*Potential Adverse Impacts of Coring:*

Research shows that coring creates wounds that may cause internal decay. There is no evidence, however, of tree mortality after increment coring (Meyer and Hayward 1936, Lorenz 1944, Hepting et al. 1949, Toole and Gammage 1959a, Hart and Wargo 1965, Cleaveland 1998, Eckstein and Dujesiefken 1999, van Mantgem and Stephenson 2004, Helcoski et al. 2019). In fact, little effect on mortality was observed when stem wedge sections were removed using a chainsaw (Heyerdahl and McKay 2001).

The first study on potential mortality rates of cored trees in the hardwood forests of the eastern US find no differences between cored and uncored trees (Helcoski et al. 2019). To date, research over the last eight decades suggest there is no indication mortality rates change after trees are cored. Trees, like most biological beings, use natural defense mechanisms to maintain their vitality (Shigo 1984, Loehle 1988). This is especially true of vigorous dominant and co-dominant individuals (Meyer and Hayward 1936, Lorenz 1944, Hepting et al. 1949). Holes from more than half of all trees cored in core damage studies healed within 2-3 years. Trees that did not heal as those observations were typically of short-lived species or suppressed individuals (Meyer and Hayward 1936, Lorenz 1944, Hepting et al. 1949, Toole and Gammage 1959b). Generally, the older a tree lives, the stronger its defense to disease and injury (Loehle 1988). Some researchers often plug the holes that are caused by increment boring. However, evidence suggests the plugging of these holes does little to reduce discoloration or decay (Meyer and Hayward 1936, Lorenz 1944, Hepting et al. 1949). Additionally, modern arborists do not seal the wounds because they have learned that leaving wounds open allows them to: 1) dry out and 2) naturally clean the wound like blood flow cleans our wounds, which discourages infection.

Dr. Neil Pederson had the opportunity to core the oldest documented pitch pine, which turned 400 years old the year after we cored it in 2013. It was discovered and tagged in the early 1970s. Since then, it has been cored multiple times by different research groups. The data from its rings when cored in 2013 indicates it is growing faster at that time than in any time over the prior four centuries.

Since the species of focus in this proposal can live for centuries, biological theory suggests that these trees have a defense system that allows them to sustain centuries of physical damage. Therefore, evidence indicates that boring trees will not significantly change mortality rates. In fact, over the last decade, the small wounds created by coring will likely heal rapidly and be insignificant injuries.

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