TREE INVENTORY SUMMARY

KIRKLAND, WA

APRIL | 2024

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KIRKLAND, WA TREE INVENTORY
SUMMARY

Having a healthy, diverse urban forest can provide many benefits to residents as well as the ecosystem. In addition to being aesthetically pleasing, trees also provide a number of ecosystem services. For example, they scrub the air of pollutants, slow the release of stormwater runoff into the watershed, filter stormwater, provide oxygen, reduce energy costs, provide shade, and offer habitat and food for wildlife.

Trees in urban environments not only contribute services to the area, but also provide residents with invaluable green space and health benefits. Research has shown that proximity to green space is linked to better mental health, as well as increases in social connections, and physical well-being. (Barton et al., 2010; Holtan et al., 2014; Takano, 2002).

The keys to maintaining a sustainable and healthy urban forest are species and age diversity, proper tree maintenance, risk management, and community support, which can be accomplished with an urban forest management plan. The information in this report is provided to guide future maintenance and management and to better plan for the health and longevity of Kirkland's urban forest.

The inventory data were analyzed in Microsoft Excel and Kirkland's own TreePlotter app (**https://pg-cloud.com/KirklandWA/**) to determine the state, characteristics, and trends of the city's urban forest. Analyses and summaries were completed for the inventoried trees to determine the health and diversity of all trees managed by the city of Kirkland.

The inventory amounted to 50,576 sites. This data includes 48,848 trees, 1,308 removed trees, 151 planting sites, and 289 stumps that were inventoried by Certified Arborists accredited by the International Society of Arboriculture and analyzed for site quality, health observations, and structural defects among other data points.

URBAN FOREST HEALTH ASSESSMENT

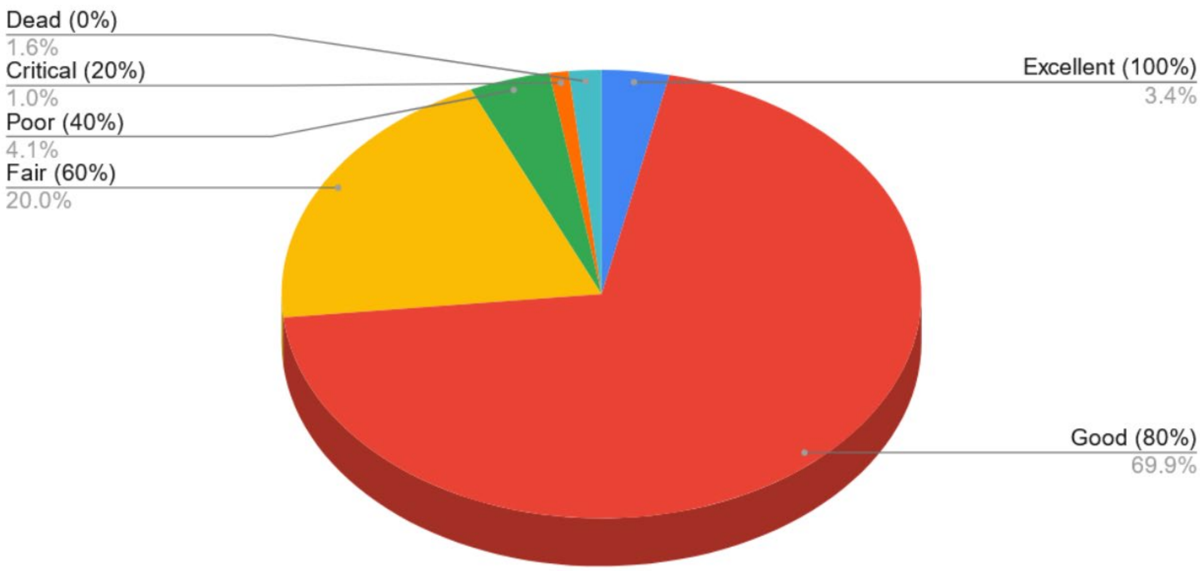
URBAN FOREST CONDITION

The inventory data were analyzed to identify potential trends in tree condition and management needs. Information on the condition of trees plays an important role in planning, budgeting, and use of resources. Each inventoried tree's health was evaluated by ISA Certified Arborists based on the condition of the wood and the foliage as well as the structure.

The chart below summarizes the 48,848 trees and shows the detailed information for each condition class.

Out of 48,848 trees, 804 trees were categorized as dead. The majority of living trees were categorized as good (69%), and 9,758 trees, (20%) were categorized as fair. Only 1% (475 trees) were categorized as critical condition and 4% were poor (1,993 trees), leaving 1,664 trees, or 3% in the excellent condition category.

Tree Health



CONDITION	COUNT	PERCENT
Excellent (100%)	1664	3.41%
Good (80%)	34154	69.92%
Fair (60%)	9758	19.98%

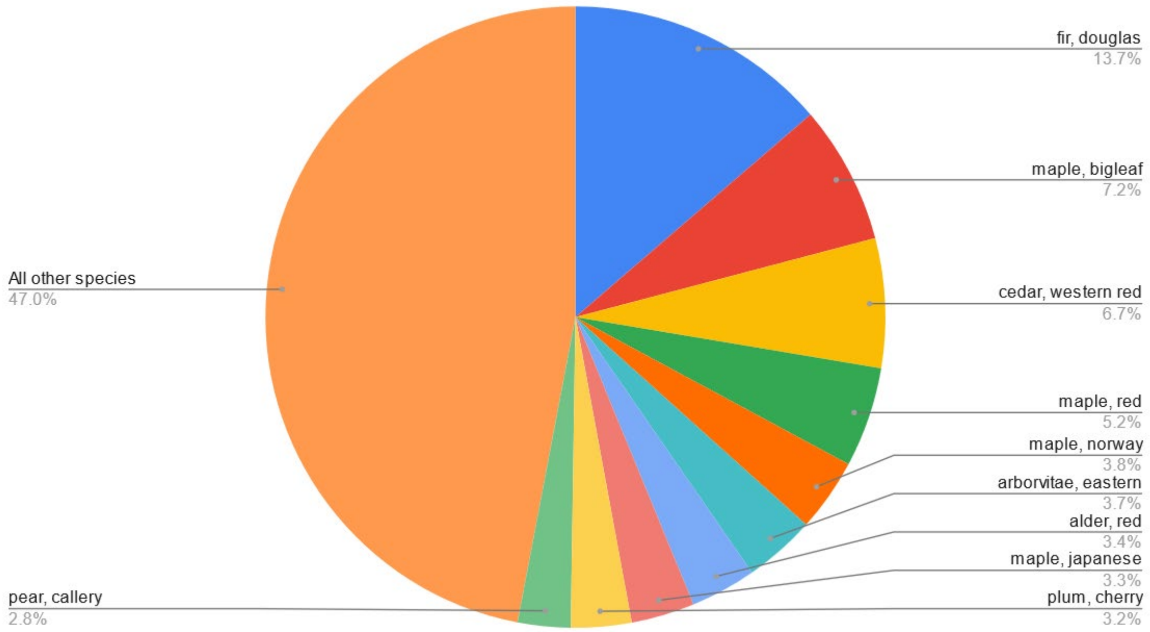
CONDITION	COUNT	PERCENT
Poor (40%)	1993	4.08%
Critical (20%)	475	0.97%
Dead (0%)	804	1.65%

TREE DIVERSITY AND COMPOSITION

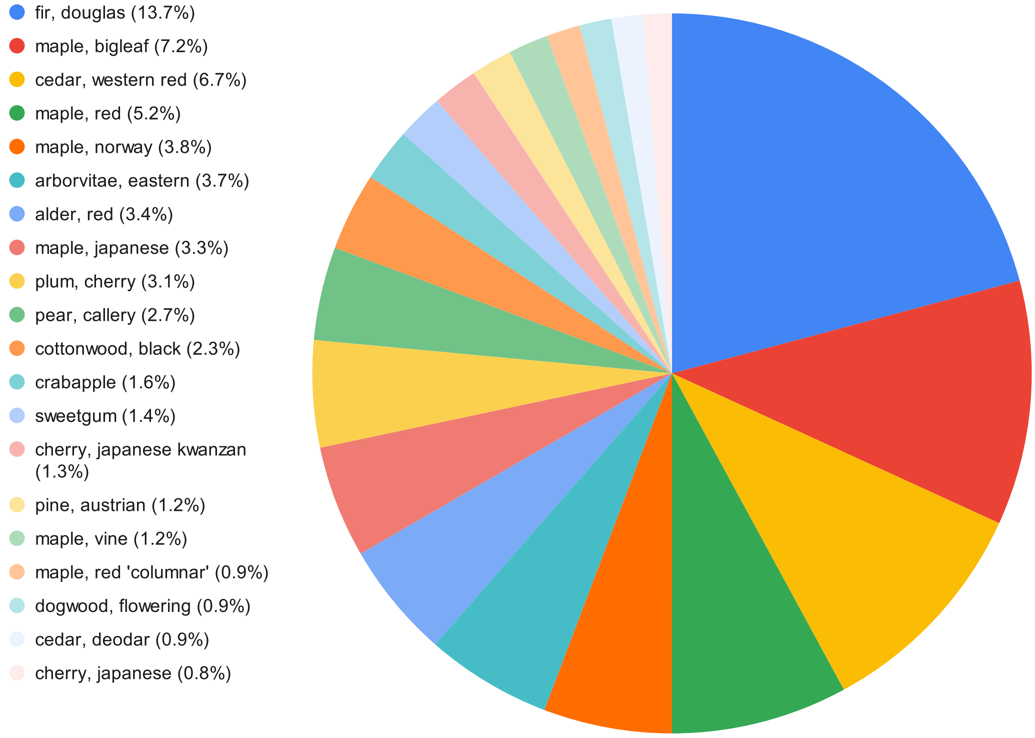
Species composition data are essential since the types of trees present throughout the city dictate the amount and type of benefits produced, tree maintenance activities required, and budget considerations.

The 48,848 trees inventoried consist of 395 different species and cultivar classifications. The top 10 species comprise 53% of the tree population. The highest percentage consists of Douglas Fir with 14% (6,691 trees) of the total tree population, followed by Bigleaf Maple with 7% (3,522 trees) and Western Red Cedar with 7% (3,287 trees). This figure shows the top 10 species compared to the other 385 species inventoried.

Top 10 Species Compared to All Other Species



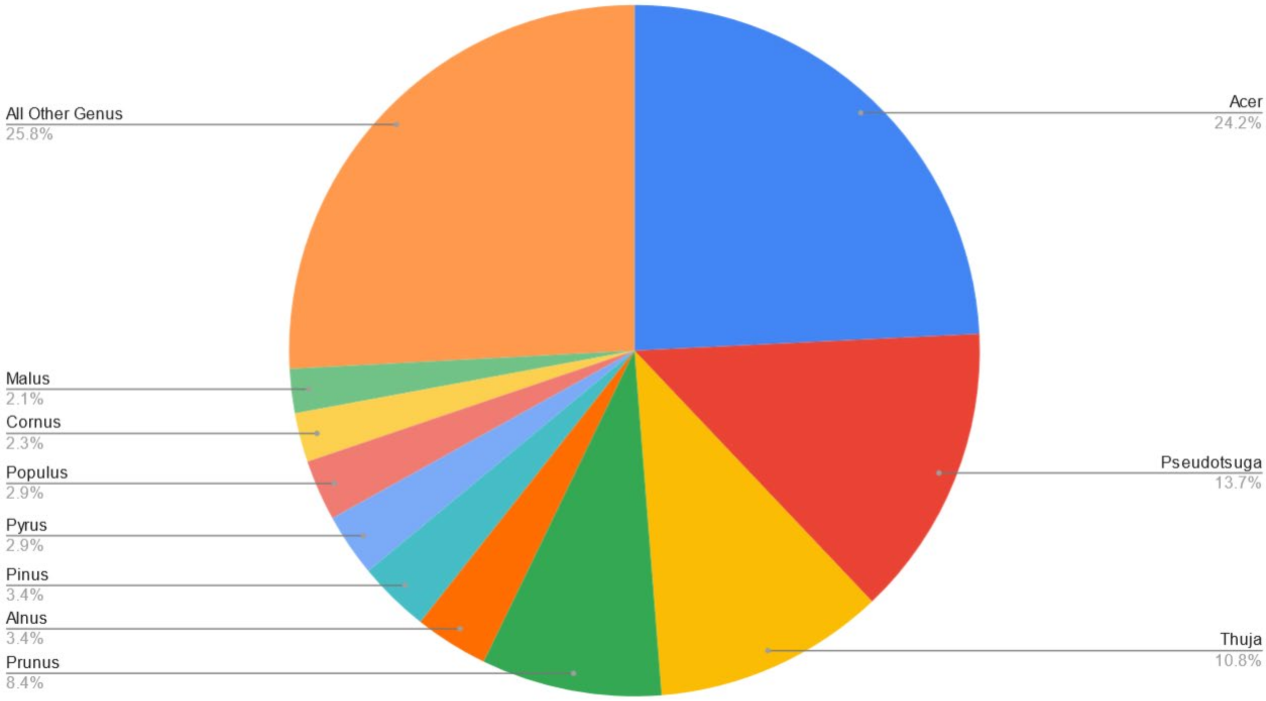
Top 20 Species



COMMON NAME	COUNT	PERCENT
fir, douglas	6691	13.70%
maple, bigleaf	3522	7.21%
cedar, western red	3287	6.73%
maple, red	2545	5.21%
maple, norway	1851	3.79%
arborvitae, eastern	1817	3.72%
alder, red	1674	3.43%
maple, japanese	1615	3.31%
plum, cherry	1539	3.15%
pear, callery	1345	2.75%
cottonwood, black	1125	2.30%
crabapple	768	1.57%
sweetgum	672	1.38%
cherry, japanese kwanzan	655	1.34%
pine, austrian	589	1.21%
maple, vine	578	1.18%
maple, red 'columnar'	485	0.99%
dogwood, flowering	463	0.95%
cedar, deodar	450	0.92%
cherry, japanese	417	0.85%

133 unique genus were inventoried. The most common genus inventoried was Acer with 24% of the total inventory. This genus, per the inventory, includes the Bigleaf Maple (*Acer macrophyllum*), Red Maple (*Acer rubrum*), Norway Maple (*Acer platanoides*), Japanese Maple (*Acer palmatum*), Vine Maple (*Acer circinatum*), Red Columnar Maple (*Acer rubrum 'columnare'*), Freeman Maple (*Acer x freemani*), Norway Maple 'Crimson King' (*Acer platanoides 'crimson king'*), Paperbark Maple (*Acer griseum*), Amur Maple (*Acer ginnala*), and Sycamore Maple, (*Acer pseudoplatanus*).

Top 10 Genus Compared to All Other Genus



SIZE DISTRIBUTION

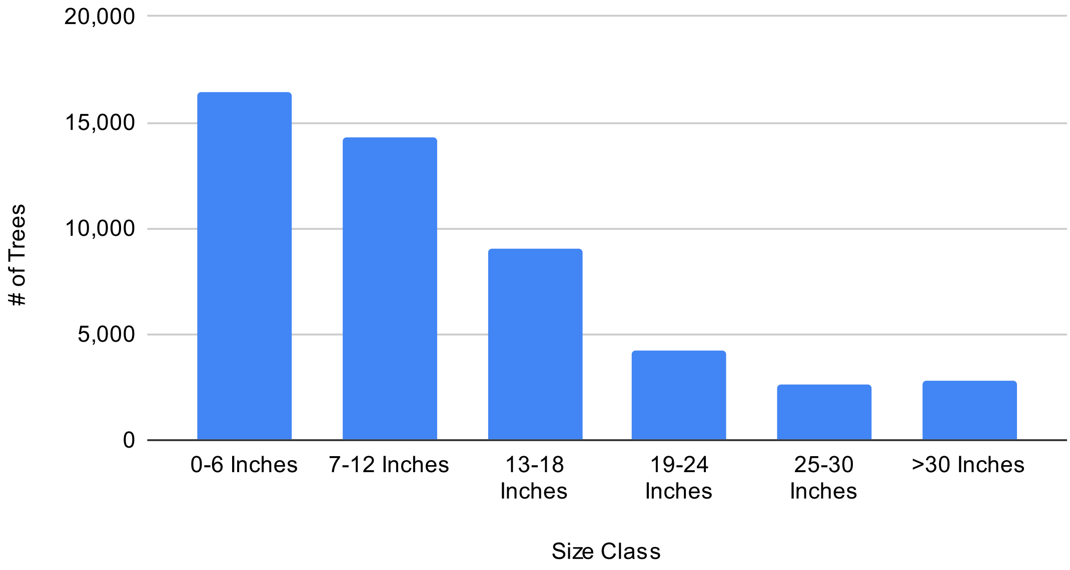
The distribution of tree sizes is a crucial factor in shaping the structure of an urban forest and determining its current and future costs. A diverse range of tree sizes ensures a steady stream of ecological benefits now and into the future, and utilizing this information can assist the city in allocating maintenance schedules and budgets with greater accuracy. In contrast, an urban forest with unevenly distributed tree ages may not provide that steady stream of ecological benefits for future generations. Careful consideration of size distribution is essential for ensuring a sustainable and healthy urban forest.

The inventoried trees were categorized into the following diameter size classes: young trees (0-6 inches DBH or diameter at breast height measured at 4.5 feet), established (7-12 inches DBH), maturing (13-18 and 19-24 inches DBH), and mature trees (25-30 and >30 inches). Since tree species have different lifespans and mature at different diameters, heights, and crown spreads, actual tree age cannot be determined from diameter size class alone. However, general classifications of size can be extrapolated into relative age classes.

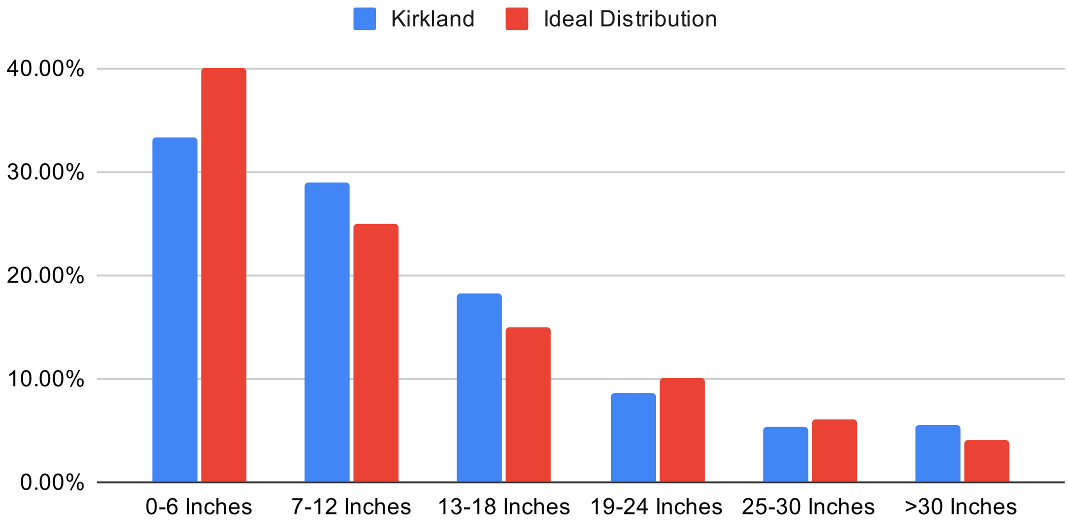
To optimize the value and benefits of Kirkland's trees, the urban forest should have a high percentage of large canopy trees, as these provide greater ecosystem benefits. On the other hand, there must be a suitable number of younger, smaller trees in the urban forest to account for and eventually replace large and mature trees in decline. Having a healthy percentage of young trees in the urban forest will ensure a sustainable tree population as well as age distribution in future years. To compare Kirkland's urban forest structure to industry-recommended standards, the "ideal distribution" is used. (Richards,."Diversity and Stability in a Street Tree Population. 1983).

Richards proposed an ideal diameter size class distribution for street trees based on observations of well-adapted trees. Richards' ideal distribution suggests that the largest fraction of trees (approximately 40% of the population) should be young (less than 8 inches DBH), while a smaller fraction (approximately 10%) should be in the large-diameter size class (greater than 24 inches DBH). A tree population with an ideal distribution would have an abundance of newly planted and young trees, and lower numbers of established, maturing, and mature trees.

Kirkland Tree Size Class Distribution



Size Distribution of Kirkland's Urban Forest vs. An Ideal Distribution



Overall, the size distribution of Kirkland's urban forest (blue bars) is similar to the ideal size distribution (red bars). As this figure shows, 33% of the urban forest (16,413 trees) is composed of trees with a DBH (or "diameter at breast height," measured at 4.5 feet above grade) ranging from 1 to 6 inches. This indicates that the majority of trees are young or small-statured, which is desirable for a healthy urban forest. However, trees with a DBH of 7-18 inches makeup 47% (23,267 trees) of Kirkland's trees, which is around 7% higher than the recommended distribution. 2,775 trees, or 6% of trees are 30" DBH or greater. Trees in this DBH range can offer larger ecological benefits if the tree is properly maintained and remains healthy, but trees of this size should be monitored frequently to determine maintenance needs, potential risks, and signs of decline. The DBH range of 19 to 24 inches, which makes up 9% of the tree population (or 4.219 trees) is around 2% below the ideal distribution and extra care should be taken to ensure the health of these trees to maintain an ideal distribution in the future. The two largest DBH trees inventoried were a Black Cottonwood (90" DBH) and a Western Red Cedar (90" DBH).

An ideal age distribution in the tree population allows managers to allocate and project annual maintenance costs uniformly. This ensures continuity in overall tree canopy coverage and associated benefits which are often dependent on the growing space of individual trees (e.g. open grown versus restricted growing areas). It is recommended to monitor and strategically manage large trees throughout the city.

URBAN FOREST PESTS AND PATHOGENS

Summary of pests and pathogens identified as most relevant to Kirkland.

Present Pests and Pathogens in Washington State:

- Armillaria Root Rot (fir, spruce, pine, hemlock, cedar)
- Annosus Root Rot (fir, spruce, pine, hemlock, cedar)
- Laminated Root Rot (fir, spruce, pine, hemlock)
- Black Stain Root Disease (doug-fir, pine, hemlock)
- Black knot (Prunus)
- Spongy Moth (300+ species)
- Japanese Beetles (300+ species)
- Bronze Birch Borer (Birch)
- Apple Maggot/Codling Moth (Apple fruit)
- Brown Marmorated Stink Bug (Apples, Apricots, Pears, Cherries)
- Anthracnose - (Dogwood, Oak, Maple, Sycamore)
- Verticillium wilt - (Acer, Fraxinus, Prunus, Cercis)

Predicted Pests and Pathogens:

- Sudden Oak Death (Oak sub. Lobotae)
- Emerald Ash Borer (Ash)
- Sirex Woodwasp (Conifers, mostly pine)
- Spotted Lantern Fly (Malus species)
- Citrus, Red-necked, and Asian long-horned beetle (Maples, some other hardwoods)

Total percentage of street tree population potentially susceptible to pests and pathogens.

Trees affected by most relevant existing pests & pathogens

AFFECTED CONIFERS (SELECT SPECIES)	
Fir	7,168
Cedar	3,769
Hemlock	482
Pine	172
Spruce	67
Larch	16
TOTAL EVERGREEN	**11,674 or 23%**
AFFECTED DECIDUOUS (SELECT SPECIES)	
Cherry/Plum	4,369
Dogwood	1,150
Ash	656
Birch	491
Sycamore	240
Apples	222
Redbud	111
TOTAL DECIDUOUS	**7,239 or 14%**
TOTAL	**18,913 or 37%**

Trees affected by most relevant predicted pests & pathogens

Acer	12,123
Pinus	1,724
Malus	1,034
Oak	599
TOTAL	**15,480 or 31%**

Total replacement value of at risk trees*

AFFECTED CONIFERS (SELECT SPECIES)	
Fir	$8,773,632
Cedar	$4,613,256
Hemlock	$589,968
Pine	$210,528
Spruce	$82,008
Larch	$19,584
TOTAL EVERGREEN	**$14,288,976**
AFFECTED DECIDUOUS (SELECT SPECIES)	
Cherry/Plum	$5,380,704
Dogwood	$1,407,600
Ash	$802,944
Birch	$600,984
Sycamore	$293,760
Apples	$271,728
Redbud	$135,864
TOTAL DECIDUOUS	**$8,893,584**
TOTAL	**$23,182,560**

Total replacement value of trees identified as having a pest/disease

628 TREES	**$768,672**

* Replacement value of trees affected by pests and pathogens is calculated using the average per tree replacement cost of $1,224. The trunk formula method used in this i-Tree Eco analysis assumes the value of a tree is equal to the cost of replacing the tree in its current state (Cullen, 2002).

Pest management recommendations using Integrated Pest Management (IPM) protocol

Pests are best managed using Integrated Pest Management (IPM) protocol. This includes setting an action threshold, monitoring and identifying pests, prevention as a first line of defense, and then controlling pest populations. Pest control is not always necessary - it is important to determine the level at which pests will become an economic threat. The pests must be identified accurately to inform control decisions to avoid unnecessary pesticides. Prevention may look like planting a variety of tree species that follow the 10 - 20 - 30 rule to minimize the effect of pest infestations.

- **Set Action Thresholds**

  Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will become an economic threat is critical to guide future pest control decisions.

  - **2,967 (6%)** trees identified as having a disease, pest, or invasive growth. Not all disease, pests, and pathogens are visible at all stages and in all conditions so this number is lower than actual.
  - Identify focus areas and species within those areas.
  - Compare the number of affected species to the total number of trees in an area to determine disease/pest concentration.
  - Determine level of damage/deterioration to understand severity of disease/pest.
  - Recommended threshold of:
    - Increase of pest/disease presence of more than 10% per year.
    - Increase of damage/deterioration of any given species or genus of more than 5% per year.
  - Establish specific thresholds for individual pests/diseases. E.G. “10 Ash trees affected by EAB within 1 mile radius”

- **Monitor and Identify Pests**

  Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.

  - 13 pests or pathogens identified as most relevant to Kirkland are:
    - Armillaria Root Rot
    - Annosus Root Rot
    - Laminated Root Rot
    - Black Stain Root Disease
    - Black knot
    - Spongy Moth
    - Japanese Beetles
    - Bronze Birch Borer
    - Emerald Ash Borer
    - Apple Maggot/Codling Moth
    - Brown Marmorated Stink Bug
    - Anthracnose
    - Verticillium wilt

- 5 pest or pathogens expected to arrive in western PNW:
    - Sudden Oak Death
    - Sirex Woodwasp
    - Spotted Lantern Fly
    - Citrus, Red-necked, and Asian long-horned beetle
    - Kudzu
- **Prevention**
  As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In an agricultural crop, this may mean using cultural methods, such as rotating between different crops, selecting pest-resistant varieties, and planting pest-free rootstock. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.
    - Complete an Urban Forest Pest Ready Assessment through the State of Washington Urban Forest Readiness Playbook
    - Identify known pathways and vectors of pest/pathogen movement
    - Train city forestry staff, relevant business owners, and residents to identify the aforementioned species and set up a reporting system.
    - Consider removing dead trees and stumps
    - Plant pest/disease resistant species and cultivars.
    - Follow 10-20-30 guideline and never plant a single species in large concentrations in any given area
        - Limit planting Douglas-fir (13.7%)
        - Limit planting Acer (24.2%)
    - Establish trap systems for EAB, BMSB, Japanese Beetle and other common pests with existing and accessible control systems.
- **Control**
  Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less risky pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.
    - Establish trap systems for EAB, BMSB, Japanese Beetle and other common pests with existing and accessible control systems.
    - Identify the best pesticide according to local and state regulation for each individual pest/pathogen.

ECONOMIC AND ECOSYSTEM BENEFIT ANALYSIS OF KIRKLAND'S URBAN FOREST

To identify the dollar value provided and returned to the community, the TreePlotter software application, which utilizes the latest i-Tree API to process this data, was used to quantify the benefits of the trees in the tree inventory. This tool in TreePlotter creates an annual benefit report that demonstrates the value public trees provide. A single tree's species, size, condition, crown light exposure, and land use are used to calculate the benefits. These benefits are calculated on a per tree basis, and added up to reach the total benefits as seen below. It is important to note that these benefits are different from benefits associated with Urban Tree Canopy analysis data. These benefits are associated with single trees and extrapolated to account for the urban forest as a whole, compared to Urban Tree Canopy benefits, which are derived from a per acre value of tree canopy.

These quantified benefits and the reports generated are described below:

- **Carbon Monetary Benefit:** Calculates the dollar value associated with the amount of carbon stored or sequestered by trees based on calculations of the social cost of carbon.
- **Carbon Sequestered:** Presents annual reductions in atmospheric CO2 due to sequestration by trees and reduced emissions from power plants due to reductions in energy use. This is measured pounds and has been translated to tons for this report. The model accounts for CO2 released as trees die and decompose and CO2 released during the care and maintenance of trees.
- **Carbon Stored:** Tallies all of the carbon dioxide (CO2) stored in the urban forest over the life of its trees as a result of sequestration. Carbon stored is measured in pounds.
- **Air Quality:** Quantifies the air pollutants (ozone [O3], nitrogen dioxide [NO2], sulfur dioxide [SO2], particulate matter less than 10 micrometers in diameter [PM10]) deposited on tree surfaces, and reduced emissions from power plants (NO2, PM10, volatile organic compounds [VOCs], SO2) due to reduced electricity use in pounds. The potential negative effects of trees on air quality due to biogenic volatile organic compounds (BVOC) emissions is also reported.
- **Stormwater:** Presents monetary savings due to reductions in annual stormwater runoff due to rainfall interception by tree canopy, as well as the reduction in annual stormwater runoff due to rainfall interception by tree canopy.

The data collected from the sample inventory of trees completed in March 2024 were analyzed in TreePlotter for an understanding of the value and benefits of Kirkland's urban forest. Benefits in the tables below represent annual benefits for each category.

ANNUAL BENEFITS	TOTAL ($)	QUANTITY
Carbon	$62,386.26	5,286,207.00 lbs sequestered
Air Quality	$86,111.52	40,172.00 pounds of pollutants removed
Stormwater	$218,214.20	823,220.10 (ft^3) runoff avoided 1,451,588.50 ft^3 intercepted
TOTAL ANNUAL BENEFITS	**$368,470.47**	

The data was also analyzed to estimate the value of the lifetime carbon stored in the trees in the inventory at their current size.

LIFETIME BENEFITS	TOTAL ($)	QUANTITY
Carbon	$2,356,606.20	54,167,788.00 lbs C stored 198,619,540.00 lbs CO_2 stored
TOTAL LIFETIME BENEFITS	**$2,356,606.20**	

Hydrological benefits for Kirkland's public trees were estimated using i-Tree eco research.

HYDROLOGICAL BENEFITS (ANNUALLY)	GALLONS	VALUE (USD)
Evaporation	3,272,3856	N/A
Transpiration	4,172,766	N/A
Potential Evaporation and Evapotranspiration	3,272,386 12,251,953	N/A N/A
TOTAL LIFETIME BENEFITS	**36,896,622**	**N/A**

Based on a population average of benefits, potential carbon storage, potential avoided runoff and potential interception were calculated by multiplying the average per tree benefits by the 151 potential planting sites inventoried.

POTENTIAL BENEFITS (ANNUAL)	TOTAL ($)	QUANTITY
Stormwater	$674.55	2,544.35 (ft^3) potential runoff avoided 4,487.72 ft^3 potential interception
CARBON STORAGE	**$192.85**	**16,340.84 potential lbs**

Public Tree Replacement Value

The current replacement value of Kirkland's street and park tree resource is nearly $60 million. The replacement value accounts for the historical investment in trees over their lifetime. This value is also a way of describing the value of a tree population (and/or average value per tree) at a given time. The replacement value reflects current population numbers, stature, placement, and condition. There are several methods available for obtaining a fair and reasonable perception of a tree's value (Council of Tree and Landscape Appraisers, 2018; Watson, 2002). The trunk formula method used in this i-Tree Eco analysis assumes the value of a tree is equal to the cost of replacing the tree in its current state (Cullen, 2002).

Of the overall replacement value, 20% is attributable to Douglas fir (*Pseudotsuga menziesii*), 12% to Western red cedar (*Thuja plicata*), and 10% to bigleaf maple (*Acer macrophyllum*) which total over $25 million of the $60 million total for the tree population. The average per tree replacement value is $1,224. To replace all 48,848 street and park trees in Kirkland with trees of equivalent size and condition would cost nearly $60 million.

The replacement value for Kirkland's public tree resource reflects the vital importance of these assets to the community. With proper care and maintenance, the value will continue to increase over time. It is important to recognize that replacement values are separate and distinct from the value of annual benefits produced by the street and park tree resource and in some instances the replacement value of a tree may be greater than or less than the benefits that that tree may provide.

SUMMARY OF MAINTENANCE NEEDS

Tree characteristics and environmental factors affect the management needs for urban trees. An analysis of the condition and maintenance requirements assists managers in planning Kirkland's urban forest.

Tree condition indicates how well trees are managed and how well they perform, given site-specific conditions. Tree maintenance needs are assigned for public safety reasons and for the health and longevity of the trees themselves. Understanding the maintenance needs of an urban forest assists tree managers in establishing daily work plans and maintaining public safety.

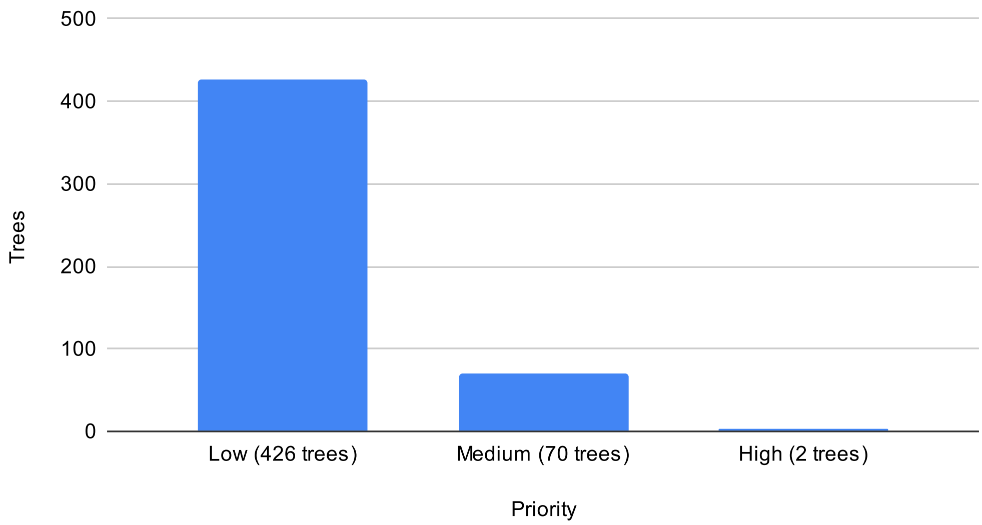
Recommended Maintenance

The arborists assigned a predetermined maintenance need for each tree. Overall tree condition and severity of potential defects present were used to guide the maintenance recommendations and prioritizations.

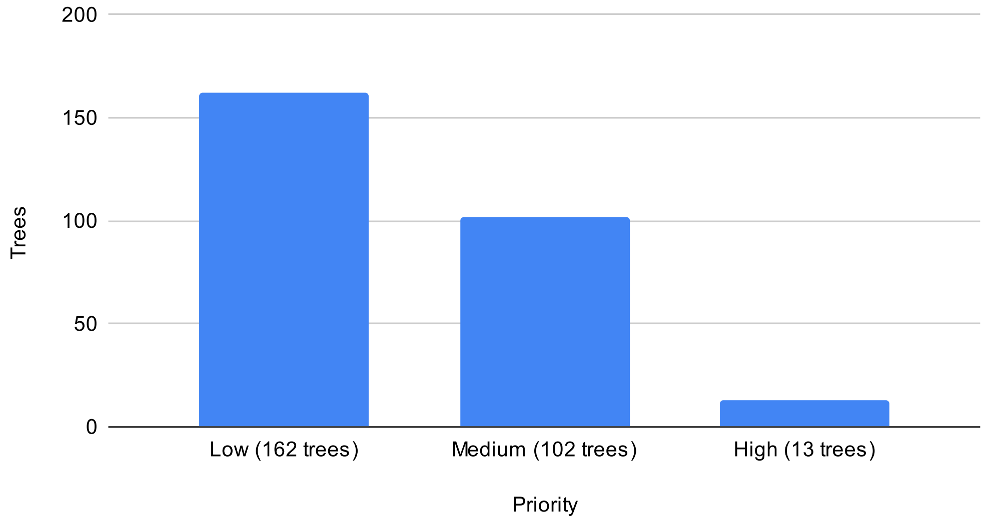
REMOVALS

Properly maintained and healthy trees are key to the success of Kirkland's urban forest. It is recommended that the city utilize the TreePlotter software and the assigned Maintenance Needs to remove the trees marked for a High Priority Removal. Overall, 977 trees were marked for removal. 682 of these trees were noted as a low priority, 263 were noted as a medium priority, and 52 of these trees were marked as high priority removal. The removals and priorities are broken down into DBH classes in the charts below.

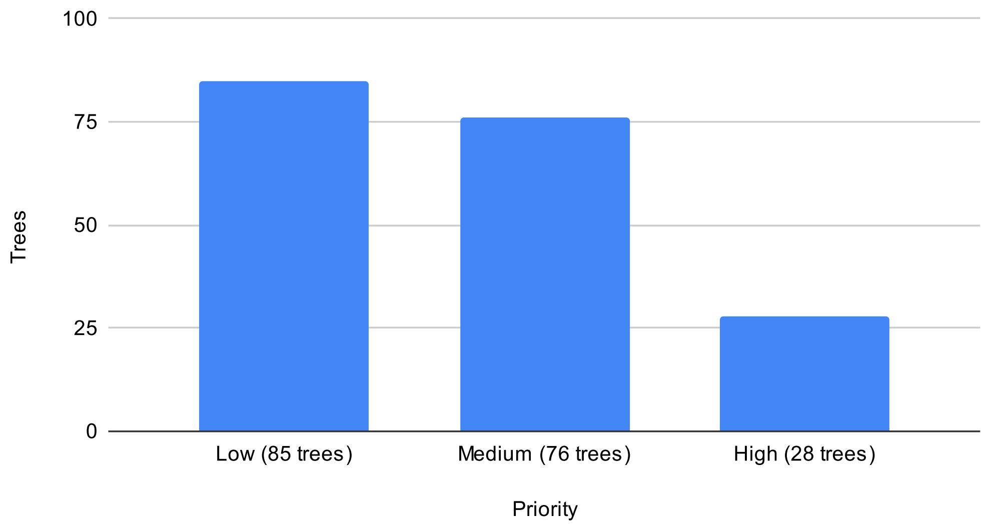
0-6 Inch DBH Class Removals by Priority (498 Trees)



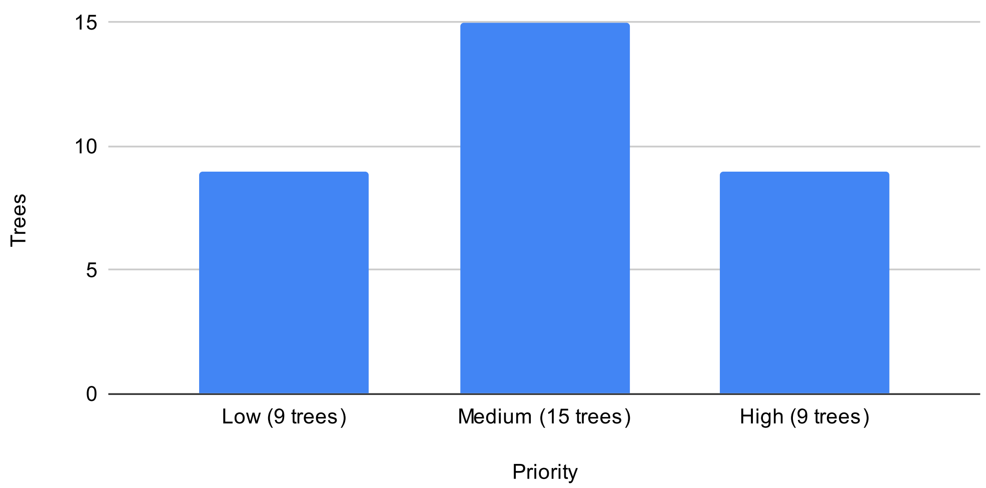
7-12 Inch DBH Class Removals by Priority (498 Trees)



13-25 Inch DBH Class Removals by Priority (189 Trees)



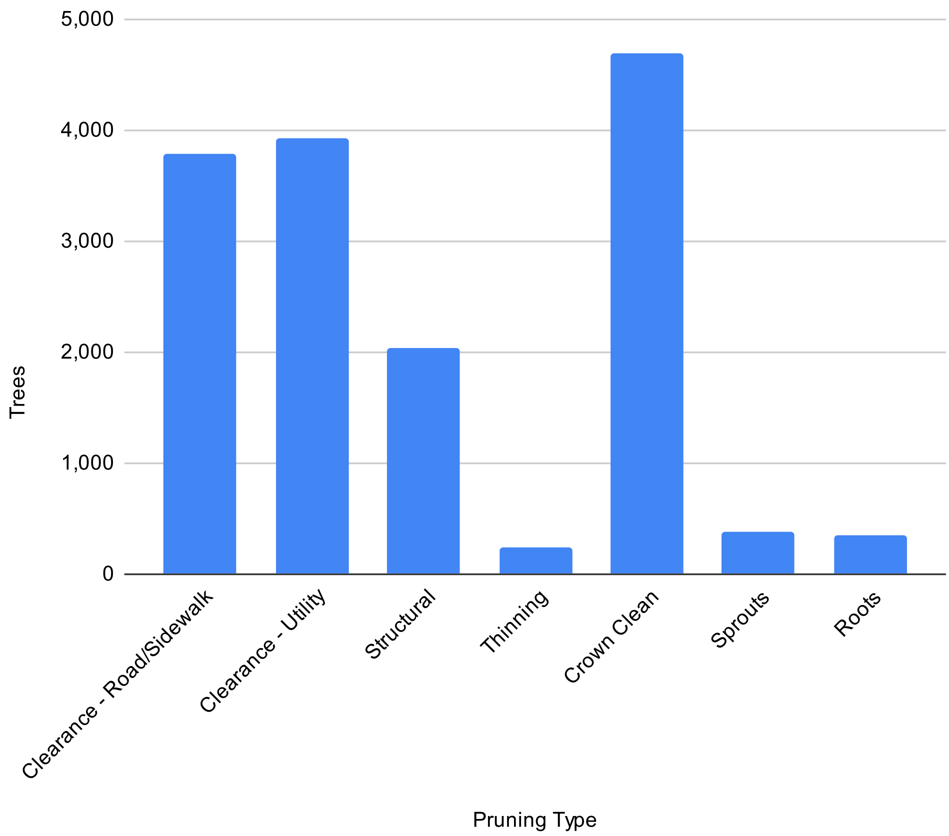
Greater than 26 Inch DBH Class Removals by Priority (33 Trees)



PRUNING

This table provides a summary of the maintenance and pruning recommendations for Kirkland's trees. 11,614 inventoried trees were assigned a pruning maintenance task. 2,033, or 13% of trees, were recommended for a Structural Prune. This suggests that these trees require routine pruning to correct structural problems or growth patterns, which would eventually obstruct traffic, become unsafe, or interfere with nearby infrastructure. Crown cleaning involves pruning to remove dead, dying, diseased, and broken branches from the tree crown. 30% (4,687) of the trees were recommended for Crown Cleaning. 50% (7,716 trees), were recommended for a Clearance Prune, which means these trees need pruned to remove branches to provide clearance from structures, vehicles, utilities, and other objects. 230 trees were marked for a thinning, which is pruning live branches to reduce crown density. Just under 5% of recommended pruning was Sprouts (2.4%) and Root (2.3%) pruning.

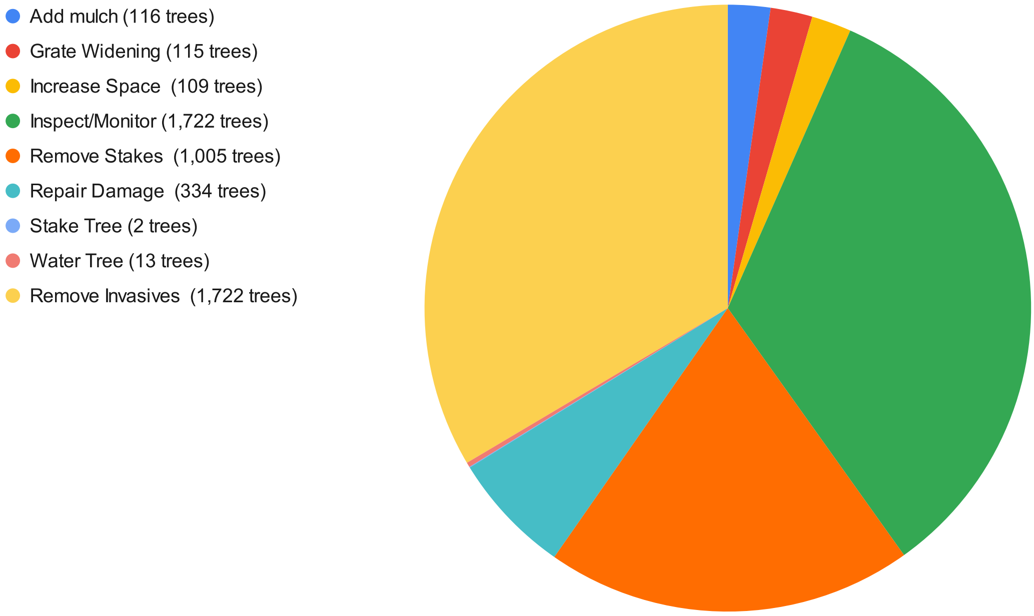
Pruning Type



ADDITIONAL MAINTENANCE

In an effort to enhance the health and vitality of the street tree population, several additional maintenance treatments have been prescribed. 3,416 trees have been suggested as needing an additional maintenance need, which are broken down in the graph below. 116 trees have been prescribed Add Mulch. The implementation of mulch serves to conserve moisture, regulate soil temperature, and suppress weed growth, thereby fostering optimal conditions for tree growth. Grate widening initiatives aim to provide trees with more space for root expansion, facilitating nutrient uptake and stability. 115 trees have been prescribed Grate Widening. 109 trees have been prescribed Increase Space. Increasing space around trees allows for improved air circulation and reduces competition for resources. Regular inspection and monitoring protocols ensure early detection of issues such as disease, pests, or structural instability, enabling prompt intervention. Most of the trees with a recommended additional maintenance were marked as Inspect/Monitor(1,722 trees), or Remove Invasives (1,722 trees) Removal of stakes is advised once trees have matured sufficiently to support themselves, promoting natural trunk development and minimizing potential damage. 1,005 trees have been noted to have the stakes removed. Repairing any existing damage promptly helps prevent further deterioration and promotes tree longevity. Damage that can be repaired was noted on 334 trees. When necessary, staking trees provide crucial support during their establishment phase, safeguarding against wind damage and ensuring upright growth, however, only 2 trees were recommended for this category of additional maintenance. Only 13 trees were recommended to be watered.

Additional Maintenance Needs



MAINTENANCE PRIORITY

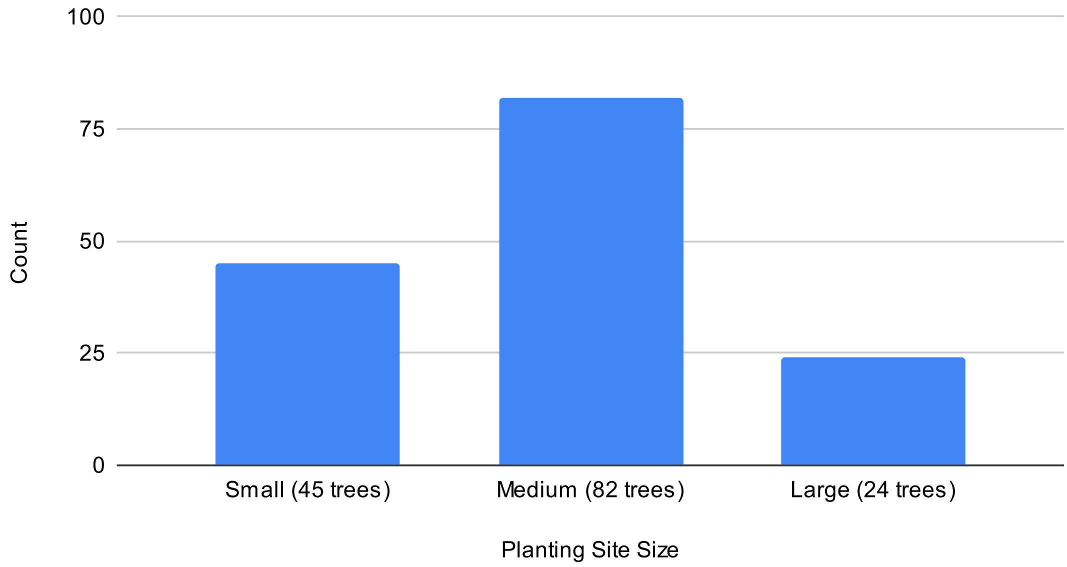
All 48,848 trees inventoried were assigned a maintenance priority. Prioritizing maintenance tasks based on their level of importance is crucial for ensuring the effective management of resources and the sustained health of urban trees. High-priority maintenance activities demand immediate attention due to their significant impact on the overall well-being of the street tree population and surrounding environment. Under 1%, or 95 trees were prescribed a high maintenance priority, and just under 3%, or 1,356 trees were assigned a medium maintenance priority. The majority of trees (97%) were assigned a low maintenance priority.

MAINTENANCE PRIORITY	COUNT	PERCENT
High	95	0.20%
Medium	1,356	2.80%
Low	47,397	97%

TREE PLANTING

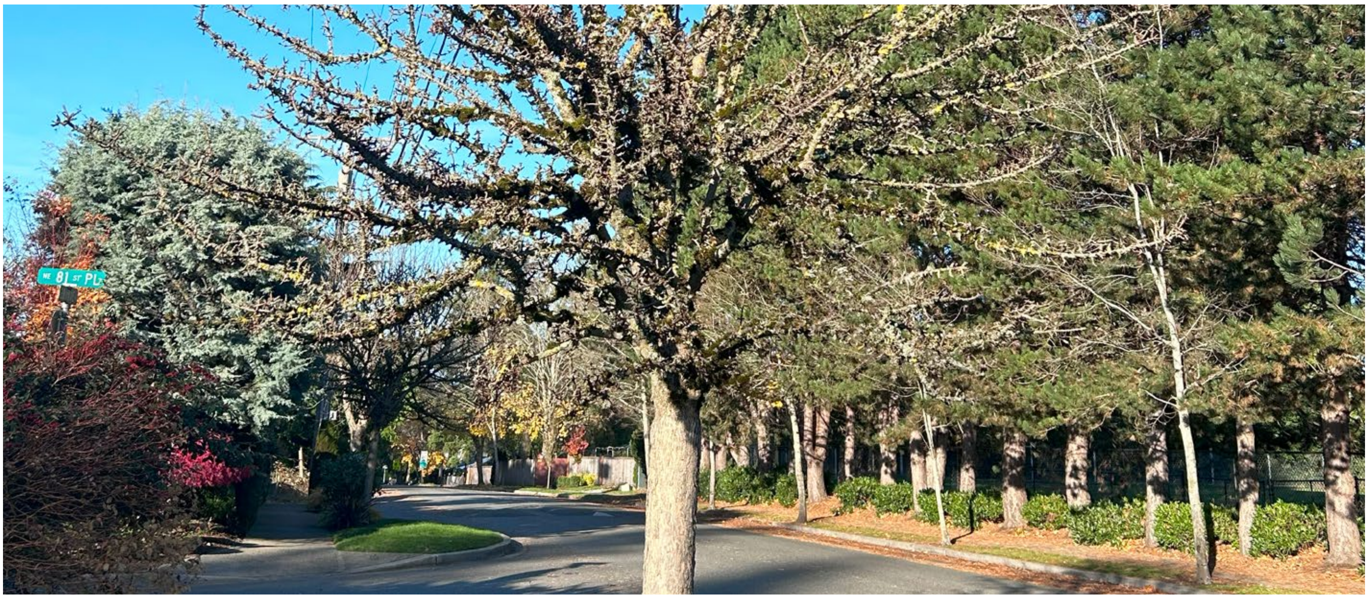
During the tree inventory the arborists also documented Potential Planting Sites, identifying a total of 151 locations. These sites were categorized by size (Small, Medium, or Large), based on their available growing space. The parameters used to determine these sites were that they had to be a located more than 3 feet from a road, 5 feet from underground utility lines, 20 feet from street lights or other existing trees, 30 feet from street intersections or 50 feet if there was a stop sign, and a minimum of 4.5 feet wide. By documenting these potential planting sites, the city can utilize this data to prioritize future planting efforts. Planting trees in these sites can help to improve air and water quality, reduce the effects of urban heat islands, provide habitat for wildlife, and enhance the aesthetic and property values of the surrounding area. Additionally, planting trees can improve mental and physical health, and increase community engagement through opportunities for outdoor recreation and education.

Proposed Planting Sites



RECOMMENDATIONS

- The city's trees are a defining and valued characteristic of Kirkland, making it a desirable place to live, work and play. It is a resource that has a history and legacy of care and management; however, certain trees require immediate removal or maintenance.
- The city should prioritize the implementation of a regular monitoring and maintenance schedule for all trees and proactively plant new trees, especially after removal, to enhance the natural beauty of the city and maximize the benefits provided by trees. While this effort will require additional resources and work, it is crucial for ensuring that Kirkland's trees remain appreciated and valued by both residents and visitors. By maintaining and planting trees, the city can promote a healthy environment, improve air and water quality, reduce energy consumption, and provide recreational opportunities for the community. Ultimately, a well-maintained urban forest can contribute to the well-being and quality of life for all who call Kirkland home.
- Utilize inventory data and analysis to develop an Urban Forest Management Plan.
- Monitor trees in less than Fair condition (2,797 trees)
- Conduct Structural Pruning on trees to promote a healthy structure (2,033 trees)
- Maintain or establish a cyclical, routine tree monitoring and maintenance schedule
- Consider pruning the 3,789 trees with clearance conflicts to bike paths, buildings, vehicles, signs/signals, utilities and sidewalks to enhance safe walking and biking facilities.
- Remove trees that are prescribed for Removal and plant trees after removal
- Remove the adventitious sprouts on 373 trees where practical
- Consider removing the stakes from the 1,005 trees.
- Plant trees in the Proposed Planting Sites
- Remove the 43 trees marked for high priority removals
- Ensure industry standards and best management practices are followed during the planting and care of trees
- Educate the community about the tree inventory population, the associated benefits, and the tree management program
- Continue to track maintenance, plantings, and removals in the TreePlotter application



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TREE INVENTORY SUMMARY

KIRKLAND, WA

APRIL 2024

King Conservation District

PlanIT Geo™
developers of TreePlotter