

Research Report

A look at recent TREE Fund funded studies

Winter 2024



Monitoring and Modeling Changes in Street Tree Communities Over Time

*Dr. Robert Fahay, University of Connecticut
2019 Hyland R. Johns Grant Program*

Our research focused on how street tree populations change over time in two large cities in the northeastern US and what observations of change might mean for the future of the urban canopy in these cities and beyond. We were also interested in understanding what factors drive changes in street tree populations and how this information can be used by stakeholders to change management practices and resource allocation.

Proactively managing for a healthy, optimally-stocked street tree population involves an optimized balance of planting and mortality informed by local or regional empirical data. To that end we conducted a systematic, repeated inventory of street tree populations in Philadelphia, PA and New York City, NY. We sought to 1) assess shifts in composition, structure, and characteristics of these cities' street tree community over time (2015-present), and 2) examine street tree mortality patterns.

We re-inventoried 2,701 street trees in 103 randomly-located, fixed-length street segment plots in Philadelphia in 2021 and half of the original 58 plots in NYC in 2022, with remaining work to be completed in 2023.



For more on this research, visit www.treefund.org/archives/22414.

A TREE Fund Webinar on this research was given in October 2024 titled, "Predictors of Street Tree Survival in Philadelphia: Tree Traits, Biophysical Environment, and Socioeconomic Context." To watch the video of this webinar, visit the Webinar Archives tab at www.treefund.org.

Producing Fibrous-Rooted Hickories Towards Commercial Production and Improved Transplanting

*Dr. Nina Bassuk, Cornell University
2022 Barborinas Family Fund Grant Program*

Carya species, commonly referred to as hickories, include many stately, native trees, that offer superior ornamental and adaptable features with great promise for application in managed landscapes, especially urban environments. Additionally, nursery stock of species such as *Carya illinoensis* (pecan), *Carya laciniosa* (kingnut hickory), and *Carya ovata* (shagbark hickory) are sought after due to their production of desirable nuts and potential for use in edible landscapes. Immense interest exists in effectively producing these trees, however, due to their lag-phase shoot growth and strong development of a taproot with minimal fibrous-root branching, these trees exhibit resistance to standard growing techniques and reduced transplant success.

This study will develop new protocols to enable nursery growers and those that manage landscapes to produce and successfully transplant multiple species of highly desirable hickories using the etiolated stool bed method.



For more on this research, visit www.treefund.org/archives/22396

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Evaluation of Load Distribution in Removal Operations: A Comparison of Techniques and Equipment

Matt Follett, Université du Québec à Montréal
2019 Safe Arborist Technique Fund Grant Program

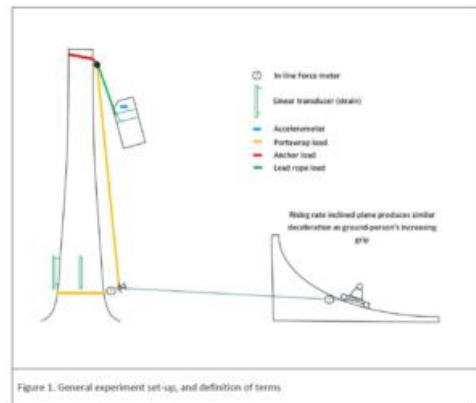
Recent advances in rigging hardware (rigging rings and rigging thimbles) have altered the way arborists perceive how loads are distributed through the rigging system and tree crown; however, little empirical research has been presented on the effects of these systems in practical use. Traditional rigging hardware has utilized a block (rotating sheave) at the upper anchor point in the rigging system; while these devices are efficient at transferring the load through the line, they cause a multiplication effect to the anchor point. This inherent feature comes as a flaw when rigging, as the load the anchor point must bear is often close to 2 times that of the actual suspended load.

For more on this research, visit www.treefund.org/archive/22239

A TREE Fund Webinar on this research was given in March 2024 titled, "Advances in our understanding of dynamic forces applied to a tree during removal operations: Results and techniques to mitigate risk of failure." To watch the video of this webinar, visit the Webinar Archives tab at www.treefund.org.



Figure 3: Selection of rigging apparatus tested



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