

Village of Shorewood Hills, WI

Community Forestry Management Plan 2024-2029



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Land Acknowledgement

The Village of Shorewood Hills was established on sacred ancestral land of the Ho-Chunk People, a place their nation has called *Teejop* (day-JOPE) since time immemorial. In an 1832 treaty, the Ho-Chunk were forced to cede this territory. Decades of ethnic cleansing followed when both the federal and state government repeatedly, but unsuccessfully, sought to forcibly remove the Ho-Chunk from Wisconsin.

The Village of Shorewood Hills acknowledges the circumstances that led to the forced removal of the Ho-Chunk People and honors their legacy of resistance and resilience. This history of colonization informs our work and vision for a collaborative future. With great respect, the community of Shorewood Hills acknowledges and celebrates the inherent sovereignty of the Ho-Chunk Nation and the eleven Indigenous First Nations within what is now referred to as the State of Wisconsin.

Executive Summary

Shorewood Hills is an incorporated village located on the southwestern shore of Lake Mendota surrounded by the City of Madison. Established in 1927, this community has historically placed a high value on trees, with commitment from Village staff and officials to maintain a robust tree canopy and to enhance the ecological vitality of the community's public trees.

This 2024 document is an updated version of the 2007 and 2012 Community Forestry Management Plans. The 2007 5-year management plan created a GIS database of street trees and made specific recommendations to improve the urban forestry program. In 2012, the Village updated its street tree inventory and completed its first inventory of the community's park trees. In 2023, certified arborists and mapping specialists completed a new comprehensive inventory, including evaluation of the condition of all street and park trees. Additionally, data from 2022 Light Detection and Ranging (LiDAR) maps of this region were used to conduct a canopy change analysis, indicating areas in which the canopy has increased or diminished over the last ~10 years.

This plan is broken up into three sections. The first section, **Environmental Analysis** (pages...), focuses on the environmental and social benefits of Shorewood Hill's urban forest canopy. The second section, **Street and Park Tree Inventory and Analysis** (pages...), details the analysis of the tree inventory data. The third section, **Management Goals and Implementation** (page...), provides detailed recommendations.

The updated Shorewood Hills tree inventory data was analyzed using i-Tree Eco, a specialized forestry modeling software, to help Village officials and residents understand how the Village's public trees affect carbon sequestration, stormwater interception, air pollutant removal, and energy use reductions. Findings are presented for all public trees as well as separately for street trees and park trees.

Finally, this plan presents a range of urban forest management considerations based on the diversity and condition of trees found in the field, including individual tree maintenance, larger scale ecological restoration efforts, and parks and forest budget.

Summary of Tree Inventory and Benefits

- The Village of Shorewood Hills has one of the highest canopy cover percentages of all Wisconsin municipalities (43% or 221 acres of canopy).
- 6,635 trees have been inventoried on Shorewood Hills public property. 1904 are street trees and 4,731 are found in parks and other Village green spaces.
- Public trees in Shorewood Hills sequester nearly 2316 tons of carbon with a value of \$394,960.

- Trees in Shorewood Hills intercept 741,820 gallons of stormwater per year resulting in an annual benefit valued at \$6,620
- 3,040 pounds of air pollutants are removed annually by trees included in this inventory for a total value of \$13,297 each year.
- The Village of Shorewood Hills is home to 111 unique tree species.
- The most common species observed were hackberry (11.5%), northern white cedar (7.1%) and Norway maple (6.0%).
- The age distribution of the tree population tends toward over-mature with an under representation of young trees. According to the Center of Urban Forestry Research an ideal age distribution for a municipality is 40% young, 30% maturing, 20% mature, 10% over mature. The Village trees are 24.7% young, 29% maturing, 25.8% mature, and 20.5% over-mature.
- The public canopy of Shorewood Hills was found to be in exceptional condition, with 3,933 trees (88%) in good health.
- The total replacement value of the public trees inventoried was \$5,538,000

Environmental and Social Benefits of Urban Trees

An advanced computer modeling program called i-Tree Eco developed by the USDA Forest Service and the Davey Tree Company measures and quantifies the ecosystem services that trees provide. The program uses the best available localized temporal, climatic, and environmental datasets to estimate the value of these services. i-Tree is considered the premier tool to evaluate tree ecosystem services, with users all around the world.

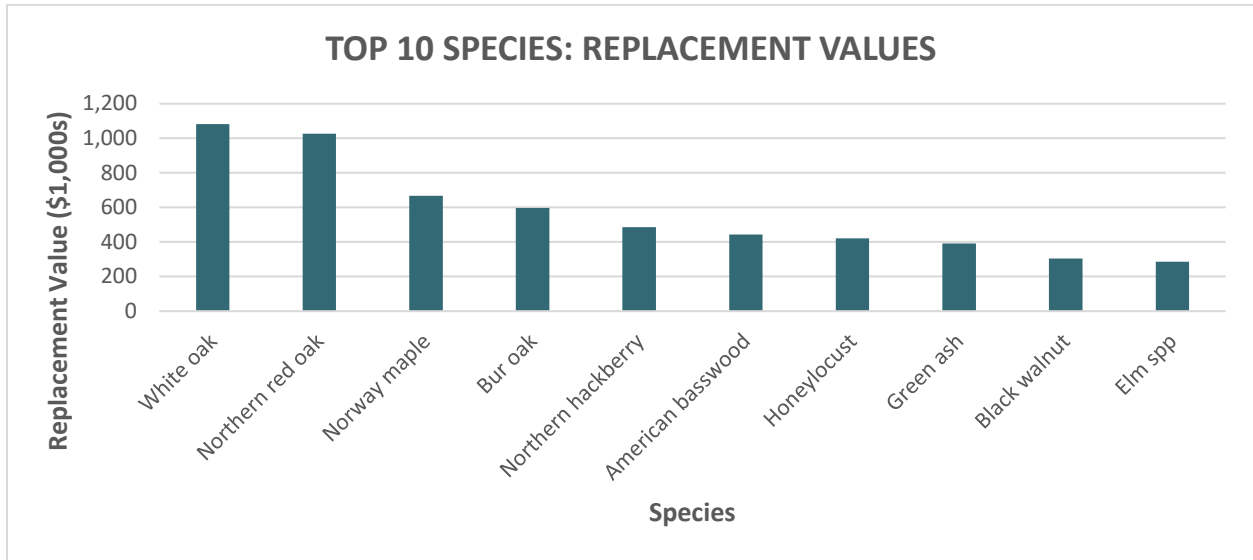
Summary of Tree Inventory Analysis and Economic Benefits

Because of the essential services trees provide, the health of the Village's tree canopy and overall community health are mutually dependent. Continued investment in and management of healthy public trees is essential for maintaining and growing their value. The Village's trees contribute the following benefits to the community:

- Pollution removal valued at \$13,297/year
- Cumulative (to date) carbon storage valued at \$394,963
- Carbon sequestration valued at \$6,768/year
- Avoided runoff valued at \$6,629/year
- Oxygen production: 116.42 tons/year
- Total tree replacement value: \$5,538,000

i-Tree Eco analysis calculated the replacement value of public trees in the Village of Shorewood Hills at \$5,538,000. The replacement value for each tree is an estimate of the cost of replacement with a similar tree. The replacement value of this urban forest will increase with a rise in the number and size of healthy trees (Nowak et al, 2002a). Benefits such as cooling, habitat, and stormwater mitigation also tend to increase with the number of healthy trees in a community.

Figure 1. Replacement Values of Shorewood Hills trees by species



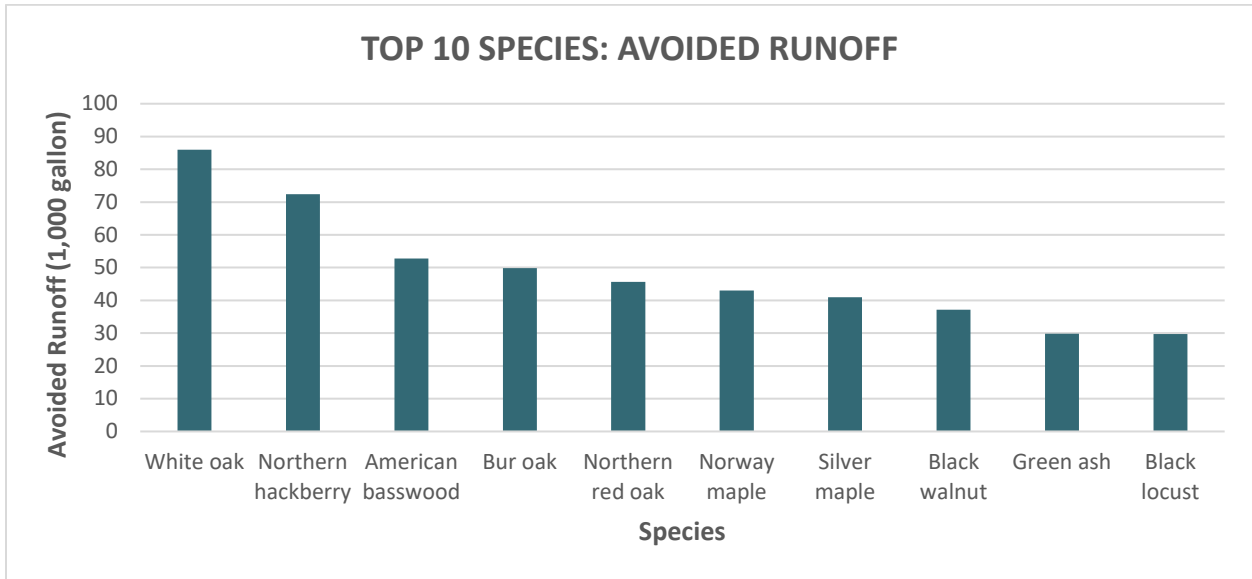
Stormwater Mitigation

Surface runoff contributes pollution to our streams, lakes, and oceans. In urban areas, the harmful effects are amplified by extensive impervious surfaces which decrease soil infiltration and increase runoff quantities. Trees mitigate stormwater flow by intercepting and storing rainwater in leaves, branches, and bark. Trees and roots also facilitate soil waste and reduce nutrient-rich sediment erosion by dampening the impact of falling raindrops (Hirabayashi 2012).

In 2020, when the annual precipitation was 40.3 inches, Shorewood Hills trees reduced runoff by an estimated 741,820 gallons a year with an associated value of \$6,629.¹

¹ All estimated values derived from a 2024 I-Tree Eco analysis of all public trees.

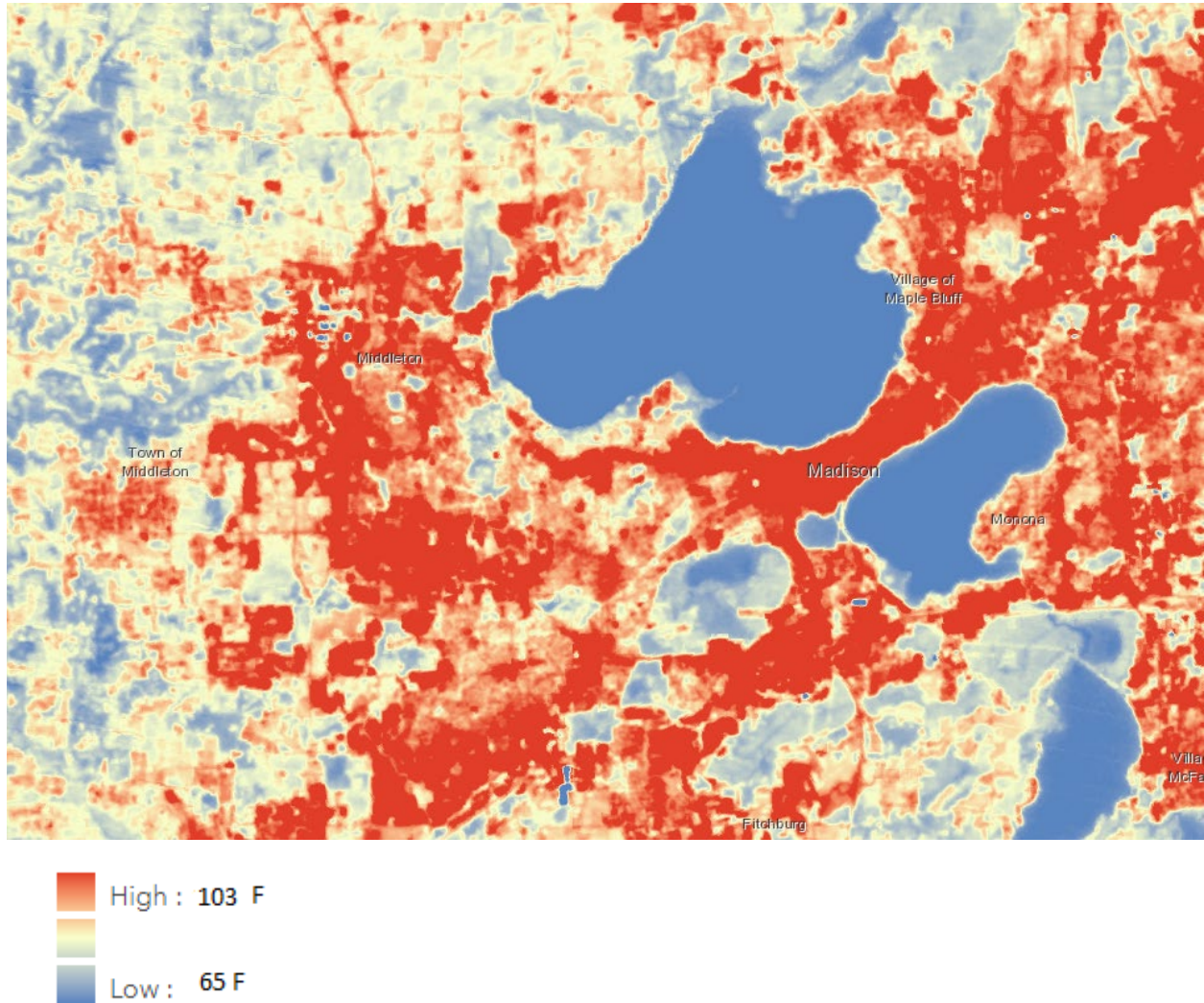
Figure 2. Annual runoff avoided by Shorewood Hills trees by species



Urban Heat Island Cooling

Urban areas are often five to nine degrees warmer than less densely developed rural areas. Exposed asphalt, concrete, and brick absorb sunlight and radiate heat back into the environment, creating what's known as the urban heat island effect. Trees mitigate this by shading surfaces and cooling the air through transpiration. Figure 3 illustrates how areas of low canopy and high development exhibit greater thermal emissions. This data source (Landsat 8) will be used to target areas of high thermal emission for tree plantings.

Figure 3. A remotely sensed Thermal infrared land surface temperature (summertime) map illustrates the urban heat island effect. Areas of high land surface temperature are displayed in yellow and red, while vegetated areas appear blue.



Carbon Sequestration & Storage

Carbon-fueled changes in our weather patterns are an issue of global concern. Trees store carbon in their roots, trunks, branches, and leaves. Carbon sequestration by urban trees can significantly offset the burning of fossil fuels (Abdollahi 2000, Nowak et al 2002).

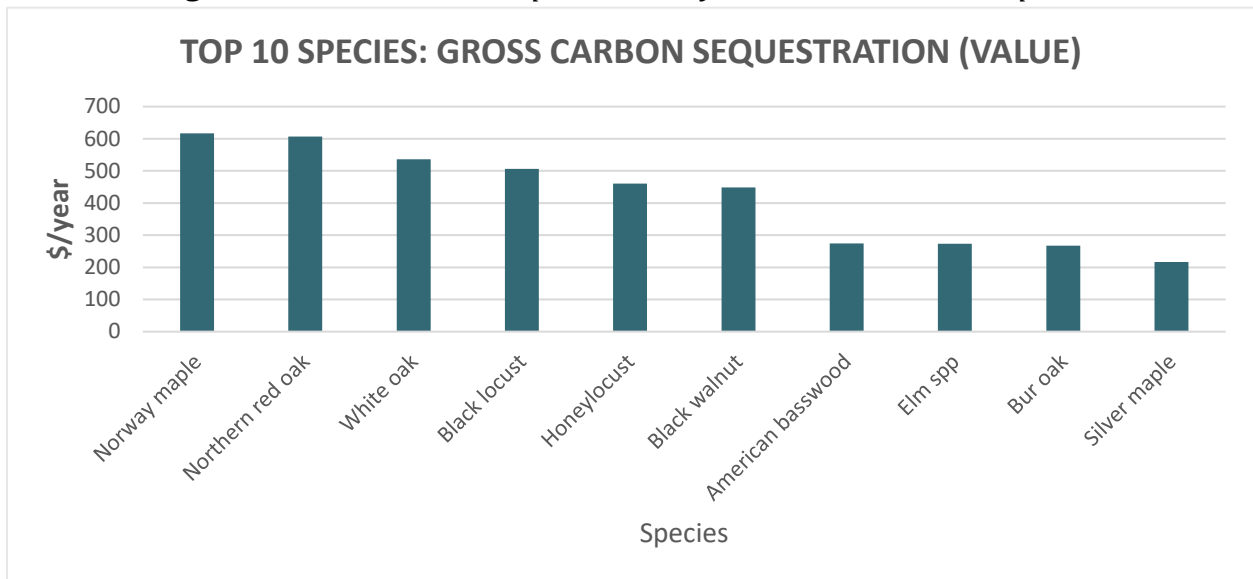
How much carbon can a tree sequester? An average car driven 12,000 miles generates 11,000 pounds of carbon dioxide. A large oak tree can sequester over 900 lbs. of carbon

annually and 38,000 lbs. over its lifetime. In other words, a large oak tree can sequester the carbon emitted by driving an average car approximately 36,000 mi.

Carbon sequestration is a measure of how much carbon a tree regularly removes from the atmosphere, while carbon storage refers to the amount of carbon a tree has converted into biomass (wood, leaves, and roots) over its lifetime. If a tree is burned or decomposes, the majority of its stored carbon is released back into the atmosphere.

The amount of carbon sequestered annually varies by tree species, size, and health. The gross sequestration of all Shorewood Hills trees is 39.68 tons of carbon/year with an associated value of \$6,768. Public trees in Shorewood Hills store a total of 2,316 tons of carbon with an associated value of \$394,963.

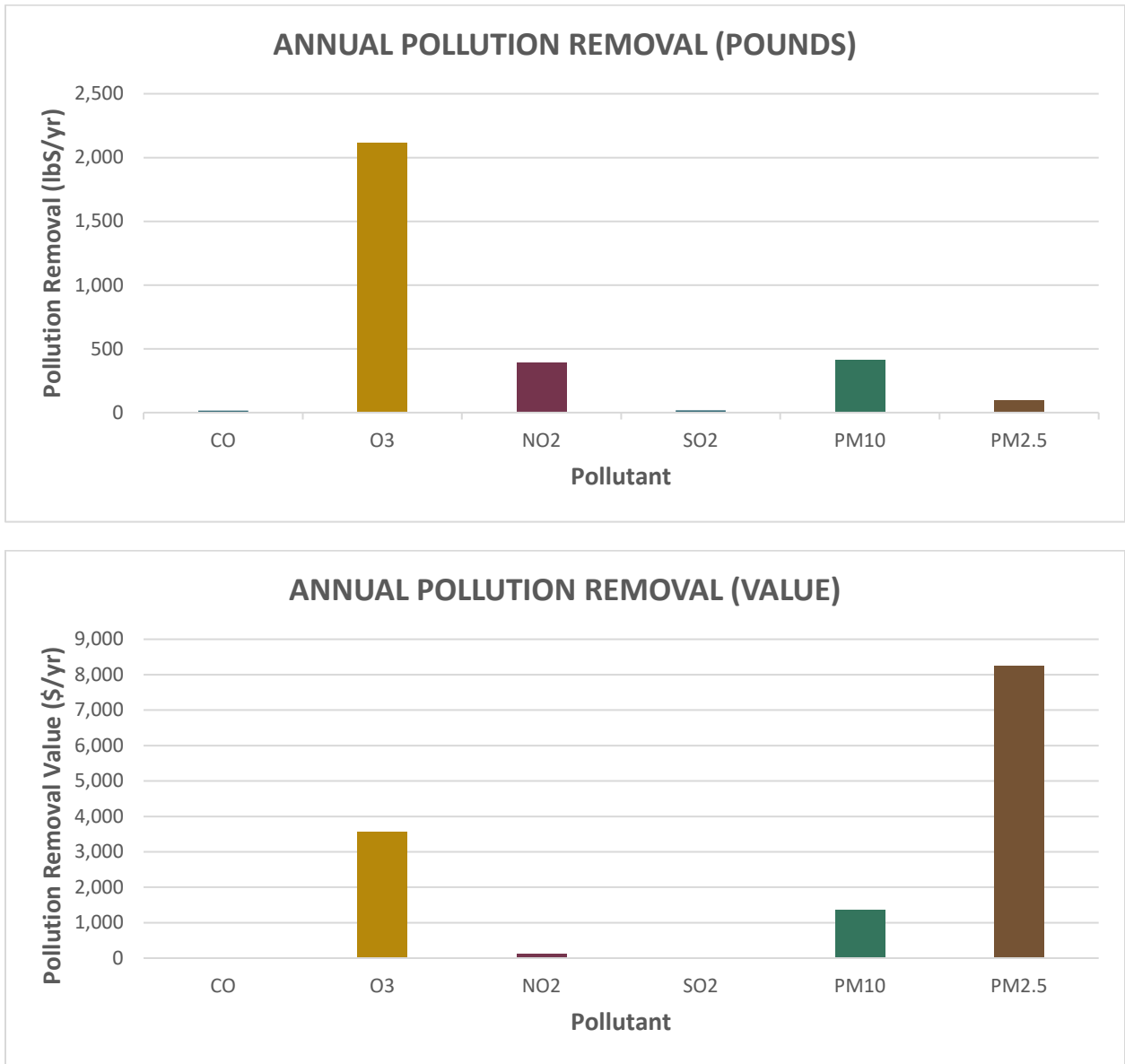
Figure 4. Annual carbon sequestration by Shorewood Hills tree species



Air Purification

Each year, the Village's trees remove an estimated 3,040 lbs. of pollution from the air, including ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter smaller than 2.5 microns. The associated value is \$13,297.

Figure 5. Annual pollution removed by Shorewood Hills trees



Energy Conservation

Trees lower greenhouse gas emissions by reducing the amount of energy needed to heat or cool buildings. In the summer, a tree’s shade can lower air conditioning bills; likewise, winter heating bills can be lessened in cold climates by trees that slow cold winds. The same oak tree that sequesters over 900 lbs. of carbon annually can also prevent the production of 600 lbs. of carbon dioxide annually by reducing heating and cooling needs. It is estimated that if every household in the country had three trees on

its property, it would generate nationwide energy savings worth \$2 billion (McPherson and Simpson, 1999).

Biodiversity

By creating habitat for birds, mammals, and insects, trees increase biodiversity in urban areas. Planting a diverse mix of trees and vegetation is particularly important for increasing wildlife biodiversity. Natural forested patches often have greater species diversity due to seed drift from urban areas.

Human Health

Urban trees benefit both mental and physical human health. By reducing air pollutants, urban trees have the potential to decrease asthma rates, an ailment especially prevalent in urban youth. Ties between decreasing access to nature and increasing obesity among adults and children. Shade provided by trees in parks, playgrounds, and backyards also has the ability to reduce exposure to ultraviolet radiation, a known contributor to the development of skin cancer.

Psychologically, the presence of trees provides a sense of relaxation. Studies have shown that surgery patients recovered more quickly when given a view of a “natural scene” from their hospital room. Similarly, trees help people recover from the mental stress experienced in daily life, improving the effectiveness with which they conduct their daily activities (Saraev et al 2021).

Community Character

Trees lend aesthetic appeal to streets, neighborhoods, shopping districts, and parks. The presence of trees and participation in tree planting programs fosters a sense of community, a positive community image, and an appreciation for natural resources (Nowak et al. 2014).

Property Values

Multiple studies have shown that the presence of trees along streets and on private properties increases home value and property rental rates, decreases the time it takes to sell a home, and increases the prices shoppers are willing to pay at retail stores (Kovacs et al. 2022).

Street and Park Trees Inventory and Analysis

Street and Park Tree Inventory Summary

A complete inventory of the trees in the Village of Shorewood Hill’s public street terraces and parks was conducted from June to early October of 2023. The primary measurements recorded for each tree were species, diameter at breast height (DBH), tree health (good, fair, poor, or dead), and geographical location.

In total 6,635 trees were measured and inventoried.

Street & Park Tree Species Composition

- The Village of Shorewood Hills is home to 111 unique tree species representing 66 genera.
- The most common species observed were hackberry (11.5%), northern white cedar (7.1%) and Norway maple (6.0%).
- The most common genera observed were hackberry (11.5%), maple (10.8%), and oak (8.8%).

Table 1. Percent canopy and count of trees by species

Species	Count	Percent	Species	Count	Percent
Hackberry	760	11.5 %	Tulip tree	15	0.2%
Northern white cedar	472	7.1%	River birch	14	0.2%
Norway maple	401	6.0%	Slippery elm	13	0.2%
American basswood	317	4.8%	Amur chokecherry	12	0.2%
Elm spp	317	4.8%	Chinkapin oak	12	0.2%
Alternate leaf dogwood	305	4.6%	Eastern hophornbeam	12	0.2%
Common chokecherry	269	4.1%	Plum spp	11	0.2%
Staghorn sumac	242	3.7%	Quaking aspen	11	0.2%
European buckthorn	230	3.5%	White mulberry	10	0.2%
Black cherry	222	3.4%	Magnolia spp	9	0.1%
White oak	190	2.9%	White fir	9	0.1%
Apple spp	176	2.7%	Bigtooth aspen	8	0.1%
Black locust	173	2.6%	Katsura tree	8	0.1%
Bur oak	150	2.3%	Cornelian cherry	7	0.1%
Black walnut	143	2.2%	Horse chestnut	7	0.1%
Northern red oak	141	2.1%	Oak spp	7	0.1%
Green ash	133	2.0%	Amur corktree	6	0.09%
Honeylocust	125	1.9%	Sweetgum	6	0.09%
Boxelder	108	1.6%	Cockspur hawthorn	5	0.08%
Eastern red cedar	106	1.6%	American sycamore	4	0.06%

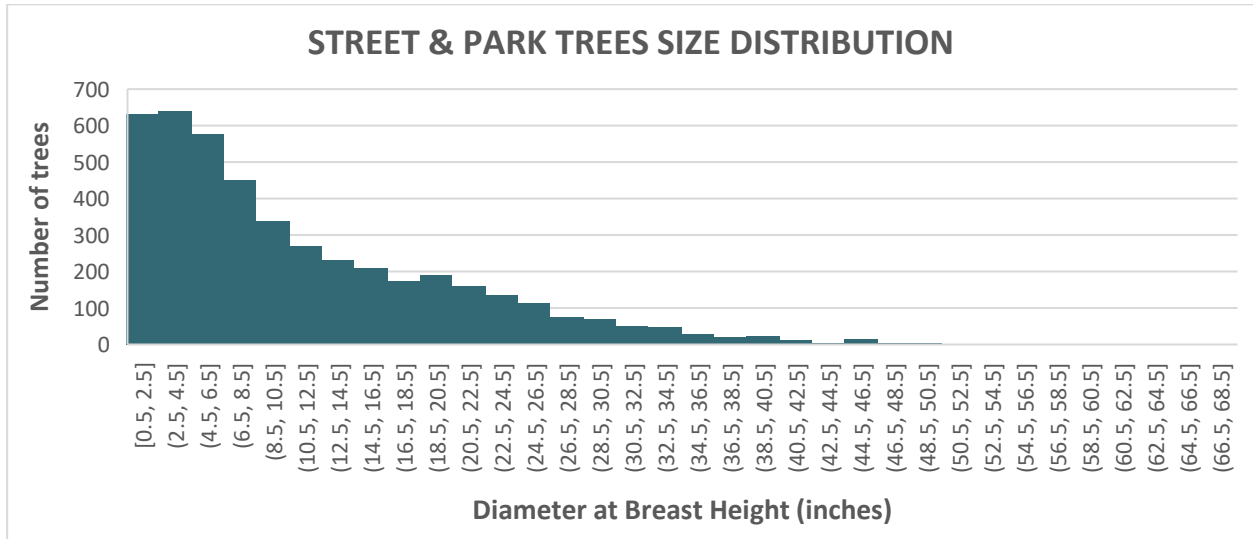
Species	Count	Percent	Species	Count	Percent
Eastern redbud	103	1.6%	Balsam fir	4	0.06%
Shagbark hickory	87	1.3%	European white birch	4	0.06%
Northern catalpa	84	1.3%	Miyabe's Maple	4	0.06%
Eastern hemlock	80	1.2%	Yellow birch	4	0.06%
Eastern service berry	73	1.1%	American beech	3	0.05%
Freeman maple	59	0.9%	American hazelnut	3	0.05%
Sugar maple	58	0.9%	American yellowwood	3	0.05%
Silver maple	55	0.8%	Austrian pine	3	0.05%
Bell's honeysuckle	50	0.8%	Japanese maple	3	0.05%
Swamp white oak	49	0.7%	Spruce spp	3	0.05%
Japanese tree lilac	41	0.6%	Washington hawthorn	3	0.05%
Common elderberry	39	0.6%	White willow	3	0.05%
Ginkgo	38	0.6%	American chestnut	2	0.03%
Callery pear	37	0.6%	American mountain ash	2	0.03%
Canada yew	37	0.6%	Bitternut hickory	2	0.03%
Eastern white pine	37	0.6%	Brewer's Weeping Spruce	2	0.03%
White spruce	37	0.6%	Dawn redwood	2	0.03%
Littleleaf linden	36	0.5%	Flowering dogwood	2	0.03%
Norway spruce	35	0.5%	Paper birch	2	0.03%
Ohio buckeye	35	0.5%	Peach	2	0.03%
Northern pin oak	32	0.5%	Silver linden	2	0.03%
Red pine	25	0.4%	Smoke tree	2	0.03%
Red maple	24	0.4%	Yellow buckeye	2	0.03%
American elm	23	0.4%	Alder spp	1	0.02%
American hornbeam	23	0.4%	American bladdernut	1	0.02%
Eastern cottonwood	23	0.4%	Common ninebark	1	0.02%
Blue spruce	20	0.3%	Common persimmon	1	0.02%
Tamarack	20	0.3%	Common plum	1	0.02%
Red mulberry	19	0.3%	Douglas fir	1	0.02%
Witch hazel	19	0.3%	English oak	1	0.02%
Baldcypress	17	0.3%	European alder	1	0.02%
White ash	17	0.3%	Jack pine	1	0.02%
Japanese flowering cherry	16	0.2%	Paperbark maple	1	0.02%
Kentucky Coffee tree	16	0.2%	Red horse chestnut	1	0.02%
London planetree	16	0.2%	White poplar	1	0.02%
Siberian elm	15	0.2%			

Street & Park Tree Size Distribution

Tree size, measured as diameter at breast height (DBH), indicates the relative age of a tree. A tree's expected lifespan varies by species; for instance, a crab apple is mature at 30 years while

a bur oak is mature at 300. Growth rates also vary by species, so that a 6" DBH crabapple would likely range between 7-10 years old, while a 6" DBH bur oak would likely be 10-15 years old. The mean DBH of all Shorewood Hills street and park trees is 11.28" with a standard deviation of 9.6".

Figure 6: Street and park tree size distribution (all species)

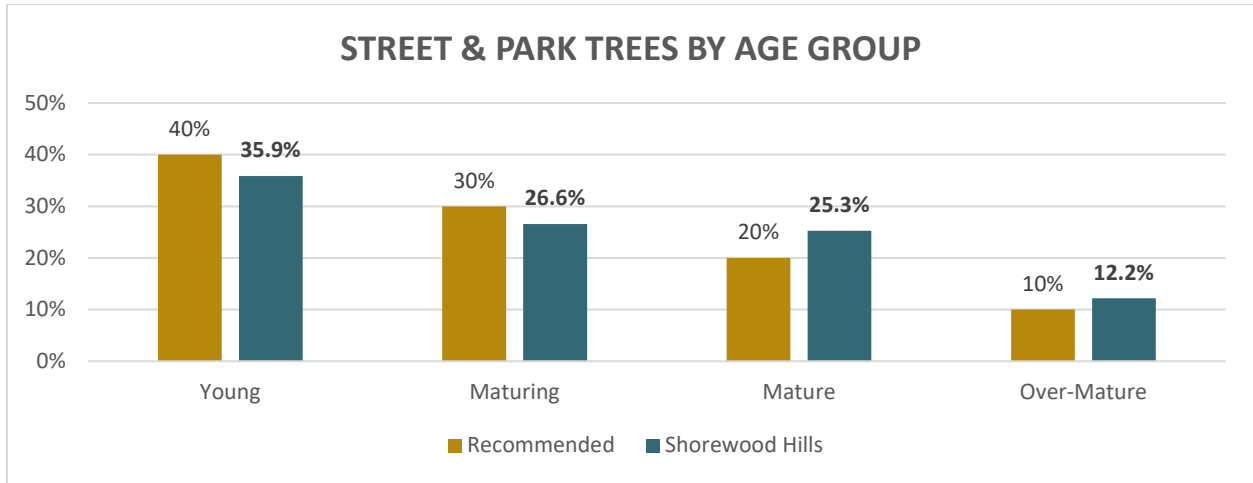


The Center for Urban Forest Research (CUFR) provides the following data ranges for classifying tree sizes according to relative age:

- *Young*: less than 6"
- *Maturing*: 6-12"
- *Mature*: 12-24"
- *Over-Mature*: greater than 24"

The CUFR further asserts that an ideal age distribution for a population of urban trees is 40% young, 30% maturing, 20% mature, and 10% over-mature. Compared to these standards, Shorewood Hills has fewer young and maturing trees and more mature and over-mature trees.

Figure 7: Street and park trees by age group



- Shorewood Hills has 6% less young trees (approx. 269 trees) and 3% less maturing trees (approx. 134 trees) than recommended.
- Shorewood Hills has 5% more mature trees (approx. 224 trees) and 2% more over-mature trees (approx. 155 trees) than recommended.

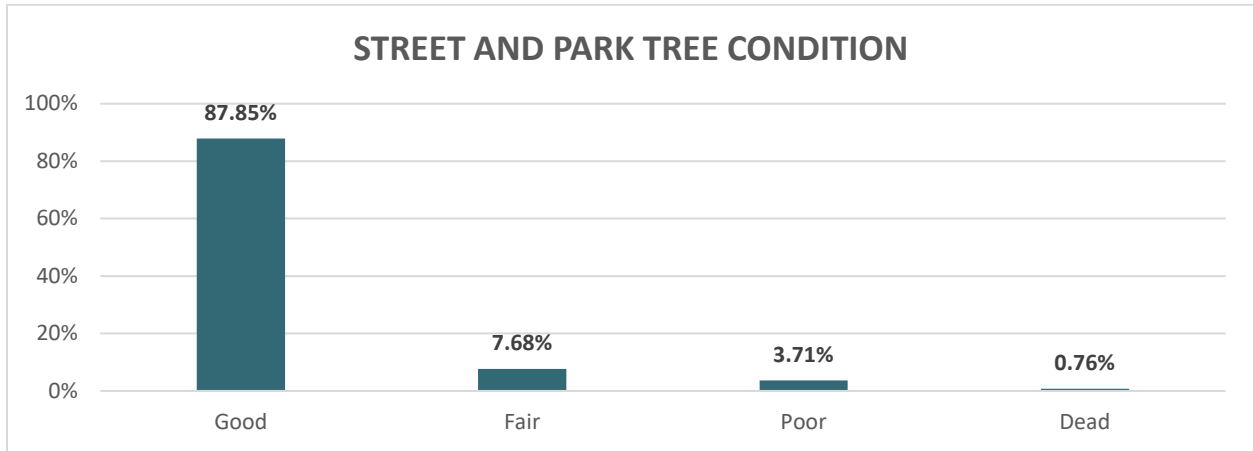
Street & Park Tree Condition

The health of each inventoried tree was assessed as good, fair, poor, or dead based on the following standards:

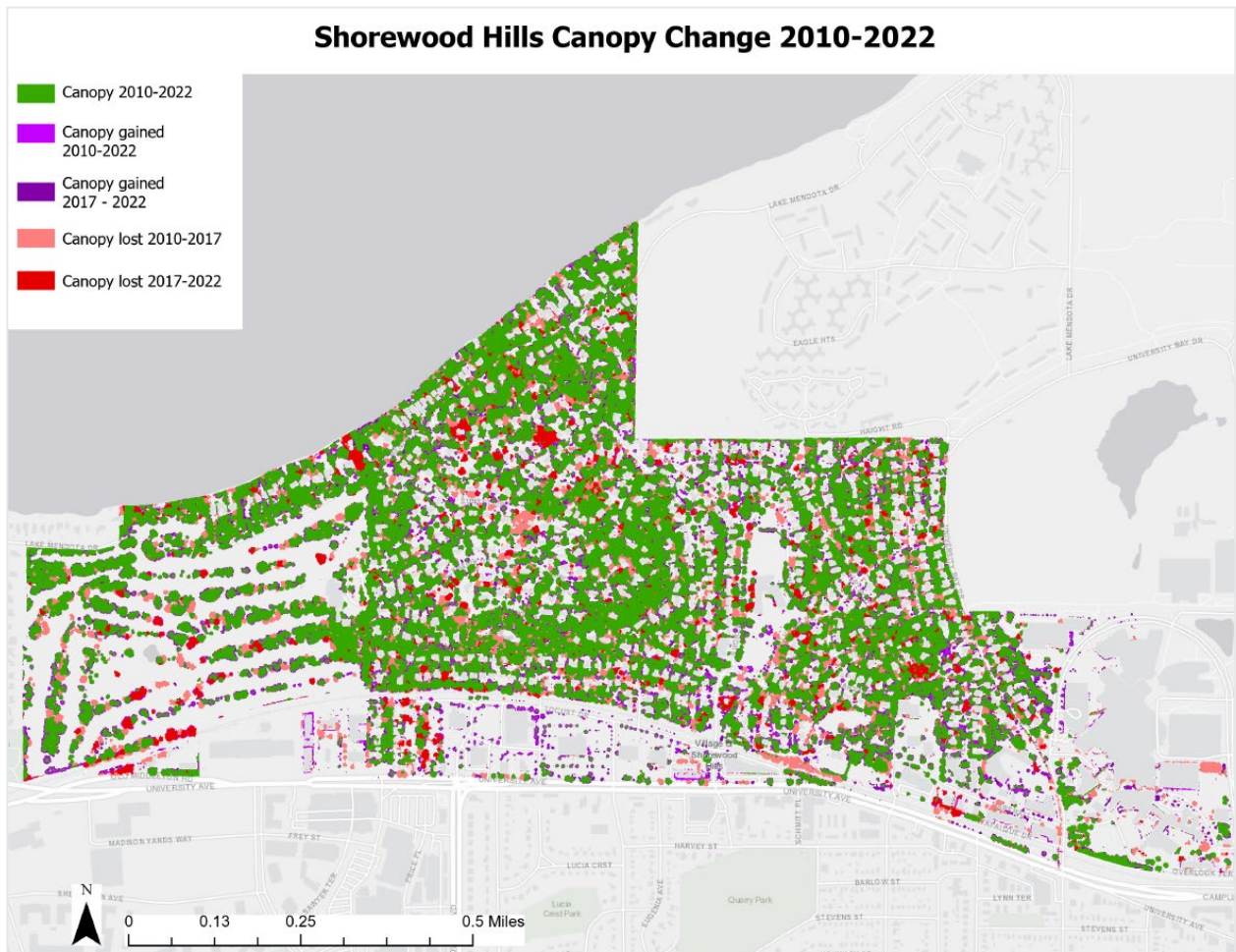
- *Good*: excellent branch structure, no obvious insect or disease problems, no deadwood, no obvious physical or environmental injuries, optimal growth space and conditions.
- *Fair*: intact branching, no obvious insect or disease problems, possible deadwood, possible physical injuries, possible constraints for growth.
- *Poor*: tree death likely within a 5 year time frame.

The public canopy of Shorewood Hills was found to be in exceptional condition, with 3,933 trees (88%) in good health. Three species (with at least 10 total trees) had 20% or more of their population either dead or in poor health: blue spruce, white ash, and boxelder.

Figure 8: Village tree condition



Historic Canopy Change



Flights capturing remotely sensed Light Detection and Ranging (LiDAR) data were flown over the Village in 2010, 2017 and 2022. The LiDAR datasets were processed to develop canopy

cover maps for each of the successive time periods. The results were integrated with ancillary GIS data sets of land use and park parcel boundaries.

The Village of Shorewood Hills has one of the highest canopy cover percentages of all Wisconsin municipalities (43% or 221 acres of canopy). While many local municipalities have observed decreases in canopy cover over the last decade due to emerald ash borer, oak wilt, development pressures and weather-related events, the Village of Shorewood Hills percent canopy cover has remained stable. The canopy remains abundant despite the virtual elimination of ash species in the Village and the loss of a significant amount of old growth oak trees due to old age or oak wilt.

Historic Canopy Change by Land Use

- Over the study period, the most significant increase in canopy cover (just under 2 acres) was observed on commercial properties.
- Canopy cover also increased on residential, recreational and institutional/government properties.
- Canopy cover decreased in all transportation-related land uses by 0.75 acres.

Table 2. Percent canopy cover by land use

2010 Land Use		
Land Use Category	Canopy Cover (Acres)	Canopy Cover (%)
Commercial	4.21	11.71
Institutional/Governmental	9.39	15.06
Recreation	44.57	39.07
Residential	111.60	54.39
Transportation	45.28	48.69
2022 Land Use		
Land Use Category	Canopy Cover (Acres)	Canopy Cover (%)
Commercial	6.19	17.19
Institutional/Governmental	10.64	17.06
Recreation	45.14	39.57
Residential	113.27	55.21
Transportation	44.52	47.88
Canopy Change by Land Use Category, 2010 -2022		
Land Use Category	Canopy Change (Acres)	
Commercial	1.97	
Institutional/Governmental	1.25	
Recreation	0.57	
Residential	1.67	
Transportation	-0.756	
Total	4.73	

Street Tree Inventory

Inventory Summary

Of the 6,635 public trees inventoried, 1,904 were street trees. Street trees are defined as trees located along the boulevard or terrace area; the term “road right-of-way” will be used in this plan.

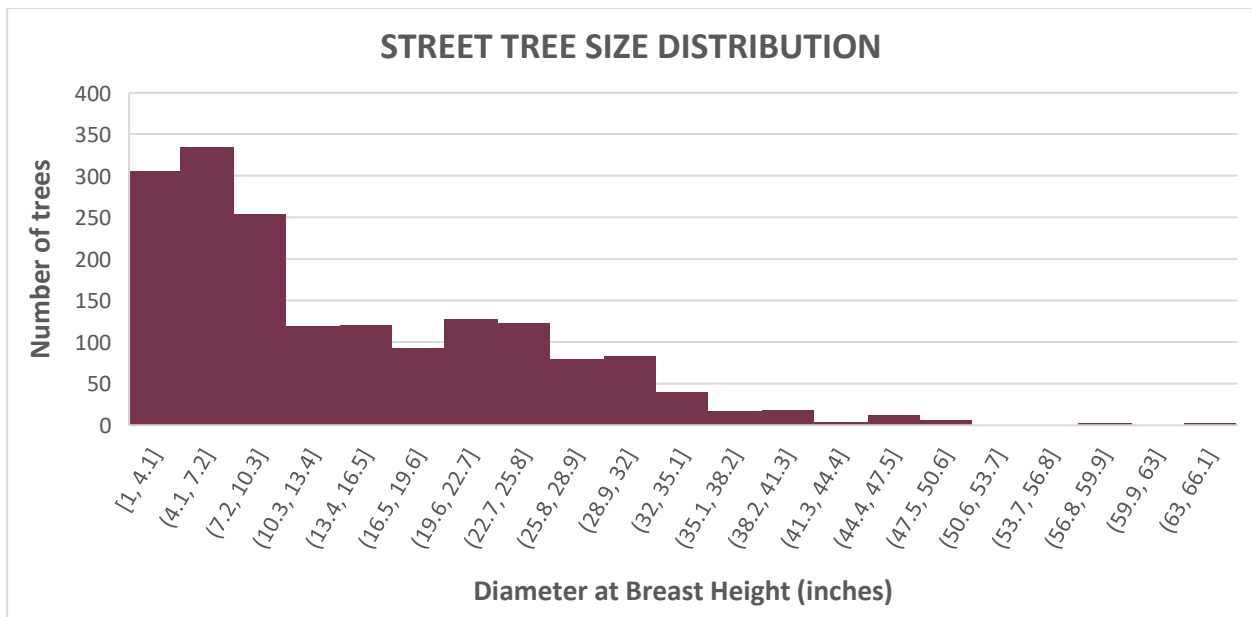
Street Tree Species Distribution

Species diversity is important to the health and longevity of the urban forest. According to the WI DNR species diversity guidelines, no tree species should exceed 20% and no genus more than 10% of the entire tree population. The Village meets both thresholds with a remarkably diverse street tree canopy.

- There were 86 unique species inventoried representing 63 genera.
- The most common species observed were northern white cedar (8.8%), apple species (8.3%), and Norway maple (6.9%).
- The most common genera observed were Acer (15.2%), Quercus (12.8%), and Thuja (8.7%).

Street Tree Size Distribution

Figure 9: Street tree size distribution



- The mean DBH is 14” with a standard deviation of 10.6”.

The CUFR recommends that an ideal age distribution for a population of urban trees is 40% young, 30% maturing, 20% mature, and 10% overmature. See [Street & Park Trees Size Distribution](#) for age group definitions.

Figure 10: Street trees by age group



- Shorewood Hills has 15% less young trees (approx. 261 trees) and 1% less maturing trees (approx. 17 trees) than recommended.
- Shorewood Hills has 6% more mature trees (approx. 104 trees) and 11% more over-mature trees (approx. 191 trees) than recommended.

A high percentage of over mature trees increases the potential for high-risk or high-cost situations. High-risk situations are precursors to tree failure which can result in harm to people or property. High-cost situations refer to a large number of expensive removals and a massive replanting program. However, mature trees with large canopies provide a higher value in terms of ecosystem benefits than young trees. Larger trees, particularly silver maples, should receive annual, detailed risk assessments that account for tree health and likelihood for failure. Potential mitigation measures such as reduction pruning, cabling and bracing should be considered to preserve canopies and reduce risk.

Street Tree Condition

Of the 1,740 street trees inventoried, 1,482 were considered to be in good condition, 176 were in fair condition, 67 were in poor condition, and 15 were dead (Figure 10). See [Street & Park Tree Condition](#) for condition class definitions.

Figure 11: Street tree condition

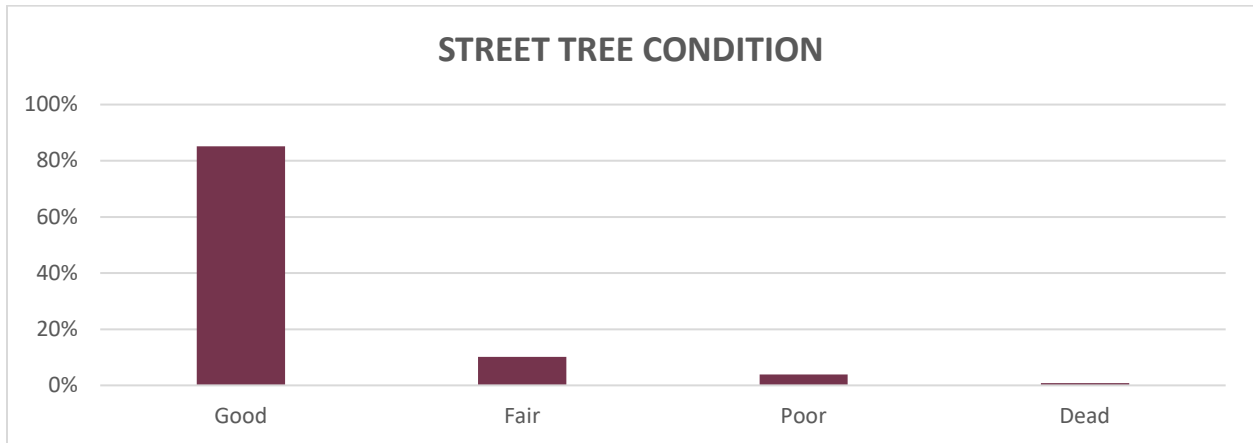
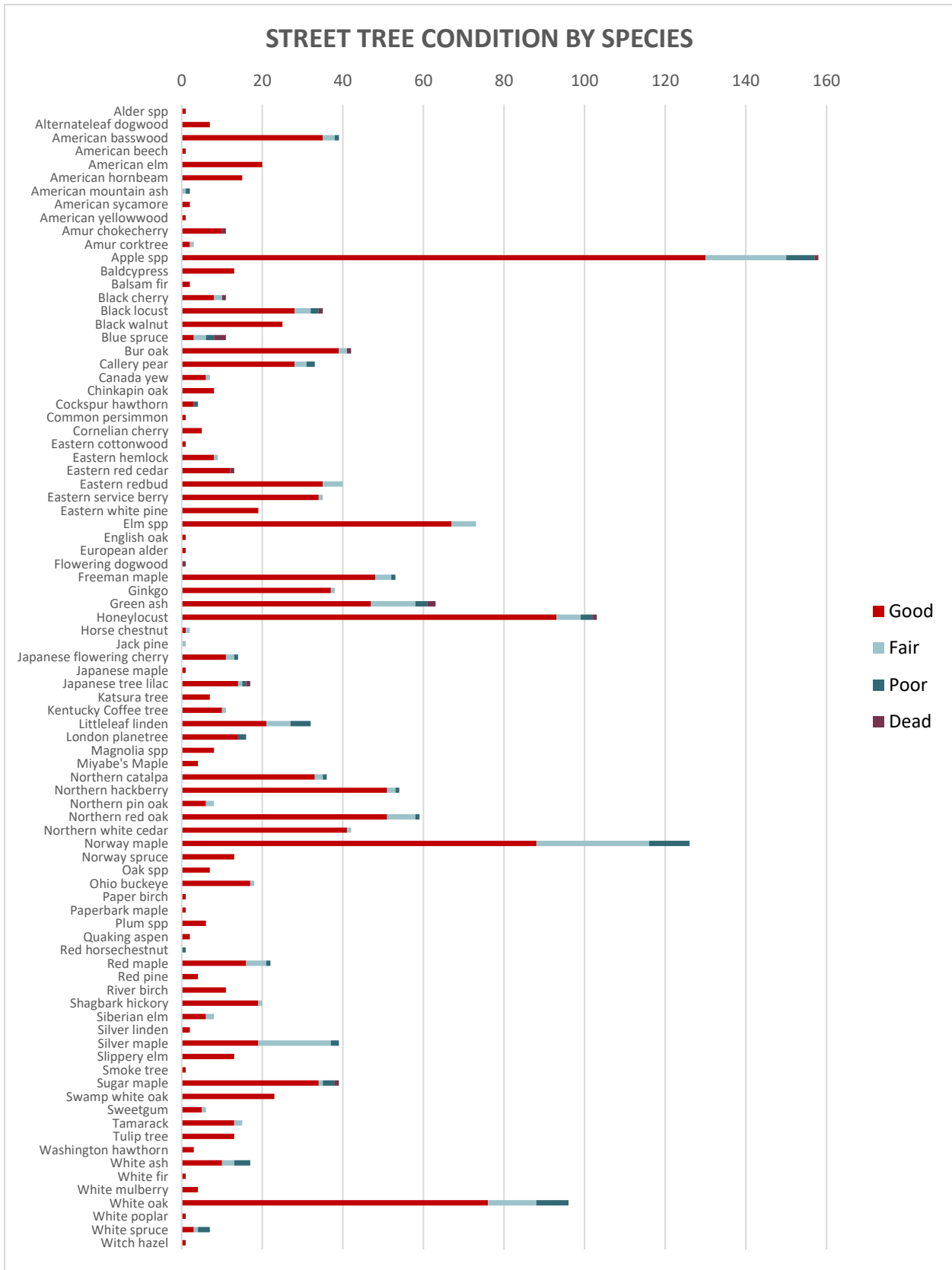


Figure 12: Species conditions



Street Trees Ecosystem Services

All of the tabular inventory data collected for street trees was imported into i-Tree. The collective results of the annual ecosystem services provided by the Village’s street trees include:

- Pollution removal: 1,180 pounds/year (\$3,884/year)
- Cumulative (to date) carbon storage: 1,297 tons (\$221,161)
- Carbon sequestration: 20 tons/year (\$3,412/year)
- Oxygen production: 53 tons/year
- Avoided runoff: 320,539 gallons/year (\$2,864 /year)
- Total tree replacement value: \$4,488,781

Tree Replacement Value

Figure 13. Replacement values of street tree species



Carbon Storage & Carbon Sequestration

Figure 14. Annual carbon sequestration by street tree species

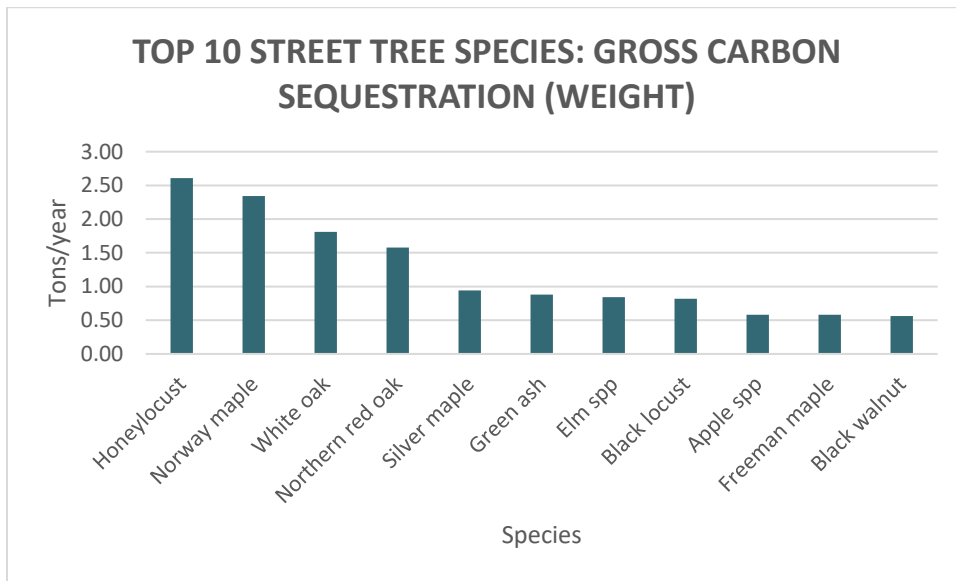
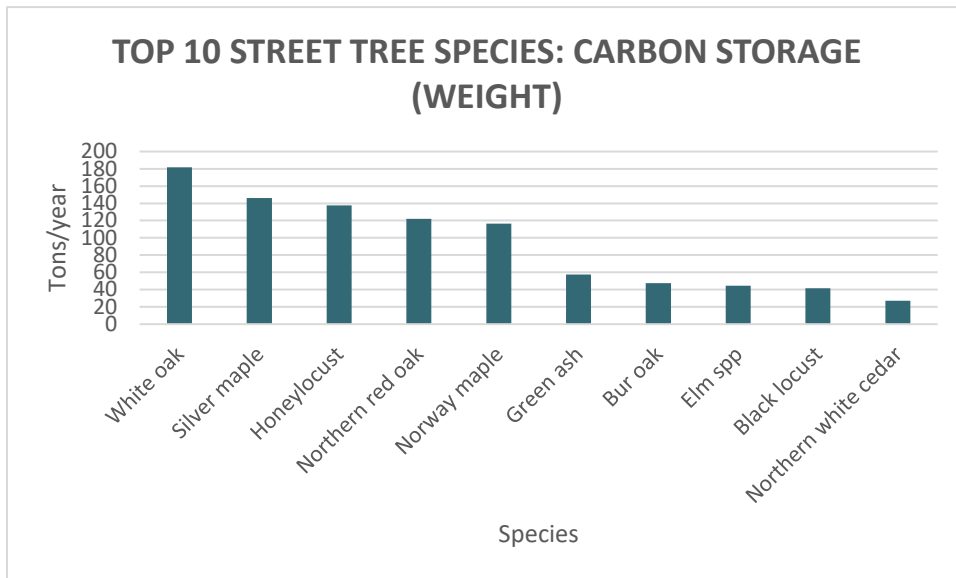


Figure 15. Annual carbon storage by street tree species



Avoided Runoff

Figure 16. Annual runoff avoided by street tree species

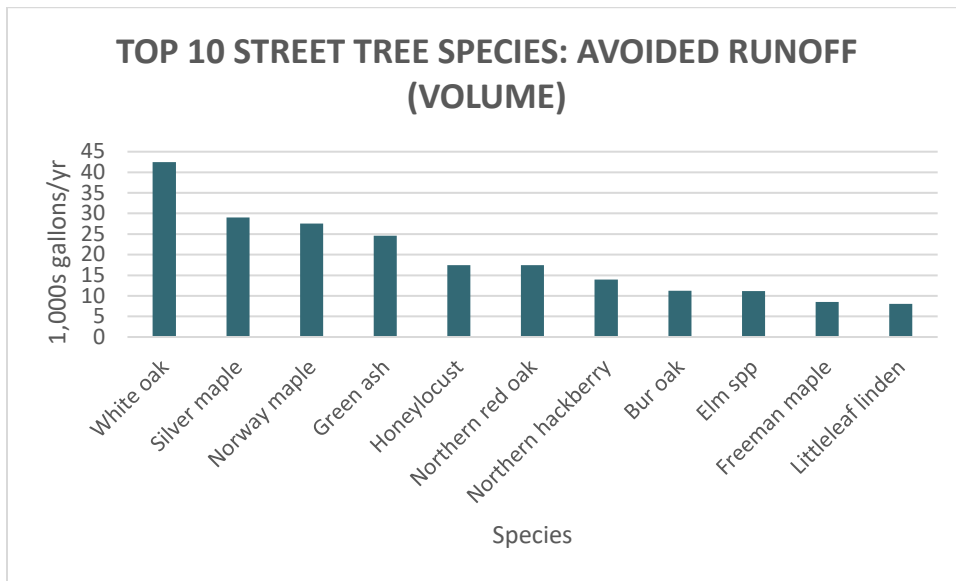
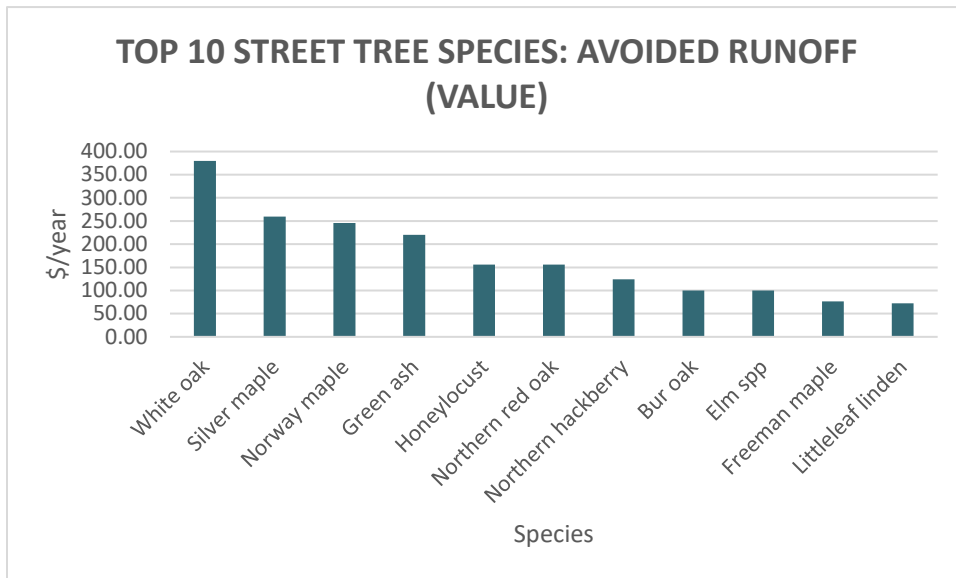


Figure 17. Value of annual runoff avoided by street tree species

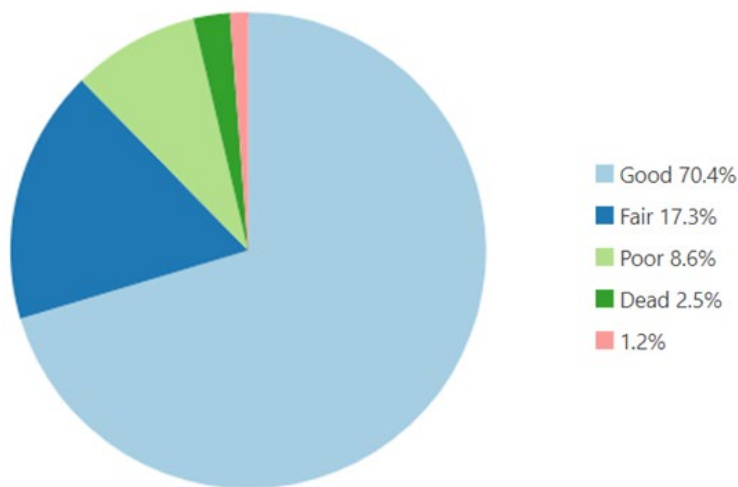


Green and White Ash

The emerald ash borer was formally recognized in the Dane in county in 2014. This flying insect creates a fatal hazard for both white ash (*Fraxinus americana*) and green ash (*Fraxinus pennsylvanica*). Larvae from hatched eggs burrow under the bark feeding on the infected trees' cambium. Typically over the course of 2 to 3 years, untreated trees will precipitously decline and create significant potential hazards as the wood quickly decays and loses its' holding strength. Injections of emmamectin benzoate into an ash tree's root flare on a two or three year cycle has proven to be highly effective method for preventing the emergence of the larvae and thereby reducing or eliminating damage to the tree.

The Village began ash tree treatments in public terraces in 2015. Initially this program was funded by property owners who had ash trees in the terraces surrounding their homes. Recently the funding for the program has been assumed by the Village. All healthy ash trees in the terraces were treated in 2024. It is recommended that the Village continue treating healthy ash trees on a two year cycle with selective removals of trees as they begin showing signs of decline.

Figure 18. Condition of ash species trees

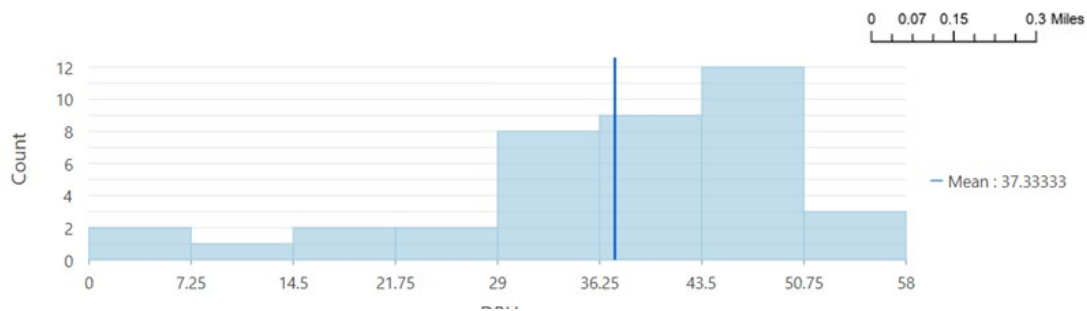


Silver Maples

Silver maples (*Acer saccharinum*) are native floodplain species that were planted widely as elm tree replacements ranging from 70-30 years ago. As a fast growing, weak wooded species, the original silver maple plantings are now reaching advanced maturity and exhibiting a range of consequential and concerning structural and health issues. In the village, the mean size of silver maples is +/- 37" dbh, whereas the overall mean for street trees is +/- 14" dbh. Large cavities and regularly falling deadwood branches are typical concerns associated with the species. These combined factors indicate that special attention should be paid to the Village's silver maple street tree population. It is recommended that a Level 2 tree risk assessment be conducted for each silver maple in the public right of way according to ISA-TRAQ standards. These assessments will provide a more detailed inventory of tree health, potential risk, and risk mitigation strategies.



Figure 19. Map and graph showing location and condition of silver maple trees in 2023



Park Tree Inventory

The Village of Shorewood Hills has 11 public parks, many of which are managed as nature-based recreation or natural areas, requiring a diverse management perspective for each park. An extensive tree inventory was conducted of all park trees and shrubs throughout the spring and summer of 2023. Each tree's GPS coordinates were recorded and input into a powerful web mapping tool ([Shorewood Hills Forest Management Explorer](#)) that allows for the filtering of inventoried trees by any recorded attribute.

Figure 20. Village of Shorewood Hills Parks



Inventory Summary

- 4,731 trees and shrubs were measured and inventoried in the Village's.
- There were 96 unique species inventoried representing 46 genera.
- The most common species observed were hackberry (14.8%), white cedar (6.4%), and basswood (5.9%).
- The species with the highest leaf area were hackberry (14.8%), basswood (11.8%), and white oak (10%).

- White cedar comprised 6.4% of all park trees, but only 1.3% of park leaf area. This was due to the fact that many white cedars are planted as hedge trees.
- Oak species comprised only 6% of all park trees, yet provided a disproportional 28.3% of park leaf area.
- Of the 334 oaks in parks, only 8.6% were between 1-5" DBH. Nearly all the oaks in the sapling diameter class were planted. There was a near complete lack of oak natural regeneration.
- The average diameter for an oak was 20".
- Notably there were 3 red, 3 white, 3 bur, and 3 swamp white heritage oak trees (estimated to be >200 years old) identified.
- Ash has effectively been eliminated from the canopy due to the invasive exotic emerald ash borer.
- Invasive shrub control throughout the parks has been very effective with the exceptions of inaccessible parts of Quarry Park and the Marina, where little forest management has occurred.
- 93.6% (4,418) of the trees were found to be in good condition, 3.9% (183) of the trees were in fair condition, 2.1% (99) of the trees were in poor condition and 0.4% (20) of the trees were found to be recently dead.
- William Kaeser Woods had the highest percentage canopy cover at 96%. Koval Woods had the second highest canopy cover at 93%.
- Post Farm Park had the lowest canopy cover at 45%. The Marina Park had the second lowest canopy cover at 60%.

Table 3. *Percent population, percent leaf area, and importance value for 10 highest Importance Value park tree species.*

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
Hackberry	14.8	14.8	29.5
American basswood	5.9	11.8	17.6
White oak	2.0	10.0	12.0
Bur oak	2.3	9.7	12.0
Black walnut	2.5	7.7	10.2
Norway maple	5.7	3.2	8.9
Black locust	2.9	5.7	8.6
Northern red oak	1.7	6.8	8.5
Elm species	5.2	3.0	8.1
Northern white cedar	6.4	1.3	7.7

Park Tree Species Composition and Structure Changes

Shorewood Hills park trees were inventoried in 2012 and again in 2023. The two inventories were compared to identify the greatest changes collectively observed between parks.

- The greatest net species increases observed between 2012 and 2023 were hackberry (296), white cedar (221), black cherry (138), and Norway maple (93).
- The greatest net species decreases observed between 2012 and 2023 were green ash (-98), mulberry (-97), and black locust (-46).
- Mature oaks decreased significantly across almost all parks. Since the 2012 inventory, red oaks (-42), bur oaks (-34), and white oaks (-28) have all declined in number.
- Oak tree loss occurred across all diameter classes but was most abundant in the larger diameter classes (> 20" DBH).
- Although there was a net increase in basswood tree occurrences, basswood showed one of the largest decreases in carbon storage and replacement value (second only to northern red oak). Significant basswood decreases in all size classes > 20" DBH were observed.
- Over the last 10 years, natural regeneration more than doubled for basswood, elm, black cherry, boxelder, and Norway maple.
- The addition of 221 white cedars was primarily due to hedge row planting.

Table 4. Greatest increases in species occurrences and associated species replacement costs and carbon storage values since 2012 for park trees

Species Name	Change in Number of Trees (n)	Replacement Cost Change (USD)	Carbon Storage Value Change (USD)
Hackberry	296	\$18,529	\$515
Northern white cedar	221	\$17,923	\$2,463
Black cherry	138	-\$1,947	-\$882
Norway maple	93	-\$3,745	-\$753
American basswood	79	-\$67,725	-\$11,659
Eastern red cedar	59	\$958	\$67
Eastern redbud	50	\$1,902	\$197
Eastern hemlock	33	\$903	-\$22
Northern catalpa	25	\$1,432	\$174
Red mulberry	19	\$2,406	\$432

Table 5. Greatest net decrease of species occurrences and associated species replacement costs and carbon storage values since 2012 for park trees

Species Name	Change in Number of Trees (n)	Replacement Cost Change (USD)	Carbon Storage Value Change (USD)
Yew	-6	-\$143	-\$18
Eastern cottonwood	-9	\$21	\$286
Spruce species	-11	-\$1,600	-\$294
Silver maple	-13	-\$3,851	-\$1,700
White oak	-28	-\$11,984	-\$3,831
Bur oak	-34	-\$43,508	-\$8,832
Northern red oak	-42	-\$90,928	-\$15,379
Black locust	-46	-\$5,998	-\$2,637
Mulberry species	-97	-\$21,051	-\$3,993
Green ash	-98	-\$47,953	-\$4,884

Historic Canopy Change in Parks

- Over the 12-year study period, a 13% decrease in canopy cover was observed in Four Corners Park, and a 10% decrease in canopy cover was observed in McKenna Park
- Village tree planting efforts in Sam Roth Park resulted in a 11% increase in canopy cover, while canopy cover in Karl Frantz Park increased 5% as well.
- Canopy cover in the remaining parks stayed relatively stable over the 12-year period.

Park Trees Ecosystem Services

All of the tabular inventory data collected in the parks was imported into i-Tree. The collective results of the annual ecosystem services provided by the Village's park trees include:

- Pollution removal: 1,640 pounds/year (\$7,023/year)
- Cumulative (to date) carbon storage: 1,019 tons (\$173,803)
- Carbon sequestration: 19.7 tons/year (\$3,356/year)
- Oxygen production: 52.5 tons/year
- Avoided runoff: 394,594 gallons/year (\$3,526/year)
- Total tree replacement value: \$1,054,613

The trees in Quarry Park/Reese Woods and Post Farm Park provided the greatest ecosystem services any Village park. Red, white, and bur oaks were found to store more carbon collectively than all other park trees combined.

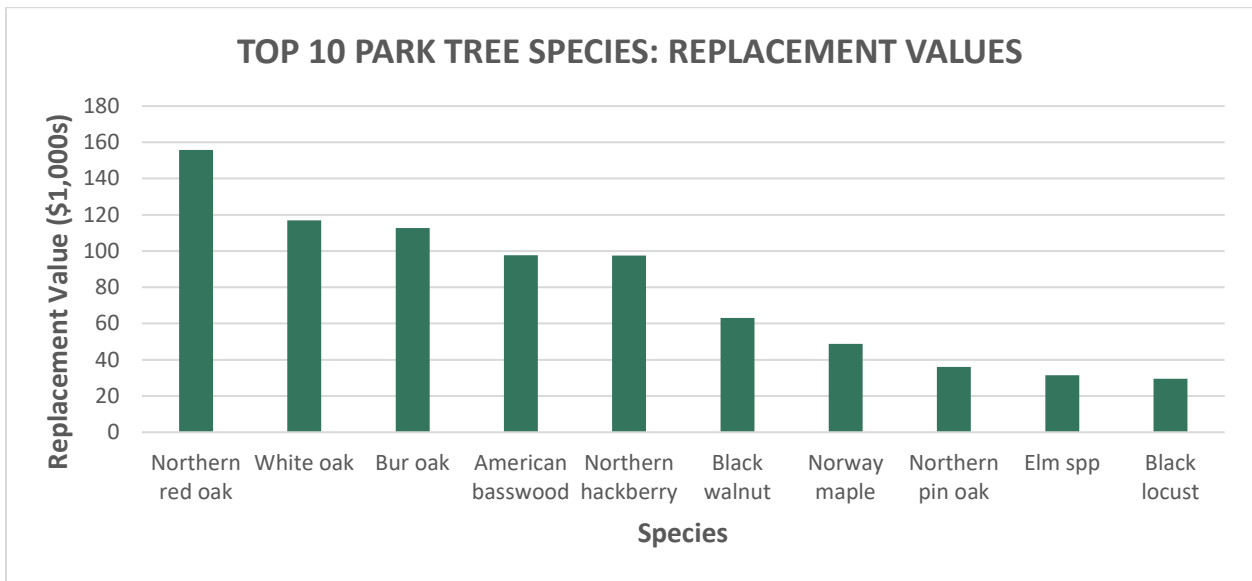
Tables 6. Ecosystem services and most common species and greatest leaf area by park. For ecosystem services, greener shades represent higher specific ecosystem services provided, more red shades represent specific lesser ecosystem services provided ranked by park. For the bottom table, most common species are color coded by park.

	Polution Removal (pounds/year)	Polution Removal \$/year	Carbon Stroage (tons)	Carbon Stroage \$/year (thousands)	Carbon Sequestration (tons)	Carbon Sequestration \$/year	O2 Production tons/year	Avoided Runoff thousand gallons/year	Avoided Runoff \$/year	Replacement Value (Thousands)
Village Park										
Bigfoot Park	32	\$102	20	\$3	0	\$78	1	8	\$68	\$86
Bradley Park	115	\$387	62	\$11	1	\$231	4	28	\$253	\$272
Entrance way/Sam Roth	73	\$264	50	\$8	1	\$136	2	18	\$157	\$214
Four Corners	155	\$580	106	\$18	2	\$290	5	38	\$338	\$423
Koval Woods	163	\$488	151	\$26	2	\$375	6	35	\$317	\$521
Marina Park	177	\$586	115	\$20	2	\$381	6	42	\$373	\$426
McKenna Park	197	\$626	129	\$22	3	\$440	7	47	\$420	\$576
Post Farm Park	257	\$853	156	\$27	3	\$512	8	62	\$551	\$571
Quary Park & Reese Woods	328	\$1,003	143	\$24	4	\$602	9	77	\$685	\$642
Triangles	18	\$77	30	\$5	1	\$88	1	5	\$46	\$121
William Kaeser Woods	150	\$477	87	\$15	2	\$365	6	34	\$305	\$306
Total	1665	\$5,443	1049	\$179	21	\$3,498	55	393	\$ 3,513	\$ 4,158

Village Park	Most Common	Greates Leaf Area Index
Bigfoot Park	Basswood, hemlock	Basswood, red oak, white oak
Bradley Park	Hackberry, Norway maple, redbud	Hackberry, bur oak, black locust
Entrance way/Sam Roth	White cedar, hemlock, red bud	Northern pin, swamp white, white cedar
Four Corners	Hackberry, Norway maple, hemlock	White pine, red oak
Koval Woods	Black cherry, boxelder	White oak, red oak, shagbark hickory
Marina Park	Basswood, boxelder	Basswood, black walnut
McKenna Park	Norway maple, basswood, dogwood	Basswood, red oak, white oak
Post Farm Park	White cedar, hackberry, elm	Hackberry, black walnut
Quary Park & Reese Woods	Hackberry, bur oak	Hackberry, bur oak, black locust
Total	Hackberry, white cedar	Hackberry, basswood, white oak
Triangles	Norway maple	Norway maple
William Kaeser Woods	Hackberry, black locust	White oak, black locust, hackberry

Tree Replacement Value

Figure 21. Replacement values of park tree species



Carbon Storage & Carbon Sequestration

The annual carbon sequestration of Shorewood Hills trees is an estimated 19.7 tons of carbon per year with an associated value of \$3,356/year. Gross carbon storage of parks trees in Shorewood Hills store approximately 1,019 tons of carbon, with an associated value of \$173,803.

Figure 22. Annual carbon sequestration by park tree species

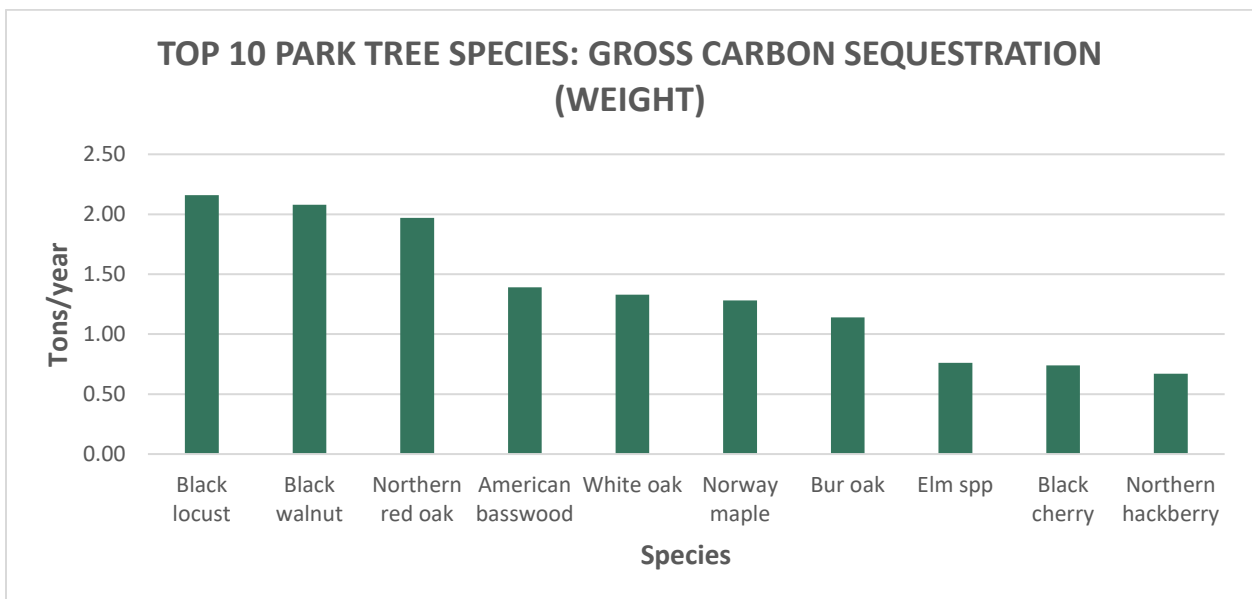
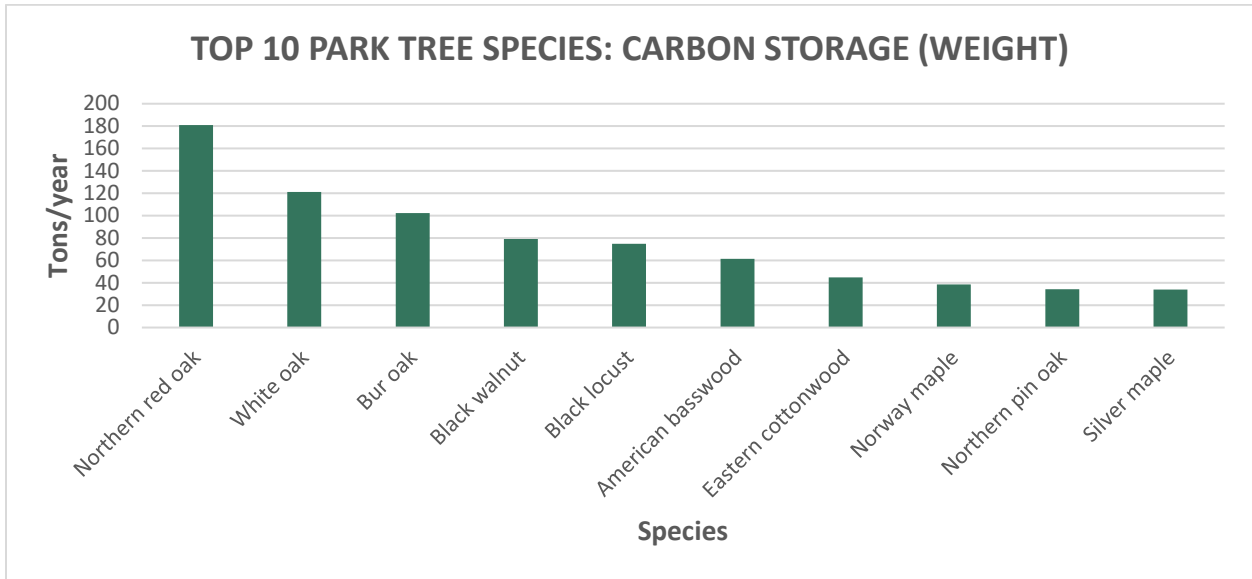


Figure 23. Annual carbon storage by park tree species



Avoided Runoff

Urban trees and shrubs, however, are beneficial in reducing surface runoff. Trees and shrubs intercept precipitation, while their root systems promote infiltration and storage in the soil. The trees and shrubs of Shorewood Hills help to reduce runoff by an estimated 394,594 gallons a year with an associated value of \$3,526/year. Avoided runoff is estimated based on local weather from the user-designated weather station. In Shorewood Hills, the total annual precipitation in 2020 was 40.3 inches.

Figure 24. Annual runoff avoided by park tree species

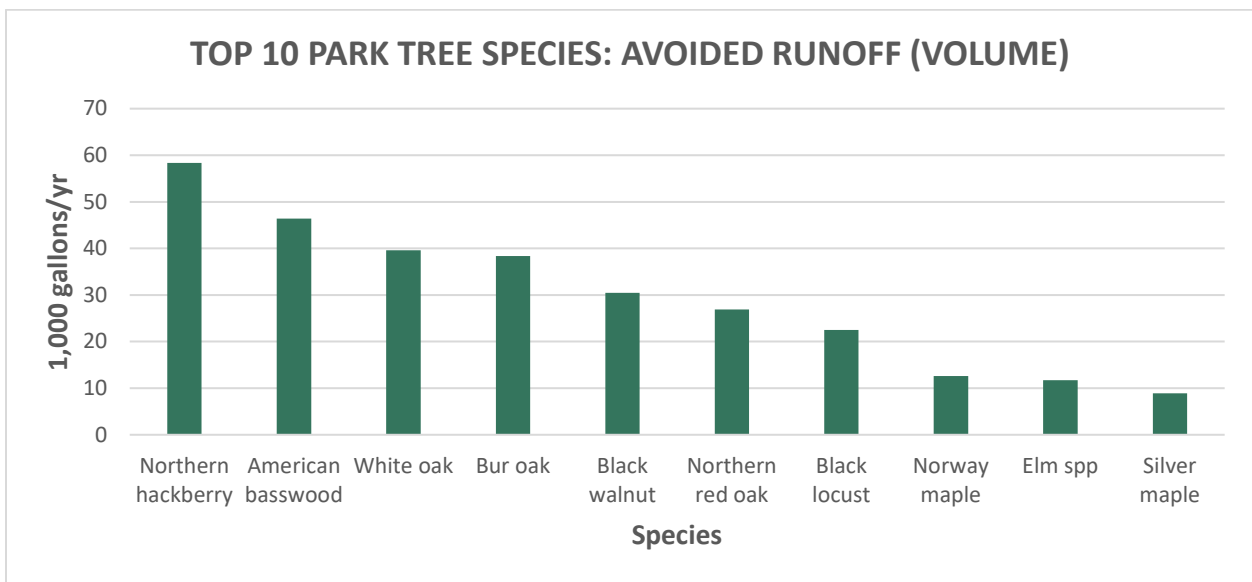
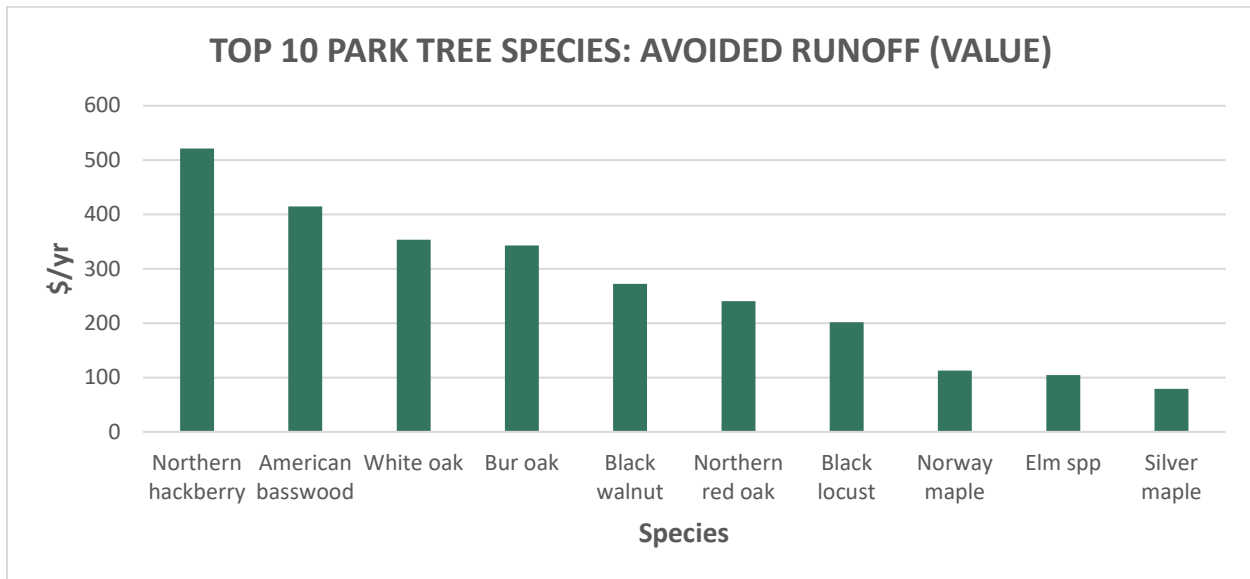


Figure 25. Value of annual runoff avoided by park tree species



Management Consideration Highlights

- Several of the parks have a history of oak wilt which has resulted in significant oak mortality over time. Continued monitoring and containment of oak wilt will be required.
- A lack of natural regeneration of oak species will require the continued planting of oaks to maintain an oak component into the future.
- There are many mature oaks throughout the parks that are becoming increasingly encroached upon by more shade tolerant species such as elm and hackberry. Given oaks shade intolerance, over time these trees will be gradually lost to forest succession.
- Successful removals of mature invasive black locust and Norway maples has occurred throughout the parks. However, there has been a significantly large increase in Norway maple regeneration that did not exist in 2012. Mature Norway maples remain in several parks, which continue to contribute to the establishment of their regeneration.
- Spongy moth egg masses have been observed in several locations in the Village; the most significant observations were at Post Farm Park. Continued monitoring of spongy moth will allow the village to best prepare to implement appropriate treatment.

Big Foot Park (0.29 Acres)

One of the smallest parks in the Village, Big Foot Park is an unimproved stormwater management parcel located off Lake Mendota Drive halfway between McKenna Park and the Shorewood Hills Marina. The park is a natural area without any recreation infrastructure. The parcel boundary is long, narrow, and steeply sloped down to the shore of Lake Mendota. Given the steepness of the park, riprap boulders have been added for erosion prevention.

Park Summary

Big Foot Park is characterized by a dominance of basswood that exists in various size classes. Natural regeneration is predominantly hackberry and basswood. There is a semi open understory, with a significant component of chokecherry. Several recent exotic plantings include an apple cultivar, Japanese maple, yew, red bud and amur chokecherry.

Management Recommendations

- Given the lack of recreation opportunities, the primary management concern is potential tree failures impacting adjacent single-family lots on either side of the park. It is recommended to monitor village trees along private property lines where tree failures could impact private properties.
- Management considerations should include removal of existing Norway maples as there is one mature 24.6" DBH seed tree in the park.

Tree Conditions/Composition

- A total of 66 trees and 100 shrubs were inventoried.
- The most common tree species were basswood (15) and hemlock (14). The largest hemlock had a DBH of 7.8".
- Canopy dominant species by percent leaf area were basswood (44%) and red oak (24%).
- There were 18 unique tree species representing 15 different genera.
- 96.7% of the trees were listed to be in good condition. There were two red oaks noted to be in poor condition of 13" DBH.
- Existing canopy cover of 86%, a 3% decrease since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
Common chokecherry	60.2	2.8	63.1
American basswood	9.0	44.5	53.5
Northern red oak	3.6	24.3	27.9
Eastern hemlock	8.4	2.7	11.2
Black locust	1.2	6.9	8.2
Norway maple	1.8	5.5	7.4
Elm species	1.2	4.3	5.5
Black cherry	0.6	3.7	4.3
Hackberry	3.0	0.8	3.8
Northern white cedar	3.0	0.1	3.2

2012-2023 Inventory Change Highlights

- The dominant canopy of basswood and red oak remains unchanged after a decade. Unlike other Village parks, hackberry and elm represent a very small component of the canopy, with very little regeneration occurring.
- Three additional hemlocks were planted, giving a total population of 14.
- Three >25" DBH American basswood and two >20" elms were lost since the 2012 inventory.
- Four boxelders <15" DBH were also lost.

Bradley Park (1.27 acres)



Bradley Park, known for its popular sledding hill, provides one of the few winter recreation opportunities in the Village. It is located just east of Shorewood Hills Elementary School off of Amherst Drive. A small path connects Bradley Park to Dartmouth Road. Fourteen single family homes border Bradley Park, where the park serves as an extension of their backyards.

The park is characterized by several large open grown bur oaks with some unique branching patterns in the manicured portion of the park. The far interior of the park is a natural area with regeneration occurring. There is a community “Fruit Forest” that was established since the last forest inventory in 2012 that consists of a variety of apple, pear, plum, peach and cherry trees.

Park Summary

Spongy moth cocoons were observed on numerous bur oak trees, likely presenting a concern to the village in 2024 and beyond. Additionally, a private property owner adjacent to the park had an oak diagnosed with oak wilt.

In the natural area portion of the park, a large bur oak (30” DBH) was found to have recently died, and several very large red or pin oaks have also died since 2012. Large numbers of Norway maple and hackberry have regenerated from the few remaining larger seed trees.

Management Recommendations

- Remove the larger Norway maples to reduce competition amongst the oak canopies and prevent future invasive regeneration establishment.
- Remove Norway maple regeneration and replant with oak seedlings and larger trees protected by metal cages.
- Remove encroaching trees to preserve the one notable large 35” DBH red oak in the natural area.
- Monitor trees for oak wilt present nearby.

- Monitor and remove observed spongy moth egg masses.

Tree Conditions/Composition

- A total of 246 trees were inventoried.
- The most abundant trees were hackberry (65) and Norway maple (41). Hackberry was represented in all size classes, but primarily observed as recent regeneration <2" DBH. There were 6 Norway maples >10" DBH, 31 Norway maples observed were <2" DBH.
- Canopy dominant species by percent leaf area were hackberry (24.7%) followed by bur oak (19.7%).
- There were 33 unique tree species representing 20 different genera.
- 83.7 % of the trees were listed as in good health, while poor or fair condition trees represent 7.7% of all trees respectively. 0.8% of trees were found to have recently died. Seven mature oaks were identified as in either fair or poor condition.
- A 30" DBH bur oak had recently succumbed, along with several large red oaks that appear to have died sometime after the 2012 inventory.
- Existing canopy cover of 74% represents a 0% change since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
Hackberry	26.4	24.7	51.1
Bur oak	6.1	19.7	25.8
Norway maple	16.7	5.3	21.9
Black walnut	4.5	11.4	15.9
Northern pin oak	3.3	11.1	14.4
Red pine	5.7	5.9	11.6
Black locust	4.5	6.4	10.8
Eastern redbud	6.1	0.4	6.5
White oak	1.2	4.3	5.5
Elm species	4.5	0.8	5.3

2012-2023 Inventory Change Highlights

- Evidence of significant efforts to remove the invasive Norway maples is apparent, including the observed removal of 14 trees >5" DBH. Even with these successful removals, a continued removal effort is required as 14 additional saplings <5" DBH were observed.
- Significant efforts in removal of black locust were also observed, resulting in the reduction of 5 trees.
- Significant increases of natural regeneration of hackberry and elm species were observed, similar to the trends observed in most natural areas in the Village.

- There was a decrease of 8 mature bur oaks in the park.

Dudley Davis Quarry Park & Reese Woods (3.86 acres)

Combined, Dudley Davis Quarry Park and the Tess and Hans Reese Woods represent the largest park area in Shorewood Hills. The two separately donated parcels that make up the area are located between Topping Road and Highbury Road. One parcel of the park was historically utilized as a sandstone quarry in the late 1800s and early 1900s. The other parcel is managed as a rare oak savanna, an example of what the pre-Euro American landscape looked like.

This park is unique in that it is secluded and contains a distinctive geological outcropping, as well as hiking trails and large cliffs that are used for rock climbing. The park also operates as a staging area for Village residents to drop off yard waste or pick up free leaf mulch and wood chips.

Park Summary

The geological inaccessibility of the landscape prevented access to timber at the time of settlement and led to the preservation of the oak savanna today. Savanna restoration began in the 1990s. The savanna exists today due to ongoing restoration work from local dedicated volunteers who have been continuously removing invasive species and conducting periodic controlled burns. The extremely shallow soils of the savanna likely slow the growth of the oaks present, meaning they are much older than similar sized trees. This park was one of the very few areas where limited natural oak regeneration was observed. Also of note is a 33" DBH swamp white oak located off Highbury Road near the access gate.

The portion of the park that was mined is now populated by early successional pioneer species such as red cedar. As disturbed areas result in prime habitat for invasives, there was a considerable presence of honeysuckle and buckthorn. However, these species most often occurred around the generally inaccessible perimeters of the park.

Unique to this park was the high abundance of sumac, with over 200 occurrences. Sumac is commonly found along roadsides and in areas of disturbance due to its ability to persist where other tree species cannot. It is native and valued for its bright colorful foliage and wildlife habitat.

Management Recommendations

- Maintain oak savanna through controlled burns and removal of invasive species.

Tree Conditions/Composition

- There were 971 tree species and 174 shrub species identified.
- The most common tree species were hackberry (309) and bur oak (73); more than half of the hackberries were less than 5" DBH, and nearly all of the bur oaks were greater than 10" DBH.

- Canopy dominant species by percent leaf area were hackberry (32.9%) and bur oak (29%).
- A total of 28 unique tree species representing 21 different genera were observed.
- 95.3% of trees were identified as being in good condition, 2.8% in fair condition, and 1.4% in poor condition. 0.5% of the trees were identified as having died within the last five years. Fourteen of the 48 trees identified as in either poor or fair condition were bur oaks.
- The majority of recently deceased trees were black locusts; these trees had been girdled to promote the health of the savanna restoration efforts.
- Existing canopy cover of 80% represents a 2% decrease since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
Hackberry	27.2	32.9	60.1
Bur oak	6.4	29.0	35.4
Staghorn sumac	20.6	0.9	21.5
Black locust	5.9	12.3	18.2
Black walnut	4.0	11.7	15.7
European buckthorn	11.5	0.5	12.0
Elm species	5.6	1.1	6.7
Eastern red cedar	4.0	1.0	5.0
Bell's honeysuckle	2.7	0.1	2.8
Eastern cottonwood	0.3	2.4	2.7

2012-2023 Inventory Change Highlights

- Due to the emerald ash borer, there was a near elimination of ash trees across all diameter ranges.
- Black locust populations have also decreased due to management operations, primarily girdling. Limited natural regeneration of black locust was observed.
- Increases of eastern red cedar were observed on the disturbed and rocky exposed sites.
- Over 10 bur oaks > 10" DBH have been lost since the 2012 inventory; five of these were >30" DBH.
- The most significant changes observed in these parks was a dramatic increase in hackberry and elm regeneration.

Entryway Parks (1.06 acres)

The Village's Entryway Parks serve as the gateway to Shorewood Hills as they are located on each side of Shorewood Boulevard, the primary entrance to the Village. Sam Roth Park is found to the east, while Karl Frantz Park is located to the west of Shorewood Boulevard. These parks represent a more manicured, landscaped environment than many of the other Village parks. Karl Frantz Park includes an attractive retention pond accompanied by several planted river birch trees.

Park Summary

Three heritage swamp white oaks of exemplary form are found in these parks. As of 2023, no spongy moth egg masses were observed on these trees despite significant spongy moth egg masses observed in nearby Post Farm Park and an outbreak in Glen Oak Hills Park in the spring of 2023.

Many of the trees in these parks have been planted, resulting in a higher diversity than in other Village parks. Two American chestnut trees planted prior to 2010 are now infected with the chestnut blight and in significant decline. Sam Roth and Karl Frantz Parks both experienced the greatest canopy cover increases between 2010 and 2022 due to successful tree planting program.

Management Recommendations

- Preserve heritage swamp white oaks and monitor for spongy moth. See [WI DNR Spongy Moth](#) standards for information on monitoring and management methods

Tree Conditions/Composition

- A total of 149 trees and 5 shrubs were inventoried.
- The most common tree species were white cedar (62) and hemlock (8). The high number of cedar trees is the result of hedge row plantings. The mean diameter of the hemlocks was 6.6" DBH.
- Canopy dominant species by percent leaf area were northern pin oak (15.7%) and swamp white oak (15.6%).
- Karl Frantz Park has 17 unique tree species representing 13 genera, while Sam Roth Park has 22 unique tree species representing 19 different genera. There is a high level of diversity for such a small park due to historic plantings. There are 7 species of conifers in these parks.
- 92.8 % of the trees inventoried were in good condition, 5.2% were in fair condition, 2% in poor condition, and no trees were dead. The only trees in poor condition were the American chestnuts and a 5.7" DBH tulip tree.
- Existing canopy cover of 74% in Karl Frantz Park represents a 5% increase since 2010.
- Existing canopy cover of 71% in Sam Roth Park represents an 11% increase since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
Northern white cedar	40.5	11.5	52.0
Swamp white oak	3.9	15.6	19.6
Northern pin oak	2.6	15.7	18.4
Blue spruce	4.6	10.3	14.8
Norway spruce	2.0	9.0	10.9
Eastern hemlock	5.2	2.5	7.7
Apple species	3.9	2.7	6.7
American basswood	1.3	5.1	6.4
Norway maple	2.0	4.1	6.1
Sugar maple	2.0	4.1	6.1

2012-2023 Inventory Change Highlights

- As these parks are more manicured than most other parks in Shorewood Hills, the most significant changes in tree species composition are related to plantings. In this case the greatest change was due to the addition of white cedar for hedge row plantings.
- Other recent plantings since the 2012 inventory include yew, redbud, silver maple, tamarack and a tulip tree.

Four Corners Park (1.61 acres)

Four Corners is a very popular park centrally located in the Village, yet largely hidden by the surrounding dense residential canopy. There is a playground, a shelter, and in summertime, a children's camp. The park is accessed from either Edgehill Drive or Sunset Drive. A very large multi-stem Norway spruce marks the main entrance. Vegetation is a mix of landscaped, manicured areas and portions of closed canopy natural area with active forest regeneration.

Park Summary

Four Corners Park is the only Village park with a presence of natural origin white pines which dominate the park's canopy. Only two other parks in the Village have any white pines at all, with only one tree each. The mean diameter of the 14 white pines in Four Corners Park is 24", while the maximum diameter is an impressive 35.4". Near the back entrance of the park, there is a heritage white oak with a diameter of 44.6".

Recent plantings have included hickory, spruce, hophornbeam, hemlock, cedar and redbud. Overall, this park has experienced significant changes in recent history, with the near elimination of a previously dominant old growth red oak/white oak forest due to oak wilt. The few remaining oak trees appear to be in decline. Other losses in the park include four red pines and a hickory tree.

Management Recommendations

- Given the park's history of oak wilt, monitor for future infections.
- Remove Norway maple regeneration and replace with native species plantings such as oak protected with metal caging.

Tree Conditions/Composition

- A total of 227 trees and 17 shrubs were inventoried.
- The most common species were hackberry (31) and Norway maple (22).
- Canopy dominant species by percent leaf area were white pine (18.9%) and red oak (10.7%).
- The park contains 41 unique tree species representing 30 different genera.
- 93% of the trees were found to be in good condition, 3.3 % in fair condition, 3.3% in poor condition, and 0.4% were found to be dead. There were 3 red oaks and 3 white pines in either poor or fair condition, 4 of which were greater than 20" DBH. The other fair or poor category trees were distributed across species, with no other species being represented more than once.
- Existing canopy cover of 71% represents a 13% decrease since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
Eastern white pine	5.7	18.9	24.7
Hackberry	12.7	6.4	19.1
Norway maple	9.0	7.0	16.0
Northern red oak	3.7	10.7	14.3
Norway spruce	3.3	9.0	12.3
Eastern hemlock	7.8	2.2	10.0
Black cherry	5.3	4.0	9.3
Northern white cedar	7.0	2.0	9.0
Black locust	2.0	4.9	6.9
Northern pin oak	1.2	5.2	6.5

2012-2023 Inventory Change Highlights

- Loss of 8 mulberries between 0-15" DBH likely due to active management activity.
- Loss of 5 white oaks, 4 of which had a DBH > 20".
- Loss of 8 red oaks, half of which had a DBH of > 35".
- Loss of 4 red pine and one hickory.
- Significant decreases in Norway maple saplings occurred, though all other size classes remained unchanged.

John C. McKenna Park (2.17 acres)

John C. McKenna Park, located on Mendota Drive, is characterized as a natural area, with steep north facing slopes leading down to the lake where there is boating and swimming access. A paved road leads down to a community boat house and picnic shelter. There is also a foot trail leading from the boat house up a steep hill to the corner of Edgehill Drive and Lake Mendota Drive. Prior to the creation of Post Farm Park, McKenna Park was the most popular park in the Village. It now offers a quiet place to access nature and Lake Mendota. A recent bridge reconstruction has resulted in the loss of several trees.

Park Summary

A significant amount of invasive tree species, primarily Norway maple and black locust, have become established in McKenna Park and are now actively reproducing. The evidence of recent management activities to remove these invasive trees was widely observed. 122 Norway maples were observed in the park, making up 18% of the tree population, though the average diameter was only 3.2". There were two very large (>35" DBH) red oaks observed that had died in the last year or two. One of the largest basswood trees (40" DBH) in all the village parks was identified here.

Management Recommendations

- Remove mature Norway maples seed trees that are promoting natural regeneration of an undesirable and invasive tree species.
- Remove shade tolerant species such as Norway maple, elm and black locust encroaching on large red oaks. Consider removing understory native species such as hackberry that will eventually shade out desirable oaks.

Tree Conditions/Composition

- A total of 591 trees and 78 shrubs were inventoried.
- The most common species were Norway maple (122) and basswood (109)
- The canopy dominant species by percent leaf area were basswood (31.5%), northern red oak (19.3%), and white oak (16.4%).
- This park contains 34 unique tree species representing 24 different genera.
- 96.1% of the trees were in good condition, 1.9% in fair condition, 1.6% in poor condition, and 0.3% were dead. Eight basswoods, 3 mature red oaks, and 1 bur oak were identified as either fair or poor condition. The two trees found to have recently died were both red oaks with diameters over 35".
- Existing canopy cover of 77% represents a 10% decrease since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
American basswood	16.9	31.5	48.4
Norway maple	18.2	6.7	24.9
Northern red oak	3.9	19.3	23.2
White oak	2.5	16.4	18.9
Alternate leaf dogwood	11.2	0.3	11.5
Hackberry	5.7	3.8	9.5
Black cherry	5.1	1.8	6.9
Northern catalpa	4.3	2.5	6.8
Elm species	3.7	3.1	6.8
Common chokecherry	4.9	0.4	5.3

2012-2023 Inventory Change Highlights

- Due to emerald ash borer, there were significant decreases in ash across all diameter classes.
- Loss of 12 red oaks across all diameter classes.
- Loss of 5 white oaks across all diameter classes.
- While there was a loss of 12 Norway maples across all diameter classes > 5" DBH, there was a significant increase of almost 100 Norway maples in the 0-5" diameter class.
- Loss of 3 hickories > 10" DBH.
- Increases of regeneration in the understory were observed with basswood, black cherry, hackberry, catalpa and Norway maple.

Koval Woods (1.66 acres)

Koval Woods is a natural area with the second highest canopy cover of all Village parks at 93%. The park is located off Edge Hill Drive and Wood Lane adjacent to McKenna Park. Koval Woods acts as an extension to nine single family homes. There is a small trail that cuts through the park, providing a second access point from Wood Lane.

Koval Woods is unique in that the area has never been logged. Oak wilt has historically spread from Eagle Heights Woods into Koval Woods since 2001. Despite precautions such as trenching and fungicide injections, the classic old growth characteristics of the woods have dramatically changed over the last two decades.

Park Summary

Koval Woods is the only park where shagbark hickory comprises a significant component of the tree canopy. Out of 34 total shagbark hickories, 15 trees were over 10" DBH. Although there was evidence of some hickory plantings, it appears that the majority of the smaller diameter trees were established through natural regeneration. The largest hickory was 33" DBH, a tree that is now likely approaching 250 years old.

The overstory is dominated by red oak, white oak, and black walnut. There were a total of 53 oaks in the park, about half white and half red. Most of the oaks were in good condition, although there were two large oaks (one a heritage oak) that had recently died and several other large oaks that had died within the last 10 years. Within the last 10 years, the Village removed a significant portion of the invasives to preserve the existing oak component. This past management activity created large canopy gaps, likely resulting in the abundance of dogwood and black cherry, which establish quickly in forest openings.

Management Recommendations

- Although the majority of Norway maples have been removed, 3 remain that are greater than 5" DBH, and there is natural regeneration occurring in several areas. It is recommended that these be removed.
- Consider removing some of the native hackberry or elm species that are encroaching on the oak canopies to help preserve the historic and rare habitat Koval Woods is providing.
- Remove the observed small population of highly invasive Japanese knotweed.
- Given the history of oak wilt in Koval Woods, continue monitoring for future outbreaks.
- Given the rarity of shagbark stands, protect the younger cohort of hickories until they are clearly established. Protection strategies include caging saplings, and removing competing tree species from established trees.

Tree Conditions/Composition

- A total of 474 trees and 5 shrubs were inventoried in Koval Woods.
- The most common trees observed were black cherry (76) and boxelder (34), although almost all of these were < 5" DBH.
- The canopy dominant species by percent leaf area were white oak (31%) followed closely by red oak (28.4%) and then shagbark hickory (15.8%).
- Koval Woods contains 27 unique tree species represented by 21 genera.
- 93.1% of the trees in the park were in good condition, 4.6% in fair condition, 1.9% in poor condition, and 0.4% were dead. There were 5 mature oaks listed in fair condition. Most of the trees listed as fair or poor condition were boxelder.
- Existing canopy cover of 93% represents a decrease of 2% since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
White oak	5.2	31.0	36.2
Alternatleaf dogwood	34.4	0.8	35.3
Northern red oak	5.8	28.4	34.3
Shagbark hickory	7.1	15.8	22.9
Black cherry	15.9	6.6	22.5
Boxelder	7.1	1.8	8.9
Hackberry	5.6	3.1	8.8
Black walnut	2.3	6.1	8.4
Elm species	3.3	1.4	4.8
Norway maple	2.9	0.9	3.8

2012-2023 Inventory Change Highlights

- Emerald ash borer caused significant decreases in ash across all diameter classes.
- Loss of 5 mature red oaks.
- Loss of 6 mature white oaks.
- Large increases of regeneration of black cherry, box elder, hackberry, and hickory in the understory.

Post Farm Park (7.75 acres)

Post Farm Park was a historic farm was purchased by the Village in 1968. It is by far the most popular and intensively utilized park in the Village because of its central location, bike trail access, tennis courts, the Shorewood Hills Pool, a natural playground, picnic tables and benches, and a large community garden. The park is accessed from either Purdue Street on its west end, or from the bike trail on the west, east, and north sides of the park. The park is composed of parking areas, three tennis courts, a pool and pool house, a manicured landscape, community gardens, and a natural area with a closed canopy in the northeast corner of the park.

Park Summary

The park's natural area is characterized by canopy primarily dominated by mature walnut, hackberry, and elm species. Post Farm Park is one of two Village parks where naturally occurring red cedar is found, indicative of a past disturbance event.

There are several heritage bur oak trees near the pool and tennis courts. Significant spongy moth egg masses were identified on several of the heritage oaks. Given the significance of these trees and their importance and visibility to the community, it is recommended that all potential treatment efforts be explored. There is one large American elm in poor condition along the bike path that should be monitored for Dutch elm disease.

A large Madison Metropolitan Sewerage District project to replace storm water lines is scheduled for the fall of 2024. This project will result in the replacement of nearly all trees along the bike trail in between the pool and the railroad tracks. Of particular note is one heritage swamp white oak along the path that the Village has been actively advocating for MMSD to preserve by altering its boring path.

Management Recommendations

- Monitor for spongy moth.
- Monitor/diagnose the large American elm for Dutch elm disease.
- Preserve and protect heritage oaks.

Tree Conditions/Composition

- In total there were 663 trees and 23 shrubs inventoried.
- The most common trees in the park were northern white cedar (195), hackberry (86), and elm (72).
- The canopy dominant species by percent leaf area were hackberry (19%) and black walnut (14.2%).
- Post Farm Park has by far the most diversity of any Village park, with 67 unique tree species from 42 genera. The abundance of diversity stems from the fact that most of the

park is manicured and has a long history of tree plantings. The abundance of species is particularly observable along the bike trail.

- 91.8 % of the trees inventoried were found to be in good condition, 6.7% in fair condition, 1.2% in poor condition, and 0.3% were dead. Notable trees in fair condition include 5 northern pin oaks, 1 swamp white oak and 1 bur oak. In total there were 8 trees in poor condition including a 17.5” cottonwood, a <5” DBH swamp white oak, and a large American elm.
- In eastern portion of the park’s natural area, the dominant vegetation is characterized by large black walnuts and co-dominant hackberry and elm species.
- There are only 7 bur oaks, representing just 1% of the tree population in the park. However, several of these bur oaks are heritage trees and in total represent a disproportional 7.1% of the total park leaf area.
- Existing canopy cover of 45% represents an increase of 4% since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
Northern white cedar	28.4	4.3	32.7
Hackberry	12.5	19.0	31.5
Elm species	10.5	8.6	19.1
Black walnut	3.9	14.2	18.1
Bur oak	1.0	7.1	8.1
White spruce	3.4	3.5	6.8
Eastern red cedar	4.8	1.5	6.3
Eastern cottonwood	1.0	5.1	6.1
Silver maple	0.7	4.2	5.0
Northern pin oak	1.2	2.4	3.5

2012-2023 Inventory Change Highlights

- Loss of 34 mulberry trees resulting from Village management activities.
- In the natural area of the park, there were large increases of regenerating elm, hackberry, and red cedar.
- Overall, the natural area composition remained relatively stable over the 10-year period.
- In the manicured portion of the park, there was an increase of over 140 northern white cedars, planted as hedges primarily along the bike path and pool.
- Loss of 8 Norway maples.

Shorewood Hills Marina (4.34 acres)

The Shorewood Hills Marina represents one of the larger parks in the Village at just over four acres. It is a natural area, with a closed canopy with the exception of the access road and temporary parking areas. The Marina is accessed from Lake Mendota Drive, adjacent to the Blackhawk Country Club.

The Marina is differentiated from other parks within the Village in that there is generally very little active forest management taking place. The park offers dock access for boaters but is generally not utilized as a recreational area as there are no picnic tables or trails and limited public access outside of Marina members. The Marina is one of three Village parks that offers lake access and the only park where there is a public dock for motorized boat craft.

Park Summary

Similar to other Village parks adjacent to Lake Mendota, the Marina is characterized by a more mesic composition heavily dominated by basswood. There is also a significant component of silver maple and walnut in the canopy. Six red oaks were inventoried, all of which were above 14" DBH, along with one heritage red oak with a DBH of 40.3" DBH. Because this park has been a lower priority for active forest management, it is not surprising to see a relatively high abundance of European buckthorn.

Management Recommendations

- Implement erosion control on steep north facing slopes leading down to the lake, eliminate buckthorn.
- Implement protection measures to preserve the heritage red oak.

Tree Conditions/Composition

- A total of 400 trees and 125 shrubs were inventoried.
- The most common trees were basswood (125) and boxelder (65). Basswood was found in all diameter classes.
- The most common shrub was buckthorn (62).
- The canopy dominant species by percent leaf area were American basswood (47.6%) and black walnut (10.3%).
- There were 23 unique tree species representing 16 different genera.
- 95.6% of the inventoried trees were classified as in good condition, 1.7% in fair condition, 2.3% in poor condition, and 0.4% were dead. Observed large, dead trees included a 35.7" white oak and a 22.5" shagbark hickory.
- Existing canopy cover of 60% represents a 1% decrease since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
American basswood	23.8	47.6	71.4
Boxelder	12.4	2.3	14.7
Black walnut	3.0	10.3	13.3
European buckthorn	11.8	0.6	12.4
Common chokecherry	11.0	0.3	11.3
Silver maple	1.1	9.8	10.9
Black cherry	7.6	1.0	8.7
White oak	1.0	5.5	6.4
Elm species	4.4	2.0	6.4
Northern red oak	1.1	4.3	5.5

2012-2023 Inventory Change Highlights

- Loss of 12 boxelders in the 10-20" DBH.
- Loss of 13 basswoods > 30" DBH. The decrease of large basswoods is likely due to the large trees reaching the end of their natural life span.
- Large regeneration increases were observed for ash, basswood, elm, hackberry, black cherry, Norway maple, and box elder.
- Loss of 7 red/bur oaks at various diameter ranges.
- Addition of 12 white cedar as part of a hedge row planting.

William Kaeser Woods (1 acre)

William Kaeser Woods is a natural area with a canopy cover of 96%, the highest of all Village parks. This lesser-known park is accessed from Oak Way. Although there is signage and several unmarked foot trails, there are no parking areas or established recreation facilities. The park is characterized by a rocky ridge following the road with a steep drop off. Similar to other parks in the village, the park acts as an extension to several single-family home backyards.

Park Summary

Kaeser Woods is a classic oak woodland, the only Village park/natural area that is dominated by primarily white oak. Notably, there were dominant 39 white oaks and 8 bur oaks, almost all of which were between 10-20" DBH. More than half of the black locust population is either in fair or poor condition; it is likely the black locust trees are reaching the end of their life span or being shaded out by competing vegetation.

Management Recommendations

- If the village desires to preserve the oak component of this park it is recommended to remove naturally occurring regeneration underneath and adjacent to specific high value oaks. The more shade tolerant species such as hackberry, elm, locust, cherry and Norway maple will eventually out compete the shade intolerant oaks.
- Monitor and protect shagbark hickory regeneration from deer browsing, and other smaller mammals who will girdle the stem of the smaller trees through caging and staking of the trees.

Tree Conditions/Composition

- There was a total of 357 trees and 61 shrubs included in the inventory.
- The most common tree species were hackberry (117) and black locust (41).
- The canopy dominant species by percent leaf area were white oak (35%), black locust (18.8%) and hackberry (17.2%).
- Kaeser Woods contains 18 unique tree species representing 15 genera.
- 88.3% of trees inventoried were identified as in good condition, 5.5% fair, 5.5% poor, and 0.7% were dead. There was a high number (46) of trees in either fair or poor condition, 25 of which were either black locust or Norway maple and 6 that were either white or bur oak. The one dead white oak observed had a DBH of 14.1".
- Existing canopy cover of 96% represents a decrease of 2% since 2010.

i-Tree, percent population, percent leaf area, and importance value for 10 most common species.

Species Name	Percent Population	Percent Leaf Area	Importance Value (IV) (Percent Population + Percent Leaf Area)
Hackberry	28.0	17.2	45.2
White oak	9.3	35.0	44.3
Black locust	9.8	18.8	28.6
Common chokecherry	14.1	0.3	14.4
Norway maple	7.7	5.8	13.4
Black cherry	8.1	3.3	11.4
Elm species	5.7	3.9	9.7
Bur oak	1.9	6.9	8.8
Alternate leaf dogwood	4.8	0.1	4.9
Eastern cottonwood	0.7	3.3	4.1

2012-2023 Inventory Change Highlights

- The most significant changes in canopy since the 2012 inventory occurred within the white oak population, which saw a decrease of 15 trees. This decrease affected white oaks of all diameter ranges.
- Loss of 12 boxelders of all diameter classes. In 2022, there were no boxelders observed.
- Additional decreases in black locust and Norway maples can be seen since the last inventory with, due to intentional Village management activity and natural decline.
- A large increase in the younger cohort of the hackberry, black cherry, and elm populations. This shift is partially the result of gaps created in the canopy by past management activity removing boxelders, Norway maples, and black locusts.

Viburnum Triangle

The Viburnum Triangle is located at the intersection of Viburnum Drive and Sunset Drive adjacent to the back entrance of Four Corners Park.

Tree Conditions/Composition

- A total of 30 trees were inventoried.
- Most common species include Norway maple (22) followed by catalpa (6). Norway maples spread evenly among all diameter classes.
- The canopy dominant species is Norway maple.
- Viburnum Triangle includes 4 species representing 4 genera.
- 2 Norway maples were in poor condition, 2 Norway maples were in fair condition, and 1 catalpa was in fair condition. All other trees were identified to be in good condition.

Management Recommendations

- Remove and replace the dominant exotic Norway maples with native tree species.

Bowdoin Triangle

The Bowdoin Triangle is just north of Shorewood Hills Elementary School and west of the school tennis courts between Shorewood Boulevard, Amherst Drive and Bowdin Road.

Tree Conditions/Composition

- The very small island triangle contains just 14 trees.
- The two very large green ash trees (>30" DBH) are a rare observation.
- There are also two very large honey locusts and two large tamarack all > 20" DBH.
- A large tamarack and a large white spruce were listed as fair condition.

Management Recommendations

- Continue protecting the ash trees from emerald ash borer.

Management Goals and Implementation

The Village of Shorewood Hills offers an exemplary model of urban forestry, with all the attendant benefits and challenges. The community recognizes that it continues to be at a critical stage in managing and protecting its aging community forest and will strive to maintain and protect the health and vigor of its existing trees. At the same time, it will work to ensure that a diverse, resilient, and attractive urban canopy thrives into the future through the planting and nurturing of new trees.

The goal of the Forestry and Parks Department is to maintain a robust urban tree canopy and to preserve the beauty and ecological vitality of the Village's parks and public green spaces. The Department works to improve the safety, health, and resilience of the Village tree population; to minimize the presence of noxious weeds and woody invasives in the Village; and to promote awareness and involvement of the public in the care and maintenance of trees.

Manage Trees for Public Safety

The Village of Shorewood Hills has an active policy to maintain the safety of the public from potentially hazardous trees. The Village will strive to reduce, in a timely fashion, the potential of harm from any tree deemed high-risk. When the available fiscal and human resources limit the ability of the Village to remove high-risk trees, priority shall be placed on trees deemed to carry the highest risk. An annual survey of existing trees in high traffic areas should assess risk priorities. Based on this survey, the Village should

- Remove high risk trees
- Prune high risk trees
- Remove Stumps
- Evaluate Street Vegetation

Optimize Tree Planting Program

- **Ensure adequate replanting of street and park trees.** Tree planting should prioritize replacement of trees lost within the past year and the tree planting locations noted in the inventory. Particular attention should be paid to recent removals associated with utility projects and along University Ave.
- **Maintain diversity of tree species to promote canopy resilience.** The Village has a remarkably diverse canopy; this should be maintained with trees that are predominately native species, but also those that show high success rates in urban area.

Tree Monitoring

- **Update GIS Inventory-** As trees are removed or planted, the inventory should be also updated with the changes recorded minimally a list or table format. Ideally the GIS database will also be updated based on the capacity of the forester to do so.
- **Perform Yearly Tree Inspections-** It is important that all of the street and park trees in the City get a yearly inspection. Complete this inspection once with leaf cover and once without until the hazard has been eliminated or the situation resolved. Additionally, all large diameter trees need an extra inspection after storms. If any hazards are identified, the situations need to be corrected immediately, and then continue with the list of routine maintenance.
- **Evaluate for Risk.** During annual inspections. Trees should be evaluated for risk, using [ISA-Tree Risk Assessment Standards](#). The map below show trees that were rated with poor health and should be prioritized in subsequent assessments.

Staff Development

- **Training-** Continue Village employee training in proper tree care and management such as Wisconsin Community Tree Management Institute (WCTMI), Extension Landscape short course and urban forestry workshops as well as WAA workshops and conferences.
- **Professional Membership-** Hold at least one membership in International Society of Arboriculture (ISA) and Wisconsin Arborist Association (WAA) and have multiple employees attend WAA meetings
- **ISA Certification-** Encourage and support staff to obtain and maintain ISA Certified Arborist status.

Park Management

- Consider multiple ecological objectives: preserve the historic native ecosystem; support pollinators, birds, and wildlife; reduce erosion and water run-off; etc.
- There have been numerous heritage oak trees lost across just about all the Village parks over the last 10 years. To preserve the old growth oaks it is recommended to:

- Release oak trees from competing, more shade tolerant trees that are encroaching and growing in the understory.
- Monitor for spongy moth egg masses. [DNR spongy moth informational page](#).
- Monitor for oak wilt disease. [DNR oak wilt informational page](#).
- Currently healthy oaks in open areas can be maintained with mulching that extends to the drip line where possible and annual monitoring
- Air spading for open grown trees with buried root collars, or trees that experience significant compact can enhance growing conditions,
- Continue and expand oak plantings in the parks. Natural oak regeneration is not occurring in any of the parks. Newly planted trees should be protected from deer browse through staking and the installation of caging.
- Significant invasive tree species removals have occurred over the last decade, however as long as seed trees remain, invasive tree species continue to get established. Continue invasive tree species removals, seed trees and regeneration.
- Shagbark hickory regeneration is rare throughout the Village parks, where it occurs, protect regenerating stands.
- Continue removal efforts of undesirable non-native tree species such as Norway maple, black locust and mulberry.
- Continue removal efforts of undesirable non-native shrub species such as European buckthorn and honeysuckle.

Operational/Capital Expenses & Funding

	2024	2025	2026	2027	2028	2029	2030
Parks:Stormwater charge	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
Parks: Insurance-Liability	x	\$ 1,434	\$ 1,434	\$ 1,434	\$ 1,434	\$ 1,434	\$ 1,434
Parks: Insurance- Property	x	\$ 325	\$ 325	\$ 325	\$ 325	\$ 325	\$ 325
Parks:Salaries and Wages	\$ 30,261	\$ 29,920	\$ 29,920	\$ 29,920	\$ 29,920	\$ 29,920	\$ 29,920
Parks:Benefits	\$ 9,416	\$ 10,960	\$ 10,960	\$ 10,960	\$ 10,960	\$ 10,960	\$ 10,960
Parks:Contracted Services	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000
Parks: Information Technolo	\$ 2,200	\$ 4,000	\$ 4,000	\$ 4,000	\$ 4,000	\$ 4,000	\$ 4,000
Parks: Telephones	\$ 2,000	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500
Parks:Training	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000
Parks:Community Gardens	\$ 900	\$ 900	\$ 900	\$ 900	\$ 900	\$ 900	\$ 900
Parks:Operating Expenses	\$ 4,700	\$ 4,700	\$ 4,700	\$ 4,700	\$ 4,700	\$ 4,700	\$ 4,700
Parks: Projects	x	x	x	x	x	x	x
Parks: Fuel	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000
Forestry: Salaries and Wages	\$ 67,123	\$ 64,979	\$ 64,979	\$ 64,979	\$ 64,979	\$ 64,979	\$ 64,979
Forestry: Benefits	\$ 26,224	\$ 28,800	\$ 28,800	\$ 28,800	\$ 28,800	\$ 28,800	\$ 28,800
Parks: Reforestation	\$ 5,500	\$ 5,500	\$ 5,500	\$ 5,500	\$ 5,500	\$ 5,500	\$ 5,500
Parks: Plantings	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500	\$ 500
Parks: Tree Maintenance an	\$ 140,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 60,000	\$ 60,000

Cost Projections

Tree Removals- Assuming that the removal of trees rated as being in poor health is prioritized, then 53 trees are recommended for removal. Over the next 5 years, the estimated cost of removals based on their size is \$37,950. It is recommended that these removals be undertaken from 2025 to 2026.

DBH Range	Cost per Tree	# of Trees	Totals
1-6"	75	6	450
7-12"	300	12	3600
13-24"	750	18	13,500
25+"	1200	17	20,400
			\$37,950

Tree Planting- Tree planting needs are relatively low given the Village’s active planting program over the last 10 to 15 years and the high existing canopy coverage. However, tree planting should be sustained on annual basis. The costs below represent 15 trees per year.

Tree Size	Tree Cost	Labor & Equipment	# of Trees	Total
1.5"-2"	200	275	15	\$7,125

Routine Pruning- Regular street tree pruning currently follows a 5-year cycle, where all trees are es-visited every five years. It is recommended that this practice and frequency continue. A review of existing and recent invoices and contracted service payments will be the most precise estimate of future costs. The estimates below are based on tree size and assume that staff will complete pruning for trees that are less the 7 inches in diameter at breast height (DBH). The total cost should be divided over 5 years; resulting in a projected cost of \$62,460/year.

DBH Range	Cost per Tree	# of Trees	Totals
7-12"	125	432	54,000
13-24"	225	458	103,050
25+"	450	345	155,250
			\$312,300

Additional Resources

Staffing-The Forestry Department is staffed by the Village Forester, a full-time forestry assistant, and two seasonal laborers.

Program Administration-The forestry program is administered by the Village Forester. This position is 40 hours/week year-round. Please review the Forester/Horticulturist position description for more detail.

Equipment-The forestry department has access to the following equipment for forestry activities: pickup truck, chipper and chipper truck, 1-ton pickup with dump/box, bobcat, toolcat front end loader tractor, small UTV, 4 chainsaws, power pole saw, and water tank trailer, manual pole saw/pruner, handsaws, loppers, and pruners.

Public Awareness-The Forester administers public awareness through monthly public Forestry Reports to the Village Parks committee, public education workshops, and Arbor Day events. An active garden club and Parks Committee also make significant public awareness efforts.

Grants- As needed, The Forester applies for urban forestry grants through the Wisconsin DNR to help fund projects like conducting tree inventories, creating management plans, tree maintenance, and public and staff education.

Utility Lines- The majority of these public trees are found along the following streets: Lake Mendota Drive, Edgehill Parkway, Oxford Road, Columbia Road, Amherst Drive, Dartmouth Road, Sweetbriar Road, Wellesley Road, Colgate Road, Harvard Drive, Cornell Court, and University Bay Drive. Partnering/communication with MGE is essential for tree maintenance/work near energized lines. For Tree Maintenance Services/questions call MGE customer service line - 608-252-7000. Partnering with MGE on removals near lines is also a potential way to reduce costs.

Street Construction-The Village is currently experiencing a major street reconstruction program. Street trees are being evaluated thoroughly during these street reconstruction projects in order to determine whether removal is warranted. Extreme care is being taken to protect and preserve existing trees. However, if damage cannot be avoided and the damage could cause a tree to become unsafe, then the tree will be removed as part of the street project.

References

Abdollahi, K.K.; Ning, Z.H.; Appeaning, A., eds. 2000. Global climate change and the urban forest. Baton Rouge, LA: GCRCC and Franklin Press. 77 p.

Hirabayashi, S. 2012. i-Tree Eco Precipitation Interception Model Descriptions, [http://www.i-treetools.org/eco/resources/iTree Eco Precipitation Interception Model Descriptions V1 2.pdf](http://www.i-treetools.org/eco/resources/iTree_Eco_Precipitation_Interception_Model_Descriptions_V1_2.pdf)

Kovacs K., West G., Nowak D.J., Haight, R. 2022. Tree cover and property values in the United States: A national meta-analysis. Ecological Economics. v-197.

McPherson, E.G.; Simpson, J.R. 1999. Carbon dioxide reduction through urban forestry: guidelines for professional and volunteer tree planters. Gen. Tech. Rep. PSW-171. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 237 p.

Nowak, D.J.; Crane, D.E.; Dwyer, J.F. 2002a. Compensatory value of urban trees in the United States. Journal of Arboriculture. 28(4): 194 - 199.

Nowak, D.J.; Stevens, J.C.; Sisinni, S.M.; Luley, C.J. 2002c. Effects of urban tree management and species selection on atmospheric carbon dioxide. Journal of Arboriculture. 28(3): 113-122.

Nowak, D.J., Hirabayashi, S., Bodine, A., Greenfield E. 2014. Tree and forest effects on air quality and human health in the United States, Environmental Pollution, Volume 193

Saraev, V., O'Brien, L., Valatin, G. and Bursnell, M. 2021. Valuing the mental health benefits of woodlands. Research Report. Forest Research, Edinburgh i-iv + 1-32pp

Appendices

AP 1. - Street trees in poor health

AP 2. - Park tree species distribution by diameter in 2012 and 2023

AP 3. - Oak canopy cover over time by park

AP 4. - Pruning schedule

Relevant local ordinances – The Village of Shorewood Hills ordinances directly relating to the public trees are found in Chapter 19 of the Municipal General Ordinance. Subsections are as follows:

Chapter 19

TREES, SHRUBS AND COMMUNITY FORESTRY MANAGEMENT

19.01 Intent and Purpose

19.02 Definitions

19.03 Jurisdiction and Power to Regulate

19.04 Public Nuisance, Declaration, and Abatement

19.05 Planting of Trees and Shrubs on Public Property

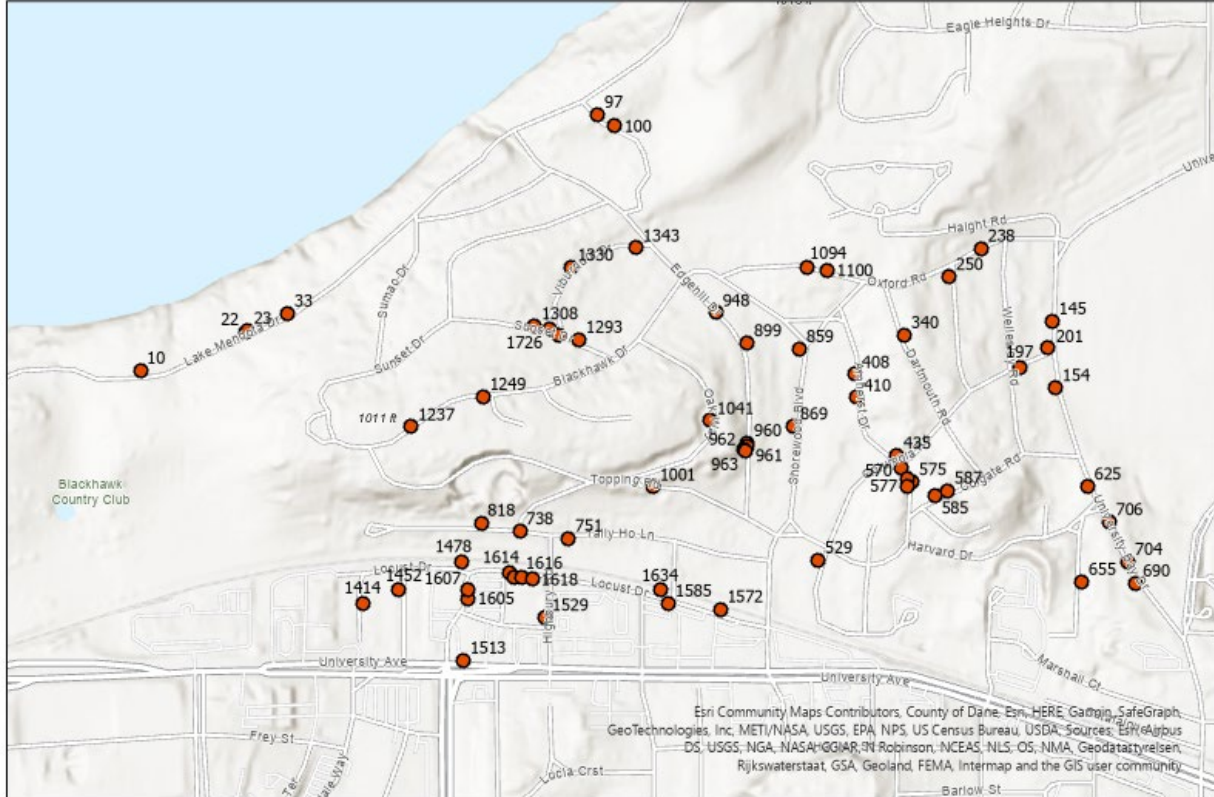
19.06 Removal, Pruning and Maintenance of Public Trees

19.07 Prohibited Acts Regarding Public Trees and Shrubs

19.08 Tree Protection during Construction

AP 1. – Street trees in poor health

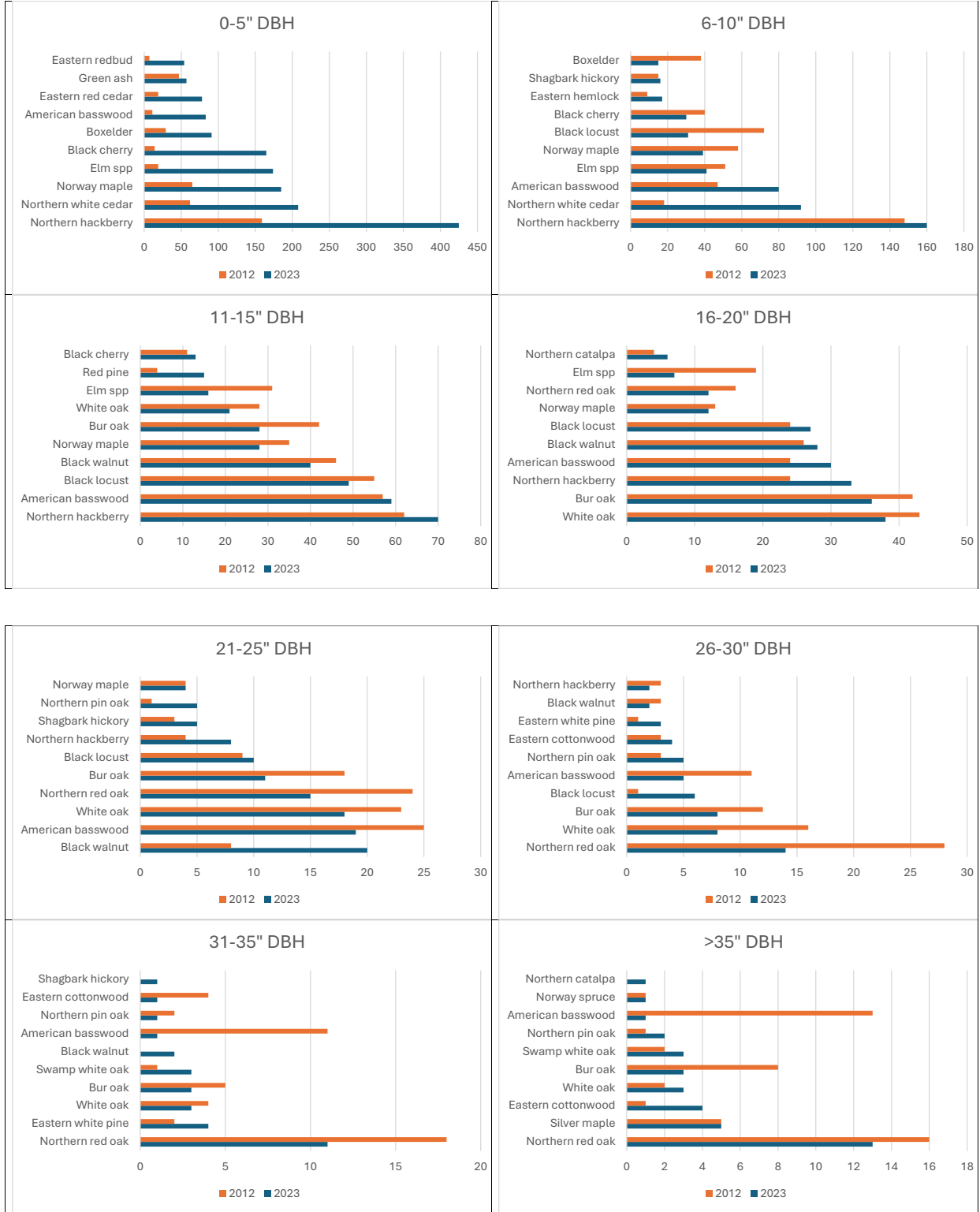
Trees in poor health are those that are likely to die within 5 years; they should be prioritized from removal over the next 5 years. Refer to page 17 for more information.



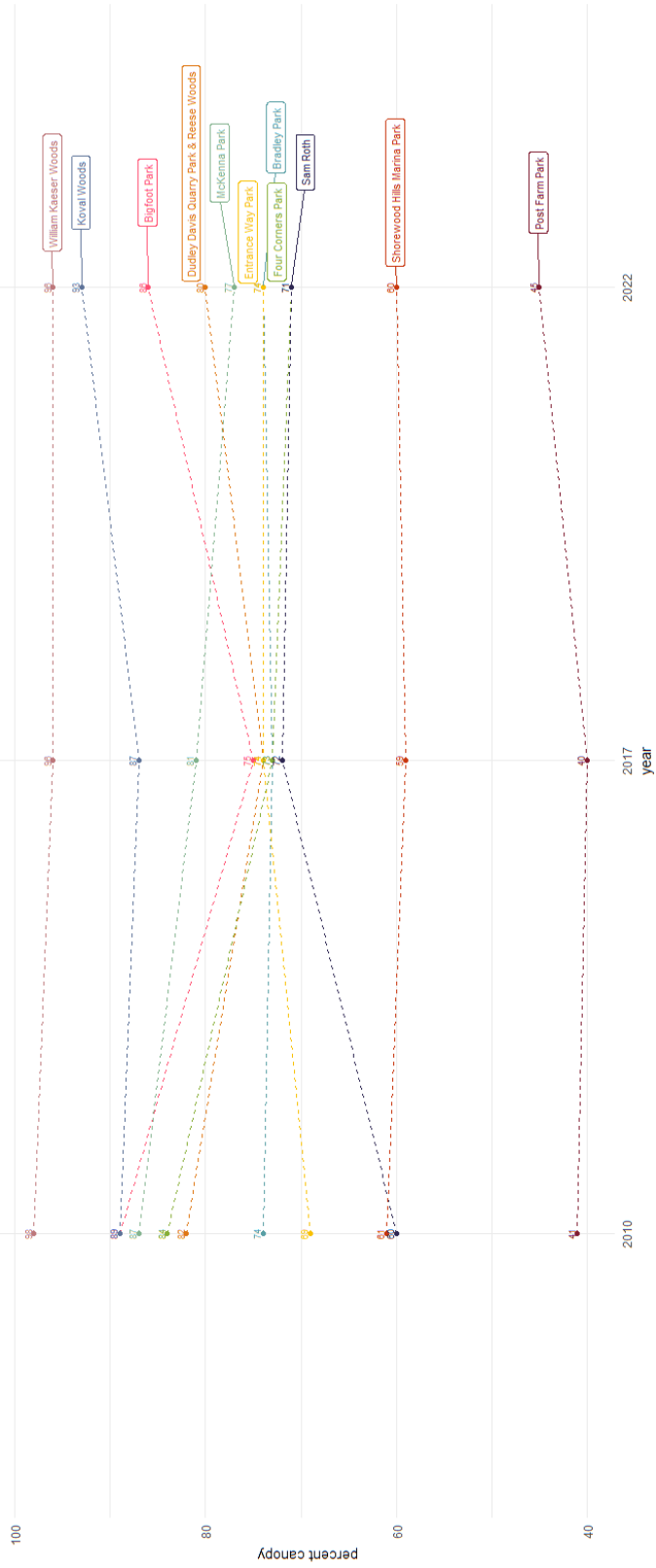
● Trees in poor health

0 0.07 0.15 0.3 Miles

AP 2. Park Tree species distribution by diameter in 2012 and 2023



AP 3. Oak canopy cover over time by park



AP 4. Pruning Schedule

Street trees should be on a 5 to 7 year pruning schedule. References pgs. 21-25 for more information.

SHOREWOOD PRUNING SCHEDULE															
	2025	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Link to Streets Map															
Amherst Drive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amherst Street	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beloit Court	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blackhawk Drive	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bowdoin Road	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bruce Court	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Burbank Place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Circle Close	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colgate Road	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Columbia Road	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cornell Court	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crestwood Drive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Dartmouth Road	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Edgehill Drive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Edgehill Parkway	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Harvard Drive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Highbury Road	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lake Mendota Drive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Locust Drive	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maple Terrace	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oak Way	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overlook Terrace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oxford Road	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Purdue Street	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shorewood Boulevard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sumac Drive	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sunset Drive	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Swarthmore Court	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sweetbriar Road	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tally Ho Lane	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Topping Road	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
University Avenue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University Bay Drive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Viburnum Drive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wellesley Road	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wood Lane	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Yale Road	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>