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Eastern Native Tree Society

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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 is free when you sign up for our discussion group, ENTSTrees, at: http://groups.google.com/group/entstrees?hl=en. Submissions to the ENTS website in terms of information, art, etc., should be made to Edward Frank at: ed_frank@hotmail.com

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COVER: Morel mushrooms (members of the genus* Morchella*) appear in the spring of the year and present a tasty (if well-guarded) treat for those who know their habits. Photo by Laurie Bragg-Valasky.

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WHAT IS THE FUTURE OF ENTS?

Those perceptive readers may notice that Larry Tucei's stylish image is again featured on this page. Larry epitomizes the energy and enthusiasm that members of ENTS have become known for—his intensity and interest in documenting the giant live oaks of the American Gulf Coast is legendary. Larry is also like the vast majority of the membership of ENTS: he is not a pedigreed academic, but rather someone with a passion for special trees and forests and the willingness to step up and contribute his own time and talent to the description of tree attributes that too many of my fellow scientists are, well, less than enthusiastic about collecting.

The work of all ENTS members is vital to both our personal well-being and the progress of science (and even art). Think of people like Bob Leverett or Will Blozan as "evangelists" about their passion for the measurement of large trees, wise forestry practices, and the protection of special places. Their message has spread far and wide, and is even beginning to creep into the mainstream forestry literature, as can be seen by the recent publication of the ENTS height measurement method in *The Forestry Source*, a membership newspaper distributed by the Society of American Foresters. ENTS membership has grown appreciably during recent years, too.

With this growth have come calls for introspection and visioning from long-time members such as Ed Frank and Gary Beluzo. We truly stand at a crossroads in the history of this organization, and it will be interesting to witness how ENTS transforms itself into the future. Having just watched the most recent *Terminator* movie, I can't help but think that we have no real future but that we make for ourselves, and it will be the passion of the individual members that carries the day.

Don C. Bragg
Editor-in-Chief

Larry Tucei stands next to a giant live oak along the Gulf Coast. Photo by Larry Tucei.

ANNOUNCEMENTS AND SOCIETY ACTIONS

ENTS Rendezvous at Cook Forest Set

Dale Luthringer reports that the biennial Cook Forest ENTS Rendezvous has been scheduled for October 3-4, 2009, at Cook Forest State Park near Cooksburg, Pennsylvania. Dale promises more details to follow shortly…

Ninth Old-Growth Forest Conference to be Held in October

The Ninth Old-Growth Forest Conference will be held October 22-23, 2009. Bob Leverett also promises more details as the planning for this meeting continues.

Errata

CONGAREE SWAMP NATIONAL PARK MEASURING BLITZ: FEBRUARY 2009
Will Blozan, James Parton, and Larry Tucei

In this article, Larry Tucei's part had incorrectly identified redbay (*Persea borbonia*) as a loblolly bay (*Gordonia lasianthus*), and incorrectly had a 72.2 ft *Carpinus* as 132 ft tall. This has also been corrected in the PDF version of the *Bulletin of the Eastern Native Tree Society* (volume 4, issue 2) on the ENTS website.

Also, this issue contained a number of errors in the title of the Congaree park—rather than "Congaree Swamp National Park," the formal name is "Congaree National Park." This error has been corrected throughout this issue, and we apologize for any confusion this may have caused.

A grove of ancient baldcypress along the Saline River in Ashley County, Arkansas. Even though cypress was heavily logged from this region in the 1800s, untold numbers of hollow or defective old trees remain today. Photo by Don C. Bragg.

Beth Koebel's 2009 Tri-State Forest Stewardship Conference Report

Friday, March 13, 2009—I left work and started to drive to Dubuque, Iowa. There wasn't much to see driving along all this interstate except I was pleased to see the expansion of a medium-sized wind farm along I-155. As I drove north from the Quad Cities, I noticed that the Quad Cities have a nuclear power plant right next to the river…I wonder how a nuclear power plant on a floodplain ever got approved. Along the east side of Ill-84 just north of Savanna, Illinois is Mississippi Palisades State Park:

http://dnr.state.il.us/lands/Landmgt/PARKS/R1/PALISADE.HTM

The river here is at an elevation of 720 to 750 ft and in of a space of approximately one-half-mile there is a rise in elevation along the banks of about 250 ft. Since the hillsides are so steep and I didn't see any evidence of any tree cutting I think that this may be an old growth remnant. I also noticed that there were white or paper birches (*Betula papyrifera*) here.

North of this park Illinois Highway 84 leaves the river-side and goes into Galena, Illinois. It is here where at one time General U.S. Grant lived and the highest point in Illinois is just outside of town at Charles Mound, elevation of 1235 ft above sea level (the lowest point of Illinois is on the Mississippi River near Cairo, at 279 ft).

Rock formations along the highway at Mississippi Palisades State Park. Photo by Beth Koebel.

On Saturday, March 14, I arrived at Sinsinawa about 8 a.m. after getting lost in Wisconsin. This gave me time go and talk to the vendors, some of which I expected, such as the Illinois Forestry Association, the US Forest Service Northeastern Area, and Wisconsin Department of Natural Resources. One of the vendors that I saw was Driftless Area Initiative (http://www.driftlessareainitiative.org/index.html), which is an organization trying to build awareness on the over 24,000 square miles of land in this region bypassed by the last glaciers as they advanced south. The Driftless Area includes the southeastern corner of Minnesota, the southwestern corner of Wisconsin, the northeastern corner of Iowa, and the northwestern corner of Illinois.

At 9 a.m. all 550 attendees gathered in the auditorium for announcements and door prizes. At 9:30 a.m. Todd Batta, Democratic Professional Staff spoke on *The Farm Bill and what it means to Forestry and Conservation in the Midwest*. Batta, a graduate of Winona State University, works for Chairman Harkin on the Committee on Agriculture, Nutrition, and Forestry as a Legislative Assistant. His primary responsibilities on the Committee were Credit, Forestry, Rural Development and Appropriations polices. I tried to listen and understand what he was saying but I was dumbfounded at one of his slides. This slide showed where the money was appropriated. The biggest hunk (over 66%) went to nutrition (food stamps, school lunch programs, WIC, etc.), 14% went to subsides for farm crops, 9% went towards conservation, 8% went to crop insurance, <1% went to foreign food aid. All I gathered from this lecture (outside of a headache) was something we all know—forestry is way under funded.

This year the conference tried something new with the sessions. They limited the attendance to two of the topics: 25 people to "Applying GIS/GPS to Your Woodlands" and 50 to "Chainsaw Use: Directional Felling and Storm Damage Removal." Not only did they place a limit on them but they also extended them for two sessions in a row. As my family just got through digging out our pond I had two topics that I wanted to take, "Aquatic Vegetation Control: Physical, Biological, and Chemical Control Measures!"

and "Pond Management: Selecting the Right Fish for Your Pond and the Long-term Management Needs." Both talks were given by Rich Clayton, an Extension Specialist in Aquaculture and Fisheries within the Department of Natural Resource Ecology and Management at Iowa State University. First, Clayton covered the basic pond life web so everyone understood that if you fish in your pond you need to have plants in there too. He then stated that you need to identify the plant that you want to get rid of and figure out how this is going to affect the rest of your pond.

Clayton then covered how to physically getting the plants out and not only out of the pond but out of the watershed of the pond. You don't want the plant to decay and then have that nitrogen find its way back to the pond. Unless you have a big pond, say several acres, you are going to be pulling plants out by hand as the cost to own/rent a machine to do this for you is way to expensive for most people. He also mentioned grass carp (*Ctenopharyngodon idella)* as a biological control. I thought that grass carp was considered an invasive species and before I could get that out of my mouth he said "Make sure to use triploid grass carp." I still don't like the idea. Guess you say I think like Jeff Goldblum's character in *Jurassic Park* – "Life will find a way."

Now, since I am lazy so I am not going out and pulling out plants by hand and I am not going to vote for the use of the carp, I guess that leaves chemical removal of the weeds. The main compound used for this is copper compounds, copper sulfate and chelated copper, but the others mentioned where 2,4-D, diquat, endothall, fluridone and glyphosate. Copper sulfate (cupric sulfate pentahydrate) "is available as either a crystal or a powder and is known as 'bluestone' or 'powder blue'" according to *Managing Iowa Fisheries: Use of Copper Compounds in Aquatic Systems*. This handout also states that you have to find out the alkalinity (in parts per million (ppm)) as the dosage rates depend on this. If the alkalinity is $\leq$ 40 ppm you should not use it. Another time you should not use copper compounds is when dealing with salmonoids (e.g., trout and salmon), as copper is toxic to them. Copper compounds are also oxygen depleters so you should treat lightly and only a quarter to a third of the area and then wait for two weeks before applying any more. The final piece of advice: **ALWAYS FOLLOW THE LABEL INSTRUCTIONS.**

During the third session Rich Clayton talked about stocking fish ponds. Now, of course, what you stock the pond with depends on what the purpose the pond is there for. If it is there just to look at then you don't have to stock it. If you want to admire Koi of course you are going to stock it with koi. If you are looking to fish from it then you should have some fish that eat the plants and/or insects, some fish that will eat the dead fish and plants and other debris on the pond floor, some fish that will eat the other fish. The three fish that are commonly used is these "slots" are bluegill, channel catfish, and largemouth bass, respectively. Or you could use hybrid bluegill, redear, green, or longear sunfish instead of the regular bluegill. He stated that crappie was not a good idea in a small pond as it will result in a large number of small size fish. You could use other species of catfish like blue, flathead, or black bullhead. Keep in mind that you will have to restock catfish every so often as they normally don't breed in ponds. As far as the largemouth bass, you could substitute other bass species such as spotted, smallmouth, striped, or white bass. You could even leave out the bass and use walleye. The choice is up to you.

The first session I attended a talk on selling carbon credits. This talk was given by Dave Miller, the Chief Science Officer for AgraGate Climate Credits Corporation and the director of research and commodity services for the Iowa Farm Bureau Federation. He spent nearly 20 minutes out of the hour explaining how AgraGate is an offshoot of the Iowa Farm Bureau. I didn't think that was good time management but then whom am I to question such things. He talked about the Carbon Credit Market in Chicago and how it has being up and running for six years now. Basically how it works is that lets say Ameren's coal power plant in Labadie, Missouri has a output of 50,000 tons of CO_2 per year (I have no idea how much CO_2 is emitted—I am just throwing out numbers here). Now here comes along President Obama and says that they can only release 20,000 tons of CO_2 per year. Ameren can retrofit the plant so it only releases 20,000 tons of CO_2 per year or they can buy 30,000 Carbon Credits on the Carbon Credit Market. Where does the Carbon Credits come from? They come from landowners who are willing to plant certain amount of trees. How many carbon credits depend on many acres and how many trees and which trees are planted.

The last session that I attended was titled "Tips and Tricks to Grow Seedling from Seed." This lecture was given by Paul Wray, who retired from Iowa State University in 2006. Out of all the lectures that I went to I got the least out of this one. This was about planting tree seeds like a crop of beans or corn. He talked about how some seeds germinate right away, white oak (*Quercus alba*) and some require stratification, walnut (*Juglans nigra*) and the advantages and disadvantages of direct seeding. Advantages that he mentioned were that the trees develop an normal tap root, the trees don't go through transplant shock, may result in higher number of trees per acre, and planting in such high numbers the trees suffer less damage from deer and rabbits because the animals are overwhelmed by the large number of trees (I agree with all of his advantages except the last one). The disadvantages that were mentioned were germination is not perfect, thus requiring larger number per area than seedling planting, animals eating the seed, controlling the weeds, gathering the seed in the first place.

Derivation of Key Cone and Paraboloid Formulae and a General Taper Equation

Robert T. Leverett,[1] Will Blozan,[2] and Gary A. Beluzo[3]

[1] Executive Director, Eastern Native Tree Society; [2] President, Eastern Native Tree Society; and [3] Professor of Environmental Science, Holyoke Community College, Holyoke, MA

INTRODUCTION

Most of the formulae presented in our recent article (Leverett et al. 2008) are not likely to be familiar to readers whose familiarity with the cone and paraboloid is through the traditional approach of analytic geometry, which develops equations of form, such as the cone, as a locus of points meeting certain criteria. Geometric solids are generated by rotating plane figures around a vertical or horizontal axis. For example, if half a parabola is rotated around the appropriate axis, the result is a paraboloid.

The formulae that we present in this paper are derivatives of original curve forms needed to generate the cone, parabola, or neiloid. The resulting formulae provide the reader with a distinct perspective on how volume is accumulated with increasing height from either the apex or base of the solid or for a frustum. Some derivations are algebraic manipulations. For example, the first two derivations are purely algebraic. However, most of the derivations require integral calculus.

VOLUME OF FRUSTUM OF PARABOLOID

Suppose we want to derive a formula for the frustum of a paraboloid that does not include the quantities R or H, but includes only variables associated with measurements of the frustum, namely height and the radii of the top and base. Two basic formulas are needed for this derivation:

$$r = R\sqrt{\frac{H-h}{H}} \qquad [1]$$

$$V = \frac{\pi R^2}{2H}\left[\left(h_2 - h_1\right)\left(2H - \left(h_1 + h_2\right)\right)\right] \qquad [2]$$

In order to rid ourselves of R and H, we impose the restriction that the frustum begins at the bottom of the parent paraboloid., allowing us to substitute r_1 for R and set h_1 to 0. Thus, $R = r_1$, $h = h_2$, and $h_1 = 0$. We can then substitute in the first equation:

$$r_2 = r_1\sqrt{\frac{H-h_2}{H}} \qquad [3]$$

and by reorganizing, we can solve for H:

$$H = \frac{r_1^2 h_2}{r_1^2 - r_2^2} \qquad [4]$$

We then substitute in the formula for the frustum of a paraboloid (equation [2]):

$$V = \left(\frac{\pi r_1^2}{H}\right)\left[h_2\left(H - \frac{h_2}{2}\right)\right] \qquad [5]$$

and insert equation [4] into [5] to express H in terms of r_1, r_2, and h_2:

$$V = \frac{\pi r_1^2}{\left(\frac{r_1^2 h_2}{r_1^2 - r_2^2}\right)}\left[h_2\left(\left(\frac{r_1^2 h_2}{r_1^2 - r_2^2}\right) - \frac{h_2}{2}\right)\right] \qquad [6]$$

This expression can be simplified to arrive at:

$$V = \frac{\pi h}{2}\left(r_1^2 + r_2^2\right) \qquad [7]$$

In this last step, we substitute h for h_2 because h_2 is just the height of the frustum, given that $h_1 = 0$. Equation [7] takes a surprisingly simple form, which is computationally desirable.

The paraboloid formula ([7]) can be used to determine an equivalent formula based on radius r, since it assumes height is measured from the apex instead of the base. Thus:

$$r^2 = R^2\frac{h}{H} \qquad [8]$$

and

$$V = \frac{\pi R^2}{2H}\left[\left(\frac{H_2^2}{R^2}\right)^2 - \left(\frac{Hr_1^2}{R^2}\right)^2\right] \qquad [9]$$

which can be reduced to:

$$V = \frac{\pi H}{2R^2}\left(r_2^4 - r_1^4\right) \qquad [10]$$

As with equation [7], this form ([10]) also allows for the calculation of the volume of a frustum of a paraboloid.

A more complicated formula for this frustum is listed below:

$$V = \frac{\pi R^2}{H}\left[\left(h_2 - h_1\right)\left(H - \frac{\left[h_1 + h_2\right]}{2}\right)\right] \quad [11]$$

This form is algebraically equivalent to equation [2]. Either formula gives the volume of a paraboloid frustum measured from the base toward the top of the frustum.

We will now derive the formula we want using the integral calculus. We begin with the equation of a parabola of basal radius *R* and height *H*. The formula returns radius as a function of height from the base. Squaring both sides of equation [1] leads to:

$$r^2 = R^2\left(\frac{H-h}{H}\right) \quad = \quad \frac{R^2}{H}\left(H-h\right) \quad [12]$$

The volume of a frustum with its base at h_1 units above the paraboloid base and top at h_2 units above the paraboloid base can be expressed by the definite integral:

$$V = \int_{h_1}^{h_2} \pi r^2 dh \quad [13]$$

We then evaluate the definite integral in terms of h_1 and h_2:

$$V = \pi \int_{h_1}^{h_2} r^2 dh \quad [14]$$

$$V = \pi \int_{h_1}^{h_2} \frac{R^2}{H}\left(H-h\right) dh \quad [15]$$

$$V = \frac{\pi R^2}{H}\left(\int_{h_1}^{h_2} H\, dh - \int_{h_1}^{h_2} h\, dh\right) \quad [16]$$

$$V = \frac{\pi R^2}{H}\left(\left[Hh\right]_{h_1}^{h_2} - \left[\frac{h^2}{2}\right]_{h_1}^{h_2}\right) \quad [17]$$

$$V = \frac{\pi R^2}{H}\left(\left[H\left(h_2 - h_1\right)\right] - \left[\frac{\left(h_2^2 - h_1^2\right)}{2}\right]\right) \quad [18]$$

We factor out ($h_2 - h_1$), giving us the final desired form:

$$V = \frac{\pi R^2}{H}\left[\left(h_2 - h_1\right)\left(H - \frac{\left(h_2 + h_1\right)}{2}\right)\right] \quad [19]$$

VOLUME OF FRUSTUM OF CONE FROM THE APEX

The formula:

$$V = \frac{\pi}{3}\left(\frac{R}{H}\right)^2\left(h_2^3 - h_1^3\right) \quad [20]$$

looks improbable as belonging to the cone because of the two cube factors. However, it is correct. First, we start with the formula for radius of a cone starting from the apex instead of the base:

$$r = R\left(\frac{h}{H}\right) \quad [21]$$

The volume of the cone is given by the integral:

$$V = \int_{h_1}^{h_2} \pi r^2 dh \quad [22]$$

Substituting for r^2, we get:

$$V = \pi \int_{h_1}^{h_2} \left(\frac{R}{H}\right)^2 h^2 dh \quad [23]$$

which simplifies to:

$$V = \pi\left(\frac{R}{H}\right)^2 \int_{h_1}^{h_2} h^2 dh \quad [24]$$

When evaluated, this can thus be reduced to:

$$V = \pi\left(\frac{R}{H}\right)^2 \left[\frac{h^3}{3}\right]_{h_1}^{h_2} \quad [25]$$

which is equivalent to equation [20]. This derivation illustrates how we can compute the volume of a cone of height *H* and radius *R* that lies between two points on the cone as measured from the apex.

VOLUME OF FRUSTUM OF CONE FROM BASE

The last formula is for the volume of a frustum of a cone lying between two points represented by heights, but measured from the base instead of the apex. To derive this formula, we begin with the equation for the radius *r* at height above the base:

$$r = R\left(\frac{H-h}{H}\right) \quad [26]$$

$$V = \int_{h_1}^{h_2} \pi r^2 dh \quad [27]$$

But,

$$r^2 = \frac{R^2}{H^2}(H-h)^2 \quad [28]$$

and

$$V = \pi \frac{R^2}{H^2}\int_{h_1}^{h_2}(H-h)^2\,dh \quad [29]$$

To simplify, let $u = H - h$. From this definition of u, it follows that $dh = -du$. We can then substitute and simplify:

$$V = -\pi \frac{R^2}{H^2}\int_{h_1}^{h_2} u^2 du \quad [30]$$

$$V = -\frac{\pi R^2}{3H^2}\left[u^3\right]_{h_1}^{h_2} \quad [31]$$

$$V = -\frac{\pi R^2}{3H^2}\left[(H-h)^3\right]_{h_1}^{h_2} \quad [32]$$

This then yields the final form:

$$V = -\frac{\pi R^2}{3H^2}\left[(H-h_2)^3 - (H-h_1)^3\right] \quad [33]$$

This completes our sample of derivations of cone and paraboloid forms.

THE NEILOID

The sides of the neiloid are concave, so its volume is less than that of the cone. The neiloid form applies near the base of tree trunks exhibiting root flare. The neiloid may also apply to the section just below a limb bulge. The formula for the volume of a neiloid as often shown in forest mensuration texts is:

$$V = \frac{1}{4}\pi r^2 h \quad [34]$$

It is not always clear what underlying curve form gives rise to this volume formula. However, the formula can be derived from assuming the following curve form:

$$r = R\left(\frac{h}{H}\right)^{3/2} \quad [35]$$

The volume of the neiloid can be derived from the definite integral:

$$V = \int_0^H \pi r^2 dh \quad [36]$$

A series of substitutions produces:

$$V = \pi \frac{R^2}{H^3}\int_0^H h^3 dh \quad [37]$$

which can be simplified to:

$$V = \frac{1}{4}\pi R^2 H \quad [38]$$

This is the form we seek, and is virtually identical to [34]. If we substitute h_1 and h_2 for the limits of integration in [38], we can then derive the formula for the frustum of the neiloid:

$$V = \pi \frac{R^2}{4H^3}\left(h_2^4 - h_1^4\right) \quad [39]$$

If we start from the base and measure toward the vertex, the taper formula is:

$$r = R\left(\frac{H-h}{H}\right)^{3/2} \quad [40]$$

Using a similar derivation process as above, we can arrive at a frustum volume formula:

$$V = -\pi \frac{R^2}{4H^3}\left[(H-h_2)^4 - (H-h_1)^4\right] \quad [41]$$

We will stop here and save further neiloid derivations for a future article.

A GENERAL TAPER EQUATION

This final section addresses a general equation of taper. The three models employed in this paper have a common root. Assuming each form is expressed in terms of height measured from the base instead of vertex, they have the following forms:

cone:

$$r = R\left(\frac{H-h}{H}\right) \quad [42]$$

paraboloid:

$$r = R\sqrt{\left(\frac{H-h}{H}\right)} \quad [43]$$

neiloid:

$$r = R\left(\frac{H-h}{H}\right)^{3/2} \quad [44]$$

These forms suggest a more general form:

$$r = R\left(\frac{H-h}{H}\right)^{p} \quad [45]$$

If we consider this the archetypal taper equation, we can derive the associated volume equation using the approach we've previously employed. First, we squared both sides of [45]:

$$r^2 = R^2\left(\frac{H-h}{H}\right)^{2p} \quad [46]$$

$$r^2 = \frac{R^2}{H^{2p}}(H-h)^{2p} \quad [47]$$

Since

$$V = \int_0^H \pi r^2 dh \quad [48]$$

then we can substitute:

$$V = \pi\int_0^H \frac{R^2}{H^{2p}}(H-h)^{2p}\,dh \quad [49]$$

which is equivalent to:

$$V = \pi\frac{R^2}{H^{2p}}\int_0^H (H-h)^{2p}\,dh \quad [50]$$

As done earlier, we let $u = H - h$ and $du = -dh$ and $dh = -du$. Substituting these in [50] and simplifying yields:

$$V = -\pi\frac{R^2}{H^{2p}}\int_0^H u^{2p} dh \quad [51]$$

$$V = -\pi\frac{R^2}{H^{2p}}\left[\frac{1}{2p+1}u^{2p+1}\right]_0^H \quad [52]$$

This can be further reduced and simplified down to the following volume equation by rearranging a number of terms:

$$V = \left(\frac{1}{2p+1}\right)\pi R^2 H \quad [53]$$

The associated frustum equation to the full volume is:

$$V = \left(\frac{1}{2p+1}\right)\frac{\pi R^2}{H^{2p}}\left[(H-h_2)^{2p+1} - (H-h_1)^{2p+1}\right] \quad [54]$$

Note that if $2p + 1 = 3$, then $p = 1$ and we get the cone equation. If $2p + 1 = 2$, then $p = ½$ and we get the paraboloid equation. If we measure height from the apex down, the taper equation is:

$$r = R\left(\frac{h}{H}\right)^p \quad [55]$$

In this form, $p = 1/4$ is the neiloid, $p = 1/2$ is the paraboloid, and $p = 1$ is the cone.

LITERATURE CITED

Leverett, R.T., W. Blozan, and G.A. Beluzo. 2008. Modeling tree trunks: approaches and formulae. Bulletin of the Eastern Native Tree Society 3(2):3-13.

The 150+ ft crown spread of the McDonough Oak in New Orleans' City Park. Photo by Larry Tucei.

THE LIVE OAK PROJECT: AN UPDATE

Larry Tucei

Eastern Native Tree Society

EDITOR'S NOTE:
The Live Oak Project has continued under Larry Tucei's capable efforts. You may remember Larry's original Live Oak Project report in the Summer 2007 issue of the *Bulletin of the Eastern Native Tree Society*. This is an update to the original—Larry's been quite busy these last couple of years! Since the 43 first described, he has almost tripled the number of live oaks with a circumference at breast height (CBH) of 20 ft or greater.

Perhaps the greatest value of this listing, in addition to its accurate quantification of this magnificent tree species, is the ability we now have to place live oak amongst the most substantial of eastern tree species. The work ENTS has done through its examination of charismatic specimens such as the Middleton or Angel Oaks, coupled with the dedicated searching of Larry Tucei, will hopefully help change how we value these stately giants.

—*DCB*

The Mississippi state champion live oak—the Walhaik Bluff Oak, with a circumference at breast height (CBH) of 33.1 ft, height of 66 ft, and crown spread of 166 ft. Photo by Larry Tucei.

Table 1. Current (as of May 24, 2009) register of largest live oaks measured by ENTS.

Rank	Tree name	CBH (ft)	Maximum spread (ft)	Height (ft)	Measurer	Champion status	Category
1	The Seven Sisters Oak	40.0	153.0	57.0	Tucei	National Co-champion	Multi-Trunk
2	The E.O. Hunt Oak	34.3	177.0	45.0	Tucei	Mississippi Co-champion	Multi-Trunk
3	The Walkaih Bluff Oak	33.1	166.0	63.0	Tucei	Mississippi Co-champion	Single
4	The Middleton Oak	32.7	118.0	67.0	Blozan		Single
5	The Saraland Oak	31.8	123.0	63.0	Tucei	Alabama Champion	Multi-Trunk
6	Josephine A Stewart Oak	31.2	150.0	71.0	Tucei		Single
7	The Duffie Oak	30.9	126.0	48.0	Tucei		Multi-Trunk
8	The Biloxi Oak	30.0	147.0	58.5	Tucei		Single
9	The Tree Of Live Oak	30.0	150.0	58.6	Tucei		Single
10	St. Johns Cathedral Oak	30.0	153.0	55.5	Tucei		Single
11	The Rita Davis Oak	29.8	138.0	54.0	Tucei		Single
12	The Grosse Tete Oak	29.6	132.0	57.0	Tucei		Multi-Trunk
13	The Andrew Jackson Oak	29.5	148.0	81.0	Tucei		Single
14	Valcour Aime Oak	29.3	132.0	74.0	Tucei		Single
15	Andrew Stewart Oak	29.0	145.5	71.0	Tucei		Single
16	The Long Beach Oak	28.7	135.0	48.0	Tucei		Single
17	The Gulfport Oak	28.5	130.0	48.0	Tucei		Single
18	The Schmitt Oak	28.2	129.0	69.0	Tucei		Multi-Trunk
19	Wesley Methodist Oak	28.0	150.0	66.0	Tucei		Multi-Trunk
20	The Front Beach Oak	28.0	150.0	63.0	Tucei		Single
21	The Meeting Oak	27.8	120.0	60.0	Tucei		Single
22	The McDonogh Oak	27.6	154.5	48.9	Tucei		Single
23	Zeb Mayhew Jr. Oak	27.4	136.5	71.9	Tucei		Single
24	Jacque T Roman Oak	27.3	125.0	71.0	Tucei		Single
25	The Ruskin Oak	27.2	136.5	57.0	Tucei		Single
26	Aunt Jenny's Oak	27.1	121.0	72.0	Tucei		Single
27	The Dedeaux Oak	27.0	151.5	66.0	Tucei		Single
28	The Bellman Oak	27.0	142.0	60.0	Tucei		Multi-Trunk
29	Wesley Methodist Oak	27.0	108.0	48.0	Tucei		Multi-Trunk
30	The Sara Hunt Oak	26.6	136.5	51.0	Tucei		Multi-Trunk
31	Back Brusly Oak	26.6	135.0	75.0	Tucei		Single
32	Bank of Maringouin Oak	26.2	112.5	63.0	Tucei		Single
33	The Richards Oak #1	26.1	100.0	72.0	Tucei		Multi-Trunk
34	The Pascagoula Oak	26.0	126.0	57.0	Tucei		Single
35	The Overseer's Oak	26.0	130.0	51.0	Tucei		Single
36	The Colony Grove Oak	26.0	149.5	68.7	Tucei		Single
37	Austins Oak	25.8	112.5	54.0	Tucei		Single
38	Celina Pilie Roman Oak	25.5	112.5	67.4	Tucei		Single
39	The Sycamore St. Oak	25.4	111.0	60.0	Tucei		Multi-Trunk
40	The May Family Oak	25.4	121.5	57.0	Tucei		Single
41	The Second St., Oak	25.2	120.0	49.5	Tucei		Multi-Trunk
42	Etienne Hotard/J.D. Pittman	25.2	150.0	70.6	Tucei		Single
43	The Central Park Condo Oak	25.1	142.0	75.0	Tucei		Multi-trunk
44	The Peter Hammond Oak	25.1	97.5	63.0	Tucei		Single
45	The Thomas Family Oak	25.0	135.0	66.0	Tucei		Single
46	Danielle's Oak	25.0	123.0	57.0	Tucei		Single
47	The Inner City Ministry Oak	25.0	126.0	63.0	Tucei		Single
48	The Frankes Oak	24.7	126.0	57.0	Tucei		Single
49	The Hammond Square Oak	24.7	150.0	58.5	Tucei		Multi-Trunk
50	The McGowen-Zoghby Oak	24.5	120.5	57.0	Tucei		Single
51	The Pass Christian Oak	24.4	132.0	63.0	Tucei		Single
52	The Treasure Oak	24.3	137.0	66.0	Tucei		Single
53	Ramsey Springs Oak	24.3	139.5	75.0	Tucei		Single
54	The Nora Fulton Oak	24.3	121.5	57.0	Tucei		Single
55	The Allard Plantation Oak	24.3	148.5	54.0	Tucei		Single
56	The Jack Wade Oak	24.2	111.0	75.0	Tucei		Single
57	The Bridge St. Oak	24.2	135.0	66.0	Tucei		Single
58	Courthouse Rd., Oak	24.1	103.0	57.0	Tucei		Single
59	The James Padgett Oak	24.0	137.0	48.0	Tucei		Single
60	The Nora Hasty Oak	24.0	157.5	63.0	Tucei		Multi-Trunk
61	The Suicide Oak	23.8	119.5	57.9	Tucei		Multi-trunk
62	The University Mall Oak	23.7	127.5	57.0	Tucei		Multi-Trunk

Continued on next page…

Table 1 (continued). Current (as of May 24, 2009) register of largest live oaks measured by ENTS.

Rank	Tree name	CBH (ft)	Maximum spread (ft)	Height (ft)	Measurer	Champion status	Category
63	The Fannie May Oak 1	23.6	138.0	66.0	Tucei		Single
64	Zeb Mayhew Sr. Oak	23.5	136.5	71.5	Tucei		Single
65	Julie Mayhew Oak	23.5	139.5	66.9	Tucei		Single
66	Collin's Oak	23.3	120.0	75.0	Tucei		Single
67	The Lumberyard Art Center	23.3	105.0	66.0	Tucei		Single
68	Shrine of Holy Cross Oak 1	23.3	142.5	78.0	Tucei		Single
69	Big Knob Oak	23.2	105.0	60.0	Tucei		Single
70	Cornelia Ireland Oak	23.2	148.5	72.0	Tucei		Single
71	Jefferson Davis Hardin Oak	23.2	138.0	65.3	Tucei		Single
72	The Fannie May Oak 2	23.2	126.0	72.0	Tucei		Single
73	The Dewey Ave. Oaks	23.1	130.0	76.5	Tucei		Single
74	The Friendsphip Oak	23.0	169.5	39.0	Tucei		Single
75	The Lil Mick Oak	23.0	120.0	78.0	Tucei		Single
76	The Holden Oak	23.0	115.5	52.5	Tucei		Single
77	The MS City Cemetary Oak	23.0	114.0	45.0	Tucei		Single
78	Point Aux Chenes Oaks	23.0	108.0	48.0	Tucei		Single
79	Pearson Park Oak	23.0	102.0	42.0	Tucei		Multi-Trunk
80	The Waveland Oak	23.0	120.0	48.6	Tucei		Multi-Trunk
81	Protestant Childrens Home	23.0	141.0	63.0	Tucei		Single
82	The Edgewater Park Oak	22.9	120.0	47.0	Tucei		Multi-Trunk
83	Porter St., Oak	22.9	133.5	66.0	Tucei		Single
84	The Elizabeth Oak	22.9	135.0	63.0	Tucei		Single
85	Water St. Apartments Oak	22.8	114.0	63.0	Tucei		Single
86	The Richards Oak #2	22.7	133.5	60.0	Tucei		Single
87	Shrine of Holy Cross Oak 2	22.6	124.5	75.0	Tucei		Single
88	Monas Oak	22.1	114.0	58.5	Tucei		Single
89	The United Methodist Oak	22.0	131.5	51.0	Tucei		Single
90	The Kell Martin Oak	22.0	117.0	63.0	Tucei		Single
91	The Miramar Oak	22.0	111.0	58.5	Tucei		Single
92	The Labranche Oak	22.0	117.0	52.5	Tucei		Single
93	Maurigi's Oak	21.8	120.0	69.7	Tucei		Single
94	Henri Roman Oak	21.8	129.0	72.0	Tucei		Single
95	The Olivioak	21.6	111.0	58.5	Tucei		Multi-Trunk
96	The Lee St. Oak	21.5	117.0	60.0	Tucei		Single
97	The Colosseum Oak	21.5	126.0	52.5	Tucei		Single
98	Hazel Hardin Derby Oak	21.4	124.5	72.0	Tucei		Single
99	The Sire Oak	21.4	132.0	66.0	Tucei		Single
100	Audubon Park Oak # 4	21.3	118.0	54.0	Tucei		Single
101	Seal Ave. Oak	21.3	105.0	66.0	Tucei		Single
102	J. Harry Roman III Oak	21.3	94.5	78.0	Tucei		Single
103	Major Tom Armstrong Oak	21.3	121.5	66.0	Tucei		Single
104	The Lewis Oak	21.0	120.0	66.0	Tucei		Single
105	Point Aux Chenes Oaks	21.0	105.0	43.5	Tucei		Single
106	The Wrought Iron Fence Oak	21.0	121.5	54.0	Tucei		Single
107	James Buchanan Blitch Oak	20.8	126.0	78.0	Tucei		Single
108	Josephine Roman Aime Oak	20.8	115.5	63.0	Tucei		Multi-Trunk
109	Jacqueline Mayhew Ireland	20.8	121.5	70.3	Tucei		Single
110	The Charbonnet Oak	20.6	120.0	72.0	Tucei		Single
111	The Dewey Ave. Oaks	20.5	150.0	75.0	Tucei		Single
112	Antoine sobral Oak	20.5	126.0	80.7	Tucei		Single
113	Bridge and College St. Oak	20.3	105.0	58.5	Tucei		Single
114	The Ceville Shiyou Oak	20.3	111.0	48.0	Tucei		Limb Collapse
115	Skip and Carol's Oak	20.3	129.0	69.0	Tucei		Multi-Trunk
116	The Gabriel Oak	20.3	109.0	55.5	Tucei		Single
117	The Delisle Cemetary Oak	20.1	111.0	51.0	Tucei		Single
118	The Etheridge Oak	20.1	126.0	57.0	Tucei		Single
119	The Handsboro Oak	20.0	125.0	66.0	Tucei		Single
120	The Mulat Oak	20.0	130.0	57.0	Tucei		Single
121	The Buddy Lizana Oak	19.8	124.5	65.8	Tucei		Single
122	Jon O'Boythe Oak	19.5	129.0	66.0	Tucei		Single
123	Martin Ave. Oak	19.5	129.0	69.0	Tucei		Single
124	The Evangeline Oak	19.0	90.0	51.0	Tucei		Limb Collapse

The McDonough Oak in New Orlean's City Park, August of 2008. This oak has a CBH of 27.5 ft, a height of 48.9 ft, and a crown spread of 154.5 ft. There are hundreds of live oaks in City Park, most planted between 100 to 150 years ago, with a few such as the McDonough Oak approaching 300 years old. Photo by Larry Tucei.

The awe-inspiring Biloxi Oak grows a couple hundred yards from the Mississippi Gulf Coast on property along Highway 90. One of the largest live oaks in Harrison County (CBH of 30 ft, height of 58.5 ft, and crown spread of 147 ft), the Biloxi Oak took the brunt of Hurricane Katrina with only minor limb damage. Photo by Larry Tucei.

HYATT'S WOODS, DREW COUNTY, ARKANSAS: FEBRUARY 2009

Don C. Bragg

Research Forester, USDA Forest Service, Southern Research Station, Monticello, AR 71656

INTRODUCTION

Hyatt's Woods is a small, privately owned parcel located in the southwestern corner of Drew County, Arkansas (approximately centered at latitude 33° 26′ 36.63″ N, longitude 91° 54′ 20.22″W). The site itself is found on the Upper West Gulf Coastal Plain (UWGCP), primarily along the low terraces of a small stream called Brown's Creek. Brown's Creek and its tributaries drain a large portion of southern Drew and northern Ashley Counties, and flow westward into the Saline River, which forms the western border of these counties.

Examination of the landscapes of the region using aerial photography such as can be found on Google Earth™ is quite telling of the recent history of the region—the largely industrially owned and highly productive timberlands have been intensively managed, primarily for loblolly pine plantations. This leaves aerial views of the region as a patchwork of rectangular green stands akin to the farm fields of other portions of the Midwest.

A recent aerial photograph showing the patchwork of young loblolly pine plantations surrounding the narrow bottomlands bordering Brown's Creek. Hyatt's Woods is roughly in the center of the image, just east of the slight curves in the main north-south running road.

A broader view of regional history helps to explain this landscape even more. The virgin pine, hardwood, and cypress of southern Arkansas started to experience significant logging after 1890, with heavy cutting occurring well into the 1920s. By 1930, most of the virgin timber of the region was exhausted, and most timber companies moved on or closed permanently (Darling and Bragg 2008). Very little of southern Arkansas and northern Louisiana escaped heavy logging—I have reported on some of these remnants to the ENTS discussion list in the past and have studied these locations as a part of my work with the US Forest Service (e.g., Bragg 2006).

Later in the 20th Century, scientific forestry help local lumber companies learn how to manage their timberlands for sustainable harvest, and much of the cutover land was reforested. The higher, drier uplands mostly naturally reseeded into loblolly and shortleaf pine stands, with a portion of oaks, gums, hickories, and other hardwoods intermixed. Bottomlands have almost always revegetated to hardwoods, although some wetter spots still have extensive cypress stands, and loblolly pine is common along some stream terraces.

An example of the many large loblolly pines scattered amongst the hardwoods in Hyatt's Woods. Photo by Don C. Bragg.

One of the primary landowner's and namesake for Hyatt's Woods, David Taylor Hyatt, Jr., measures a prized old loblolly pine near Brown's Creek. Photo by Don C. Bragg.

This particular tract of timber has a somewhat different (if still not fully described) history. While the adjacent higher uplands were cleared many decades ago and in part converted to row crop agriculture, there is decidedly less evidence of lumbering along the bottomlands. One of the current landowners, David Taylor Hyatt, Jr., is a long-time resident of the area, and does not recall seeing any indication of logging along the Brown's Creek terraces during his lifetime in the study area. During the years he and his family have owned these properties, they have occasionally salvaged dead or tipped-over trees, often sawing them into boards using their own private mill. In this process, Mr. Hyatt reports it was not unusual to count over 200 rings in some of the salvaged trees.

I have yet to core trees on this site in our current research on the area, but I would expect that a number of the large, old-looking oaks and gums exceed 150 years of age. There are a number of very large baldcypress growing along Brown's Creek and along the old channels that still dissect the otherwise flat stream terraces. Given their large size and branch/crown morphology, I believe these cypress are easily the oldest trees around, and may be hundreds of years old.

Most of the pine show evidence of only modest age, and probably date back only 80 to 100 years. However, as noted in other second-growth areas in this part of the UWGCP, it is still possible to find scattered individual pines that easily exceed the age of the dominant pine overstory (Shelton and Cain 1999, Bragg and Heitzman, In press). These individuals are likely either culled specimens left by the lumberman because they were of too poor quality to waste time cutting, or were suppressed advance regeneration or other submerchantable-sized trees when the area was original harvested. The large loblolly pine being measured by Mr. Hyatt in the picture above certainly shows signs of being fairly old (for a loblolly).

My research has focused on a just under 3 ac part of this stand (the overall property totals 80 ac, but not all is in mature forest). This 3 ac portion (called "Deer Camp" for the buildings near it) has been stem mapped using an Impulse 200™ Laser rangefinder, which has a horizontal accuracy of about 1 to 2 ft over the area being surveyed. Within this stem mapped stand, every live tree greater than 4 inches in diameter at breast height (DBH) were identified to species, measured for their diameter, and assigned coordinates based on their location. In addition to the trees sampled within this stem map, a number of big pines, cypress, and hardwoods from nearby areas were also included.

Table 1. Large tree measurements taken at Hyatt's Woods and vicinity, primarily in February of 2008.

Common name	Scientific name	DBH (in)	CBH (ft)	Height (ft)	Comments
American hornbeam	*Carpinus caroliniana*	8.7	2.3	n/a	No height taken—indistinct crown
Bitternut hickory	*Carya cordiformis*	25.4	6.6	98.1	Rucker Index tree
Shagbark hickory	*Carya ovata*	30.6	8.0	103.0	Rucker Index tree
Mockernut hickory	*Carya tomentosa*	21.2	5.6	n/a	No height taken—indistinct crown
		20.1	5.3	87.3	
American holly	*Ilex opaca*	10.7	2.8	48.6	
Sweetgum	*Liquidambar styraciflua*	37.8	9.9	120.1	Rucker Index tree
Red mulberry	*Morus rubra*	19.5	5.1	73.2	
Blackgum	*Nyssa sylvatica*	24.6	6.4	85.3	Rucker Index tree
Loblolly pine	*Pinus taeda*	45.3	11.9	122.0	Homesite area [a]
		39.0	10.2	110.5	Son's Farm area [a]
		38.1	10.0	111.5	Homesite area
		37.2	9.7	124.0	Homesite area
		36.9	9.7	126.5	Homesite area (Rucker Index tree)
		34.1	8.9	106.3	Deer Camp area
		33.5	8.8	124.7	Deer Camp area
		32.0	8.4	123.4	Deer Camp area
		30.9	8.1	118.8	Deer Camp area
		30.2	7.9	120.4	Deer Camp area
White oak	*Quercus alba*	38.9	10.2	110.6	Rucker Index tree
		33.9	8.9	104.7	
		30.2	7.9	99.1	
Overcup oak	*Quercus lyrata*	23.8	6.2	n/a	No height taken—indistinct crown
		22.3	5.8	73.2	
		29.3	7.7	64.0	
Swamp chestnut oak	*Quercus michauxii*	45.7	12.0	102.0	Rucker Index tree
		27.4	7.2	96.1	
		34.4	9.0	93.2	
Cherrybark oak	*Quercus pagoda*	25.5	6.7	95.5	Rucker Index tree
Shumard oak	*Quercus shumardii*	44.1	11.5	101.7	Rucker Index tree
Sassafras	*Sassafras albidum*	18.5	4.8	75.5	
Baldcypress	*Taxodium distichum*	62.5	16.4	108.3	Rucker Index tree
		53.3	14.0	99.4	
Winged elm	*Ulmus alata*	16.0	4.2	85.3	
		17.9	4.7	77.4	

10 SPECIES RUCKER INDEX (RI_{10}) FOR HYATT'S WOODS = 105.1 ft

[a] Sampled in March 2007 from either an adjoining part of this property (Homesite area) or a nearby farm owned by Hyatt's son.

A red maple with many small burls in Hyatt's Woods. Photo by Don C. Bragg.

US Forest Service forestry technician Kirby Sneed examines a large swamp chestnut oak towering over an old channel of Brown's Creek. Photo by Don C. Bragg.

As can be seen in Table 1, Hyatt's Woods contains a large number of good-sized trees. It has been my experience that the UWGCP does not tend to produce extremely tall trees. Loblolly and shortleaf pine appear to reach their current maximums at between 130 and 140 ft, although the giants of the virgin forest may have exceeded 150 ft. In this region, sweetgum is usually the tallest of the hardwoods, and that certainly is the case at both Hyatt's Woods and the nearby Levi Wilcoxon Demonstration Forest (Bragg 2006). A number of oak species also show potential to exceed 120 ft, although a white oak 110.6 ft tall was the tallest I found. The Rucker Index (RI_{10}) of this area will probably max out between 110 and 120 ft, as there are taller individuals out there than my abbreviated search could find. However, I would not expect much more than this, given the frequency of damaging ice storms and wind events, both of which tend to limit height growth. The wetter than usual nature of these low terraces also probably works to constrain overall tree height.

This site is fairly fertile, although it does not show the signs of a luxuriant understory one may expect in the richest forests. The open understory is dominated by shade-tolerant trees such as American holly, eastern hophornbeam, American hornbeam, horse-sugar, and a few oaks and gums. Woody shrubs and vines, including greenbriar, blueberry, honey-suckle, and scattered poison-ivy can be found. There is little evidence of recent large-scale disturbance in Hyatt's Woods, with limited quantities of shade-intolerant tree species regeneration. Windthrow and bank undercutting are some of the more common disturbances on this site—a number of large oaks blew over during the recent passing of Tropical Storms Gustav and Ike during the late summer of 2008. These trees toppled over not because of excessively high winds, but rather a combination of saturated soils and strong winds.

Hyatt's Woods represents a unique opportunity to study a relatively undisturbed and reasonably old stand of natural origin in the otherwise intensively managed landscapes of the UWGCP. The fact that it was preserved by private landowners for the long-term, and their eagerness to have this area studied, is exceptional during this day and age. This stand has no formal protection, and thus remains vulnerable to future events such as landowner change.

Large, old baldcypress can still be found along the old and active channels of Brown's Creek and its tributaries. These remnant cypress were not cut during the original lumbering period because of either their poor form, hollow or rotten centers, or there just was not enough suitable timber for the loggers to make the effort. Photo by Don C. Bragg.

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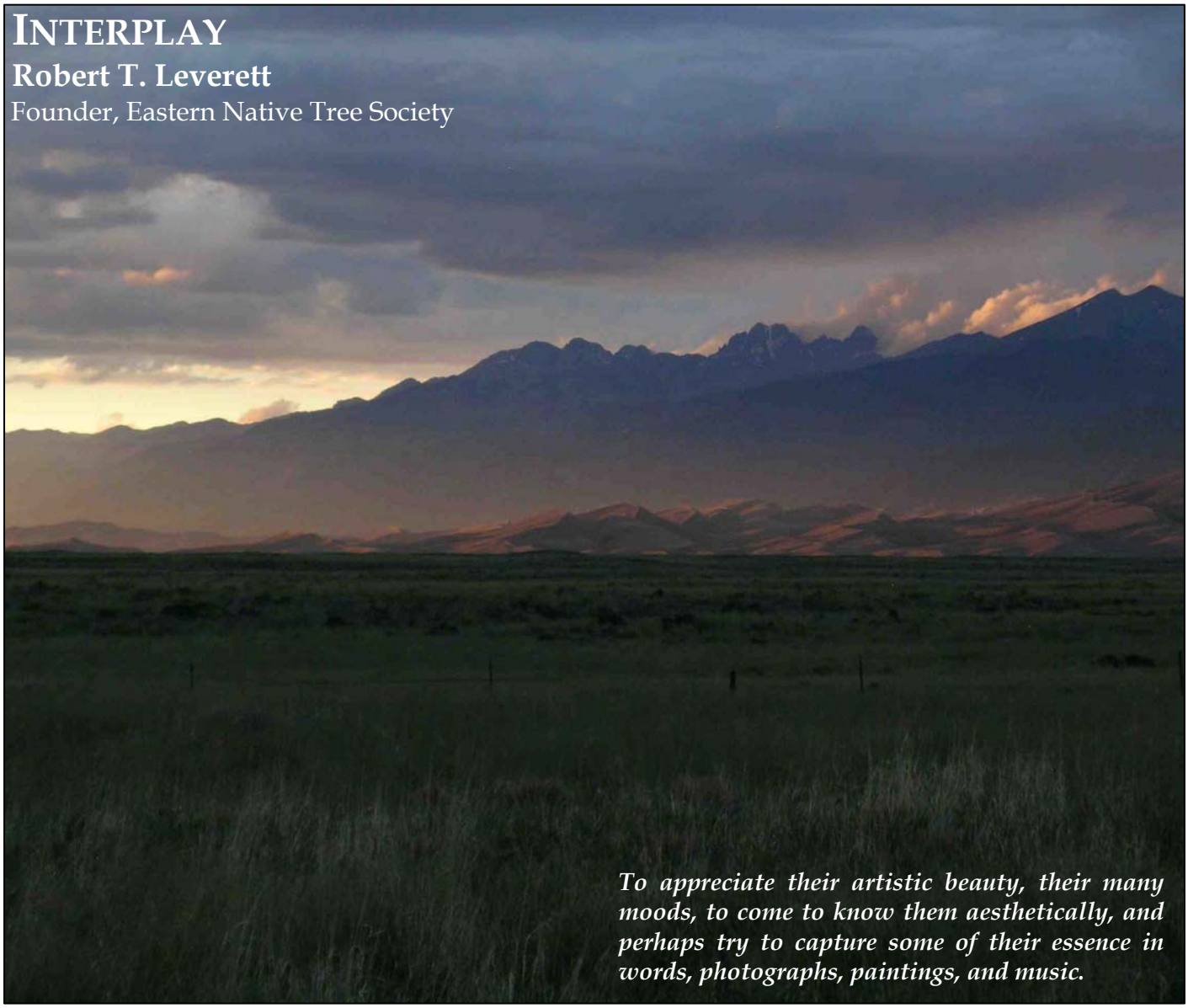
INTERPLAY

Robert T. Leverett
Founder, Eastern Native Tree Society



The laughter of children...

To walk on them, explore them;
To study them and understand;
To capture their essence,
To connect with them spiritually...

One cannot truly come to know the dunes
without this full range of experiences.

Adapted from an email from Bob Leverett on Great Sand Dunes National Park
by Don C. Bragg, who also just rekindled his love for the majestic West on a recent trip.

ITCHIN' FOR THE CROSS TIMBERS

Robert T. Leverett

Founder, Eastern Native Tree Society

As our first really significant nature stop on our way out, we camped in eastern Kansas at the Cross Timbers State Park. Before stopping, we Googled the little state park (courtesy of my new iPhone) and learned that it harbors one of the northern most extensions of the historic Cross Timbers ecosystem, most of which is in Oklahoma and Texas. The old-growth area of Cross Timbers in the latter two states is in the hundreds of thousands of acres—a fact that few nature lovers know. Thanks to Dr. David Stahle and associates, we now know what a treasure we have in that ecosystem.

Before describing the Cross Timbers State Park, I note that the origin of the term 'cross timbers' is in dispute. One can imagine different sources, one being an area of timberlands that had to be crossed. That is a doubtful source, though. However, regardless of the origin of the name, and the scruffy appearance of the forest to most people, romantic descriptions of the Cross Timbers region exist. The most famous was provided by Washington Irving. More attuned visitors have become captivated by the gnarled old post oaks and write about them in poetic terms.

Cross Timbers State Park boasts a remnant population of ancient post oaks and encompasses about 1,075 ac of slightly hilly Kansas terrain along the Verdigris River. The park is adjacent to a 2,800-ac lake named Toronto Reservoir. While Cross Timbers State Park is in prairie rich Kansas, it is a part of the eastern forest ecosystem. Much of Kansas is in either the tall or short grass prairie ecosystems, but transitions to different ecosystems are sometimes gradual. The perimeter of the reservoir is completely forested and includes the park with its area of old-growth Cross Timbers. There is a one mile loop trail through the best of the old growth with interpretive markers that include ecological and historical data and photos of nearby trees. Associated with the age of the tree are historical events that are meant to garner appreciation for the tree.

After surveying the campground and deciding that we would stay there, Monica and I first took the narrow, not well maintained old growth nature trail. We quickly learned from the interpretive markers that the University of Arkansas Tree-Ring Laboratory had done the dendrochronological study and confirmed the area as part of the historic Cross Timbers. Dave Stahle's mark has left an indelible imprint on the interpretive natural history of Kansas, a fact that I feel very proud of, since Dave is one of the cofounders of ENTS.

The area of Cross Timbers that we walked through includes post oak, black oak, and eastern red cedar as the dominant tree species. There are also a few hackberries, shagbark hickories, and green ashes, but the oaks hold absolute dominion. I doubt that the total acreage of Cross Timbers part of the park is around 80 to 100, although the total Kansas share of Cross Timbers numbers several thousand. As one would expect, the old forest is diminutive and the trees gnarled. The bedrock is basically limestone, as is so much of Kansas. Within the park, Dave and company dated the oldest post oaks to around 1730. However, ages of the conspicuously old trees varied considerably, so the area has seen the coming and going of several generations of oaks. The youngest of the old trees are about 170 years.

After dinner and a walk along the shore of the reservoir, we settled in our tent for the night. We had the flaps up so we could see out and look upward to the pleasing forms of the campground post oaks and beyond into the crystal clear night sky. We listened to a chorus of coyotes from the other side of the lake. I thought to myself that this was what one should expect out under the Kansas night sky. It was a very pleasant experience, especially considering that the campground was almost empty. However, as the evening wore on, I found spots on my ankles and legs beginning to itch. More on this later.

While looking up into the forms of the oaks, Monica observed that looking at the silhouettes of the post oak leaves against a moonlit night sky reminded her of a mosaic of pieces of a jigsaw puzzle scattered about. The rounded shape of the lobes does invoke that image. Other species will not do—or do as well. Try the experience some time.

When in each new place, I always try to sense the spirit of the land, its energy imprint as I am want to say. I cannot scientifically define these imprints or prove their existence, but I do sense them. I'm sure I key off a lot of visual, auditory, and olfactory cues, but there is something else involved, which I'll discuss from time to time in the coming descriptions. At this point, I will just observe that Kansas has its range of imprints that differ from those of South Dakota.

Because of the overwhelming acreage of agricultural lands in eastern Kansas and a mix of agriculture and cattle ranching in western Kansas, the state never really seems wild, but traveling on its rural routes can be pleasant and satisfying in a tame sense. However, Kansas does have its superlatives. When the sunflowers are in bloom, Kansas and sunflowers become synonymous. But regardless of the time of year, the expansive sky and the perpetual prairie winds of Kansas can't help but shape the perceptions of the observant traveler. Kansas is about prairie, even in its modern agricultural transformation.

Upon awakening the next morning, I discovered that the source of the itching that I had experienced throughout the night was from tick bites, a lot of bites. I had close to 30 of the little beggars latched on to me—the tiny variety, very easy to miss. Monica had close to 10 on her. How did it happen? We had not gotten off trail, but we had brushed against shrubs and had walked through some grass within the campground. That evidently had been enough. And there's more—chiggers! Not even a half dozen mosquito bites can compare with one chigger bite. How I despise the little red devils! Now, I'm spending much of my time scratching, applying topical lotions, and swearing. Oh well, it's part of the experience. Ugh, gotta end this now—gotta go scratch!

Editor's note: This trip report will have to suffice as Bob spends some quality time vacationing amongst the ponderosa pine, Douglas-fir, and spruces of Colorado.

--DCB

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.

A remnant parcel of old-growth eastern hemlock along the edge of a lake near Rhinelander, Wisconsin, is reflected amongst the lily pads on this calm late summer day. Photo by Don C. Bragg.