



URBAN FOREST HEALTH

A Survey of the Walnut Creek Neighborhood

ABSTRACT

Working with community members to identify the unique assets, challenges, and opportunities found in our neighborhood urban forests.

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Executive Summary

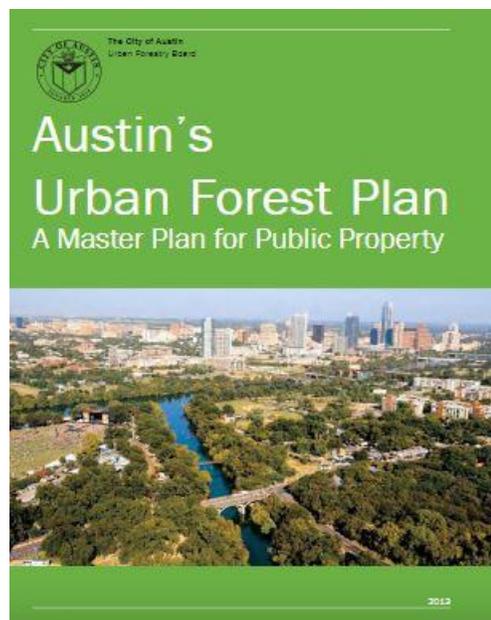
As urban populations continue to grow, it is increasingly important that the environment where people live provide the full potential of ecosystem service benefits for both natural resource conservation and public health. The Urban Forestry Program has piloted a neighborhood urban forest health survey to provide information and recommendations that may increase resilience of the urban forest ecosystem at the neighborhood scale.

Increasing the resilience of urban forest ecosystems throughout our community will help them withstand challenges including insect and disease pressures, climactic variability, water scarcity, urban heat island, invasive species, and other stresses. Indicators of urban forest resilience include tree age and species diversity, percent canopy cover, wildfire potential, the presence

of species that are well suited to the environment and cared for according to the best practices in arboriculture, healthy soil, and an urban forest ecosystem that is valued by the community.

This pilot survey reflects the unique characteristics of the Walnut Creek Neighborhood. Data collection, recommendations, and implementation strategies are customized to complement the unique character of the neighborhood and encourage community involvement and ownership in data collection, delivery of findings, and next steps. Findings are partially based on factors which people have little control over including lot size and percent impervious cover, and partially based on tree planting and care practices, which community members have greater control and discretion. This survey process seeks to increase community members' stewardship of and personal connection to the natural ecosystem to increase urban forest ecosystem resilience within our sphere of influence.

The City of Austin is committed to maintaining and enhancing the health of the urban forest to provide shade, air and water quality benefits, and urban heat island mitigation throughout Austin. These and other benefits contribute to public safety, public health, natural resource conservation, neighborhood character, and other attributes that enhance the quality of life for community members. Promoting strategies to increase urban forest ecosystem resilience aligns with priorities and recommendations identified in the Austin Strategic Direction 2023, Imagine Austin Comprehensive Plan, Austin's Urban Forest Plan, and Austin City Council's Climate Resolution 20131121-060.



Walnut Creek Neighborhood Summary + Key Recommendations

On August 9 and 30, 2018 a team from the City of Austin Community Tree Preservation Division assessed the urban forest in the Walnut Creek Neighborhood in north Austin. The area is defined by I35 to the east, Lamar Boulevard to the west, Braker Lane to the south, and the Walnut Creek Greenbelt to the north. The community was built in the 1950's and at 46%, has a relatively high tree canopy cover compared to the Austin average of 31%¹. Most mature trees are live oak, pecan, and cedar elm. Young trees planted in the last 10 years are helping to increase species age and diversity, two of the primary factors that contribute to urban forest resilience.

Walnut Creek Neighborhood is adjacent to Walnut Creek and the Walnut Creek Greenbelt.

Proximity to these environmental and recreational features is an amenity but also contributes to elevated flood and wildfire potential. The area has low to moderate slopes and both natural and constructed drainage features with dense vegetation. Walnut Creek falls within the Blackland Prairie soil type which is characterized by deep, fertile, and alkaline soils.

Neighborhood goals include maintaining tree canopy cover, improving urban forest resilience, and increasing general knowledge of tree species, their benefits and how to care for them. They have groups and initiatives that are committed to improving the health and welfare of the community and stewardship of the environment including:

- Walnut Creek Neighborhood Association
- Communication via NextDoor, FaceBook and Yahoo Group
- Bimonthly print newsletter mailed to each address
- Adopt-a-Park & Adopt a Creek groups

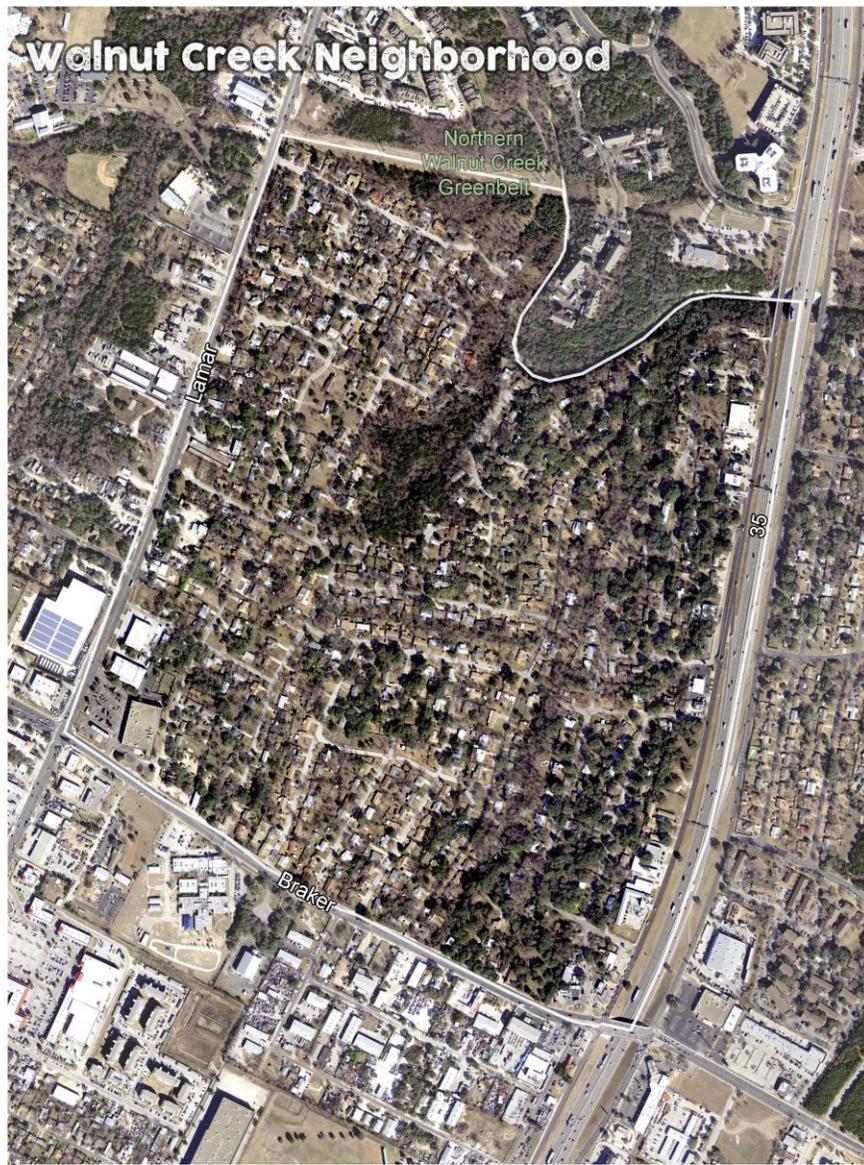


Figure 1. Residential Street in Walnut Creek Neighborhood.

¹ Source: Austin's Urban Forest 2014

KEY RECOMMENDATIONS TO INCREASE URBAN FOREST RESILIENCE

- Plant diverse tree species at regular intervals in available planting areas.
- Work with International Society of Arboriculture (ISA) Certified Arborists to identify pruning needs for young, middle-aged and mature trees. Longevity and safety of trees may increase with pruning.
- Maintain 3 inches of mulch around the root zone of all trees to improve soil conditions.
- Water the root zone deeply if it hasn't rained at least 1" in a one-month period.
- Maintain annual education efforts to promote general tree care tips, planting recommendations, information about oak wilt, emerald ash borer, and the importance of working with ISA Certified Arborists.



Map 1. Location of Walnut Creek Neighborhood.

Species Composition + Age Distribution

Approximately 70% of the trees in Walnut Creek are mature (25 years and older), approximately 20% are young (planted in the last ten years), and 10% are middle-aged (10-25 years old). Ideally, an urban forest has a more even distribution of mature, middle-aged and young trees because as mature trees age and decline they need to be replaced by younger trees. In urban communities we often need to facilitate succession by removing aging or declining trees and establishing new trees through planting or by allowing natural regeneration.

The majority of trees in Walnut Creek are mature therefore new tree planting, structural pruning of young and middle-aged trees, and canopy restoration or preservation of mature trees are important goals to maintain canopy into the future. Mature trees can offer an important benefit for nearby young trees; mature trees may act as a buffer during the establishment period to environmental challenges such as drought and high temperatures.

Mature, large stature trees provide significantly greater benefits to the community and the environment than small trees, these are called ecosystem services. All trees should be maintained according to the best practices in tree care so that they have the potential to reach their ultimate size and live for as long as they are healthy and safe. The longer our community has large mature trees, the more we benefit from their ecosystem services including storm water interception, carbon storage, particulate matter filtering, ambient air temperature reduction, energy savings, and property value contributions. To learn more about the ecosystem services of your tree visit: <https://mytree.itreetools.org/>.

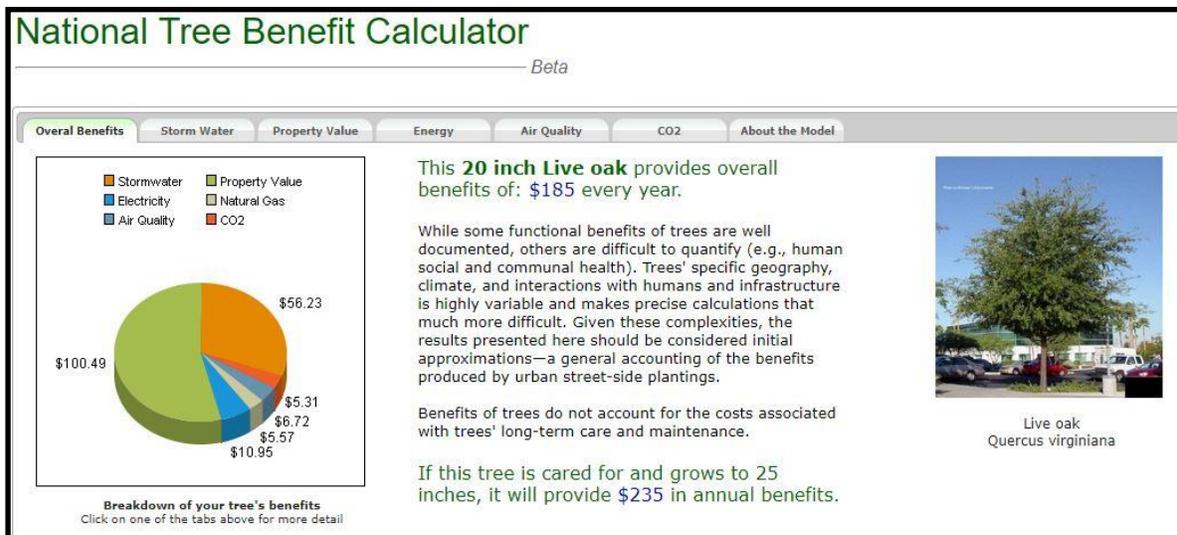


Figure 2. Ecosystem Service Calculator.

The ten most frequently occurring tree species are listed below and in Table 1.

1. Live oak
2. Pecan
3. Cedar elm
4. Crape myrtle
5. Hackberry
6. Shumard oak
7. Bur oak
8. Texas mountain laurel
9. Ash
10. Sycamore

This is similar to species diversity throughout Austin. Thirty-two additional species were observed in the Walnut Creek Neighborhood. Most of the oldest trees in the neighborhood are live oak, pecan, cedar elm, and mountain laurel.

Mature sycamore, red oak, and American elm are also present. Younger tree species include more representatives from the white oak group including bur oak, chinquapin oak, and Monterrey oak. These oak species are especially important for species diversity because they are less likely to become infected with oak wilt than live oak and red oak trees.

Mature Durand oaks are present in the northern area of the neighborhood, these are relatively uncommon in Austin landscapes, difficult to find at plant nurseries, and they are resistant to oak wilt. The lots where these trees occur would be good candidates for natural regeneration techniques (exclude an area from mowing and allow tree seeds to germinate and grow).

Mature trees and young trees have different management needs. Consult with an ISA Certified Arborist to determine what is recommended for your trees and see the “Plant Health Care” and “Recommendations” section for more information about mature vs. young tree maintenance and care.

Recommendations:

- Increase age and species diversity by planting trees at regular intervals throughout the neighborhood. A short list of recommended trees is listed in Appendix A (page 26).
- Planting guidelines available at: <http://texastreeplanting.tamu.edu/index.html>.
- Inform community about host specific pathogens like oak wilt and emerald ash borer.
- Look for opportunities to allow natural regeneration of trees to occur.
- Free tree resources at <https://www.treefolks.org/free-trees/>.



Figure 2. Durand oak, *Quercus sinuata*

Table 1. Sample of Trees Species, Percentage of Tree Canopy and Suitability for Planting in the Walnut Creek Neighborhood.

Large Trees	% of Canopy	Planting Suitability*	Medium Trees	% of Canopy	Planting Suitability*	Small Trees	% of Canopy	Planting Suitability*
Live oak	22	M	Crape myrtle	10	L	Mt laurel	3	H
Pecan	13	L	Bradford pear	2	L	Tx redbud	1	H
Elm cedar	11	L	Ashe juniper	1	M	Loquat	1	M
Hackberry	7	L	Ligustrum***	1	N/A	Vitex***	1	L
Shumard oak	6	M	Mulberry	<1	M	Palo verde	<1	H
Bur oak	6	H	Ch tallow***	<1	N/A	Mx plum	<1	H
Ash spp.**	2	L	Eastern redcedar	<1	M	Eve's necklace	<1	H
Sycamore	2	M	Honey mesquite	<1	H	Fig spp.	<1	H
Chinquapin oak	2	H	Red maple^	<1	N/A	Peach spp.	<1	M
Southern magnolia	1	L	Lacey oak	<1	H	Desert willow	<1	H
Durand oak	1	H	Chinese pistache***	<1	N/A	Yaupon holly	<1	M
Cottonwood	1	M						
American elm	<1	M						
Black walnut	<1	H						
Boxelder	<1	L						
Southern catalpa	<1	L						
Chinaberry***	<1	L						
Lacebark elm	<1	M						
Monterrey oak	<1	H						
Sweetgum	<1	M						

*High, Medium and Low Scale

**Not recommended for planting due to Emerald Ash Borer

***Not recommended due to exotic, invasive status or potential

^Not recommended for our soil type

Canopy Cover

The City of Austin overall tree canopy cover is 31%. Walnut Creek Neighborhood tree canopy cover is 46%, which is relatively high; this is largely due to the high percentage of mature trees which have broad crown areas. Maintaining tree canopy cover is an important goal to reduce ambient air temperature, provide shade, filter particulate matter from the air, filter and slow storm water, contribute to property value, and support quality of life in the community. Approximately 70% of the trees are mature. To maintain 46% tree canopy, mature and middle aged trees need to be well cared for according to the best practices in tree care and new trees need to be established to replace aging canopy. They may be planted, or allowed to germinate naturally from seed.

Geographic Information Analysis was used to identify 75 acres of potential planting space within the neighborhood (areas with no impervious cover or existing tree canopy). Assuming that all of these areas are suitable for planting, Walnut Creek Neighborhood could plant 200 trees per year for the next 10 years to fill all of the potential 75 acres of available planting spaces, increase age and species diversity, and replace aging tree canopy.

Recommendations:

- Help mature trees weather challenges by investing in their longevity: mulch and water as needed and have trees regularly inspected by a Certified Arborist.
- Continue planting trees in available planting spaces or allow natural regeneration to occur to recruit young trees that will replace aging canopy.
- Free tree resources at <https://www.treefolks.org/free-trees/>.



Map 2. Walnut Creek Neighborhood has 46% Tree Canopy Cover.

Urban Heat Island Effect (Hot Spots)

The urban heat island effect occurs when an urban area experiences warmer temperature than surrounding rural areas. This is due to urban materials like pavement and buildings retaining more heat. Also, more vegetation is often found in rural areas. Vegetation moves water through the air acting as nature's air conditioner. Neighborhood temperatures benefit greatly from Walnut Creek, its natural channel tributaries, and riparian vegetative growth that moderate temperatures.

Walnut Creek Neighborhood's temperature gradient is similar to neighborhoods throughout Austin: the residential areas show mild temperatures with pockets of warmer temperatures occurring at higher land use areas, notably the commercial uses to the south. Trees and other vegetation provide a local cooling effect; by identifying a neighborhood's hot and cool spots you can plant vegetation, convert impervious cover to pervious, and implement other practices to regulate temperatures.

Recommendations:

- Explore planting opportunities to increase vegetation near hot spots shown in Map 3.
- Consider strategies to increase the reflectance potential of roof and building materials.
- Learn more at: <http://www.austintexas.gov/urban-heat>.



Map 3. Land Surface Temperature in Walnut Creek Neighborhood.

Water Quality + Flood Potential

The Walnut Creek Neighborhood is adjacent to Walnut Creek, one of the larger and healthier creeks in Austin. With huge limestone bluffs, perennial clear flow, good water quality, and greenbelt and trail access, Walnut Creek is one of Austin's best water resources. The City of Austin routinely monitors water quality in this section of [Walnut Creek](#), and it consistently scores in the Good or Very Good category in the [Environmental Integrity Index](#). However, E. Coli bacteria levels can become elevated, especially after rain events and in the summer when creek flow is traditionally low, making swimming risky during these times.

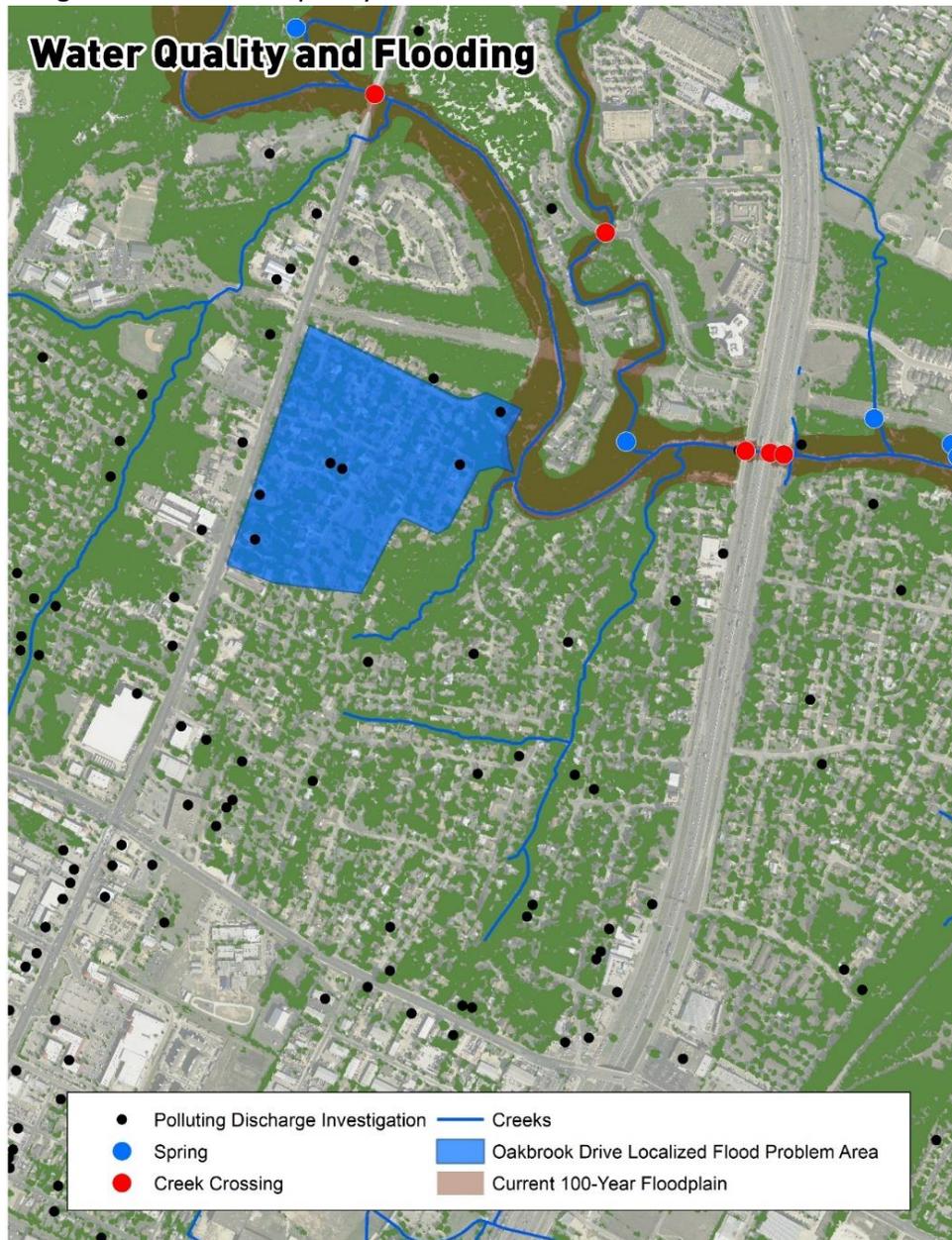
This high degree of ecological health is partly due to a healthy riparian zone comprised of mature trees and vegetation, which help clean and slow storm water runoff before it gets to the creek. The riparian buffer reduces erosion by stabilizing bank soils, while also providing habitat and shade to support plant and animal life. The tributaries that run down the middle of the neighborhood include springs that keep those areas wet and cool. Notice that on the Land Surface Temperature map (page 13) the coolest places are along Walnut Creek and its tributaries.

Walnut Creek's 100-year floodplain is largely undeveloped near the Walnut Creek Neighborhood, with few structures located in the mapped 100-year floodplain. There are several nearby roadways which cross the creek (red dots on the map on page 13); however, floodplain modeling indicates that only the Lamar crossing is expected to flood during intense storms. A new study called Atlas 14 will alter floodplains to reflect updated rainfall data. We expect the future 100-year floodplain to closely mimic the current 500-year floodplain. While the floodplain elevation will increase because of Atlas 14, the land area to be added to the floodplain in the Walnut Creek neighborhood is not significant due to the steep topography of Walnut Creek.

"Localized flooding" occurs away from creeks and is generally due to undersized or nonexistent storm sewer pipes, inlets, ditches, and culverts that make up the drainage system. Because the Walnut Creek Neighborhood was largely built prior to the implementation of drainage criteria in 1977, much of the infrastructure may be undersized. The Oakbrook Drive area in blue on the Water Quality and Flooding map (page 13) is as a localized flooding problem area.

Recommendations:

- Determine if your home is in a mapped floodplain: www.ATXFloodPro.com
- Find more information about Atlas 14 at: <http://austintexas.gov/atlas14>
- Learn about Walnut Creek at: <http://www.austintexas.gov/blog/walnut-creek>
- A portion of Walnut Creek is adopted by TCEQ. Learn more at: <https://keepaustinbeautiful.org/programs/adopt-a-creek/>
- Call 3-1-1 to report flooding, erosion, and other drainage problems.
- Call the City of Austin 24-Hour Pollution Hotline at 512-974-2550 to report a polluting discharge or other water quality concern.



Map 4. Water Quality and Flooding Concerns in Walnut Creek Neighborhood.

Oak Wilt

Oak wilt is an often fatal fungal disease that predominantly infects live oak and red oak trees. The Walnut Creek Neighborhood has a long history of oak wilt infection areas, City of Austin observations date back to 2001 (Map 5. Oak Wilt Symptoms Observed in Walnut Creek). During the 2018 Forest Health Survey no active disease movement was observed. Several trees that had previously documented appeared in poor health, which may be due to ongoing oak wilt infection. Additional areas may have oak wilt but were not reported to the City of Austin.



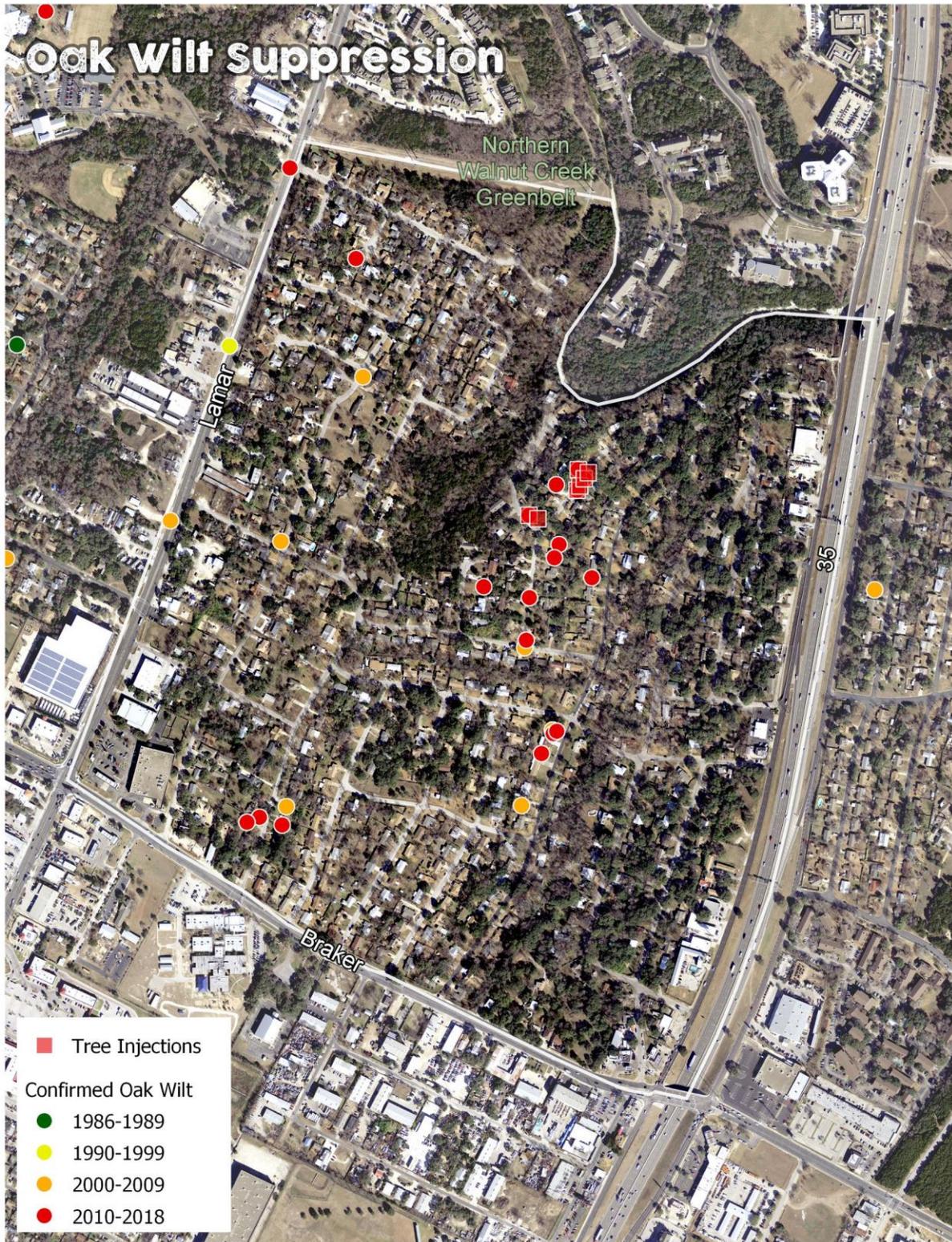
Figure 3. Oak leaf with veinal necrosis, a symptom of oak wilt.

Most oak wilt infections occur when the fungus moves between oak trees via underground root graft connections. The other method of spread is when a fungal spore spreads from an infected red oak fungal mat by a beetle, to a fresh wound or pruning cut. If a red oak tree is infected with oak wilt then we strongly encourage prompt removal since they may produce a fungal mat in the spring, which increases the airborne spread potential. The Texas Forest Service has a cost share program to help defray the cost of red oak removal and limit the potential spread of oak wilt. Oak wilt symptoms in red oaks are similar in appearance to Bacterial Leaf Scorch (page 23) and drought; an ISA Certified Arborist or lab analysis can confirm diagnosis.

Oak wilt cannot be cured by injection, only suppressed. There may be active disease centers where homeowners have been treating their trees with fungicide which may mask the symptoms. People should be aware of symptoms (especially veinal necrosis), inspect their trees regularly, and work with an Oak Wilt Qualified Arborist (OWQA) to assess their risk of oak wilt and strategies to reduce canopy loss. If oak wilt is confirmed, please talk to neighbors so they may act proactively to protect tree canopy. Property owners may decide to treat based on the recommendations from their OWQA, landscape goals, and budget; no regulations exist that require treatment or removal of infected trees.

Recommendations:

- Learn more about oak wilt: www.TexasOakWilt.org.
- City of Austin Oak Wilt site: <http://www.austintexas.gov/page/oak-wilt-suppression>.
- Talk to neighbors when oak wilt is confirmed, proactive fungicide injections just ahead of the disease are the best way to reduce canopy loss.
- If a red oak is diagnosed with oak wilt, check with Texas A&M Forest Service to determine cost share eligibility.
- Clean tools before work on each tree.
- Paint any oak wound or pruning cut immediately (any paint will work).
- Lab confirmation: <https://plantclinic.tamu.edu/>



Map 5. Oak Wilt Symptoms Observed in Walnut Creek Neighborhood. Additional areas may exist.

Emerald Ash Borer

Ash trees were the ninth most frequently occurring tree in Walnut Creek Neighborhood. All ash trees are susceptible to the Emerald Ash Borer (EAB), an invasive insect that kills ash trees. The pest has killed millions of trees across the Midwest and is rapidly making its way south. EAB has recently been confirmed in four Texas counties including Tarrant County and the City of Fort Worth.

Emerald Ash Borer (EAB) kills trees as their larvae chew through the conducting tissue just beneath the bark. EAB could arrive in Travis County in 3-5 years on its own, or it could already be here and we have not yet detected its presence. Ash trees that are in good condition are recommended for treatment when the insect is confirmed in Travis County; no treatment is recommended until EAB has been confirmed in Travis County.



Figure 4. Ash tree bark.

The City of Austin is developing a plan to prepare for impacts from this insect. It will include public education, and the treatment, removal and replanting of public trees. When EAB does arrives in Austin, it is likely to kill all of the 1.4 million ash trees, 4.2% of our urban forest.

Recommendations:

- Learn about emerald ash borer (EAB) <http://www.emeraldashborer.info/index.php>.
- Learn if you have ash trees <https://extension.illinois.edu/eab/ashtree/>.
- Do not plant ash trees.
- Learn more about EAB in Texas: <https://tfsweb.tamu.edu/eab/>



Figure 5. Ash tree form, leaf shape and seed.

Wildfire Potential

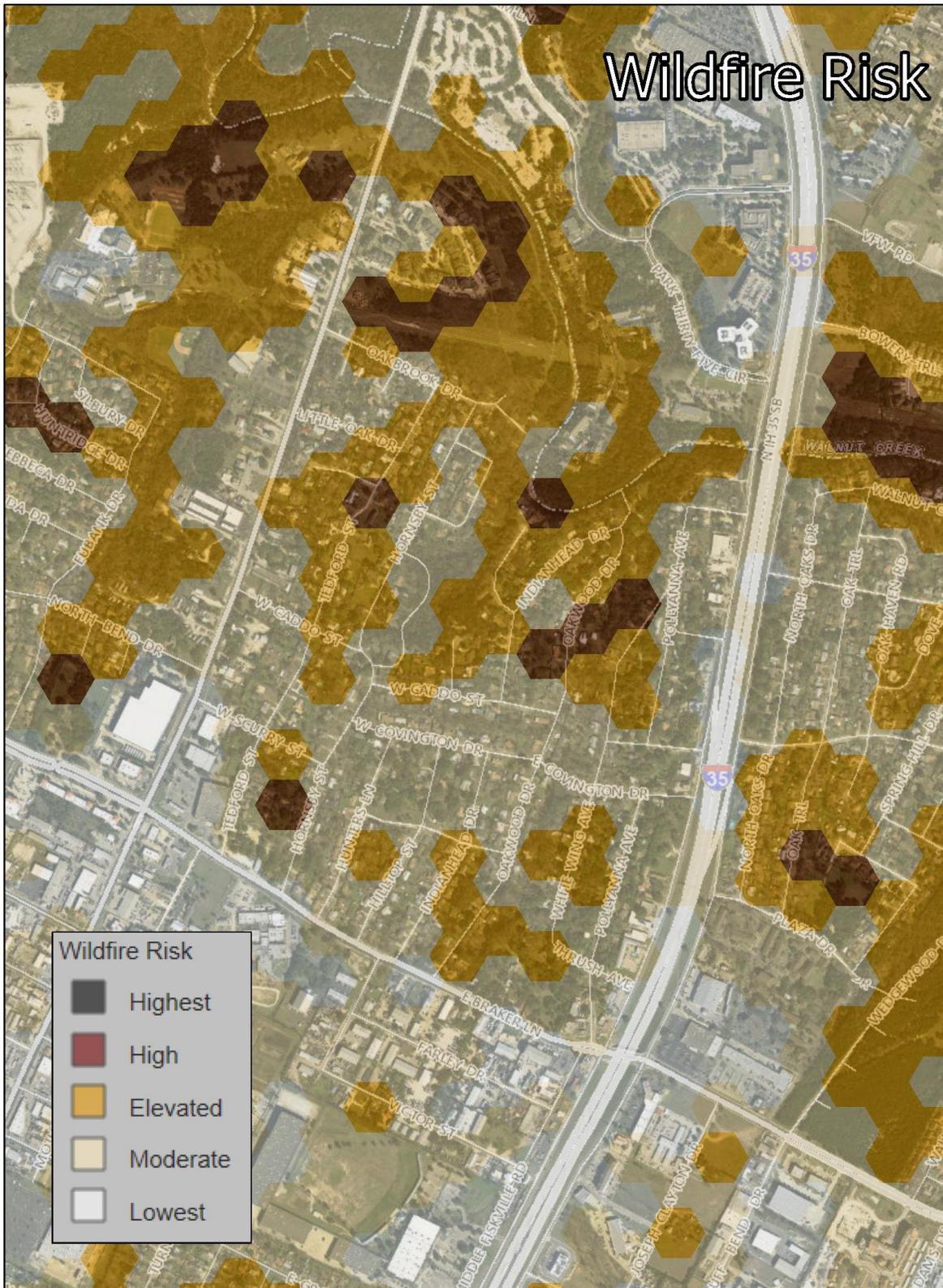
The Walnut Creek neighborhood is adjacent to a greenbelt and vegetated drainage areas. The presence of dense overstory and understory vegetation, moderate slopes, and relatively low impervious cover contribute to an increased wildfire potential in some areas (Map 6. Relative Wildfire Potential in Walnut Creek Neighborhood). View the Austin Fire Department's (AFD) Wildfire Division wildfire risk map online to learn more: <http://arcg.is/1Gi4vr>.

The first and most important step to neighborhood protection is for people to create and maintain defensible space on their property to protect their homes and reduce the risk of wildfire spreading from their property to adjacent properties. Landscaping should be maintained and dense understory vegetation should be removed to prevent grass fires from reaching into the tree canopy. Firewise landscaping principles are available [here](#). Also, read the [Ready, Set, Go](#) wildfire action guide for recommendations on how to prepare yourself and your family for wildfire.

The community may benefit from a consultation with AFD's Wildfire Division; Louise Liller is the Firewise Community Coordinator. A consultation can help a community identify wildfire risks and recommend strategies to enhance public safety. Contact (512) 974-0270 or visit ATXfire.com for more information. To report hazardous vegetative conditions or concerns, please contact 311.

Recommendations:

- View the wildfire risk map: <http://arcg.is/1Gi4vr>.
- Austin Fire Department's [Wildfire Threat Story Map](#).
- Firewise Community Coordinator: Louise Liller, (512) 974-0270, Louise.Liller@ausps.org
- Report hazardous vegetative concerns to 311.
- Learn more about Firewise landscaping:
[http://tfsweb.tamu.edu/uploadedFiles/TFSMain/Preparing_for_Wildfires/Prepare_Your_Home_for_Wildfires/Contact_Us/EDITED%202012firelandscape\(1\).pdf](http://tfsweb.tamu.edu/uploadedFiles/TFSMain/Preparing_for_Wildfires/Prepare_Your_Home_for_Wildfires/Contact_Us/EDITED%202012firelandscape(1).pdf).
- Learn how to be prepared for an emergency with the Ready, Set, Go guide:
http://austintexas.gov/sites/default/files/files/Fire/Wildfire/readyssetgo_booklet.pdf.



Map 6. Relative Wildfire Potential in Walnut Creek Neighborhood.

Plant Health Care Trends

Most trees are in fair or good condition, however there are indicators of historical pruning and construction practices that we now know increases trees vulnerability to insects, disease and other stresses. When working with trees it is advisable to hire an International Society of Arboriculture (ISA) Certified Arborist who understands how trees grow, proactive health care, and how they respond to pruning wounds and other treatments. Regular, proactive inspections and maintenance by a Certified Arborist can help trees achieve their maximum public health, safety, and environmental benefits.

ROOT ZONE + MULCH

Soil in the urban environment tends to be more compacted and have less organic matter than undisturbed soils. This can make it challenging for trees to get what they need from the root zone, especially during periods of drought. Trees usually benefit when 3” of mulch is maintained throughout the root zone (from the trunk to the edge of the canopy or beyond). Mulch can improve conditions by adding organic matter to the soil, reducing competition from turf grass, moderating root zone temperatures, and alleviating compaction.

When applying mulch, keep it several inches away from the base of the tree; the taper or root flare at the base of trees should always be visible (Figure 7). Mulch piled up against the bark traps moisture and can increase the chance for fungus or insects to enter the tree’s conducting tissue. If left uncorrected, buried root flares often contribute to tree decline.



Figure 6. Correctly Mulched Tree with Visible Root Flare (Base of Trunk).

Many mature trees are showing decline due to a variety of factors, including stress from home foundations, driveways and construction impacts within the critical root zone (Figure 8). Stress from drought, excessive heat, and disease compounds the stress from construction impacts in the root zone. Maintaining mulch in the remaining root zone and occasional deep watering during periods of drought is an important part of keeping trees resilient during periods of drought (Figure 9).

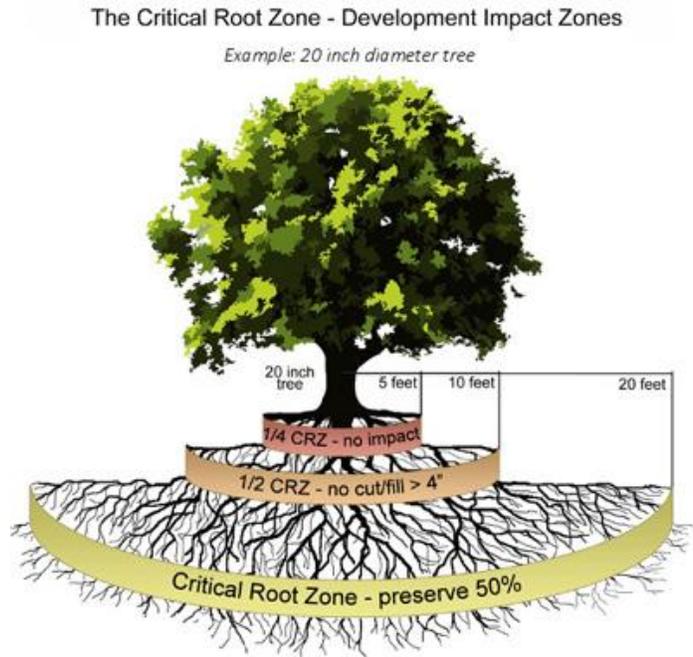


Figure 7. Critical Root Zone (CRZ) of a Tree.

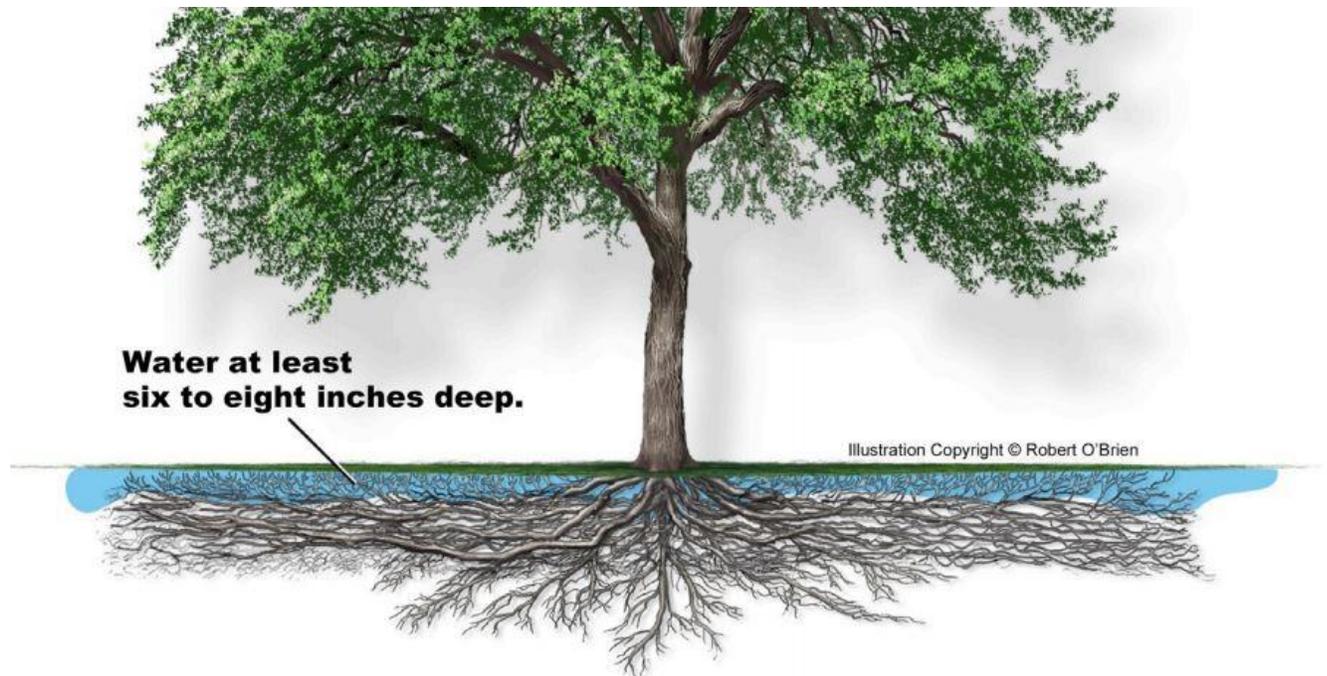


Figure 8. Water the Entire Root Zone of a Tree During Periods of Drought.

PRUNING

Some trees show signs of poor pruning, or a lack of pruning that may have corrected structural problems while the tree was young. A few trees had topping wounds (Figure 10), this is a pruning practice that once was thought to make trees safer by reducing canopy size, but now we know that the damage caused is usually much worse than letting the trees grow to their natural size.

Other trees were “lion-tailed,” (Figure 11) this is a practice where excessive interior foliage is removed. Some people think this makes a tree look “clean” or want this method to increase sunlight to turf grass. Lion-tailing makes limbs more prone to breaking, and the resulting sprouts are weakly attached.

Pruning mature trees should usually be limited to limb clearance as needed and hazard reduction. Occasionally, cabling or bracing may be an appropriate option to reduce risk. Some trees that have been topped or lion-tailed may be candidates for crown restoration or structural pruning.

Many mature trees did not receive structural or training pruning when they were young or middle-aged and may benefit from pruning to improve structure and stability. Young and middle-aged trees would benefit from training or structural pruning to establish good form that will contribute to their longevity and public safety. For example, many cedar elms develop “codominant stems” (Figure 12) that are roughly the same size. This condition often leads to branch failure. Training or structural pruning when young can reduce or eliminate codominant stem formation and encourage branch structure that is more resilient.



Figure 9. Incorrect Pruning: Topped Pecan Tree.



Figure 10. Incorrect Pruning: Lion-Tailed Tree.

WATER

Watering recommendations vary widely depending on the age of the tree, the soil conditions, degree of sun exposure, and other factors. Generally, newly planted trees need to be watered weekly and sometimes more frequently during the summer months. Mature trees may not need supplemental water at all, but usually benefit from an occasional deep soaking in the summer months (Figure 9). Every tree requires supplemental water during periods of drought (a prolonged period of inadequate soil moisture); a slow soaking of water applied to the soil around valuable trees can help them survive drought stress. It is better for all trees at every stage of maturity to be deeply watered as needed rather than receive a light sprinkle on a frequent interval.



Figure 11. Cedar Elm Tree with Codominant Stems.

BALL MOSS

Ball Moss is a plant that often causes concern for people, but it rarely becomes a serious problem for tree health. Despite the name, it is not a moss at all. It is an epiphyte in the bromeliad family, which means it takes all the nutrients and moisture it needs from the air. It clings to trees in the cool, humid parts of the canopy, which is also where the tree's branches struggle to survive due to low light. This often leads to the assumption that the ball moss is damaging the branches, but it's rarely true. Occasionally, especially near creeks and lakes, the ball moss becomes so dense that the branch no longer receives light; in these situations, it can lead to tree decline.



Figure 12. Ball Moss is Rarely Harmful to Trees.

In these extreme cases, or when people simply find the plants unattractive, there are limited options to improve the situation. A Certified Arborist can spray the ball moss to kill it, though the dead ball moss will still hang in the tree for a long time before it dries out and crumbles from the branches. Often, because the ball moss prefers shady areas, it occurs on dead branches, so pruning can remove a large percentage of it. However, the only truly effective control measure is to physically remove the plants. For large trees, this often requires a Certified Arborist who can safely climb the tree. No special tools or treatments are required, though care should be taken to avoid wounding the tree.

BACTERIAL LEAF SCORCH

Bacterial leaf scorch (BLS) is a disease caused by a bacterium, *Xylella fastidiosa*, which affects a wide range of plants by plugging the tubes that carry water up and down the tree. There are a few varieties of BLS, each with its own host plant(s). In Austin, the most damaged trees are usually red oaks (Shumard Oak, Buckley's Oak), sycamores and elms. The disease is carried from tree to tree by insects that feed on the tree's sap. These insects move around a lot, so pesticide is not effective as a control of the disease. Once the plant is infected, symptoms appear in late summer to early fall. When the new leaves appear in spring, they generally appear healthy, though the tree usually loses vigor year after year until it dies. Early in the infection, it may only affect a few branches, but over time more and more of the tree becomes symptomatic and branches begin to decline and die.



Figure 13. Red Oak Leaves with Bacterial Leaf Scorch Symptoms (note yellow line between the green and brown tissue).

The symptoms are similar to oak wilt in red oak: The outer edges and tips of the leaves begin to die while the base stays green. It can be quite difficult to distinguish between these two diseases. Often, we can recognize BLS by a thin, yellow or red band between the dead and live parts of the leaves. We also consider the timing of the symptoms. Oak wilt usually appears in spring or early summer, while BLS symptoms appear in late summer. Also, oak wilt is almost always fatal within a few weeks or months, while a tree with BLS usually survives for years.

There is no known cure for BLS once the tree is infected. The best we can do is to slow the effects of the disease and prolong the tree's life a bit longer. We do this by keeping the tree as healthy as possible otherwise so it can defend itself. Regularly applying compost to feed the soil, maintaining mulch around the root zone, and maintaining proper soil moisture are our best practices to meet this goal. Fertilizers should usually be avoided; things that promote growth as opposed to improving soil health can make the tree more susceptible to infection by insects that feed on tender new foliage. Annual antibiotic injections can suppress the disease, as well, but will not eradicate the bacteria.

Resources

TREES + TREE CARE

- Free tree resources at <https://www.treefolks.org/free-trees/>.
- Texas A&M Forest Service Seedling Program – low cost seedlings to help restore canopy after disease, drought, fire and improve canopy resilience to support other goals including water quality: <http://texasforests.tamu.edu/WestTexasNursery/>.
- Local nurseries – Ask about the seed source of trees, it is important to plant trees that are adapted to local soil and climate conditions.
- Planting instructions and interactive tree selector tool at: <http://texastreeplanting.tamu.edu/>
- Learn more about tree care at <https://www.treesaregood.org/treeowner>

CERTIFIED ARBORISTS

When working with trees it is advisable to hire an International Society of Arboriculture (ISA) Certified Arborist; they understand how trees grow, proactive health care, and how they respond to pruning wounds and other treatments. Regular, proactive inspections and maintenance by a Certified Arborist can help trees achieve their maximum public health, safety, and environmental benefits. Ask for references, proof of liability insurance and worker's compensation insurance.

- Find a Certified Arborist: <https://www.treesaregood.org/findanarborist>
- Find an Oak Wilt Qualified Arborist: <http://isatexas.com/for-the-public/oak-wilt-help/>
- Find a Registered Consulting Arborist: <https://www.asca-consultants.org/search/custom.asp?id=3818>

CITY OF AUSTIN DEPARTMENT CONTACTS FOR TREE CONCERNS

- 311 is the best place to start with a tree concern; they can field inquiries and route the concern to the appropriate department. Each call generates a Service Request number that the caller can use to check on the status of a concern.
- Public Works – Responsible for maintaining vegetation in the Right of Way. Routine tree maintenance is the responsibility of homeowner, Public Works does proactive routine pruning ahead of road work and clears vegetation that is a public safety hazard. All practices are done according to industry standards to minimize risk and disease prevention.
- Austin Fire - Wildfire Division works to mitigate wildfire risk through vegetation management on public land and to educate communities, especially those adjacent to the “Wildland Urban Interface” about wildfire potential, home hardening strategies, evacuation planning, shaded fuel breaks, and other strategies to mitigate wildfire risk.
- Watershed Protection – Promotes best practices throughout the community to stabilize stream banks, reduce risk of flooding, and promote water quality.
- Development Services Department Urban Forestry Program - responsible for urban forest planning and preparedness; viewing the urban forest as infrastructure that contributes to public health, safety and welfare.
- Development Services Department City Arborist Program – responsible for implementation and enforcement of Austin’s tree preservation ordinance. Trees greater than 8” are protected on commercial property and trees greater than 19” are protected on residential property. Protected trees require a permit for removal or significant impacts.
- Parks and Recreation Department – Responsible for the care and maintenance of trees on Parks and Recreation Department properties.
- Austin Energy – Maintains clearance around powerlines for energy distribution. May make trees safe for property owners if tree canopy is near power lines. Supports tree planning programs like NeighborWoods to reduce urban heat island effect.

URBAN FOREST GRANT PROGRAM

The Urban Forest Grant supports tree stewardship projects across Austin that benefit our urban forest ecosystem and strengthen community connections to nature and each other. The Grant program enhances the community's urban forest ecosystem through projects associated with:

- Tree planting and care,
- Education, public service announcements, award programs
- Invasive species
- Disease control, and
- Other related efforts.

Grant applicants are Austin area community members, businesses, academic and private institutions, homeowners' associations, artists, youth groups, and non-profit organizations. Applicable projects show a clear benefit to Austin's public urban forest while helping to build Austin area community connections with nature and each other. Equity conscious projects are prioritized. To learn more visit: <http://www.austintexas.gov/page/urban-forest-grant>.

Appendix A Recommended Species List.

Table 2. Recommended Tree Species for Planting or Natural Regeneration in Walnut Creek Neighborhood, Austin Texas.

Large Trees	Medium Trees	Small Trees
Chinquapin oak	Lacey oak	Tx persimmon
Monterrey oak	Anacua	Carolina buckthorn
Bur oak	Huisache	Tx redbud
Live oak	Honey mesquite	Desert willow
Shumard oak	Red mulberry	Palo verde
Durand oak	Bigtooth maple	Mx plum
Pecan	Carolina cherry laurel	Possumhaw holly
Black walnut	Western soapberry	Yaupon holly
American elm	Eastern redcedar	Eve's necklace
Cedar elm	Ashe juniper	Mexican buckeye
Lacebark elm	Escarpment black cherry	Loquat
Montezuma cypress		Fig spp.
American sycamore		Mt laurel
Mexican sycamore		Peach spp.
Cottonwood		
Sweetgum		