



Restoring the American Chestnut Tree at William Paterson University



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ABSTRACT

The NY Chapter of the American Chestnut Tree Foundation, SUNY ESF and The Department of Environmental Science are working with WPU ENV students on a project to bring back the American Chestnut tree that was blighted by a fungus in 1904 and wiped-out AC across the Northeastern US. Our students are engaged in planting trees on campus and tasked to nurture the trees. So that we can begin to bring back the tree to its former glory. Over the next year, we will start an American chestnut tree orchard to support large-scale restoration efforts.



Figure 1: Grove of AC killed by the Chestnut Blight. Credit: <https://appvoices.org/2012/06/11/american-chestnut-return-of-the-forest-king/>



Figure 3: Chestnut blight canker. Credit: William Powell, CC BY-ND



Figure 4: The base of an American Chestnut tree *note the massive size. Credit: <https://www.theguardian.com/environment/2019/feb/09/blight-fight-the-story-of-americas-chestnuts-offers-hope-for-british-trees>



Figure 9: American chestnut seed, ready for planting.



Figure 10: American chestnut recently germinated at WPU.



Figure 5: 2023 AC saplings in WPU greenhouse



Figure 6: Freshly planted 2023 sapling



Figure 7: 3-year-old sapling with protective caging.

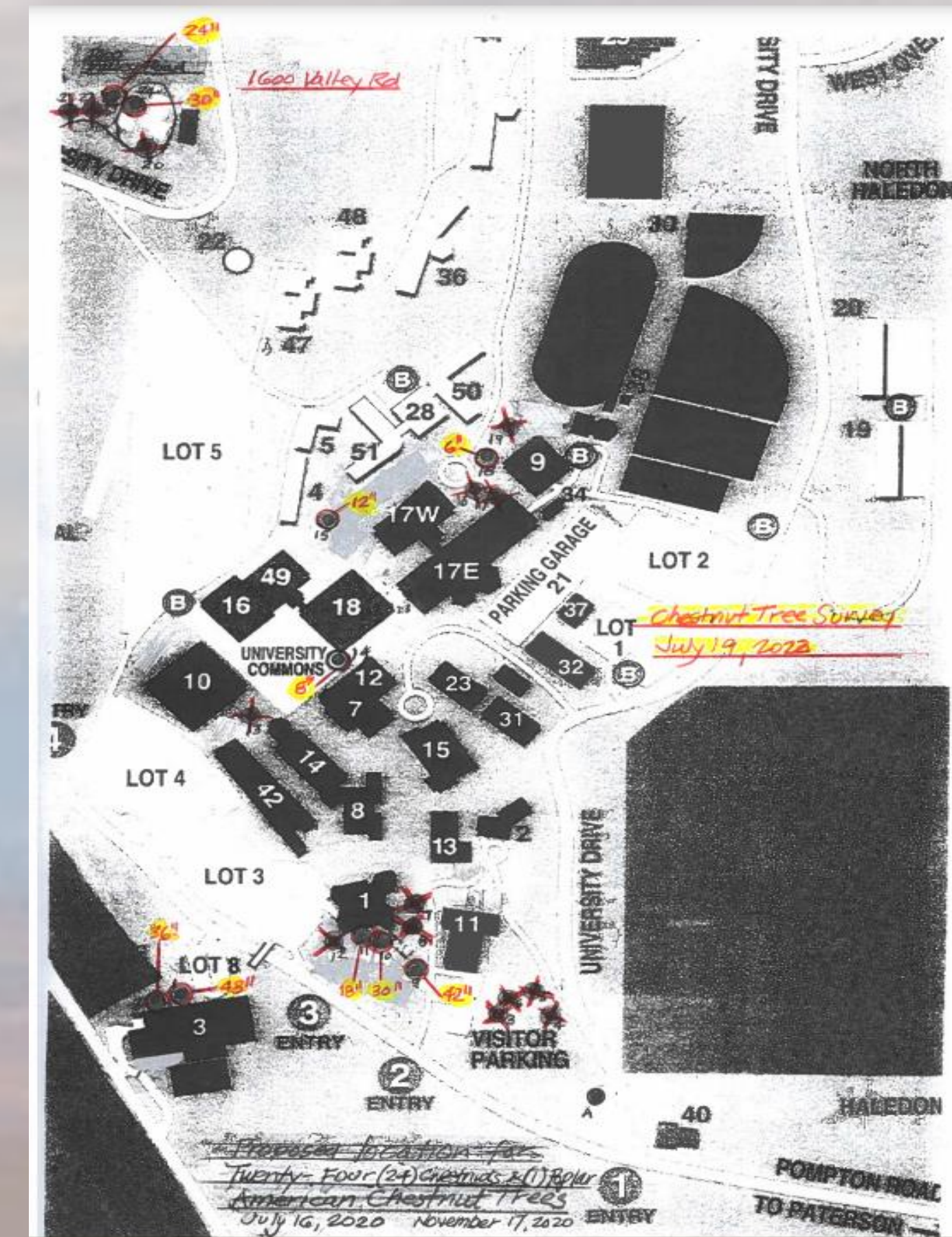


Figure 11: Location of the pure American Chestnut trees planted on campus

Background

- The American chestnut was the giant of the eastern U.S. forests referred to as the "redwoods of the east coast"
- There were once billions of them in the expanse of their range stretched from Georgia and Alabama to Michigan
- But the majestic tree was gone before forest science existed to document its role in the ecosystem.
- Mature American chestnuts have been functionally extinct for decades. With few stragglers hanging in
- At the turn of the 20th century when a disease called chestnut blight swept through Eastern forests
- Source USGS (<https://www.usda.gov/media/blog/2019/04/29/what-it-takes-bring-back-near-mythical-american-chestnut-trees>)



Figure 8: 3-year-old sapling with first male catkin.

Why GMO?

- Conventional methods of backcrossing Chestnut with the Chinese Chestnut prove inefficient in restoration.
- Hybrids do not possess the same growth form as pure AC
- Hybrids muddy the gene pool of pure AC
- Transgenic trees are pure AC, with a natural gene derived from wheat (OxO).
- This gene allows the tree to break down oxalic acid, a chemical produced by the Chestnut blight that kills the tree.

WPU's Future Chestnut Orchard



Figure 12: Future WP Campus location of the Darling 58 American chestnut tree orchard. Collaborators from WPU, ACF and SUNY ESF.



Figure 4A: sneak peak of story map
Figure 4B: 360 camera photographing AC
Figure 4C: 360 cameras mounted on tripod.