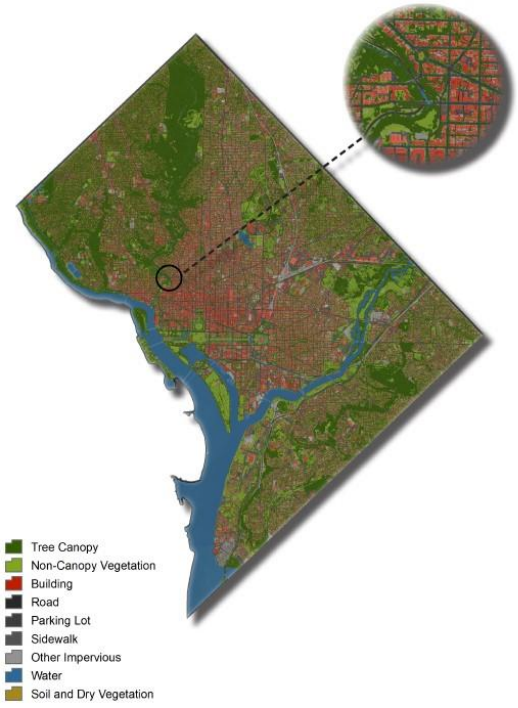
Forest Health Highlights: District of Columbia

1. Forest Resource Summary

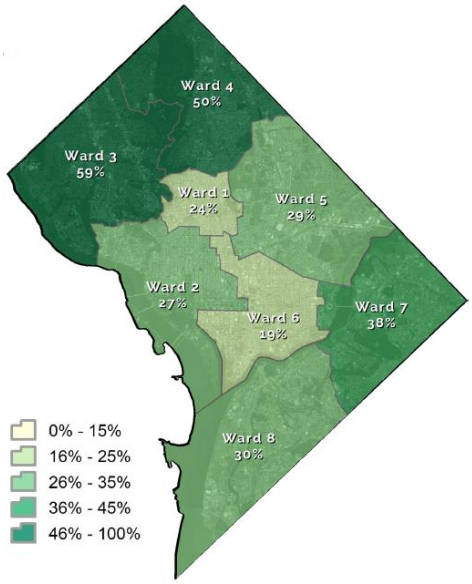
The District of Columbia occupies a land area of 39,072 acres. The urban forest in Washington, D.C. consists of forested areas located on private, federal, and state land comprised of approximately 2.01 million trees (USFS, 2018). These areas are managed by private landowners, federal agencies, and the District of Columbia. Three District agencies manage District-owned lands that contain forested areas: Department of Energy & Environment, Department of General Services, and Department of Transportation. DDOT's Urban Forestry Division (UFD) owns and manages approximately 170,000 street trees. In addition, UFD also manages trees on District public school and park property, which comprises an additional 10,000+ trees. UFD also administers the Urban Forest Preservation Act of 2002, which regulates the removal of mature trees from private property. The Urban Forest Preservation Act of 2002 was amended in 2016 and 2022 to include further protection of large trees with a circumference greater than 100 inches (Heritage trees), lowered the minimum size of trees protected to 44-99.9 inches circumference (Special trees), allows UFD to issue Stop Work Orders for non-compliance, and ensures District government agencies also comply with tree removal restrictions.

The District of Columbia is unique in having much of the land within its boundaries owned by the federal government. Forested land owned by the federal government is divided between parks such as the National Mall, Rock Creek Park, Anacostia Park and Ft. Circle Parks as well as other federal entities including the Smithsonian museums and Architect of the Capitol. Overall, forest ownership in the District is comprised of 22% privately owned forested land and the remaining 78% of forested land is publicly-owned, a combination of federal and District-owned land (USFS, 2018).



Land cover assessment for Washington, D.C., based on 2020 Pleiades imagery and LiDAR (PlanIt Geo, 2021). *The inset highlights landcover at the neighborhood level.*

The District of Columbia is committed to reaching and maintaining an urban tree canopy of 40% by the year 2032. This goal supports Sustainable DC, the District's plan to achieve a healthy, green, and livable city in one generation, by the year 2032 (Sustainable DC 2019). As of 2020, the District of Columbia enjoys an overall urban tree canopy of 37% (Planet Geo, 2021)However, urban tree canopy varies spatially by ward and neighborhood. For example, highly urbanized wards 1 and 6 have the lowest UTC at 24 and 19%, respectively while the more residential wards 3 and 4 had the highest UTC at 59 and 50%, respectively. The UTC analysis is conducted every five years, using updated high-resolution imagery and LiDAR data.

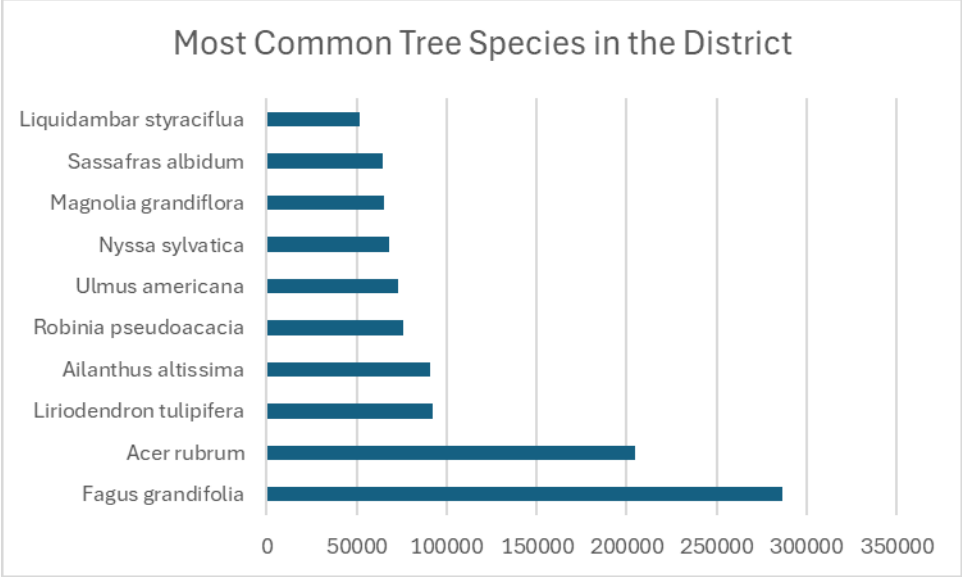


Urban tree canopy assessment by ward in Washington, D.C., based on 2020 Pleiades imagery and LiDAR (PlanIt Geo, 2021).

a. Forest Inventory

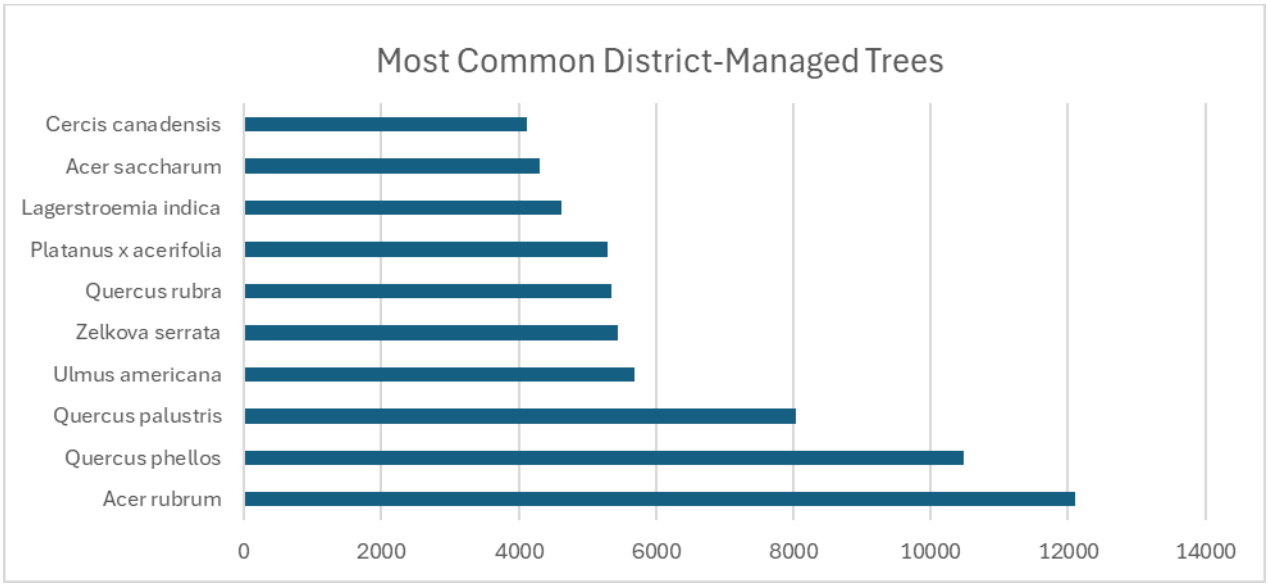
i. Species diversity

The District's urban forest is comprised of a combination of deciduous forest typical of the Mid-Atlantic, as well as landscape trees chosen for their hardiness in the urban environment. Washington, DC occurs within two ecoregions, to the northwest is the Northern Piedmont while much of the District lies in the Southeast Plains. Across the District, the five most common trees are American beech, red maple, tulip poplar, black locust, and American elm (USFS, 2024).



The Urban Forest Inventory reports the top ten most common trees species found on all land in the District. (USFS, 2022)

Among street trees, the most commonly occurring species are red maple, willow oak, pin oak, Japanese zelkova, and American elm (https://opendata.dc.gov/ accessed on December 17, 2022). Data shown are for the twenty most commonly occurring tree species in the public tree inventory. These totals do not include cultivars, such as those comprising the American elm population which include *Ulmus americana* 'Princeton', ' Jefferson', and 'New Harmony'. The total tree count for American elms and American elm cultivars is approximately 9110 trees.

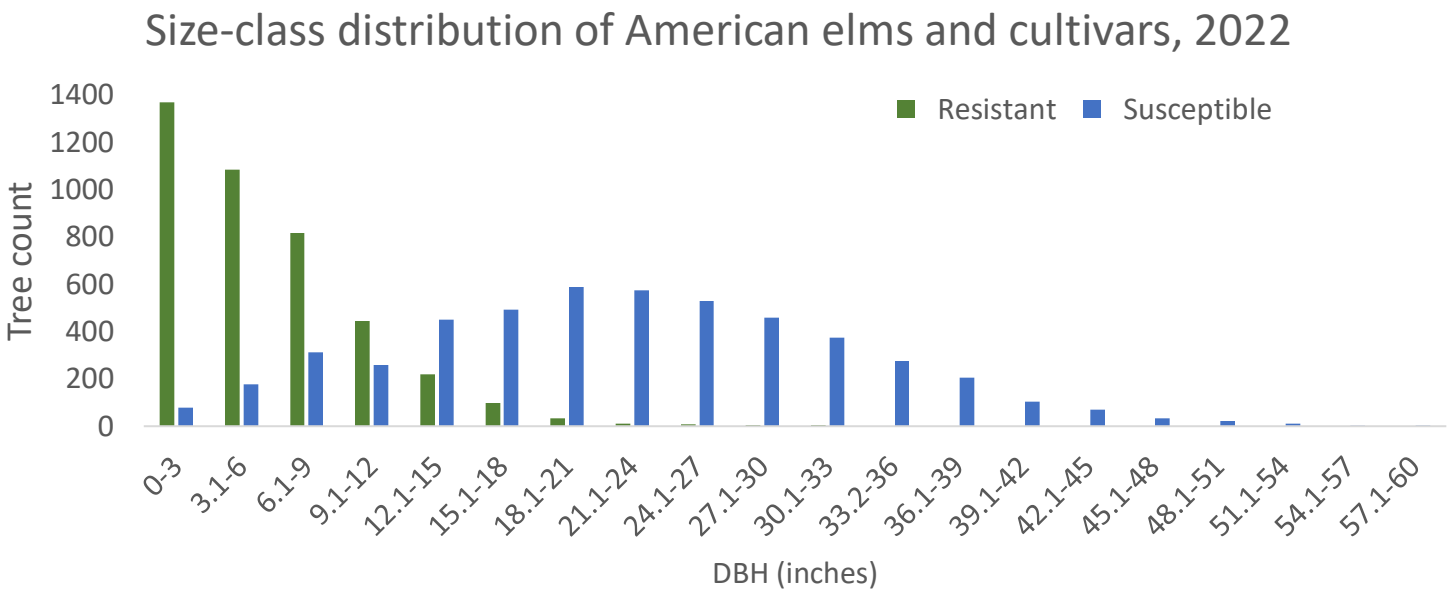


The Most Common DC-Managed Trees (https://opendata.dc.gov/ accessed on Dec 18, 2024)

b. Components of change

i. Elm management

American elms are iconic trees in the District of Columbia. They line many prominent avenues and form a beautiful, closed canopy over the west-bound approach to the Capitol. Moreover, American elms are some of the District's larger-mature trees often in size classes above 20 inches in DBH. Unfortunately, American elms in the District are also subject to Dutch elm disease (DED). Urban Forestry Division continues to plant elms, though limited to DED resistant/tolerant cultivars such as *Ulmus americana* 'Princeton', ' Jefferson', and 'New Harmony'. Consequently, the proportion of District elms resistant to DED continues to increase. In addition, UFD treats mature American elms for DED and expedites removal of elms that exhibit signs and symptoms of DED.

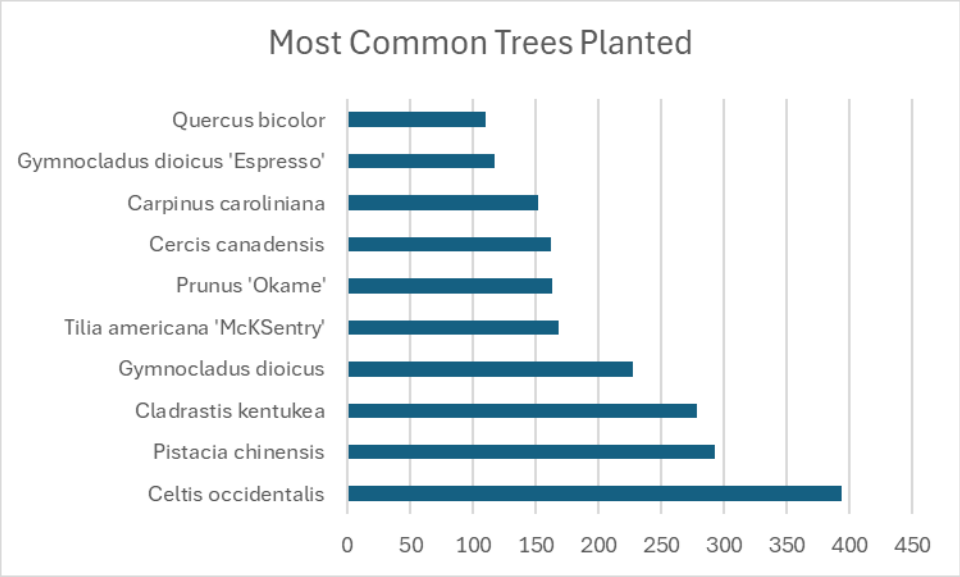


Size-class distribution for American elms and elm cultivars known to be resistant to Dutch elm disease. Diameter of trees was measured to the nearest 0.1 inch at a height of 4.5 feet. Data accessed from opendata.dc.gov on 11/1/2022.

(October 2021-September 2022). In 2024, a total of 1,171 elm trees were injected with arbor.

ii. Planting

Each year Urban Forestry Division plants six to eight thousand trees in the public right of way and on District-owned land in support of reaching the 40% urban tree canopy goal by 2032. In the 2021-2022 planting season, UFD planted approximately 5,700 street trees and trees in public parks and schools throughout the District. (https://opendata.dc.gov/ accessed on Dec 18, 2024). In efforts to diversify the species in our inventory, steps have been taken to plant less common species as seen in our ten most common trees planted in 2024 (see below). Please note, cultivars were separated from straight species.



The Most Common planted trees by UFD in 2024 (https://opendata.dc.gov/ accessed on Dec 18, 2024)

2. Forest Health Issues

a. Emerald ash borer

Emerald ash borer (EAB) was first observed in the District in 2013. Fortunately, the street tree inventory consists of very few ash trees, making up approximately 0.09% of all publicly-owned trees. Following the discovery of live emerald ash borer in 2014, UFD began tracking observations of emerald ash borer in street trees and ash trees located on other District-owned properties. To date, emerald ash borer has been observed in all eight District Wards. UFD expedites the removal of any District-owned ash trees known to be infested with EAB. Across DC, Urban Forest Inventory and Analysis indicate that the urban forest is comprised of approximately 0.8% ash, *Fraxinus pennsylvanica* (USFS, 2018).

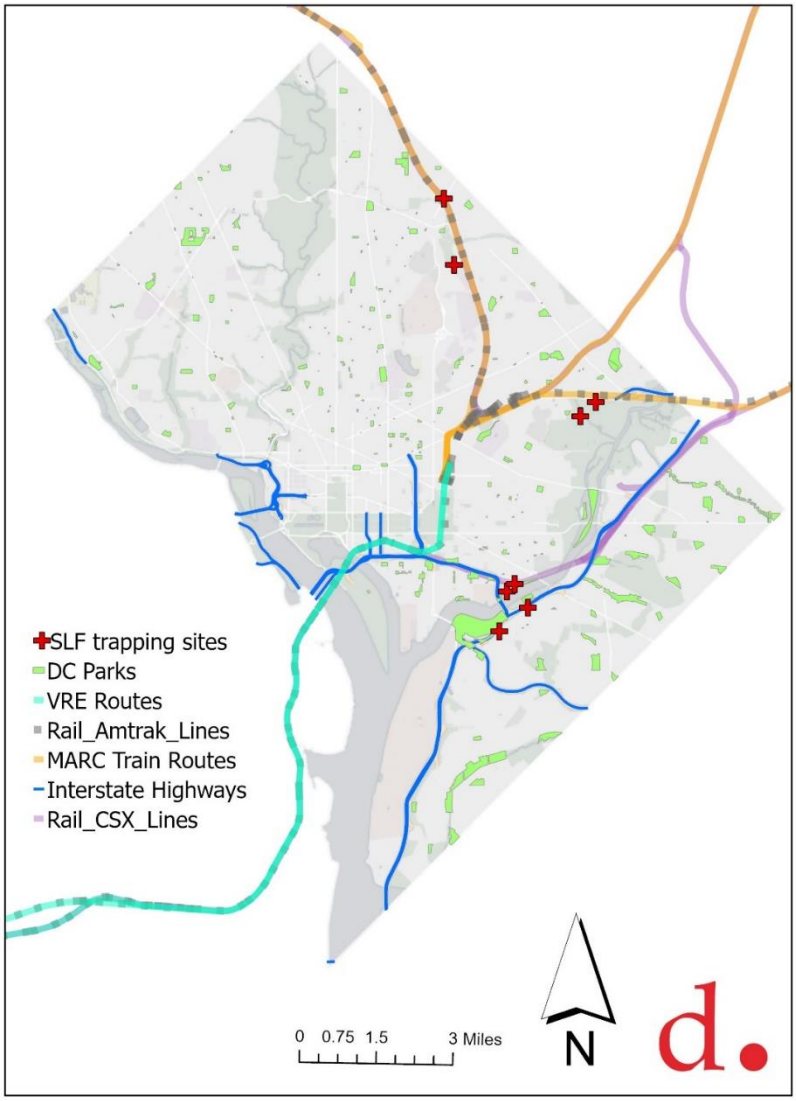
The overall urban forest in the District contains a greater proportion of ash trees compared to the street tree population, particularly in riparian areas such as Kenilworth Park and Aquatic Gardens. In areas managed by the National Park Service in the National Capital Area (including parks in MD, VA, WV), the density of live ash trees has slowly but steadily declined since approximately 2014, with a corresponding increase in standing dead ash since 2014 (Matthews & Nortrup, 2018). In more recent years the density of standing dead ash trees has surpassed that of live ash in the National Capital Area, which also includes NPS parks in MD, VA, WV (Chen, 2021). Very few ash remain in the Urban Forestry inventory.

b. Emerging forest health issues

i. Spotted lanternfly

The first known confirmation of spotted lanternfly (*Lycorma delicatula*) in the District of Columbia was made on October 31, 2022 near the Deanwood neighborhood of NE DC. USDA APHIS was alerted and confirmed the identification. Subsequently, they conducted visual surveys in the area with Department of Energy & Environment staff.

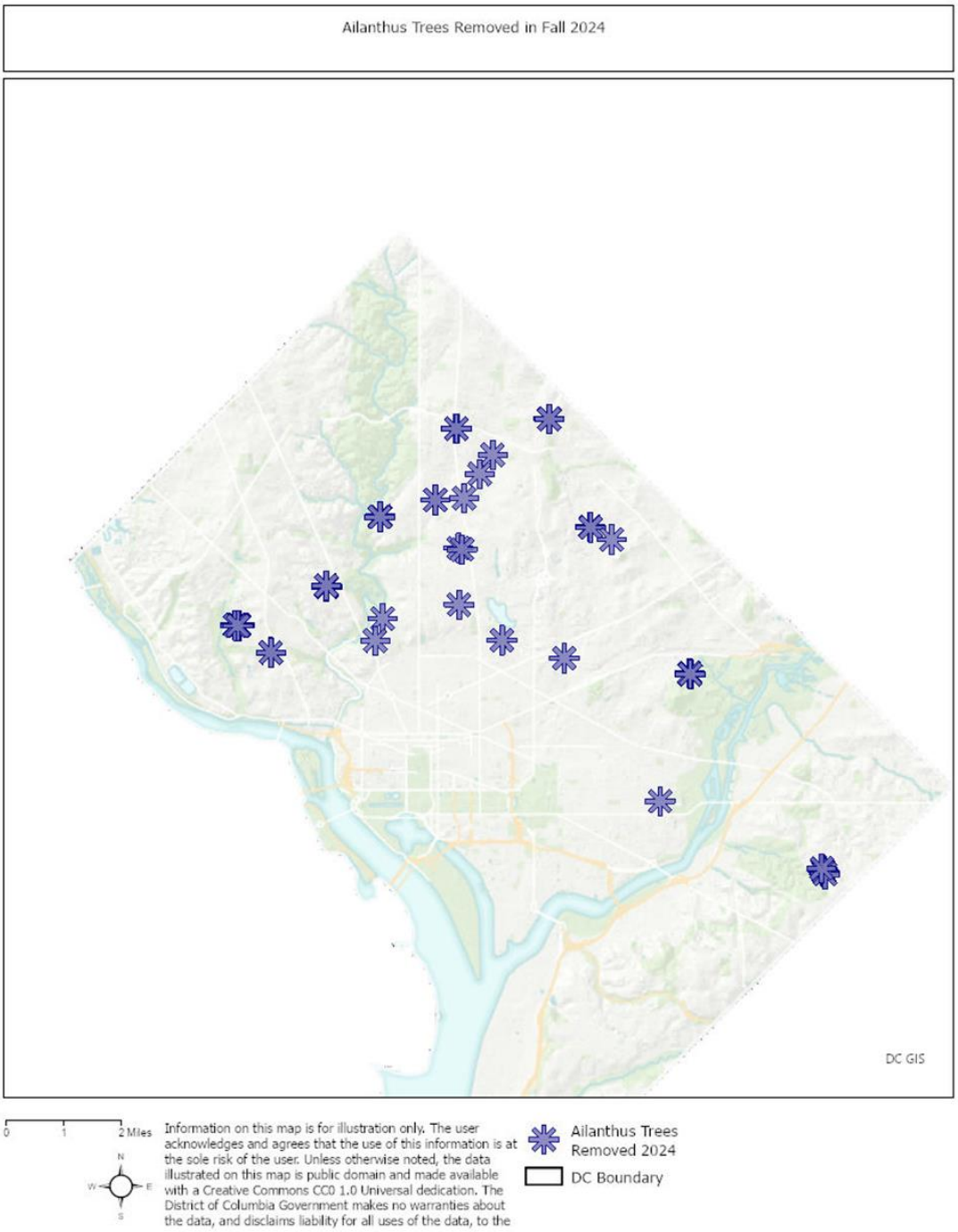
During fiscal year 2022 (October 2021 – September 2022), UFD received 27 reports of spotted lanternfly from the District's Survey 123 reporting website. Of the 27 reports, nine were reported for locations outside of the District, in Pennsylvania, Maryland, and New York. The remaining 18 reports for the District consisted of seven confirmed spotted lanternfly adults, six were identified as other insects, and five reports were inconclusive due to a lack of information. Online reports that included a photograph confirming the identification of spotted lanternfly were followed up with visual surveys and community outreach. Upon inspection at locations with



Left) spotted lanternfly circle trap installed on tree of heaven, Right) map of 2022 trapping sites located near high-risk areas (Photo by Urban Forestry Division, DDOT.)

confirmed spotted lanternfly sightings, no additional observations were made, nor were any other life stages observed.

Spotted Lantern fly was reported through a survey 123 system with an uptick in reporting beginning in July 2024 and increasing through October. We believe SLF is present throughout the District and therefore, we removed the traps seen in the picture below to help mitigate the effects for SLF on the landscape, especially in public areas, we used money from a BIL grant to remove 75 ailanthus trees on the street, at recreation centers, and on school properties. The locations of these removals can be seen below.



ii. Crape myrtle bark scale

The crape myrtle bark scale (CMBS) *Acanthococcus lagerstroemiae*, a non-native scale pest was observed in 2021. Since the first observation made by a UFD Urban Forester in May 2021, CMBS has been reported on *Lagerstroemia* street trees and on privately-owned trees as well. Symptoms observed include excessive honey dew, growth of sooty mold, and dieback in twigs and stems. Urban Forestry Division has developed a management program to address this new issue, including a temporary moratorium on planting crape myrtles on public land, enhanced sanitation practices and outreach. Natural enemies such as lacewing larvae and coccinellid larvae have been observed on trees with moderate to advanced CMBS infestations.

Due to the ongoing CMBS infestations, UFD has not planted nor will it plant crape myrtle trees throughout the 2024-2025 planting season.

Early infestation of crape myrtle bark scale on street tree. Interior branches show symptomatic sooty mold and scale (Photo by Urban Forestry Division, DDOT.)

iii. Beach Leaf Disease

Beech leaf disease appears to be caused by a microscopic nematode (Carta et al., 2020) called *Litylenchus crenatae* ssp. *Mccannii* (LCM). This is a subspecies of the nematode *Litylenchus crenatae*, originally described in Japan. Nematodes, or roundworms, are tiny, unsegmented worms. The nematode damages beech leaf tissue by feeding inside leaves and buds. The nematode overwinters in the young buds and in leaves (Reed et al., 2022). Scientists are studying how LCM moves between trees. Possible modes of dispersal are still being investigated, but could included human-mediated dispersal or movement via birds or insects (Martin and Volk, 2021). Leaf-loving nematodes like LCM rely on water for movement and dispersal (Kohl, 2011).

Thus far, we have not detected BLD in the District. However, BLD has been detected in the neighboring suburbs such as Fairfax County as early as 2023. Therefore, we expect to detect it in 2024. Although Fagus Americana makes up less than one percent of the District owned trees, it is the most common species (over 12% of the population in the District) mostly found on federal land. Through outreach events, we are increasing awareness of the issue as BLD will be very disruptive the forests in the District.

iv. Oak decline

In 2019 and 2020, District residents reported decline symptoms in white oaks (*Quercus alba*) that included: early leaf browning, canopy loss, and ambrosia beetle activity. These symptoms were often found in mature white oaks, more commonly occurring on private property. In nearby states, foresters and the public alike have reported rapid declines of white oaks in Virginia and Maryland (Borowy, 2020; Chamberlin, 2018; Rane, Gill, & Clement, 2019). As described by Rane et al. (2019), white oaks may decline quite quickly, in as little time as two weeks, and suddenly turn brown, though leaves often remain on the trees. There does not appear to be any single factor associated with this rapid decline. The presence of frass from ambrosia beetles is a frequent observation, though most consider this activity to be secondary (Rane, Gill, & Clement, 2019). Jurisdictions close to the District in Maryland and Northern Virginia have cited wet springtime weather and summer drought conditions as possible inciting factors for these declines (Verweij, 2019; Rane, Gill, & Clement, 2019; Virginia Tech, 2019).

In 2020, Urban Forestry Division, University of the District of Columbia (UDC), and the US Forest Service collaborated on a survey of oak health to document symptoms of rapid decline in white oaks in the District. In the 2021-2022 academic year a UDC College of Agriculture and Environmental Sciences graduate student compiled data for the oak health survey from the UFD tree inventory, Urban Forest Inventory and Analysis (USFS, 2018), previous iTree analyses, and National Park Service inventory data. During the summer of 2022, Urban Forestry Division deployed traps for detection of bark and ambrosia beetles on District property identified as having recent urban tree canopy loss and the presence of *Q. alba*. Data from trapping is forthcoming and will be combined with existing inventory data in a summary report.

In 2024, a new graduate student began field work investigating oaks in decline. He has sampled oak trees throughout the district and noted his observations. He plans to compile his findings and share them in a report with UFD in 2025.

v. Cicada damage study

Kasey Yturraldi PhD. has worked to publish a manuscript about the recent cicada outbreak in the District. The study assessed the impact of the 2021 Brood X cicada emergence on newly planted urban trees in Washington, D.C., focusing on egg-laying damage and tree health. It found significant differences in cicada damage across ten tree genera, with the most damage observed in Acer and Nyssa, particularly in scaffold and lateral branches. Although egg laying was correlated with foliage loss, it did not affect overall tree health or survival, as tree condition and survival rates were similar to those in previous years without cicada emergence. Remote sensing techniques were ineffective in distinguishing cicada damage from other types. The study suggests that urban forestry departments can mitigate damage by selecting less preferred tree genera and that cicada emergence should not deter tree planting efforts, as cicada damage does not appear to impact tree health in the short term.

Cicada damage caused during the egg laying process

vi. Other forest health issues

There are a variety of additional insect pests observed on street trees in the District of Columbia. Scale insects are often observed, particularly on maple and oak street trees. Other insects and pathogens observed in 2022 include cynipid oak galls, woolly hackberry aphid (*Shivaphis celti*), bark and ambrosia beetles, and powdery mildew. These issues have continued to be observed throughout 2024

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