# LEVI WILCOXON DEMONSTRATION FOREST, ARKANSAS: FEBRUARY 2006

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I have recently completed a resurvey of the Levi Wilcoxon Demonstration Forest (LWDF) just south of Hamburg in Ashley County, Arkansas. Some of you may recall that I presented some information on the LWDF when I first joined, and at that time I promised to do a fuller assessment using the sine method to meet ENTS standards. A lot of water passed under the bridge since then, but I had an opportunity to revisit this stand.

The LWDF is located in the Upper West Gulf Coastal Plain of southern Arkansas, not far from the Mississippi Embayment (also known as the "Delta"). The LWDF is located on a formation called the "Prairie Terrace," or sediments deposited by an ancestral version of the major rivers (including the Mississippi, Missouri, and Arkansas) that flowed in this region at some point in the distant past. The low, rolling hills are interspersed with flatter, Holocene period floodplains of the many small streams that drain the area. A layer of loess covers much of the area, although not nearly as deep as across the Mississippi River. Another interesting feature of this landform is the "pimple" or "prairie" mounds that dot the surface. These low, circular mounds are though to have a natural (non-human) biotic origin, but little about them is known.

The upland forests of the region are largely pine or some mix of pine-oak-gum-hickory, and are relatively diverse. Loblolly pine is the most dominant species, having been heavily planted and managed for decades. Shortleaf pine is common, although not in nearly the quantities found historically. Various oak species are found throughout the area, especially southern red oak, white oak, post oak, water oak, and willow oak. Sweetgum and blackgum are very common, as are numerous other hardwoods like elm, maple, and dogwood.

The following individuals were measured with our Impulse 200LR. I measured the sine and tangent heights at exactly the same points, so this is further evidence of the value of the sine method. The American Forests Bigness Index (AFBI) was calculated using their averaged value for crown width (Table 1).

**Table 1. Big tree information from the LWDF in southeastern Arkansas.**

| Species | CBH (ft) | HT (ft) | AvgCW (ft) | AF BI |
|---|---|---|---|---|
| Loblolly pine | 10.7 | 138.3 | 47.7 | 279 |
| Loblolly pine | 10.5 | 126.8 | 67.1 | 269 |
| Loblolly pine | 11.2 | 122.2 | 53.7 | 270 |
| Loblolly pine | 14.6 | 116.9 | 57.0 | 306 |
| Loblolly pine | 11.0 | 116.8 | 55.1 | 263 |
| Post oak | 8.4 | 99.7 | 42.5 | 211 |
| Post oak | 8.4 | 91.4 | 60.0 | 207 |
| Shortleaf pine | 9.4 | 136.1 | 49.8 | 261 |
| Shortleaf pine | 9.0 | 131.4 | 37.2 | 249 |
| Shortleaf pine | 7.7 | 129.6 | 37.4 | 232 |
| Shortleaf pine | 6.6 | 124.2 | 28.7 | 210 |
| Shortleaf pine | 8.6 | 121.1 | 45.4 | 236 |
| Shortleaf pine | 8.1 | 112.7 | 38.9 | 219 |
| S. red oak | 10.1 | 102.8 | 80.2 | 244 |
| Sweetgum | 7.9 | 120.7 | 50.0 | 227 |
| Sweetgum | 8.4 | 98.9 | 52.2 | 213 |
| Water oak | 7.4 | 102.3 | 36.8 | 200 |
| White oak | 9.6 | 110.0 | 76.7 | 244 |
| White oak | 11.8 | 109.2 | 68.5 | 268 |
| White oak | 7.7 | 106.5 | 54.5 | 213 |
| White oak | 8.4 | 104.9 | 73.8 | 224 |
| White oak | 9.6 | 100.7 | 63.5 | 231 |
| Winged elm | 4.8 | 90.4 | 46.7 | 160 |
| Rucker Index (8 spp): | | | 112.5 | |

*AvgCW = average crown width* sensu *American Forests.*

I could have picked up a few other subordinate hardwood species to calculate a 10-species Rucker

Index, but that didn't seem most appropriate. This stand was reserved as an example of the virgin pine forests in the late 1930s, and was probably typical of the last few parcels of old-growth pine-dominated forests remaining in the region, but is not likely an example of the most productive sites of the area. Over the decades, pine regeneration has ceased, and the stand is slowly converting to mixed hardwoods.

The 14.6-ft CBH loblolly pine is known as the "Morris Pine," and I have sent the ENTS website pictures of this tree before. The biggest pine I have seen mentioned in the GLO land survey notes for the Ashley County area was given as 18.8-ft CBH, and I think 14 to 16-ft CBH pines were pretty common in the area. I strongly suspect that loblolly (and perhaps even shortleaf) pine may have exceeded 150 ft tall in the presettlement forests, and perhaps loblolly approached 170 ft in some of the richer minor bottoms it grows the quickest in, but we have no real way to show that now, given that virtually all old-growth pines have been logged from the area. I think that 140 ft is probably about the upper end of the pine height potential in the LWDF, given the frequency of ice storms and damaging winds this stand receives.

Few hardwoods of large size are found in this stand, as it was primarily pine when it was reserved. There are some impressive forest-grown white and post oaks, but sweetgum appears to be the only hardwood challenging the pines for supercanopy positions. The winged elm was an impressive individual for this species, which is usually just a small understory tree.

Finally, the Walsh Pine, the 136.1-ft Arkansas state champion shortleaf pine, saw its crown reduced somewhat from storms in recent years, but is still vigorously healthy. I was recently on the American Forests website, and looked up shortleaf pine. Lo and behold, the two co-champion shortleaf pines scored 240 and 245 points. When I nominated the Walsh Pine several years ago, it scored more than that, but I was told that a different shortleaf pine had been nominated that outscored the Walsh Pine, and therefore the LWDF didn't have a national champion. Imagine my surprise when I saw the 2004—2005 register online with these trees!

We carefully remeasured the Walsh Pine using the sine method (it shrunk in height from 143-ft to 136.1-ft), and although a branch broke that narrowed its crown slightly, the Walsh Pine still scored 261 points! Turns out that there is another shortleaf in the LWDF that scored 249 points, also outscoring the current co-champs! I have resubmitted the Walsh Pine as national champion, and it is currently under consideration.

***The Levi Wilcoxon Demonstration Forest near Hamburg, Arkansas in March of 2006.***

***Most of the pines in this photograph are loblolly, with some shortleaf. Overstory dominant pines are 100 to 200 years old.***

***Photo by Don C. Bragg.***