

## Little Broad Brook Flexes Its Forest Muscles – Part I

By Bob Leverett

### Overview of Fitzgerald Lake Conservation Area

For urban dwellers, the quality of life can improve when plenty of open space exists in the form of nature parks. This applies to cities, large and small. Northampton, MA recently added 80 acres to its popular Fitzgerald Lake Conservation Area located in the northwest corner of the city. You can read about the property at [www.broadbrookcoalition.org/fitzgerald-lake/photo-gallery](http://www.broadbrookcoalition.org/fitzgerald-lake/photo-gallery). The total acreage now is close to 800, an impressive accomplishment for a town the size of Northampton, and there are plans to add more land. The key to the success of ‘Fitz Lake’ lies in the partnership between foresighted city planners and the Broad Brook Coalition, a conservation group that helps manage the property. Monica is a past president of the Coalition. Needless to say, I have a strong interest in supporting the cause.

One entrance to the Fitzgerald Lake Conservation Area is hardly a 10-minute trek from our front door. Monica ritualistically walks down the street, crosses North Farms Road to the entrance to Fitz Lake, passes through a grove of hemlocks, follows a boardwalk to a dock and returns by a circular route that goes through a second swath of attractive hemlocks and white pines and by a favorite boulder, which she has affectionately named Dame Lady Rock. Fitz Lake has provided Monica with immeasurable enjoyment over the years. I now share in the rewards. During the past 6 years, we have shared images of the lake and surrounding areas with friends and in postings to the Native Tree Society.

Local people visit Fitzgerald Lake to ice fish, ice skate or cross-country ski in the winter, and fish, kayak/canoe, hike or walk their dogs, year around. Friends and relatives who visit us usually get treated to at least one walk in the conservation area. Despite Fitz Lake’s popularity, you can still find peace and solitude on the several miles of developed trails. The ones that border the lake are my favorites. Here is an image of the lake taken on a still autumn day.



Fitz Lake is an urban dweller's wildlife paradise. There is a thriving black bear and bobcat population. We think at least one moose has taken up residence and there are beavers, muskrat, mink and fishers. Lots of critters call the woodlands around the lake home. With the new acquisition, a Great Blue Heron rookery has been added, and a neighbor has seen river otter.

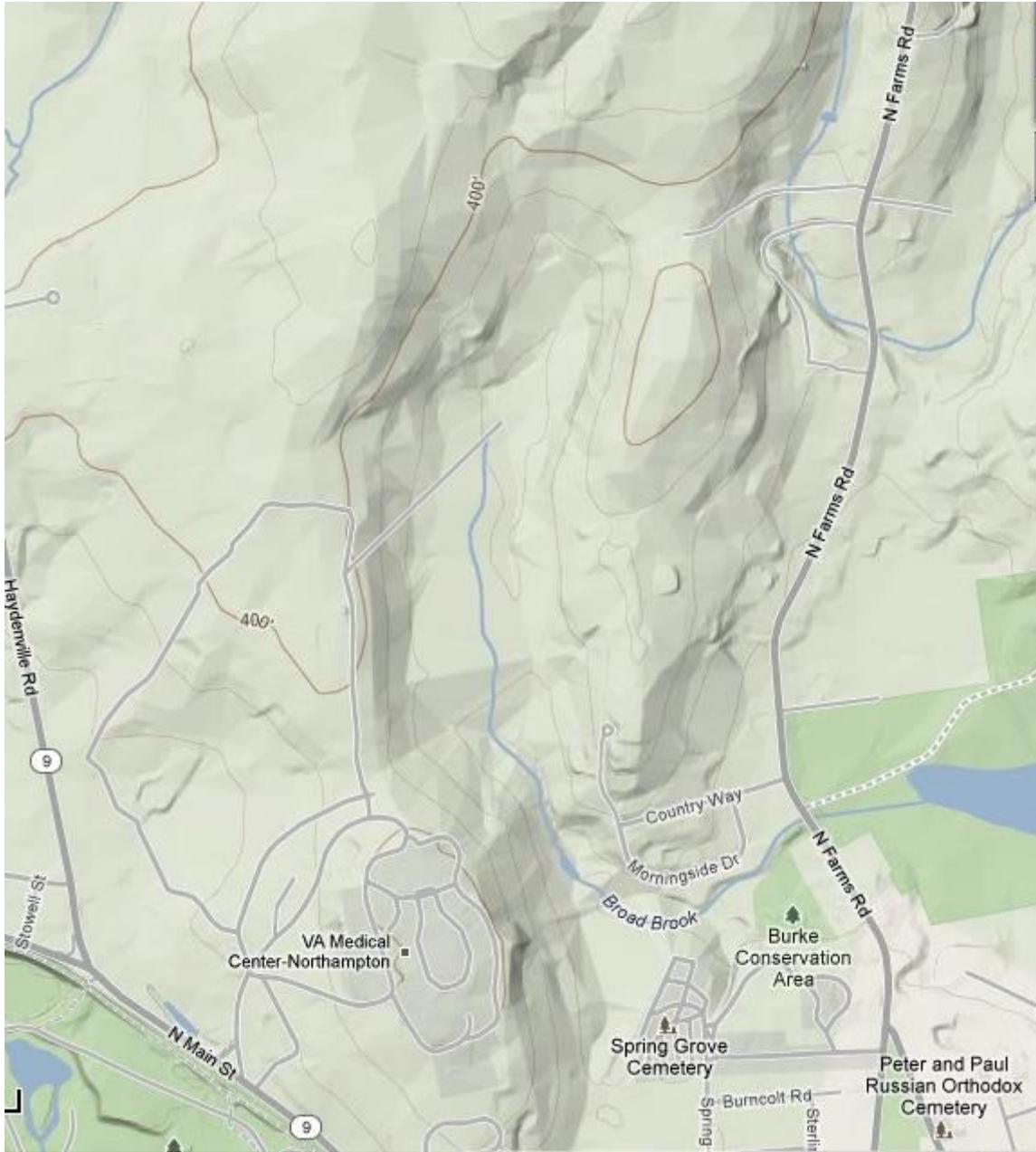
Regardless of where you go, there is the possibility of seeing wildlife and fairly diverse plant communities. An example of a rare plant community is an extraordinary swath of chestnut coppices that give hikers a look at chestnut leaves. Chestnut sprouts are not that uncommon in the woodlands of Massachusetts and Connecticut, but seldom in abundance. Here is the list of tree species that we've compiled so far along the Broad Brook corridor, primarily in the Conservation Area. Each species is followed with an abundance code: A= very abundant, C=common, I = infrequent, R = rare, E = Extremely rare.

- |                         |                            |                           |
|-------------------------|----------------------------|---------------------------|
| 1. White pine - C       | 12. Tuliptree - I          | 23. American basswood - I |
| 2. Eastern hemlock - C  | 13. Sugar maple - C        | 24. American beech - C    |
| 3. Pitch pine - E       | 14. Red maple - A          | 25. American hornbeam - I |
| 4. Northern red oak - A | 15. Striped maple - I      | 26. White ash - I         |
| 5. White oak - C        | 16. Slippery elm - I       | 27. Green ash - I         |
| 6. Black oak - C        | 17. Bigtooth aspen - I     | 28. Hop hornbeam - I      |
| 7. Scarlet oak - I      | 18. Quaking aspen - E      | 29. Black cherry - I      |
| 8. Chestnut oak - E     | 19. Pignut hickory - I     | 30. Gray birch - I        |
| 9. Black birch - C      | 20. Shagbark hickory I     | 31. American chestnut - I |
| 10. Yellow birch - I    | 21. Eastern cottonwood - I | 32. American sycamore - E |
| 11. White birch - I     | 22. Sassafras - E          |                           |

There may be a little silver maple, swamp white oak, pin oak, and hackberry near where Broad Brook joins the Mill River. I don't know. Wetlands along the Connecticut River and across the broad valley with meandering streams that flow into the Connecticut characteristically possess these riparian species. The cutoff to where you see them and where you don't is an irregular line that has a lot to do with the level of the ground water, the frequency of flooding, and the depth of the soils.

At this point in our tree cataloging, the maximum number of tree species probably falls just shy of 40, which is not bad diversity for the latitude. And this does not include non-native species in the area, which will likely increase the count by 10.

Fitzgerald Lake is a conservation success story and we anticipate its importance will continue to grow, but the general area has another story to tell, one not well known. The second story centers on Broad Brook, the primary stream that forms Fitzgerald Lake. More particularly, my focus is on the part of the stream above the lake to the west of North Farms Road. Perhaps a map will help.



### The Rest of the Story

Broad Brook begins north of our house in a wetland and meanders for about a mile and a half before entering Fitzgerald Lake. Its origins are a marsh surrounded by sloping ridges. From a coalescing path, the brook establishes a recognizable channel and flows southward, eventually passing our house before turning eastward where it flows under North Farms Road through a culvert and then gently spreads into a cattail marsh at the head of Fitzgerald Lake. For most of this length, the little stream runs through a small valley that narrows to a steep, though not deep, ravine just north of our house. Much of the land along the brook is owned by Smith Vocational High School, which uses the forests in its forestry program.

So what is the untold story about Broad Brook? Before relating it, we should point out that most of the forests in the primary conservation area are young and recovering. While there are small swaths of woodlands that are quite pleasing to the eye, especially those bordering the lake, most of the area carries the unmistakable mark of having been exploited in the past. So, despite its obvious charms and wildlife appeal, Fitzgerald Lake Conservation Area is not the place to go to see outstanding trees.

The place to go is the forested corridor along Broad Brook west of North Farms Road. The area isn't old growth and it has had more than its share of having been tampered with, but there are plenty of stately, mature trees that change its appearance, stirring the imagination by conjuring images of a wooded landscape of New England past. But photographs can better convey the feel one gets when visiting these woodlands. The first image we present is of a large white pine that is about a 15-minute walk up the brook from our house.



This big white pine approaches old growth status. Joan Maloof and Monica serve as models to showcase its size. Its girth is an impressive 11.6 feet and its height is just shy of 124 feet. That is a good start.

Most people we take up the brook are impressed by this big tree, but within sight of it, stands an even larger pine, which was first measured by Will Blozan in October 2007. It was then around 135.5 feet tall. In 5 growing seasons, it has put on annual growth leaders of nearly a foot and now just exceeds 140 feet. The pine has two trunks that are fused for the first 15 feet or so. Most people will see it as a single tree. I have showcased this big double in past posts to the Native Tree Society BBS. In recognition of its matriarchal role, it has been named the Grandmother Tree. Let's take a look at Grandmother.



Grandmother's fused trunk measure 15.2 feet around at mid-slope, and its southern trunk of the pair is between 140.1 and 140.3 feet in height, as measured with a laser rangefinder an inclinometer and with a generous dose of trigonometry. This height presently makes Grandmother one of only three trees in the lower Connecticut River Valley in Massachusetts to surpass the height threshold of 140 feet. That's a pretty exclusive club. Let's look at the twin trunks.



I think that the big tree is between 170 and 200 years in age. I haven't modeled it for volume, but I would be surprised if there isn't at least 800 cubic feet in the overall structure. To put this volume into perspective, the first white pine shown has between 400 and 500 cubic feet, and the largest we have modeled, the Grandfather Pine in Monroe State Forest, has 1075 cubic feet.

Father up the stream corridor, but still within sight of the big double, a small cluster of attractive pines makes its presence known. They have entered their maturity and are handsome trees with straight trunks. Five of them exceed 130 feet in height, with the tallest at 139.0 and a second at 135.8. Here is a look at #2 in the height list. Monica stands behind the tree for scale.



Including the big double, this section on the west side of Broad Brook now boasts 6 pines over 130 feet and another half dozen over 120.

Across the brook to the east, two more pines in this upper section of Broad Brook exceed 130 feet, bringing the total to eight. But the story doesn't end here. Five pines downstream on the east side and one tuliptree bring the total of trees making the 130-foot threshold to fourteen growing on either side of a mile-long stretch of Broad Brook. This is a very significant total of trees in this height class for the Connecticut River Valley region of Massachusetts. Presently, the number surpasses the other lower valley tall tree hot spots, including Robinson SP, Mount Tom State Reservation, Look Park, Stanley Park, Forest Park, Smith College property, a site in Easthampton, and Old Deerfield, most of which are far larger than the Broad Brook corridor. The little stream flexes some real muscle. Here is a list of the 130-footers. The last is a tuliptree.

<b>Area of Broad Brook</b>	<b>Tree Name</b>	<b>Height</b>
Upper-West Side	Grandmother	140.2
Upper-West Side	Unnamed	139.0
Monica's Woods	Monica's Pine	136.2
Upper-East Side	No 2 Double	136.0
Upper-West Side	Unnamed	135.8
Upper-West Side	Unnamed	135.2
Upper-East Side	Unnamed	132.0
Upper-West	Unnamed	131.9
Upper-West	Unnamed	131.2
Upper-West	Unnamed	130.5
Upper-West	Unnamed	130.2
Neighbor's Property	Unnamed	130.1
Neighbor's Property	Kaeza's Pine	130.0
Monica's Property	Monica's Tulip	130.5

To put these numbers into perspective, there are over 1,000 trees in Mohawk Trail State Forest that exceed 120 feet in height and numbers in the low hundreds making the grade on the Bryant Homestead in Cummington, and in Ice Glen in Stockbridge. However, as of this writing, we've broken 130 feet only once east of Worcester, MA. The distribution of tall trees greatly favors western Massachusetts, with most being in a relatively few spots in the Berkshires and Taconics. Thereafter, comes the Connecticut River Valley, and little Broad Brook makes its debut.

If the pines and the tuliptrees of Broad Brook win the stature contest, the hemlocks have their own aesthetic appeal. Trees in the 100 to 110-foot height class are common along Broad Brook, and several trees are taller. So far, the champion grows a few yards below the 139-foot pine, a double-trunk hemlock that just reaches 120 feet - a respectable achievement for the species anywhere in Massachusetts. However, height is not everything. One old hemlock in particular reminds us that it and other more full-figured members of its species are not to be taken for granted. In the next image, Monica stands behind it, so it looks very large. It is, in fact, 11.5 feet in girth and 106.5 feet in height.



Aloft, the old hemlock is a mass of unruly limbs. One gets the feeling of forest wisdom. So far as we've found, it is the largest of its species on the Brook west of North Farms Road.

Elsewhere, the uniform trunks of hemlocks create aesthetic wooded corridors. Here's a view along a snow mobile path. The triple on the right is a northern red oak. The original tree would have been quite large. The trees on the left are hemlocks. From a distance, their impact is muted.



Drawing closer to the hemlocks, their impact grows as the following image shows.



What makes the forests along this section of Broad Brook so appealing to Monica and me? I'll deal with this question later in greater detail, but I believe that a no less iconic figure than Henry Thoreau would have not shrunk from elevated descriptions of the pines, hemlocks, and oaks along the corridor especially after surveying much of today's worked-over landscape. Here is a look at the two 130-foot white pines on the upper east side of the brook.



The one on the right measures 8.9 feet in girth and stands 132.0 feet tall. The left pine is a huge double with a breast-high girth of 12.6 feet and a height that just reaches 136 feet, making it one of a baker's dozen trees in the lower Connecticut River Valley in Massachusetts to achieve the 136-foot threshold. There may be more, but I haven't confirmed them.

The big pines along the east and west sides of the Brook fit our perception of what a mature New England pine forest should look like. Their deeply furrowed bark suggests ages over 150 years. Many of these pines have largely shed their lower limbs, which magnifies their height. The vertical dimension of a forest is what creates that cathedral appearance which appeals to practically everyone. Here are two examples.



By contrast, travelers through the wooded countryside of southern New England often view recovering forests featuring cluttered stands of spindly trees in the one to two-foot diameter class. Tree plantations around reservoirs add insult to injury, exhibiting uniformly spaced, densely distributed, pole-sized trees. These junior forests are, for the most part, quite frankly, boring. Woodlands bordering roadways are often choked with vines. The public has grown accustomed to such a scraggly backdrop as the forest norm for our region. It wasn't always that way.

By contrast, in addition to bigger trees, mature woodlands have a complex structure that provides a variety of wildlife habitats. In addition, ground plant colonization tends to be richer and more complex with a wealth of lichens, mosses, liverworts, and ferns. In mature and old growth, one becomes more conscious of the death and decay cycle of forest ecosystems. This doesn't sound attractive, yet oddly, natural events that create the complex structure previously mentioned can produce photograph opportunities. In the following image, we see a large wind-throw that creates a different habitat and microclimate. The cavity at the base of the roots ball stays cooler in the summer. The soil on top of the ball offers a seedbed to species like yellow and black birch, which have tiny seeds needing mineral soil to germinate.



The embedded rocks are glacial till. The entire region was a dumping ground for receding glaciers. This geological formation continues to the east and is dominant in the conservation area.

Next is a close up of fungus on the decayed trunk of a small hemlock. Artistry through degeneration.



And a final look at the hemlock-dominated forests of upper Broad Brook and its structural complexity.



Leaving the conspicuous pines and hemlocks, the tuliptree community is our next species to profile. Range maps for *Liriodendron* show this lord of the eastern forests as reaching southern Massachusetts and abruptly stopping. This is what Professor Gary Beluzo and I have confirmed in our distribution studies. So, an important part of the second story of Broad Brook pertains to the tuliptree. This more southerly species of the magnolia family makes one of its last stands in the northeasterly part of its range along little Broad Brook. Farther north, it exists primarily as a yard tree. There is an outlier stand of *Liriodendrons* in Keene, New Hampshire near a lake, but their scraggly appearance suggests that they escaped from planted trees in the area. They show no signs of natural adaptability to the region.

The tuliptrees along Broad Brook are among the last that grow naturally in the northeasterly part of the range. Altogether, counting saplings, arborist Bart Bouricius and I have identified over 50 tuliptrees in the corridor from our house to a mile upstream. This is an ecologically significant community. But the story does not end with the simple existence of the Broad Brook tuliptrees. *Liriodendron* is no ordinary species. To my mind, it is the king/queen of the hardwoods. No eastern species achieves greater stature. It reaches its zenith in the southern Appalachians where we measured one specimen to 191.9 feet, and have documented around one hundred at 170 feet or more. But this is at the center of the species distribution.

Moving northward, *Liriodendron* holds significant height into southern New York and New England, and westward into Ohio and southern Michigan. In our region, we have measured trees to 155 feet in lower Connecticut and along the Hudson in southern New York. At about 41.5 degrees latitude, the species loses its competitive advantage, but refuses to surrender its tall tree image. Even farther north, at just above 42 degrees north latitude, the tulips do not go out with a whimper. While diameters for the Broad Brook tulips are modest at only slightly more than two feet, four trees exceed 120 feet in height, including one at 130.5 feet. This lone tree grows on Monica's property and so

far as I have been able to determine is the northeastern most 130-foot of its species. A fifth tuliptree will like reach 120 feet in 2 to 3 years, and a sixth could make it in five.

The next image shows two tall tuliptrees on Monica's property. The tuliptrees are the ones in the center and left of center. The one on the left is the 130.5-footer. The one on the right is 126.6 feet tall.



The tulips have lots of company. Notice the tree just to the right of the center tulip. It is a gorgeous white pine that we've named in honor of two friends. It is the Sarah and Phoebe Pine and it is 128 feet in height and 8 feet in girth. It is a relatively young pine with lots of growing left to do. Here is an image looking up its trunk.



I have concentrated on the pines and tuliptrees as the tallest species in the eastern forests. It is appropriate to the story that these species make one of their last showings together along Broad Brook. But I do not want to ignore other species. One pignut hickory on the west side of the brook north of the Grandmother tree is hardly noticeable with its slender trunk measuring only 4.7 feet around. But if you stand beneath this little hickory and look upward, its height is amazing. I measured it to 121.5 feet. I have no explanation for such height given the very small girth. The view looking up the ramrod straight trunk follows.



I'll now summarize the tall tree numbers for upper Broad Brook, i.e. the 120s and above. I have not measured all the white pines in the height range of 120 – 129.9 feet along the corridor, but I believe there to be between 35 and 40. So, if we take the 14 pines in the 130 feet and above class that I have measured, add the hoped-for 40 in the 120 to 129.9-ft class, throw in the 4 tuliptrees over 120 feet, the one hemlock, and the lone pignut hickory, we have no less than 60 total trees reaching to 120 feet or more along a mile and a half of Broad Brook. My current plan is to measure and document all of them.

As a final exploration of the numbers, turn to Broad Brook's Rucker Index. The Native Tree Society uses the Rucker Index as a measure of stature for a forest. The heights of the single tallest member of each of the ten tallest species are added and averaged. In New England, Mohawk Trail State Forest has the highest index at 136. In Massachusetts, Ice Glen is second with 127, followed by Monroe State Forest at 124. Robinson State Park and Mount Tom State Reservation follow at 119 each. Mount Greylock State Reservation is around 117. After Greylock, Broad Brook and a few other sites vie with one another for the next highest Rucker. Broad's Brook's index presently stands at 115. This almost certainly insures a spot in the top dozen Massachusetts sites and maybe the top ten.

The final story of this initial submission on Broad Brook touches on the northern red oak. Big red is a commercially valuable species and catches the eye of the lumberman. It is an important wildlife tree. Oaks of all species connote power and solidness. Mature specimens are scattered along the path of Broad Brook from North Farms Road to the head of the stream. Most of the older trees are between 7 and 9 feet in girth and 90 to 110 feet in height. The tallest I've found just eclipses 116 feet, and that tree is on Monica's property. I expect there are a few others near this height, but I like to think that her trees benefit from the proximity of her music room. On Monica's property, alone,

at least nine northern reds exceed 100 feet in height. On adjacent Smith Vocational property, a handsome large oak exceeds 9 feet in girth and reaches to 102 feet in height. We regularly pass by the imposing oak on our way to the upper reaches of the brook. It has become an old friend. But it is not alone. Other isolated large oaks dot the path going upstream until an area owned by a third party is reached. The big trees stop there.

### **The Meaning of the Numbers**

I apologize for the preceding deluge of numbers. But, the real story of upper Broad Brook's forests lies in its tree statistics. I should explain. Some nature lovers walk woodlands paying minor attention to the trees. They relate to forests primarily as wildlife habitat. Others focus on wildflowers or mushrooms. This is perfectly okay, but upper Broad Brook's exceptional qualities, as a forest, lie in the abundance of its mature trees and the visual images they provide us. Consider a tree that is 20 inches in diameter, free of limbs for 30 feet, and 60 to 80 feet tall. These dimensions will not make much of a visual impact, and a smaller tree will look decidedly juvenile. Now, add 6 inches to the diameter, 10 more feet of limb-free trunk, bring the total height to 100 feet, and we have a tree that makes an impact. Add still another half a foot of diameter, 10 more feet of limb-free height, and increase the total height to between 110 and 130 feet and we have reached the tree size appropriate for a stately northeastern forest. I have just described trees you can see along parts of upper Broad Brook.

### **Summary**

I was first introduced to upper Broad Brook in 2005. My initial impression was favorable, but colored by the superlative big forests that I was studying elsewhere. Cook Forest, PA, Hearts Content, PA, and Mohawk Trail State Forest, MA in the Northeast; Joyce Kilmer in North Carolina; the Great Smoky Mountains National Park, TN-NC; Congaree NP, SC; the Porcupine Mountains, MI and other such places are top-of-the-line – the East's forest icons. By comparison, little Broad Brook struggles. But it is manifestly unfair to compare the 100-acre swath of woodlands to the iconic, world-class places. By contrast, when compared to the bulk of the Massachusetts regrowth landscape, little Broad Brook flexes its muscles. It boasts trees to impressive heights of 140 feet and girths to 12, one of the northeastern-most stands of tuliptrees, abundant wildlife, and solitude. It has the look and feel of an attractive New England forest, the type that Thoreau wrote about as he witnessed the loss of the virgin woodlands to wide-scale logging. With its mature forest cover, upper Broad Brook gives us a hint of a lost heritage, a heritage that can only exist in places protected from exploitation. In our geographical region, trees require between a century and a century and a half to achieve sizes that tease the Tolkien imagination. Upper Broad Brook gives us the hope of recapturing a bit of New England past.

I will close with three scenes. The first two are taken from a spot on little Broad Brook's meandering course about half a mile south of its source.



Lastly, we see Monica’s favorite tree, standing at the base of the hill behind the house. It is a tuliptree that sends its arrow-straight trunk 128 feet skyward. The tulip’s diagnostic grooved bark is showcased behind the tuning fork shape of a closer, young white pine.



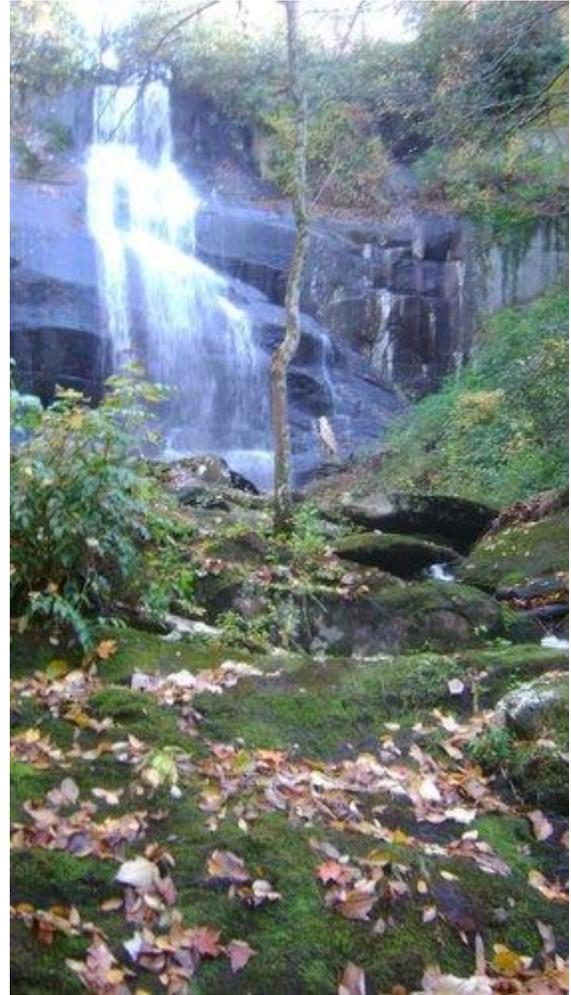
Part II of the Broad Brook series will focus on other tree species growing in the corridor.

## [Pareidolia in TN: Face in the Waterfall](#)

by pitsandmounds » Wed Mar 13, 2013 7:14 pm

Here's a case of Pareidolia.

Check out the face in the rock right next to the waterfall. You're looking at the side of his face. This is on the Falls Branch hike in Citico Creek Wilderness. The trail starts next to the Cherochala Skyway and is marked as Rattlesnake Trail West. There were some old growth Yellow Buckeyes there, but this was before my measuring days.



- Matt

## [Hemlock Legacy Project](#)

by Neil » Sun Mar 03, 2013 10:09 pm

Dear NTS of the eastern US and Canada,

There is a new opportunity for citizen science that is right up our alley: collecting and preserving hemlock samples before they are lost through the Hemlock Legacy Project - HeLP. There will be an article coming out soon in a mainstream source about it and there was this clip, too:

<http://news.sciencemag.org/sciencenow/2013/02/saving-the-past-in-dying-trees.html?ref=hp>

It will take some time to coordinate the project in its entirety. Most of the coordination will come out of Dr. Amy Hessl's lab at West Virginia University. <http://hessl.eberly.wvu.edu/> - there might be a grad student and web page in the fall organizing the project a little more formally. I'll def keep you updated as things develop.

The original article is available below at the open access site of Columbia University. It has recently become CU's policy that its researchers make their publications available to the public - hear, hear! So, download HeLP here:

<http://academiccommons.columbia.edu/catalog/ac%3A157045>

Neil Pederson

## [Re: Hemlock legacy Project](#)

by Neil » Thu Mar 14, 2013 8:56 am

Dear NTS,

I posted in the Hemlock Legacy Project already, but want to drop a quick note here as well.

The project's web site is now live here: <http://www.geo.wvu.edu/hemlocklegacy/>

There are many ways to participate. Please join in and HeLP as you can.

thank you,  
neil

## [Eastatooe Creek Heritage Preserve, SC](#)

by bbeduhn » Wed Mar 13, 2013 4:56 pm

Eastatooe Creek forms a gorge on the edge of The Jim Timmerman Natuarl Resources area. It was listed on National Geographics "50 Places to visit before you Die" list. Some very rare ferns grow there. the original trail that led down to the gorge suffered considerable damage from hurricanes in 2004. I followed the old route for a while on an old logging road but doubled back about a quarter mile into single track. It became very steep with blowdowns and washed out trail. Since there was a chance nobody else would even be in the Preserve that day, let alone on the closed trail, I figured it was best to get back on the new trail.

The trees get tall from the get go. Tulips are at their highest along with white oak at the slightly higher altitude. Hickories are rather puny at first but more than make up for it later on. There's a relatively flat area with little undergrowth along the creek which harbors tall, fairly young specimens, including one of the best second growth hemlock forests I've seen.

As always, there's certainly a chance I got a couple of the hickories wrong.

pinus rigida	pitch pine	92.2'	101.4'
		124.5'	
Pinus Virginiana	VA pine	91.0'	108.9'
Pinus echinata	shortleaf pine	83.3'	117.4'
Pinus strobus	white pine	131.7'	
Tsuga canadiensis	hemlock	106.2'	106.2'
		122.9'	122.9'
		125.3'	
Tsuga morte	dead hemlock	138.6'	It

appears these easily topped 150' before infestation

Juglans cinera butternut 81.0' 84.7'  
84.8'

Carya alba mockernut hickory 116.7' 123.0'  
123.1' 123.1' 126.7' 131.2' (141.5' may be  
bitternut)

Carya cordiformis bitternut hickory 126.6'  
130.5' 141.5'

Carya glabra pignut hickory 117.5'  
121.9'

Carya pallida sand/pale hickory 95.5'

Quercus alba white oak 113' 125.6'

Quercus rubra red oak 107'

Quercus montana chestnut oak 102.4'

Fagus grandifolia American beech 104.7'  
111.6' 113.5'

Acer rubrum red maple 104.6'  
117.0'

Robinia pseudoacacia black locust 104.7'  
115.7' 117.2'

Oxydendrum arboreum sourwood 72'

Magnolia acuminata cucumbertree 120.8'

Magnolia fraseri Fraser magnolia 80' 98.8'

Sassafras albidum sassafras 96.5'

Dyosporos virginiana persimmon 84.0' 107'

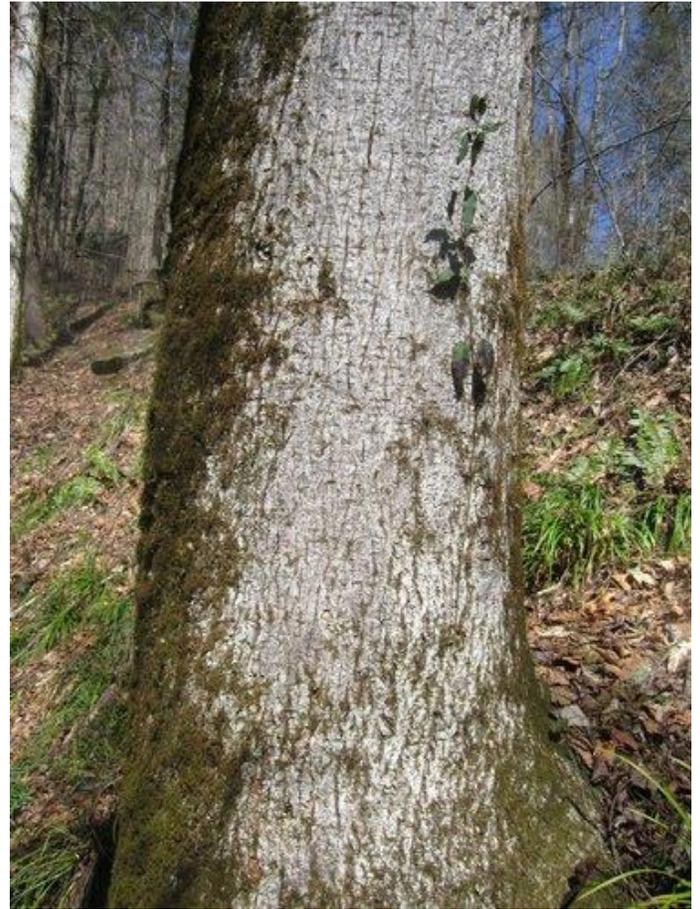
Fraxinus Am. var. biltmoreana biltmore ash 76.6'

Liquidambar styraciflua sweetgum 109.3'

Betula lenta black birch 101.0'  
102.3'

Liriodendron tulipifera tuliptree 138.0'  
138.4' 138.6' 138.9' 145.5' 145.6' 150.1' 151.8'  
152.0' 157.2' '

It's interesting to see the height disparities between this site and Laurel Fork, as they are just a few miles apart. VA pine, sourwood and sweetgum all shine at Laurel Fork. Hickories dominate at Eastatoe. Tulips do well at both sites. White pine is almost nonexistent at Eastatoe and dominant at Laurel Fork.



*Mockernut or bitternut 141.5'*



*Mockernut or bitternut crown 141.5'*



*pitch pine 124.5'*



*Eastatoe sluice*



*Interesting mockernut bark*



*Whitest mockernut I've seen*

## [Re: Eastatoe Creek Heritage Preserve](#)

by **bbeduhn** » Thu Mar 14, 2013 9:53 am

*Bart Bouricius wrote: Is the ravine deeper here than at Laurel Fork?*

Bart, Yes, the ravine is deeper than at Laurel Fork, but not by too great a margin. Both ravines are relatively steep. The Eastatoe creek runs basically due south, with some twists and turns. Laurel Fork runs southwest where tulips and sweetgum dominate, and a few yellowwood reside. It then heads due west and the ravine opens up and becomes a bit more level. Pines dominate in the westerly section.

I counted 160 rings on a hemlock roughly 2' d at Eastatoe. I counted 160 rings/whorls combined on a white pine at Laurel Fork, nearly 3' d. The white pine

was located on a 10' high bluff and growing up from the side of the bluff. I assume the bulk of the white pines at Laurel Fork are a bit younger (100-130 yrs. but it's just a guess).

Brian

## [41 foot Japanese Umbrella Pine | SW Portland, OR](#)

by **mdvaden** » Wed Mar 13, 2013 8:39 pm

Unique find today, considering that 41 feet is so short compared to native conifers ... but I spotted a Japanese Umbrella Pine in a back yard while discussing drainage with someone. 41 feet is a lot shorter than it's native habitat's older trees, but 41 feet is the tallest one I've seen in an Oregon landscape setting.

The location is not the most photogenic, but it's an okay looking tree. Not real full, but it adds some character. Leaves look very healthy. First time I've ever seen cones on one too.

M. D. Vaden of Oregon



## [Re: 41 foot Japanese Umbrella Pine | SW Portland](#)

by [JohnnyDJersey](#) » Wed Mar 13, 2013 10:47 pm

Now see Mario, that's how you can tell a real tree fanatic from an ordinary guy who just likes trees. Photographing a 41ft tall tree. :) Reminds me of when I first met the wife and we were out all day measuring 20+ ft CBH Oaks and Sycamores. Suddenly I run into the woods all excited to measure a 13ft CBH American Beech. She said, "Come on John, this is getting out of hand, if your gonna measure that tiny tree you might as well measure the entire forest." I said, "No you dont understand, its a BEECH! Its huge!" Lol. When your a tree lover you just have a different perspective on things.

John D Harvey

## [Eastern hemlock needle tea](#)

by [sylvanicedawn](#) » Thu Mar 14, 2013 8:52 am

Just curious about something: I've read somewhere that people have made tea from hemlock twigs. It's something I've never done, and would like to try, since there are still some tsuga trees alive in my area. But what if, for example, I was in a park where hemlock trees had been chemically treated? Would traces of the chemical in the tree render the bark of the twigs absolutely unsafe for making a hemlock tea, or would it be OK to still use them?

## [Re: eastern hemlock needle tea](#)

by [Will Blozan](#) » Thu Mar 14, 2013 6:21 pm

I think regardless of chemical traces the tea would be nasty. Carolina might be pretty good with the tangerine essence. With chemical traces any lice, fleas, ticks would have a rough time... but wouldn't harm you unless allergic. I'd steer clear if you suspect they have been treated.

## [Laurel Fork Heritage Preserve, SC](#)

by [bbeduhn](#) » Mon Mar 11, 2013 3:57 pm

The Laurel Fork Heritage Preserve is located in the Jim Timmerman Natural Resources Area, aka Jocassee Gorges. There are several old logging roads on the property, and the Foothills Trail traverses it east to west. I measured along the Foothills Trail for about two miles west of the Preserve as well.

The Virginia pine would be a new record. It appeared to be mid 110's but came out at 124.6'. I didn't crunch the numbers in the field so there is a slight chance that it is in error. I'm not sure when I can get back to confirm it and take pictures. The tallest Sweetgum is easily the tallest one I've seen. I don't know if it is a mountain record. It's still 10' shy of Congaree.

Pinus rigida pitch pine 104.2' 108.4' 111.3'  
114.0' 114.1' 115.8' 116.1' 116.5' 121.9'

Pinus Virginiana VA pine 102.3' 104.1'  
110.9' 113.6' 113.7' 113.9' 124.6' potential new record

Pinus strobus white pine 141.6' 144.4' 146.3'  
147.4' 151.0' 151.5' 156.3' 157.5' 161.9'

Pinus echinata shortleaf pine 106.1' 109.2' 110.4'  
116.6' 118.2' 123.9' 124.0'

Tsuga canadensis hemlock 107.5' 113.4' 115.0'  
119.0'

Tsuga morte dead hemlock 143.6' 148.9'

Liriodendron tulipifera tuliptree 141.9' 143.1' 143.5'  
144.2' 145.5' 146.6' 147.2' 148.2' 152.7'  
157.3'

Liquidambar styraciflua sweetgum 130.0' 131.0'  
133.4' 133.9' 137.6' 138.0' 146.7'

Robinia pseudoacacia blk. locust 123.6' 129.4'

Carya alba mockernut hickory 114.5' 117.0'

138.5'

Betula lenta black birch 105.6'

Oxydendrum arboreum sourwood 82.5' 97.3'

quercus alba white oak 112.9'

Acer rubrum red maple 114.0'

Carya cordiformis? Bitternut hick. 96.0'

Nyssa sylvatica Black gum 95.3'



*Appears to be sugar maple but I could find only red maple leaves*



*Mystery tree crown 96.0'*



*157.5' white pine*



*Cool shortleaf bark*



*Black gum*



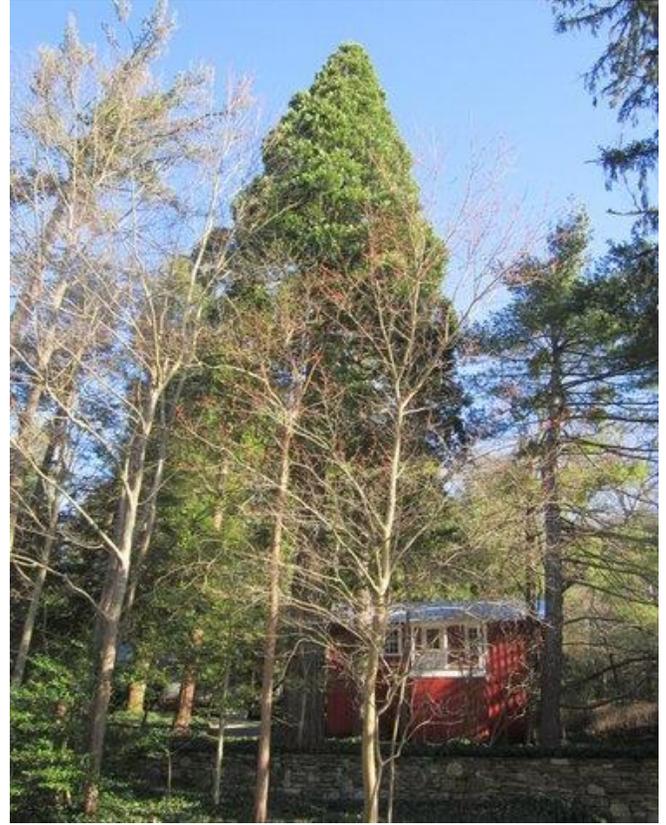
*Virginia Hawkins Falls*



*Black gum crown*



*Mystery tree (bitternut hickory?)*



*122.5' incense cedar*

### Saluda Incense Cedars

by **bbeduhn** » Fri Mar 15, 2013 10:06 am

This property is under the care of Will Blozan and his crew. I was driving by it over a year ago and noticed the incense cedars. They really stuck out. I originally thought they might be sequoias. I measured on the spot, let Will know about them and he told me he had measured the tall one to 122' in 2006 or 2007, while I came up with 112'. My vantage point wasn't the best as I was still learning how to measure properly. I got a higher figure but still may not have hit the top as it is rather rounded.

Calocedrus decurrens      Incense cedar      122.5'  
110.0'    80.0'

Cunninghamia lanceolata    China-fir            64.5'  
63.3'



*110' incense cedar*



*China-fir*



Robert T. Leverett

## [Photo Measuring with Bart Bouricius](#)

by [dbhguru](#) » Mon Mar 11, 2013 7:44 pm

NTS,

Attached are the results of a trunk modeling this afternoon by Bart Bouricius and yours truly using photo analysis and a reticle monocular. The results speak for themselves. The method continues to show its relevance and power.

Bob Leverett

## [Re: Photo Measuring with Bart Bouricius](#)

by [dbhguru](#) » Wed Mar 13, 2013 9:44 am

NTS, I've done more analysis on the photo modeling that Bart and I did. This time I compute trunk length segments via photo analysis to see how they match

up to the laser-clinometer determined lengths. I've attached an updated version of the spreadsheet showing the results. I'll let the spreadsheet do the talking.

Bob Leverett



[PhotoMonocularMeasurementBart.xlsx](#)

## [Re: Photo Measuring with Bart Bouricius](#)

by **edfrank** » Thu Mar 14, 2013 12:04 am

NTS, Bob, and Bart,

I am optimistic that this will be a great tool for measurement. Essentially what you are doing is determining an optical factor for a particular lens focal length using a scale. The scale is measured and the optical factor is determined. All the points in that same photo have the same optical factor. The formula for a reticled monocular is as follows:

Diameter= (Reticle scale) X (distance to target) ÷ (optical factor)

In the case of these measurements the above calculations are carried out for each position selected via the Excel spreadsheet. The distances to the target position are measured via the laser rangefinder. The width is measured on the photograph. There is no reason at all that this should not work exactly like a reticled monocular for girth measurements.

I need to think about how you are determining trunk length. The top and bottom of each segment are at different distances from the camera, even if you consider the trunk to be straight up and down and not leaning. Perhaps you can elaborate how the trunk length is being determined. You also suggested when I talked to you, and it is in Will's Tsuga Search guidelines about breaking the trunk into sections for volume modeling based upon interpolation between actual measurements. How are you determining on

the photograph exactly the height where the diameters are being taken given that the sections are progressively farther away from bottom to the top and the scales are changing (think of a log type scale). It is a smooth change and I am sure it can be calculated, but if this process could be articulated, it would be helpful.

Overall I think it is fantastic that the volume can be calculated from a photograph gives a scale and a handful of distance measurements. It will make the process of volume calculations more accessible and usable by anyone with a camera and rangefinder.

Looks good. it will change the paradigm of trunk volume modeling for trees where a good shot or series of shots of the entire trunk can be taken from one position.

The other concern is potential lens distortion, but you can work to minimize that effect in a given photograph.

Edward Frank

## [Re: Photo Measuring with Bart Bouricius](#)

by **Bart Bouricius** » Thu Mar 14, 2013 8:26 am

Ed,

I am sure Bob will give a better answer than this, but calculating the length is not a problem as we have the laser measurements to the previous measurement point on the tree and the new one. just as in measuring height with the Nikon 440 alone, as long as you check the angle, It does not matter if the tree leans because we have the lengths of the sides and the shape of the triangle in question, one of who's sides represents the length of trunk. It would be a problem if the trunk was strongly curved, such as an extremely squirrely pitch pine for example, but this example would create difficulties with other measurement methods as well. Depending on the shape of the trunk cross section, a perpendicular shot

would be required as well. I doubt that this method will be as accurate for volume as actual circumference measurements but it will be interesting to compare this method with trees that have been measured by hand, at least as far as the trunk volume is concerned. In trees such as Ceiba pentandra, where gigantic branches make up a very important part of the volume, using photos of branches from the center of the tree may be sufficient to decrease the time substantially in getting a volume measurement for the entire tree. Time and experiments will tell. I hope this is not confusing, or that I am not confused. I will let Bob correct me if I am.

Bart Bouricius

## [Re: Photo Measuring with Bart Bouricius](#)

by [dbhguru](#) » Thu Mar 14, 2013 9:27 am

Ed, Bart, et al.,

Ed, you are correct to suspect that vertical measurements would be distorted. We have to stick with measurements of circular (more or less) objects at known distances. The reference object needs to be relatively small, say a maximum of a two-foot length and oriented at 90 degrees to the camera. When we view a circular object at a distance, looking toward the middle, we are automatically oriented at 90 degrees toward the view of maximum object width. If we stay within these parameters, we're okay. I got lucky on that last post.

So, the template works sheet has to have cells for laser-measured distances and clinometer-measured angles to the targets, meaning that we can wait to select the targets on the photo and work out vertical distances from the photo. The photo analysis is strictly for the diameters. The ratio and proportion feature of the image size of an object within the photo is based on distance to the object. I created a momentary stir for nothing.

Robert T. Leverett

## [Re: Photo Measuring with Bart Bouricius](#)

by [edfrank](#) » Thu Mar 14, 2013 9:48 am

Bob, Bart, I am just wondering about the interpolation. If the tree were vertical with the upper measured value for the trunk directly over the base, then the height would be  $\sin A \times \text{hypotenuse} = \tan A \times \text{horizontal distance to the trunk}$ . If the section from the top to the bottom as shown on the photograph were broken down into equal length segments, each segment would have the the same number of degrees of angle but would be of different lengths. But then you could go back and use the tangent function to determine the height of each of those points, and thus determine the segment length between each of the interpolated lengths. If the tree were slanted from vertical but still straight, then this process would give you the base length of a similar triangle with a length of trunk = hypotenuse =  $\arctan(\text{angle from base to uppermost measurement})$ . So the length of the trunk segments could be calculated if the tree were straight and either the upper and lower measured sections were directly over each other, or if the section was tilted and you were looking in the same plane as the tilt angle. A 10 degree slant in the tree would only affect the calculated length by 1.5% so minor irregularities on the trunk will not make that much difference. So segment length could be calculated if you treat interpolated points as angles and work from there.

The basic point being if you can calculate the height of a particular cross-section then you can calculate the distance as  $[(\text{height})^2 + (\text{horizontal distance})^2]^{1/2}$  and thus determine the width at the interpolated point. The diameter of a cylinder isn't going to change no matter what the viewing angle, so the angle to the width measurement point only matters in regard to length.

In the field the angles to the measurement points could be directly measured with a clinometer, but I am trying to present a possible work-around for measurements based on a photo.

Edward Frank

## [Re: Photo Measuring with Bart Bouricius](#)

by **dbhguru** » Thu Mar 14, 2013 1:47 pm

Ed, Bart, Larry, Doug, Will, et al.

The attached Excel workbook just confirms what you already recognized, Ed. We can take multiple close up images from the same location and a reference object in any one of the images applies to the others. In the attachment, you'll notice three images of different parts of an oak named Pokey. I chose a spot in the dining room where I could see the tree to be measured. From there, I split a section of the tree up in three photos, keeping the same focal length throughout. Absolutely no change of camera settings. I also shot distances and reticle values to points in the three separate images. The reference object is the diameter at the location of the round marker near the base.

As you can see, I got extremely close measurements via the reticle and the photo process. My next step is to develop a clean spreadsheet template for this process and good user instructions. The method really does work on circular objects. With reference object of known dimension, laser rangefinder, clinometer, and digital camera, we can model trunks for volume. Throw in a compass to get horizontal angles and the process can be extended to limbs at all angles.



[PhotoMeasurementPokey.xlsx](#)

Robert T. Leverett

## [Re: Photo Measuring with Bart Bouricius](#)

by **Don** » Fri Mar 15, 2013 7:21 pm

Over a century of photogrammetry suggests that as you go in any direction from the center of the photo, increasing distortion due to the curvature of the lens

the "optical factor", as Ed refers to it, changes. That is the case even in a flat field such as photographing a paragraph such as these looking straight down at the paper on a table, when using a camera with a specialized "flat-field lens".

Add topography (whether it's aerial photography or land-based panoramic photography), and the amount of distortion increases with the background distance.

When the subject is a tree, it does present a flat field from its base to its top, but still experiences a variable "optical factor" as you "scroll" up and down from the center of the photo. To say nothing of issues such as variable distances between the base (baseline) and the top (hypotenuse), from the typical camera perspective.

I should think that the rule of thumb that photogrammetrists use may help here, which is to use the inner third of the image to experience the least distortion. For example, I think I recall Randy Brown (you still around, Randy?" using a camera with very high resolution, and a quality wide angle lens. This allows continued good image resolution, and keeps the distortion down (to the extent that the entire tree is framed in that inner third of the image's extent).

Don Bertollette

## [Re: Photo Measuring with Bart Bouricius](#)

by **edfrank** » Fri Mar 15, 2013 7:56 pm

Don, My use of optical factor really refers to the scale to distance ratio for the particular focal length.

It is the term used by the manufacturers for the reticle/monocular. The distortion is a something to be aware of. Using multiple images will help in this regard as the diameters to be measured can be centered in each individual photo rather than up and down the entire frame. We really should look at photographing something like a brick wall with a

regular grid pattern to see the potential effects of this distortion on the measurements.

Edward Frank

## [Re: Photo Measuring with Bart Bouricius](#)

by [dbhguru](#) » Fri Mar 15, 2013 9:32 pm

Don, Ed, Keeping the target centered and small is the current order of the day. I plan to experiment more and will use a flat vertical surface to experiment with. There is another consideration for the method I'm using with Excel for a vertically oriented object seen at a high or low angle. I'll give an example. Suppose we're photographing a 160-foot tall tree from a baseline of 100 feet. The last 10 feet of trunk us tends an angle of 1.7 degrees, I.e. the field of view is 1.7 degrees for the segment from 150 to 160 feet. Now the angle for the first 10 feet (assuming our eye is at base level) is 5.7 degrees. Stated another way, an angle of say 1 degree covers more trunk farther up the tree. The implications in photographic images rule out measuring height directly from a photograph by any simple process. A pixel higher up the trunk becomes worth more, but how much more?

Tomorrow, Monica and I head to Plattsburgh, NY for a couple days. I hope to extend the photo analysis beyond what I've done thus far, but the road has suddenly gotten rough. However, for the simple measurements done and passed along in the series of spreadsheets, we've got us a new technique.

Robert T. Leverett

## [Re: Photo Measuring with Bart Bouricius](#)

by [edfrank](#) » Fri Mar 15, 2013 10:00 pm

Bob, You can measure height if you are willing to accept a tangent height and the error problems it entails. You know the distance to the target and the size of the target. From that you can calculate the angle that the length of the measuring stick represents. From this you can measure the height of the tree in terms of the number of times that angle is expressed from top to bottom. Thus you know the angle to the top of the tree, and at basically any point up and down the tree. By using the tangent function you can calculate the height based upon the original horizontal distance to the tree.

You could also measure the distance to the top of the tree with the laser rangefinder and just make everything easier. The angle to the top could be measured on the photo as outlined above, or more easily measured by a clinometer in the field.

Edward Frank

## [Re: Photo Measuring with Bart Bouricius](#)

by [dbhguru](#) » Sat Mar 16, 2013 8:54 am

Ed, We have taking measurements in the field and using them in abstract mathematical models down pretty well. How well, we can then apply some, or all, of the field measurements to a photograph is a different proposition. I'm satisfied that we're okay in measuring narrow widths or heights at known distances on the photos using proportionality. But when we expand the area to be measured on the photograph and use an overlaid object like an Excel line shape compared to another overlaid shape line of known distance and actual size, we encounter a different set of challenges. I'll attempt to illustrate these challenges on a series of spreadsheets over the next week. Maybe we can settle on the combination of measurements and objects needed to bump this

methodology up to the next level.

I really appreciate you, Don, and others joining me on the project to develop photo measuring as a productive tool for us. I usually make these posts, recognizing that they have a limited appeal because I'm working on the fringes. On occasion, a new technique holds real promise. I believe, as do you, that the photo measuring has a place in our repertoire. Again, thanks.

Robert T. Leverett

## [Re: Getting started with the Fusion program and LiDAR data](#)

by [pitsandmounds](#) » Sat Mar 09, 2013 7:24 am

Steve,

Thanks so much for sharing your process on how to analyze the OGRIP files with Fusion. Your step-by-step explanation made it easy to jump in and get started.

So far I've used it for scouting purposes, but now I want to find the individual trees that caused the tallest hits. Utilizing the view of the terrain has put me in the right area, but I want to use latitude/longitude to ensure that I'm not misreading the terrain and that I'm actually in the right spot.

I haven't been able to figure out if Fusion can show the latitude/longitude of a specific point, but I've been able to find it using this method. If anyone knows how to pull latitude/longitude directly from Fusion, please let me know.

- 1) Use the LIDAR Data Viewer to pinpoint the tallest hit.
- 2) Select a very small area on the Fusion image that includes the tallest hit.
- 3) Right click on the Fusion image until the

individual tree is visible.

4) Compare the Fusion image with [maps.google.com](http://maps.google.com) and line up a couple landmarks, and match up the location of the tree. Use the "What's Here" functionality on [maps.google.com](http://maps.google.com) to find the latitude/longitude.

Or,

Compare the terrain on the LIDAR Data Viewer with the terrain on the USGS National Map Viewer. Place the cursor on the spot of where the tree would be on the USGS National Map Viewer and the cursor position will show the latitude/longitude.

5) For verification purposes, enter the latitude/longitude into the OGRIP site and make sure that the tree image matches the tree image that was on the Fusion image.

- Matt

## [Re: Getting started with the Fusion program and LiDAR data](#)

by [Steve Galehouse](#) » Sat Mar 09, 2013 12:16 pm

Matt-

I've also tried to get lat/long co-ords directly through Fusion, without success. There must be a way to do so, as the viewer screen has a button for GPS values. I end up doing something similar to what you do, but I've found Big Birdseye images to be more helpful than [google.maps](http://google.maps). The tall trees in my area are nearly always associated with topography that readily relates the screen image to the actual location.

Steve Galehouse

## [Re: Getting started with the Fusion program and LiDAR data](#)

by **Jess Riddle** » Sat Mar 16, 2013 5:10 pm

Steve, Matt;

If you're just interested in the highest points, there is a clunky way to get coordinates out of Fusion. Try Tools->Terrain model->describe terrain model then select the canopy height model that you're interested in. In the "Describe DTM" window that pops up, hit the "view elevation data" button. A new window should open with a contour map of your canopy height model. Increase the contour interval to slightly less than the tallest trees. You should then see a nearly blank map with a few small rings that indicate where the highest canopy is. Move your cursor over the tall tree area of interest, and the X and Y boxes will display the coordinates in the same units as the original LiDAR data.

Jess Riddle

## [Sweden's Bioenergy Success Story](#)

by **Joe** » Sun Mar 17, 2013 8:14 am

I don't see a sub forum for Sweden, so I'll post this here.

please read the following: <http://www.renewableenergyworld.com/renewableenergyworld.com/news/article/2013/03/swedens-bioenergy-success-story>

and be sure to read the comments at the bottom.

regarding the guy I dialogue with near the end, a big critic of Swedish forestry- he's posted an article on the Yale360 web site: [http://e360.yale.edu/feature/swedens\\_green\\_veneer\\_hides\\_unsustainable\\_logging\\_practices/2472/](http://e360.yale.edu/feature/swedens_green_veneer_hides_unsustainable_logging_practices/2472/)

and his personal web site: <http://erikhoffner.com/index.html>

reading Erik's personal web site, i see he wrote an article about Poland's Bialowieza National Park : [http://www.earthisland.org/journal/index.php/eij/article/forest\\_medieval/](http://www.earthisland.org/journal/index.php/eij/article/forest_medieval/)

Joe Zorzin

## [Hello from "Wild and Wonderful" WV](#)

by **Brian VTLC** » Sun Mar 17, 2013 8:38 am

Hi everyone,

I was afforded the opportunity of a lifetime about a year ago to join a wonderful new company, Virgin Timber Lumber Company. We are building some really incredible furniture from 100% recycled timber from the old growth virgin forest of the Appalachian mountains that built southern West Virginia during the coal and timber boom of the late 1800's and early 1900's. Now over 100 years later we are saving these dilapidated structures from the landfill and giving the wood a second chance at life, to be enjoyed for generations to come.

Being from a family that has always been in the construction business I guess it was inevitable that I would follow the many generations before me and become a home builder as well. It has always been a struggle though! Being an avid environmentalist it was tough seeing all the wastefulness that is involved with the construction industry. Luckily my new career path has remedied this struggle.

While we travel around WV reclaiming these dilapidated structures that were built during the time period (early 20th century) that the virgin forest of WV were being cut, we also like to document everything we can to help tell not only our story but the story of these once great trees and forest that built this country. Here's a link to some pics from our stop at Gaudineer State Park, WV after making a delivery

to northern Virginia last summer. [http://www.facebook.com/media/set/?set=...\\_019&type=3](http://www.facebook.com/media/set/?set=..._019&type=3) I hope you enjoy.

Brian Sutphin  
[www.virgintimberlumber.com](http://www.virgintimberlumber.com)



*Red Spruce in Gaudineer State Park, WV*

## [Chile Trip Part 1: Rio Puelo and Parque Tagua Tagua](#)

by **Josh Kelly** » Fri Mar 15, 2013 11:39 pm

Dear NTS,

I recently took an unusual four week vacation to Chile with my wife to visit my sister and Chilean brother-in-law who became sweethearts when my sister visited as a high school exchange student over 15 years ago . Taking so much time off of work is unusual in the nose-to-the-grindstone work culture of the U.S. - a trend I think it would be healthy to change. We were joined for two weeks by mutual friends from Asheville. All told, we saw a fairly wide swath of the country, mostly in Santiago and just north in Pichidangui, and also in the Auracaria and Lakes Districts.

I have long had an interest in Chile and its mountains, rivers, and forests. My sister lives in the semi-arid north of the country, where what trees do occur are non-natives like Eucalyptus and Ailanthus. I made sure to schedule about 20 days of travel in the south of Chile, where a climate ideal for temperate rainforest occurs south of the 35th parallel and in isolated areas further north.

Because I was travelling in a group, and because my own interests are diverse, I did not spend as much time measuring trees and exploring primary forests to satisfy my own desires, though I still feel fortunate to have the opportunity to travel. I hope that the members of this forum find what I share to be interesting, despite the limited amount of empirical data gathered on my journey. Given that Chile uses the metric system, I will report what measurements I did take in metric and English units.

On March 25, our party of six arrived in the small community of Puelo (elevation 70 m), on the banks of the mighty Rio Puelo, and surrounded by coastal montans, including Volcan Yates (~2187 m; 7175')—whose glaciated volcanic cone made for good scenery if you could ignore a recently erected communications tower on its slope. Treeline in the area is above 1500 meters and most of the forest

below 1200 meters is evergreen, Valdivian Rainforest.



Volcan Yates

Valdivian Rainforest is the name given to a large band of evergreen, temperate rainforests in southern Chile and Argentina. While these forests are evergreen, they are dominated by angiosperms, not gymnosperms.

Some great links for learning more about valdivian rainforest

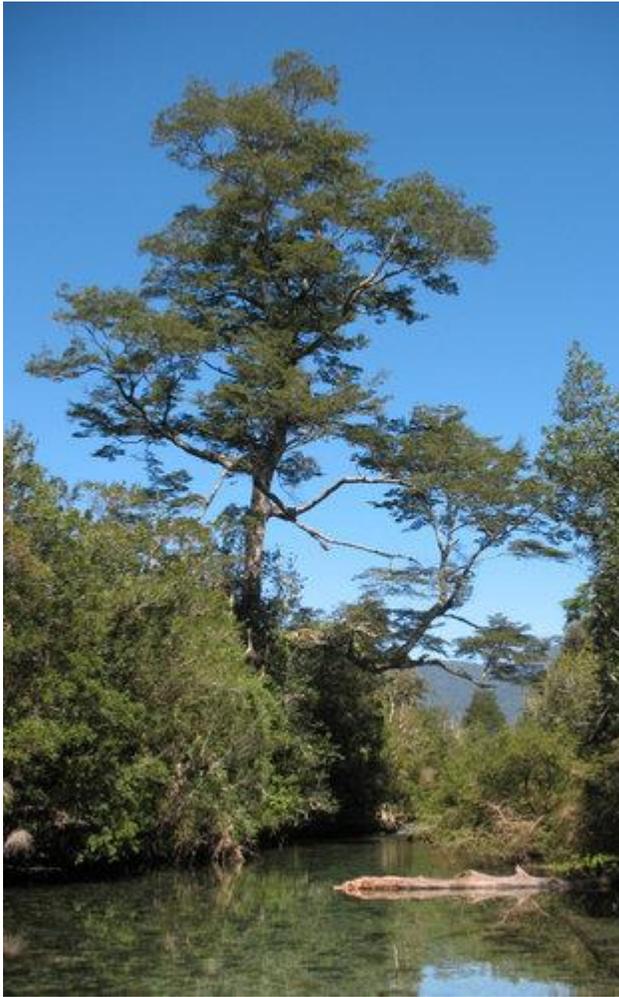
are: [http://en.wikipedia.org/wiki/Valdivian\\_ain\\_forest](http://en.wikipedia.org/wiki/Valdivian_ain_forest)

[http://www.eoearth.org/article/Valdivia\\_opic=49597](http://www.eoearth.org/article/Valdivia_opic=49597)

Some of the common trees I learned to recognize were *Nothofagus dombeyi* (common coihue), *Eucryphia cordifolia* (Ulmo), *Weinmannia trichsperma* (Tineo), *Podocarpus nubigina* (manio), and several shrubs, including *Luma appiculata* (Arrayan). There were a great many more shrubs that I failed to put a name on, as well as many woody vines. Epiphytes, especially filmy ferns, mosses, and liverworts are abundant – Valdivian Rainforest is a paradise for bryologists.

I spent the 26th fishing a fantastic tributary of Rio Puelo, landing several trout between 16 and 22", and hooking a two that were even larger. I thought that the fishing in Chile was going to be as good as I saw on YouTube, but this was to be my glory day

angling. I had other days with many fish, but not huge fish. The stream I spent my time on was absolutely gorgeous, surrounded by native forest and agricultural fields. My eye became accustomed to the different forms of the Nothofagus dominated forest around me, and I did my best to drink in the beauty with every breath. Despite the non-wilderness character of the area, I was absolutely entranced by this landscape and its broad swaths of forest. The fact that the area really is still a frontier in some ways was something that I could feel.



Valdivian Rainforest along productive stream

On the 27th, we had arranged to visit Parque Tagua Tagua, a private park consisting of a 4,000 ha watershed on Tagu Tagua Lake, the lowest elevation glacial lake in the Rio Puelo Watershed. Arranging the visit was difficult, requiring a bank transfer from a Chilean bank, and somewhat expensive; about 30

USD per person for a 6 hour tour. To get to the park, you can take public transportation to Tagua Tagua Lake, a public ferry across the lake, and then you are picked up by the staff of Mitico Puelo Lodge and taken across Tagua Tagua Lake on a smaller boat to the park.

On our way across the lake we saw what became a common sight: thousands of hectares of forest killed by human ignited fires. Clearing land with fires has had a long and disastrous history during the Spanish Colonization of Chile. From colonial times up until the 1940's, title to land was granted by clearing it, and fire was the preferred method. I saw lots of different figures for the loss of forest, but during the 1900's alone, a minimum of 4,000,000 ha of primary forest was cleared through burning, and much more was damaged and is reforesting. Even more than industrial forestry, this tradition of burning has damaged and continues to damage forests in Patagonia. The situation is different in Chile's Cordillera Costal and Central Valley, where industrial forestry really is the devil following on the heels of colonial burning, as far as I can tell.

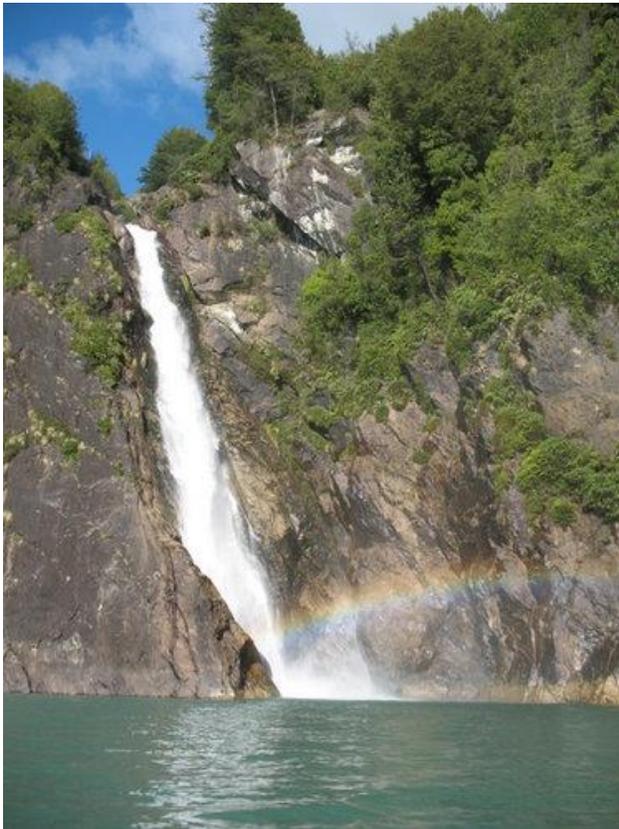


Forest Damaged by Anthropogenic Fire at Lago Tagua Tagua

The scenery at Parque Tagua Tagua is incredible. From the 80' waterfall where the main stream enters the lake, to the granite peaks ringing the park, it is a beautiful place. Except for a small, abandoned homestead at the bottom of the valley, the entire

forest is primary Valdivian Rainforest. I was attracted to the park because of reports of high-quality alerce (*Fitzroyia cupressicoides*) forest there.

To my surprise we were provided with a guide – more like a baby sitter – that demanded that we stay within sight and on the trail at all times. Our guide was a nice college kid – a total novice naturalist – and just following orders, so I tried not to hold the restrictive policies of the park against him. Given the difficulties of going there, I probably wouldn't return.



Tagua Tagua Falls

Our guide urged us to hike quickly if we wanted to see the alerce forest, which we did, so most of our day was spent on a militant trek to a supposed alerce stand. We were quite disappointed when we got to the alerces hundidos (flooded alerces) and found them all dead, killed by a lake caused by a landslide in these geologically active mountains. There are living alerces further up the valley that we did not have time to see. Fortunately, the forest on the way to the “alerces” is fantastic. *Nothofagus dombeyi* rules here, and in most settings of Valdivian Rainforest I

visited. I was surprised that even the most towering trees I measured (only four in all, given the time restrictions) maxed out at 40.45 m (132.7') in height.



"Alerces Hundidos" and Granite Peaks



Measuring a Coihue (*Nothofagus dombeyi*)



184 cm dbh Coihue (*Nothofagus dombeyi*)



40.45 meter tall x >260 cm dbh (buttress) *Nothofagus dombeyi*

I learned here that the largest individuals of *Nothofagus dombeyi* are uniformly buttressed, and that measuring the diameter above the buttress is a major chore, one that I never undertook. I got excited when I measured a tree with a swollen base at 184 cm dbh (72.4"). I soon found trees this size to be common along the trail. One buttressed individual, the 40.45 M tall tree was over 260 cm dbh (>102.4" dbh, see photo). Other common trees at the site included *Ulmo* (*Euchryphia cordifolia*), *Manio* (*Podocarpus nubigena*), and *Tepa* (*Laureliopsis philipiana*).

It was at Tagua Tagua that I first perceived that Valdivian Rainforests reminded me much more of tropical cloud forest than of the temperate hardwood forests of the Southern Appalachians I know so well, or the temperate rainforests of the Pacific Northwest. The Valdivian Rainforest is dominated by angiosperms, like the Appalachian moist forests, but the trees are evergreen, and herbaceous diversity in the deep forest was quite low. By contrast, the forests of the Pacific Northwest are dominated by gymnosperms. Much like tropical cloud forest, there is high botanical diversity of epiphytic ferns, woody vines, mosses, and liverworts. Diversity of woody plants in general is quite high. The overall impression is interesting ecologically and gorgeous aesthetically. Because of the great beauty of the forest, I thoroughly enjoyed my trip to Parque Tagua Tagua, despite what I would describe as administrative shortcomings there. Stay tuned for several more postings on my trip to Chile.



Large Ferns



Valdivian Rainforest



Bryophytes and Filmy Ferns



Large Coihues



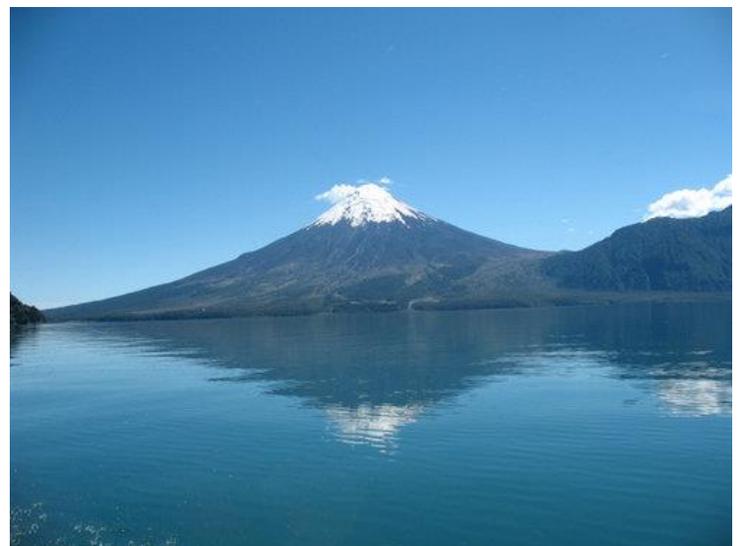
Texture of the Forest Canopy

## [Chile Trip Part 2: Parque Nacional Vicente Perez Rosales](#)

by **Josh Kelly** » Tue Mar 19, 2013 12:13 am

Trip to Chile Part 2: Parque Nacional Vicente Perez Rosales

On March 1st, two friends, my wife and I, embarked on a 3 day backpacking trip to Parque Nacional Vicente Perez Rosales. Vicente Rosales was a mining magnate in Southern Chile who used his great wealth to purchase and protect what is today's national park. The 253,000 hectare park (977 sq. miles) includes volcanoes, Lago Todos los Santos, and lush Valdivian Rainforest. Annual precipitation at the lake is reported to range from 3,000-4,000 mm (up to 157 inches) and may reach five meters (197 inches) in the mountains.



*Volcan Osorno reflected in Lago Todos Los Santos*



*Volcan Puntagudo*

Getting to the trailhead for our hike was half of the fun. We started in Puerto Varas at around 11 a.m., taking a bus to Petrohue, at the outlet of Lago Todos los Santos. The public transportation infrastructure in Chile allows travelers to take buses just about anywhere, including national parks. At Petrohue, there are many tour boat operators waiting to take tourists on half-hour site seeing tours. Our

destination was much further away – over an hour and half to the trail head. After chatting and bartering with some of the boat operators, we agreed upon a price and were underway within 20 minutes and with very little hassle. The fact that Becky spent two years in the Peace Corp in a Spanish speaking country came in handy at time such as these.



*The turquoise waters of Lago Todos Los Santos*

Lago Todos los Santos surrounded by mountains, including two volcanoes, Osorno (2,652 meters; 8,701') and Puntagudo, and the highest peak in the Chilean Lakes District, Monte Tronador (3,491

meters; 11,453 ft). The lake has the characteristic aquamarine clarity of many of southern Chile's water ways and is ultra scenic, and we enjoyed the ride both to and from the hike.



*Monte Tronador*

Upon being left off at the trail head at around 3 p.m., we proceeded up a cattle trail through mostly private land. Chile allows private in-holdings in its national parks so long as they pre-date the park. The valley we were hiking up had three working farms, two of which ran guest houses (hospedajes). Had it not been for the farms, there may have been no trail present, because the trail was basically unmaintained and without grading, water bars and other features. The trail, and most others in Chile, was not up to North American standards. It was fairly muddy and included lots of up and down. Some particularly eroded sections were like small canyons through the deep volcanic soil. Looking at these eroded banks we could see dark layers of volcanic ash deposited many times over the centuries, which built deep and apparently very productive soils.



*Deeply eroded cattle/hiking trail*

After hiking 11 kilometers, we arrived at Hospedaje Dos Condors where we elected to set up our tents and enjoy a wood fired hot shower. We ate a nice backpacker's meal around a camp fire and were bedazzled by zillions of stars before we called it a night. The next day we hiked to a scenic double water fall and I spent some time measuring trees and fishing – competing interests of mine throughout the trip.

The farm we were camping at had been founded in 1935, carved out of primary Valdivian Rainforest.

On the hike in I noted that the trees looked a bit taller than elsewhere in Chile, and when I broke out the laser range finder and clinometer I found out that my eyes did not deceive me. The tallest *Nothofagus dombeyi* I found at Parque Tagua Tagua had been 40.45 meters. Here I could find *Nothofagus* over 40 meters with ease. The large trees on the edge of pastures were particularly easy to measure, and I did a thorough job on a few and gave a rough measurement to many.



*Hospedaje Dos Condors*



*49.2 meter coihue*

On the edge of the homestead where we were camping I found the tallest coihue (*Nothofagus dombeyi*) I saw on the trip. It measured 49.2 meters tall (161.9'). The largest tree I saw, however, was another huge coihue with a large buttressed base and a thick-limbed crown. It had the look of a respectably old tree. On the note of age, I counted several trail cut coihues at over 300 years, for what it's worth. This large coihue had a diameter of 3.32 (10.9') meters at breast height and appeared to be approximately two meters in diameter above the buttress. It measured 47.6 meters (156.2') tall.



*View of the crown of the 3.32 meter diameter x 47.6 meter tall *Nothofagus dombeyi**

Ironically, every primary forest I visited in Chile was reputed to have trees over 50 meters tall. The fact that I found no angiosperms over 50 meters in height reinforces one of the core observations of NTS members: tree heights are almost always exaggerated. Now, I am sure there are many coihues out there over 50 meters, but I am also sure that these occur on a tiny fraction of growing sites.



*Base of the 3.32 meter Coihue. This picture does not capture the size of this tree well. Imagine, 2 meters in diameter above the buttress!*

The forests of P.N. Vicente Perez Rosales left me in awe of coihues (*Nothofagus dombeyi*). So, let me try to convey some of its characteristics. First, it is the most common canopy tree in the mountains of southern Chile. Its dominance is comparable to tulip poplar (*Liriodendron tulipifera*) in the Southern Appalachians, but it occurs over a broader range of landforms, from ridges, to slopes of various grades and aspects, to nearly level benches and gentle coves, where I saw the largest individuals. It reaches diameters of over 1.5 meters (~60") before buttressing, and trees of this size are as common as .9 meter (3') dbh trees in the Southern Apps. Larger and older trees are buttressed up to 2.5 - 4 meters (~8-12') above ground level and many are over 1.5 meters diameter (15' gbh) above the buttress. Many specimens taper quickly but some do not, and instead

maintain large boles over 25 meters up, and support massive, thick-limbed crowns. Coihues can also have very large crown-spreads of over 100 ft. To make an analogue to a North American tree, they reminded me a bit of a longer lived, larger, slower tapering, much thicker limbed cherry bark oak (*Quercus pagoda*).

Given how few sites I saw and how large some of the trees were (I don't see 34.6' girth x 156' tall angiosperms too often – yeah, I know, the girth includes buttress, but still!), I wonder if *Nothofagus dombeyi* might be in the running for the largest member of the Fagaceae Family. I would be interested to hear folk's thoughts on that. Some of the photos of *Quercus castanifolia* that were posted from Iran a couple of years ago looked off the charts, though. In any case, *Nothofagus dombeyi* is an abundant, mighty, and ecologically important tree in Chile of which. "El Rey del bosque", as one of the locals told me. I have seen just a small portion of its range, so I think I only have an inkling of its maximum potential.



*triple stemmed coihue*



*Another Coihue*



*Flowers of Ulmo (Eucryphia cordifolia)*

Also of note in the area were the ulmo trees (*Eucryphia cordifolia*). These were perhaps the second most abundant, and definitely the second largest canopy trees I saw in the area. They have beautiful white blossoms that make a delicious honey that is famous throughout Chile. From a distance, you can see whole slopes dominated by their white-flowered crowns. Ulmos regularly exceed one meter in diameter at Rio Sin Nombre and may reach two meters. It's height is not as impressive, the tallest individual I measured was 37.5 meters (123.1'). I

suspect this is nowhere near the maximum for this species.



*Large ulmos by the homestead*

I also measured a straight tepa (*Laureliopsis philliana*), a member of the sassafras (*Lauracea*) family. The leaves of this tree are pleasantly fragrant. While the form of this tree was nice it topped out at 30.6 meters (100.4'). I'm sure taller ones can be found.



*A large Arayan*

For me, three days was far too short a time to spend along the ironically named “Rio Sin Nombre”.

Tantalizingly, our hosts told us that alerces larger than any of the coihues I measured were to be found about 10 kilometers from our camp site. Exaggerated big tree stories are just as common in Chile as anywhere else, but from what I saw of the stature of other species growing on the amazing volcanic soils at P.N. Vicente Perez Rosales, this could be a great place to look for truly huge alerces, and I am positive there are larger specimens to be found of every species I measured, basking in the sun and rain in the lush valley of Rio Sin Nombre.



Rio Sin Nombre

## [Re: Chile Trip Part 2: Parque Nacional Vicente Perez Rosales](#)

by **KoutaR** » Tue Mar 19, 2013 8:33 am

Josh,

Outstanding report! There are many interesting similarities with Tasmanian rainforests where *Nothofagus cunninghamii* is the most important tree, but *N. dombeyi* appears to become a bit taller and likely also a bit thicker: the tallest measured *N. cunninghamii* is 46.7 m. The secondmost and thirdmost important rainforest trees in Tasmania also have Chilean counterparts. *Eucryphia lucida* is clearly smaller than *E. cordifolia*; I think that the maximum of the former could be 30-35 m. *E. lucida* is famous for the honey, too. The Tasmanian counterpart of *Laureliopsis philippiana* is *Atherosperma moschatum*, the both being in the Atherospermataceae family.

The *Nothofagus* trees and forests in your photos looks very similar to their Tasmanian counterparts.

Of course, there are also marked differences. The precipitation in NW Tasmania (where the "rainforests" are the most luxuriant) is only 1200-2400 mm. There are no recent volcanoes in Tasmania. And in Tasmania there are eucalypts.

Today, *Nothofagus* is placed in a monogeneric family Nothofagaceae. According to molecular studies, Fagaceae is more closely related to families like Juglandaceae and Betulaceae than to Nothofagaceae. <http://www.mobot.org/mobot/research/APw...tm#Fagales>

Chile is high in my dream destination list. Is hiking free in the park or is it restricted to the trail you hiked?

Kouta

## [Re: Chile Trip Part 2: Parque National Vicente Perez Rosales](#)

□ by **Josh Kelly** » Tue Mar 19, 2013 10:39 am

Kouta, Thanks for the compliments, the comparison with Tasmania, and the correction on my understanding of Nothofagus phylogeny. It's fascinating how these two isolated remnants of Gondwanaland have similar dominant genera after being separated for 10's (or 100's?) of millions of years.

So, it sounds like *N. dombeyi* could be in the running for the largest member of Nothofagaceae?

There is no entrance fee to Parque National Vicente Perez Rosales. There seem to be few trails outside of those used by farmers.

Some Chilean Parks do charge an entrance fee. Huerquehue, which I will report on later, charged 4500 Pesos/Day - about \$9.50 USD - for foreigners. There is a lower rate for Chileans. Alerce Andino National Park charged 1500 Chilean for entry.

## [Re: Chile Trip Part 2: Parque National Vicente Perez Rosales](#)

□ by **Josh Kelly** » Tue Mar 19, 2013 12:51 pm

Also, thanks for the correction about Laureliopsis, it is in Laurales, but not Lauracea.

There are many Eucalyptus plantations in Chile and some very large individuals. Eucalyptophiles would probably enjoy a trip to Chile to see how that species performs there.

Josh Kelly

## [Re: Chile Trip Part 2: Parque National Vicente Perez Rosales](#)

□ by **KoutaR** » Tue Mar 19, 2013 6:22 pm

*Josh Kelly wrote: So, it sounds like N. dombeyi could be in the running for the largest member of Nothofagaceae?*

Might be. At least it is one of the largest. I have seen only the Australian species. *N. moorei* of NE NSW and SE Queensland is of about the same size as *N. cunninghamii*. According to "The Ecology and Biogeography of *Nothofagus* Forests" (ed. by Veblen et al.), some New Guinean species can reach 50 m, New Caledonian species are lower and the tallest New Zealander *N. fusca* has reached 43 m. According to the book, *N. dombeyi* often exceeds 50 m. Can't wait to read your Alerce Andino report!

Kouta

## [Re: Chile Trip Part 2: Parque National Vicente Perez Rosales](#)

□ by **Josh Kelly** » Tue Mar 19, 2013 11:24 pm

Kouta,

Everywhere I went in Chile people told me that the large trees were 50 meters or taller. According to my laser, only one tree I measured in Chile out of dozens (rough measurements of the biggest trees) exceeded 50 meters. I'm sure that *Nothofagus dombeyi* exceeds 50 meters. I would be willing to wager that most of the reports of 50 meter trees are false. My Alerce Andino post will be illuminating on that subject.

Josh

## [Re: Chile Trip Part 2: Parque National Vicente Perez Rosales](#)

by **KoutaR** » Wed Mar 20, 2013 2:46 am

Josh,

I meant "exceeds 50 m" only as a comparison with other species. If other species only REACH 50 m and *N. dombeyi* OFTEN EXCEEDS 50 m, the latter may be the tallest supposing that all have similar measurement errors (which in fact is not true as different regions countries have different authors in the book, and the New Guinean spp. are certainly poorly known).

Kouta

## [Re: Chile Trip Part 2: Parque National Vicente Perez Rosales](#)

by **Jess Riddle** » Wed Mar 20, 2013 6:49 pm

Josh, Great report. Sounds like a stunningly beautiful area. I like your inclusion of details on the precipitation, soil, and species to give a well-rounded picture on the area. The pictures look good too, especially the mountain shots.

In several of the pictures around the edge of the farm, there are dense columns of foliage that reach up to the bottom of the ulmo crowns. Are those a smaller tree species or lianas on the ulmos? It also looks like there is a browse line at the bottom of some of the vegetation. Do you know how far the cattle ranged into the forest and how great their impact on tree regeneration is?

Jess Riddle

## [Re: Chile Trip Part 2: Parque National Vicente Perez Rosales](#)

by **Bart Bouricius** » Wed Mar 20, 2013 8:56 pm

Wonderful report, this starts to make up for the deficits of an expensive several day long "expedition" to see old growth Alerce forest where no heights were measured, and only a few images from this expedition web site even show trees. I would have to look back in the Board index to find it. It was done by the "Global exploration and Oceanographic Society". They were documenting Alerce trees *Fitzroya cupressoides* looking back at it I notice that when Kouta suggested measuring the height of the trees, an expedition responds "I am unfamiliar with the diagnostic value of fitzroya height measurements". The site is at: <http://www.g-eos.org/2010/03/explorers-...field.html> I do not wish to be too harsh regarding this expedition which, after all did have as a goal conservation of Alerce trees which are theoretically already protected, but are still illegally cut. They did not post this on the Bulletin Board, but I believe Ed posted a link to it there.

## [Re: Chile Trip Part 2: Parque National Vicente Perez Rosales](#)

by **Josh Kelly** » Wed Mar 20, 2013 9:12 pm

Kouta,

I agree with your assessment of the implications of height reports of *Nothofagus* from around the world. I hope that excellent and superlative examples of *Nothofagus* species can be protected in New Guinea, Tasmania, Chile and elsewhere, because its wood surely is beautiful and valuable. It seems to be tight grained, hard, and rot resistant and *N. dombeyi* is frequently used in construction in Chile.

## [Re: Chile Trip Part 2: Parque Nacional Vicente Perez Rosales](#)

by **Josh Kelly** » Wed Mar 20, 2013 9:20 pm

Jess, Cattle and goats have a measureable impact on the understory near the farms, as does selective logging. The best indicator I found of truly primary forest was the presence of large *Podocarpus nubigena* (manio) and a lack of other signs of human disturbance. Manio was present on the National Park lands but hard to find in the privately owned tracts. Grazing tends to denude the understory, while logging allows more light in for the growth of weedy shrubs such as *Rubus*.

Bart, I find the report by this charitable organization to be quite comical, really. Their "exploration" is of a well known and popular backpacking and rock climbing location in Cochamo Valley known as La Junta. The site is even in Lonely Planet and Becky and I had plans to visit, courtesy of excellent public transportation and our boots, but the weather did not cooperate. Check out the site <http://www.cochamo.com/> for trail maps to the two Alerce stands these intrepid explorers supposedly documented. Again, well known and visited by tourists for quite some time now. I'm sure there are little known and possibly "undiscovered" stands of alerce out there, but these global explorers did not document any new areas, as far as I can tell.

Josh Kelly

## [Explore: The Ancient Trees Of Africa: Tree Height Data](#)

by **edfrank** » Mon Mar 18, 2013 10:21 am



Measurement Data from the 2013 Explore: The Ancient Trees of Africa expedition  
by David "Dak" Wiles

<https://www.facebook.com/ExploreTheAncientTreesOfAfrica>

<http://exploretrees.com/>

The Team

David "Dak" Wiles (RSA/UK)  
Stephen Fry (UK)  
Geoff Pugsley (UK)  
Drew Bristow (NZ)  
Greg Parker (NZ)  
Rob Fisher, Photographer  
Vince Jolin (Canada)

**Explore: Yellowwoods**



<http://www.youtube.com/watch?v=DX9UA3VWL7s>

An edit focusing on the Yellowwood trees of South

Africa. These trees were climbed as part of a 4 week expedition throughout South Africa, Documenting and climbing South Africa's Champion trees.

### Explore: Baobabs



[http://www.youtube.com/watch?v=BU6\\_haz3vuo](http://www.youtube.com/watch?v=BU6_haz3vuo)

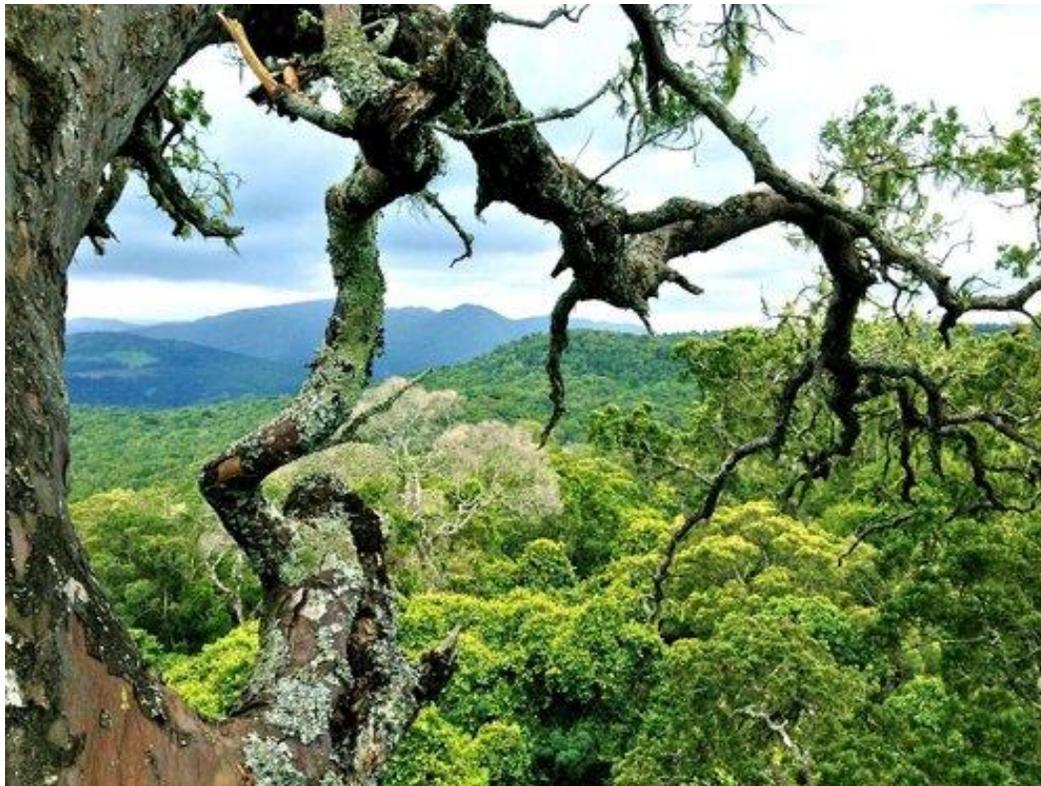
An edit focusing on the Baobab trees of South Africa. These trees were climbed as part of a 4 week expedition in Jan 2013 throughout South Africa, Documenting and climbing South Africa's Champion

### Yellowwood Canopy



<http://www.youtube.com/watch?v=PDY4r2z3eUE>

Just a brief iPhone 4s view of the upper canopy of the Eastern Monarch Yellowwood, Hogsback, South Africa. This tree had never been climbed before and the video is shot at about 32m.



*View from Old Growth Yellowwood Forest, nr Kynsna. photo by Drew Bristow*

DATE	LOCATION	TREE NAME	SPECIES	HEIGHT (m)	CIRCUMFERENCE [at 1.5m] (m)	DIAMETER (m)	CROWN DIAMETER (m)	NOTES
1/5/2013	Arderne Gardens, Claremont, Cape Town, Western	Morten Bay Fig	<i>Ficus macrophylla</i>	27.4m	11.2m	3.56m	49.13m and 41.12m	
1/6/2013	Arderne Gardens, Claremont, Cape Town, Western	Aleppo Pine	<i>Pinus halepensis</i>	32.9m	5.48m	1.74m	29.4m and 32.51m	
1/7/2013	Stellenbosch University Theological Faculty, Western Cape	Norfolk Island Pine	<i>Araucaria heterophylla</i>	45.3m	6.0m	1.91m	21.33m and 21.78m	
1/9/2013	Collin's Hoek, Bergplaas Forest Estate, Western Cape	Woodville Big Tree	<i>Podocarpus falcatus</i>	34.0m	8.8m	2.8m	34.1m and 27.0m	Extensive helical decay cavity midway up main central stem (20m+). Extensive cavity also present in base and evidence of
1/10/2013	Krisjan-se-Nek, Knysna Forest, Western Cape	Dalene Matthee Big Tree	<i>Podocarpus falcatus</i>	35.4m	5.41m	1.72m	27.71m and 29.0m	
1/10/2013	Knysna Forest, Western Cape	Circles in the Forest Tree	<i>Podocarpus falcatus</i>	did not clim	6.31m	2.01m	did not measure	
1/11/2013	Diepwalle Forest Estate, Western Cape	King Edward VII Tree	<i>Podocarpus falcatus</i>	36.9m	6.65m	2.12m	35.6m and 27.5m	
1/12/2013	Plaatsbos Nature Reserve, Eastern Cape	Tsitsikamma Big Tree	<i>Podocarpus falcatus</i>	39.36m	8.71m	2.77m	33.6m and 33.6m	Evidence of vertical shearing on the backside of main stem, maybe due to heavy lean. Cavity in base also
1/14/2013	Auckland Nature Reserve, Keiskamma Forest Estate, Eastern Cape	Eastern Monarch		39.49m	8.65m	2.75m	29.29m and 30.18m	Evidence of decay low down on main stem with pale bracket fungi fruiting bodies present. Definitely contained the highest abundance and diversity of epiphytes within canopy.
1/16/2013	KwaZulu-Natal Botanical Gardens, Pietermaritzburg, KwaZulu-Natal	Central Eucalyptus growing in the triangle of the footpath, near the pond and in front of the sign for gum tree	<i>Eucalyptus saligna</i>	59.1m	4.18m	1.33m	15.5m and 18.29m	
1/21/2013	Mutale Municipality, Limpopo	Sagole Baobab	<i>Adansonia digitata</i>	20.55m	(47.85m with con	8m (15.23	43.15m and 37.0m	
1/23/2013	Sunland Estate, Platland, Limpopo Province	Sunland Baobab (Pub Tree)	<i>Adansonia digitata</i>	19.08m	(43.55m with con	7m (13.86	37.96m and 34.23m	Evidence of decay in the main fork of stem growing out towards the car park. Decay also present around pub door cavity entrance. Young fig tree working its way into main stem and upper canopy.
1/25/2013	Amorentia Estate, Mooketsi Valley, Limpopo	Amorentia Big Matumi	<i>Breonadia salicina</i>	33.04m	8.81m	2.81m	36.06m and 38.10m	
1/25/2013	Amorentia Estate, Mooketsi Valley, Limpopo Province	Amorentia Tall Matumi (opposite main nursery gates)	<i>Breonadia salicina</i>	38.63m	7.58m	2.41m	27.18 and 18.38m	
1/26/2013	Woodbush Plantation, Haenertsburg, Limpopo	Twin No. 1 (left of path when facing away from triplet)	<i>Eucalyptus saligna</i>	78.7m	4.14m	1.31m	19.97m and 19.29m	
1/26/2013	Woodbush Plantation, Haenertsburg, Limpopo	Twin No. 2 (right of path when facing away from triplet)	<i>Eucalyptus saligna</i>	79.0m	3.0m	0.96m	14.84m and 7.59m	
1/26/2013	Woodbush Plantation, Haenertsburg, Limpopo Province	The Triplet (previously the tallest tree in Africa with display sign)	<i>Eucalyptus saligna</i>	80.3m	4.26m	1.36m	21.57m and 19.44m	
1/26/2013	Woodbush Plantation, Haenertsburg, Limpopo	The Quartet (new tallest tree in Africa next to the triplet)	<i>Eucalyptus saligna</i>	81.5m	3.28m	1.04m	10.78m and 10.34m	
1/27/2013	Plantation near Barberton	First ascent tree	<i>Eucalyptus grandis?</i>	72m	3.61m	1.15m	17.0m and 26.6m	
1/27/2013	Plantation near Barberton	Second ascent tree	<i>Eucalyptus grandis?</i>	72.3m	3.31m	1.05m	18.5m and 14.5m	

## West Coast Forest Products Production in WA - Schafer Bros

by edfrank » Tue Mar 19, 2013 1:01 am

Historic footage from 1926 by Schafer Bros. of Montesano, WA. This reel shows Grays Harbor County cities, lake, maps, timber cruiser, Schafer offices, Railroads

<https://www.youtube.com/watch?v=BcHO2UzJr7w>



Historic footage from 1926 by Schafer Bros. of Montesano, WA. This reel shows tree falling, spring boards, logging of Douglas Fir, Sitka Spruce and Western Red Cedar. Also log bucking, scaling, spar tree topping and setting up the spar tree.

<https://www.youtube.com/watch?v=p27MX9Vy4Jk>



This reel of the 1926 Schafer Bros of Montesano WA historic footage shows choker setters, a steam donkey, loading lumber onto a train, steam locomotive, log dump into the river, grading and

sorting the logs in the river and a raft of logs heading into the mill.

<https://www.youtube.com/watch?v=C95EFowJUXg>



Part of the 1926 historic Schafer Bros. logging films. This reel involves moving hemlock, spruce and red cedar into the four Schafer mills for processing. Shows moving logs into the mill up a log slip, a shingle mill, kiln drying, making of various boards including cants and lath.

[https://www.youtube.com/watch?v=9wOoOfbn3\\_E](https://www.youtube.com/watch?v=9wOoOfbn3_E)



The last reel from the Schafer Bros. historic film from 1926 covering logging and lumber operations in the Grays Harbor County area. This reel covers lumber production, including kiln drying and planer operations, planer, resaw, mouldings, tongue & groove, and shipping to Japan of huge cedar logs and large unfinished lumber.

<https://www.youtube.com/watch?v=pqDK14lhBuM>