massachusetts. These events are sponsored by Holyoke Community College, the Eastern Native Tree Society (ENTS), and the Friends of Mohawk Trail State Forest (FMTSF). The agenda is tentative at this point, but will include lectures on old-growth forests, big tree measuring and modeling, and the accomplishments of the ENTS during the year.

The following schedule is anticipated (and subject to change, up until the last minute):

Friday, October 27, 2006
4th Forest Summit Lecture Series
Holyoke Community College
Holyoke, Massachusetts

1:00 p.m.—1:15 p.m. Welcome and announcements, President of Holyoke Community College and Professor Gary Beluzo

1:15 p.m.—2:15 p.m. "Mapping in Progress: First-Growth Forest in the Catskills and Adirondacks," Dr. Michael Kudish, Professor Emeritus, Paul Smith College

2:1 p.m.—3:00 p.m. "400 Years of Fire and Wind in the Boundary Waters Canoe Area Wilderness, Minnesota," Dr. Lee Frelich, Director of the Center for Hardwood Ecology, University of Minnesota

3:00 p.m.—3:15 p.m. Break

3:15 p.m.—4:00 p.m. "Old-Growth Ecosystems in Western New York and What They Are Teaching Us," Dr. Thomas Diggins, Associate Professor of Ecology, Youngstown State University, Ohio

4:00 p.m.—4:30 p.m. "The Structure and Dynamics of Old-Growth Forests in Western Massachusetts," Tony D'Amato, Ph.D. candidate, University of Massachusetts

4:30 p.m.—6:30 p.m. Dinner (on your own)

6:30 p.m.—7:00 p.m. "Tsuga Search Project—Saving the Best of the Eastern Hemlock," Will Blozan, President, Eastern Native Tree Society

7:00 p.m.—7:30 p.m. "Western Pennsylvania Big and Tall Tree Reserve Update: Cook Forest, Anders Run, Lake Erie Gorges," Dale Luthringer, Naturalist and Educational Director, Cook Forest State Park, Pennsylvania and Eastern Native Tree Society

7:30 p.m.—7:45 p.m. Break

7:45 p.m.—9:00 p.m. Presentations on the timber sale in Robinson State Park, Massachusetts. Details to be announced on the ENTS website (http://www.nativetreesociety.org/events/mohawk06/forest_summit_IV%20agenda.htm)

9:00 p.m.—9:30 p.m. "Whither Goest the Eastern Native Tree Society?" Robert T. Leverett, President and cofounder, Friends of Mohawk Trail State Forest and Executive Director and cofounder, Eastern Native Tree Society

For the most up-to-date schedule of speakers and happenings at the Forest Summit and other events, be sure to consult the ENTS website at: http://www.nativetreesociety.org/events/index_events.htm

Saturday, October 28, 2006
Eastern Native Tree Society Annual Rendezvous
Mohawk Trail State Forest
Charlemont, Massachusetts

10:00AM—1:30 p.m. (non-ENTS members must register) Tree Climb and Tree-Measuring Workshop, Mohawk Trail State Forest

1:30 p.m.—4:00 p.m. (non-ENTS members must register) Walk on the Original Mohawk Trail, Mohawk Trail State Forest

4:00 p.m.—4:30 p.m. Travel to Charlemont Inn, Charlemont, Massachusetts

4:30 p.m.—5:15 p.m. (non-ENTS members must register) "Stalking the Champion Trees of Arkansas and the Midsouth," Dr. Don C. Bragg, Research Forester, USDA Forest Service, Southern Research Station

5:15 p.m.—7:00 p.m. (non-ENTS members must register) Dinner at the Charlemont Inn and then travel to the Federated Church of Charlemont, Charlemont, Massachusetts

7:00 p.m.—8:00 p.m. (Open to public) "Big Trees of Borneo: A Tropical Experience," Dr. Roman Dial, Professor of Biology and Director of the MS in Environmental Science Program, Alaska Pacific University

8:00 p.m.—9:15 p.m. (Open to public) Evening of Music, Poetry, and Prose in Celebration of the Trees at the Federated Church of Charlemont
Musical performances by Peter W. Shea, tenor; Lee Frelich, violin; Monica Jakuc Leverett, piano, and will include a first performance of a new work by Greenfield composer Kaeza Fearn commissioned especially for the occasion. Poetry and prose readings from the works of John Muir, Thomas Berry, William Cullen Bryant, and others, with readers including Ed Frank, John Knuerr, and Ellice Gonzalez.

There is no registration fee to attend the meeting. Attendees are also expected to cover their own meal and transportation costs. Ride sharing and lodging arrangements may be coordinated in advance. The lectures on October 27 at Holyoke Community College are a public service of Holyoke Community College, and there is no pre-registration requirement for the Forest Lecture series. There is also no charge for the Eastern Native Tree Society tree-measuring workshop at Mohawk Trail State Forest on October 28; however, there is limited space at the site and the Charlemont Inn. Non-ENTS members must pre-register to attend this event by contacting Robert T. Leverett (dbhguru@comcast.net). This event is appropriate for those who want to learn how to measure trees using high-tech equipment and trigonometry.

The Evening of Music, Poetry, and Prose sponsored by the Eastern Native Tree Society is open to the public. There is no pre-registration requirement. The HCC website and the Eastern Native Tree Society website (www.nativetreesociety.org) will list the details of this part of the agenda. Outside of key ENTS members, the dinner at the Charlemont Inn is on a space-available basis and requires pre-registration for non-ENTS members. All attendees will pay for their meal (approximately $20 per person), which will be served buffet-style (the menu will be posted on the websites).

Notes on Speakers:

The line-up of speakers for this year's combined events of the Forest Summit Lecture Series and ENTS rendezvous emphasizes our interest in forest ecology, old-growth forest research and preservation, and the search for, and the documentation and preservation of champion trees and exemplary forest sites. We believe these topics are of considerable interest to the public. Our agenda has been established to satisfy the interest as the following comments explain.

Dr. Michael Kudish is the foremost authority on old-growth in New York's Catskill Mountains. He is the author of a book on the history of the Catskill forests, *The Catskill Forests—A History*. Mike is also the author of *Adirondack Upland Flora* and is one of the top authorities on the old-growth forests of New York's Adirondacks. The two parks have a combined area of first-growth forest approaching or exceeding 600,000 ac. The only larger area of first-growth forest in the eastern forest type is Minnesota. Mike's presentation will provide those interested in old-growth in the Catskills and Adirondacks with the most current and accurate assessment of where and how much there is and how the first-growth forests in the two regions differ.

Dr. Lee Frelich is one of the most distinguished forest ecologists in the United States and the foremost expert on natural forest disturbance regimes in the forests of the upper Midwest. His list of credits is extensive. He is the author of *Forest Dynamics and Disturbance Regimes*. Lee is also the Vice President of the Eastern Native Tree Society and on the board of Friends of Mohawk Trail State Forest, and is often called as an expert witness on subjects ranging from the potential impact of climate change on forest composition to what constitutes an old-growth ecosystem. In his latest presentation, Lee will discuss how nature has "managed" the forests of the Boundary Waters Canoe Area Wilderness over the past 400 years.

Dr. Thomas Diggins has gained a reputation as one of the most knowledgeable forest ecologists on the old-growth western New York. Over the past several years, he has been studying a unique old-growth ecosystem within the scenic Zoar Valley and has become the undisputed authority on the Zoar Valley ecosystem. This old-growth gem was about to slip through the cracks under the not-so-watchful eye of New York's DEC, which was focused on forest products. Tom will describe the dynamic forest ecosystem of Zoar Valley and how it differs from other areas of northeastern old-growth.

As the focus of his PhD work, the University of Massachusetts's **Tony D'Amato** has gathered more data on the old-growth forests of Massachusetts than any previous researcher and continues his studies of the surviving pockets of old-growth. Tony will talk about these first forests of Massachusetts and how they differ from the surrounding re-growth woodlands, and the value of old-growth ecosystems in a small state like Massachusetts.

Will Blozan is the President of the Eastern Native Tree Society, and he is a man with a mission. *Tsuga canadensis*, or the eastern hemlock, is considered to be a tree of the northeastern and midwestern United States. The epicenter of hemlock development is usually considered to be the 6-million ac Allegheny Plateau of Pennsylvania, which was once covered by so much hemlock that the region was called the "black forest." However, unknown to all but a few, the greatest of all the eastern hemlocks grow in the southern Appalachians. Trees over 160 ft tall and 17 ft in girth grow in temperate rainforest luxuriance. Trunk volumes reach 1,500 ft^3. However, these greatest of hemlocks are in danger of being extirpated by the hemlock woolly adelgid. Will Blozan and associates have been fighting a battle against the clock to both document the largest, tallest, and oldest of the species, and to treat as many as possible. In cooperation with the Great Smoky Mountains National Park, he has launched the Tsuga Search Project. Learn what the Park and the Eastern Native Tree Society are doing to save the greatest of the eastern hemlocks.

Dale Luthringer is the naturalist and educational director at Cook Forest State Park, Pennsylvania. For many people, Cook Forest is the old-growth icon of the Northeast. Dale is also a key member of ENTS. In his ENTS capacity, he roams the most rugged parts of the Keystone State hunting, measuring, comparing, and documenting the most impressive trees in Pennsylvania, using the most accurate tree-measuring techniques as developed by the ENTS. Join Dale as he brings us up to date on his latest Pennsylvania big tree-tall tree discoveries and his continued documentation of the Northeast's most charismatic stand of old-growth white pines—the white pines of Cook Forest. Dale will describe how he carefully monitors the growth of the Northeast's tallest trees, including the 182.5 ft tall Longfellow Pine.

Robert T. Leverett is one of the two principal conceptualizers of the Eastern Native Tree Society. The other is Will Blozan. Will is the President and Bob is the Executive Director. Will and Bob were joined by three others, Dr. David Stahle, the late Michael Perlman, and Dr. Matthew Therrell to co-found ENTS. ENTS has come a long way since its inception and is now the East's premier tree-measuring organization. How did ENTS achieve this status and why the focus on measuring trees? Where will ENTS go from here? Who are the present movers and shapers of ENTS? Join Bob as he discusses ENTS, its mission, its past, and its future. Learn about some of ENTS's stellar accomplishments in the evening's final presentation.

Dr. Don C. Bragg is a research forester with the USDA Forest Service, Southern Research Station in Monticello, Arkansas. He is the Editor-in-Chief of the *Bulletin of the Eastern Native Tree Society*. Don brings a wealth of experience to the Eastern Native Tree Society as both forester and forest ecologist. His presentation will cover his recent work on locating and measuring (using ENTS techniques) some of the largest trees in Arkansas and the midsouth.

Dr. Roman Dial is a Professor of Biology at Alaska Pacific University. He holds four degrees—two in mathematics and two in biology. He is also a noted rainforest researcher and has spent a lot of time in the canopy of the tallest of the rainforest giants in Borneo. Roman brings the unique perspectives of a scientist and daredevil to provide views of the rainforest that few humans will ever experience.

TSUGA SEARCH: SPRING 2006 PROGRESS REPORT

Will Blozan and Jess Riddle

Eastern Native Tree Society

ABSTRACT—
Tsuga Search is an ongoing project between the Eastern Native Tree Society (ENTS), Appalachian Arborists, and Great Smoky Mountains National Park to identify, measure, document, and protect the large groves of immense hemlock within the park. These trees are threatened by a number of factors, especially the hemlock woolly adelgid, which has started killing hemlocks and devastating whole ecosystems in the region.

Despite a lack of funding, the Tsuga Search project has begun! We have explored new areas and revisited previously measured trees. In addition to finding several new record trees, we have added a monocular telescope to our survey equipment. This device has a reticle scale within the optics that allows for measuring the width of a target remotely, and our extensive testing has shown this device to be extremely accurate, even at great distances. Hence, we can accurately determine volumes of trees we have located. We tested the device against actual tree-climb data and found the monocular to be within 3 to 5% of the climb results. We find those results highly encouraging and have included the tool in routine scouting trips. The device greatly increases survey efficiency by allowing ground-based volume estimations and remote diameter measurements.

SEARCH AREAS
We have focused recent searches on Cataloochee and Greenbrier districts. Streams searched in Cataloochee include Jim Branch, eastern Winding Stairs Branch, Hurricane Creek, Cataloochee Creek and lower Winding Stairs Branch. In Greenbrier, we have explored Lowes Creek, lower Cannon Creek, Porters Creek and Kalanu Prong. All these sites exhibit excellent hemlock forests and have been recommended for treatment to the National Park Service. In addition, we visited and measured the tallest known hemlock in Georgia. All sites surveyed were heavily infested with hemlock woolly adelgid (HWA) and showed various signs of decline. Upper Winding Stairs Branch and the groves in Greenbrier still looked healthy, but heavy infestations were indicated by fallen HWA "wool."

NEW TALL TREES
Before the Tsuga Search began, the Eastern Native Tree Society (ENTS) had located 22 hemlocks over 160 ft tall in a combined search period of more than 30 years. After just a few trips into the areas listed above, we have increased the total by four to 26 trees over 160 ft, including a new record for Georgia (first in the state) and the third and fourth tallest living trees in the Smokies (Table 1). We relocated a tree on Lowes Creek that had not been measured since 1997, and confirmed the height at 166.6 ft; the highest in Tennessee and third tallest in the park. This hemlock is just 3.3 ft shorter that the tallest ever recorded, documented by ENTS to be 169.8 ft tall. It grew on Winding Stairs Branch in Cataloochee; unfortunately, this hemlock died in 1999.

Table 1. New tall trees greater than 160 ft identified during Tsuga Search (CBH = circumference at breast height).

Height (ft)	CBH (ft)	District	Location	Volume (ft^3)
166.6	14.3	Greenbrier	Lowes Creek[a]	985
165.3	12.7	Greenbrier	Porters Creek	> 850
162.3	13.3	Georgia, USFS	Holcomb Falls Trail	> 800
161.8	15.4	Cataloochee	Winding Stairs Branch	1223
161.3	12.9	Cataloochee	Winding Stairs Branch	1023

[a] Relocated.

NEW BIG TREES
The largest living hemlock tree known before the Tsuga Search began was a huge tree on Long Branch in Greenbrier. Will Blozan climbed this tree in 2005, and found the tree to contain 1294 ft^3 of trunk volume. At this time, that tree remains the largest known, but a new find on Kalanu Prong approaches that size with 1270 ft^3 based on the monocular measurements—see Table 2 (which includes two of these tall trees).

IMPROVED SEARCH IMAGE
The use of the monocular allows graphical representation of trunk profiles and helps produce a visual reference that aids in quick field estimations of relative size. We have learned that in order for a tree to be massive, it must be not only large in diameter, but also very tall. This fact may appear obvious in hindsight, but trees we once thought were massive are now passed over due to an improved search image. Conversely, smaller girthed trees with minimal taper and great height are larger than we initially thought (Figure 1).

Several more trees were found close to 160 ft tall, but we are still convinced the 160-ft threshold will stand as exceptional. Our original goal of finding trees over 1300 ft^3 will prove difficult. However, we have knowledge of trees in both Cataloochee and Greenbrier that will surely exceed 1300 ft^3. Hopes for surpassing the all-time record of 1420 ft^3 remains doubtful, but possible.

Table 2. New large tree finds from Tsuga Search, with hemlock volumes exceeding 1000 ft³.

Tree location	Bole Volume (ft³)	Circumference (in ft) at:					Tree height (ft)
		4.5 ft	25 ft	50 ft	100 ft	150 ft	
Kalanu Prong	1270	15.1	13.1	12.5	7.5	n/a	152.9
Winding Stairs Branch	1223	15.5	12.7	12.1	7.2	1.8	161.8
Cataloochee Creek	1076	15.5	11.5	10.8	8.0	n/a	144.1
Winding Stairs Branch	1077	13.6	11.9	11.4	8.2	n/a	158.7
Winding Stairs Branch	1023	12.9	11.5	11.1	n/a[a]	n/a	161.3

[a] Forked.

RECOMMENDED TREATMENT AREAS

Winding Stairs Branch, North Carolina promises to be the premier hemlock habitat in the park. The stream contained five trees over 160 ft tall including the two tallest ever located. It also grew the largest hemlock ever documented (1420 ft³), which was also the second tallest ever recorded at 168.9 ft. This tree died in 1999, presumably from drought stress. A Tsuga Search survey in the vicinity of those dead records located three more notable trees. Two of them are new additions to the "160 Club," and the other may be one of the ten largest trees yet located. Numerous other hemlocks in the high 150-ft range foreshadow more records to come. The only grove on earth that included more 160-ft hemlocks grew in the Ellicott Rock Wilderness on the East Fork of the Chattooga River, South Carolina. That grove, and all six trees in it over 160 ft, has now succumbed to HWA. Winding Stairs Branch has the highest concentration of super-tall *and* massive hemlocks anywhere heretofore documented. Furthermore, the main entrance road into Cataloochee bisects the watershed, providing a prominent visitor experience. In fact, visitors can see some of the tallest trees from the roadside. Several sections of the watershed include hemlock "bog" forests that contain some exceptional vegetative assemblages and possible rare plants. *Goodyera repens*, a diminutive orchid believed to be associated with eastern hemlock, grows particularly abundantly in this area.

We would also like to recommend for treatment the incredibly vibrant second-growth hemlock forests along Porters Creek and False Gap Prong. Indeed, some of these forests have been treated (near the parking area for Porters Creek Trail) but much more exists in good condition. In general, the tallest hemlocks are old trees growing in undisturbed forests. However, the young groves on Porters Creek and False Gap Prong have spectacular growth rates with some trees already exceeding 140 ft, and they may have the potential to eventually surpass in height any of the trees in the remaining old-growth forests.

Our other recommendation considers not so much a specific area but a community type. In our surveys we have traversed many acres of hemlock/silverbell/Fraser magnolia forests. We believe this assemblage is endemic to the Smokies and as such should have representative examples preserved. These forests are also unusual in that they are low-elevation ridge communities with a high hemlock component and lack the ubiquitous rhododendron shrub layer. They more closely resemble north-eastern hemlock forests than the classic southern Appalachian moist acid-cove hemlock/heath community. Having a very high mountain silverbell (*Halesia tetraptera* var. *monticola*) component makes them all the more unique, as this species is scarce outside of the Smokies. Three former national champion silverbells grew in these forests—which will presumably be heavily impacted by the loss of eastern hemlock.

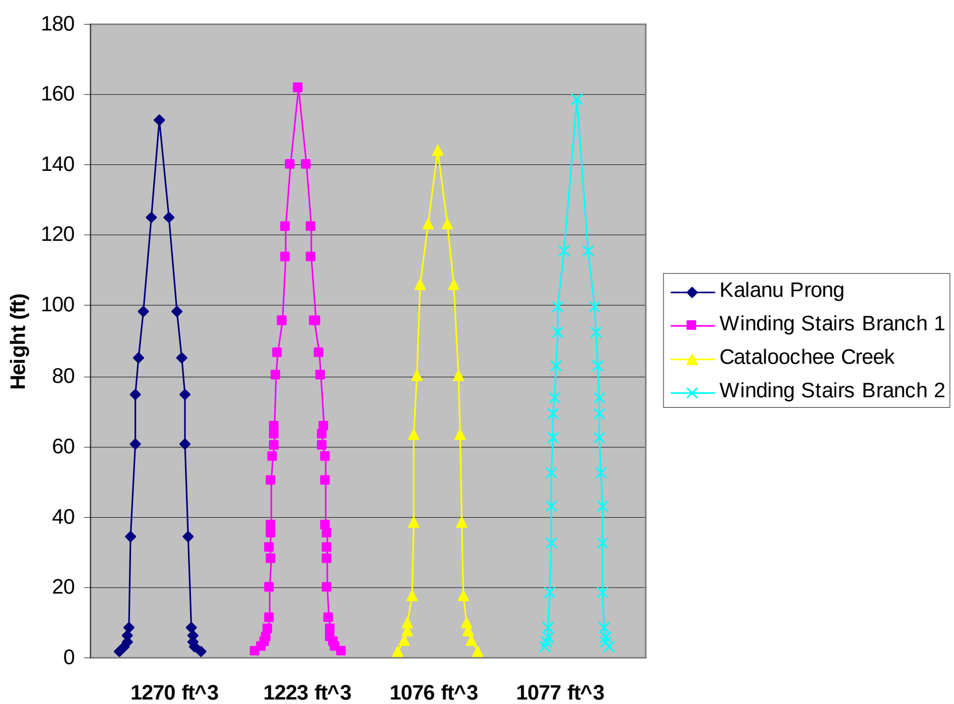


Figure 1 (left). Stem profiles of large volume hemlocks identified in Tsuga Search Phase 1.

NEXT STEPS
Over the coming weeks, we will spend more time in upper Caldwell Fork and the north slopes of Mount LeConte and Mount Guyot. Buck Fork, Middle Prong and Surry Fork hold especially great promise. We will also revisit several specimens previous ENTS surveys have located, and estimate volumes with the monocular.

The "Caldwell Colossus" in North Carolina. Photo by Michael Davie.

In early March, we plan to climb the "Caldwell Colossus." This tree on Caldwell Fork, North Carolina, promises to lay claim—*at least*—to the second largest hemlock ever documented. We also plan to climb and measure an enormous tree near Highlands, North Carolina that was located during a beetle release for the USDA Forest Service in 2004. That tree will also vie for the top position. These trees are nearly identical in diameter and height, so climbs are needed to reveal which tree is the largest.

Another tree to be revisited is a new National Champion nominee (pictured with Jess at right). Although relatively short, this huge, 17.5 ft CBH and 144 ft tall hemlock on Dunn Creek will likely place itself in the top ten big trees due to its massive lower trunk.

The Dunn Creek tree will replace the previous National Champion tree that grew on Ramsay Branch on the south slope of Greenbrier Pinnacle. The tree, which fell in 1999, was 164.7 ft tall—one of the tallest known hemlocks in the park.

Jess Riddle and a possible new National Champion eastern hemlock. Photo by Will Blozan.

EASTERN HEMLOCK VOLUME PROFILES:
NEW TREES AS OF FEBRUARY 2006
On the following pages are summaries and pictures of some of the newly found trees within the Tsuga Search.

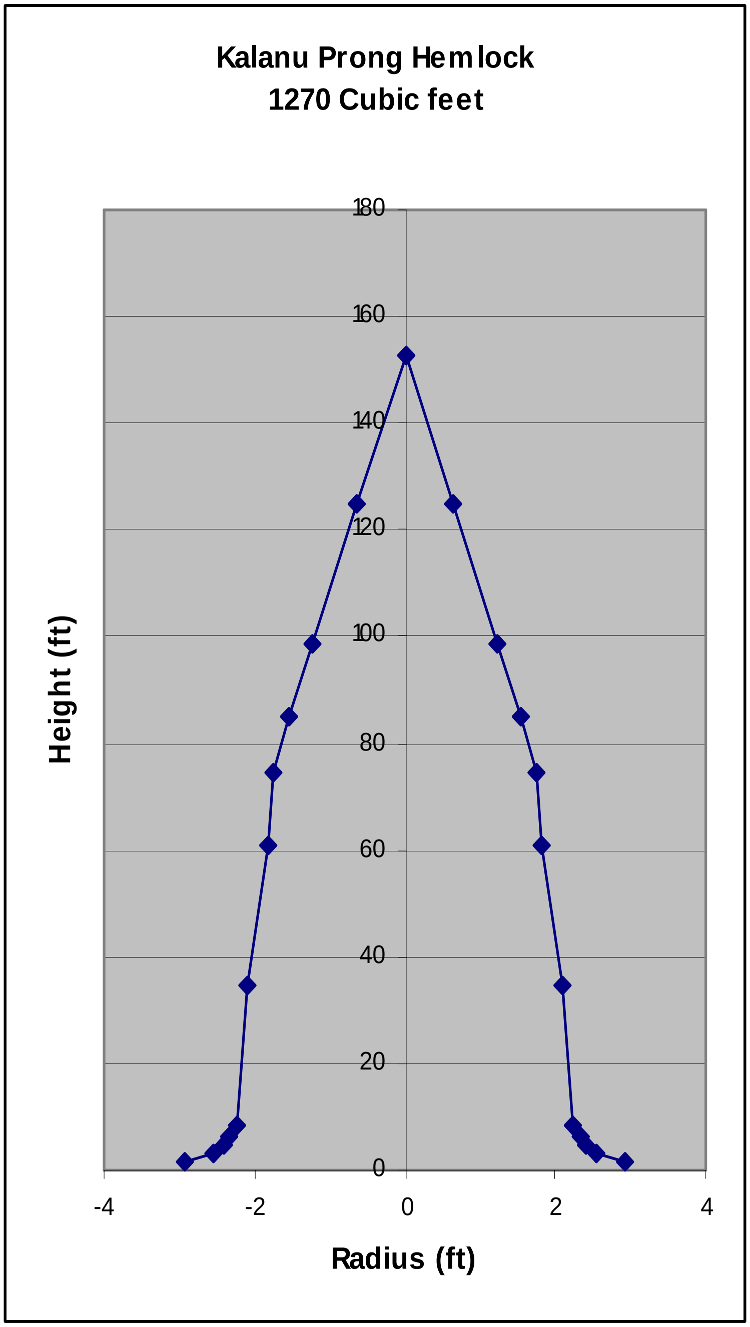
The condition of the upper portions of trees like these giant hemlock can be quite remarkable. Looking "down the throat" of a giant on Hoglen Branch, North Carolina (above) and the trunk detail of treated tree #8 at Jim Branch, North Carolina (right). The images of the hollow stem and the exterior branches of this ancient crown show but a portion of the complexity of the hemlock-dominated stands in the Smokies. Photos by Will Blozan.

EASTERN HEMLOCK PROFILE: KALANU PRONG, TENNESSEE

We completed a survey of Kalanu Prong on February 3, 2006. Large hemlocks were scarce, but one in particular caught our eye. Although the girth was not exceptional, the lack of taper and impressive height combined to produce one of the largest hemlocks thus far documented. It is exceeded only by the Long Branch hemlock, which is considerably larger in girth but 11 ft shorter.

Photo by Will Blozan.

Basal perimeter = 18.5 ft
Girth at 4.5 ft = 15.1 ft
Girth at 50 ft = 12.5 ft
Girth at 100 ft = 7.5 ft
Total height = 152.9 ft



EASTERN HEMLOCK PROFILE: LOWES CREEK, TENNESSEE

Skeptical of the extremely great height of 165.9 ft from 1998, we set out to relocate the tree and verify the original measurement. We found the tree with no problems, and the first laser measurement suggested it may be over 166 ft tall. After locating midslope precisely and setting up a basal target for the laser, we found it to be an impressive 166.6 ft tall. The tree quickly tapers into a rather small-diameter column, but its great height allows it to rack up nearly 1000 ft^3 according to the monocular data (based on one side).

Basal perimeter = 17.2 ft
Girth at 4.5 ft = 14.3 ft
Girth at 50 ft = 9.5 ft
Girth at 100 ft = 7.6 ft
Maximum height = 166.6 ft
Volume = 985 ft^3

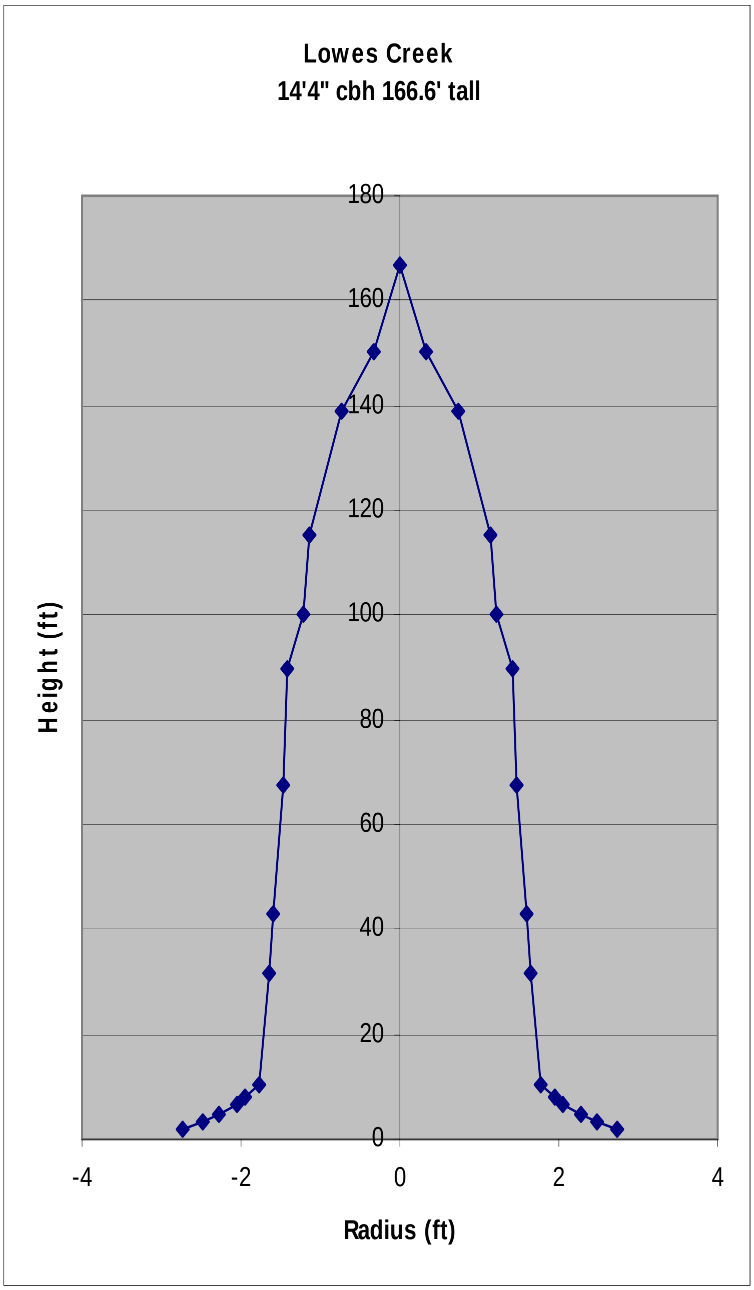


Photo by Will Blozan.

EASTERN HEMLOCK PROFILE: CATALOOCHEE CREEK, NORTH CAROLINA

This tree illustrates how a lack of taper can really add up to a big tree. Although it is nowhere near one of the biggest, it was an important tree to study with respect to our search image. It is neither exceptionally tall nor wide, but rather exhibits a trunk that is relatively big the whole length of the tree. Its volume of 1076 ft^3 is impressive—but will not be enough to maintain its place in the final lists of giant trees. But with successful HWA treatments, this tree is destined to get huge, as witnessed by its large crown.

Basal perimeter = 17.9 ft
Girth at 4.5 ft = 15.5 ft
Girth at 50 ft = 10.8 ft
Girth at 100 ft = 8.0 ft
Maximum height = 144.1 ft
Volume = 1076 ft^3

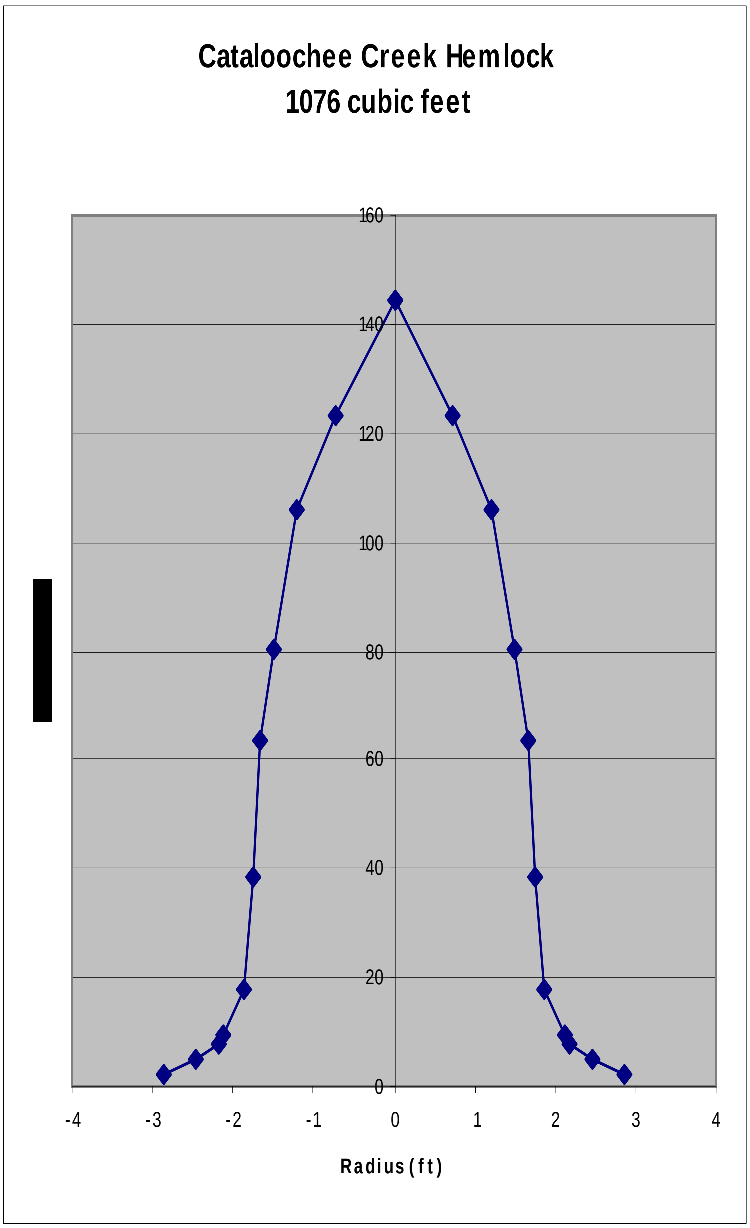


Photo by Will Blozan.

EASTERN HEMLOCK PROFILE: WINDING STAIRS BRANCH, NORTH CAROLINA

Will had located a record in his notes of a giant tree on eastern Winding Stairs Branch from 1998. The record included a very tall tree meriting a search of the area to relocate it. The first attempt to relocate the tree was successful. We found the tree just below the gravel entrance road into Cataloochee Valley, but the day was so foggy we could not even get the laser to work. We cross-triangulated the height and estimated it to be between 158 and 166 ft tall. A return trip found it to be in the middle of these estimations—161.8 ft. This tree is the only known hemlock over 15 ft in girth that reaches 160 ft tall, and is one of the largest hemlocks thus far documented at 1223 ft³. The topographical location of this tree defies all we previously knew about where the tall trees grow. The lack of adjacent shelter, relatively high elevation, and lack of tall canopy competition do not ordinarily support a tree of this stature.

Basal perimeter = 19.4 ft
Girth at 4.5 ft = 15.5 ft
Girth at 50 ft = 12.1 ft
Girth at 100 ft = 7.2 ft
Maximum height = 161.8 ft
Volume = 1223 ft³

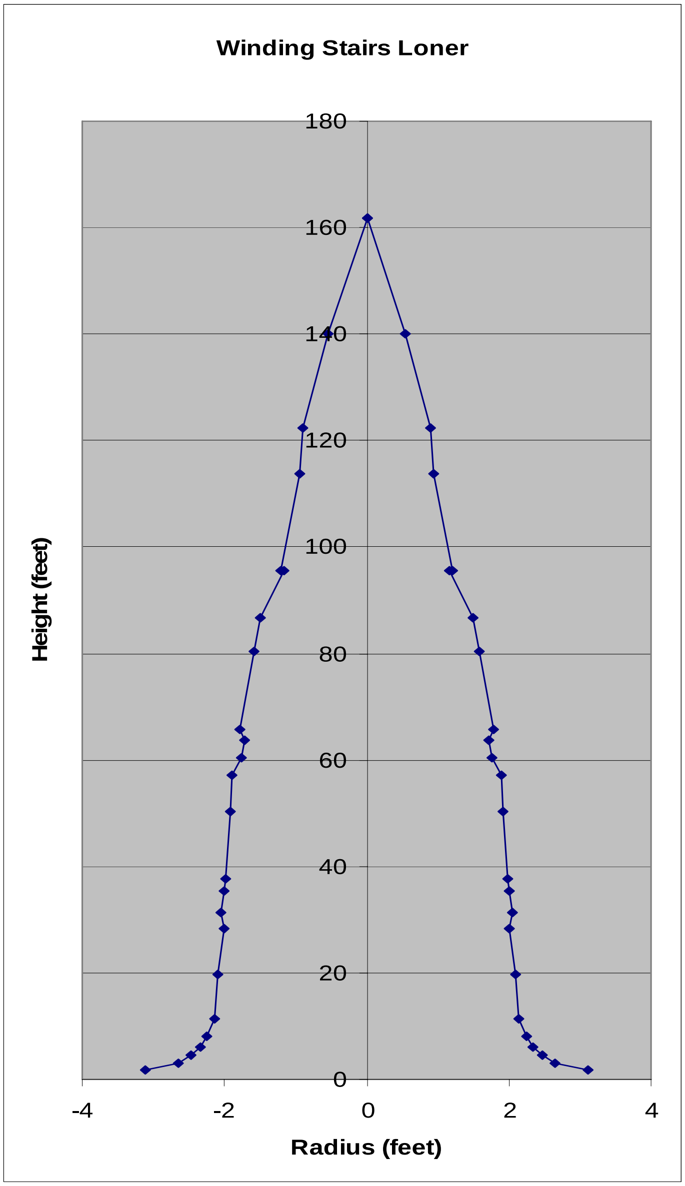


Photo by Will Blozan.

INCIDENTAL TREE MEASUREMENTS

As mentioned in the proposal, we expected incidental tree measurements to enhance our understanding of eastern tree height and size potential. All trees listed below were measured with laser rangefinders following ENTS height measuring protocol. So far, we have located 13 new height records and three new potential state champion trees as listed in Table 3.

Based on the ENTS database, the tuliptree on Porters Creek is the tallest known tree in Tennessee, and the American holly height far exceeds (by nearly 15 ft) the previous record in Congaree National Park. Also, the white ash on Hurricane Creek is the second specimen over 160 ft thus far documented, bested only by another tree in the park 167.2 ft tall growing on Big Branch, North Carolina.

We used the monocular to approximate the size of some of the larger tuliptrees on Kalanu Prong, Tennessee. One tree, the "Greenbrier Giant," has long been considered one of the largest, if not the largest, tree in the park. The monocular confirmed the tree's great size, but the tree does not approach the size of the largest known tree in the park. The volume of the main stem is 2200 ft^3. This total is less than that of the tree at the end of the unofficial trail to the grove, known as "Boat Gunnel Flats." That tree, the "Trails End Tulip," is truly one of the most massive in the park. But even its impressive 2520 ft^3 trunk volume is no match for the immense tuliptree on Sag Branch, North Carolina, which ENTS researchers climbed in 2004. Including limbs, the Sag Branch tree is over 4000 ft^3. Neither of the Kalanu Prong trees will exceed much over 3000 ft^3 due to their smaller trunks and crowns. ENTS plans to model some of the more publicly visible tuliptrees (such as those on Ramsay Cascades Trail) to help people visualize how big these trees are.

Trail's End Tulip, Kalanu Prong, Tennessee. Photo by Will Blozan.

Table 3. Other incidental champion-sized trees encountered and measured during Tsuga Search.

Species	Girth (ft)	Height (ft)	Location	Champion status
White ash	13.5	163.1	Hurricane Creek, NC	NC state champion
Chestnut oak	15.1	124.5	Jim Branch, NC	NC state champion
Fraser magnolia	4.9	118.7	Jim Branch, NC	US height record
American chestnut	2.4	75.0	Winding Stairs Br., NC	NC height record
Rhododendron	1.2	30.2	Winding Stairs Br., NC	NC height record
Silverbell	7.8	125.8	Cannon Creek, TN	TN height record
Blackgum	12.3	112.1	Cannon Creek, TN	TN height record
American holly	4.5	106.2	Cannon Creek, TN	US height record
Table mountain pine	4.0	96.0	False Gap Prong, TN	TN height record
Black birch	10.1	103.9	Lowes Creek, TN	TN state champion
Black birch	8.7	108.6	Lowes Creek, TN	TN height record
Red Mulberry	8.2	81.3	Middle Prong, TN	US height record
Fraser magnolia	7.5	118.3	Porters Creek, TN	TN height record
Tuliptree	21.2	173.4	Porters Creek, TN	TN height record
Pin cherry	3.3	96.0	Webb Creek, TN	US height record
Sourwood	3.6	107.7	Woolly Tops Prong, TN	TN height record

MEEMAN-SHELBY FOREST STATE PARK, TENNESSEE: MARCH 2006

Jess Riddle and Will Blozan

Eastern Native Tree Society

Fifteen miles north of Memphis, Meeman-Shelby Forest State Park protects approximately 13,000 ac of mostly forested land along the Mississippi River. That area includes 9,000 ac of floodplain and 4,000 ac of Chickasaw Bluff Number 3. The bluff, slightly over 100 ft high, consists of silty sediments driven by winds from the west. Consequently, water easily erodes the unconsolidated sediments, and small streams have incised a network of branching, narrow ravines into the bluff leaving broad, flat-topped ridges between them. Water flowing from the smaller ravines leaves little impression on the floodplain while the larger streams form the bayous that meander across the floodplain towards the river. Overall, the floodplain, features fewer bayous and is flatter than smaller river floodplains in the southeast. Elevation changes of only one to two feet produce broad inundated areas, whereas many smaller floodplains have more confined wet areas associated with elevation changes of approximately 5 ft.

We only had time to explore a small fraction of the floodplain near the bluffs, and species composition near the river may be markedly different. Cherrybark oak, swamp chestnut oak, and a variety of other hardwoods dominate some areas, but eastern cottonwood is the most common species over larger areas. Sycamores frequently grow amongst the cottonwoods and pecan forms a lower canopy below the faster growing trees. Other canopy layers are largely absent, but within 500 ft of the base of the bluffs, boxelder forms a well-developed midstory. Chinese privet, spicebush, free standing tangles of greenbrier are locally abundant, but the understory is largely open. Other common vines include trumpet creeper and Virginia creeper, which hang off of many trees and reach large sizes. The forest floor ranges from grey cottonwood leaves to a cover of a short, yellow flowered spring ephemeral that resembles the Dicentras. A few stout, low-branching baldcypress remain along the edges of depressions and bayous, but most of the forest appears to be 70 to 90 years old.

Ancient baldcypress with cherrybark and other oaks dominating the bluff in the background. Photo by Will Blozan.

A forest of similar age occurs on the bluffs, comprised of species typically termed bottomland hardwoods, even on the ridge tops. Cherrybark oak and white oak grow abundantly on the ridges and upper slopes, while tuliptree and beech are more prevalent in the ravines. Some of the larger ravines have flat areas in the bottom where species more common in the floodplain, like sycamore and cottonwood, also thrive. The midstory is sparse throughout and the understory is poorly developed in many areas, but red buckeye covers some ravines. In early spring, trilliums and a Claytonia are among the most common herbs. On both the floodplain and the bluffs, many other tree species occur at lower densities; in one day of tree measuring, we saw 61 tree species.

A fuller, but less site-specific description of the forests of Meeman-Shelby can be found at:
http://www.natureserve.org/explorer/servlet/NatureServe?searchCommunityUid=ELEMENT_GLOBAL.2.721881

Table 1. Floodplain forest at Meeman-Shelby Forest State Park near Memphis, Tennessee.

Species	CBH (ft)	Height (ft)
Baldcypress	22.9	120.6
Baldcypress	NA	121.7
Boxelder	6.9	89.0
Boxelder	5.0	89.6
Boxelder	7.7	91.7
Boxelder	4.6	92.7
Boxelder	3.8	93.5
Boxelder	5.1	94.7
Boxelder	5.3	95.9
Boxelder	4.1	98.3
Boxelder	4.3	101.3
Eastern cottonwood	8.7	134.3
Eastern cottonwood	10.5	141.9
Eastern cottonwood	13.3	142.8
Eastern cottonwood	15.3	146.1
Eastern cottonwood	13.7	147.1
Eastern cottonwood	10.7	147.8
Eastern cottonwood	13.6	148.7
Eastern cottonwood	8.2	148.8
Eastern cottonwood	11.9	149.4
Eastern cottonwood	9.8	149.7
Eastern cottonwood	12.2	150.0
Eastern cottonwood	10.0	151.4
Eastern cottonwood	10.1	153.6
Swamp dogwood	1.1	22.6
American elm	10.5	114.3
Cedar elm	7.3	99.3
Cedar elm	8.3	105.1
Cedar elm	6.3	106.8
Honeylocust	5.7	106.2
Honeylocust	6.3	107.1
Honeylocust	9.0	115.1
Honeylocust	6.5	115.4
Honeylocust	11.7	116.8
Honeylocust	6.9	120.6
Honeylocust	9.1	124.4
Honeylocust	8.4	124.7
Honeylocust	8.2	127.4
Honeylocust	7.3	129.9
Red maple	11.2	119.6
Red maple	9.3	121.1
Red maple	8.8	123.2

Table 1. Floodplain forest at Meeman-Shelby Forest State Park near Memphis, Tennessee (continued).

Species	CBH (ft)	Height (ft)
Cherrybark oak	NA	118.0
Nuttall oak	10.0	115.8
Nuttall oak	11.4	122.3
Overcup oak	8.1	119.1
Overcup oak	9.8	126.6
Persimmon	5.2	113.2
Persimmon	6.0	116.3
Persimmon	7.5	118.1
Sycamore	8.9	136.3
Sycamore	9.7	138.0
Sycamore	7.2	140.0
Sycamore	8.1	143.2
Sycamore	13.0	152.9
Virginia creeper	1.7	NA
Virginia creeper	2.1	NA
Virginia creeper	2.3	NA

NA = not available.

A relic baldcypress at Meeman-Shelby, 22.9 ft CBH by 120.6 ft tall. Photo by Will Blozan.

The boxelders grew more upright and appeared much more vigorous than commonly seen in southeastern floodplains. They have little dieback in the crowns and consistently reach heights that would be exceptional for smaller river sites.

150 ft tall cottonwood with huge trumpet creeper. Photo by Will Blozan.

The cottonwood stands far surpass any stands of the species I have seen elsewhere. The stands extend unbroken over dozens of acres, and in places cottonwood forms pure groves. Those areas support an unusual density of stems over 3 ft in diameter, all of the overstory trees, and have average canopy heights of over 140 ft; prior to these trees and one Bob Leverett found at Big Oak Tree State Park in Missouri at the same time, no eastern cottonwoods had been measured over 140 ft. The cottonwoods appear to have accumulated that great volume of wood in under a century.

The swamp dogwood is a potential national co-champion. The cedar elms only grew scattered in the more oak-dominated sections of the floodplain. The species was easily identifiable by their dense, tortuous crowns of fine twigs. The long, large trunks of the honeylocusts were extremely impressive to someone accustomed to seeing the species only in ornamental settings. The 129.9 ft height exceeds the few previously measured individuals. The red maples had the tight bark and dense crowns typical of the species growing in low elevation areas. They occurred primarily in small groups on the edge of depressions.

Table 2. Bluff forest at Meeman-Shelby Forest State Park near Memphis, Tennessee.

Species	CBH (ft)	Height (ft)
White basswood	6.8	129.0
American beech	9.1	117.5
American beech	8.8	120.7
American beech	7.4	126.5
Blackgum	6.4	111.6
Red buckeye	1.8	33.1
Red buckeye	1.8	33.4
Black cherry	9.0	118.6
Kentucky coffeetree	5.6	115.8
Kentucky coffeetree	4.6	116.7
Kentucky coffeetree	6.8	121.2
Eastern cottonwood	10.9	154.4
Red elm	4.8	118.6
Bitternut hickory	6.4	119.9
Bitternut hickory	6.9	123.3
Bitternut hickory	5.6	128.9
Eastern hophornbeam	2.8	68.3
Cucumber magnolia	5.3	114.8
Florida maple	6.6	103.3
Cherrybark oak	7.3	127.2
Chinquapin oak	6.5	113.2
Chinquapin oak	7.3	113.8
Chinquapin oak	5.9	114.7
Chinquapin oak	NA (burl)	115.6
Chinquapin oak	8.4	120.8
Northern red oak	6.1	121.6
Northern red oak	5.5	127.8
Northern red oak	6.8	128.5
Northern red oak	8.1	130.3

Table 2. Bluff forest at Meeman-Shelby Forest State Park near Memphis, Tennessee (continued).

Species	CBH (ft)	Height (ft)
Shumard oak	9.1	134.4
White oak	10.1	127.2
White oak	6.3	131.0
Sassafras	5.2	112.8
Sassafras	6.6	115.5
Sassafras	5.2	118.5
Sweetgum	7.6	137.2
Sweetgum	6.6	137.8
Sweetgum	8.8	143.7
Sycamore	8.1	140.9
Sycamore	9.1	141.4
Tuliptree	NA	135.6
Tuliptree	9.6	139.1
Tuliptree	9.3	144.4
Tuliptree	8.1	145.9
Tuliptree	10.5	151.5
Black walnut	7.0	117.2
Yellowwood	5.5	83.0
Yellowwood	5.2	103.5

NA = not available.

Measuring crown spread on a huge persimmon. Photo by Will Blozan.

The red buckeyes listed above grow in a small parking area; understory individuals only infrequently exceeded 10 ft in height. The black gum is within one foot of the state height record. ENTS previously had data on Kentucky coffeetree only from Beall Woods in Illinois. The Meeman-Shelby trees easily exceed the heights of those at Beall Woods.

Cottonwoods are far less common along the streams dissecting the bluffs than in the floodplain, but the 154.4 ft tree in the bluffs is the tallest known eastern cottonwood. The 120.8 ft chinquapin oak is a new state height record, and less than a foot shorter than the current height record for the species. The white oak ties for the state height record. ENTS has now measured five sassafras between 118 and 120 ft tall; three of those trees grow in the Smokies and the other two grow in Meeman-Shelby. The 103.5 ft yellowwood shatters the previous height record of 93.4 ft from North Carolina.

Rucker Height Index = 138.6 ft

Eastern cottonwood = 154.4 ft
Sycamore = 152.9 ft
Tuliptree = 151.5 ft
Sweetgum = 143.7 ft
Shumard oak = 134.4 ft
White oak = 131.0 ft
Northern red oak = 130.3 ft
Honeylocust = 129.9 ft
White basswood = 129.0 ft
Bitternut hickory = 128.9 ft

Rucker Girth Index = 12.6 ft

Baldcypress = 22.9 ft
Eastern cottonwood = 15.2 ft
Sycamore = 13.0 ft
Honeylocust = 11.7 ft
Nuttall oak = 11.4 ft
Red maple = 11.2 ft
American elm = 10.5 ft
Tuliptree = 10.5 ft
White oak = 10.1 ft
Overcup oak = 9.8 ft

The site is considerably more impressive than the Rucker Indices suggest. Several other southeastern sites surpass the height index, but the variety of species reaching great heights and the number of height records at Meeman-Shelby stand out as exemplary. Additional searching should substantially increase the indexes, especially the circumference index which was not a focus on this trip.

"Classic" honeylocust. Photo by Will Blozan.

LOWER JERRY RUN NATURAL AREA, PENNSYLVANIA: MAY 2006

Edward Frank

Eastern Native Tree Society

On Sunday, May 28, 2006, Anthony Kelly, Jacqui Noel, and I visited the Lower Jerry Run Natural Area in north-central Pennsylvania (Cameron County). There were a couple of previous posts on the area from Dale Luthringer and Ernie Ostuno. Each had reported remnant old-growth hemlock near the upper reaches of the steep valley walls leading down into the valley. Our goal was to explore more of the natural area and check out the reported old-growth.

The Pennsylvania DCNR, Department of Forestry described the site as follows:

> Lower Jerry Run Natural Area—892 acres with old-growth pine-hemlock. Lower Jerry Run is a small stream draining into Sinnemahoning Creek. The area not only contains a remnant stand of old-growth white pine and hemlock, but it is also a reptile and amphibian protection area. The entire area is relatively inaccessible, but the old-growth is found on a northeast-facing slope at the upper (south) end of the watershed, in the forks of Lower Jerry Run. This is a challenging and remote area visited only on foot. You can go all day without seeing another vehicle on the narrow dirt roads or another person in the forest. Solitude is almost guaranteed.
>
> http://www.dcnr.state.pa.us/forestry/oldgrowth/jerryrun.aspx

This region is part of what is known as the Allegheny Plateau. It is a broad general flat to lightly rolling plateau that covers much of north and west central Pennsylvania. In this particular area, the cap rock of the ridges is a thick bedded sandstone unit. Joints and pores within this sandstone unit allow water to quickly seep downward resulting in a relatively dry upland surface. Springs commonly emerge along hillsides and valley walls where the downward percolating water reaches less permeable layers of shale and siltstone.

Almost all of the area had been timbered in the late 1800s. There is a nice description of the lumbering history of the immediate area in a document entitled Elk State Forest:

> The virgin forest in Elk District consisted of magnificent white pine, hemlock, some red pine, mixed oaks and northern hardwoods, which included beech, sugar maple, birch, and black cherry. The first timber removed from the [Elk State Forest] district was the white pine used for ship masts. Some of the finest white pine spar trees in the country were removed from Sterling Run between 1865 and 1872. After white pine logs became scarce, hemlock lumber prices rose high enough for the tanneries formerly using only the bark, to begin marketing hemlock logs for lumber. Sawmills and logging camps sprang up throughout the district. Logs cut from the vast stands of hemlock were rafted or floated down streams such as the First Fork, the Driftwood Branch and the Bennett's Branch of the Sinnemahoning Creek. In 1915, the last log raft went down the Driftwood Branch, thus ending the hemlock logging era. The cut-over areas were further altered by vast wildfires that killed the remaining young trees. With the exception of few virgin stands passed up by loggers, the old-growth forest in this area was gone. The first purchase of land for the Elk State Forest was 3,487 ac tract in Middle Jerry Run bought from D.R. Fullterton on May 31, 1900. Originally called Forest Reservations, these lands were purchased to reestablish a forest that had been nearly eliminated by cutting and burning.
>
> http://www.pa-conservation.org/Elk-Forest.PDF

We met at the entrance to the natural area. There is an easy-to-find parking lot off Three Runs Road. There was a small American chestnut at the edge of the parking area 25 ft high. It looked like a good omen for the day. From the parking lot we jumped into Anthony's jeep and drove down a rough road running along the western plateau above the run. The upper surface of the plateau was forested with small, relatively young trees. The canopy reached 60 ft and consisted primarily of red maple with white, chestnut, and red oak also forming portions of the canopy. Scattered pitch pine reached 50 ft, sassafras grew to 40 ft. The lower understory included smaller sassafras, maple and oaks, and nice witch hazel up to 20 ft in height. The forest floor was relatively open with scattered blueberry and laurel, and a covering of woodland ferns just starting to unfurl. The map showed an old road paralleling the stream valley about a ½ mile to the west. The idea was to drive down the road, then cut cross country to the east when we reached downstream as far as the second small side branch. Here was an interesting-looking patch of dark blobs that could be old-growth conifers.

We followed the road until it ended at a camp. A blazed trail led into the woods beyond the camp, so we started hiking. After a half-mile or so, it became apparent that this trail was leading toward a small side stream draining to Upper Jerry Run to the west. So we took a compass bearing and headed east. We were bound to intersect Lower Jerry Run somewhere. On our hike we had passed patches of blueberry bushes, most with only the beginning of buds for the flowers that would eventually become blueberries. Here, however, was a virtually impassible thicket of mountain laurel. Most from chest height to over head high, entangled with downed branches and tree trunks. Anthony and I took turns leading. We were forced to go northward as well as eastward as we traveled. Eventually we reached the cover of trees and escaped the thicket of laurel bushes. An old tree stand or dilapidated structure of some sort reminded me of something out of the *Blair Witch Project*.

Pitch pine on the uplands. Photo by Edward Frank.

Beyond the sheltering edge of the woods the land began to slope downward. We walked downhill through some open woods and into a hemlock thicket. Most of the hemlocks were small 6 to 8 in. in diameter. A few were upward of 18 to 24 in. across and 60 to 70 ft tall. Nothing really impressive. They could be old, but likely date from the 1880 to 1915 period. Just below the hemlocks was an old road. This was the one appearing on the topo map. We followed the road down the hill deciding we were descending into the valley of Middle Jerry Run. The hillsides were very steep. As we descended the types of trees slowly changed. We picked up some tuliptrees, ash, some birches. Occasional massive blocks of sandstone were encountered along the downward path. Small waterfalls and cascades could be seen in the run far below. We descended to stream level near the downstream end of the run.

Photo by Edward Frank.

As I crossed the stream at the bottom of the valley, I slipped and fell in the water, getting a wet and breaking my tripod. No real harm done. The road continued on the eastern side of the stream. We passed some open fields and circled around the bluff separating Middle Jerry Run from Lower Jerry Run, past a camp on private property along the lower edge of the natural area. The road continued up Lower Jerry Run to another cabin in the woods. Along this reach of the stream were many sycamore; none of them looked very old, but very nicely shaped, and a few reached 100 to 120 ft in height. In the area we also found basswood, beech, and yellow birch trees.

Photo by Edward Frank.

Lower Jerry Run is a pretty little stream. There are numerous small cascades and waterfalls along its length. We walked up the stream valley, crossing from side to side as the stream wandered back and forth in the narrow valley. We clambered over rocks, boulders and downed trees as we worked our way upstream. All together a pretty fine walk in the cool shade near the cascading streams. We could follow our progress on the air photo maps, I was even able to get a GPS location at the one place we stopped for a break, surprising in light of the narrowness of the valley itself. We found a variety of microfauna—snails, millipedes, centipedes, and caterpillars. Squirrels and chipmunks played in the woods. Under one small hemlock was a pile of seeds from a nearby tuliptree gathered by some enterprising creature. Alas, we did not see any elk. This is part of the Pennsylvania Elk Range, and elk can be found in the area since their re-introduction into the state several years ago.

Photo by Edward Frank.

We passed a couple of side branches with water and some without. Toward the upper end of the stream, we began to climb upward as it cascaded down the steeper ground. The stream itself at times occupied most of the valley bottom. My left leg was hurting; I had twisted my knee when I fell in the stream. It really did not hurt much but kept cramping when I worked harder. We looked at the maps and photos periodically. Anthony was doing an excellent job of interpreting our location; however, the objective was always farther downstream and lower in elevation than I wanted it to be.

At last we reached the upper major fork of the Lower Jerry Run. The plan was to hike out the right hand (going upstream) fork of the run to another cabin, and then follow the road back to the jeep. Anthony spotted an open area up the steep side of the valley, and what might be old hemlock trees. He climbed straight up the side to investigate. After sitting at the bottom for awhile and looking at the run ahead, I felt it would be better to just climb the slope here and follow along the level top to the cabin, rather than to deal with stream, debris, rocks, and climbing following the stream itself.

I talked to Jacqui about it and started the steep climb out of the valley. I stopped frequently on the slope, eventually reaching Anthony. He hollered for Jacqui to climb up as well, and I continued upward to a less steep shoulder near the top. (The shoulder itself was likely because of a slightly softer rock layer.) Above this shoulder, the hillside continued upward for a distance before reaching the hilltop. However, this slope and the hilltop were covered by the same laurel thicket we encountered on the hike in.

The trees Anthony had seen were hemlocks. They were not impressive in size, but had a number of old-growth characteristics—furled bark, branching patterns. We talked about it some, but thought they were small in size because of the rocky nature of the ground and limited water that would have been available to them at this location. There were a few other old trees here some white oaks stand out in particular, not large in size, but giving the appearance of age. This patch was on the northern side of this fork of the run—not on the south side where others had found old-growth. So it was a newly found patch of old-growth. From the areas indicated by Dale as being old-growth, and what we found, it is possible, or likely, that many of the dark blotches near the upper part of these valleys are patches of old-growth hemlock, and maybe some white pine. Further trips will be necessary to explore all of these features.

From here we hiked along the slope toward the cabin. I was forced to stop multiple times because of cramping in my knee. (I must apologize to my hiking companions.) This was fairly level, with only a little up and down to avoid patches of laurel. Even with my leg problems, I think this was easier than it would have been hiking up the stream bottom beyond the fork. Besides, we got to see some of the old-growth hemlock. We soon reached the camp and started up the road toward the vehicles. I had to stop again several times because of cramps in my knee. Tony and Jacqui suggested going and getting the jeep and picking me up. I agreed. After they left I drank the rest of my refreshments and rested for another ten minutes or so. I hiked out to the main dirt road and waited for them there, exploring the ridge-top forest while I waited.

Overall we hiked perhaps 5 miles—we started at an elevation of 2089 ft and dropped down to 880 ft and back up again. It was a good trip overall. We hiked the length of the natural area and found some old-growth, with potential for more. The stream with the cascades and waterfalls was beautiful. I took some nice photos. I was disappointed that I don't have pictures of the hemlocks. I was hurting at the time and just didn't think to take any. I expect I will be back again later this summer.

THE WALSH PINE

Don C. Bragg

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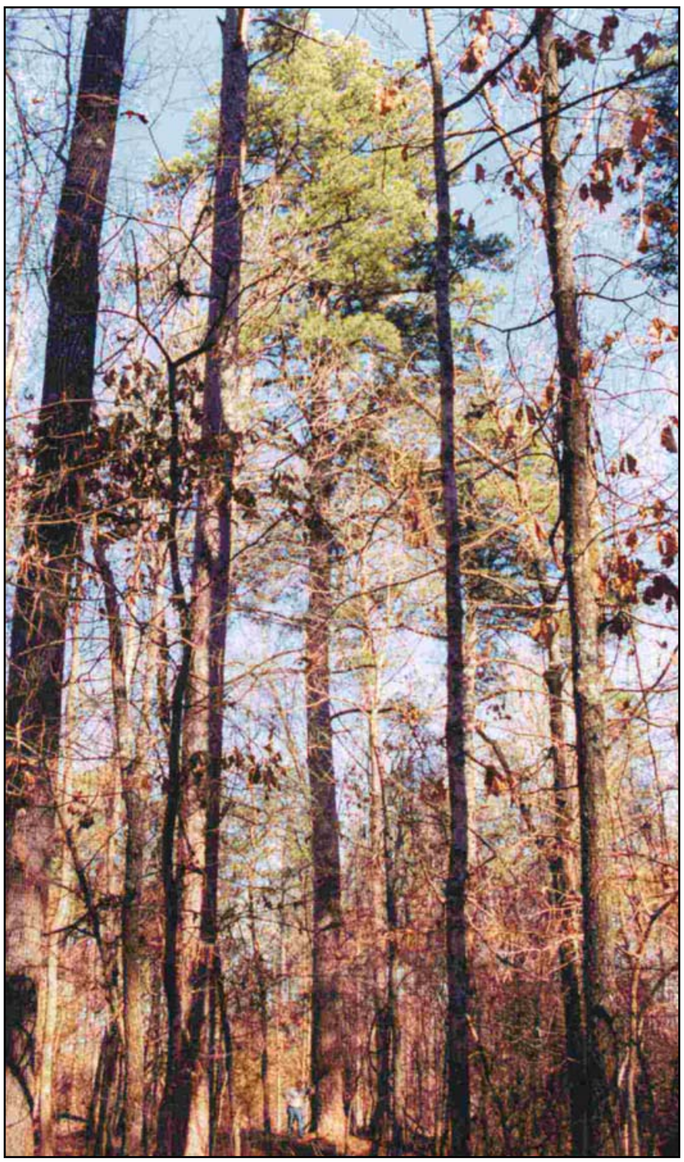
The Walsh Pine is a shortleaf pine of impressive stature growing in the Levi Wilcoxon Demonstration Forest just south of Hamburg, Arkansas along US Highway 425. According to Bragg (in press), this pine is 41.5 m tall and 91 cm DBH (diameter at breast height). No age data are available for this tree, but it is estimated to be more than 200 years old.



The Walsh Pine towers above Dr. James Guldin of the USDA Forest Service's Southern Research Station. Photo by Don C. Bragg.

The Walsh Pine in the spring of 2006. Photo by Don C. Bragg

This particular tree is named after a Forest Service forestry technician, Bruce Walsh (now deceased), who located the tree while conducting research on the Levi Wilcoxon Demonstration Forest. This pine was crowned as Arkansas state champion shortleaf pine, and more recently, this individual has also been nominated as the American Forest's National Champion shortleaf pine, as its combined bigness index score of 261 outpoints the current co-champions for this species.

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MUSINGS ON THE DEFINITIONAL QUAGMIRE SURROUNDING OLD-GROWTH FORESTS

Robert T. Leverett

Founder, Eastern Native Tree Society

Since its inception, ENTS has concentrated its efforts on finding, documenting, and measuring large trees and exceptional forest sites. In pursuing this mission, we have become the East's premier tree-measuring organization and we're widening the gap between ourselves and other tree-measuring individuals and groups. They are glued to the three traditional tree measurements and they don't do two of them very well. However, there is another area in which individual Ents have extensive experience—old-growth forests. In my case, old-growth research occupies much of my time. The same can be said of half a dozen other ENTS members and old-growth forests fit nicely into the range of interests held by the majority of the membership. So, perhaps, it is time to bring our individual associations with old-growth into the ENTS spotlight and give our oldest woodlands a boost of attention.

Over the past 20 years, I have searched for and documented old-growth forests mainly in the East. Concurrently, I have pursued extensive research into what constitutes an "old-growth forest." In fact, all of us who are involved with the old-growth are challenged to define what it is that we are hunting—an odd situation, to say the least. Along the definitional pathway, I've collaborated with distinguished scientists, naturalists, and professional foresters, and not to toot my whistle too much, was the principal architect of two conferences/symposia on old-growth forest definitions held at Harvard University's Harvard Research Facility. Over the years, I have been exposed to well over 100 definitions of old-growth as compiled by the USDA Forest Service and others, and I routinely peruse new definitions as I come across them.

You might think I would be able to spew out a clear definition for an old-growth forest, but I am humbled to admit that I'm no closer to settling on a definition now than when I started hunting for old-growth, and for a reason that the other serious researchers well understand. Old-growth is an arbitrary, human-spawned concept. There is nothing in Nature that stands out and proclaims itself to be old-growth. There are no rites of passage for a forest. Old-growth is not a separate species and has no DNA imprint. Rather, it is more of an impression about the forest.

Early ideas of old-growth were tied to the concept of virgin forest, forest undisturbed by humans, which was often cast in romantically structured prose and was married to the idea of wild woodlands free of human intervention. Few of the early descriptions of virgin forests were scientifically motivated. Virgin forest represents another strictly human notion or definition.

Beyond the idea of non-intervention, another competing concept of old-growth came from forestry and the timber profession and was based on an economic view of forests. Old-growth forests were forests with a preponderance of trees beyond economic maturity. "Over-mature" is a common description applied to trees that are past their economic zenith.

In the early 1900s, ecological concepts of old-growth also began to appear. George Nichols wrote a paper on a 300-acre tract of old-growth in Colebrook, Connecticut that was about to be cut (Nichols 1913). He concentrated on the development of the forest and on the physical characteristics of what were still being called virgin forest remnants. Nickolson and other researchers focused their attentions on a dwindling number of forested sites that had escaped the axe and had developed under the influence of natural forces that had acted unimpeded over centuries of time. These remnants possessed an abundance of old trees (unusually large when compared to the surrounding woodlands), so they were visually distinct from the re-growth. The challenge faced by these early ecologists was to decode the impacts of the myriad of natural processes in play and describe them to the satisfaction of science. Did these forests move predictably toward a stable species mix and age structure—i.e., did they reach a point at which species and average age remained relatively constant so that the forest appeared basically unchanged, barring major disturbances? The concept of a climax forest emerged from this line of investigation.

In recent years, old-growth researchers have attempted to identify points of passage to an old-growth phase and isolate the natural processes involved. The idea of quantitative thresholds has always been attractive too. Can we distinguish a point at which a forest enters into an old-growth phase? Can we peg the point of passage to some combination of physical characteristics? This approach has often been tied to concepts of stand dynamics, in which a stand of trees develops from an opening and proceeds along a predictable path of species succession to eventually reach an old-growth phase. However, stand-based approaches to understanding old-growth suffer from fatal flaws. They simplify too much, imposing limits on a natural development that can actually follow many paths. The proponents of the stand-based approach sought to simplify the ecological processes involved too much.

Well, today, while the definitional quagmire continues, the notion of old-growth refuses to pass. It lives on because forests that have been shaped by natural processes for several centuries develop sufficiently different physical characteristics from their younger counterparts to allow us to see the differences with our eyes, even if we can't identify points of passage into some state we choose to call old-growth. The ageless look, the larger trees, the structural complexity of forest from canopy to forest floor lead many to view old-growth as a kind of venerable elder that has earned our respect and needs protection. A generation of old-growth hunters, professional scientist and amateur alike, was stimulated by this inner appreciation of the appearance of old-growth forests.

But if old-growth is still in need of a definition, and one that can be simply applied, I vote for the one that is evolving from the work of ENTS Vice President, Dr. Lee Frelich (e.g., Frelich 2002). Lee stresses the importance of a naturally developed, multi-aged forest with plenty of old trees. In my view, it is a surrogate for the notion of old-growth. In applying Lee's concept, I try to judge each forest on a sliding scale that points me to a conclusion about where the forest lies on the scale of succession. In applying the criteria, nothing actually changes by substituting the term "old-growth" for natural, multi-aged forest. I'm no longer encumbered with the baggage of the long-standing old-growth controversy. However, in public, I continue using old-growth terminology, especially with interested parties here in Massachusetts. Dropping the term "old-growth" would create mayhem among the Bay State faithful and open up opportunities for some wily timber-community types to make mischief with public forest areas currently designated as old-growth. Best to let sleeping dogs lie.

But among the ENTS faithful, what understanding of the illusive old-growth phase should we be shooting for, and what technical vocabulary should we adopt? Should we acknowledge shades of gray, i.e., classes of old-growth? When Ed Frank opened up the old-growth subject for debate on the ENTS list, with the exception of one e-mail, I refrained from putting in my two cents worth. I wanted to read the views of others and to review my on thinking. I examined the URL that Ed cited from the Ontario website:

http://www.lrconline.com/Extension_Notes_English/pdf/oldgwth.pdf

This source provides us with an excellent overview of the physical characteristics of old-growth in southern Ontario, which is also what one can expect over much of the northeastern United States.

It is tempting to shut the door on the discussion after reading the descriptions on the Ontario website and conclude that a woodland possessing the characteristics of the one described is an old-growth forest, but a thorough discussion of old-growth definitions necessitates that we address some of the early attempts to define old-growth and test their merits in light of what we now think we know. Did the old-timers get it right after all? Did they push different concepts of old-growth as far as they can be pushed?

In a continuing dialog on old-growth definitions with NPS forester and long-time friend Don Bertolette, I suggested that we sunset the classic old-growth definition presented in "Forest Stand Dynamics" (Oliver and Larson 1996). In fact, I would recommend sunsetting all old-growth definitions that suggest or imply discrete beginning points for the old-growth phase. We should move away from definitions that utilize average stand rotation, average/maximum tree age, refer back to some indistinct reference point, or require a percentage of standing canopy trees to meet an age threshold. These definitional approaches imply points reached by a forest along some time continuum that presumably signal the onset of the old-growth phase. But these definitions attribute too much significance to arbitrary statistics that one derives from a stand of trees. It is time to pay homage to the original conceptualizers and move on.

Taking a slightly different tack on the old-growth subject, over the years, concepts and terms come into and fall out of favor. Terms like "virgin," "ancient," "original," "presettlement," "climax," and "old-growth" are sometimes used interchangeably and are at other times differentiated. The list of terms cited above incorporate different ideas or concepts that are not inter-changeable. One of the oldest concepts previously mentioned is that of a virgin forest, which embodies the notion of purity. Virgin forests are not supposed to have been shaped by activities of modern humans. However, it is less clear where the actions of aboriginal populations fit into the notion of a virgin forest. Regardless, the idea of a virgin forest has fallen out of favor with scientists.

Another concept that has been rejected by many ecologists is that of a climax forest. Forest ecologists who specialize in disturbance regimes are disinclined to use the term "climax" because they know that disturbance patterns often make the theoretical climax phase briefer than originally thought. But, given that all forests constantly change, we still like reference points in evaluating what has happened or is happening within our forests relative to what we think they once were like. So, old concepts and notions hang on.

Beyond "virgin" and "climax," some researchers like to hold on to the concept of an original forest condition. However, this concept is no less misleading than "virgin." The term "original growth" or "condition" is intended to point to the state of the forest that existed prior to the arrival of Europeans in a particular area. "Original state" is usually interpreted as what the white settlers originally saw, i.e., the original forest was the pre-European-settlement woodlands. But was it in some "original" condition that we would recognize were we to become time travelers? The appearance of Europeans on the scene with axes and an exploitative land ethic did lead to land clearings. Forests that grew back did so from forestless open fields. But exactly what was the original state of the forest before the arrival of Europeans? Was there just one condition, or were there many, depending on forest type, aboriginal use of the land, natural disturbance regime, most recent major disturbance, etc.? Examining the idea of "original" condition reveals it to be less clear than when viewed from afar—there just wasn't any single original state.

It is my humble opinion, and hopefully not surprisingly, that the confusion over old-growth definitions stems from the fact that there are many ecological/disturbance trajectories that lead to what most of us have in mind as old-growth. There is no magic aggregate set of conditions, or thresholds, that indisputably mark the onset of the "old-growth state." Nor are there useful individual thresholds for the number of snags, amount of coarse woody debris, stem densities in various age classes that can be applied. In truth, there are far too many forest processes involved in different stages to facilitate a workable definition of old-growth centered on thresholds, cutoffs, rotations, and startup points. The number of combinations goes through the roof.

The above conclusion was not initially obvious to me. I kept looking for a silver bullet. At one time I backed the statistical descriptions approach to defining old-growth. From the standpoint of tree age, an old-growth forest was one where 50% of the canopy trees had reached 50% of the maximum age for the represented species and a few reached the maximum ages. But the limits to this statistical model soon became evident. It was far too arbitrary. Processes are on-going. So, most of us have abandoned definitions that invoke statistical thresholds. However, in fairness to their proponents, the approach to defining old-growth through statistical thresholds seemed to make sense for a time and was a step along the way in thinking through the competing approaches.

For me, I owe the progress that I have made in sorting out how to view old-growth to Lee Frelich's concepts applied to the landscape-scale, complex multi-aged forests of New York's Adirondacks, Michigan's Porcupine Mountains, and the Great Smoky Mountains in eastern Tennessee and western North Carolina. The patches of old-growth in the Massachusetts Berkshires and Taconics that I have spent lots of wonderful time in are just too small to allow me to understand how patch dynamics fit into the interpretation of what we agree is or is not old-growth. The disturbance patterns that can be expected from the episodic events associated with different geographical regions are vastly different, and those differences are reflected in forests in dramatic ways.

There is another notion that we old-growth sleuths are entertaining these days. Based on the structural differences in what we expect to see going from small stands of trees to the larger areas that fold in both old and young forests, some of us like the concept of distinguishing areas of what we call "first forest" to identify our rarest forests, regardless of the average ages of their trees. First forests are those that have suffered the least amount of direct impact by human activity, at least human activity of a significant magnitude. If the term, "first forest" begs for a better definition. I will simply quote a passage from Dr. Michael Kudish, the guru of the New York Catskills: "never been logged, burned by people, barked, pastured, etc." Mike is currently determining the acreage of first forests in the Catskills and Adirondacks, and the first forest concept allows Mike to include black spruce- and red maple-dominated bogs where the trees are not very old, but nonetheless represent an ecosystem that developed without significant direct human impact. I think this category of forest also occupies large areas of the Boundary Waters Canoe Area Wilderness in Minnesota that Dr. Lee Frelich studies.

One practical significance of the notion of first forests, as separate from old-growth, is that Mike Kudish now believes that the Adirondacks may have retained over 500,000 acres of first-growth forest. The Catskills have over 65,000. Lump in other areas of New York, and it is mind-boggling to think that nearly 600,000 acres of New York State forests may have survived the onslaught of European settlement. Contrast this with the between 1,200 and 1,500 acres of first forests in Massachusetts, spread over at least 50 separate locations. But at least Massachusetts has some first forests.

Is there one quintessential feature that distinguishes the large-scale first-growth forests of the Adirondacks from the small patches of the Berkshires? Yes, there is. Isolated patches of old-growth in the Berkshires, or in Ohio, Indiana, or Illinois, for that matter, are too small to absorb large-scale disturbances. An area of old-growth in Massachusetts can be gone in one gust of wind. When all that exists are small patches, the forest dynamics change and that leads us to think about old-growth at purely the stand level, which in this context has its place. It allows us to follow forest succession from the initial disturbance, through the seedling-sapling stage, on into the stem exclusion phase, and beyond.

But, proceeding from a zero state, do we eventually reach a point where there is an "old-growth pop?" The answer in the minds of most of us is no and that is the conclusion reached by Drs. Alan White and Matt Hunter from the University of Maine after our 1994 meeting at Harvard Forest. As an outgrowth of that old-growth definitions symposium, White and Hunter chose to investigate the old-growth state through the concept of a mathematical step function—a sophisticated way of saying "now you see it, now you don't." At the end of their research, they rejected the step function approach.

If we are forced to reject a particular old-growth definition or approach to defining old-growth, we have plenty left to consider. Fortunately or unfortunately, of the more than 100 definitions of old-growth that I have read, many are not that distinguishable. I have come to recognize that authors play shuffleboard with nouns, verbs, and adjectives. It is easy to spot a new attempt to define old-growth that plays the word-shuffling game after you've read through 25 or 30 definitions and visited a couple hundred old-growth sites. You come to recognize when a newly proposed definition doesn't contain new ideas, but is more elegant or precise-sounding, or just plain academic. As a past president of a management consulting firm, I've been schooled in the techniques of dressing up old problems in new verbal garb. Sometimes a fresh vocabulary can lead to new insights, but more often it is a way that wily individuals disguise their powerlessness to solve a problem.

Because old-growth is an imprecise human concept, it will remain a moving target. Definitions espoused by bureaucracies will usually have more to do with politics and/or ease of administering boundaries than being scientifically defensible. But that is the way things are. So, scientists like Lee Frelich who are frequently called upon to give expert testimony accept many working definitions of old-growth when dealing with governmental, private forestry, and environmental organizations. Old-growth is whatever those agencies say it is.

I suppose that for those of us who cut our old-growth teeth in the field, it will remain the visual impacts of the physical characteristics that forests develop over a couple hundred years in the absence of persistent and significant direct human impact that grabs and holds our attentions. This still leaves us with a lot to discuss, but in the analogy of the dog chasing its tail, if we hope to eventually arrive at a mutually acceptable definition that elucidates what has been lurking in the shadows just out of our grasp, I fear we'll find ourselves repeatedly arriving at previous starting points with a clear sense of déjà vu. However, the more we know what to expect from natural, episodic disturbances played out on different spatial and temporal scales, the more we can codify the range of old-growth conditions that we intuitively come to recognize. We can at least agree on the natural imprints of complex disturbance patterns that control species composition, age structures, spatial arrangements, etc. Well, I think this brings us to the first page of Lee Frelich's book on forest dynamics and disturbances…

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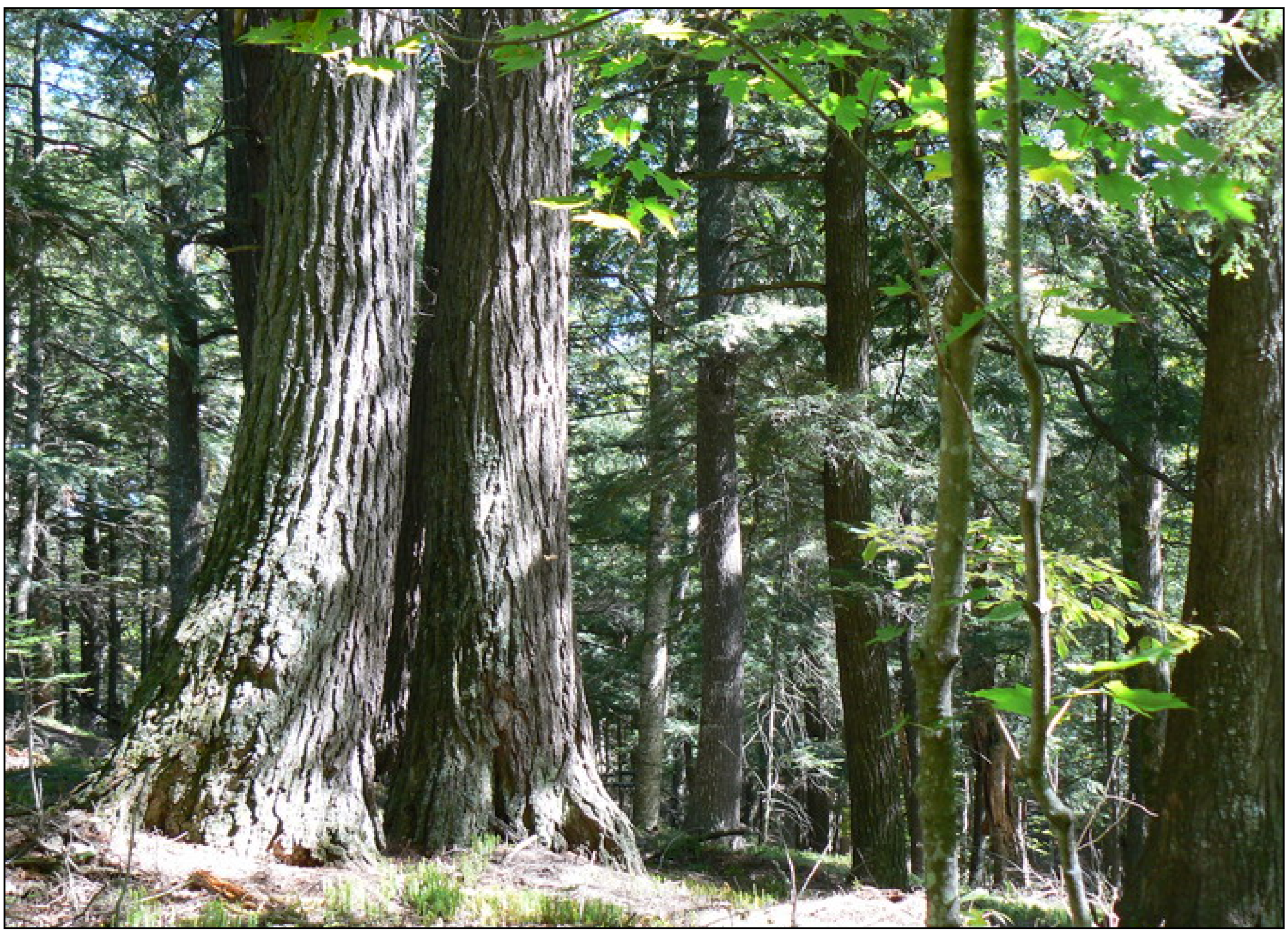
An old-growth eastern hemlock-dominated stand in the Sylvania Wilderness Area of the Ottawa National Forest in the Upper Peninsula of Michigan. Photo by Don C. Bragg.



THE "ENTS GENE"

Robert T. Leverett

Founder, Eastern Native Tree Society

I have come to the conclusion that we Ents are wired differently from most folks, including otherwise highly accomplished forestry and forest ecology professionals. I've been moving toward this conclusion for a long time, but I'll now state it forthrightly. We're a different breed—at least in so far as the treatment of numbers is concerned. Inaccuracies actually cause us physical pain. I believe that. I know where I feel the pain, but won't mention the location here. What triggered this?

While scanning the two books on the geology of Wyoming that I bought while on Monica and I were on our western excursion, I read the descriptions that the two authors of one book and the single author of the other wrote about the different mountain ranges of Wyoming and discovered a number of factual errors with respect to the elevations of prominent mountains. I even found conflicting information for the same peaks at different points in the books. I had come to expect numbers sloppiness from authors who must draw from other sources when writing on a topic because they are not themselves experts.

In the case of the three geologists, it became increasingly obvious that they all cherry-picked their way though old material to fill out the formats of their books. But geologist authors shouldn't miss the current altitudes of the most prominent mountains that they are writing about. For example, the current listed altitude of Gannett Peak in Wyoming is 13,804 ft, while the old altitude was 13,785 ft. Sources using the latter number are now clearly dated.

I could give other examples from the two books, but it is not my purpose to pick on these three authors. So, let's choose another book and profession. The "bible" on stand dynamics, *Forest Stand Dynamics*, by Oliver and Larson, quotes in a table as factual the extraordinarily badly mismeasured red maple that *American Forests* carried for years—the purported 179-ft tall one. Okay, administrative people, which is what I judge the *American Forests* staff to be, putting together editions of their magazine, aren't likely to know what is realistic and what isn't in terms of the height of an eastern species, but distinguished academic foresters should… think. Well, maybe they trusted the source, regardless of how outlandish the number may have been. Maybe they didn't check—perhaps they just went with the number given.

The point I'm working toward is that when it comes to the use of numbers, Ents don't do that. Why, I'll bet that when Will and Jess last measured the tall tulip poplar in Cataloochee, not only was Will working to ensure the height number he would later quote to us was as humanly accurate as possible, he could also tell us the length (to a half-millimeter) of the hang-nail that he was nursing—numbers he'll remember for decades.

Like Will, Lee Frelich is amazing in the numbers that he recalls on many subjects, and the judgment he exercises on which magnitudes make sense and which don't. He picked up on that dubious 64-degree average annual temperature for Hot Springs, South Dakota, I'm sure in the flicker of an eye. And he knew approximately what the number should be and how to derive the approximation. However, he holds a doctorate from the University of Wisconsin, so such accuracy is to be expected. But I believe that his demonstrated skill with magnitudes does not come wholly from his academic achievement. I have a sneaky feeling that it is really the Ent genes in him that sensitizes him to numeric accuracy beyond that common to many other distinguished academics.

I also see an Ents gene in Ed Frank, who threads the needle on numeric accuracy as well as procedural rigor. But then if I mentioned everyone in ENTS who demonstrates numbers sensitivity, the list would include all driven to measure trees to ever higher levels of accuracy. It is a manifestation of the Ent gene in us. This doesn't mean that there is only one kind of Ents gene. There are other types and thank goodness for it. There is the Ent gene of the sort that Pamela Briggs possesses. Her sensitivity to trees lies in other realms that will not be covered in this communication...

Anyway, it is clear that we Ents are a breed apart and we should celebrate the difference, and celebrate we shall on the upcoming ENTS Rendezvous. Perhaps our motto should be: "Decimal Points Matter."

INSTRUCTIONS FOR CONTRIBUTORS

SCOPE OF MATERIAL
The *Bulletin of the Eastern Native Tree Society* accepts solicited and unsolicited submissions of many different types, from quasi-technical field reports to poetry, from peer-reviewed scientific papers to digital photographs of trees and forests. This diverse set of offerings also necessitates that (1) contributors specifically identify what type of submission they are providing; (2) all submissions should follow the standards and guidelines for publication in the *Bulletin*; and (3) the submission must be new and original material or be accompanied by all appropriate permissions by the copyright holder. All authors also agree to bear the responsibility of securing any required permissions, and further certify that they have not engaged in any type of plagiarism or illegal activity regarding the material they are submitting.

SUBMITTING A MANUSCRIPT
As indicated earlier, manuscripts must either be new and original works, or be accompanied by specific written permission of the copyright holder. This includes any figures, tables, text, photographs, or other materials included within a given manuscript, even if most of the material is new and original.

Send all materials and related correspondence to:

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Depending on the nature of the submission, the material may be delegated to an associate editor for further consideration. The Editor-in-Chief reserves the right to accept or reject any material, regardless of the reason. Submission of material is no guarantee of publication.

All submissions must be made to the Editor-in-Chief in digital format. Manuscripts should be written in Word (*.doc), WordPerfect (*.wpd), rich-text format (*.rtf), or ASCII (*.txt) format.

Images can be submitted in any common format like *.jpg, *.bmp, *.tif, *.gif, or *.eps, but not PowerPoint (*.ppt). Images must be of sufficient resolution to be clear and not pixilated if somewhat reduced or enlarged. Make sure pictures are at least 300 dots per inch (dpi) resolution. Pictures can be color, grayscale, or black and white. Photographs or original line drawings must be accompanied by a credit line, and if copyrighted, must also be accompanied by a letter with express written permission to use the image. Likewise, graphs or tables duplicated from published materials must also have expressly written copyright holder permission.

PAPER CONTRIBUTIONS (ALL TYPES)
All manuscripts must follow editorial conventions and styling when submitted. Given that the *Bulletin* is edited, assembled, and distributed by volunteers, the less work needed to get the final product delivered, the better the outcome. Therefore, papers egregiously differing from these formats may be returned for modification before they will be considered for publication.

Title Page
Each manuscript needs a separate title page with the title, author name(s), author affiliation(s), and corresponding author's postal address and e-mail address. Towards the bottom of the page, please include the type of submission (using the categories listed in the table of contents) and the date (including year).

Body of Manuscript
Use papers previously published in the *Bulletin of the Eastern Native Tree Society* as a guide to style formatting. The body of the manuscript will be on a new page. Do not use headers or footers for anything but the page number. Do not hyphenate text or use a multi-column format (this will be done in the final printing). Avoid using footnotes or endnotes in the text, and do not use text boxes. Rather, insert text-box material as a table.

All manuscript submissions should be double-spaced, left-justified, with one-inch margins, and with page and line numbers turned on. Page numbers should be centered on the bottom of each new page, and line numbers should be found in the left margin.

Paragraph Styles. Do not indent new paragraphs. Rather, insert a blank line and start the new paragraph. For feature articles (including peer-reviewed science papers), a brief abstract (100 to 200 words long) must be included at the top of the page. Section headings and subheadings can be used in any type of written submission, and do not have to follow any particular format, so long as they are relatively concise. The following example shows the standard design:

FIRST ORDER HEADING
Second Order Heading
Third Order Heading. The next sentence begins here, and any other levels should be folded into this format.

Science papers are an exception to this format, and must include sections entitled "Introduction," "Methods and Materials," "Results and Discussion," "Conclusions," "Literature Cited," and appendices (if needed) labeled alphabetically. See the ENTS website for a sample layout of a science paper.

Trip reports, descriptions of special big trees or forests, poetry, musings, or other non-technical materials can follow less rigid styling, but will be made by the production editor (if and when accepted for publication) to conform to conventions.

Table and figure formats. Tables can be difficult to insert into journals, so use either the table feature in your word processor, or use tab settings to align columns, but DO NOT use spaces. Each column should have a clear heading, and provide adequate spacing to clearly display information. Do not use extensive formatting within tables, as they will be modified to meet *Bulletin* standards and styles. All tables, figures, and appendices must be referenced in the text.

Numerical and measurement conventions. You can use either English (e.g., inches, feet, yards, acres, pounds) or metric units (e.g., centimeters, meters, kilometers, hectares, kilograms), so long as they are consistently applied throughout the paper. Dates should be provided in month day, year format (June 1, 2006). Abbreviations for units can and should be used under most circumstances.

For any report on sites, heights must be measured using the methodology developed by ENTS (typically the sine method). Tangent heights can be referenced, especially in terms of historical reports of big trees, but these cannot represent new information. Diameters or circumference should be measured at breast height (4.5 ft above the ground), unless some bole distortion (e.g., a burl, branch, fork, or buttress) interferes with measurement. If this is the case, conventional approaches should be used to ensure diameter is measured at a representative location.

Taxonomic conventions. Since common names are not necessarily universal, the use of scientific names is strongly encouraged, and may be required by the editor in some circumstances. For species with multiple common names, use the most specific and conventional reference. For instance, call *Acer saccharum* "sugar maple," not "hard maple" or "rock maple," unless a specific reason can be given (e.g., its use in historical context).

For science papers, scientific names MUST be provided at the first text reference, or a list of scientific names corresponding to the common names consistently used in the text can be provided in a table or appendix. For example, red pine (*Pinus resinosa*) is also known as Norway pine. Naming authorities can also be included, but are not required. Be consistent!

Abbreviations. Use standard abbreviations (with no periods) for units of measure throughout the manuscript. If there are questions about which abbreviation is most appropriate, the editor will determine the best one to use. Here are examples of standardized abbreviations:

inch = in	feet = ft
yard = yd	acre = ac
pound = lb	percent = %
centimeter = cm	meter = m
kilometer = km	hectare = ha
kilogram = kg	day = d

Commonly recognized federal agencies like the USDA (United States Department of Agriculture) can be abbreviated without definition, but spell out state names unless used in mailing address form. Otherwise, spell out the noun first, then provide an abbreviation in parentheses. For example: The Levi Wilcoxon Demonstration Forest (LWDF) is an old-growth remnant in Ashley County, Arkansas.

Citation formats. Literature cited in the text must meet the following conventions: do not use footnotes or endnotes. When paraphrasing or referencing other works, use the standard name date protocol in parentheses. For example, if you cite this issue's Founder's Corner, it would be: "…and the ENTS founder welcomed new members (Leverett 2006)." If used specifically in a sentence, the style would be: "Leverett (2006) welcomed new members…" Finally, if there is a direct quotation, insert the page number into the citation: (Leverett 2006, p. 15) or Leverett (2006, p. 16-17). Longer quotations (those more than three lines long) should be set aside as a separate, double-indented paragraph. Papers by unknown authors should be cited as Anonymous (1950), unless attributable to a group (e.g., ENTS (2006)).

For citations with multiple authors, give both authors' names for two-author citations, and for citations with more than two, use "et al." after the first author's name. An example of a two-author citation would be "Kershner and Leverett (2004)," and an example of a three- (or more) author citation would be "Bragg et al. (2004)." Multiple citations of the same author and year should use letters to distinguish the exact citation: Leverett 2005a, Leverett 2005b, Leverett 2005c, Bragg et al. 2004a, Bragg et al. 2004b, etc.

Personal communication should be identified in the text, and dated as specifically as possible (not in the Literature Cited section). For example, "…the Great Smoky Mountains contain most of the tallest hardwoods in the United States (W. Blozan, personal communication, March 24, 2006)." Examples of personal communications can include statements directly quoted or paraphrased, e-mail content, or unpublished writings not generally available. Personal communications are not included in the Literature Cited section, but websites and unpublished but accessible manuscripts can be.

Literature Cited. The references used in your work must be included in a section titled "Literature Cited." All citations should be alphabetically organized by author and then sorted by date. The following examples illustrate the most common forms of citation expected in the *Bulletin*:

Journal:

Anonymous. 1950. Crossett names giant pine to honor L.L. Morris. Forest Echoes 10(5):2-5.

Bragg, D.C., M.G. Shelton, and B. Zeide. 2003. Impacts and management implications of ice storms on forests in the southern United States. Forest Ecology and Management 186:99-123.

Bragg, D.C. 2004a. Composition, structure, and dynamics of a pine-hardwood old-growth remnant in southern Arkansas. Journal of the Torrey Botanical Society 131:320-336.

Proceedings:

Leverett, R. 1996. Definitions and history. Pages 3-17 *in* Eastern old-growth forests: prospects for rediscovery and recovery, M.B. Davis, editor. Island Press, Washington, DC.

Book:

Kershner, B. and R.T. Leverett. 2004. The Sierra Club guide to the ancient forests of the Northeast. University of California Press, Berkeley, CA. 276 p.

Website:

Blozan, W. 2002. Clingman's Dome, May 14, 2002. ENTS website http://www.uark.edu/misc/ents/fieldtrips/gsmnp/clingmans_dome.htm. Accessed June 13, 2006.

Use the hanging indent feature of your word processor (with a 0.5-in indent). Do not abbreviate any journal titles, book names, or publishers. Use standard abbreviations for states, countries, or federal agencies (e.g., USDA, USDI).

ACCEPTED SUBMISSIONS

Those who have had their submission accepted for publication with the *Bulletin of the Eastern Native Tree Society* will be mailed separate instructions to finalize the publication of their work. For those that have submitted papers, revisions must be addressed to the satisfaction of the editor. The editor reserves the right to accept or reject any paper for any reason deemed appropriate.

Accepted materials will also need to be accompanied by an author contract granting first serial publication rights to the *Bulletin of the Eastern Native Tree Society* and the Eastern Native Tree Society. In addition, if the submission contains copyrighted material, express written permission from the copyright holder must be provided to the editor before publication can proceed. Any delays in receiving these materials (especially the author contract) will delay publication. Failure to resubmit accepted materials with any and all appropriate accompanying permissions and/or forms in a timely fashion may result in the submission being rejected.

A giant water tupelo in a swamp in eastern Arkansas. Photo by Don C. Bragg.