



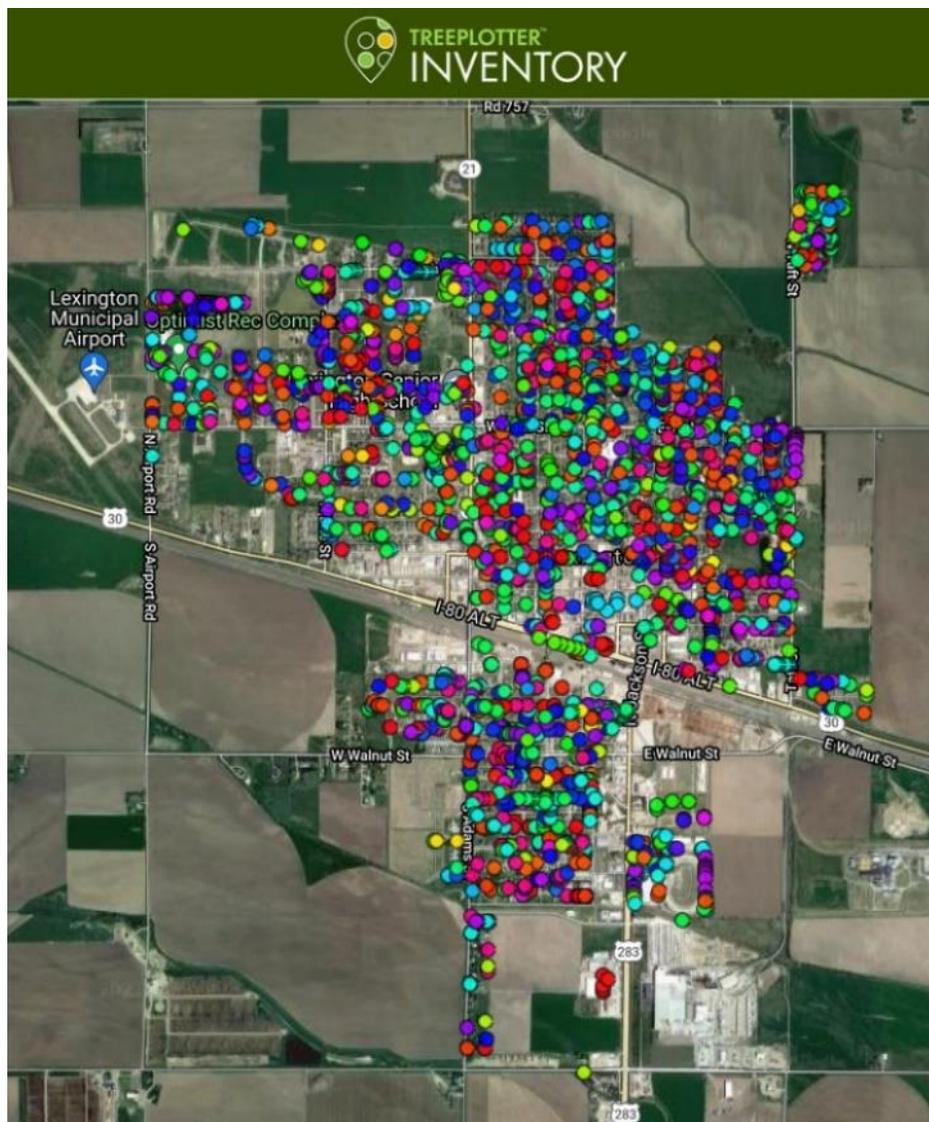
The City of Lexington

Tree Inventory Analysis Report

Data collected by: City Staff & Tree Board Members

Report developed by: Chrissy Land, Western Community Forester

Report created: December 2021





Community Tree Inventory Summary

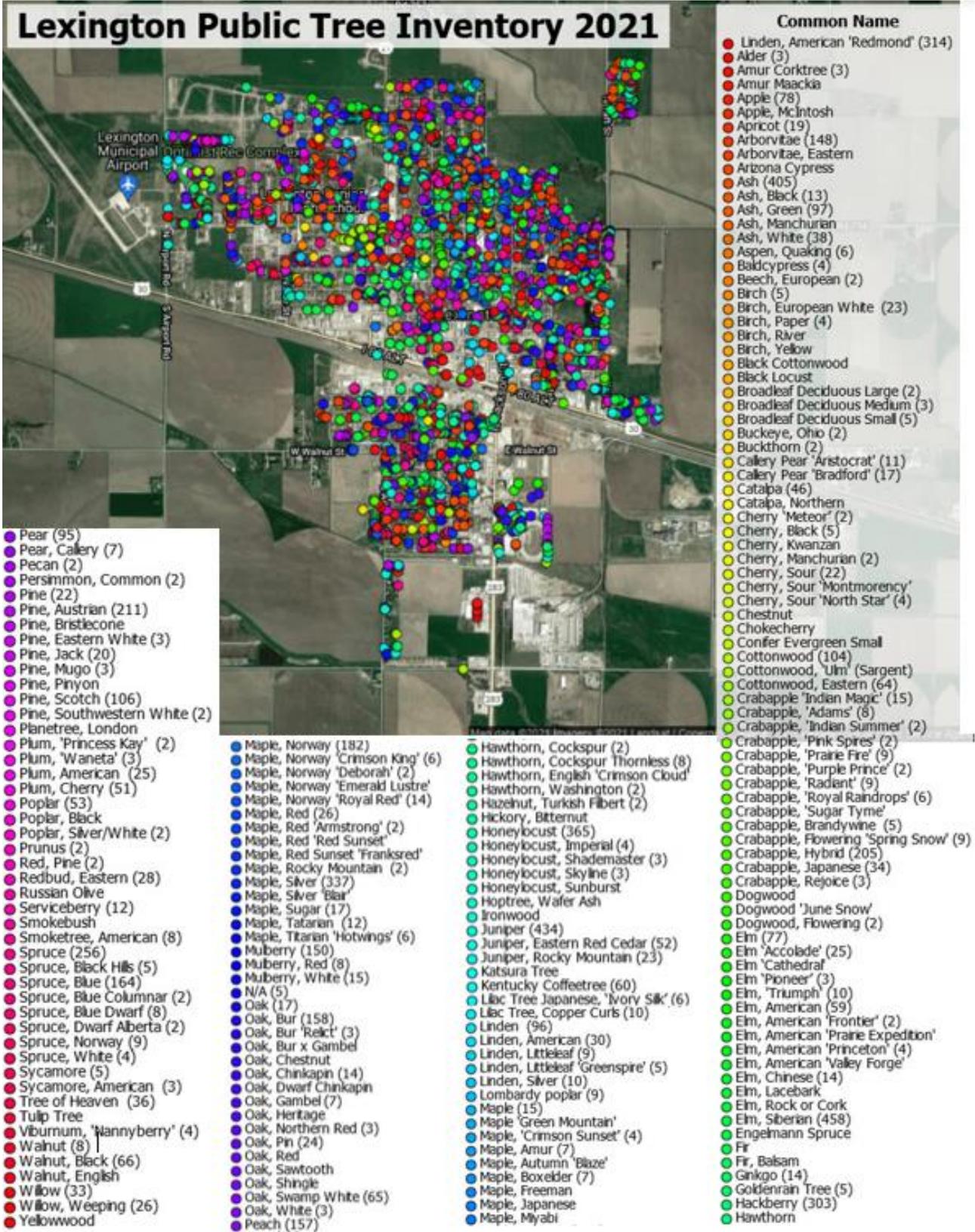
The Nebraska Forest Service worked with the City of Lexington to complete a public tree inventory (pictured on the next page). A special thank you for entering data goes to, Dave Stenberg – Tree Board Member, Marty Smith – Tree Board Member, Chris Salem – Tree Board Member, Robert Thompson – City Staff, and Dennis Burnside – City Staff & Tree Board Liaison. For the purpose of evaluating the public benefits that trees provide, and only for the purpose of this inventory, tree data was collected on any tree on public property, and any that stand within twenty feet from the back of the curb along all streets located within the city limits. Trees recorded along the streets, identified as street trees, are not an identification of street trees as defined in the city code. These trees are all considered to provide public benefit in some form. This set of data provides a broad understanding of the community tree canopy including, but not limited to, its age and species distribution.

A total of 6,490 trees were inventoried in the community of Lexington in 2021. A summary of recommendations is on pg. 14.

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Ecosystem Benefits

Community trees provide more than simply a good-looking street or boulevard. We can estimate the savings in monetary value of the energy, CO₂, air quality, storm water, and aesthetic benefits that community trees provide. In Lexington, the community forest provides total annual benefits of \$697,906 for the 6,490 trees that were inventoried. Trees also provide many other benefits that are not monetized by the data collection software. Some of these additional benefits include positive impacts on public health and psychology, wildlife habitat, community aesthetics, sense of place, increased community walkability and reduction of crime. Below is a summary of the tree value and savings.

ECOSYSTEM BENEFITS



Total Tree Value and Savings

Total Monetary Benefit: \$697,906

Benefits are only calculated for trees with defined species, DBH, and land use based on i-Tree research. Totals are annual amounts.



Stormwater Monetary Benefit
\$241,656 ?

Runoff Prevention (Gallons)
9,090,180 ?



Property Value Total
\$200,491 ?



Energy Savings
\$70,752 ?

Energy Saved (kWh)
932,238 ?

Natural Gas Savings
\$125,466 ?

Heat Prevention (Therms)
127,850 ?



Air Quality Monetary Benefit
\$35,622 ?

Pollutants removed (lb)
12,529 ?



Carbon Monetary Benefit
\$23,915 ?

Carbon Stored (lb)
3,218,480 ?

Carbon Sequestered (lb)
1,797,720 ?

Carbon Avoided (lb)
1,562,570 ?

Canopy Cover

Two things a community can do to increase the benefits received from the community forest are: improve overall tree health in the community and plant large canopy shade trees as they provide far more benefit than small, ornamental trees. Based on the most recent satellite imagery of the community the relative canopy cover appears to be moderate. Community forestry staff is available to assist and provide training on quantifying canopy cover percentage for setting future goals.

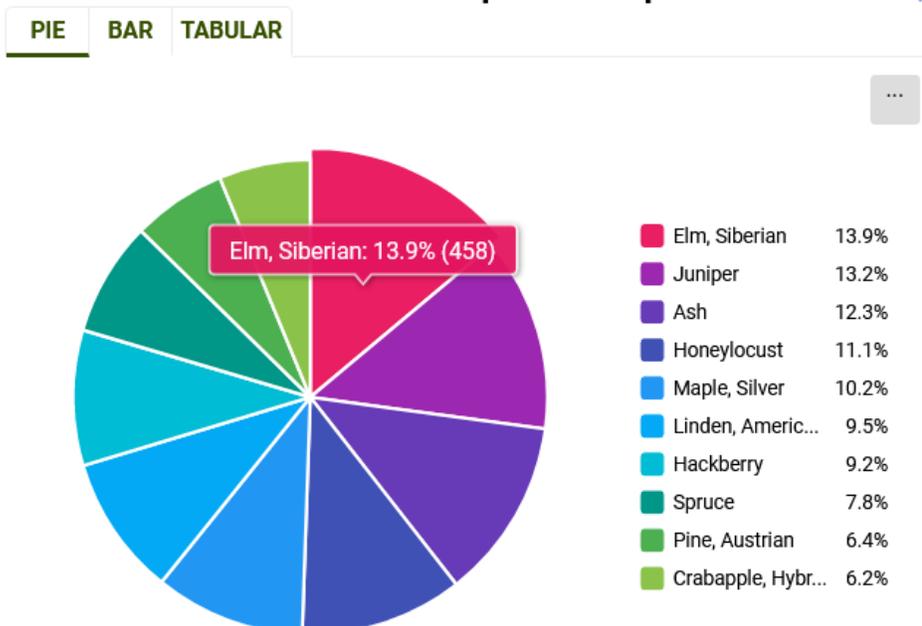
Tree Diversity

Urban tree species diversity is a key feature required to maintain and grow resilient forests. The 10-20-30 guideline is used to evaluate diversity and reduce the risk of catastrophic tree loss due to pests. The rule suggests an urban tree population should include no more than 10% of any given species, 20% of any one genus, or 30% of any family.

Tree Diversity – Species (Goal: <10%)

The top ten species inventoried were Siberian Elm, Juniper, Ash, Honeylocust, Silver Maple, American Linden, Hackberry, Spruce, Austrian Pine and Hybrid Crabapple. Of these species, Siberian Elm, Juniper species, Ash species, Honeylocust and Silver Maple were above or very near 10% of the total community forest resource. As a rule, no single tree species should represent more than 10% of any community’s tree resource. When tree species exceed this 10% threshold, it can signify low species diversity, which can increase the potential impact of insect and disease issues on the community’s trees as a whole.

Most Common Species - Top 10



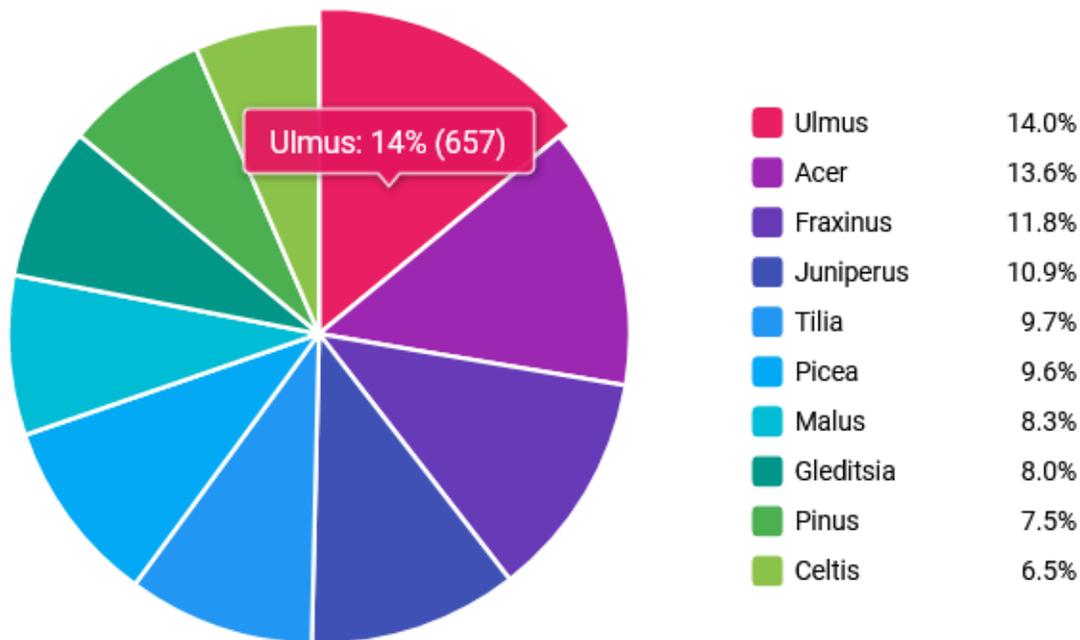
Tree Diversity – Genus (Goal: <20%)

As we continue to follow the guideline that suggests an urban tree population should include no more than 10% of any one species, 20% of any one genus, or 30% of any family. We can see below in the chart there are no genus that exceed the 20% of any one genus rule. The top five genus are, *Ulmus* (elms), *Acer* (maple), *Fraxinus* (Ash), *Juniperus* (juniper and cedar) and *Tilia* (linden).

Most Common Genus - Top 10

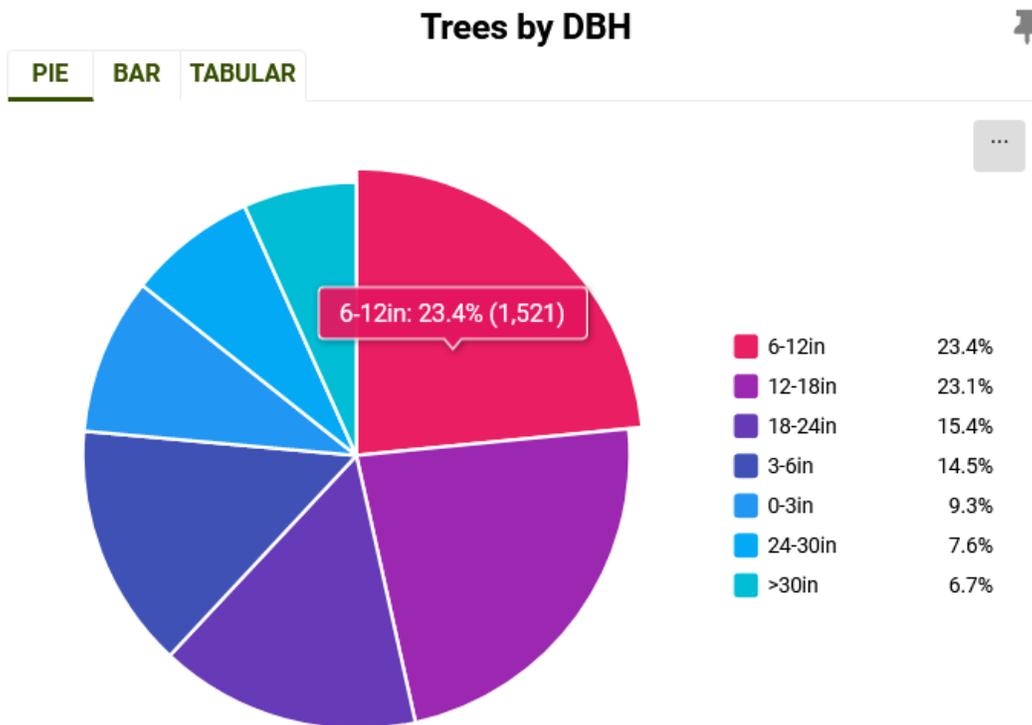
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Tree Diversity – Age

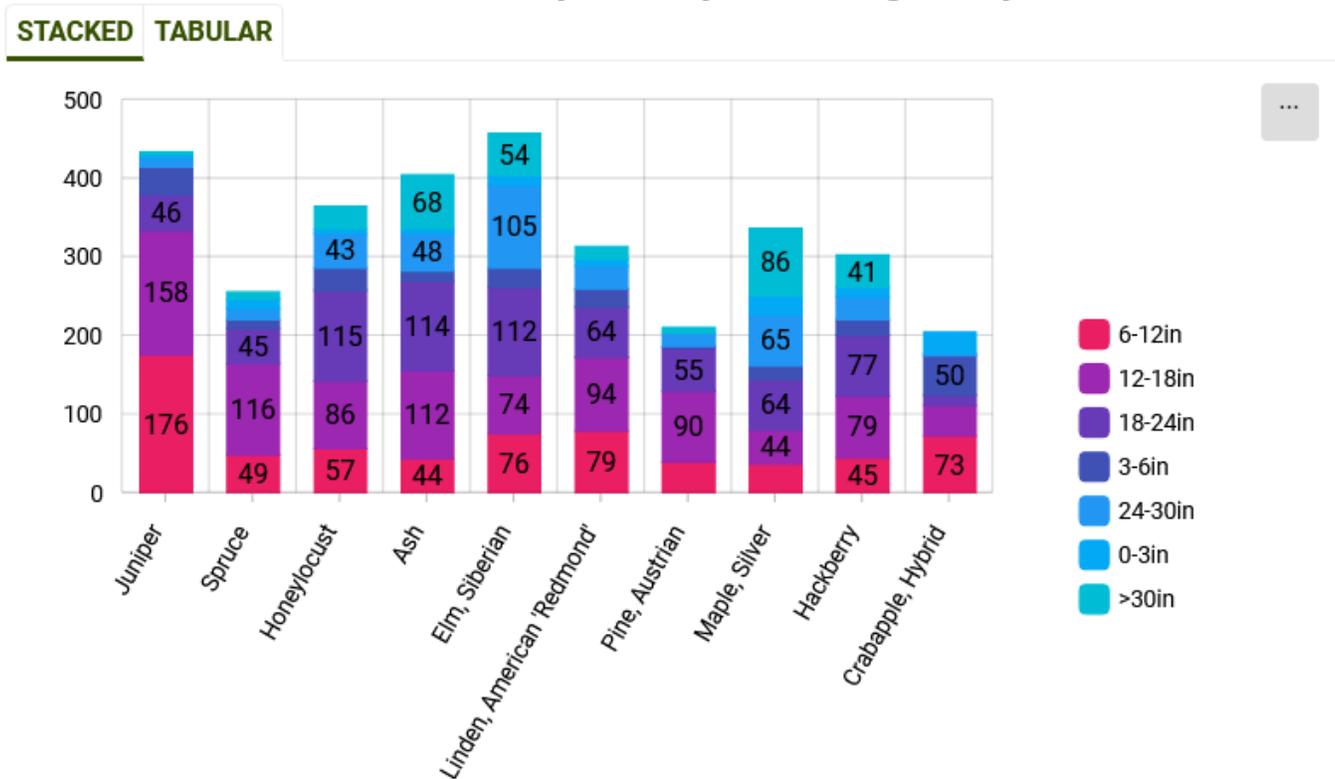
The relative age, generally revealed by analysis of stem diameter distribution, can say a lot about a community’s tree resource. This can provide clues about current or previous planting habits, types of trees being planted, and estimates about the longevity of existing trees. Lexington shows a relatively middle-aged forest resource, with 46.5% of all trees between 6 and 18 inch trunk diameter. Studies show that large shade tree species provide more environmental benefits such as household utility savings, improving air quality, and the beneficial use and interception of rainwater. With 29.7% of the current trees being larger than 18 inches in diameter, we can assume that there are some mature, large trees within the community.



Tree Diversity – Age by Species

When evaluating which species should or should not be planted, it is critical to evaluate the general age distribution of each species. Below you will see a breakdown of the top ten most common species by diameter at breast height (DBH). A species may exceed the 10% guideline overall, that does not mean it should not be planted. The current species population may be majority older in age meaning it has on average a larger trunk diameter. In Lexington, Spruce can be an example where there are not many young trees, but a fair number of middle-aged trees. A balance of age distribution in one species is a good goal to aim for.

Most Common Species by DBH Range - Top 10

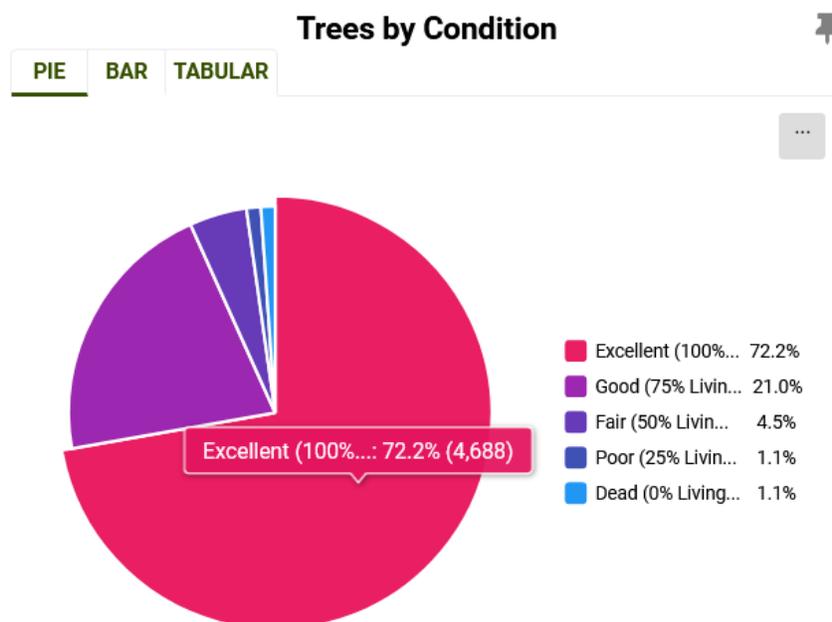


Canopy Condition

Overall tree condition can be a good way to judge the general health of a tree. In our inventories, trees were categorized as being in one of four conditions based on the overall appearance of the tree at the time of the inventory. This inventory was completed as a Level One Limited Visual Assessment. The condition categories are:

- Excellent – Healthy, vigorous tree. No apparent signs of insect, disease, or mechanical injury. Little or no corrective work required. Form representative of species
- Good – Average condition and vigor for area. May be in need of some corrective pruning or repair. May lack desirable form characteristics of species.
- Fair – General state of decline. May show severe insect, disease, or mechanical damage, but death not imminent. May require major repair in renovation.
- Poor – No chance of correcting a declining condition, death imminent.

This tree condition designation is not a substitute for in-depth tree inspections which should be completed on all questionable trees. Overall, trees in Lexington appear to be healthy with only 6.7% of the tree population being in fair, poor or dead condition.





Community Distribution

The trees are identified by management type per their location to help break down the distribution of the trees throughout the different management areas. Many communities take responsibility of management for trees located on municipal owned properties. This breakdown can provide a clear understanding of how many trees they will need to plan and budget for. For the City of Lexington inventory, trees were divided into these categories: Street Tree, Park Tree, Cemetery Tree, Arboretum Tree, School Tree and Other. The City takes responsibility of the 955 park trees, 346 Cemetery trees, 24 Library Trees (other), and 10 trees located in the city owned parking lot (other). The County manages the 251 Arboretum Trees, 9 trees at the court house (other) and the 10 trees at the Museum (other).

Inventory Type



Inventory Type		
Inventory Type	Count	Percent
Street Tree	4698	72.39%
Park Tree	955	14.71%
Cemetery Tree	346	5.33%
Arboretum Tree	251	3.87%
School Tree	187	2.88%
Other	53	0.82%

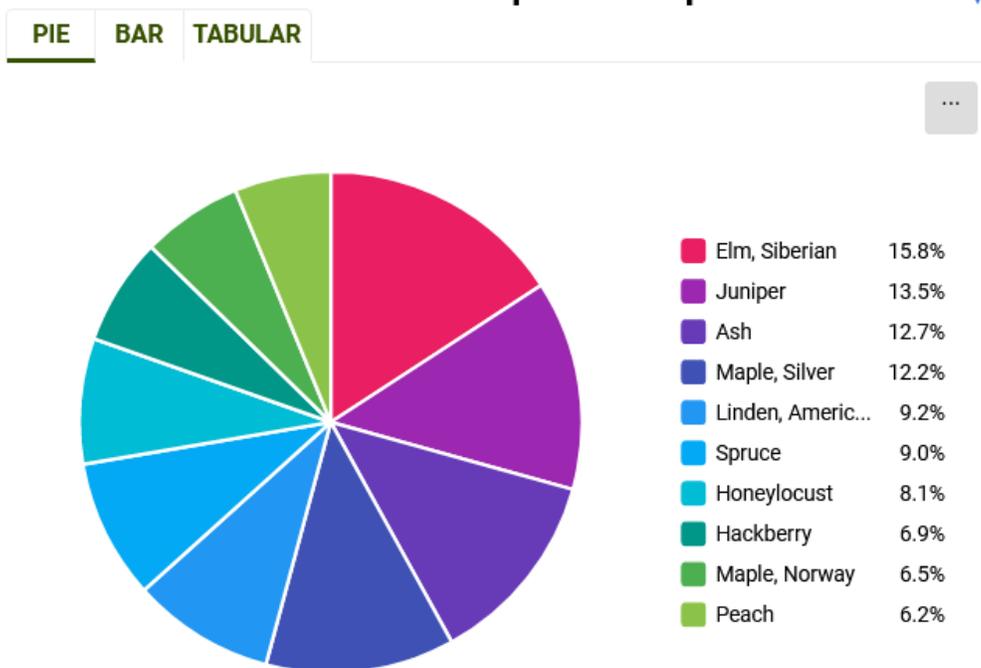
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Street Trees

There were 4,692 street trees inventoried in Lexington. The top five species inventoried during the street tree inventory were Siberian elm, Juniper, ash spp., silver maple, and American linden, see the top pie graph below. Siberian elm, Juniper, ash spp., and silver maple were all over the 10% diversity threshold. The street trees in Lexington were in good to excellent shape, with only 7.3% of the inventoried trees in fair, poor or dead condition, see the bottom pie graph below.

Most Common Species - Top 10



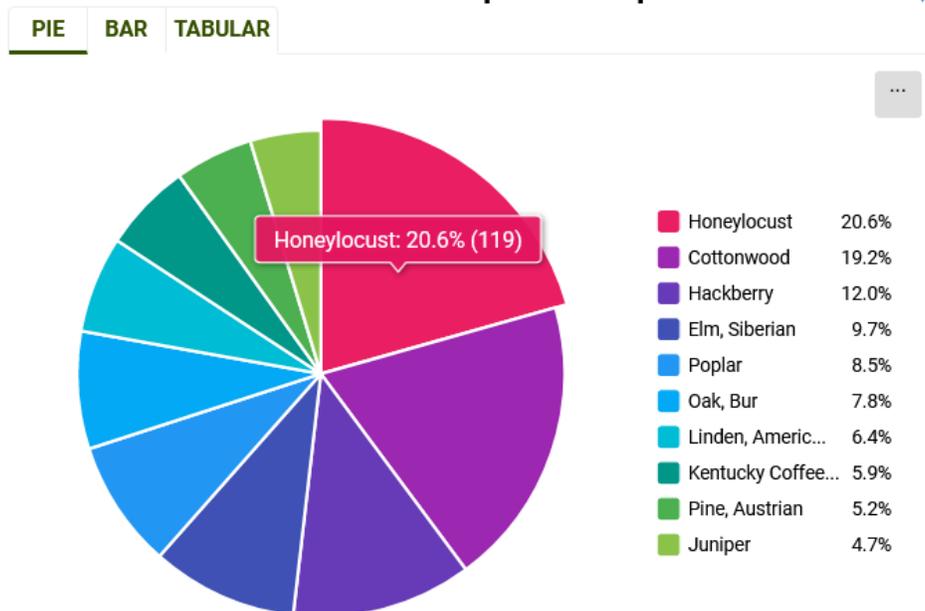
Trees by Condition

Condition	Count	Percent
Excellent (100% Living)	3378	71.90%
Good (75% Living)	979	20.84%
Fair (50% Living)	215	4.58%
Dead (0% Living)	65	1.38%
Poor (25% Living)	61	1.30%

Park Trees

There were 955 park trees identified in Lexington. The top five species inventoried during the park tree inventory were Honeylocust, Cottonwood, Hackberry, Siberian Elm and Poplar (likely Lombardy Poplar). Honeylocust, Cottonwood, and Hackberry were over the 10% threshold, see the top pie graph. The Nebraska Forest Service would simply stress the importance of shade when creating comfortable community parks. The Park trees in Lexington were in good to excellent condition, with 74 inventoried trees in fair, poor or dying condition, see the bottom table.

Most Common Species - Top 10



Trees by Condition

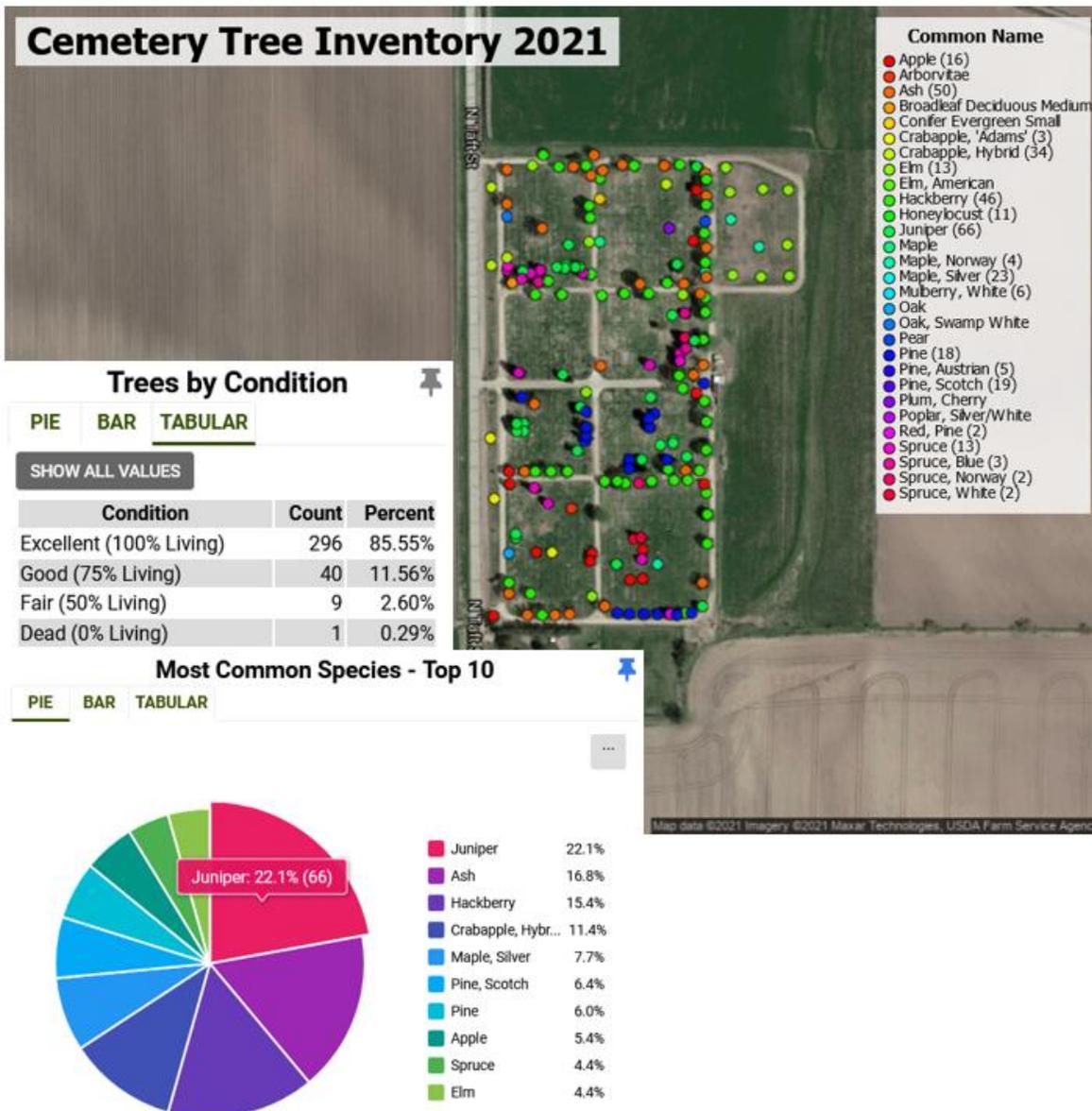
Condition	Count	Percent
Excellent (100% Living)	619	64.82%
Good (75% Living)	262	27.43%
Fair (50% Living)	59	6.18%
Poor (25% Living)	9	0.94%
Dead (0% Living)	6	0.63%

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Cemetery Trees

There were 346 cemetery trees identified. The top five species inventoried were juniper, ash spp., hackberry, crabapple and silver maple. Juniper, Ash, Hackberry and Crabapple were above the 10% threshold. This indicates there is a limited diversity of species in the cemetery. The Nebraska Forest Service would simply stress the importance of shade when creating comfortable community green spaces. The cemetery trees were mostly in good to excellent shape, with 10 of the inventoried trees in fair or dead condition.



Other Trees

There were 24 trees inventoried at the library and 10 trees at the parking lot on N Washington Street. At the library, only three types of species were inventoried, they were crabapple, honeylocust and American Linden. Only one species was recorded at the parking lot, which was American Linden. As these trees age out, it would be most appropriate to focus on incorporating species diversity when selecting replacement trees.



Community Tree Inventory Recommendation Summary

To improve the overall community forest of Lexington, the following recommendations are provided regarding the future management of the community's tree resources:

1. Due to potential forest health threats, discontinued planting of ash spp., Scotch pine, and black walnut.
2. Consider tree species distribution and if necessary, plant more of the underrepresented species. In the event of an invasive insect or severe winter freeze, species diversity can be the determining factor of how much canopy is lost at one given time. For example, the Halloween freeze of '91 killed many Siberian Elm and Emerald Ash Borer is attacking Ash.
3. Increase species diversity by planting less common, yet site appropriate species. Species lists can be found on the Nebraska Forest Service website, or by contacting your NFS community forester.
4. With 23.76% of the total trees inventoried, it will be important to put more emphasis on young tree structural pruning to ensure proper structural integrity.
5. Maintain an annual tree planting and management plan. Work with community maintenance staff and state and local resources to establish a management plan for the community.
6. Complete individual tree health assessments on known or potential defective trees.
7. The Community of Lexington should continue to support and strengthen the role of the tree board within the community. Many communities strive to form a close working relationship with the City Staff and the volunteer tree board such that the tree board serves as an advocate for proactive management efforts. The City Council should be kept appraised about the "state" of the community forest resources and its benefits. This will support and enhance favorable financial support by the City Council for tree planting and management needs.

Community Forest Resources

1. Nebraska Forest Service Website: www.nfs.unl.edu
 - a. Community Forestry Resources:
<https://nfs.unl.edu/community-forestry-and-sustainable-landscapes>
2. Find a Forester – Nebraska Forest Service
 - a. <https://nfs.unl.edu/foresters>
3. Nebraska Statewide Arboretum Website: www.plantnebraska.org.
4. Tree, shrub and plant lists for Nebraska
 - a. <https://plantnebraska.org/plants/>
5. Pine Wilt – A fatal disease of Scotch Pine:
 - a. <https://nfs.unl.edu/publications/pine-wilt-nebraska>
6. Emerald Ash Borer – An invasive pest of ash species:
 - a. <https://nfs.unl.edu/nebraska-emerald-ash-borer>
7. Pros and Cons of Emerald Ash Borer Treatment
 - a. <https://nfs.unl.edu/publications/pros-and-cons-emerald-ash-borer-treatment>
8. Trees to Replace Ash
 - a. <https://nfs.unl.edu/ash-replacements>
9. Primary Processors directory for more information on saw mills:
 - a. <https://nfs.unl.edu/timber-buyers>
 - b. <https://nfs.unl.edu/documents/ruralforestry/2013%20primary%20processors%20ENTIRE.pdf>