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# Proactive, Not Reactive: Evolving Elm Management in the Nation's Capital

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# Proactive, Not Reactive: Evolving Elm Management in the Nation's Capital

Washington D.C. is home to many historic elm corridors managed in close partnership between numerous urban forestry stakeholders. In recent years, the city's elms have been used as part of streetscape revitalization initiatives due to their quick-growing nature. The use of a popular *Ulmus americana* cultivar, Princeton, has brought about notable challenges in urban tree management. From the nursery to the tree box and even ten years later, these elms have required consistent attention in order to adequately train the form to achieve a sustainable canopy while minimizing structural defects. Two such plantings are explored, both with hand-selected trees from the same stock and nursery. These serve to highlight the differences between traditional urban forestry plantings and those under constant and careful scrutiny.

## **Keywords**

Washington D.C., Elm, Management, Pruning, Crotches, Urban Forestry, Canopy

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## SETTING THE STAGE FOR D.C.'S ELMS

In 2003, a major tree planting initiative took place in Washington D.C., introducing approximately 250 Princeton American elms to the city's urban forest. All hand-selected from the same nursery, the elms have posed considerable challenges for urban tree maintenance in recent years. This Practitioners Note investigates the structural issues which began with nursery management, and highlights two divergent management strategies that reflect current issues facing D.C.'s elm population and urban forestry in general.

## AMERICA'S HISTORIC TREE

The American elm was once the tree of choice for America's avenues, particularly prevalent and historic in the nation's capital. This beautiful native tree is hardy and adaptable to a wide range of conditions found in the urban landscape, notably pollution and compacted anaerobic soils. The fast-growing nature of the American elm has lent itself to urban revitalization efforts and comprises about 5-8% of Washington D.C.'s street tree canopy (Nowak et al. 2006).

Despite a robust and thriving population, non-cultivar elm stands throughout the country have been devastated by Dutch elm disease (DED), including significant losses in Washington, D.C.—millions of *Ulmus americana* were lost in the 85 years since DED introduction from Europe (Raupp et al. 2006). Though DED has taken its toll and American elms remain susceptible today, the species has prevailed. Many types of elms continue to thrive across the landscape, including those naturally occurring, along river banks, alleyways, fence lines, and in abandoned areas.

In recent years, the National Park Service (NPS), D.C. Department of Transportation Urban Forestry Administration (DDOT-UFA), and Casey Trees (a locally-based nonprofit organization) have conducted plantings of many disease-resistant American elm cultivars and hybrids across the city, furthering the success of this depleted species. Planted cultivars include Jefferson, New Harmony, Princeton and Valley Forge.

## EXAMINING ELM FORM

Elms are alternate branching and have a decurrent growth form (rounded, spreading crown), with several co-dominant trunks. These characteristics yield the graceful arching and spreading canopies emblematic of the celebrated American elm.

However, the introduction of DED-resistant elm cultivars has produced narrower crowns and tighter branching habits. When coupled with their characteristically weed-like growth, these unestablished elms require an aggressive, reiterative regimen over the initial 5-7 years after planting to adequately “train” their trunks and influence a mature spreading form, and reduce branch failure. This added maintenance investment presents a challenge to the resources and efficiency of municipal urban forestry programs, which often focus pruning resources on larger, more established trees.

## SOURCING AND PLANTING CULTIVARS

Since 2003, Casey Trees has planted 2,250 disease-resistant hybrid and cultivated elms in Washington D.C., including 1,467 Princeton American elms. The first of these efforts consisted of a large-scale American Elm Restoration Initiative in partnership with DDOT-UFA. Responsible for all trees between the curb and the sidewalk, DDOT-UFA would use the quick-growing elm to rapidly revitalize streetscapes.

One major planting in this initiative, Barracks Row (Figure 1), was part of the continued rehabilitation of a dilapidated commercial corridor on Capitol Hill. The 88 American elms planted in the neighborhood were part of an \$8.5-million investment largely organized by the Barracks Row Main Street Association. Cooperative development along the 8<sup>th</sup> Street SE corridor also included brick sidewalks, lights, signs, angle-in parking, and water-permeable tree planting strips.



**Figure 1.** The Barracks Row elm corridor, 10 years post-planting, Fall 2013. Photo credit: Joseph Duszak, October 2013

would go on to be selected as the Tree of the Year for 2004, awarded by the Garden Club of America. Their high-regard in the urban forestry community and assumed superiority suggested great promise for these trees.

However, while still at the nursery, these elms were pruned in an attempt to accentuate the vase-like aesthetic popular among elm-lovers, rather than receiving structural pruning better suited to the form. This nursery management created a “mitten-like” effect with many co-dominant leaders upon planting. Such modifications in elm form perplexed arborists and foresters, and would yield significant challenges in subsequent years.

A parallel planting, taking place in front of the White House at 1600 Pennsylvania Avenue NW (Figure 2), introduced 90 Princeton American elms to the park and vehicle-restricted promenade. In contrast to Barracks Row, which would be managed jointly by DDOT-UFA and Casey Trees, this White House corridor was planted and maintained by the National Park Service.

In both of these planting projects, the same nursery, cultivar, and stock were used. These particular Princeton elms



## STRATEGIES FOR MANAGEMENT

Upon sourcing these Princeton elms, all involved parties were provided with specific guidelines for management by the nursery owner to maximize the popular elm form. At Barrack's Row, Casey Trees conducted occasional maintenance on these trees in their early years, as DDOT-UFA guidelines recommend beginning the pruning regimen after a 5-year establishment period to maximize success. Subsequent collaborative efforts between Casey Trees and DDOT-UFA would begin in the following years to develop a maintenance strategy for these elms.

In contrast, these same guidelines were provided to NPS regarding the Pennsylvania Avenue planting, but were set aside in favor of early pruning to maintain security sight-lines and

aesthetic success (Figure 3). The NPS maintained an annual pruning cycle because of the cultural significance of the site.

## FROM THE NURSERY TO NOW

Ten years later, in March 2013, these same elms were examined to determine their overall success and health. A decade post-planting, these sites reveal both landmark growth in tree canopy, as well as severe structural defects and failures.

Barracks Row has been redeveloped into a commercially-thriving district, integral to Capitol Hill. However, its 88 elms, despite impressive canopy growth, are in sharp contrast to the success of the business district they adorn. Severely “included” bark, failing crotches and large co-dominant branch tears are rampant in the busy corridor. It is hypothesized that this is a result of lapsed structural pruning and management in their early years. These structural issues have created significant urban forestry management challenges, which will only increase in the future (Figure 4).



**Figure 2.** American elms at the 1600 Pennsylvania Avenue corridor Photo credit: Joseph Duszak, October 2013



**Figure 3.** American elms in front of the White House at 1600 Pennsylvania Avenue Photo credit: Joseph Duszak, October 2013





**Figure 4.** Jim Woodworth, Director of Tree Planting at Casey Trees, observes a trunk tear in November 2012. Such tree damage is commonly seen in the Barracks Row elms. Photo credit: Jessica Sanders, November 2012



**Figure 5.** Heavily pruned and lion-tailed elms in front of the White House at 1600 Pennsylvania Avenue. Photo credit: Joseph Duszak, 2013

The corresponding planting at 1600 Pennsylvania Avenue offers a unique perspective on street-tree management, as its elms also demonstrated the same co-dominant elm structure at planting. However, aggressive corrective pruning carefully managed by NPS may have achieved improved structure and scaffold branching associated with classic American elms (Figure-5). Additionally, the high-profile location of this planting has and will continue to receive careful scrutiny in perpetuity, including annual inspections, pruning, cabling and bracing as needed.

## LESSONS LEARNED IN ELM MANAGEMENT

In 2013, there was an apparent difference between the Barracks Row and Pennsylvania Avenue elms in the quantity of cracks, decay in crotches and overall form based on the nursery practices and subsequent differences in management. As demonstrated by the Barracks Row planting, many of these trees are on a path to failure in the next decade, and careful consideration needs to be taken when replanting these streetscapes. Nursery management can be significantly improved by early involvement, assessment and pruning upon recognizing disparities. Delaying pruning programs of unestablished trees may increase the susceptibility of significant structural problems later.

Alternatively, rapid and aggressive pruning as seen at 1600 Pennsylvania Avenue may have significantly mitigated structural tears and weakened crotches, but such focused maintenance takes time and requires a considerable monetary investment. This focused management to train the elms at an early age to prevent, correct, or minimize defects and achieve the expected lifespan of these trees is not likely feasible in most municipal forestry contexts. Urban foresters must recognize and commit to early tree maintenance if problems arise. Also to be considered is the role of partnering organizations in urban forestry as



**Figure 6.** American elms at the 1600 Pennsylvania Avenue corridor

Photo credit: Joseph Duszak, October 2013

opposed to singularly-focused entities. Solely planted and managed by the National Park Service, the White House trees have received detailed and consistent maintenance since planting to maximize security sightlines and aesthetic success. Serving as the backdrop for an international center of policy and tourism, such management is both expected and budgeted (Figure 6).

Collaboration between Casey Trees and DDOT-UFA has demonstrated the overall success of the Barracks Row elm plantings—a lasting stewardship and ownership in the community along 8th Street SE, due in part to the volunteer event at which the trees were planted. When trees were inspected in November 2012 and March 2013, and eventually tagged for removal or pruning, there was a substantial amount of community concern and interest in what was going to be performed. The trajectory for removal and replacement for these elms is expected to be stretched over 10 years or approximately 10%-15% replacement annually due to the community concern and desire to avoid wholesale streetscape canopy loss, as was the case in 2002 when the streetscape overhaul was initiated (Figure 7, Figure 8)



**Figure 7.** Princeton elm tagged for removal in Barracks Row, showing obvious signs of mitten-like growth and no central leaders. Photo credit: Timothy Hoagland, May 2013



**Figure 8.** Princeton elm being removed in Barracks Row. Photo credit: Timothy Hoagland, May 2013



The elm installation on Barracks Row was an important factor in resuscitating this commercial corridor. This now-thriving commercial district has a demonstrated connection between bustling tree-canopied streets and lively businesses, such that Washington D.C. has continued to plant successful elm corridors. This has led to increased investment in the city's trees, as well as increased education in elm sourcing, stock and early management during the establishment period. Plantings like that of Pennsylvania Avenue, while aesthetically pleasing and revered, are unlikely to reach this level of community connection.

As planting initiatives continue to increase not only in Washington D.C., but across the country, a better understanding of plant selection and nursery stock is necessary. Even with the most proactive management strategies, an initial "bad stock" can never be completely corrected. While a proactive strategy requires a notable monetary and labor-intensive investment, increased management through partnerships and collaborations can ultimately facilitate the long-term success of the urban forest. By involving the community, an otherwise unrealized partnership with the public can foster stewardship and ownership of street trees.

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