
*Preston, IA*

# Urban Forestry Management Plan

SUMMER 2022

JEO CONSULTING GROUP

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# Executive Summary

# EXECUTIVE SUMMARY

## Overview

**This plan was developed to assist the City of Preston in managing its urban forest, including budgeting and future planning. Trees bring numerous benefits to a community, and sound management helps leaders take advantage of these benefits. Management is especially important now considering the serious threats posed by forest pests like the emerald ash borer (EAB). EAB is an invasive insect imported from Eastern Asia on wood shipping crates that kills all species of ash trees except mountain ash. There is a strong possibility that 5% of Preston's city-owned trees will die once EAB becomes established in the community, unless local leaders begin preventative treatment. With proper planning and management, the costs of removing dead and dying trees can be extended over years, mitigating public safety issues.**

## Inventory and Results

In 2022, JEO conducted a tree inventory using Global Positioning System (GPS) data collectors. The inventory was a complete inventory of street and park trees. Below are some key findings of the 159 trees inventoried.

- Preston trees provide $32,095 of benefits annually, an average of $202 per tree
- There are over 23 species of trees
- The top three genera are: Maple 72%, Ash 5%, and Oak 5%
- 32% of trees need some type of management
- 1 tree should be removed

## Recommendations

We detail our core recommendations in the Recommendations Section. In the Emerald Ash Borer Plan, we include management recommendations. Below are some key recommendations.

- Out of the 1 tree needing removal, 1 tree is over 24 inches in diameter at 4.5 ft and must be addressed immediately. *City ownership of the trees recommended for removal should be verified prior to any removal*
- 3 of the 8 ash trees should be carefully examined, as they have one or more symptoms that could be related to an EAB infestation.
- All trees should be pruned on a routine schedule: one third of the city every other year.
- Plant a diverse mix of trees that do not include: ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut.
- Check ash trees yearly with a visual survey.
- With the current budget it could take 12 years to remove ash. We suggest that city officials request a budget increase to $2,000 annually and apply for grants to plant replacement trees.

# Introduction

# INTRODUCTION

This plan was developed to assist Preston with managing, budgeting, and future planning of their urban forest. Across the state, forestry budgets continue to decrease as a higher percentage of the budgets are devoted to tree removal. With the anticipated arrival of Emerald Ash Borer (EAB), an invasive pest that kills native ash trees, it is time to prepare for the increased costs of tree removal, treatment, and replacement planting. With proper planning and management of the current canopy in Preston, these costs can be spread out over the years and public safety issues from dead and dying ash trees can be mitigated.

Trees are an important part of Preston's infrastructure and one of the city's greatest assets. The benefits of trees are immense. Trees improve air quality, intercept stormwater runoff, conserve energy, lower traffic speeds, increase property values, reduce crime, improve mental health, and create a desirable place to live, to name just a few. Good urban forestry management will maintain these important benefits for the people of Preston and future generations.

Urban forestry management sets goals and develops management strategies to achieve them. To develop management strategies, a comprehensive public tree inventory must be conducted. The inventory informs maintenance, removal schedules, tree planting, and budgeting. Aligning management actions with the tree inventory results will help meet Preston's urban forestry goals.

**Assist Preston with Managing its Urban Forest**

**Inform on the Benefits of a Healthy Urban Forest**

**Establish Preventative Treatment for Emerald Ash Borer**

**Develop Efficient City Tree Management Techniques**

**Mitigate Public Safety Issues**

# Findings

# INVENTORY

In 2022, JEO conducted a tree inventory that included 100% of the city-owned trees on both streets and parks. The team collected tree data using a handheld Global Positioning System (GPS) receiver. The data collector gives Geographic Information Systems (GIS) coordinates with an accuracy of 3 meters, which can be used in Arc GIS as an active GIS data layer. Because the inventory is a digital document the data can be updated with new information and become a working document.

The data collectors' programming was written to be compatible with a state-of-the-art software suite called i-Tree. i-Tree was developed by the USDA Forest Service to quantify the structure of community trees and the environmental services that trees provide. The i-Tree suite is a public domain which can be accessed for free.

To quantify the urban forest structure and benefits, specific data is collected for each tree. This data includes: location, land use, species, diameter at 4.5 ft, recommended maintenance, priority of that maintenance, leaf health, and wood condition. Additionally, for all ash trees, the team notes signs and symptoms associated with EAB including canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

# INVENTORY RESULTS

JEO entered the data collected for the 159 city trees into the USDA Forest service program Street Tree Resource Analysis Tool for Urban forestry Management as part of the i-Tree suite. Following are results from the i-Tree STREETS analysis.

# ANNUAL BENEFITS

## Annual Energy Benefits

Trees conserve energy by shading buildings and blocking winds. Preston's trees reduce energy-related costs by approximately $8,448 annually (Appendix A, Table 1). These savings are both in electricity (40.3 MWh) and in natural gas (5,502.3 Therms).

## Annual Stormwater Benefits

Preston's trees intercept about 454,613 gallons of rainfall or snow melt per year (Appendix A, Table 2). This interception provides $12,320 in benefit to the city.

## Annual Air Quality Benefits

Air quality is a persistent public health issue in Iowa. The urban forest improves air quality by removing pollutants, lowering air temperature, and reducing energy consumption, which in turn reduces emissions from power plants, and lessens emissions of volatile organic matter (ozone). In Preston, it is estimated that trees remove 526 lbs of air pollution (ozone (O3), particulate matter less than 10 microns (PM10), carbon monoxide (CO), nitrogen dioxide (NO2), and sulfur dioxide (SO2)) per year with a net value of $1,482 (Appendix A, Table 3).

## Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Preston, trees sequester about 99,444 lbs of carbon per year with an associated value of $1,191 (Appendix A, Table 5). In addition, the trees store 1,604,098 lbs of carbon, with a yearly benefit of $12,031 (Appendix A, Table 4).

## Annual Aesthetics Benefits

The social benefits of trees are hard to capture. The i-Tree analysis does have a calculation for this area that includes aesthetic value, property values, lowered rates of mental illness and crime, city livability and much more. Preston receives $8,653 in annual social benefits from trees (Appendix A, Table 6).

## Financial Summary of All Benefits

According to the USDA Forest Service i-Tree STREETS analysis, Preston's trees provide $32,095 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 159 trees in Preston provide approximately $202 annually (Appendix A, Table 7).

| ENERGY | STORMWATER | AIR QUALITY | CARBON | AESTHETICS | SUMMARY |
|---|---|---|---|---|---|
| • Reduce energy cost by **$8,448** | • Intercept 454,613 **gallons**<br>• Provides **$12,320** benefit | • Remove 526 **lbs** of pollution<br>• Net value of **$1,482** | • Sequester 99,444 **lbs**<br>• Value of **$1,191**<br>• Store 1,604,098 **lbs**<br>• Value of **$12,031** | • **$8,653** in social benefits | • **$32,095** annual benefits<br>• Each tree provides **$202** annually |

# FOREST STRUCTURE

## Species Distribution

Preston has over 23 different tree species along city streets and parks (Appendix A, Figure 1).

The distribution of trees by genera is as follows:

| | | |
|---|---|---|
| Maple | 115 | 72% |
| Ash | 8 | 5% |
| Oak | 8 | 5% |
| Basswood/Linden | 6 | 4% |
| Hackberry | 5 | 3% |
| Spruce | 4 | 3% |
| Pine | 3 | 2% |
| Poplar | 2 | 1% |

| | | |
|---|---|---|
| Elm | 2 | 1% |
| Alder | 1 | <1% |
| Apple | 1 | <1% |
| Birch | 1 | <1% |
| Redbud | 1 | <1% |
| Sycamore | 1 | <1% |
| Tree of Heaven | 1 | <1% |

## Age Class

Most of Preston's trees (24%) are between 24 and 30 inches in diameter at 4.5 ft (Appendix A, Figure 2).

To prepare for natural mortality and to maintain canopy cover, most trees should be in the smallest size category (a downward slope), indicating youth. Preston's size curve is on the larger side, indicating a older than average stand.

## Condition: Wood and Foliage

Both wood condition and leaf condition are good indicators of the urban forest's overall health. The foliage condition results for Preston indicate that 94% of the trees are in good health, with only 1% of the foliage in poor health, dead, or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 65% of Preston's trees are in good health for wood condition (Appendix A, Figure 4 & Appendix B, Figure 3). Five percent of the tree population's wood condition is in poor health, dead, or dying. This 5% is an estimate of trees that need management follow up.

## Management Needs

The following outlines the specific management needs of the street and park trees by number of trees and percent of canopy (Appendix B, Figure 3).

| Action | Number of Trees | Percentage |
|---|---|---|
| Crown Cleaning | 31 | 20% |
| Crown Raising | 17 | 11% |
| Tree Removal | 1 | 1% |
| Crown Reduction | 0 | 0% |
| Tree Staking | 0 | 0% |

## Canopy Cover

The total canopy with both private and public trees is 53 acres or 9% cover. The canopy cover included in the Preston inventory includes approximately 5 acres (Appendix A, Figure 4). The city's canopy goal is to increase canopy by 10% in 30 years. To achieve this goal it is estimated that 2 trees need to be planted annually on public and private lands.

## Land Use and Location

The majority of Preston's city and park trees are in planting strips in single family residential neighborhoods (Appendix A, Figure 6 & Appendix A, Figure7). The following describes the land use and locations for the street and park trees.

| Land Use | Percentage |
|---|---|
| Single Family Residential | 73% |
| Park/Vacant/Other | 27% |
| Industrial/Large Commercial | 0% |
| Small Commercial | 0% |
| Multifamily Residential | 0% |

# Recommendations

# RECOMMENDATIONS

## Risk Management

Hazardous trees can be a significant threat to both people and property. Trees that are dead, dying, or have large issues such as trunk cracks longer than 18 inches should be removed. Broken branches and branches that interfere with motorists' vision of pedestrians, vehicles, traffic signs and signals should be removed.

### HAZARDOUS TREES

Preston has 1 critical concern trees that need immediate removal. These trees can be seen on the Location of Trees with Recommended Maintenance Map (Appendix B, Figure 4). We recommend starting with the large-diameter, critical concern trees first. There are 1 trees over 24 inches in diameter at 4.5 ft that should be addressed immediately. Please refer to the Six-Year Maintenance Plan at the end of this section. After all of the critical concern trees are addressed, there should be follow up on the trees marked as needing maintenance. There are a total of 154 trees with maintenance needs.

### POOR TREE SPECIES

After removing the critical concern trees, ash trees in poor health should be assessed for removal (Appendix B, Figure 3 & Appendix B, Figure 4). One ash tree is recommended for removal. There are a total of 8 ash trees, and 3 of those have signs and symptoms that have been associated with EAB. In addition, there are 8 trees that are in poor health. *City ownership of the trees recommended for removal should be verified prior to any removal*

## Pruning Cycle

Proper pruning can extend the life and good health of trees, as well as reduce public safety issues. In the Management Needs section of the Findings there are four main maintenance issues to be addressed: routine pruning, crown cleaning, crown raising, and crown reduction. Crown cleaning removes dead, diseased, and damaged limbs. Crown raising removes lower branches that are two inches in diameter or larger to provide clearance for pedestrians or vehicles. Crown reduction removes individual limbs from structures or utility wires. We recommend that all trees be pruned on a routine schedule every five to seven years. Please refer to the Six Year Maintenance Plan for further information.

## Planting

Most of the planting over the next five years will replace the trees that are removed. We recommend planting 1.2 trees for every tree removed, since survival rates will not be 100%. It is not essential that the new trees be planted in the same location of the trees being removed. However, maintaining the same number of trees helps ensure continuation of the benefits of the existing forest in Preston.

It is important to plant a diverse mix of species in the urban forest to maintain canopy health, since most insects and diseases target a genus (ash) or species (green ash) of trees. Current diversity recommendations advise that a genus (i.e. maple, oak) not make up more than 20% of the urban forest and a single species (i.e. silver maple, sugar maple, white oak, bur oak) not make up more than 10% of the total urban forest. Presently, the forest is heavily planted with maple (72%) (Appendix A, Figure 1). Maples should not be planted until this percentage can be lowered. Also, ash trees have not been recommended since 2002, due to the threat of EAB. Other species to avoid because they are public nuisances include: crabapple, Japanese Lilac, serviceberry, oak (red, white), hackberry, linden, elm (disease resistant), cork, London plane, ironwood hornbeam as outlined in section 2.7.4 of the city ordinance (Appendix C). All trees planted must meet the restrictions in city ordinance 2.7.4 (Appendix C).

### Continual Monitoring

Due to the threat of EAB, it is important to continuously check the health of ash trees. We recommend that ash trees be checked with a visual survey every year for tree decline and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

## EMERALD ASH BORER PLAN

### Ash Tree Removal

Tree removal will be prioritized by first removing dead, dying, hazardous trees (Appendix B, Figure 4). Next will be all ash in poor condition that display EAB signs and symptoms (Appendix B, Figure 2 & Appendix B, Figure 3). *City ownership of the tree recommended for removal should be verified prior to any removal*

### Treatment of Ash Trees

Chemical treatment can be an effective tool for communities to spread removal costs out over several years while allowing trees to continue providing benefits. However, treatment is not recommended if EAB is more than 15 miles away from the community. For more information on the cost of treatment strategies visit http://extension.entm.purdue.edu/treecomputer/

## EAB Quarantines

EAB is an extremely destructive plant pest and it is responsible for the death and decline of millions of ash trees. Ash in both forested and urban settings constitute a significant portion of the canopy cover in the United States. Current tools to detect, control, suppress and eradicate this pest are not as robust as the USDA would desire. In order to stay ahead of this hard to detect beetle, the USDA is attempting to contain the beetle before it spreads beyond its known positions by regulating articles.

A regulated article under the USDA's quarantine includes any of the following items:

- emerald ash borer
- firewood of all hardwood species (for example ash, oak, maple and hickory)
- nursery stock and green lumber of ash
- any other ash material, whether living, dead, cut or fallen, including logs, stumps, roots, branches, as well as composted and not composted chips of the genus ash (Mountain ash is not included)

In addition, any other article, product, or means of conveyance not listed above may be designated as a regulated article if a USDA inspector determines that it presents a risk of spreading EAB once a quarantine is in effect for your county.

## Wood Disposal

A very important aspect of planning is determining how wood infested with EAB will be handled, keeping in mind that quarantines will restrict its movement. Consider who will cut and haul the dead and dying trees? Is there an accessible, secured site big enough to store and sort the hundreds of trees and the associated brush and chips? How will wood be disposed of or utilized? Do you have equipment capable of handling the amount and size of ash trees your tree inventory has identified? Once your county is under quarantine for EAB, contact USDA-APHIS-PPQ at 515-251-4083 or visit the website http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/regulatory.shtml. Wood waste can be normally disposed of if your county is not part of a quarantine.

## Canopy Replacement

As budget permits, all removed trees will be replaced. All trees will meet the restrictions in city ordinance 2.7.4 (Appendix C). The new plantings will be a diverse mix and will not include crabapple, Japanese Lilac, serviceberry, oak (red, white), hackberry, linden, elm (disease resistant), cork, London plane, ironwood hornbeam.

## Postponed Work

While finances, staffing, and equipment are focused on the management of ash, usual services may be delayed. Tree removal requests on genera other than ash will be prioritized by hazardous or emergency situations only.

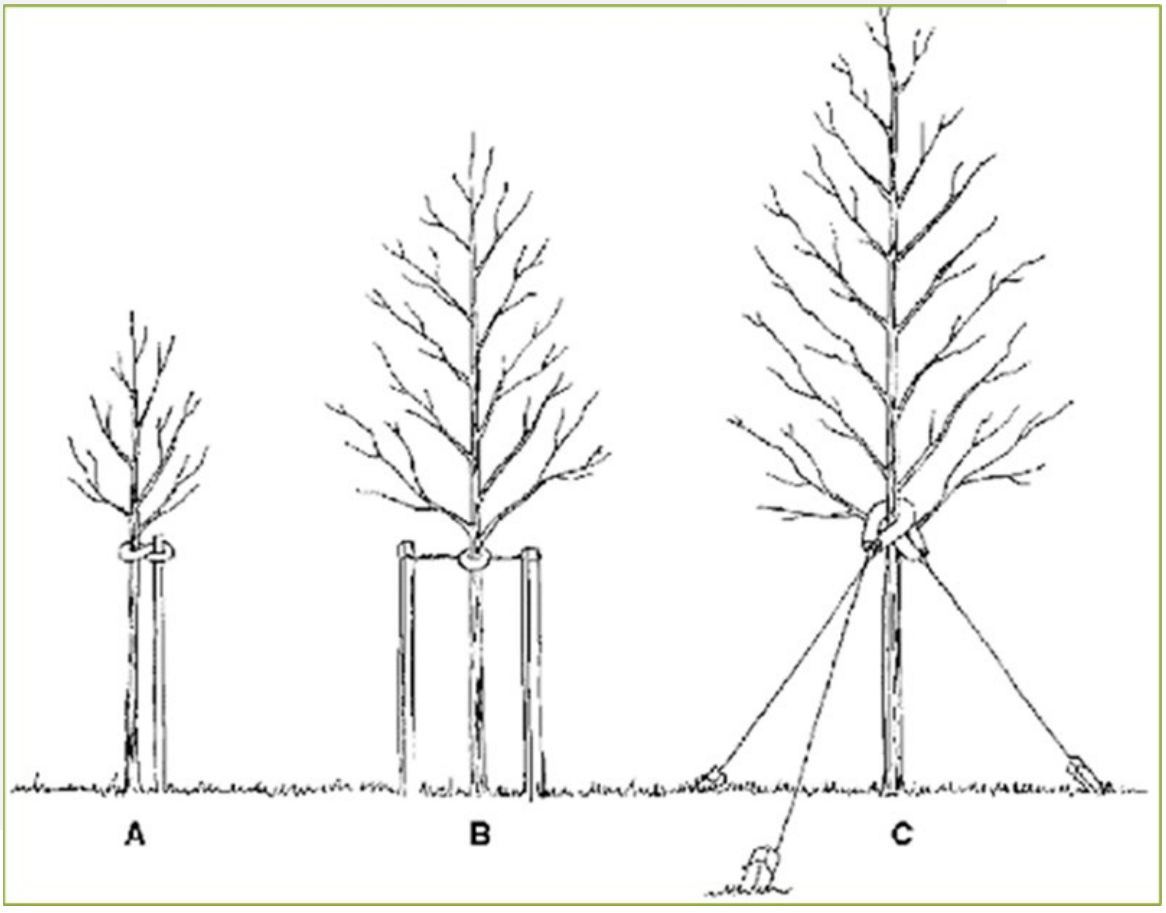
## Monitoring

It is recommended that ash trees be checked with a visual survey every year for tree death and for EAB signs and symptoms including canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

## Private Ash Trees

It is strongly recommended that private property owners start removing ash trees on their property upon arrival of EAB if preventative treatments are not being used. City Code 2.7.4 states “A property owner may remove a tree that is on personal property as long as the property owner does the actual work. Otherwise, the property owner must hire a licensed tree surgeon to remove the tree.”

# Schedule & Budget



# PROPOSED WORK SCHEDULE & BUDGET

Budget Allowance of $500/Year – (Based off Reported Yearly Tree Budget)

| YEAR 1 | Est. Cost |
|---|---|
| Remove 1 ash tree in poor condition | $700 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$700** |

| YEAR 2 | Est. Cost |
|---|---|
| Prune 1/5 of city owned trees | $477 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$477** |

| YEAR 3 | Est. Cost |
|---|---|
| Plant 3 trees in open locations | $450 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$450** |

| YEAR 4 | Est. Cost |
|---|---|
| Prune 1/5 of city owned trees | $477 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$477** |

| YEAR 5 | Est. Cost |
|---|---|
| Plant 3 trees in open locations | $450 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$450** |

| YEAR 6 | Est. Cost |
|---|---|
| Prune 1/5 of city owned trees | $477 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$477** |

*Estimated costs based on average costs of $700/tree for removal, $150/tree for planting and maintenance, and $15/tree for pruning.*

***To remove all ash trees within 6 years alone, the budget would need to be $1,000 a year. If the budget were increased to $2,000 a year all ash could be removed in 3 years.*

# PROPOSED WORK SCHEDULE WITH INCREASED BUDGET

Budget Allowance of $2,000/Year – (Budget Increase Suggested to Best Manage City Trees)

| YEAR 1 | Est. Cost |
|---|---|
| Remove 1 tree recommended for immediate removal | $700 |
| Remove 1 ash tree in poor condition | $700 |
| Plant 4 trees in open locations | $600 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$2,000** |

| YEAR 2 | Est. Cost |
|---|---|
| Remove 1 ash trees in poor condition | $700 |
| Plant 3 trees in open locations | $450 |
| Prune 1/3 of city owned trees | $795 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$1,945** |

| YEAR 3 | Est. Cost |
|---|---|
| Remove 2 ash trees | $1,400 |
| Plant 4 trees in open locations | $600 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$2,000** |

| YEAR 4 | Est. Cost |
|---|---|
| Remove 1 ash tree | $700 |
| Plant 3 trees in open locations | $450 |
| Prune 1/3 of city owned trees | $795 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$1,945** |

| YEAR 5 | Est. Cost |
|---|---|
| Remove 2 ash trees | $1,400 |
| Plant 4 trees in open locations | $600 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$2,000** |

| YEAR 6 | Est. Cost |
|---|---|
| Remove 1 ash tree | $700 |
| Plant 3 trees in open locations | $450 |
| Prune 1/3 of city owned trees | $795 |
| Visual Survey of EAB Signs/Symptoms | n/a |
| TOTAL | **$1,945** |

**Purposed Budget Increase**

EAB could potentially kill all ash trees in Preston within four years of its arrival. To remove all ash trees within six years, the budget would need to be increased to $1,000 a year. If the budget were increased to $2,000 per year all ash could be removed within 3 years. Additionally, we recommend that Preston apply for grants to fund replacement trees. Utility Company grants

are usually between $500 and $10,000 for community-based, tree-planting projects that include parks, gateways, cemeteries, nature trails, libraries, nursing homes, and schools.

Another option considered by many communities is treating selected trees, either to maintain those trees in the landscape or to delay their removal – to spread out the costs and number of trees needing removal all at once. Trunk injection is administered every two years for the life of the tree. If treatment is discontinued, the tree dies. For instance, in this treatment scenario, the average ash diameter is 20 inches and at $15 per inch, about 1 tree could be treated per year (every other year treatment). Four trees would be selected for treatment, and Preston would still need to find $2,800 for removal. Alternatively, if there are 6 treatable trees, it would cost approximately $900 a year for treatment and leave $0 for removal. These are alternatives to straight removal of ash trees. However, whether or not the treatment option is selected, there will be an increased cost of dealing with ash trees if EAB is found in Preston. We suggest considering an increased budget to plan for this.

# WORKS CITED

Census Bureau. 2010. http://censtats.census.gov/data/IA/1601964290.pdf(April, 2013)

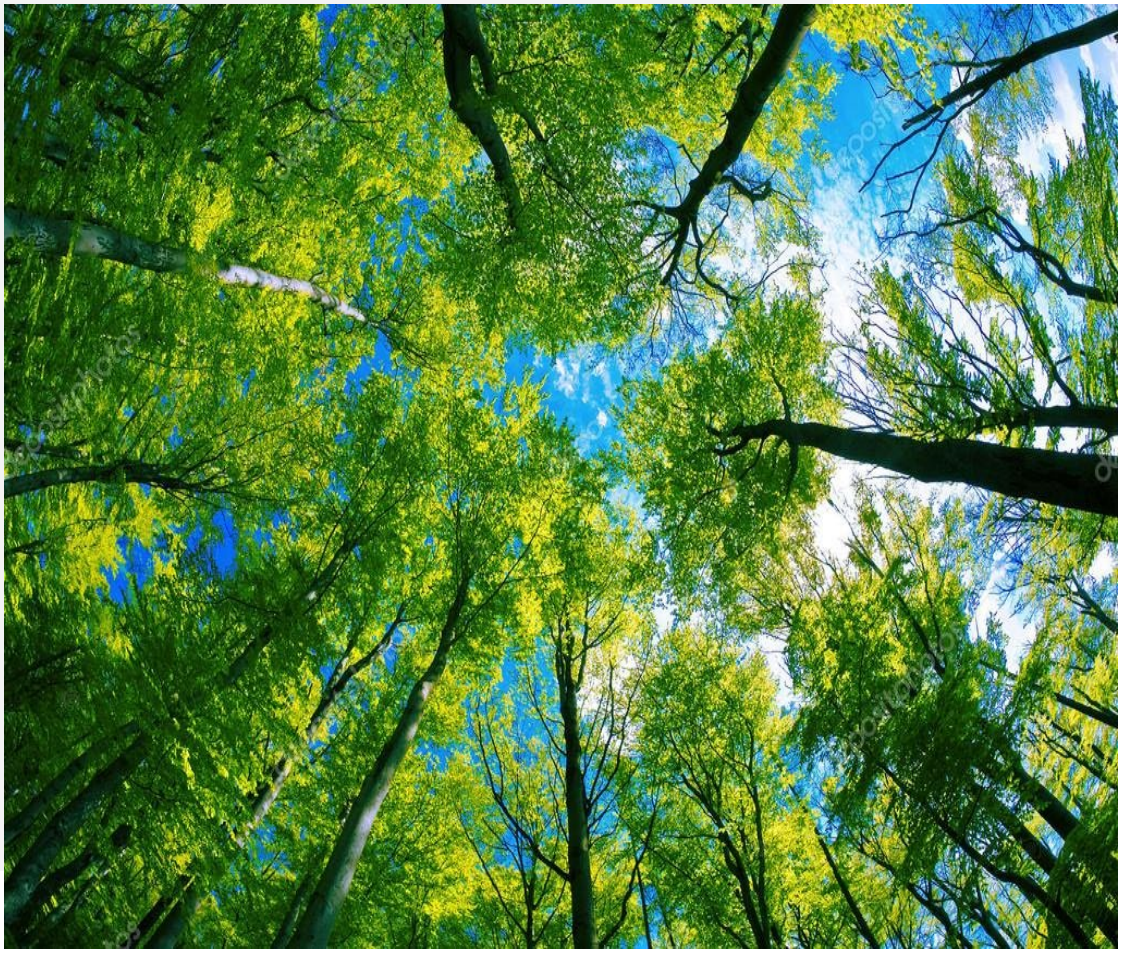
USDA Forest Service, et al. 2006. i-Tree Software Suite v1.0 User's Manual. Pp. 27-40.

McPherson EG, Simpson JR, Peper PJ, Gardner SL, Vargas KE, Ho J, Maco S, Xiao Q. 2005b. City of Charleston, South Carolina, municipal forest resource analysis. Internal Tech Rep. Davis, CA: U.S. Department of Agriculture, Center for Urban Forest Research. p. 57

Nowak, DJ and JF Dwyer. 2007. Understanding the benefits and costs of urban forest ecosystems. In: Kuser, J. (ed.) Urban and Community Forestry in the Northeast. New York: Springer. Pp. 25-46.

Peper, Paula J; McPherson, E Gregory; Simpson, James R; Vargas, Kelaine E; Xiao, Qingfu 2009. Lower Midwest community tree guide: benefits, costs, and strategic planting. Gen. Tech. Rep. PSW-GTR-219. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. p.115

# Appendices



# APPENDIX A: i-TREE DATA

## Table 1: Annual Energy Benefits

**Preston**

# Annual Energy Benefits of Public Trees

2/7/2023

| Species | Total Electricity (MWh) | Electricity ($) | Total Natural Gas (Therms) | Natural Gas ($) | Total ($) | Standard Error | % of Total Trees | % of Total $ | Avg. $/tree |
|---|---|---|---|---|---|---|---|---|---|
| Norway maple | 11.4 | 867 | 1,616.2 | 1,584 | 2,451 | (N/A) | 29.6 | 29.0 | 52.14 |
| Silver maple | 14.2 | 1,080 | 1,858.3 | 1,821 | 2,901 | (N/A) | 27.0 | 34.3 | 67.46 |
| Sugar maple | 2.9 | 223 | 403.9 | 396 | 619 | (N/A) | 7.5 | 7.3 | 51.54 |
| Red maple | 1.1 | 82 | 136.6 | 134 | 216 | (N/A) | 6.9 | 2.6 | 19.62 |
| Ash | 1.9 | 148 | 281.5 | 276 | 424 | (N/A) | 5.0 | 5.0 | 52.95 |
| Northern red oak | 1.3 | 102 | 190.4 | 187 | 288 | (N/A) | 3.8 | 3.4 | 48.05 |
| American basswood | 1.3 | 102 | 177.0 | 173 | 275 | (N/A) | 3.8 | 3.3 | 45.89 |
| Northern hackberry | 1.9 | 146 | 276.7 | 271 | 417 | (N/A) | 3.1 | 4.9 | 83.34 |
| Blue spruce | 0.4 | 29 | 45.6 | 45 | 74 | (N/A) | 1.9 | 0.9 | 24.51 |
| Eastern white pine | 0.2 | 15 | 29.2 | 29 | 44 | (N/A) | 1.3 | 0.5 | 22.02 |
| Maple | 0.0 | 3 | 6.0 | 6 | 9 | (N/A) | 1.3 | 0.1 | 4.44 |
| Tulip tree | 0.9 | 66 | 118.0 | 116 | 182 | (N/A) | 1.3 | 2.2 | 91.02 |
| Siberian elm | 0.6 | 46 | 84.5 | 83 | 128 | (N/A) | 1.3 | 1.5 | 64.22 |
| Eastern redbud | 0.0 | 2 | 3.8 | 4 | 5 | (N/A) | 0.6 | 0.1 | 5.40 |
| Tree of heaven | 0.0 | 3 | 6.2 | 6 | 9 | (N/A) | 0.6 | 0.1 | 8.99 |
| Apple | 0.2 | 15 | 31.6 | 31 | 46 | (N/A) | 0.6 | 0.5 | 46.14 |
| Alder | 0.1 | 6 | 12.8 | 13 | 18 | (N/A) | 0.6 | 0.2 | 18.19 |
| Scotch pine | 0.1 | 10 | 14.6 | 14 | 24 | (N/A) | 0.6 | 0.3 | 24.14 |
| American sycamore | 0.4 | 33 | 59.0 | 58 | 91 | (N/A) | 0.6 | 1.1 | 91.02 |
| Northern pin oak | 0.3 | 24 | 47.4 | 46 | 71 | (N/A) | 0.6 | 0.8 | 70.84 |
| Pin oak | 0.4 | 29 | 51.8 | 51 | 80 | (N/A) | 0.6 | 0.9 | 80.25 |
| Spruce | 0.0 | 2 | 4.0 | 4 | 6 | (N/A) | 0.6 | 0.1 | 5.61 |
| River birch | 0.3 | 24 | 47.4 | 46 | 71 | (N/A) | 0.6 | 0.8 | 70.84 |
| Total | 40.3 | 3,056 | 5,502.3 | 5,392 | 8,448 | (N/A) | 100.0 | 100.0 | 53.13 |

## Table 2: Annual Stormwater Benefits

**Preston**

# Annual Stormwater Benefits of Public Trees

2/7/2023

| Species | Total rainfall interception (Gal) | Total ($) | Standard Error | % of Total Trees | % of Total $ | Avg. $/tree |
|---|---|---|---|---|---|---|
| Norway maple | 102,906 | 2,789 | (N/A) | 29.6 | 22.6 | 59.33 |
| Silver maple | 202,969 | 5,500 | (N/A) | 27.0 | 44.6 | 127.92 |
| Sugar maple | 30,492 | 826 | (N/A) | 7.5 | 6.7 | 68.86 |
| Red maple | 6,383 | 173 | (N/A) | 6.9 | 1.4 | 15.73 |
| Ash | 17,086 | 463 | (N/A) | 5.0 | 3.8 | 57.88 |
| Northern red oak | 14,689 | 398 | (N/A) | 3.8 | 3.2 | 66.34 |
| American basswood | 9,020 | 244 | (N/A) | 3.8 | 2.0 | 40.74 |
| Northern hackberry | 19,463 | 527 | (N/A) | 3.1 | 4.3 | 105.49 |
| Blue spruce | 4,633 | 126 | (N/A) | 1.9 | 1.0 | 41.85 |
| Eastern white pine | 3,565 | 97 | (N/A) | 1.3 | 0.8 | 48.30 |
| Maple | 149 | 4 | (N/A) | 1.3 | 0.0 | 2.02 |
| Tulip tree | 14,478 | 392 | (N/A) | 1.3 | 3.2 | 196.17 |
| Siberian elm | 5,649 | 153 | (N/A) | 1.3 | 1.2 | 76.55 |
| Eastern redbud | 69 | 2 | (N/A) | 0.6 | 0.0 | 1.86 |
| Tree of heaven | 163 | 4 | (N/A) | 0.6 | 0.0 | 4.41 |
| Apple | 1,174 | 32 | (N/A) | 0.6 | 0.3 | 31.82 |
| Alder | 264 | 7 | (N/A) | 0.6 | 0.1 | 7.17 |
| Scotch pine | 1,539 | 42 | (N/A) | 0.6 | 0.3 | 41.70 |
| American sycamore | 7,239 | 196 | (N/A) | 0.6 | 1.6 | 196.17 |
| Northern pin oak | 3,764 | 102 | (N/A) | 0.6 | 0.8 | 102.01 |
| Pin oak | 4,943 | 134 | (N/A) | 0.6 | 1.1 | 133.95 |
| Spruce | 213 | 6 | (N/A) | 0.6 | 0.0 | 5.77 |
| River birch | 3,764 | 102 | (N/A) | 0.6 | 0.8 | 102.01 |
| Citywide total | 454,613 | 12,320 | (N/A) | 100.0 | 100.0 | 77.48 |

## Table 3: Annual Air Quality Benefits

**Preston**

# Annual Air Quality Benefits of Public Trees

2/7/2023

| Species | Deposition (lb) | | | | Total Depos. ($) | Avoided (lb) | | | | Total Avoided ($) | BVOC Emissions (lb) | BVOC Emissions ($) | Total (lb) | Total ($) | Standard Error | % of Total Trees | Avg. $/tree |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $O_3$ | $NO_2$ | $PM_{10}$ | $SO_2$ | | $NO_2$ | $PM_{10}$ | VOC | $SO_2$ | | | | | | | | |
| Norway maple | 20.8 | 3.6 | 10.2 | 0.9 | 112 | 55.1 | 8.0 | 7.6 | 51.8 | 342 | -4.9 | -18 | 153.1 | 436 | (N/A) | 29.6 | 9.27 |
| Silver maple | 34.2 | 5.8 | 16.8 | 1.5 | 185 | 66.9 | 9.8 | 9.4 | 64.3 | 419 | -17.3 | -65 | 191.5 | 539 | (N/A) | 27.0 | 12.53 |
| Sugar maple | 3.8 | 0.6 | 1.9 | 0.2 | 21 | 14.0 | 2.0 | 1.9 | 13.3 | 87 | -3.0 | -11 | 34.8 | 97 | (N/A) | 7.5 | 8.06 |
| Red maple | 1.1 | 0.2 | 0.6 | 0.1 | 6 | 5.1 | 0.7 | 0.7 | 4.9 | 32 | -0.4 | -2 | 12.9 | 36 | (N/A) | 6.9 | 3.30 |
| Ash | 3.3 | 0.6 | 1.7 | 0.1 | 18 | 9.4 | 1.4 | 1.3 | 8.8 | 58 | -0.8 | -3 | 25.8 | 74 | (N/A) | 5.0 | 9.19 |
| Northern red oak | 3.2 | 0.5 | 1.5 | 0.1 | 17 | 6.5 | 0.9 | 0.9 | 6.1 | 40 | -4.6 | -17 | 15.2 | 40 | (N/A) | 3.8 | 6.66 |
| American basswood | 0.9 | 0.1 | 0.5 | 0.0 | 5 | 6.4 | 0.9 | 0.9 | 6.1 | 40 | -0.9 | -3 | 15.0 | 41 | (N/A) | 3.8 | 6.90 |
| Northern hackberry | 3.1 | 0.5 | 1.6 | 0.1 | 17 | 9.3 | 1.3 | 1.3 | 8.7 | 58 | 0.0 | 0 | 25.9 | 74 | (N/A) | 3.1 | 14.87 |
| Blue spruce | 0.6 | 0.1 | 0.5 | 0.1 | 4 | 1.8 | 0.3 | 0.2 | 1.7 | 11 | -1.7 | -6 | 3.6 | 9 | (N/A) | 1.9 | 2.89 |
| Eastern white pine | 0.4 | 0.1 | 0.3 | 0.0 | 3 | 1.0 | 0.1 | 0.1 | 0.9 | 6 | -1.5 | -6 | 1.5 | 3 | (N/A) | 1.3 | 1.46 |
| Maple | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.2 | 0.0 | 0.0 | 0.2 | 1 | 0.0 | 0 | 0.4 | 1 | (N/A) | 1.3 | 0.62 |
| Tulip tree | 2.3 | 0.4 | 1.0 | 0.1 | 12 | 4.2 | 0.6 | 0.6 | 4.0 | 26 | 0.0 | 0 | 13.1 | 38 | (N/A) | 1.3 | 19.04 |
| Siberian elm | 0.8 | 0.1 | 0.4 | 0.0 | 4 | 2.9 | 0.4 | 0.4 | 2.7 | 18 | 0.0 | 0 | 7.8 | 22 | (N/A) | 1.3 | 11.10 |
| Eastern redbud | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.1 | 0.0 | 0.0 | 0.1 | 1 | 0.0 | 0 | 0.3 | 1 | (N/A) | 0.6 | 0.71 |
| Tree of heaven | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.2 | 0.0 | 0.0 | 0.2 | 1 | 0.0 | 0 | 0.4 | 1 | (N/A) | 0.6 | 1.21 |
| Apple | 0.4 | 0.1 | 0.2 | 0.0 | 2 | 1.0 | 0.1 | 0.1 | 0.9 | 6 | 0.0 | 0 | 2.9 | 8 | (N/A) | 0.6 | 8.35 |
| Alder | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.4 | 0.1 | 0.1 | 0.3 | 2 | 0.0 | 0 | 0.9 | 3 | (N/A) | 0.6 | 2.55 |
| Scotch pine | 0.2 | 0.0 | 0.1 | 0.0 | 1 | 0.6 | 0.1 | 0.1 | 0.6 | 4 | -0.5 | -2 | 1.2 | 3 | (N/A) | 0.6 | 2.82 |
| American sycamore | 1.2 | 0.2 | 0.5 | 0.1 | 6 | 2.1 | 0.3 | 0.3 | 2.0 | 13 | 0.0 | 0 | 6.6 | 19 | (N/A) | 0.6 | 19.04 |
| Northern pin oak | 0.9 | 0.1 | 0.4 | 0.0 | 5 | 1.6 | 0.2 | 0.2 | 1.5 | 10 | -0.2 | -1 | 4.7 | 14 | (N/A) | 0.6 | 13.58 |
| Pin oak | 0.9 | 0.2 | 0.5 | 0.0 | 5 | 1.8 | 0.3 | 0.3 | 1.8 | 12 | -1.7 | -6 | 4.0 | 10 | (N/A) | 0.6 | 10.20 |
| Spruce | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 0.1 | 0.0 | 0.0 | 0.1 | 1 | -0.1 | 0 | 0.2 | 1 | (N/A) | 0.6 | 0.56 |
| River birch | 0.9 | 0.1 | 0.4 | 0.0 | 5 | 1.6 | 0.2 | 0.2 | 1.5 | 10 | -0.2 | -1 | 4.7 | 14 | (N/A) | 0.6 | 13.58 |
| Citywide total | 78.9 | 13.5 | 39.3 | 3.6 | 427 | 192.0 | 28.0 | 26.7 | 182.4 | 1,197 | -37.8 | -142 | 526.6 | 1,482 | (N/A) | 100.0 | 9.32 |

## Table 4: Annual Carbon Stored

## Preston

# Stored CO2 Benefits of Public Trees

2/7/2023

| Species | Total Stored CO2 (lbs) | Total ($) | Standard Error | % of Total Trees | % of Total $ | Avg. $/tree |
|---|---|---|---|---|---|---|
| Norway maple | 341,845 | 2,564 | (N/A) | 29.6 | 21.3 | 54.55 |
| Silver maple | 733,591 | 5,502 | (N/A) | 27.0 | 45.7 | 127.95 |
| Sugar maple | 107,243 | 804 | (N/A) | 7.5 | 6.7 | 67.03 |
| Red maple | 13,578 | 102 | (N/A) | 6.9 | 0.8 | 9.26 |
| Ash | 54,410 | 408 | (N/A) | 5.0 | 3.4 | 51.01 |
| Northern red oak | 70,198 | 526 | (N/A) | 3.8 | 4.4 | 87.75 |
| American basswood | 30,816 | 231 | (N/A) | 3.8 | 1.9 | 38.52 |
| Northern hackberry | 45,696 | 343 | (N/A) | 3.1 | 2.8 | 68.54 |
| Blue spruce | 3,355 | 25 | (N/A) | 1.9 | 0.2 | 8.39 |
| Eastern white pine | 3,599 | 27 | (N/A) | 1.3 | 0.2 | 13.50 |
| Maple | 235 | 2 | (N/A) | 1.3 | 0.0 | 0.88 |
| Tulip tree | 78,517 | 589 | (N/A) | 1.3 | 4.9 | 294.44 |
| Siberian elm | 18,988 | 142 | (N/A) | 1.3 | 1.2 | 71.20 |
| Eastern redbud | 178 | 1 | (N/A) | 0.6 | 0.0 | 1.33 |
| Tree of heaven | 218 | 2 | (N/A) | 0.6 | 0.0 | 1.64 |
| Apple | 6,743 | 51 | (N/A) | 0.6 | 0.4 | 50.57 |
| Alder | 908 | 7 | (N/A) | 0.6 | 0.1 | 6.81 |
| Scotch pine | 1,170 | 9 | (N/A) | 0.6 | 0.1 | 8.78 |
| American sycamore | 39,259 | 294 | (N/A) | 0.6 | 2.4 | 294.44 |
| Northern pin oak | 14,280 | 107 | (N/A) | 0.6 | 0.9 | 107.10 |
| Pin oak | 24,952 | 187 | (N/A) | 0.6 | 1.6 | 187.14 |
| Spruce | 38 | 0 | (N/A) | 0.6 | 0.0 | 0.29 |
| River birch | 14,280 | 107 | (N/A) | 0.6 | 0.9 | 107.10 |
| Citywide total | 1,604,098 | 12,031 | (N/A) | 100.0 | 100.0 | 75.67 |

The value of stored carbon dioxide is calculated as the total amount of carbon dioxide sequestered annually over the life of each tree, summed for the population. This value should not be added to the Replacement Value or double-counting of the carbon dioxide storage benefit will occur.

## Table 5: Annual Carbon Sequestered

**Preston**

# Annual CO $_2$ Benefits of Public Trees

2/7/2023

| Species | Sequestered (lb) | Sequestered ($) | Decomposition Release (lb) | Maintenance Release (lb) | Total Released ($) | Avoided (lb) | Avoided ($) | Net Total (lb) | Total Standard ($) Error | % of Total Trees | % of Total $ | Avg. $/tree |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Norway maple | 16,255 | 122 | -1,643 | -116 | -13 | 19,155 | 144 | 33,650 | 252 (N/A) | 29.6 | 21.2 | 5.37 |
| Silver maple | 56,953 | 427 | -3,521 | -154 | -28 | 23,860 | 179 | 77,138 | 579 (N/A) | 27.0 | 48.6 | 13.45 |
| Sugar maple | 6,310 | 47 | -516 | -32 | -4 | 4,922 | 37 | 10,684 | 80 (N/A) | 7.5 | 6.7 | 6.68 |
| Red maple | 1,869 | 14 | -65 | -10 | -1 | 1,812 | 14 | 3,605 | 27 (N/A) | 6.9 | 2.3 | 2.46 |
| Ash | 3,246 | 24 | -261 | -20 | -2 | 3,265 | 24 | 6,229 | 47 (N/A) | 5.0 | 3.9 | 5.84 |
| Northern red oak | 2,009 | 15 | -337 | -18 | -3 | 2,248 | 17 | 3,902 | 29 (N/A) | 3.8 | 2.5 | 4.88 |
| American basswood | 2,458 | 18 | -148 | -13 | -1 | 2,252 | 17 | 4,549 | 34 (N/A) | 3.8 | 2.9 | 5.69 |
| Northern hackberry | 2,613 | 20 | -219 | -18 | -2 | 3,217 | 24 | 5,593 | 42 (N/A) | 3.1 | 3.5 | 8.39 |
| Blue spruce | 272 | 2 | -16 | -6 | 0 | 639 | 5 | 889 | 7 (N/A) | 1.9 | 0.6 | 2.22 |
| Eastern white pine | 240 | 2 | -17 | -4 | 0 | 341 | 3 | 560 | 4 (N/A) | 1.3 | 0.4 | 2.10 |
| Maple | 42 | 0 | -1 | -1 | 0 | 67 | 1 | 107 | 1 (N/A) | 1.3 | 0.1 | 0.40 |
| Tulip tree | 1,824 | 14 | -377 | -10 | -3 | 1,469 | 11 | 2,906 | 22 (N/A) | 1.3 | 1.8 | 10.90 |
| Siberian elm | 1,124 | 8 | -91 | -6 | -1 | 1,009 | 8 | 2,036 | 15 (N/A) | 1.3 | 1.3 | 7.63 |
| Eastern redbud | 38 | 0 | -1 | -1 | 0 | 37 | 0 | 74 | 1 (N/A) | 0.6 | 0.0 | 0.55 |
| Tree of heaven | 96 | 1 | -2 | -1 | 0 | 65 | 0 | 158 | 1 (N/A) | 0.6 | 0.1 | 1.18 |
| Apple | 0 | 0 | -32 | -4 | 0 | 335 | 3 | 299 | 2 (N/A) | 0.6 | 0.2 | 2.24 |
| Alder | 114 | 1 | -4 | -1 | 0 | 124 | 1 | 232 | 2 (N/A) | 0.6 | 0.1 | 1.74 |
| Scotch pine | 116 | 1 | -6 | -2 | 0 | 216 | 2 | 324 | 2 (N/A) | 0.6 | 0.2 | 2.43 |
| American sycamore | 912 | 7 | -188 | -5 | -1 | 734 | 6 | 1,453 | 11 (N/A) | 0.6 | 0.9 | 10.90 |
| Northern pin oak | 370 | 3 | -69 | -4 | -1 | 539 | 4 | 837 | 6 (N/A) | 0.6 | 0.5 | 6.27 |
| Pin oak | 2,196 | 16 | -120 | -4 | -1 | 652 | 5 | 2,723 | 20 (N/A) | 0.6 | 1.7 | 20.43 |
| Spruce | 18 | 0 | 0 | -1 | 0 | 38 | 0 | 55 | 0 (N/A) | 0.6 | 0.0 | 0.41 |
| River birch | 370 | 3 | -69 | -4 | -1 | 539 | 4 | 837 | 6 (N/A) | 0.6 | 0.5 | 6.27 |
| Citywide total | 99,444 | 746 | -7,704 | -433 | -61 | 67,533 | 506 | 158,839 | 1,191 (N/A) | 100.0 | 100.0 | 7.49 |

## Table 6: Annual Social and Aesthetic Benefits

**Preston**

# Annual Aesthetic/Other Benefits of Public Trees

2/7/2023

| Species | Total ($) | Standard Error | % of Total Trees | % of Total $ | Avg. $/tree |
|---|---|---|---|---|---|
| Norway maple | 1,552 | (N/A) | 29.6 | 17.9 | 33.01 |
| Silver maple | 4,488 | (N/A) | 27.0 | 51.9 | 104.38 |
| Sugar maple | 671 | (N/A) | 7.5 | 7.7 | 55.88 |
| Red maple | 272 | (N/A) | 6.9 | 3.1 | 24.73 |
| Ash | 308 | (N/A) | 5.0 | 3.6 | 38.53 |
| Northern red oak | 139 | (N/A) | 3.8 | 1.6 | 23.18 |
| American basswood | 210 | (N/A) | 3.8 | 2.4 | 34.98 |
| Northern hackberry | 327 | (N/A) | 3.1 | 3.8 | 65.38 |
| Blue spruce | 76 | (N/A) | 1.9 | 0.9 | 25.23 |
| Eastern white pine | 63 | (N/A) | 1.3 | 0.7 | 31.25 |
| Maple | 7 | (N/A) | 1.3 | 0.1 | 3.66 |
| Tulip tree | 117 | (N/A) | 1.3 | 1.3 | 58.34 |
| Siberian elm | 86 | (N/A) | 1.3 | 1.0 | 42.97 |
| Eastern redbud | 2 | (N/A) | 0.6 | 0.0 | 2.06 |
| Tree of heaven | 13 | (N/A) | 0.6 | 0.1 | 12.89 |
| Apple | 0 | (N/A) | 0.6 | 0.0 | 0.00 |
| Alder | 6 | (N/A) | 0.6 | 0.1 | 6.40 |
| Scotch pine | 32 | (N/A) | 0.6 | 0.4 | 32.32 |
| American sycamore | 58 | (N/A) | 0.6 | 0.7 | 58.34 |
| Northern pin oak | 31 | (N/A) | 0.6 | 0.4 | 31.46 |
| Pin oak | 157 | (N/A) | 0.6 | 1.8 | 157.02 |
| Spruce | 7 | (N/A) | 0.6 | 0.1 | 6.83 |
| River birch | 31 | (N/A) | 0.6 | 0.4 | 31.46 |
| Citywide total | 8,653 | (N/A) | 100.0 | 100.0 | 54.42 |

## Table 7: Summary of Benefits in Dollars

**Preston**

# Total Annual Benefits, Net Benefits, and Costs for Public Trees

2/7/2023

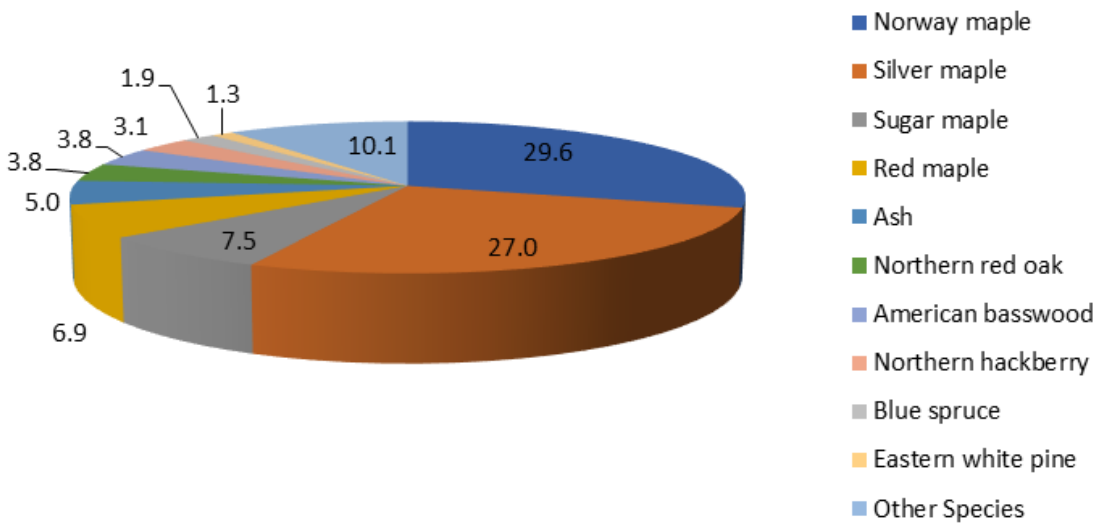
| Benefits | Total ($) | Standard Error | $/tree | Standard Error | $/capita | Standard Error |
|---|---|---|---|---|---|---|
| Energy | 8,448 | (N/A) | 53.13 | (N/A) | 8.35 | (N/A) |
| CO2 | 1,191 | (N/A) | 7.49 | (N/A) | 1.18 | (N/A) |
| Air Quality | 1,482 | (N/A) | 9.32 | (N/A) | 1.46 | (N/A) |
| Stormwater | 12,320 | (N/A) | 77.48 | (N/A) | 12.17 | (N/A) |
| Aesthetic/Other | 8,653 | (N/A) | 54.42 | (N/A) | 8.55 | (N/A) |
| Total Benefits | 32,095 | (N/A) | 201.86 | (N/A) | 31.71 | (N/A) |
| Costs | | | | | | |
| Planting | 0 | | 0.00 | | 0.00 | |
| Contract Pruning | 0 | | 0.00 | | 0.00 | |
| Pest Management | 0 | | 0.00 | | 0.00 | |
| Irrigation | 0 | | 0.00 | | 0.00 | |
| Removal | 0 | | 0.00 | | 0.00 | |
| Administration | 0 | | 0.00 | | 0.00 | |
| Inspection/Service | 0 | | 0.00 | | 0.00 | |
| Infrastructure Repairs | 0 | | 0.00 | | 0.00 | |
| Litter Clean-up | 0 | | 0.00 | | 0.00 | |
| Liability/Claims | 0 | | 0.00 | | 0.00 | |
| Other Costs | 0 | | 0.00 | | 0.00 | |
| Total Costs | 0 | | 0.00 | | 0.00 | |
| Net Benefits | 32,095 | (N/A) | 201.86 | (N/A) | 31.71 | (N/A) |
| Benefit-cost ratio | 0.00 | (N/A) | | | | |

## Figure 1: Species Distribution

**Preston**

# Species Distribution of Public Trees

2/7/2023



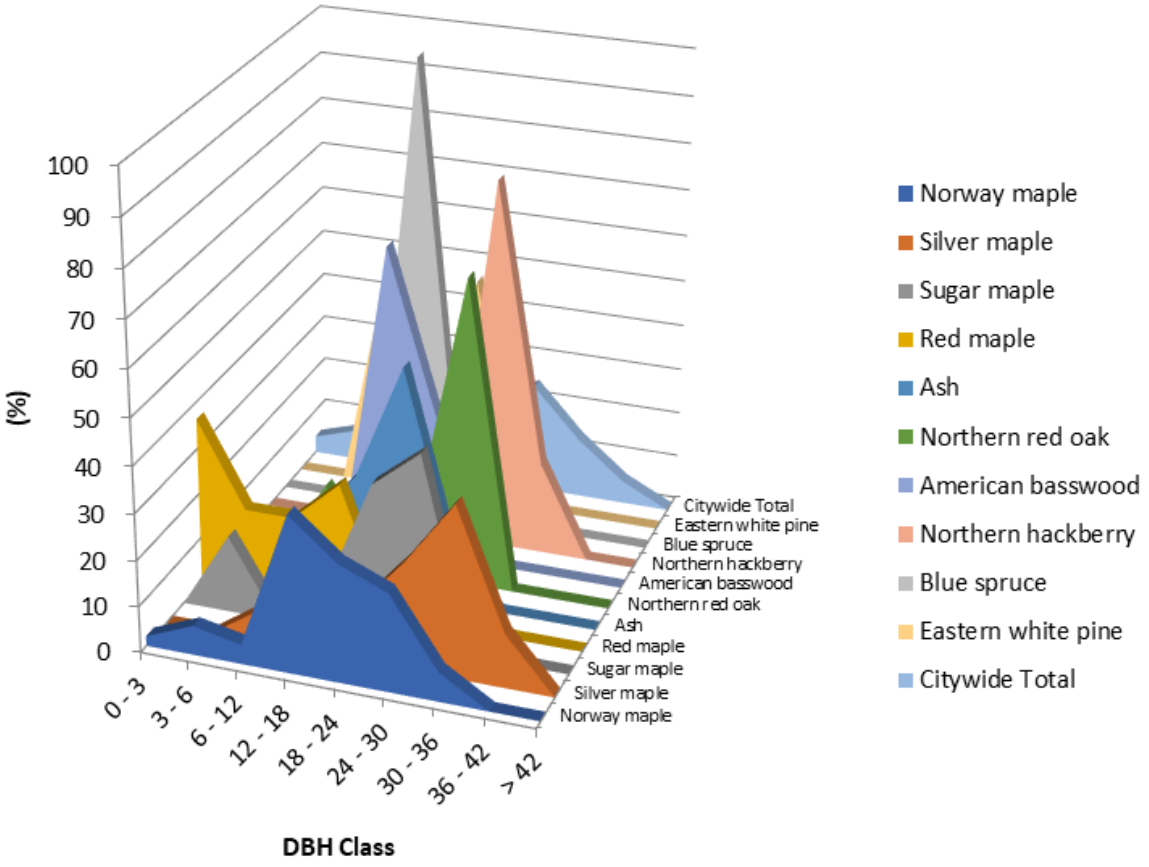

| Species | Percent |
|---|---|
| Norway maple | 29.6 |
| Silver maple | 27.0 |
| Sugar maple | 7.5 |
| Red maple | 6.9 |
| Ash | 5.0 |
| Northern red oak | 3.8 |
| American basswood | 3.8 |
| Northern hackberry | 3.1 |
| Blue spruce | 1.9 |
| Eastern white pine | 1.3 |
| Other Species | 10.1 |
| Total | 100.0 |

## Figure 2: Relative Age Class

**Preston**

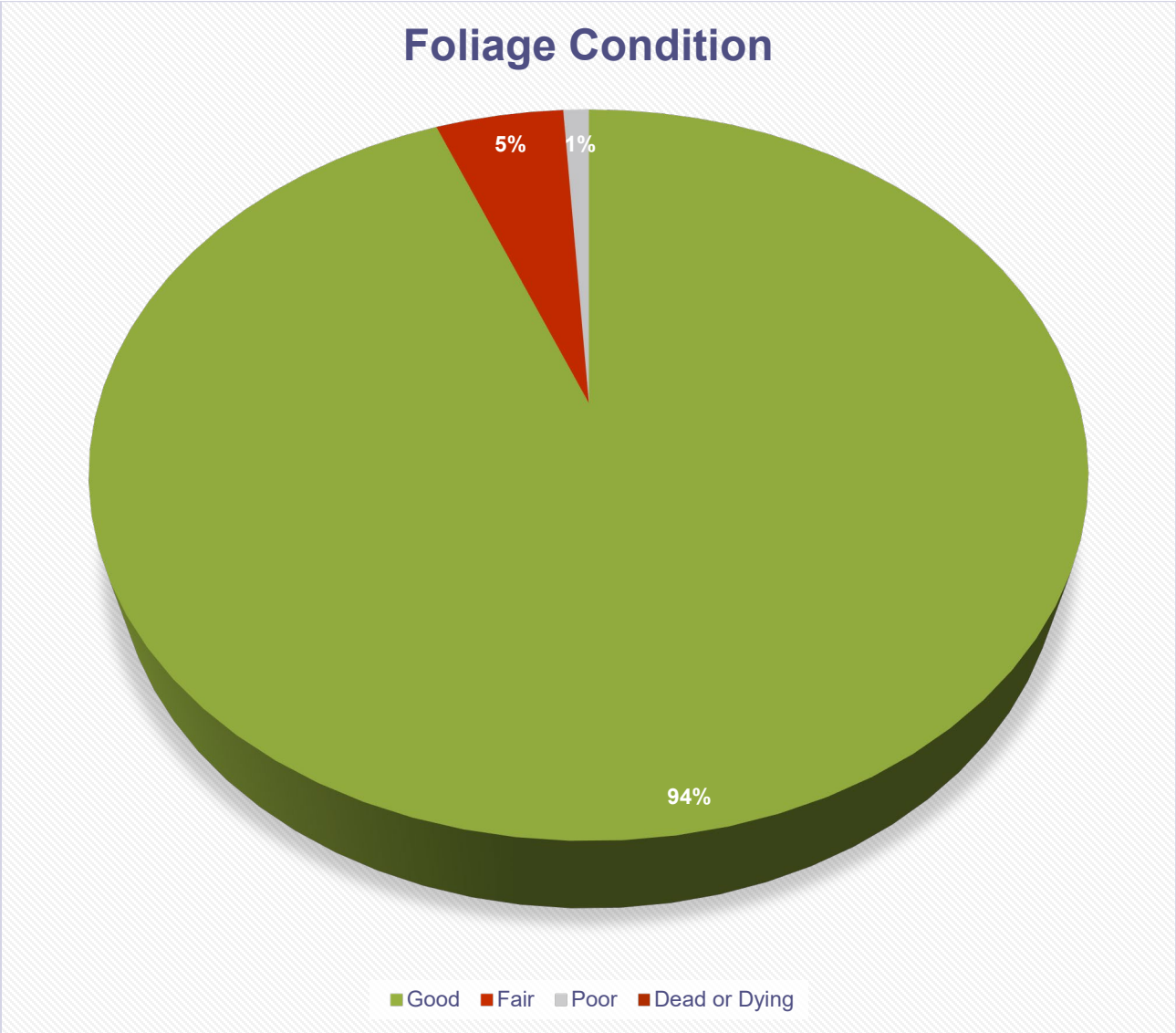
# Relative Age Distribution of Top 10 Public Tree Species for All Zones (%)

2/7/2023

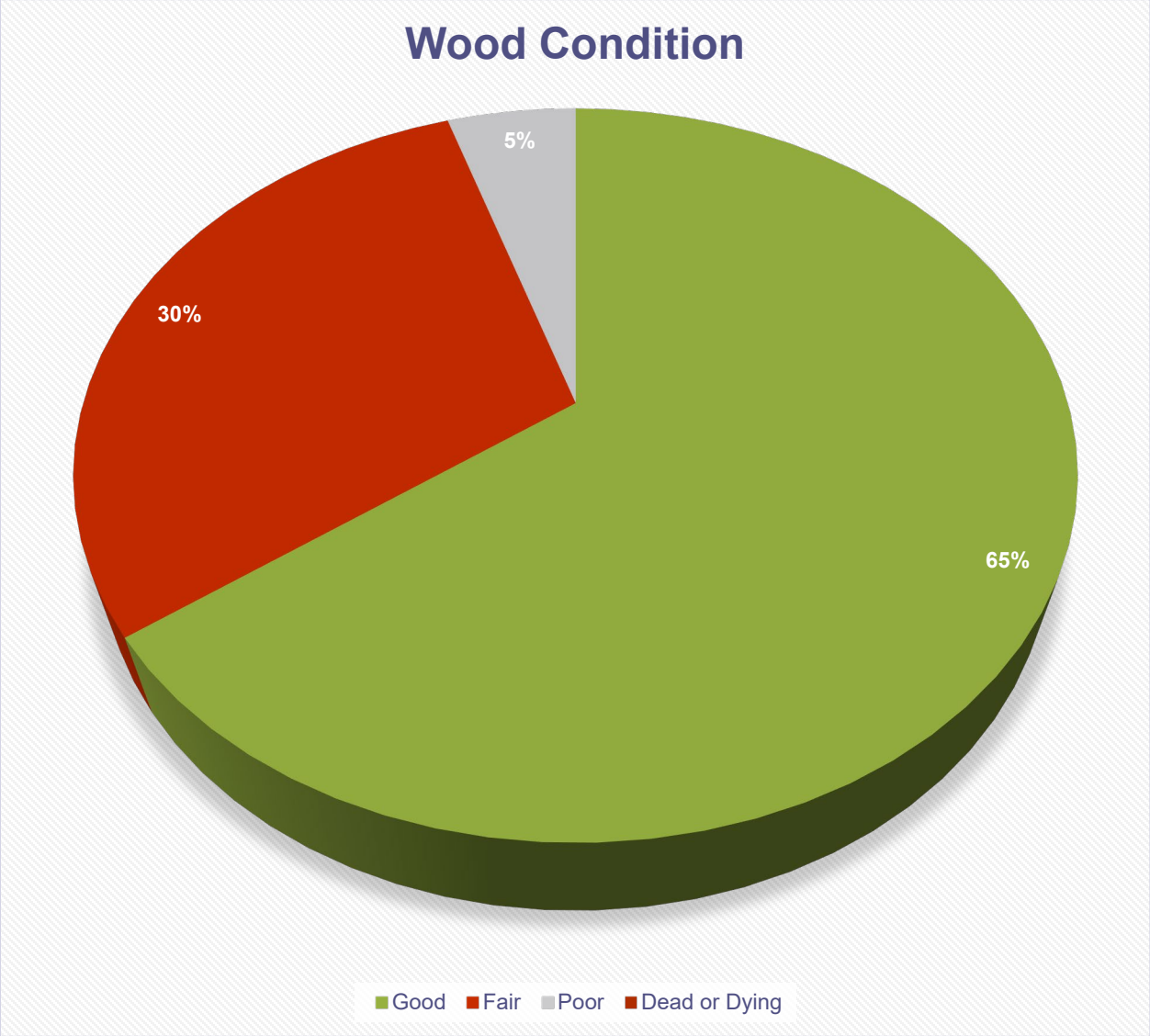



| | DBH class (in) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Species | 0-3 | 3-6 | 6-12 | 12-18 | 18-24 | 24-30 | 30-36 | 36-42 | > 42 |
| Norway maple | 2.13 | 6.38 | 4.26 | 34.04 | 25.53 | 21.28 | 6.38 | 0.00 | 0.00 |
| Silver maple | 0.00 | 0.00 | 6.98 | 9.30 | 11.63 | 23.26 | 37.21 | 11.63 | 0.00 |
| Sugar maple | 0.00 | 16.67 | 0.00 | 8.33 | 33.33 | 41.67 | 0.00 | 0.00 | 0.00 |
| Red maple | 36.36 | 18.18 | 18.18 | 27.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Ash | 0.00 | 0.00 | 12.50 | 25.00 | 50.00 | 12.50 | 0.00 | 0.00 | 0.00 |
| Northern red oak | 0.00 | 0.00 | 16.67 | 0.00 | 16.67 | 66.67 | 0.00 | 0.00 | 0.00 |
| American basswood | 0.00 | 0.00 | 0.00 | 66.67 | 33.33 | 0.00 | 0.00 | 0.00 | 0.00 |
| Northern hackberry | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 80.00 | 20.00 | 0.00 | 0.00 |
| Blue spruce | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Eastern white pine | 0.00 | 0.00 | 50.00 | 0.00 | 50.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Citywide Total | 3.77 | 6.92 | 6.92 | 21.38 | 18.87 | 23.90 | 13.21 | 5.03 | 0.00 |

## Figure 3: Foliage Condition



## Figure 4: Wood Condition

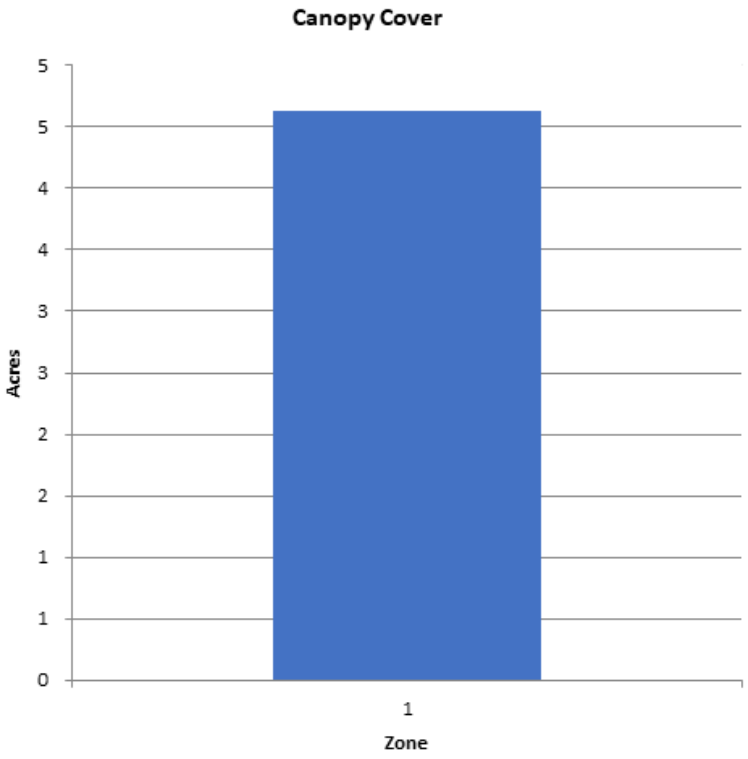


## Figure 5: Canopy Cover in Acres

**Preston**

# Canopy Cover of Public Trees (Acres)

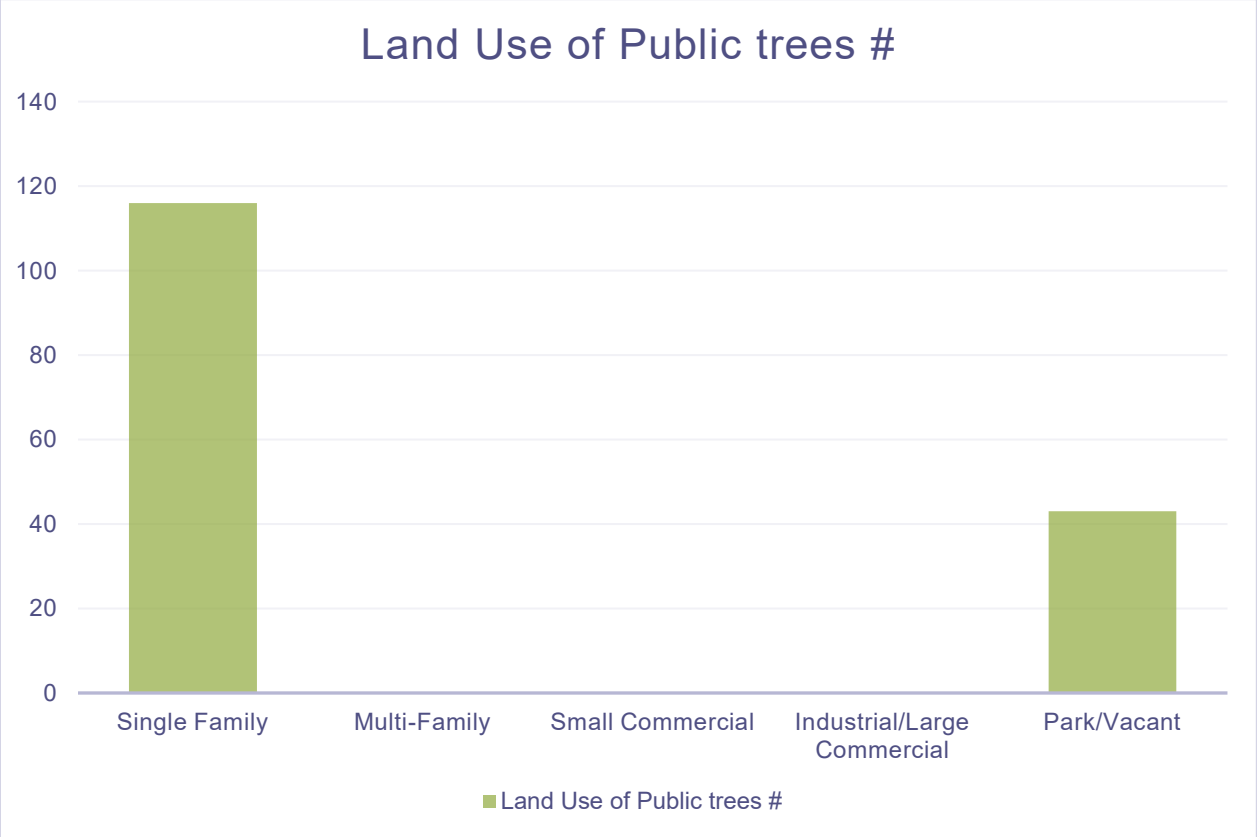
2/7/2023




| Zone | Acres | % of Total Canopy Cover |
|---|---|---|
| 1 | 5 | 100.0 |
| Citywide total | 5 | 100.0 |

| | Total Land Area | Total Street and Sidewalk Area | Total Canopy Cover | Canopy Cover as % of Total Land Area | Canopy Cover as % of Total Streets and Sidewalks |
|---|---|---|---|---|---|
| Citywide Total | 0 | 0 | 5 | 0.00 | 0.00 |

## Figure 6: Land Use of City/Park Trees



# APPENDIX B: ArcGIS MAPPING

## Figure 1: Location of Ash Trees

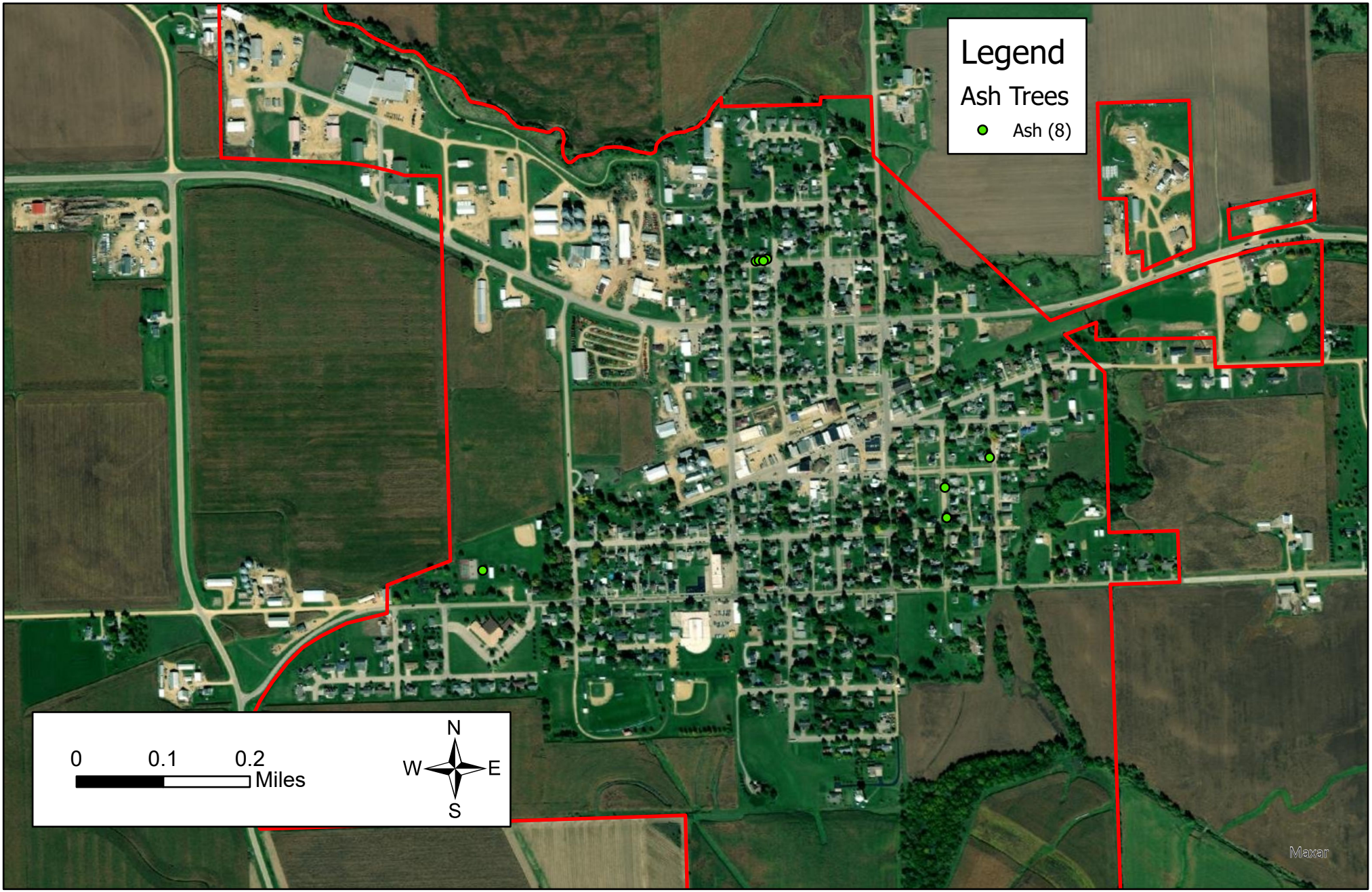
## Figure 2: Location of EAB Symptoms

## Figure 3: Location of Poor Condition Trees

## Figure 4: Location of Trees with Recommended Maintenance

## Figure 5: Maintenance Tasks

*City ownership of the trees recommended for removal should be verified prior to any removal*



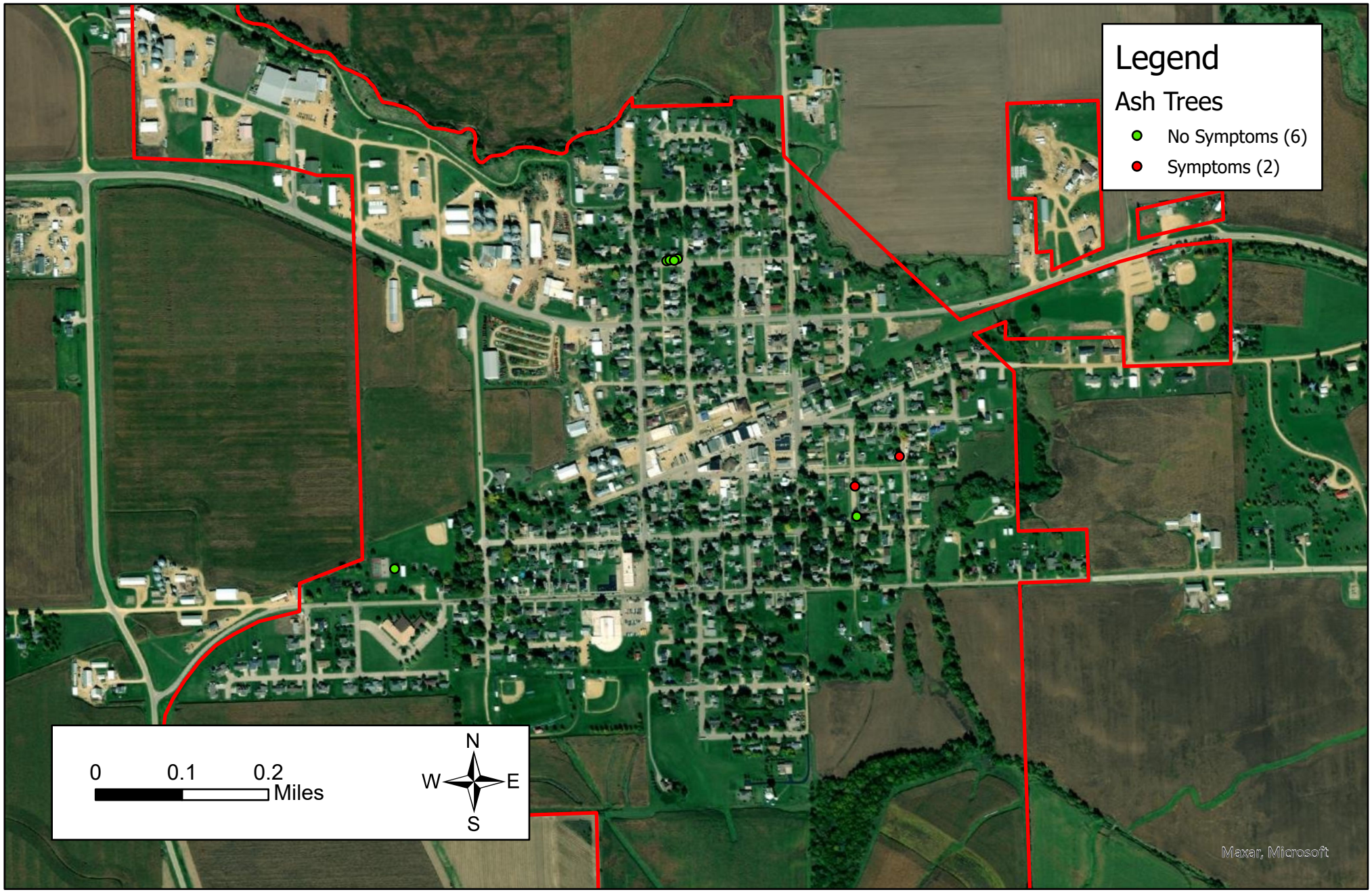

Created By: D. Genereux
Date: 1/26/2023
Software: ArcGIS Pro 3.0.3
File: 2022 IDNR Tree Inventory.aprx



# 2022 IDNR Tree Inventory

Figure 1 - Ash Tree Location
Preston, Iowa

JEO CONSULTING GROUP INC

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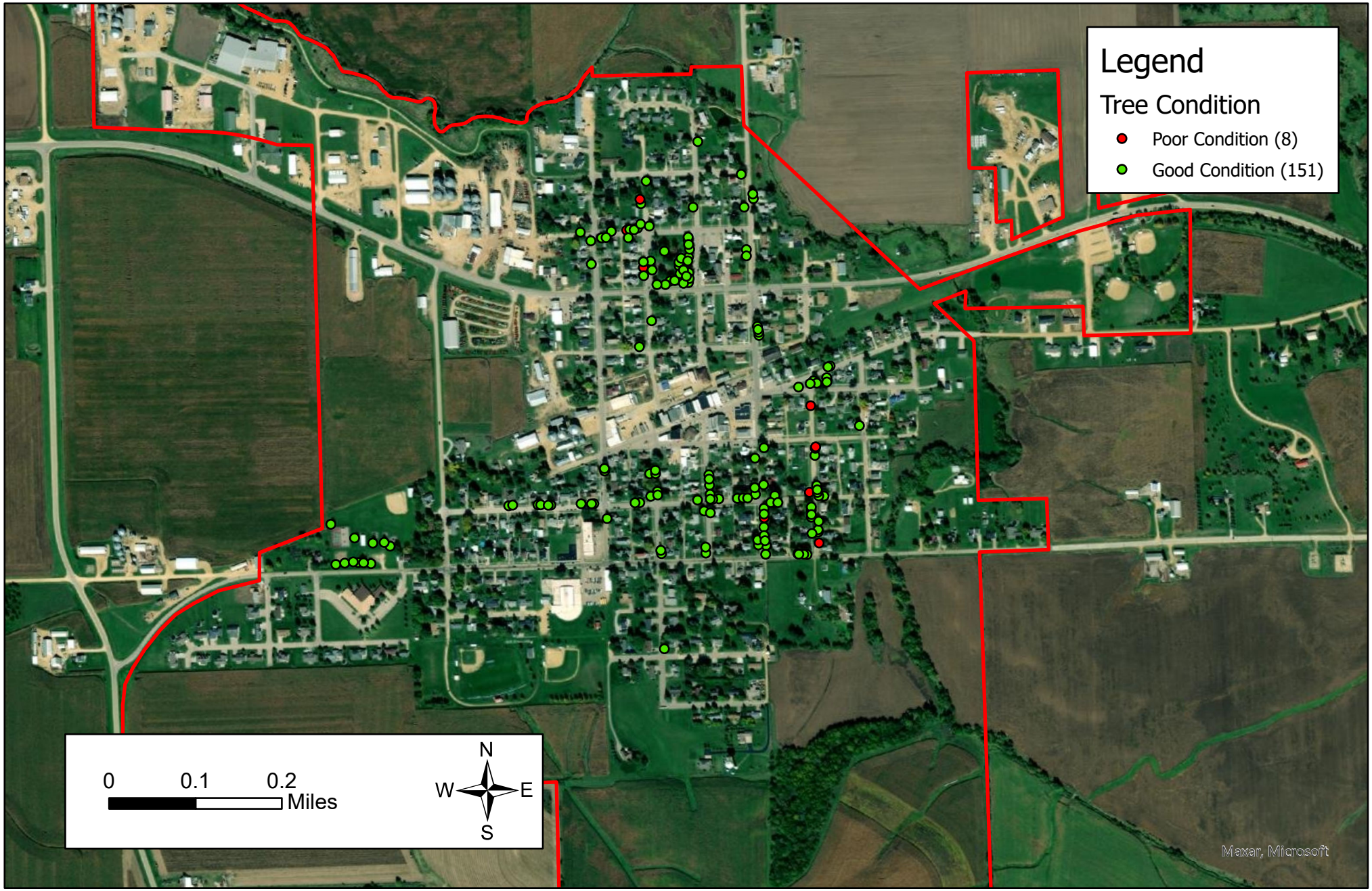
Date: 1/26/2023
Software: ArcGIS Pro 3.0.3
File: 2022 IDNR Tree Inventory.aprx



# 2022 IDNR Tree Inventory

Figure 2 - EAB Symptoms
Preston, Iowa

JEO CONSULTING GROUP INC

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Date: 1/26/2023
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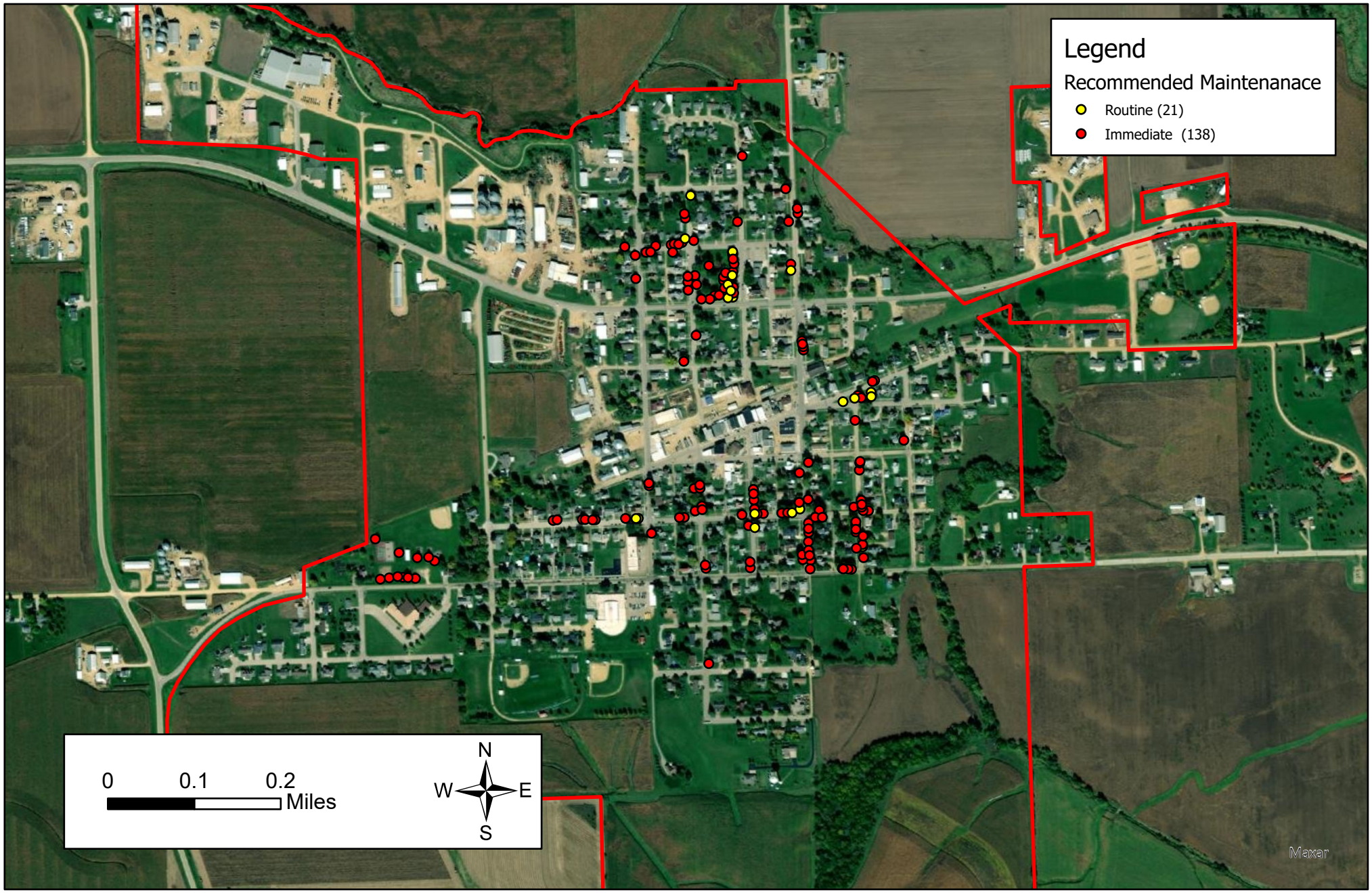
File: 2022 IDNR Tree Inventory.aprx



# 2022 IDNR Tree Inventory

Figure 3 - Poor Condition Trees
Preston, Iowa

JEO CONSULTING GROUP INC

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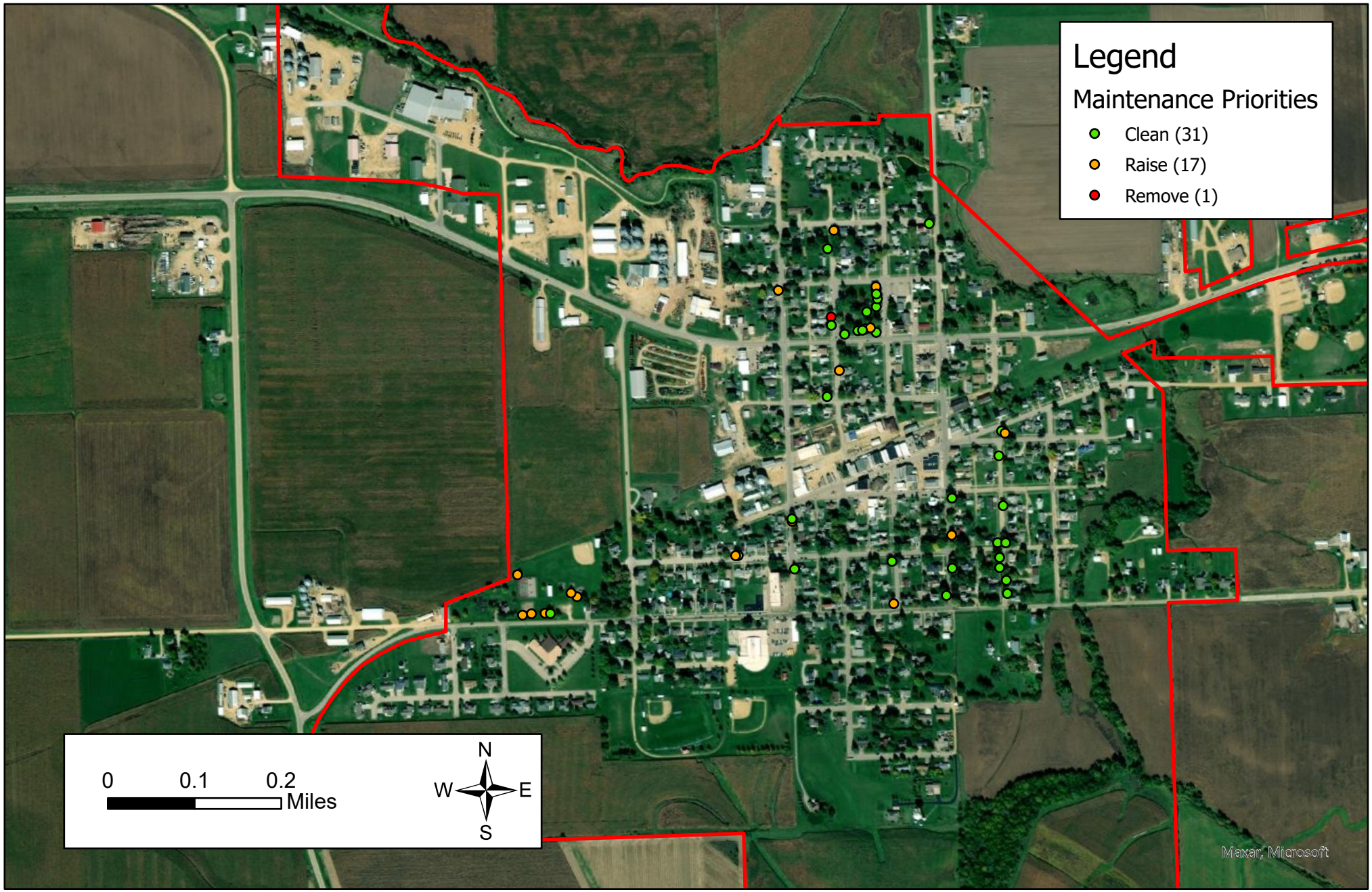
Date: 1/26/2023
Software: ArcGIS Pro 3.0.3
File: 2022 IDNR Tree Inventory.aprx



# 2022 IDNR Tree Inventory

Figure 4 - Recommended Maintenance
Preston, Iowa

JEO CONSULTING GROUP INC




Created By: D. Genereux
Date: 1/26/2023
Software: ArcGIS Pro 3.0.3
File: 2022 IDNR Tree Inventory.aprx



# 2022 IDNR Tree Inventory

Figure 5 - Maintenance Priorities
Preston, Iowa

JEO CONSULTING GROUP INC

# APPENDIX C: PRESTON TREE ORDINANCES

**ORDINANCE 2021-04**

**AN ORDINANCE TO ADD CHAPTER 7, CITY TREE BOARD TO TITLE** II, **POLICY AND ADMINISTRATION BE IT ENACTED BY THE CITY COUNCIL OF PRESTON, IOWA:**

**Section 1:** *Purpose.* The Purpose of this Ordinance is to create and establish a City Tree Board by adding Chapter 7 to Title II, Policy and Administration.

**Section 2:** *Addition.* Title II Policy and Administration, Chapter 7 City Tree Board

**CHAPTER 7**



**2-7-1 CREATION AND ESTABLISHMENT.** There is herby created and established a City Tree Board for the City, which shall consist of five (5) members. All Board Members shall be appointed by Mayor and City Council. The Board Member may be residents or non-residents of Preston.

**2-7-2 TERM OF OFFICE.** The members of the Board shall serve staggered terms of three (3) years and in the event that a vacancy occurs during the term of any member, said member's successor shall be appointed for the unexpired portion of the term.

**2-7-3 COMPENSATION.** Members of the Board shall serve without compensation.

**2-7-4 DUTIES AND RESPONSIBILITIES.** It is the responsibility of the Board to study, investigate and to development and /or update annually and administration of a written plan for the care, preservation, pruning, planting, replanting, removal or disposition of trees and shrubs along the City streets or on any City property. The Board, when requested by the Council, shall consider, investigate, make findings, report and recommend upon any special matter or questions coming within the scope of its work.

**2-7-5 OPERATION.** The Board shall choose its own officers, make its own rules and regulations and keep a journal of its proceedings. A majority of the members shall be quorum for the transaction of business.

**2-7-6 INTERFERENCE WITH BOARD.** It is unlawful for any person to prevent, delay or interfere with the City Tree Board or any of its agents while engaging in and bout the planting, cultivating, mulching, pruning or removing of any street trees, park trees or trees on private grounds, as authorized by this chapter.

**2-7-7 REVIEW BY COUNCIL.** The Council shall have the right to review the conduct, acts and decisions of the Board. Any person may appeal from any ruling or order of the Board to the Council, who may hear the matter and make final decision.

**Section 3.** *Repealer.* All ordinances or parts of ordinances in conflict with this ordinance are hereby repealed.

**Section 4.** *Severability.* If any section, provision or part of this Ordinance shall be adjudged invalid or unconstitutional, such adjudication shall not affect the validity of the Ordinance as a whole or any section, provision, or part thereof not adjudged invalid or unconstitutional.

**Section 5.** *Effective Date.* This Ordinance shall be in effect after its final passage, approval and publication as provided by law.

Passed and approved by the City Council of Preston, Iowa on this 24th day of January, 2022.

Tyler Sieverding, Mayor

Attest:

Teresa Weinschenk, City Administrator/Clerk

Certification: I hereby certify that the foregoing was published as Ordinance No. 2021-04 on

h6n-lttry 2,1 , 2022.

Teresa Weinschenk, City Administrator/Clerk First

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