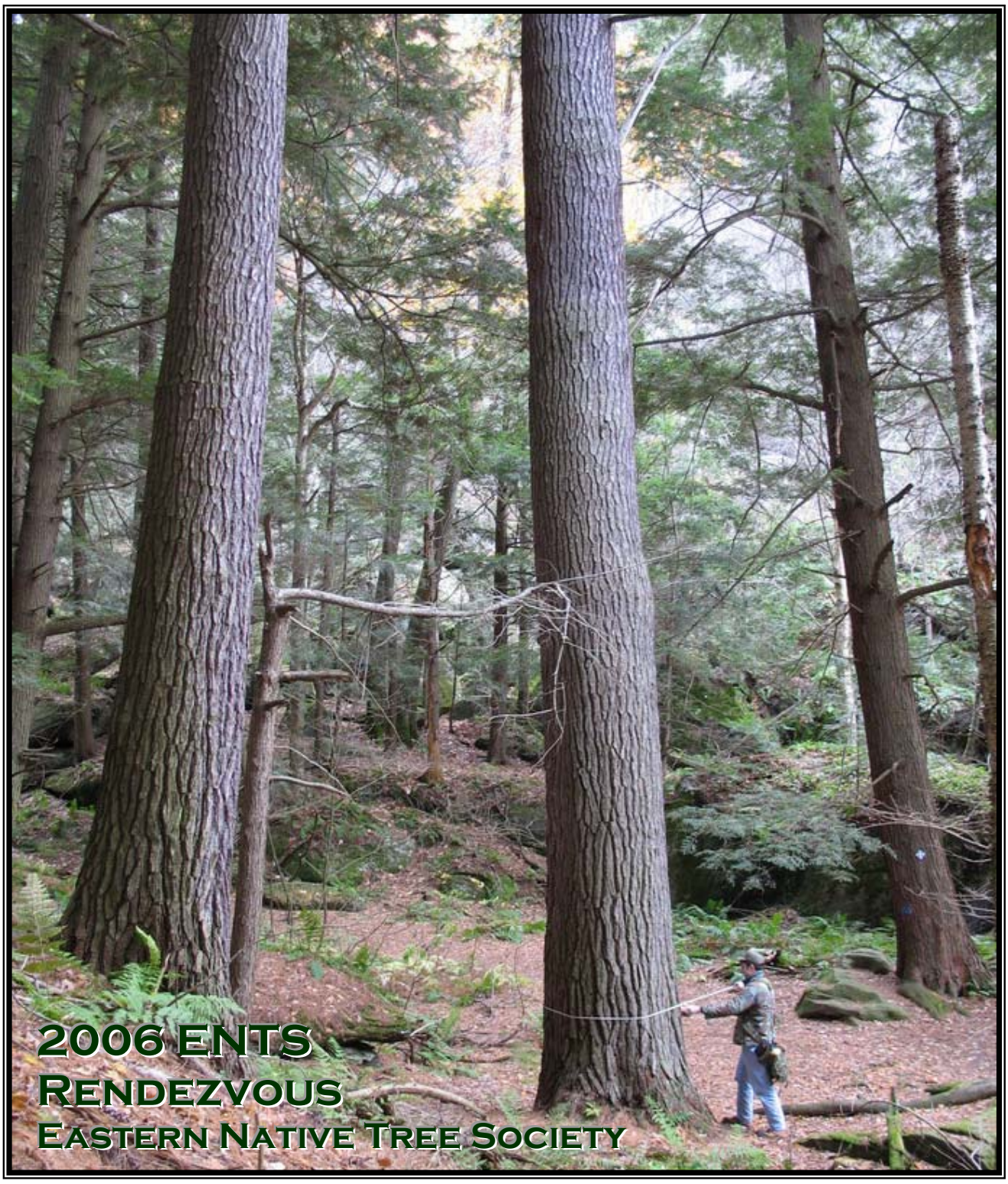
Bulletin of the Eastern Native Tree Society

Volume 2 Winter 2007 Issue 1



Bulletin of the Eastern Native Tree Society

ISSN: 1933-799X

Eastern Native Tree Society
http://www.nativetreesociety.org/

ENTS Rendezvous 2006

Volume 2, Issue 1
Winter 2007

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.

Membership and Website Submissions:

Membership in ENTS is FREE and automatic. Simply sign up for our online 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: Dale Luthringer measures the Ice Glen Pine during the 2006 Eastern Native Tree Society Rendezvous. Photo by Will Blozan.

TABLE OF CONTENTS

A CHANGE IN ENTS AUTHOR CONTRACTS

Starting with this issue, most contributors to the *Bulletin of the Eastern Native Tree Society* will be asked to sign a new version of the author contract. Concerns had been raised about the intellectual property of the authors, and the need for the Eastern Native Tree Society to be in the business (at least in part) in managing copyrights. Also, certain types of submissions (e.g., trip reports, photographs) that are submitted to the e-mail list and republished in the *Bulletin* will come with *de facto* authorship contracts of the same nature and intent, and authors of these will not be required to sign a paper version of this agreement. Other types of original material, with the exception of specific feature columns written especially for the *Bulletin*, will need signed author contracts.

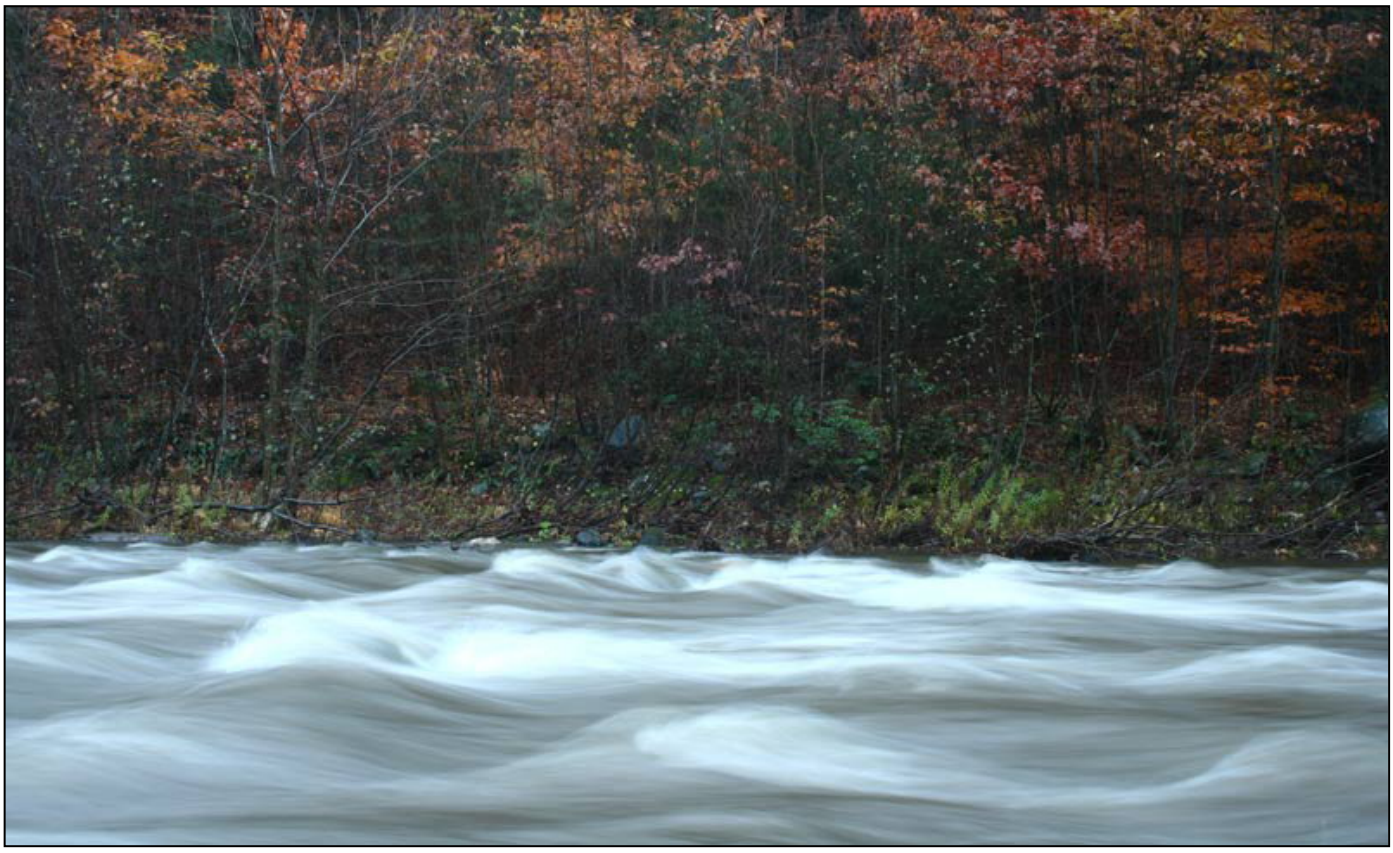
The new contract keeps a formalized relationship between the *Bulletin* and the author(s) in which the author(s) certify that the material they are submitting to the journal is new original work and properly cited (i.e., no plagiarism), and that there are no competing claims to the validity of the author(s) copyright. The *Bulletin* agrees to publish the material in PDF format, and is granted certain distribution privileges in the process.

Fundamentally, this change has little impact on the production of the *Bulletin*, while it secures the author's rights to control the materials they produce. The burden on authors is somewhat larger, as they are now responsible for maintaining and protecting their copyrights, but given the nature of our publication, this seems of little real challenge. Copyright issues are critical topics in much of the publishing and scientific fields, and not a trivial issue in our journal. However, we also seek to maximize the quality of our submissions without infringing on the rights of our authors, some of whom make at least part of their living by publishing their writings.

This change is a technical one, and will be seamless for virtually every reader. The Eastern Native Tree Society still reserves all other rights to the *Bulletin* not specified in the author contract, and we look forward to high-quality submissions for future issues.

Don C. Bragg
Editor-in-Chief

Swollen by recent heavy rains, the Cold River flows through Mohawk Trail State Forest in late October of 2006. Photo by David Katz.



ANNOUNCEMENTS AND SOCIETY ACTIONS

A Reminder: Please Help Support the Tsuga Search!

The Tsuga Search Project is a joint 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, dedicated ENTS members Will Blozan and Jess Riddle 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, whose fiscal agent is the Friends of Mohawk Trail State Forest (FMTSF). Please send 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 project will be issued to Edward 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 needs your support now!

Don't Forget—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.

Planning Underway For ENTS Events in 2007

Barely has the last ENTS Rendezvous been completed, and the Eastern Native Tree Society is actively planning upcoming events. According to a recent e-mail from Dale Luthringer, dates for the Spring 2007 ENTS Cook Forest Rendezvous (a.k.a. the Cook Forest Big Tree Extravaganza) will be the weekend of April 20-22, 2007. Few details are available yet, but most of the official program will likely be held on Saturday, April 21, 2007. It is highly probable to expect presentations by many of the illustrious core of ENTS, as well as others in the old-growth and forest ecology communities.

Plans are also in the works for another get-together in eastern Kentucky, thanks to Dr. Neil Pederson. Stay tuned as more details become available!

Correction

The second paragraph in the second column on page 24 in Robert Leverett's musing on old-growth definitions (*Bulletin of the Eastern Native Tree Society* 1(2):24-27) provides the name "Nickolson" rather than "Nichols," as it should have been.

A RECAP OF THE 2006 FOREST SUMMIT AND ENTS RENDEZVOUS

With contributions by

Robert Leverett, Don C. Bragg, Edward Frank, and Will Blozan

EDITOR'S NOTE: This is a compendium of thoughts on the recently completed Forest Summit and ENTS Rendezvous, coupled with pictures, some of which appeared in the e-mail discussion group, others that did not. Each account provides a little different spin on the events, as each took away something different from this meeting. For those that have never attended one of these weekend-long meetings, perhaps this taste of the event will help whet your appetite for future adventures.

Robert Leverett:

Well, the fourth combined event in the Forest Summit Lecture Series—western Massachusetts ENTS Rendezvous enters the history books as an unqualified success. Gary, Monica, and I are ready to relax. We're thoroughly pooped. However, we can't rest on our laurels too long—the April event in Cook Forest is not that far away!

This year's events began on Wednesday evening with Monica and Lee teaming up to play classical music in Monica's music room. Lee brought his violin and Monica played her two pianos in an impromptu event for a party of one—me! Boy, was it tough work…I had to play the part of all types of listeners to make the audience seem authentic. Next year I think they plan to do it again, but we'll organize the event into a more formal one and keep it in Monica's beautiful music room.

Thursday began with a survey of Robinson State Park. The walk in Robinson was attended by myself, Lee Frelich, Gary Beluzo, Will Blozan, botanist Pam Weatherbee, Friends activist Ray Weber, and three state officials. I think we fairly conclusively settled one item—there is no black maple. After looking at various areas marked for harvesting, we went after Robinson's Rucker index. Will Blozan did his usual eagle-eyed spotting of new height candidates. He quickly focuses in on tall tree candidates of all species. By the time we had left Robinson, the Rucker Index had gone from 112.2 up to 117.8 ft! Robinson is now tops in the Connecticut River Valley region, jumping well past Mount Tom's 115.8 ft. Robinson State Park is home to Massachusetts' tallest tuliptree at 139.1 ft.

On Friday we had the usual stellar performers at the Forest Summit. Presentations by Michael Kudish, Lee Frelich, Tom Diggins, Tony D'Amato, Will Blozan, and Dale Luthringer represented the ecology-based lectures. After that Robinson State Park became the focus of attention. EOEA representative Bob O'Connor, Ray Weber representing Friends of Robinson State Park, and myself made presentations. We ran over on time, so Ed Frank's presentation of ENTS accomplishments had to be rescheduled.

On Saturday, we assembled in Mohawk Trail State Forest to the pelting of raindrops—and they never stopped. So, Will's scheduled climb of the Calibration Pine was canceled. After slogging around for a time, we eventually cried uncle (except for Lee, who didn't notice the mild weather) and decided to go to the Charlemont Inn and dry out. Lee Frelich and Ed Frank then made excellent presentations before dinner. Lee gave us more grim news about the earthworm invasion. Lee has so many presentations that he can give off the top of his head that the entire lecture series could be successfully done letting Lee

The Cold River in Mohawk Trail State Forest. Picture by David Katz.

give a presentation, take a break, call Lee back, take a break, etc. Ed followed with a presentation of some of the history of ENTS and the major accomplishments of ENTS in the most convincing manner ever done. Ed came through again.

After dinner Don Bragg gave an excellent presentation on big trees in the southwestern corner of the ENTS domain. We saw the huge water tupelos that were discovered in the field trips associated with the Ecological Society of America's recent gathering. Following Don's presentation, we were off to the Federated Church of Charlemont to hear Roman Dial's riveting look at life in the canopy of the tropical giants. Roman traveled from Alaska for this meeting, and brought his mother and son up from Virginia. So, in terms of travel distance for an ENTS gathering, Roman holds the record. Seeing inspiring images of the tropical giants followed by pictures of the devastation of the tropical rainforests was sobering. It is abundantly clear that the human forces of planetary destruction are outpacing the forces of conservation. I couldn't help thinking that our species is proving to be by far the worst parasite that planet Earth has ever seen.

On a more positive note, Roman's lecture was followed by our celebration of trees through music, poetry, and prose, which was absolutely outstanding. There will be more to come on the celebration, but suffice it to say that ENTS amply demonstrated itself to be far more than an organization that measures trees. Professor and concert pianist Monica Jakuc Leverett and tenor Peter Shea were their customary outstanding selves.

Climbing the Ice Glen Pine to calculate its cubic volume. Photo by Will Blozan.

On Sunday, we went to Ice Glen where we quickly raised the Rucker Index to 127.0 ft, courtesy of John Eichholz's keen eye. I have little doubt that the index will go slightly higher, perhaps to 127.5 or 127.6. The main event at Ice Glen was Will's climb of the old Ice Glen white pine. Because of the curvature of the upper trunk and the tangle of gnarly limbs, Will could not drop the tape vertically, but snaked it down the trunk. The length of the path was 155.8 ft. Consequently, we didn't change the pine's lasered height of 154.3 ft, which I suspect is within 0.2 or 0.3 ft of the tree's conventional height. The big deal was the volume modeling. Dale Luthringer stayed on the ground and recorded Will's girth measurements via walkie-talkie. From repeated girth measurements and subsequent calculations, Will calculated the volume of the Ice Glen Pine at 920 ft^3 of trunk volume. If the limbs were added, the volume would likely be just at 1000 cubes.

Don Bragg:

The 2006 Forest Summit/ENTS Rendezvous was the first of (hopefully) many such events I will attend. To date, the distance from Arkansas to Massachusetts or Pennsylvania had always been too far to travel, but this year's program happen to coincide with other professional meetings in Pennsylvania during that part of October, so I had no excuse this time.

We had a wet yet fascinating drive (yes, my family and I drove from Arkansas) to Massachusetts. Once the fog burned off, the fall colors in the hills and mountains of West Virginia were spectacular—the best we'd seen in several years. After a fabulous forestry field tour in the black cherry country of north-central Pennsylvania and a couple fun-filled days in Pittsburgh, we drove on to the vaunted hills and forests of New York's Catskill Mountains.

After a long day's drive, we finally arrived in western Massachusetts. It was dark by the time we got to our hotel in Pittsfield, so we weren't quite sure what to expect. As it turns out, the rain, fog, and clouds of a powerful fall storm kept us from seeing much of the landscape this day. As we made our way to Mohawk Trail State Forest, the rain increased in intensity, helping to swell each river and creek to bursting. Water cascaded down every little ravine, gulch, and draw in the hills, and our son had a fine time spotting all of the waterfalls these ephemeral rivulets produced.

After stumbling our way around the park, we finally figured out where we needed to go to meet up with the gang. Everybody was milling around, trying to figure out what the weather was going to allow us to do. In the end, we opted for a drenching yet fulfilling march amongst the sentinel pines of the Mohawk Valley. Having left my Impulse laser in the van (which, by this point, was in another part of the state), I had to satisfy myself with watching others scope out the big white pines. It was still refreshing to walk through the woods, rain or not, and experience the history and ecology of this forest. Superb!

View of the countryside from the top of the Ice Glen Pine. Photo by Will Blozan.

But the drenching rain and the need to move along towards the rest of the day's program finally prodded us out of the woods. We returned to the Charlemont Inn, and quickly took over a large portion of the bar and restaurant area, where we warmed ourselves with hot food and certain spirits. After an extended break to warm up and dry out, we settled into a "bonus" part of the program, with Lee Frelich and Ed Frank providing fascinating talks. We then sat down for a fine dinner before my part of the program.

After this, we concluded the evening at the Federated Church of Charlemont. Roman Dial provided a riveting "sermon" on his work in the tropics, with impressive rainforest giants that left Bob Leverett and the rest of us green with envy. Unfortunately, because of the need to return to the hotel to get our young children to bed, I missed the rest of that evening's program. The necessity of being in Pennsylvania for another meeting early the following week also meant that I had to pass on the Ice Glen pine climb, which must have been an adventure, given the bluster of that Sunday. We did find time to detour into the beautiful Green Mountains of Vermont, even though blowing snow and the press of time eventually turned us westward.

My next meeting was at Grey Towers, the impressive Pinchot family home that is now a historic site preserved by the Forest Service. This location has special meaning to foresters, and especially those of us in the Forest Service, as the Pinchot family did so much to encourage the implementation of scientific forestry to America. Gifford Pinchot was a man decades ahead of his time, and we have his energy and foresight to thank for much of the lands we see preserved and stewarded today. What many people don't realize is that his parents (James and Mary) single-handedly funded much of the forestry program at Yale University, even setting up a field camp on their Grey Tower property. Gifford's wife Cornelia was also a force to be reckoned with, and without her generosity, Grey Towers may not be the fantastic public resource that it is today.

Raymondskill Falls in the Delaware River Gap National Recreation Area. Photo by Don C. Bragg.

We saw incredible beauty in our few days in the Milford, Pennsylvania area—from the waterfalls of the Delaware River Valley to the rocky hills of the region. We also saw much to be saddened by—the spread of urban areas, and the inexorable march of the hemlock woolly adelgid. I know that if my children return to that vicinity to relive distant memories of their youth, they will go away disappointed, as the hemlocks that we hiked under fade into the past, and the drone of the highways increases.

But I'll finish my thoughts on a happier note—we also made a quick yet exhilarating sojourn to Cook Forest State Park in Pennsylvania, where Dale Luthringer happily accommodated my need to measure some tall white pines. Nothing like measuring 170- to 180-ft tall eastern whites on a crisp fall morning to get the blood pumping!

Edward Frank:

I arrived at Bob Leverett's house Thursday evening. As I walked in the living room I was greeted by many ENTS who had already arrived: Jess Riddle, Dale Luthringer, Will Blozan, Bob Leverett, Carl Harting, Anthony Kelley, Holly Post, Lee Frelich, and one person I didn't know, who turned out to be Dr. Michael Kudish. I heard an account of their day's activities

at Robinson State Park, general visiting and getting caught up with everyone. Later, Lee whipped out his flash drive and said, "Here is 400 years of fire history in the Boundary Waters!"

Eventually we all were off to bed. The next morning Holly, Michael, Anthony, and I went to Dinosaur Footprints Reservation. This is a small roadside park just a couple miles up the road from Bob's house. At the park, in the shadow of the roadway, is a series of dinosaur footprints in a sandy siltstone. The sign explains there are 134 footprints that make up 27 distinct pathways dating from 190 million years ago related to tectonics in the Connecticut River Valley taking place at that time.

Bob met us back at the house around noon or so, and we headed off to the Forest Summit so that various presenters in our party could get set up. After the introductions, Dr. Kudish gave his slide show on the Catskills and Adirondacks. He also had charts taped to stands that kept trying to fall over as we set up, and large maps taped to the walls. It was a different feel for his presentation—Dr. Kudish was particularly animated and used a series of props. For instance, at one point he donned a train engineer's hat and blew a wooden whistle that made train whistle sounds. Very animated and enjoyable…

Next was Lee Frelich's presentation on forest fire history in the Boundary Waters of Minnesota, showing how areas of fire have overlain each other, making a complex mosaic over time. The final portion of the program dealt with the Cavity Lake Fire from last summer (2006). There is a cliché that guys like explosions in movies. I must admit I enjoyed the photos of massive flames and destruction. Lee's student had study plots in the area to look at various forest processes. Then partway through that investigation there was a massive blowdown in the area, so the study became one of blowdown regeneration. Then there was the Cavity Lake Fire, and it became a study of the forest fire. I believe he said there were 750 plots with a lot of data from each of these intervening studies prior to the area being burned over by the fires—an excellent data set that likely has not been duplicated. He talked of a graduate student fleeing the oncoming fire by canoe. The fire jumped across a lake skipping from island to island, some as far as a mile apart. Lee posed the question—what are they accomplishing with firemen out there with shovels and rakes making fire breaks when the fire could jump a mile across open water? The massive amount of effort spent fighting the fire had no obvious effect on the overall fire progression.

The next talk was by Tom Diggins. He spoke of ongoing research at Zoar Valley and disturbances from wind and flooding in the history of the valley. He had nice charts of multivariate analysis—I am not sure how they work, but they looked impressive and seemed to mean something to Tom and others.

A profile image of the Ice Glen Pine. Photo by Will Blozan.

The final talk of the afternoon session was by Tony D'Amato on the structure and dynamics of old-growth forests in western Massachusetts. Tony gave an excellent overview of the various old-growth patches he had been studying. He had everything down well as he was preparing for an upcoming Ph.D. defense on the research. Most of the old-growth forests in western Massachusetts are dominated by hemlock systems—16 out of 18 study plots, I believe. What will become of these areas after the hemlock woolly adelgid?

After the session we helped Dr. Kudish gather his materials and we all went to dinner. We had pushed together perhaps eight or nine tables to make one long table. The staff seemed somewhat frazzled at the sudden influx of a couple dozen people at the giant table, but everything went well. Some people fussed about being late for the evening session and missing the presentations, but everyone on the agenda was sitting at the table.

The evening session started with a presentation of the Tsuga Search Project by Will Blozan and "colleague." The introduction was made by Will Blozan, but most of the presentation was by Jess Riddle. We had some fun with Jess at dinner because Gary had referred to him as "colleague" when listing the presentations. The Tsuga Search Project is partially funded by the National Park Service for Will and his team to document, climb, and measure the largest of the great hemlock trees in Great Smoky Mountains National Park, and chemically treat select groves to prevent their death from the adelgid infestation. Areas outside the park are being paid for out of pocket by Will and Jess, and others have made contributions to the fund. This was an excellent presentation and I don't know how to best summarize what was said (there is a section on the website dealing with the issue that includes more material by Will and Jess).

This session was followed by a series of three presentations on Robinson State Park in Massachusetts. Robinson is a relatively small park in an urban/suburban setting. Some timbering operations had been proposed by the state DCNR, and these were being opposed by some of the local population. Bob Leverett was asked/volunteered himself and ENTS to be a mediator in the issue. I was not sure I was pleased at this turn of events as the organization could be embroiled in a hot local political issue. At this stage the proposed operation has been put off for a year for further review. Local people can submit information on vernal pools and rare species that somehow had been "lost" sometime prior to the plan to remove timber from the site. I will not go into details, but I must congratulate Bob Leverett on the masterful job getting the parties to cooperate together and agree on some of the issues. I am optimistic the project will work out to the satisfaction of the various parties. My presentation was to close the evening, but after a series of debates and comments by various residents on Robinson State Park, time was running late, and the crowd would not have been responsive to my talk anyway.

The next morning we left for a field trip to Mohawk Trail State Forest. It was raining when we arrived. Everyone was waiting in a picnic shelter. Introductions were made. New faces included Roman Dial, his son and mother, and Don Bragg. We decided to go on the hike in the rain, but scratch the tree climb. We visited some of the named pine groves, the Jake Swamp Pine, the Norton Pine, and then a hike across the meadow, followed by some more trees and then back again. It was a chance for me to meet and talk to some of these people.

Once Bob called to make sure it was all right, we adjourned to the Charlemont Inn to change into dry clothes. After people ate and dried out, we decided to do a couple of presentations. Dale whipped out his digital projector from his van, Don Bragg got out a remote control that plugged into the laptop and controlled the slide show, and Lee Frelich and I both pulled out our flash drives. Lee gave a presentation on invasive earthworms and the effects on the forest. He added some information from personal observations made during the past few days in Massachusetts. The presentation went well and engendered a series of questions. Links to invasive worm information on the internet, Lee's stuff in particular, are on the website. I then gave my presentation intended for the evening before. I thought it went well. One slide was a composite of thirty or so smaller photos of ENTS members. That was all I could import into Power Point without it crashing on my laptop. Everyone was looking for their photo, or photos of others. On one slide I explained that the Tree Dimension Index was eventually called TDI because I was obstinate and argumentative…

After the presentations we had a nice meal before the evening's program. Don Bragg gave a talk right after dinner. It turned out to be on the big trees of Arkansas. He had many photos of impressive trees from the state. One was an enormous hollow shell. There also were slides of the Old-growth Summit field trip from last spring. From here we went to the Federated Church of Charlemont for the rest of the evening's activities. The first presentation was by Roman Dial. He has been featured in *National Geographic*, *Outside* magazine, and others for his work in the East Indies, Australia, and Borneo. Very impressive, with massive trees and great climbs! Much of this work was sponsored by National Geographic Society, so he may be limited in what he can send to the website and the *Bulletin*, but consider this a plea to send us what photos you can and perhaps some of your World Rucker calculations, Roman!

This presentation was followed by a cookie and cider session, and then the "Evening of Music Prose and Poetry" began. Monica Jakuc Leverett organized this event. It featured a series of musical selections played by Monica on the piano and sung by Peter Shea interspersed by various readings. My reading was after the first musical piece: *In the Willow-Meads of Tasarinan* (text by J.R.R. Tolkien) by Donald Swann. Then there was a selection from John Muir's article in *American Forests* from 1897. Other readers in the evening included: Ellice Gonzalez, "Inscription for the Entrance to the Wood" and "Lines on Revisiting the Country" by William Cullen Bryant, John Knuerr read "The North American Continent" by Thomas

Berry, and Bob Leverett read "Beyond Measure" by fellow Ent Pamela Briggs.

The music was an eclectic selection of music from people like Robert Schumann, Mrs. H. H. A. Beech, Greig, and Edward MacDowell. There were three distinct settings of Heinrich Heine's poem "Der Fichtenbaum" (Heine is a hobby of Peter Shea). He has a database of over 8,000 adaptations of Heine's work, and that is just for one or two voices and piano. He personally has collected 1,200 adaptations (he might have said more—I am not sure). One of these adaptations was written by Kaeza Fearn—the first performance of a new song composed for this occasion. Kaeza attended the concert event. The entire program was very well organized. I enjoyed the mix of readings and music and believe this format should be continued in the concert next year—if we can get Monica to organize another concert.

EDITOR'S NOTE: Ed's e-mail continued, but we shall spare you the details of the demise of his beloved Tracker…

Will Blozan:

Will provided many of the beautiful pictures in this article, especially the ones from the crown of the Ice Glen pine. 'Nuff said!

Picture of gnarled branches in the crown of the Ice Glen Pine. Photo by Will Blozan.

The current state champion cherrybark oak in the Cache River State Natural Area in southern Illinois.

Pictures by Beth Koebel.

LOOKING AT THE FOREST FROM THE TOP DOWN

Robert Leverett and Will Blozan

Eastern Native Tree Society

INTRODUCTION

As an organization, ENTS has been slowly, but inexorably, growing. As of the beginning of December, our membership stood at 143—the highest number of members we have ever had. But stability continues to elude us. New members come onto the ENTS e-mail list, get saturated with tree talk and the daily deluge of numerical data, and drop off the list, to be replaced by others. The trend is upward, but there are some long pauses. However, we do have a core of the faithful. Around 100 members have been carrying the torch now for several years.

If our increase in membership has been gradual, the ENTS database that holds our tree measurements has taken off like a rocket. Our adoption of a site-based documentation system has been the principal reason. We are presently collecting tree dimension data at more than 130 named forest sites and that number is steadily increasing. In two to three years, we will probably be reporting on 250 or more forest sites in the eastern U.S.

Throughout the past decade, we have improved on our methods for measuring tree dimensions, especially height, spread, and volume. Undeniably, tree stature has been our main focus, and we unabashedly proclaim ENTS to be the most proficient in the East. We now have a deep repository of tree height data that we can call upon to fine-tune our understanding of the maximum heights to which a number of important eastern species can grow. We'll continue improving on our determinations of maximum tree heights—species by species.

As a side benefit of our tree stature sensitivity, some of us can spot errors in the height measurement data of others at a glance, errors that otherwise go unrecognized. A core group of us can height-profile a couple dozen or more species across much of the range of those species. We are slowly but surely identifying where species of interest reach local, regional, and range-wide height maxima and what those maxima are. We will eventually produce a scientific paper on maximum heights of eastern species correlated to the key independent variables that may explain the maximum height. To our knowledge, no other organization or person(s) presently does this—at least not to the ENTS level of proficiency and accuracy.

To many interested in various aspects of trees, either professionally or as amateurs, our preoccupation with tree height often appears downright fanatical. It is true that the volume of high quality data that ENTS members have produced on tree heights has no equal and our zeal for adding measurements weekly is undiminished. But why have we chosen to collect so much data on tree heights? What fuels our passion? There are several reasons. Despite the ubiquity of dimensional data, the biggest single reason for our interest in tree heights is that our data are filling a large informational deficiency.

Back in the mid-1990s, we came to recognize that a large gap existed in the understanding of foresters, forest scientists, and naturalists about the maximum heights that different eastern species achieve locally, regionally, and range-wide. We observed that people who make their living growing, pruning, cutting, and studying trees seldom show serious interest and understanding of species maximums and only rarely spot suspect tree height data in otherwise authoritative publications. For example, inaccurately measured trees in the prestigious National Register of Big Trees often go unchallenged for years. And the problem isn't limited to the champion tree lists. In their classic "Forest Stand Dynamics," distinguished scientists Oliver and Larson cite a significantly mismeasured national champion red maple in Michigan at 179 ft tall. The authors apparently failed to recognize the improbability of a 179-ft tall red maple in Michigan. But, in fairness to the authors, they may have paid little attention to the numbers appearing in the National Register of Big Trees. Champion tree data often appear to serious scientists as little more than interesting tree trivia. However, when authoritative sources propagate inaccurate data, they clothe it in credibility. How is a trusting public to know? Who is inclined to challenge the data or sources? Obviously, we have, but how can we be so sure the Michigan's red maple's height is in error?

As a species, red maple has been measured to heights in the high 130s to low 140s in the Great Smoky Mountains National Park and to heights in the high 120s to the low 130s in the Northeast. One tree was measured to a height of 136 ft in Pennsylvania. But is 179 that far from 136 ft? The answer is yes, if you know the species. The tallest red maples usually grow in fairly dense stands where competition with their neighbors coaxes them to grow upward instead of outward. The Michigan tree grew in the open. How do we know this? ENTS president Will Blozan traveled to Michigan and measured this champion. The tree's actual height is right at 120 ft (twenty years *after* it was first measured). The difference between the published height and Will's measurement is an eye-popping 59 ft, an error equivalent to a whole tree. How could an error of such magnitude go unchallenged by American Forests, an organization that is supposed to have the expertise to recognize plausible height ranges for a common species like red maple? The short answer is that there is a lack of accurate data on species height maximums.

We could continue on this theme, but it is not the purpose of this article to point out the many measurement errors that ENTS tree measurers have discovered over the past decade. The point is that the tree height data that are commonly presented in both reputable scientific publications and champion tree lists are a mishmash of conflicting, erroneous numbers that confuse what a species can achieve. As a consequence, a number of important forests sites that are truly exceptional have gone largely unnoticed—at least until ENTS tree measurers identified them.

So what have we learned from our preoccupation with tree heights? We can best illustrate the state of our knowledge by using a particular species. Tuliptree, *Liriodendron tulipifera*, will be our focus for the remainder of this article. We will reveal some of what we now know about the stature of the tuliptree and contrast our understanding to what is published elsewhere. We will begin with what is in the literature about the maximum height of the tuliptree, and then we will turn to the ENTS database to profile the height maxima for the species.

HEIGHT PROFILE OF THE TULIPTREE

Non-ENTS Sources on the Height of the Tuliptree

Popular sources of information on the tuliptree often claim historical maximum heights of 200 ft and more. Tree guides usually list the maximum height of the tuliptree as numbers like 120, 150, 165, 190, or 200 ft, but seldom state where such maxima occur, and never how they were determined. A few sources even list the maximum height at a curiously low 100 ft. For a person interested in learning the true maximum height for the tuliptree, researching the existing sources of information for authoritative discussions leads nowhere. To illustrate this, the following table provides a look at what a number of presumed reliable Internet sources say about the maximum height of the tuliptree. In Table 1, the source of the maximum height is listed first followed by the Internet URL that led to the data. Maxima are usually presented by the sources as either up to a stated figure, the actual number, or the number and higher. We have also included a column identifying where the source stated that the maximum height is achieved.

The total number of references to "*Liriodendron tulipifera*" given by Google is around 341,000, so there is clearly no shortage of Internet information on the tuliptree. The 41 Internet sources chosen are weighted heavily toward university expertise situated in schools of forestry, horticulture, etc. The more one searches, the more that the pattern of maximum quoted heights of the tuliptree becomes clear. The citing of a 200-ft maximum utilizes information in the USDA Forest Service Silvics Manual. The 190 comes from a tree cut in the Great Smoky Mountains National Park. But very few of the Internet sources site the location or locations where 200-ft trees are to be found, or once were found. Five sources citing a maximum of 150 ft or more list the southern Appalachians as the location. Three sources did not consider maximum height to be important enough to list, and one source listed an improbable height of more than 250 ft.

It is apparent to us that all but an insignificant fraction of sources of the information on tuliptree height maxima do not have specific information. At least, if they do, they have chosen not to share it with readers. We acknowledge that two sources recognize Joyce Kilmer Memorial Forest as an outstanding site for tuliptree, but overstate its role. Three of the sources listed did not include maximum height and illustrate examples that exclude dimensional data.

The Sag Branch Tulip. Photo by Will Blozan.

Table 1. Maximum heights of the tuliptree as identified by 41 internet sources.

Source	Internet address	Max. height (ft)	Location(s) of species max.
Website for Hazard and Perry Counties	http://hazardkentucky.com/	250	Perry County, KY
Ohio Historical Society	http://www.oplin.org/tree/fact%20pages/tulip_tree/tulip_tree.html	200	Not Specified
Portland Parks and Rec.	http://www.portlandonline.com/shared/cfm/image.cfm?id=102654	200	Not Specified
Reed College	http://web.reed.edu/trees	200	Not Specified
USDA Forest Service	http://hort.ufl.edu/trees/LIRTULA.pdf	200	Not Specified
USDA Forest Service - Dr. Franklin T. Bonner	http://www.nsl.fs.fed.us/wpsm/Liriodendron.pdf	200	Not Specified
University Alabama-Huntsville	http://www.uah.edu/admin/Fac/grounds/TULIP.HTM	200	Not Specified
University of Kentucky – Coop. Extens. Service	http://www.uky.edu/Ag/Horticulture/kytreewebsite/pdffiles/liriodenprint.pdf	200	Not Specified
University of Tennessee Gardens	http://utgardens.tennessee.edu/ohld220/trees/liriodendron/index2.html	200	Not Specified
Wellesley	http://portal.cetadl.bham.ac.uk	197	Not Specified
Arnold Arboretum-Harvard University	http://www.arboretum.harvard.edu/plants/cent_intro.html	190	Not Specified
LSU	http://rnstreamer.lsu.edu/ecosystems	190	Appalachian coves
Virginia Department of Forestry	http://www.dof.virginia.gov/trees/poplar-yellow.shtml	190	Not Specified
Wikipedia	http://en.wikipedia.org/wiki/Liriodendron_tulipifera	165	Appalachian coves
Dictionary Labor Law Talk	http://dictionary.laborlawtalk.com/tulip_tree	164	Appalachian coves
About Forestry	http://forestry.about.com/od/hardwoods/ss/tuliptree.htm	150	Joyce Kilmer Memorial Forest
Auburn University	www.ag.auburn.edu/hort/landscape	150	Not Specified
Elisabeth Carry Miller Botanical Garden	http://www.greatplantpicks.org/index.php?page=display&id=2967&searchterm=all	150	Not Specified
University of Connecticut	http://www.hort.uconn.edu/Plants	150	Not Specified
University of Florida – Environ. Hort. Dept.	http://hort.ufl.edu/trees/LIRTULA.pdf	150	Joyce Kilmer Memorial Forest
Winona State Univ.		150	Not Specified
eFloras.org	www.efloras.org/florataxon.aspx	148	Not Specified
Native Plant Database	http://evergreen.ca/nativeplants/search/view-plant.php?ID=00779	121	Not Specified
Michigan State University	http://www.hrt.msu.edu/ash.alt/tulip_tree.htm	120	Not Specified
Yale University	http://www.yale.edu/fes505b/tulip.html	120	Not Specified
Fitzroy Gardens	http://www.fitzroygardens.com/Trees%20in%20the%20Gardens.htm	115	Not Specified
Coll. William and Mary	http://ccrm.vims.edu/wetlands/techreps/00-3-Tulip-poplar.pdf	100	Not Specified
Floridata	http://www.floridata.com	100	Not Specified
Magnolia Gardens Nursery	www.magnoliagardensnursery.com	100	Not Specified
N. Carolina State Univ.	http://www.ces.ncsu.edu/depts/hort/consumer/factsheets/trees-new	100	Not Specified
Ohio State University	http://ohioline.osu.edu/b700/b700_35.html	100	Not Specified
Ohio State University	http://hcs.osu.edu/pocketgardener/source/description/li_ifera.html	100	Not Specified
Univ. Illinois Extens.	http://www.urbanext.uiuc.edu/treeselector	100	Not Specified
Canopy	http://www.canopy.org/db/main.asp?tree=115	90	Not Specified
Penn State University	http://fgp.huck.psu.edu	70	Not Specified
University of Wisconsin	http://www.midwestlandscapeplants.org/plantdetails.cfm?speciesid=661	70	Not Specified
TVA	http://www.tva.gov/river/landandshore/stabilization/plants/tulip_poplar.htm	>50	Not Specified
Shenandoah NP	http://www.nps.gov/shen/naturescience/tuliptree.htm	Not given	Not Specified
Standford University	http://Trees.Stanford.edu	Not given	Not Specified
Virginia Tech	http://www.cnr.vt.edu/dendro	Not given	Not Specified

Editor's note: There is also a sign at the Fred Russ Forest Experiment Station in Cass County, Michigan, that reports a fallen former state champion tuliptree at 225 ft tall. The Cass County Parks Department website (http://www.casscountymi.org/) reports another tree at this site to be 180 ft tall, although recent sine height measurements with a laser found a height of 134 ft.

Table 2. Maximum heights of the tuliptree as identified by book sources.

Title	Author	Publish date	Publisher	Max. height (ft)	Location
Trees, Shrubs, and Woody Vines of Great Smoky Mountains National Park	Arthur Stupka	1964	University of Tennessee Press	Not Given	Not specified
The Best Loved Trees of America	Robert S. Lemmon	1952	Literary Guild of America	200	Not specified
The Complete Trees of North America	Thomas S. Elias	1987	Gramercy Publishing Company	200	Not specified
Trees Worth Knowing	Julia Ellen Rogers	1924	Doubleday Page & Company	200	Lower Ohio Valley
Trees of Pennsylvania and the Northeast	Charles Fergus	2002	Stackpole Books	200	Southern Appalachians
A Natural History of Trees	Donald Culross Peattie	1950	Houghton Mifflin Company Boston	200	Southern Appalachians
New England Natives	Sheila Connor	1994	Harvard University Press	200	Ohio River Valley
North American Trees (Audubon Society)	Barbara Burn	1984	Bonanza Books	200	Appalachian Valleys
Know Your Woods	Albert J. Constantine, Jr.	1959	Charles Scribner and Sons	200	Not specified
Michigan Trees	Burton V. Barnes and Warren H. Wagner	1981	University of Michigan Press	197	Michigan
Woody Plants of Maryland	Russell G. Brown and Melvin L. Brown	1972	University of Maryland	197	Not specified
A Field Guide to Trees and Shrubs	George A. Petrides	1958	Houghton Mifflin Company Boston	190	Not specified
Eastern Forests	John Kricher and Gordon Morrison	1988	Houghton Mifflin Company Boston	190	Not specified
Our Native Trees	Harriet Keeler	1934	Charles Scribner and Sons	190	Not specified
Field Book of American Trees and Shrubs	F. Schuyler Mathews	1915	G.P.Putnam's Sons-New York and London	190	Not specified
Trees and Shrubs of Virginia	Oscar W. Gupton and Fred Swope	1981	University Press of Virginia	190	Not specified
Our Friends the Trees	Dr. P.G. Cross	1936	E.P. Dutton & Co., Inc	190	Mississippi Basin
Trees of Arkansas	Dwight M. Moore	1999	Arkansas Forestry Commission	150	Not specified
Textbook of Dendrology	Harlow et al.	1996	McGraw Hill	120	Not specified

If these Internet sources are thought to be lacking on information for space reasons, consulting hard-copy publications does little to improve the quality or depth of the information on tuliptree height. Table 2 provides maximum heights for tuliptree as presented in some prominent book sources. Maximum heights listed for the tuliptree in popular tree guides range from 120 to 200 ft. A few sources qualify their information. For example, in his book on the trees of Arkansas, Dwight M. Moore states: "Tree credited with attaining height of 150 ft or more and diameter of 7 ft or more; one of the largest trees of eastern United States." (Moore 1999). In general, the authors of books faired better than the Internet sources in identifying where the maximum heights are achieved. Thirty-seven percent of the authors listed a location, albeit a large region.

Before leaving the non-ENTS sources of information about maximum tuliptree heights, we would be remiss if we didn't mention what has actually been measured and reported in the state and national champion tree lists. These lists utilize a formula that seeks to choose an overall size champion and seldom includes the tallest of a species. For those listed, heights are often exaggerated because of the methods used to measure height. We can state unequivocally that champion tree lists are not reliable sources of information about the tallest members of a species.

ENTS Data on the Maximum Height of the Tuliptree

We are left with the ENTS database to glean information about the maximum heights to which eastern tree species grow. Try as we have, we have not been able to confirm a height of 200 ft for *Liriodendron tulipifera*. In fact, we've yet to confirm 180 ft, although the odds are very favorable to eventually confirming a small population of tuliptree that reaches or slightly exceeds 180 ft. Perhaps a few isolated populations will exhibit individuals in the 185 to 190-ft class, but that has not yet happened. We must base our judgment on the maximum height that the tuliptree can attain from the data that we have collected from many outstanding sites.

We believe that these sites reveal the maximum height performance of the tuliptree across a broad latitudinal range. Admittedly, we have some holes in our database. The Midwest needs much more coverage, but we have visited highly acclaimed sites like Goll woods in Ohio, Pioneer Mothers Memorial Forest in Indiana, and Beall Woods State Park in Illinois. So, what do we know? Table 3 lists all the sites in the ENTS database with tuliptrees that are 140 ft or more in height. In the table, all sites are sufficiently separated geographically to warrant their treatment as distinct.

Table 3. Sites in ENTS Database with tuliptrees at least 140 ft in height.*

Site	Maximum height (ft)	Site	Maximum height (ft)
Great Smoky Mountains National Park (GRSM)-Big Creek, NC	178.3	Chestnutwood Mountain, NC	153.1
Laurel Creek Heritage Preserve, SC	177.0	Ricketts Glen, PA	152.9
GRSM- Oconaluftee, NC	176.1	Meeman-Shelby State Park, TN	151.5
GRSM- Deep Creek, NC	175.0	Addiss Cove Gap, GA	151.2
GRSM- Cataloochee, NC	173.5	Cohutta Wildlife Management, GA	150.9
GRSM- Greenbrier, TN	173.3	Welwynn Preserve, NY	149.6
Widen Stand, WV	173.2	Black Mountain, NC	149.4
Tamassee Knob, SC	172.5	Side of Mountain Creek, SC	149.0
GRSM- Cosby, TN	167.1	Brasstown Bald Wilderness, GA	148.3
Station Cove, SC	164.8	N. Prong Sumac Creek, GA	148.0
Joyce Kilmer Memorial Forest, NC	164.5	Carter's Grove, VA	147.7
Dry Branch, NC	164.1	Wintergreen Gorge, PA	147.4
Rock Creek Park, Washington D.C.	162.5	Overton Park, TN	147.4
Shelton Laurel, NC	162.2	Patterson Gap Roadless Area, GA	147.0
Savage Gulf State Park, TN	161.7	Cohutta Wilderness, GA	146.4
Wadakoe Mountain, SC	161.3	Cliff Creek, GA	146.3
Lilly Cornett Woods, KY	161.0	McConnells Mill State Park, PA	146.0
Lee Branch, SC	160.3	Green Lake State Park, NY	144.7
Belt Woods, MD	159.9	Flint Creek, Bankhead National Forest, AL	144.7
Fall Creek Falls, TN	159.7	Highrock Knob, VA	144.5
Till Ridge Cove, GA	159.4	Otter Creek, SC	144.0
Kelly Creek Roadless Area, GA	159.0	Cowpens Mountain, GA	143.6
Montpelier, VA	158.8	Alum Bridge, WV	142.6
Fairmount Park, PA	158.6	Storza Woods, GA	142.2
Panther Creek, GA	157.6	Corcoran Woods, MD	142.1
Chase Woods, MD	157.6	Buckeye Mountain, GA	141.7
Zoar Valley, NY	156.0	Camp Creek, GA	141.7
USFS- East Fork Chattooga River, SC	155.9	Webster Springs, WV	141.4
Vanderbilt Estate, NY	155.1	Cook Forest State Park, PA	141.4
Clear Creek, NC	155.0	Tyler Arboretum, PA	141.3
Tanglewood Park, NC	155.0	Carl Sandburg Home, NC	140.9
GRSM- Cades Cove	154.6	Robinson State Park, MA	140.9
Sosbee Cove, GA	153.7	Erie Bluffs, PA	140.3

Due to a large yet indefinite number of sites with 140 ft tuliptrees, selected southern Appalachian sites and districts in the Great Smoky Mountains National Park list trees > 160 ft. Undoubtedly, taller trees can be found on some southern Appalachian sites listed below.

Based on our data, we doubt that the tuliptree reached 200 ft historically, except maybe as very few, isolated trees—statistical outliers. However, there are many tuliptrees in the southern Appalachians that exceed 160 ft in height and we are documenting a growing number of sites with a small population of 170s. Several regions of GSMNP have been confirmed to have substantial numbers of 170s. The species seems to encounter a growth barrier above 170 ft.

We can say that range-wide there is a small population of tuliptrees that are between 170 and 175 ft in terms of actual numbers, and as a percentage distribution a miniscule population over 175. ENTS has sampled vigorous young trees, middle-aged trees, and old-growth specimens. A few sites in the Cataloochee District of the Great Smoky Mountains National Park in North Carolina have several trees above 170 ft and one site, Baxter Creek (also in North Carolina) has two dozen more. It is at these sites that we expect to see the species break 180 ft. But as tuliptrees age, their crowns tend to break up, so that the tallest members of the species are seldom old-growth specimens.

Using the data we have, let's now examine maximum tuliptree height as a function of latitude. Our data suggests that the range of latitude that includes tuliptrees of 170 ft or more in height spans about 3 degrees. Another 3 degrees covers trees reaching 160 to 169.9 ft, and finally, a final 3.5 degrees covers sites with trees in the 150 to 159.9 ft height range. The full range of 150-ft and above tall tuliptrees lies from approximately 33 to 42.5 degrees latitude. An important point is that the numbers are weighted heavily to the southern end of the distribution. There are literally thousands of tuliptrees reaching the 150-ft

threshold in the southern Appalachians, but a tiny number in sites above 41.5 degrees. Regardless, few other eastern species reaches such lofty heights as often as does the tuliptree.

An interesting pattern that we have observed for tuliptree in the species northeastern natural range limit is that its height drops rapidly in just a few miles. From 42.1 degrees latitude to 42.4 degrees, the species loses about 10 ft of maximum height potential. However, as one travels westward into central New York State, the lost potential is more than reclaimed. Tuliptrees in the mid-140s have been documented for Green Lake State Park, New York at 43 degrees latitude. At 42.4 degrees in western New York, a tuliptree has been measured to 156 ft in the Zoar Valley, although this tree appears to be a statistical outlier (tuliptrees to 145 ft are more typical for the site).

Another curious perception often left by browsing websites of arboretums and nurseries is that while "wild tuliptrees" can reach to heights of 150 ft or more, that the lawn variety reaches only modest proportions. Where short-stature tuliptrees are routinely observed, the answer is that homeowners are likely to cut down tuliptrees that get too tall and loom menacingly over homes. However, we often see exceptions. Yard tuliptrees in western Massachusetts and northwestern Connecticut are frequently found to be between 100 and 115 ft tall. A few specimens surpass 120 ft. There are likely countless tuliptrees farther south in yards and in medians of streets that surpass 100 ft and on occasion reach to heights of 130 or more ft. Asheville, North Carolina boasts open-grown tuliptrees to 130 ft tall. Urban parks often have tuliptrees in the 120 to 135-ft height range and sometimes above. Fairmount Park in Philadelphia, Pennsylvania has a tuliptree that has been measured to 158.6 ft, and probably has others over 150 ft.

FINAL OBSERVATIONS AND CONCLUSIONS

The availability of accurate data on maximum heights of eastern tree species, and where and under what conditions the maximums are attained, is for all practical purposes non-existent outside of the ENTS database. There may be some site-specific studies that adequately treat a few species, but if so, we have not found them. We often state that the champion tree lists are not reliable sources of tree height data, but there are a few exceptions. Champion tree program coordinators like Bob Van Pelt, Will Fell, and Scott Wade operate excellent programs. However, they are all ENTS members. There may be some independent coordinators out there doing a good job of making their lists accurate, but they are overwhelmed by the remainder who don't. Most state coordinators either don't measure trees themselves or feel compelled to accept, unchallenged, height measurements made by others, especially forest professionals designated to certify submissions by amateurs. The state certifiers ordinarily use a tape measure and clinometer and therefore make the type of measurement errors that ENTS has explained in its website description of measuring tree height.

As a result, we have witnessed reports of 150-ft tall, broad-crowned trees that in fact hardly break 100 ft. This has been especially prevalent for white oaks. But since a few white oaks do approach 150 ft in height in places like Great Smoky Mountains National Park, tree guides can legitimately state that the species approaches 150 ft in height. This allows certifiers to conclude that their measurements of 150 ft do not violate the maximums for the species as reflected in tree identification guides.

It is unfortunate that the only credible source of information on maximum heights of eastern species is ENTS. There is plenty of room for newcomers, but until such time as the subject is treated with greater seriousness, ENTS will remain the only reliable source for the maximum heights of eastern species. It keeps our plate full, but we're not complaining.

LITERATURE CITED

Moore, D.M. 1999. Trees of Arkansas. 5th ed. Arkansas Forestry Commission, Little Rock, AR. 142 p.

Ed Coyle at about 40 ft above the ground on the Sag Branch Tulip. Photo by Will Blozan.

FALLS CREEK FALLS STATE RESORT PARK, TENNESSEE: JULY 2006

Jess Riddle and Will Blozan

Eastern Native Tree Society

View of the Falls from above. Photo by Will Blozan.

Fall Creek Falls State Resort Park encompasses over 20,000 ac on the western edge of Tennessee's Cumberland Plateau. On the park's flat plateau lands, the state has developed several amenities (cabins, picnic areas, a lake, and a golf course) to accommodate travelers from Knoxville, Chattanooga, and Nashville, all about equidistant, but the central attraction of the park remains the waterfalls. Cane Creek, Falls Creek, and Piney Creek plunge over the thick, erosion-resistant layer of sandstone that forms the top of the plateau into two gorges that reach a depth of 600 ft. Cane Creek has the largest water volume, but the park's namesake fall has achieved the greatest notoriety for a 180-ft free drop. The waterfalls, gorges, and much of the undeveloped plateau lands now make up a state natural area.

Falls from below. Photo by Will Blozan.

Not surprisingly, steep slopes and copious boulders limited logging in the gorges. Previous estimates of old growth in the park range from 20 to 200 ac and suggest extensive selective cutting (Davis 2003). While loggers could have removed the largest tuliptrees and a few other valuable individuals, old trees occupy much of the Cane Creek Gorge, and the upper reaches of the gorge are likely untouched. Sandstone underlies that section of the gorge, so hemlock strongly dominates the canopy.

Farther down the gorge, layers of limestone allow a diverse, mixed mesophytic forest to develop on the north- and east-facing slopes. The rich forest generally resembles the forests of Savage Gulf, but pignut hickory, cucumbertree, and basswood are less common. Basswood still makes up a significant portion of the overstory and is mixed with sugar maple, hemlock, yellow buckeye, and smaller quantities of several other hardwoods. Under them grow yellow birch and a thin understory of striped maple. In early spring, acute-leaved hepatica, spring beauty, purple phacelia, and intermediate wood fern grew on the boulders and forest floor.

Large eastern hemlock. Photo by Will Blozan.

More surprisingly, uncut forests remain atop the plateau; however, these forests bear scant resemblance to the towering cove forests in the gorges below. Among the patchwork of developed areas, clearcuts of the last few decades, and mature second growth, several tracts, probably totaling hundreds of acres, of stunted oak forests survive on the gentle terrain of the plateau. Weathered white, post, and scarlet oaks form a low canopy with scattered black oaks and southern red oaks and patches of Virginia pine.

The dry forests boast an open understory except near the edges of the gorges where mountain laurel and chestnut oak are common. Unfortunately, significant sections of this forest may have been lost to development and cutting over the past few decades.

Table 1. Large tree dimensions at Fall Creek Falls State Resort Park in Tennessee.

Species	CBH (ft)	Height (ft)
Green ash	8.0	143.9
Green ash	6.9	146.7
White basswood	7.8	127.3
White basswood	6.2	135.1
White basswood	6.3	136.0
White basswood	6.2	153.2
American beech	8.0	127.3
American beech	10.2	127.6
American beech	8.3	131.7
American beech	10.2	136.3
Yellow buckeye	7.6	124.7
Yellow buckeye	9.1	139.4
American elm	10.1	96.0
American elm	9.2	111.7
Eastern hemlock	11.3	147.6
Bitternut hickory	7.9	134.1
Bitternut hickory	6.0	137.4
Shagbark hickory	6.7	146.1
Shagbark hickory	7.7	147.7
Sugar maple	8.2	127.1
Sycamore	7.6	132.9
Tuliptree	8.6	159.7

The 146.7 ft green ash is the second tallest known, and tallest in Tennessee. The basswood slightly eclipses one at Savage Gulf for the eastern height record, although Savage Gulf still has a greater number of tall basswoods.

The beeches may constitute one of the tallest known groves in the southeast, and the 136.3 ft individual is the second tallest ENTS has identified. No other site in the southeast is known to have multiple beeches over 130 ft, but that fact may change with additional searching at Meeman-Shelby State Park in western Tennessee.

Jess Riddle measuring large shagbark hickory in boulder field. Photo by Will Blozan.

Rucker Height Index = 142.8 ft
Tuliptree = 159.7 ft
White basswood = 153.2 ft
Shagbark hickory = 147.7 ft
Eastern hemlock = 147.6 ft
Green ash = 146.7 ft
Yellow buckeye = 139.4 ft
Bitternut hickory = 137.4 ft
American beech = 136.3 ft
Sycamore = 132.9 ft
Sugar maple = 127.1 ft

The Rucker Index is the third highest in Tennessee behind the Smokies and Savage Gulf, which rank one and two in the eastern U.S., respectively.

LITERATURE CITED

Davis, M.B. 2003. Old-Growth in the East: A survey. Appalachia-Science in the Public Interest, Mt. Vernon, KY. 249 p.

Falls panorama from overlook. Photo by Will Blozan.

Beech and ash forest. Photo by Will Blozan.

TALL TREES OF CHASE CREEK WOODS, MARYLAND: JULY 2003

Colby B. Rucker

Eastern Native Tree Society

EDITOR'S NOTE: This trip report by the now deceased Colby Rucker inaugurates a new aspect to the reports published in the Bulletin*. Prior to now, trip reports were relatively current explorations of stands, including visits to areas already documented. As Edward Frank astutely pointed out to me, these early reports are often some of the most groundbreaking efforts of the Eastern Native Tree Society, showing both the development of our measurement techniques and standards and insights into the evolution of the organization. For instance, the "…height index used by the Eastern Native Tree Society…" as referenced later in this paper is now called the Rucker Index in Colby's honor.*

I could not think of a more fitting tribute to Colby, a man I never had the privilege to meet, than to offer one of his elegant studies as the first example of these classic reports. In this report on Chase Creek Woods, Colby helps to define the scope and attention to detail we still strive to meet – and rarely do!

Chase Creek Woods is located at Arnold, in the highlands of the Severn River, in Anne Arundel County, Maryland. Anne Arundel has been called the northernmost county in southern Maryland; it has a variety of soil types and corresponding plant communities, but most are typical of the Mid-Atlantic Coastal Plain, where southern red oak, willow oak, sweet gum, pitch pine and sweetbay magnolia abound.

Chase Creek Woods differs in that these species are rarely encountered. The topography and soils are quite varied, offering suitable habitat for more than fifty native tree species. Elevations range from tidewater to 140 ft. The soils are sandy loam, silt loam, loamy sand, and alluvium. On the highest elevations, silt loams are underlain by nearly impervious subsoils, thereby supporting plants similar to those on lowland sites. Sandy intermediate-elevation terraces support more xeric plant communities. Deep ravines with rich soils and cool exposures form outliers for vegetation more typical of cove hardwood regimes above the Fall Line.

Much of the Chase Creek watershed was cleared over 300 years ago for the growing of tobacco and, more recently, for residential development. Perhaps half is still wooded, but highly fragmented. The existing wooded areas are old fields, narrow ridges, steep slopes, ravines and wetlands. Although some areas have been undisturbed for 75 to 100 years, logging has occurred in the past, resulting in a greater prevalence of tuliptrees on many sites. Despite these impacts, Chase Creek Woods is one of the county's outstanding natural areas.

Beginning in April 2000, approximately 150 ac of forest were studied, consisting of four tracts (listed as A, B, C, and D in Table 1) in private ownership. The letters for the otherwise unnamed study properties were used ensure privacy for the landowners.

The tallest examples of 56 taxa were measured, including seven naturalized species. An additional native species were seen, but were not included, being outside the study properties, immature (under fifteen feet in height), or of uncertain origin. Tree circumferences were measured at 4.5 ft above average grade. Heights of smaller trees were measured directly with a telescoping aluminum pole. Heights of taller trees were determined with a laser rangefinder in conjunction with a clinometer, using a pole for an accurate sighting point above screening vegetation.

MAXIMUM HEIGHTS

The following trees (Table 1) are the tallest of each species measured within the study area. Although specimens with larger trunk diameters were encountered, most of these were not as tall. The modest size of the study area suggests a similar genetic height potential within each species; therefore, the tallest examples usually occur on sites most conducive to height development for that species. While some species are present in very limited numbers, the maximum heights still reflect those species' place in the forest structure at this time.

These species have been divided into six groups. It is useful to consider what the trees within each group have in common. Each group has been named. This is not a description of forest types; a group may include species from both upland and lowland regimes. The approach taken here is more structural, and indicates typical canopy position for maximum height development. This yields a height profile for the entire study area. In the following list, the maximum height for each species is followed by the circumference at breast height (CBH) for that specimen. The habitat, soil and exposure for each specimen often show distinct patterns, which indicate the influence of those factors upon maximum height.

Table 1. Species, heights, circumferences, and habitat attributes of the tallest individuals at Chase Creek Woods, Maryland, in 2003.

Species	Scientific name	Height (ft)	CBH (ft)	Tract	Habitat	Soil	Exposure
			Mesic dominants: Low-slope position, east or north facing; circumneutral soils				
Tuliptree	*Liriodendron tulipifera*	157.6	9.6	A	cool ravine, base of slope	moist sandy loam	NE
Northern red oak	*Quercus rubra*	137.4	22.0	A	cool ravine, mid-slope	sandy loam	NE
Black oak	*Quercus velutina*	135.6	10.2	A	small ravine, low-slope	sandy loam	E
American sycamore	*Platanus occidentalis*	132.3	6.2	A	deep ravine, bottom	moist sandy loam	E
White ash	*Fraxinus americana*	132.0	8.7	A	cool ravine, base of slope	moist sandy loam	NE
Pignut	*Carya glabra*	124.1	5.4	A	deep ravine, low-slope	sandy loam	SE
			Sub-mesic dominants: Mixed slope position, often south-facing, soils more acidic				
Chestnut oak	*Quercus prinus*	124.8	5.5	B	broad ravine, low-slope	sandy loam	W
White oak	*Quercus alba*	121.4	8.3	A	ravine, low-slope	sandy loam	SE
American beech	*Fagus grandifolia*	119.5	10.3	B	broad ravine, low-slope	sandy loam	E
Mockernut	*Carya tomentosa*	117.2	5.9	A	dry ravine, broad upper swale	sandy loam	SE
Black cherry	*Prunus serotina*	116.5	6.6	C	upland, old-field	silt loam	E
Red maple	*Acer rubrum*	110.3	7.3	C	low-slope/swamp interface	loam/org./alluv.	SW
Bitternut	*Carya cordiformis*	108.3	6.0	C	mixed woods, mid-slope	sandy loam	S
Black walnut	*Juglans nigra*	107.1	7.9	B	ravine, mid-slope opening	sandy loam	SE
Sweetgum	*Liquidambar styraciflua*	103.0	5.8	B	upland, old-field	sandy loam	S
Blackgum	*Nyssa sylvatica*	98.5	5.5	B	swale, low end	loamy sand	W
			Dry-mesic: Usually sandy soils, south-facing				
Shortleaf pine	*Pinus echinata*	105.0	5.7	B	mixed woods, mid-slope	sandy loam	SE
Southern red oak	*Quercus falcata*	103.7	5.3	B	terrace, middle position	loamy sand	NW
Scarlet oak	*Quercus coccinea*	103.2	7.5	C	terrace, upper position	loamy sand	NW
Sand hickory	*Carya pallida*	88.9	5.3	C	mid-slope below terrace	loamy sand	S
Virginia pine	*Pinus virginiana*	85.2	4.5	B	upland, mixed woods	sandy loam	S
Bigtooth aspen	*Populus grandidentata*	81.9	2.6	C	terrace, middle, opening	loamy sand	S
Pitch pine	*Pinus rigida*	77.5	3.8	C	terrace, upper position	loamy sand	W
			Transitional zones: Solar access usually provided at upland/wetland or forest/field interface				
Ailanthus*	*Ailanthus altissima*	91.0	5.7	D	upland, interface influence	silt loam	E
Sassafras	*Sassafras albidum*	81.0	3.2	C	old-field, upper slope	silt loam	E
Black locust	*Robinia pseudoacacia*	79.9	3.5	C	low-slope, disturbed, interface	sandy loam	E
Black willow	*Salix nigra*	76.8	2.8	C	swamp/slope interface	alluvium	SW
Mazzard cherry*	*Prunus avium*	73.2	2.8	C	mid-slope, disturbance	loamy sand	SE
Paulownia*	*Paulownia tomentosa*	71.9	5.0	C	upper slope, disturbance	loamy sand	SE
Willow oak	*Quercus phellos*	66.2	2.4	D	upland, old-field interface	silt loam	E
American elm	*Ulmus americana*	63.4	2.3	C	upland, old-field, opening	silt loam	S
Boxelder	*Acer negundo*	59.5	6.5	C	mid-slope, opening	sandy loam	S
Persimmon	*Diospyros virginiana*	57.2	3.2	D	upland, old-field, interface	silt loam	SE
American holly	*Ilex opaca*	56.6	3.5	D	upper slope, interface	sandy loam	S
Eastern redcedar	*Juniperus virginiana*	55.9	4.0	D	upland, open/interface	sandy loam	S
American hornbeam	*Carpinus caroliniana*	50.8	3.0	C	slope above wetland interface	loamy sand	SE
Saul oak	*Quercus* x *saulei*	49.2	1.6	D	mid-slope, opening	sandy loam	S
Red mulberry	*Morus rubra*	46.4	2.4	D	upland, interface	silt loam	S
White mulberry*	*Morus alba*	46.3	1.6	D	upland, interface	silt loam	SE
American chestnut	*Castanea dentata*	46.1	3.3	B	terrace, edge, above interface	loamy sand	N
Callery pear*	*Pyrus calleryana*	39.2	1.4	C	low terrace, interface	silt loam	SW
Mimosa*	*Albizzia julibrissin*	31.5	0.8	C	low terrace, interface	silt loam	E

* Naturalized.

Table and article continued on the next page.

Table 1 (cont.). Species, heights, circumferences, and habitat attributes of the tallest individuals at Chase Creek Woods, Maryland, in 2003.

Species	Scientific name	Height (ft)	CBH (ft)	Tract	Habitat	Soil	Exposure
			Understory: Solar access often via windthrow openings				
Pawpaw	*Asimina triloba*	36.5	1.3	D	upland, mixed woods, opening	silt loam	W
Flowering dogwood	*Cornus florida*	33.3	2.0	C	mixed woods, mid-slope	sandy loam	E
Redbud	*Cercis canadensis*	31.8	2.2	D	upland, mixed woods, interface	silt loam	S
Poison sumac	*Toxicodendron vernix*	29.5	1.5	C	swamp, opening	organic/alluvium	W
Hazel alder	*Alnus serrulata*	27.7	0.7	C	swamp, opening	organic/alluvium	W
Blackhaw viburnum	*Viburnum prunifolium*	27.5	1.3	B	upper slope, opening	sandy loam	S
Hercules club	*Aralia spinosa*	26.6	1.2	C	upland, old-field, opening	silt loam	E
Staghorn sumac	*Rhus typhina*	20.4	0.8	C	upland, interface/clearing	silt loam	NW
Hackberry	*Celtis occidentalis*	19.5	0.7	C	low slope, interface	sandy loam	S
			Small arborescent specialists: Single-trunked examples of shrubby, shade-tolerant species				
Downy serviceberry	*Amelanchier arborea*	19.7	0.8	B	terrace, edge, above interface	loamy sand	N
Spicebush	*Lindera benzoin*	19.0	1.0	C	upland, old-field, opening	silt loam	E
Althea*	*Hibiscus syriacus*	19.0	0.7	D	upland, interface influence	silt loam	S
Whorled winterberry	*Ilex verticillata*	18.5	0.5	C	swamp, opening	organic/alluvium	W
Mountain laurel	*Kalmia latifolia*	17.7	0.8	B	terrace, edge, above interface	loamy sand	N
			Additional species				
Swamp chestnut oak	*Quercus michauxii*	Immature		C	exposed weedy swale	sandy loam	S
Post oak	*Quercus stellata*	Access not obtained		--	exposed slope below terrace	dry loamy sand	SW
Blackjack oak	*Quercus marilandica*	Access not obtained		--	exposed slope below terrace	dry loamy sand	SW
Winged sumac	*Rhus copallina*	Not relocated		C	cut & fill	sandy loam	S
Smooth sumac	*Rhus glabra*	Not relocated		D	upland, old-field, interface	silt loam	S
Witch hazel	*Hamamelis virginiana*	Immature		C	steep mossy swale below terrace	loamy sand	N
Sugar maple	*Acer saccharum*	Uncertain origin		C	wet ravine, low slope	moist sandy loam	E
American linden	*Tilia americana*	Uncertain origin		B	ravine, base of slope	sandy loam	E

* Naturalized.

FINDINGS

This study indicates that Chase Creek Woods is an important natural area worthy of protection. A height index used by the Eastern Native Tree Society indicates that Chase Creek Woods is the tallest privately-owned woodland known in the eastern United States, having an index of 130.2 ft for the ten tallest species. The variety of habitat supports large examples of nearly fifty native tree species. Twelve are the tallest of their species on record in Maryland: white ash, chestnut oak, American beech, black cherry, red maple, shortleaf pine, American hornbeam, pawpaw, poison sumac, hazel alder, blackhaw and whorled winterberry.

The 157.6 ft tuliptree is one of the tallest trees known to exist in Maryland, being surpassed only by 159.9 ft and 159.6 ft tuliptrees at Belt Woods. The tallest examples of seven species are also champions by the point system. In terms of height, girth and spread, the following were listed by the Maryland Forest Service in 2002 as state champions/co-champions: northern red oak, shortleaf pine, poison sumac, Hercules club, hazel alder, spicebush, whorled winterberry, and althea. The poison sumac and althea were listed by American Forests as 2002 national champions/co-champions.

The study also shows that laser-derived height indices can provide valuable data for a variety of forest studies. In the past, tree heights were difficult to determine, especially on steep terrain and in densely forested areas. Faulty techniques also led to inflated measurements, which have limited any scientific use of height data. With laser technology, accurate measurements provide maximum heights for each species, which helps to define their niche in specific environments.

A rather well-defined height index exists for each species where sufficient mature examples are available for measurement. Age and trunk diameter are less of a factor than expected, with some slender specimens being as tall, or taller, than well-formed specimens of much greater diameter. Eighteen species exceed 100 ft in height, and the average height of the ten tallest species is 130.2 ft. This maximum height index is very close to Belt Woods, a National Natural Landmark site in Prince George's County, Maryland, with an

index of 131.0 ft. These species are typical of cove hardwood forests, and are usually on low-slope mesic sites with a generally eastern exposure. Various herbaceous plants serve as indicators of unusually high soil fertility at these sites; some plants are state-rare or rare on the Maryland Coastal Plain.

Tuliptrees dominate the forest in most areas, and other species are at a height disadvantage. Small differences in maximum height indicate a need for the other species to occupy a niche that provides sufficient solar access to survive. On rich sites, the broad crowns of many oaks assure solar access despite the proximity of taller tuliptrees. Black walnut and sycamore benefit from windthrow openings on adjoining wetter soils. Steep slopes and southern exposures provide habitat for chestnut oaks, pines, and other species typical of a more xeric habitat.

On the sandy terraces, tuliptree displays poor form and many species, including scarlet oak, are competitive. Smaller species obtain solar access in windthrow openings and along interfaces, both forest/field and forest/wetland. Large trees in swamps are unstable, and windthrow provides numerous openings for smaller species. Some species, including black locust, bigtooth aspen and black cherry, are successful in a mid-successional role following disturbance. Shade-tolerance is important to survival by certain small species and saplings of larger ones.

Despite logging in the past, many old trees still exist. The largest tuliptree has a CBH of 19.8 ft; another has a trunk volume of 910 ft^3, and three specimens exceed 150 ft in height. Many blackgums are quite old; the largest measures 11.2 ft CBH. Old chestnut oaks are numerous, with CBH up to 13.1 ft. Other prominent specimens include numerous northern red oaks, black oaks, and American beech.

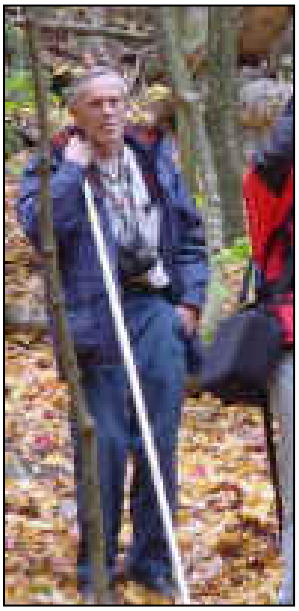
Naturalized tree species are seldom height-competitive, with white mulberry, paulownia, ailanthus and mazzard cherry being found on the more recently disturbed sites. Japanese maple, an escape, is present over about five acres and establishing well under tuliptrees, suggesting a more permanent role, similar to pawpaw and spicebush. Invasive plants were found at many sites, with English ivy, climbing euonymus, multiflora rose, cinnamon vine and Asiatic bittersweet causing serious alteration of the native forest.

CONCLUSIONS

While each tree species is adapted to various habitats, involving soil types, topography, hydrology and exposure, sufficient sunlight is essential; therefore, the genetic height potential of each species is inherent to its survival within those habitats. These height indices are closely graduated, giving small survival advantages to certain species. In cool rich northeast-facing coves, the mesic dominants, by their height, exclude most of the other dominant species. The drier nature of sites having lighter soils and progressively warmer exposures limits the height of mesic dominants, allowing the sub-mesic dominants to be competitive. Heights are limited even more on well-drained terraces and upland sites with loamy sand soils and a southwest exposure, permitting the dry-mesic species to be co-dominant.

Although many of the dry-mesic species exist as mid-successionals, they may be more permanent on a xeric site. Several small xeric sites, having post oak and blackjack oak on impoverished soils, exist nearby, but could not be accessed for study. The remaining species are relegated to progressively less dominant roles, according to height. Solar access is via transitional interfaces and windthrow openings, with the smallest species surviving by their shade tolerance. The total influence of these height factors dictates the structure of both the old-growth forest and the woodland disrupted by management practices.

Study by Colby B. Rucker, corrected to July 2003.



In memorial

Colby Rucker
April 26, 1937
To
November 23, 2004

Pictures courtesy of the ENTS website.

THE THOMASVILLE "BIG OAK"

Don C. Bragg

Research Forester, USDA Forest Service, Southern Research Station
P.O. Box 3516 UAM, Monticello, AR 71656

The Thomasville Oak is a large, spreading live oak growing near downtown Thomasville, Georgia. Live oaks are classic specimens of the antebellum South, and many such massive individuals still grace historical districts and plantation manors across the region.

As the picture shows, this ancient specimen is not particularly tall, although its girth of 24 ft is impressive. Most impressive (and typical of the species) is the extreme elongation of the lower branches, which reach out far from the stem, and usually hang low to the ground. This species is considered quite resistant to damage from hurricanes, no doubt due to the uniqueness of its architecture.

Many of these grizzled old veterans also carry a thick coat of resurrection fern, an epiphytic plant that shrivels to almost nothing as it dries out, only to reflush into brilliant green glory when soaked by rain.

The Thomasville Oak is easily located, once you get near downtown. The population of Thomasville is justly proud of this specimen, and have put up a number of signs to steer the curious straight to it. As an aside, the freshly cut branch on the picture below is the product of a vehicle collision (from a mail truck, I believe) that struck one of the large branches that extended onto a local road, much to the consternation of locals.

The Thomasville Oak. Picture by Don C. Bragg.

Beyond Measure

Prose By

Pamela Briggs

Trees, and their spirits, surround us—from cradle to coffin.

Trees are alchemists—transforming air, water, light, and earth.
They can flirt and swagger, flamboyant; or pose—dainty, elegant, solemn, or bizarre.

Like parents, they are older than we, and usually wiser.
They give freely, and we take—often, with more arrogance than gratitude.
We burn a hundred years of growth for an hour's worth of warmth.

They surrender their lives and their bodies in a thousand thousand ways.
Hazel and oak cradle us. Willow and cherry heal us.
Crisp apple and cinnamon tang fill our hungers.
Their unseen gifts sustain us—breath for our bodies; food for our souls.

Are wood spirits happy to shelter us? Are they proud to carry our words?
Do they thrill to the resonance of strings above them, beneath our hands?

If trees could run from us, they wouldn't run far.

Photo by David Katz

BEHIND THE SCENES

Robert T. Leverett

Founder, Eastern Native Tree Society

If you want a tree-measuring superstar, just call on the services of ENTS mathematician John Eichholz. On our Robinson visit yesterday, John went right to work and by day's end we had earned a detour to Friendly's where John introduced himself to the miracle of watermelon sherbet. Why had John earned the trip? Because we successfully raised Robinson's Rucker by 0.3 of a point from 118.2 to 118.5 ft! I expect that we'll eventually get Robinson's Rucker to 119. This day's celebration served as a reminder that we have to stay honest to our mission—we must intensify our search for a taller Valley white pine.

One side story worth presenting is the (yes, we did it again) remeasurement of the champion tuliptree. The species can be devilishly difficult to measure with lots of tops to test, one often behind another. Change your ground position by a couple of feet and the laser no longer returns bounces from the target twig. However, I wanted John's determination to represent another expert measurement and to stand beside Gary's and mine. So, we each measured the tulip from a different location. Gary got a 140.9 ft, I got a 140.9, and John got a 140.8. Two other measurements of mine were 140.6 and 141.1. I settled on 140.9. The tulip's girth is a highly respectable 10.5 ft.

So, why do we keep measuring the same tree? It's to get a cluster of measurements on the twig of interest, once we've zeroed in on the spot that gives us our highest readings. This may not happen for a couple or three visits, because we just don't find the same twig. But for the Robinson tree, we've now had Will Blozan, John Eichholz, Gary Beluzo, and myself measure the tree and all of us have gotten at least one measurement over 140 ft. We've also got measurements in the 139.0 to 139.9 range.

However, as Ed Frank points out, choosing the right measurement is not a process of averaging. It is a process of locating the spot in the crown of the tree that gives the highest readings, taking repeated measurements of that spot, examining the patterns. That way, spurious returns can be identified and eliminated, and checks can be made on clinometer readings when the device sticks.

I have never thought of tree-measuring as a group activity, but there is a lot depending on the height of the big Robinson tuliptree. Uh, okay, Bob, you ask: what specifically is at stake? Well, as of yesterday, the Robinson tree became the tallest tree of any species to be measured in the Connecticut River Valley. The 140.9 ft figure surpasses two Valley white pines, both of which are a hair over 140 ft. In addition, at least four other tuliptrees in Robinson surpass 130 feet. What is Robinson's competition? There are three tuliptrees in a stand in Northampton over 130 ft and an isolated tuliptree on U.S. Route 20 just over 130 ft. So far, that's all… The number of other hardwood species in the Valley that have been measured to over 130 feet in height stands at one species—American sycamore. We've found one sycamore in that class, and it grows in Easthampton. That worthy individual stands at an impressive 137 ft, but based on all the other sycamores we've measured it is a statistical outlier.

Courtesy of Robinson State Park, we have a white ash at 127.0 ft, but none that reach the magic 130. The northern red oak in Robinson weighs in at 117.2 ft. It is tops of its species in the Valley. Somewhere there may be an eastern cottonwood that brushes 130, but darned if I can find it! Eventually, John Eichholz, Gary Beluzo, or I will confirm a Valley pine to 141 or 142 ft, but until that happens, the Robinson State Park tuliptree is the "Lord of the Valley."

We now have our work cut out for us. We need to scour the Westfield River corridor, to include its Little River tributary for other tuliptree spots. It isn't enough to know that they are present, somewhere, but how well they are doing in the Connecticut River Valley and its tributaries. It is all part of our tuliptree profiling and we're gradually making headway across the range of the species.

The big tuliptree we measured in the new location that we visited dresses out at an impressive 136.0 ft in height and 11.4 ft in girth. So these aren't pencil-thin trees that shot up through an opening to significant heights, but would hardly be noticed except to height measurers. These are impressive trees!

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:

Don C. Bragg
Editor-in-Chief, *Bulletin of the ENTS*
USDA Forest Service-SRS
P.O. Box 3516 UAM
Monticello, AR 71656

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.

Graceful eastern white pine planted adjacent to Grey Towers in Milford, Pennsylvania. Grey Towers was the Pinchot family home, and much of the effort to restore American forestlands and shape the profession of forestry in the United States started here.

Photo by Don C. Bragg.