Monona, 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 Monona 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 9% of Monona'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 286 trees inventoried.

- Monona trees provide $45,149 of benefits annually, an average of $158 per tree
- There are over 34 species of trees
- The top three genera are: Maple 48%, Apple 22%, and Ash 9%
- 9% of trees need some type of management
- 10 trees 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 10 trees needing removal, 3 trees are 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*
- 12 of the 24 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 2 years to remove ash. We suggest that city officials request a budget increase to $12,000 annually and apply for grants to plant replacement trees.

Introduction

INTRODUCTION

This plan was developed to assist Monona 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 Monona, 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 Monona'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 Monona 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 Monona's urban forestry goals.

Assist Monona 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 286 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. Monona's trees reduce energy-related costs by approximately $12,130 annually (Appendix A, Table 1). These savings are both in electricity (57.2 MWh) and in natural gas (7,947.3 Therms).

Annual Stormwater Benefits

Monona's trees intercept about 592,536 gallons of rainfall or snow melt per year (Appendix A, Table 2). This interception provides $16,058 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 Monona, it is estimated that trees remove 748 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 $2,113 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Monona, trees sequester about 129,678 lbs of carbon per year with an associated value of $973 (Appendix A, Table 5). In addition, the trees store 2,225,401 lbs of carbon, with a yearly benefit of $16,691 (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. Monona receives $13,241 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, Monona's trees provide $45,149 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 286 trees in Monona provide approximately $158 annually (Appendix A, Table 7).

ENERGY	STORMWATER	AIR QUALITY	CARBON	AESTHETICS	SUMMARY
• Reduce energy cost by **$12,130**	• Intercept **592,536 gallons** • Provides **$16,058** benefit	• Remove 748 **lbs** of pollution • Net value of **$2,113**	• Sequester **129,678 lbs** • Value of **$973** • Store 2,225,401 **lbs** • Value of **$16,691**	• **$13,241** in social benefits	• **$45,149** annual benefits • Each tree provides **$158** annually

FOREST STRUCTURE

Species Distribution

Monona has over 34 different tree species along city streets and parks (Appendix A, Figure 1).

The distribution of trees by genera is as follows:

Maple	138	48%	Cedar	3	1%
Apple	63	22%	Walnut	3	1%
Ash	25	9%	Hackberry	2	<1%
Basswood/Linden	16	6%	Birch	1	<1%
Locust	13	5%	Catalpa	1	<1%
Oak	11	4%	Coffee Tree	1	<1%
Other Deciduous	6	2%	Pine	1	<1%
Lilac	5	2%	Redbud	1	<1%
Cottonwood	4	1%	Spruce	1	<1%

Age Class

Most of Monona's trees (25%) are between 6 and 12 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. Monona's size curve is on the smaller side, indicating a younger 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 Monona indicate that 93% of the trees are in good health, with only 5% of the foliage in poor health, dead, or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 80% of Monona's trees are in good health for wood condition (Appendix A, Figure 4 & Appendix B, Figure 3). Seven percent of the tree population's wood condition is in poor health, dead, or dying. This 7% 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	14	5%
Tree Removal	10	4%
Crown Reduction	0	0%
Crown Raising	0	0%
Tree Staking	0	0%

Canopy Cover

The total canopy with both private and public trees is 92 acres or 12% cover. The canopy cover included in the Monona inventory includes approximately 6.5 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 7 trees need to be planted annually on public and private lands.

Land Use and Location

The majority of Monona'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	82%
Industrial/Large Commercial	5%
Park/Vacant/Other	5%
Small Commercial	5%
Multifamily Residential	2%

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

Monona has 4 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 is 1 tree 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 14 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). Of the 10 removals, 9 are ash trees. There are a total of 25 ash trees, and 12 of those have signs and symptoms that have been associated with EAB. In addition, there are 6 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 Monona.

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 (48%) (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 151.02 of the city ordinance (Appendix C). All trees planted must meet the restrictions in city ordinance 151.02 (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 151.02 (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.

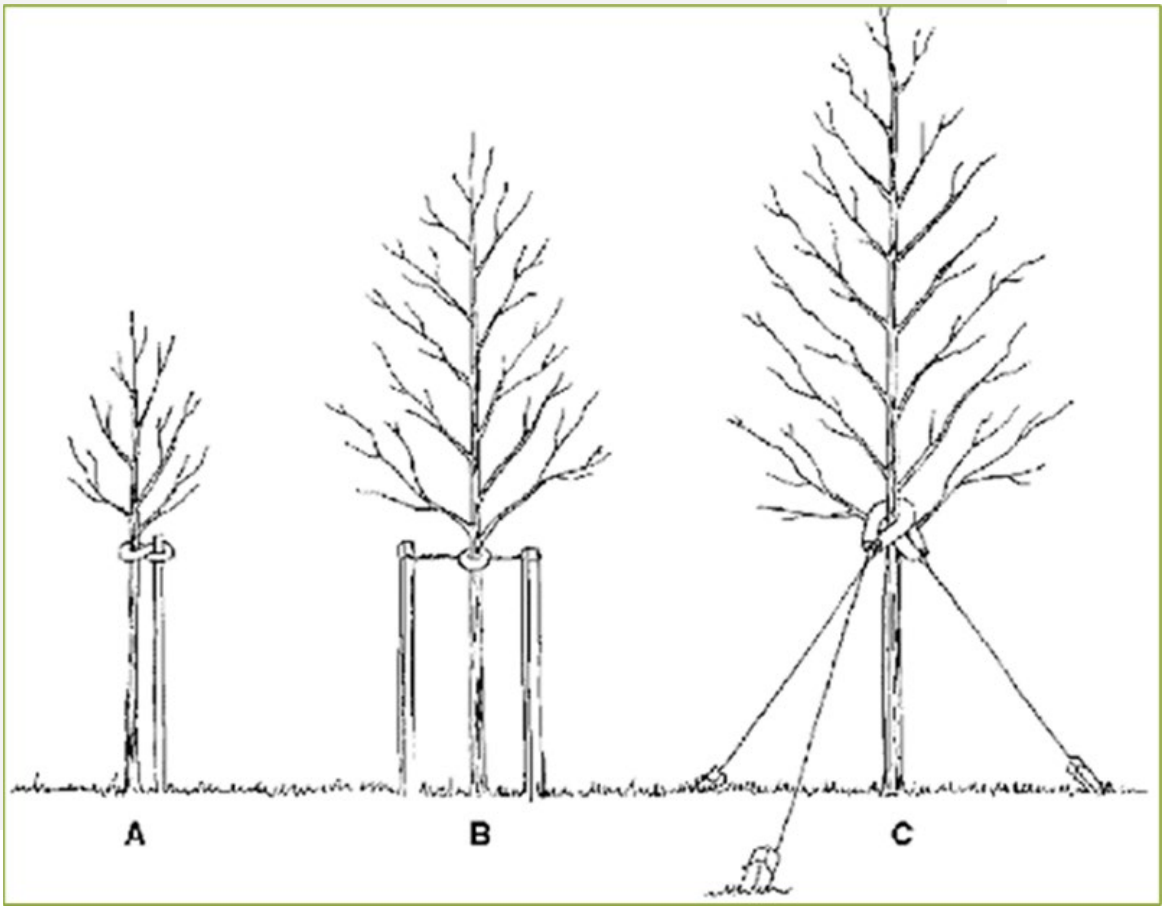
Monitoring

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 151.03 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 $11,000/Year – (Based off Reported Yearly Tree Budget)

YEAR 1	Est. Cost
Remove 5 trees recommended for immediate removal	$3,500
Remove 5 ash trees in poor condition	$3,500
Plant 20 trees in open locations	$3,000
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$10,000**

YEAR 2	Est. Cost
Remove 8 trees recommended for immediate removal (or ash)	$5,600
Plant 16 trees in open locations	$2,400
Prune 1/3 of city owned trees	$1,430
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$9,430**

YEAR 3	Est. Cost
Remove 1 tree recommended for immediate removal	$700
Remove 8 ash trees in poor condition	$5,600
Plant 24 trees in open locations	$3,600
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$9,900**

YEAR 4	Est. Cost
Possible Removal (5 trees)	$3,500
Plant 40 trees in open locations	$6,000
Prune 1/3 of city owned trees	$1,430
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$10,930**

YEAR 5	Est. Cost
Possible Removal (5 trees)	$3,500
Plant 50 trees in open locations	$7,500
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$11,000**

YEAR 6	Est. Cost
Possible Removal (2 trees)	$1,400
Plant 50 trees in open locations	$7,500
Prune 1/3 of city owned trees	$1,430
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$10,330**

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

PROPOSED WORK SCHEDULE WITH INCREASED BUDGET

Budget Allowance of $12,000/Year – (Budget Increase Suggested to Best Manage City Trees)

YEAR 1	Est. Cost
Remove 5 trees recommended for immediate removal	$3,500
Remove 5 ash trees in poor condition	$3,500
Plant 30 trees in open locations	$4,500
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$11,500**

YEAR 2	Est. Cost
Remove 9 ash trees in poor condition	$6,300
Plant 26 trees in open locations	$3,900
Prune 1/3 of city owned trees	$1,430
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$11,630**

YEAR 3	Est. Cost
Remove 7 ash trees	$4,900
Plant 46 trees in open locations	$6,900
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$11,800**

YEAR 4	Est. Cost
Possible Removal (12 trees)	$8,400
Plant 14 trees in open locations	$2,100
Prune 1/3 of city owned trees	$1,430
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$11,895**

YEAR 5	Est. Cost
Possible Removal (12 trees)	$8,400
Plant 24 trees in open locations	$3,600
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$12,000**

YEAR 6	Est. Cost
Possible Removal (10 trees)	$7,000
Plant 23 trees in open locations	$3,450
Prune 1/3 of city owned trees	$1,430
Visual Survey of EAB Signs/Symptoms	n/a
TOTAL	**$11,880**

Purposed Budget Increase

EAB could potentially kill all ash trees in Monona within four years of its arrival. With the current budget all ash trees can be removed within 3 years. Additionally, we recommend that Monona 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 6 trees could be treated per year (every other year treatment), if there are 12 treatable trees, it would cost approximately $1,800 a year for treatment and leave $9,200 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 Monona. We suggest considering an increased budget to plan for this.

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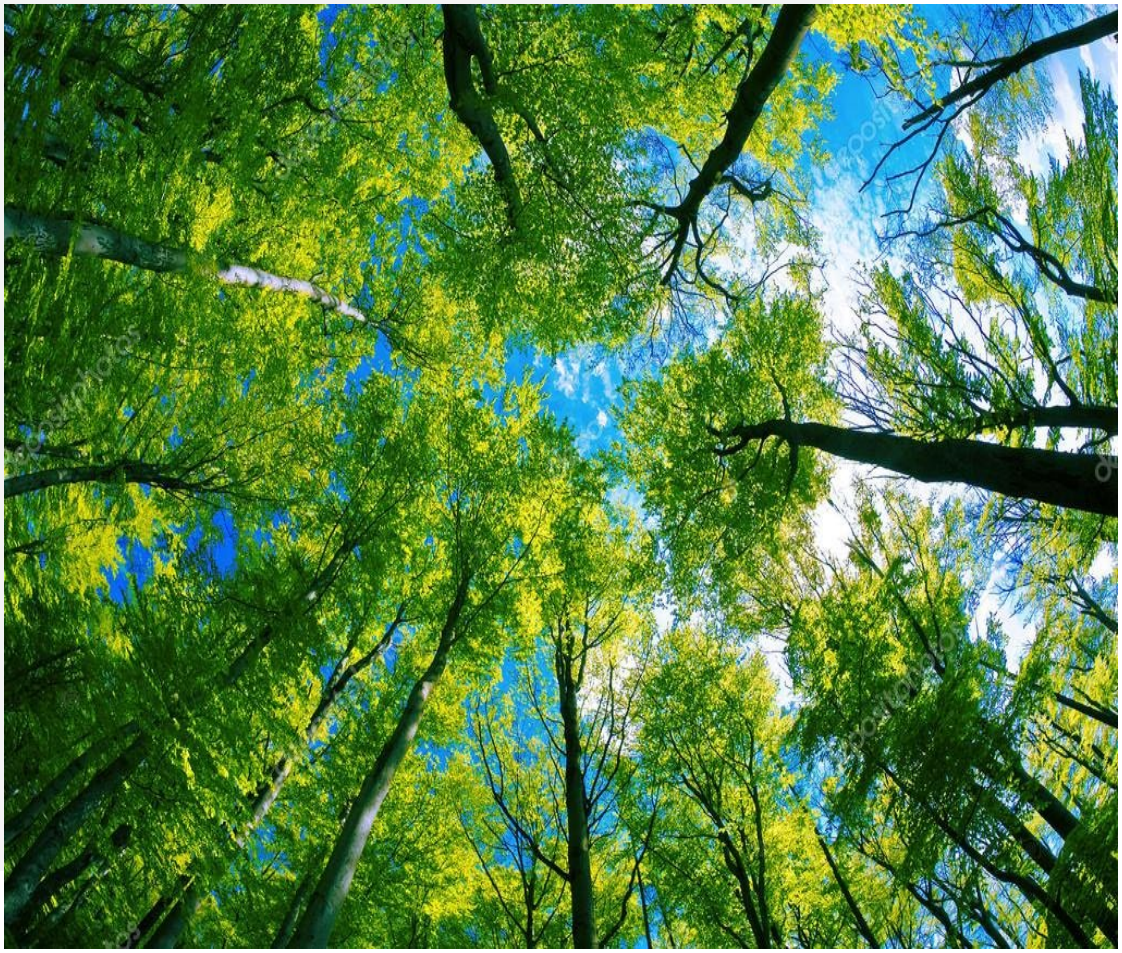
Appendices



APPENDIX A: i-TREE DATA

Table 1: Annual Energy Benefits

Monona

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
Apple	4.2	316	674.0	661	976	(N/A)	22.0	8.0	15.49
Norway maple	11.4	867	1,658.0	1,625	2,492	(N/A)	18.5	20.5	47.01
Silver maple	9.3	709	1,245.7	1,221	1,930	(N/A)	11.9	15.9	56.77
Sugar maple	5.5	415	719.7	705	1,120	(N/A)	5.6	9.2	69.99
Green ash	4.3	325	584.6	573	898	(N/A)	5.2	7.4	59.84
Littleleaf linden	2.3	178	321.6	315	493	(N/A)	4.9	4.1	35.24
Honeylocust	4.1	308	535.6	525	833	(N/A)	4.5	6.9	64.06
Black maple	2.7	207	372.4	365	572	(N/A)	3.8	4.7	51.99
White ash	3.1	238	389.3	382	620	(N/A)	3.1	5.1	68.89
Red maple	1.5	111	190.0	186	297	(N/A)	3.1	2.4	33.00
Amur maple	0.5	34	70.8	69	104	(N/A)	2.1	0.9	17.25
Eastern cottonwood	1.6	121	217.3	213	334	(N/A)	1.4	2.8	83.39
Broadleaf Deciduous Small	0.1	5	12.0	12	17	(N/A)	1.4	0.1	4.27
Japanese tree lilac	0.4	28	61.1	60	88	(N/A)	1.4	0.7	21.98
Oak	0.6	45	78.8	77	122	(N/A)	1.0	1.0	40.73
Swamp white oak	0.3	24	50.6	50	73	(N/A)	1.0	0.6	24.47
Black walnut	0.9	69	129.9	127	197	(N/A)	1.0	1.6	65.55
Broadleaf Deciduous Mediu	0.4	28	56.4	55	83	(N/A)	0.7	0.7	41.58
Northern hackberry	0.8	61	114.8	112	173	(N/A)	0.7	1.4	86.67
American basswood	0.3	25	50.2	49	74	(N/A)	0.7	0.6	37.13
Bur oak	0.5	40	76.2	75	115	(N/A)	0.7	0.9	57.32
Eastern red cedar	0.1	9	17.1	17	25	(N/A)	0.7	0.2	12.75
Paper birch	0.2	18	27.0	26	44	(N/A)	0.3	0.4	44.23
Catalpa	0.0	0	0.5	0	1	(N/A)	0.3	0.0	0.66
Lilac	0.2	15	31.6	31	46	(N/A)	0.3	0.4	46.14
Eastern redbud	0.2	14	24.7	24	38	(N/A)	0.3	0.3	38.13
Northern pin oak	0.3	24	47.4	46	71	(N/A)	0.3	0.6	70.84
Eastern white pine	0.1	10	14.6	14	24	(N/A)	0.3	0.2	24.14
Northern red oak	0.3	20	36.4	36	55	(N/A)	0.3	0.5	55.22
White oak	0.2	18	27.0	26	44	(N/A)	0.3	0.4	44.23
Northern white cedar	0.0	2	4.0	4	6	(N/A)	0.3	0.0	5.61
Spruce	0.1	10	14.6	14	24	(N/A)	0.3	0.2	24.14
Kentucky coffeetree	0.4	29	53.7	53	82	(N/A)	0.3	0.7	82.02
Ash	0.3	20	39.6	39	59	(N/A)	0.3	0.5	58.69
Total	57.2	4,341	7,947.3	7,788	12,130	(N/A)	100.0	100.0	42.41

Table 2: Annual Stormwater Benefits

Monona

Annual Stormwater Benefits of Public Trees

2/7/2023

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Apple	15,187	412	(N/A)	22.0	2.6	6.53
Norway maple	107,218	2,906	(N/A)	18.5	18.1	54.82
Silver maple	132,990	3,604	(N/A)	11.9	22.4	106.00
Sugar maple	74,087	2,008	(N/A)	5.6	12.5	125.48
Green ash	44,216	1,198	(N/A)	5.2	7.5	79.88
Littleleaf linden	19,238	521	(N/A)	4.9	3.2	37.24
Honeylocust	41,691	1,130	(N/A)	4.5	7.0	86.91
Black maple	24,527	665	(N/A)	3.8	4.1	60.43
White ash	36,753	996	(N/A)	3.1	6.2	110.67
Red maple	9,829	266	(N/A)	3.1	1.7	29.60
Amur maple	1,597	43	(N/A)	2.1	0.3	7.21
Eastern cottonwood	22,163	601	(N/A)	1.4	3.7	150.15
Broadleaf Deciduous Small	213	6	(N/A)	1.4	0.0	1.45
Japanese tree lilac	1,772	48	(N/A)	1.4	0.3	12.00
Oak	4,664	126	(N/A)	1.0	0.8	42.13
Swamp white oak	1,758	48	(N/A)	1.0	0.3	15.88
Black walnut	10,672	289	(N/A)	1.0	1.8	96.40
Broadleaf Deciduous Medium	3,065	83	(N/A)	0.7	0.5	41.53
Northern hackberry	8,604	233	(N/A)	0.7	1.5	116.58
American basswood	2,606	71	(N/A)	0.7	0.4	35.32
Bur oak	5,181	140	(N/A)	0.7	0.9	70.21
Eastern red cedar	1,659	45	(N/A)	0.7	0.3	22.48
Paper birch	1,466	40	(N/A)	0.3	0.2	39.72
Catalpa	18	0	(N/A)	0.3	0.0	0.48
Lilac	1,174	32	(N/A)	0.3	0.2	31.82
Eastern redbud	667	18	(N/A)	0.3	0.1	18.06
Northern pin oak	3,764	102	(N/A)	0.3	0.6	102.01
Eastern white pine	1,539	42	(N/A)	0.3	0.3	41.70
Northern red oak	3,030	82	(N/A)	0.3	0.5	82.12
White oak	1,466	40	(N/A)	0.3	0.2	39.72
Northern white cedar	213	6	(N/A)	0.3	0.0	5.77
Spruce	1,539	42	(N/A)	0.3	0.3	41.70
Kentucky coffeetree	5,491	149	(N/A)	0.3	0.9	148.79
Ash	2,479	67	(N/A)	0.3	0.4	67.19
Citywide total	592,536	16,058	(N/A)	100.0	100.0	56.15

Table 3: Annual Air Quality Benefits

Monona

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								
Apple	3.3	0.5	1.7	0.2	18	20.8	3.0	2.8	18.8	127	0.0	0	51.1	145	(N/A)	22.0	2.30
Norway maple	21.9	3.8	10.8	1.0	119	55.5	8.0	7.6	51.8	343	-5.1	-19	155.3	443	(N/A)	18.5	8.35
Silver maple	23.4	4.0	11.5	1.0	126	44.2	6.5	6.2	42.3	276	-12.9	-48	126.2	354	(N/A)	11.9	10.42
Sugar maple	12.0	2.0	5.7	0.5	64	25.8	3.8	3.6	24.7	161	-9.3	-35	68.9	191	(N/A)	5.6	11.92
Green ash	5.1	0.8	2.5	0.2	27	20.4	3.0	2.8	19.4	127	0.0	0	54.3	155	(N/A)	5.2	10.31
Littleleaf linden	2.8	0.5	1.5	0.1	15	11.2	1.6	1.6	10.7	70	-1.4	-5	28.5	80	(N/A)	4.9	5.71
Honeylocust	8.0	1.3	3.7	0.4	42	19.2	2.8	2.7	18.4	120	-6.1	-23	50.3	140	(N/A)	4.5	10.73
Black maple	6.0	1.0	2.8	0.3	32	13.0	1.9	1.8	12.3	81	-2.0	-8	37.2	106	(N/A)	3.8	9.60
White ash	6.7	1.1	3.0	0.3	35	14.6	2.2	2.1	14.2	92	0.0	0	44.1	127	(N/A)	3.1	14.12
Red maple	2.0	0.3	1.0	0.1	11	6.9	1.0	1.0	6.6	43	-0.7	-3	18.1	51	(N/A)	3.1	5.66
Amur maple	0.4	0.1	0.2	0.0	2	2.2	0.3	0.3	2.0	14	0.0	0	5.5	16	(N/A)	2.1	2.60
Eastern cottonwood	3.7	0.6	1.6	0.2	19	7.6	1.1	1.1	7.2	47	0.0	0	23.0	66	(N/A)	1.4	16.61
Broadleaf Deciduous Small	0.0	0.0	0.0	0.0	0	0.4	0.1	0.0	0.3	2	0.0	0	0.8	2	(N/A)	1.4	0.56
Japanese tree lilac	0.5	0.1	0.3	0.0	3	1.9	0.3	0.2	1.7	11	0.0	0	4.9	14	(N/A)	1.4	3.54
Oak	0.4	0.1	0.2	0.0	2	2.8	0.4	0.4	2.7	18	0.0	0	7.0	20	(N/A)	1.0	6.58
Swamp white oak	0.2	0.0	0.1	0.0	1	1.6	0.2	0.2	1.4	10	-0.1	0	3.7	10	(N/A)	1.0	3.47
Black walnut	1.3	0.2	0.6	0.1	7	4.4	0.6	0.6	4.1	27	0.0	0	12.0	34	(N/A)	1.0	11.46
Broadleaf Deciduous Medium	0.5	0.1	0.3	0.0	3	1.8	0.3	0.2	1.7	11	-0.1	-1	4.8	14	(N/A)	0.7	6.81
Northern hackberry	1.4	0.2	0.7	0.1	8	3.9	0.6	0.5	3.6	24	0.0	0	11.0	32	(N/A)	0.7	15.88
American basswood	0.3	0.0	0.1	0.0	1	1.6	0.2	0.2	1.5	10	-0.3	-1	3.8	10	(N/A)	0.7	5.24
Bur oak	0.5	0.1	0.3	0.0	3	2.5	0.4	0.4	2.4	16	0.0	0	6.6	19	(N/A)	0.7	9.34
Eastern red cedar	0.3	0.1	0.3	0.0	2	0.6	0.1	0.1	0.5	3	-0.9	-3	1.1	2	(N/A)	0.7	1.14
Paper birch	0.1	0.0	0.1	0.0	1	1.1	0.2	0.2	1.1	7	0.0	0	2.6	7	(N/A)	0.3	7.42
Catalpa	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.0	0	(N/A)	0.3	0.08
Lilac	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)	0.3	8.35
Eastern redbud	0.2	0.0	0.1	0.0	1	0.9	0.1	0.1	0.8	5	0.0	0	2.3	7	(N/A)	0.3	6.56
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)	0.3	13.58
Eastern white 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)	0.3	2.82
Northern red oak	0.7	0.1	0.3	0.0	4	1.2	0.2	0.2	1.2	8	-1.0	-4	2.9	8	(N/A)	0.3	7.65
White oak	0.1	0.0	0.1	0.0	1	1.1	0.2	0.2	1.1	7	0.0	0	2.6	7	(N/A)	0.3	7.42
Northern white cedar	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)	0.3	0.56
Spruce	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)	0.3	2.82
Kentucky coffeetree	0.8	0.1	0.4	0.0	4	1.9	0.3	0.3	1.8	12	0.0	0	5.5	16	(N/A)	0.3	15.71
Ash	0.5	0.1	0.2	0.0	3	1.3	0.2	0.2	1.2	8	-0.1	0	3.6	10	(N/A)	0.3	10.16

Monona

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								
Citywide total	104.8	17.7	51.0	4.7	564	274.0	39.8	38.0	259.2	1,705	-41.3	-155	747.8	2,113	(N/A)	100.0	7.39

Table 4: Annual Carbon Stored

Monona

Stored CO2 Benefits of Public Trees

2/7/2023

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Apple	58,434	438	(N/A)	22.0	2.6	6.96
Norway maple	363,123	2,723	(N/A)	18.5	16.3	51.39
Silver maple	579,190	4,344	(N/A)	11.9	26.0	127.76
Sugar maple	361,110	2,708	(N/A)	5.6	16.2	169.27
Green ash	164,638	1,235	(N/A)	5.2	7.4	82.32
Littleleaf linden	61,487	461	(N/A)	4.9	2.8	32.94
Honeylocust	101,920	764	(N/A)	4.5	4.6	58.80
Black maple	65,067	488	(N/A)	3.8	2.9	44.36
White ash	108,725	815	(N/A)	3.1	4.9	90.60
Red maple	22,557	169	(N/A)	3.1	1.0	18.80
Amur maple	6,116	46	(N/A)	2.1	0.3	7.65
Eastern cottonwood	123,641	927	(N/A)	1.4	5.6	231.83
Broadleaf Deciduous	547	4	(N/A)	1.4	0.0	1.03
Japanese tree lilac	8,736	66	(N/A)	1.4	0.4	16.38
Oak	13,164	99	(N/A)	1.0	0.6	32.91
Swamp white oak	3,302	25	(N/A)	1.0	0.1	8.26
Black walnut	42,859	321	(N/A)	1.0	1.9	107.15
Broadleaf Deciduous	9,046	68	(N/A)	0.7	0.4	33.92
Northern hackberry	21,555	162	(N/A)	0.7	1.0	80.83
American basswood	9,243	69	(N/A)	0.7	0.4	34.66
Bur oak	16,915	127	(N/A)	0.7	0.8	63.43
Eastern red cedar	1,105	8	(N/A)	0.7	0.0	4.14
Paper birch	3,672	28	(N/A)	0.3	0.2	27.54
Catalpa	12	0	(N/A)	0.3	0.0	0.09
Lilac	6,743	51	(N/A)	0.3	0.3	50.57
Eastern redbud	3,037	23	(N/A)	0.3	0.1	22.78
Northern pin oak	14,280	107	(N/A)	0.3	0.6	107.10
Eastern white pine	1,170	9	(N/A)	0.3	0.1	8.78
Northern red oak	15,239	114	(N/A)	0.3	0.7	114.29
White oak	3,672	28	(N/A)	0.3	0.2	27.54
Northern white cedar	38	0	(N/A)	0.3	0.0	0.29
Spruce	1,170	9	(N/A)	0.3	0.1	8.78
Kentucky coffeetree	25,943	195	(N/A)	0.3	1.2	194.57
Ash	7,945	60	(N/A)	0.3	0.4	59.59
Citywide total	2,225,401	16,691	(N/A)	100.0	100.0	58.36

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

Monona

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
Apple	6,557	49	-281	-64	-3	6,972	52	13,184	99 (N/A)	22.0	6.2	1.57
Norway maple	12,245	92	-1,745	-129	-14	19,159	144	29,530	221 (N/A)	18.5	13.8	4.18
Silver maple	41,001	308	-2,781	-108	-22	15,674	118	53,786	403 (N/A)	11.9	25.1	11.86
Sugar maple	14,885	112	-1,733	-63	-13	9,161	69	22,250	167 (N/A)	5.6	10.4	10.43
Green ash	10,229	77	-790	-43	-6	7,177	54	16,572	124 (N/A)	5.2	7.7	8.29
Littleleaf linden	7,083	53	-296	-27	-2	3,938	30	10,698	80 (N/A)	4.9	5.0	5.73
Honeylocust	11,775	88	-489	-32	-4	6,805	51	18,058	135 (N/A)	4.5	8.4	10.42
Black maple	1,297	10	-312	-25	-3	4,572	34	5,531	41 (N/A)	3.8	2.6	3.77
White ash	5,490	41	-522	-28	-4	5,270	40	10,210	77 (N/A)	3.1	4.8	8.51
Red maple	2,946	22	-108	-13	-1	2,447	18	5,272	40 (N/A)	3.1	2.5	4.39
Amur maple	685	5	-29	-7	0	755	6	1,404	11 (N/A)	2.1	0.7	1.76
Eastern cottonwood	3,255	24	-593	-18	-5	2,665	20	5,309	40 (N/A)	1.4	2.5	9.95
Broadleaf Deciduous Smal	123	1	-3	-2	0	117	1	235	2 (N/A)	1.4	0.1	0.44
Japanese tree lilac	744	6	-42	-6	0	620	5	1,317	10 (N/A)	1.4	0.6	2.47
Oak	1,314	10	-63	-6	-1	993	7	2,238	17 (N/A)	1.0	1.0	5.59
Swamp white oak	672	5	-16	-4	0	528	4	1,180	9 (N/A)	1.0	0.6	2.95
Black walnut	2,279	17	-206	-10	-2	1,533	11	3,596	27 (N/A)	1.0	1.7	8.99
Broadleaf Deciduous Medi	694	5	-43	-4	0	616	5	1,262	9 (N/A)	0.7	0.6	4.73
Northern hackberry	1,116	8	-103	-8	-1	1,345	10	2,350	18 (N/A)	0.7	1.1	8.81
American basswood	717	5	-44	-4	0	553	4	1,222	9 (N/A)	0.7	0.6	4.58
Bur oak	1,319	10	-81	-5	-1	883	7	2,115	16 (N/A)	0.7	1.0	7.93
Eastern red cedar	43	0	-5	-2	0	193	1	229	2 (N/A)	0.7	0.1	0.86
Paper birch	445	3	-18	-2	0	393	3	819	6 (N/A)	0.3	0.4	6.14
Catalpa	3	0	0	0	0	4	0	7	0 (N/A)	0.3	0.0	0.05
Lilac	0	0	-32	-4	0	335	3	299	2 (N/A)	0.3	0.1	2.24
Eastern redbud	268	2	-15	-2	0	308	2	560	4 (N/A)	0.3	0.3	4.20
Northern pin oak	0	0	-69	-4	-1	539	4	466	3 (N/A)	0.3	0.2	3.49
Eastern white pine	116	1	-6	-2	0	216	2	324	2 (N/A)	0.3	0.2	2.43
Northern red oak	370	3	-73	-4	-1	432	3	725	5 (N/A)	0.3	0.3	5.44
White oak	445	3	-18	-2	0	393	3	819	6 (N/A)	0.3	0.4	6.14
Northern white cedar	18	0	0	-1	0	38	0	55	0 (N/A)	0.3	0.0	0.41

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
Spruce	116	1	-6	-2	0	216	2	324	2 (N/A)	0.3	0.2	2.43
Kentucky coffeetree	960	7	-125	-4	-1	650	5	1,481	11 (N/A)	0.3	0.7	11.11
Ash	470	4	-38	-3	0	440	3	869	7 (N/A)	0.3	0.4	6.52
Citywide total	129,678	973	-10,686	-636	-85	95,941	720	214,298	1,607 (N/A)	100.0	100.0	5.62

Table 6: Annual Social and Aesthetic Benefits

Monona

Annual Aesthetic/Other Benefits of Public Trees

2/7/2023

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Apple	368	(N/A)	22.0	2.8	5.85
Norway maple	1,230	(N/A)	18.5	9.3	23.21
Silver maple	3,191	(N/A)	11.9	24.1	93.85
Sugar maple	1,417	(N/A)	5.6	10.7	88.53
Green ash	860	(N/A)	5.2	6.5	57.30
Littleleaf linden	766	(N/A)	4.9	5.8	54.74
Honeylocust	2,766	(N/A)	4.5	20.9	212.73
Black maple	191	(N/A)	3.8	1.4	17.41
White ash	616	(N/A)	3.1	4.7	68.48
Red maple	411	(N/A)	3.1	3.1	45.65
Amur maple	39	(N/A)	2.1	0.3	6.47
Eastern cottonwood	227	(N/A)	1.4	1.7	56.84
Broadleaf Deciduous Small	6	(N/A)	1.4	0.0	1.55
Japanese tree lilac	44	(N/A)	1.4	0.3	10.92
Oak	132	(N/A)	1.0	1.0	44.03
Swamp white oak	79	(N/A)	1.0	0.6	26.22
Black walnut	182	(N/A)	1.0	1.4	60.66
Broadleaf Deciduous Medium	69	(N/A)	0.7	0.5	34.64
Northern hackberry	136	(N/A)	0.7	1.0	68.11
American basswood	61	(N/A)	0.7	0.5	30.31
Bur oak	115	(N/A)	0.7	0.9	57.69
Eastern red cedar	18	(N/A)	0.7	0.1	8.98
Paper birch	46	(N/A)	0.3	0.3	45.86
Catalpa	5	(N/A)	0.3	0.0	5.26
Lilac	0	(N/A)	0.3	0.0	0.00
Eastern redbud	15	(N/A)	0.3	0.1	15.48
Northern pin oak	0	(N/A)	0.3	0.0	0.00
Eastern white pine	32	(N/A)	0.3	0.2	32.32
Northern red oak	24	(N/A)	0.3	0.2	23.84
White oak	46	(N/A)	0.3	0.3	45.86
Northern white cedar	7	(N/A)	0.3	0.1	6.83
Spruce	32	(N/A)	0.3	0.2	32.32
Kentucky coffeetree	67	(N/A)	0.3	0.5	66.60
Ash	43	(N/A)	0.3	0.3	43.05
Citywide total	13,241	(N/A)	100.0	100.0	46.30

Table 7: Summary of Benefits in Dollars

Monona

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

2/7/2023

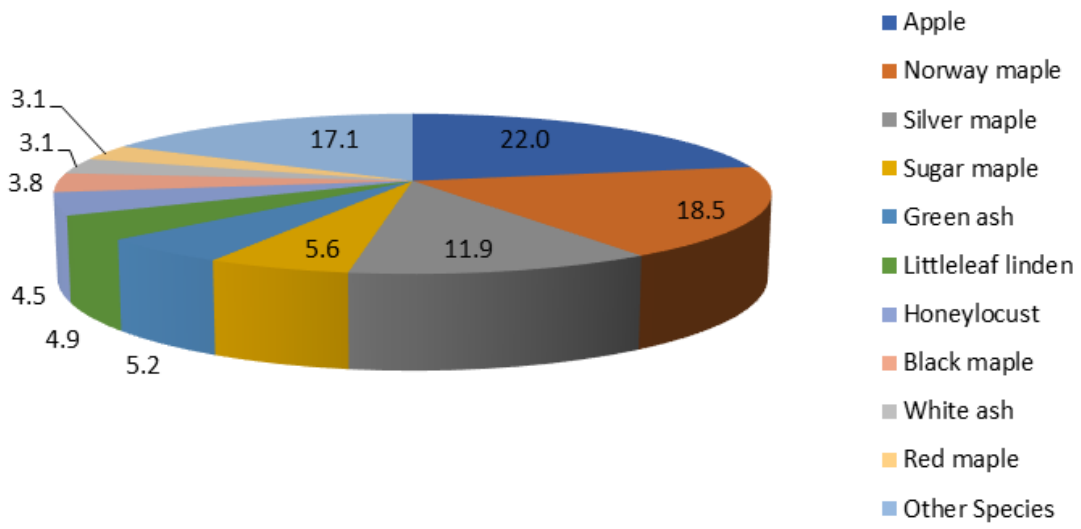
Benefits	Total ($)	Standard Error	$/tree	Standard Error	$/capita	Standard Error
Energy	12,130	(N/A)	42.41	(N/A)	8.25	(N/A)
CO2	1,607	(N/A)	5.62	(N/A)	1.09	(N/A)
Air Quality	2,113	(N/A)	7.39	(N/A)	1.44	(N/A)
Stormwater	16,058	(N/A)	56.15	(N/A)	10.92	(N/A)
Aesthetic/Other	13,241	(N/A)	46.30	(N/A)	9.00	(N/A)
Total Benefits	45,149	(N/A)	157.86	(N/A)	30.69	(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	45,149	(N/A)	157.86	(N/A)	30.69	(N/A)
Benefit-cost ratio	0.00	(N/A)				

Figure 1: Species Distribution

Monona

Species Distribution of Public Trees

2/7/2023



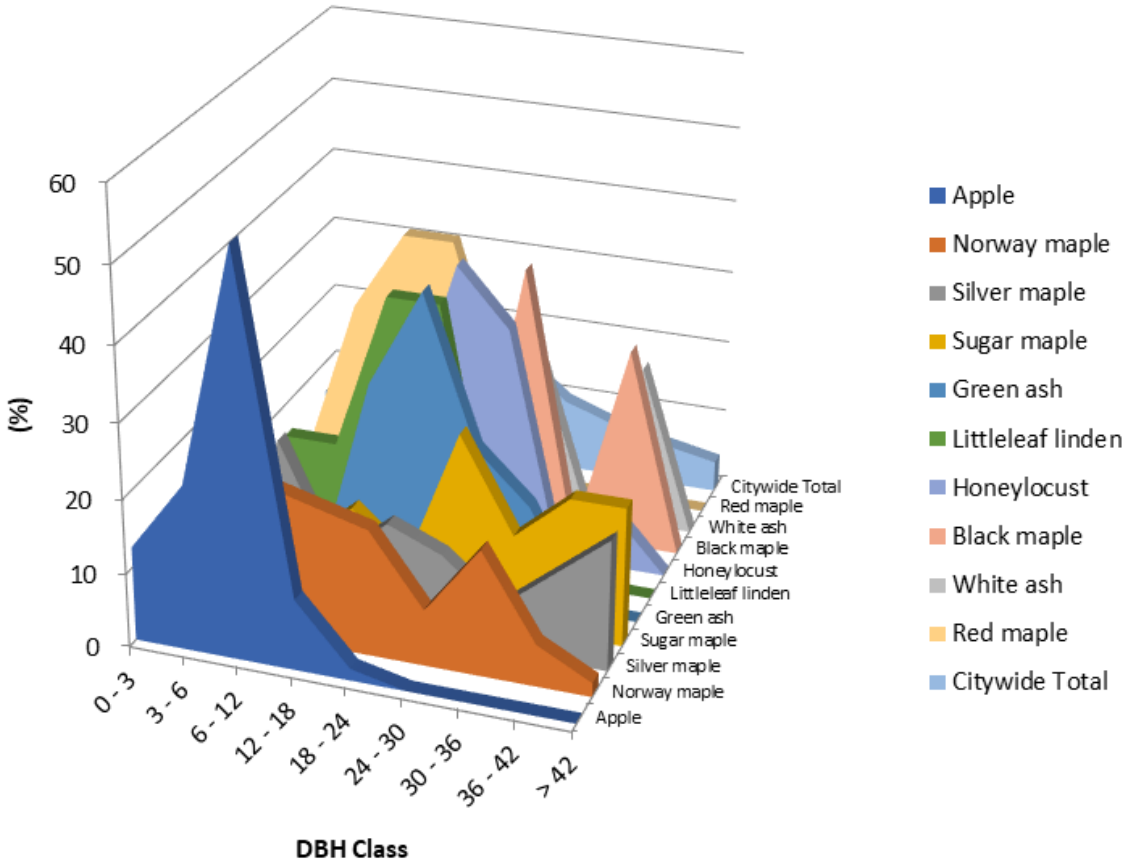
Species	Percent
Apple	22.0
Norway maple	18.5
Silver maple	11.9
Sugar maple	5.6
Green ash	5.2
Littleleaf linden	4.9
Honeylocust	4.5
Black maple	3.8
White ash	3.1
Red maple	3.1
Other Species	17.1
Total	100.0

Figure 2: Relative Age Class

Monona

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
Apple	12.70	22.22	53.97	9.52	1.59	0.00	0.00	0.00	0.00
Norway maple	7.55	3.77	20.75	18.87	16.98	7.55	16.98	5.66	1.89
Silver maple	2.94	2.94	23.53	8.82	14.71	11.76	5.88	11.76	17.65
Sugar maple	0.00	0.00	6.25	12.50	6.25	25.00	12.50	18.75	18.75
Green ash	0.00	0.00	0.00	26.67	40.00	20.00	13.33	0.00	0.00
Littleleaf linden	0.00	14.29	14.29	35.71	35.71	0.00	0.00	0.00	0.00
Honeylocust	0.00	0.00	7.69	15.38	38.46	30.77	0.00	7.69	0.00
Black maple	0.00	0.00	18.18	18.18	0.00	36.36	0.00	27.27	0.00
White ash	0.00	0.00	11.11	22.22	22.22	22.22	0.00	22.22	0.00
Red maple	0.00	22.22	33.33	33.33	11.11	0.00	0.00	0.00	0.00
Citywide Total	5.59	9.79	25.87	16.43	15.38	9.79	7.34	5.59	4.20

Figure 3: Foliage Condition

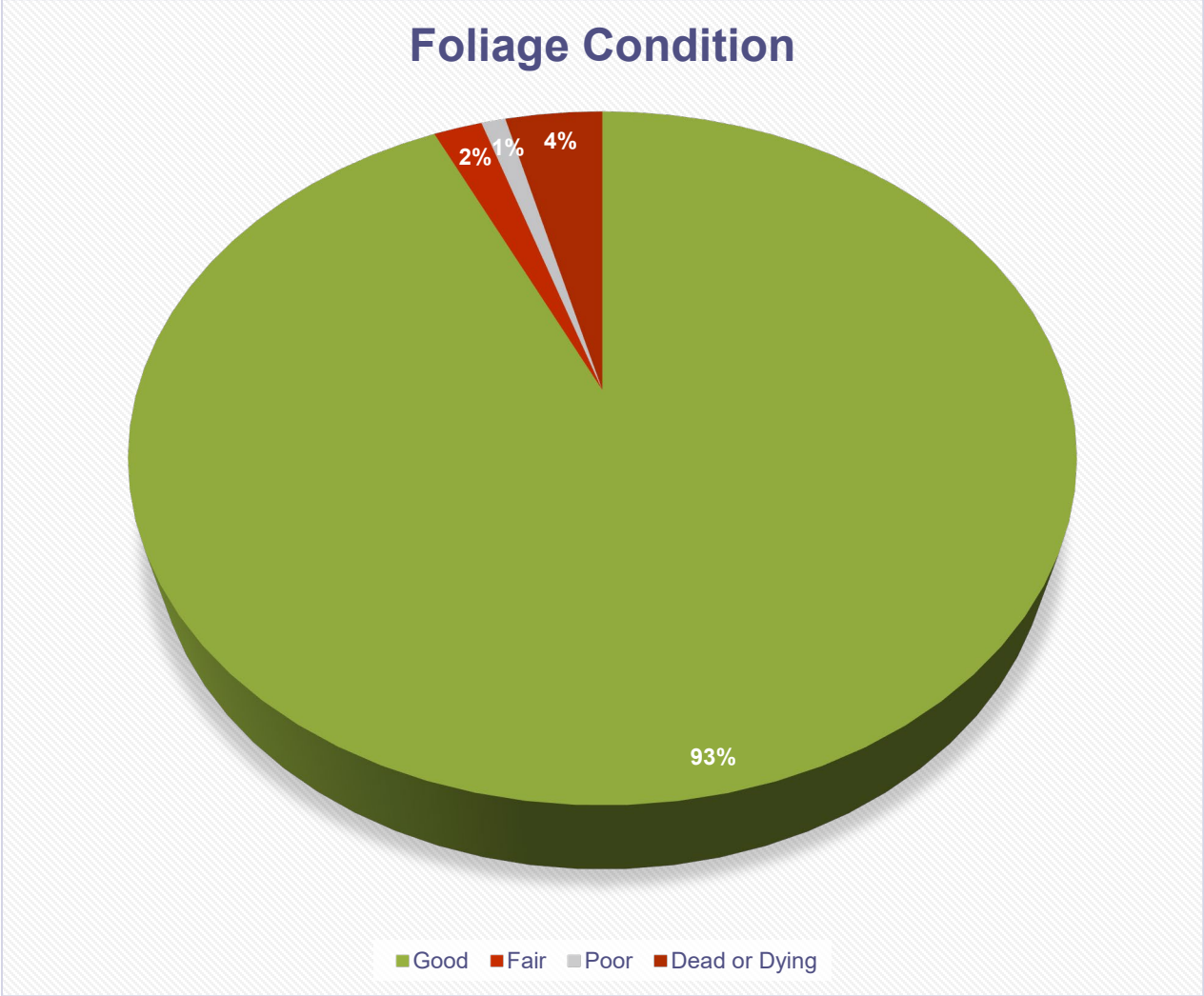


Figure 4: Wood Condition

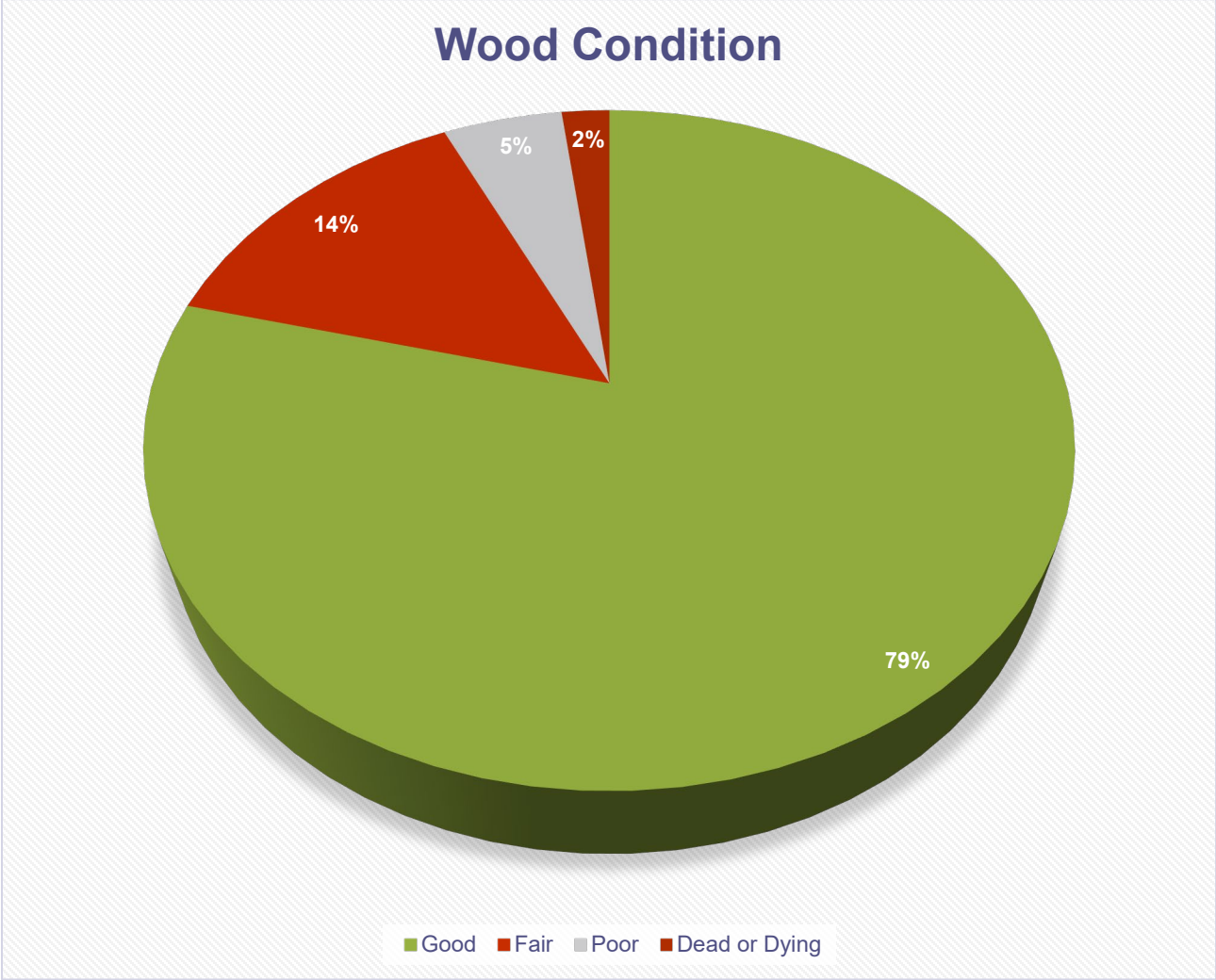
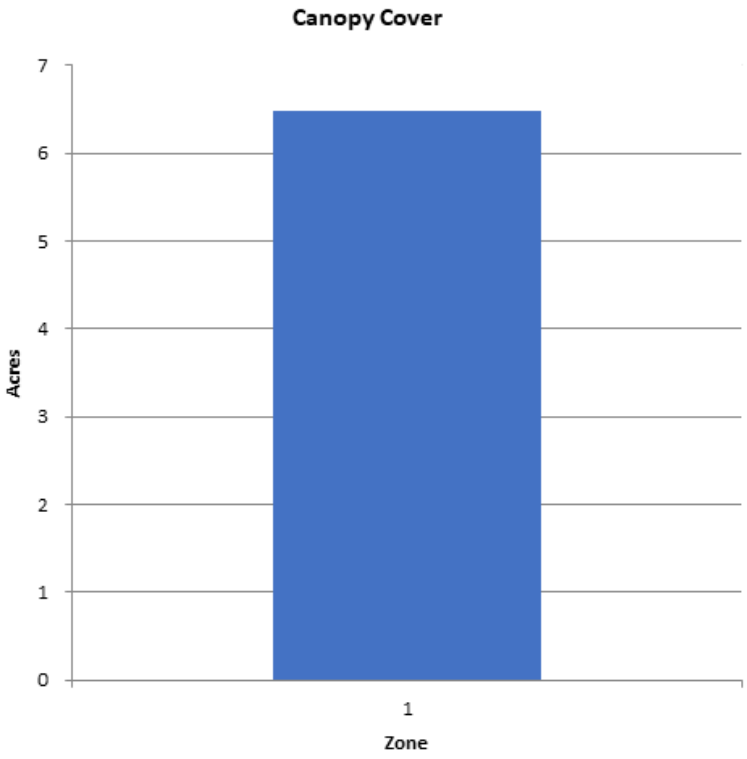


Figure 5: Canopy Cover in Acres

Monona

Canopy Cover of Public Trees (Acres)

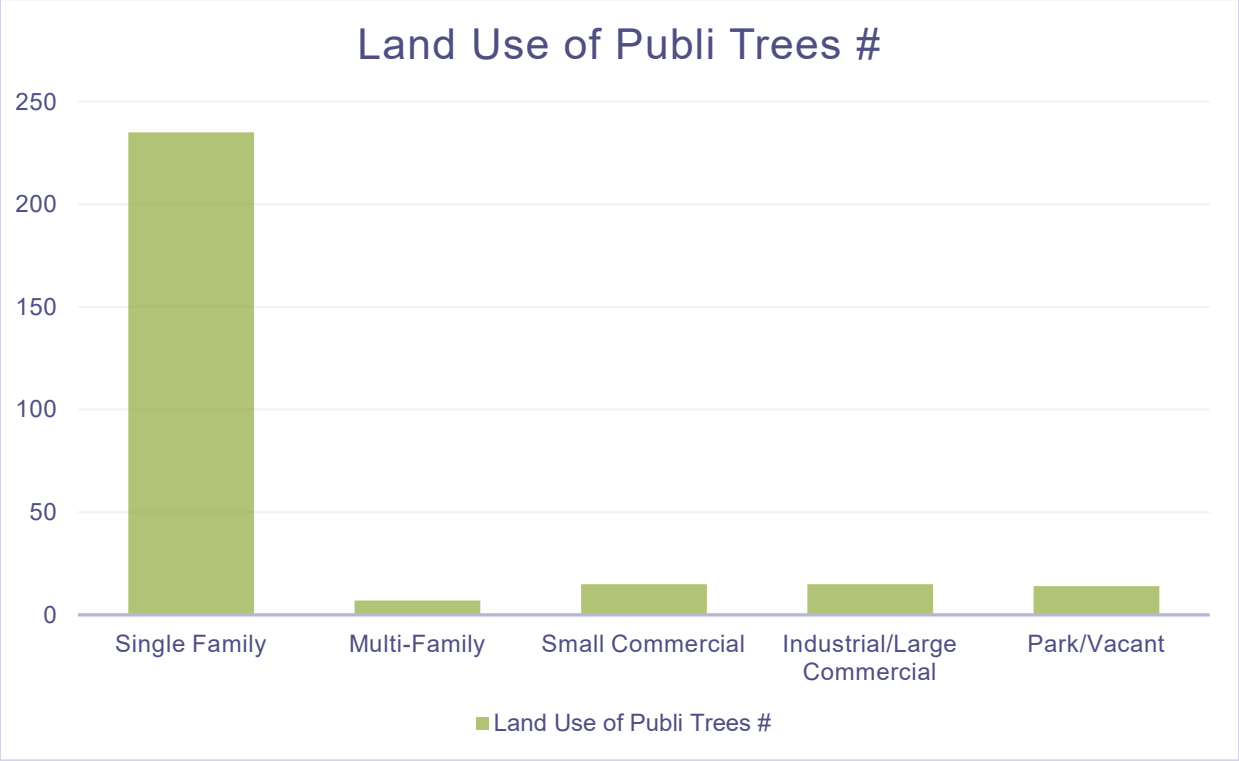
2/7/2023



Zone	Acres	% of Total Canopy Cover
1	6	100.0
Citywide total	6	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	6	0.00	0.00

Figure 6: Land Use of City/Park Trees



APPENDIX B: ArcGIS MAPPING

Figure 1: Location of Ash Trees

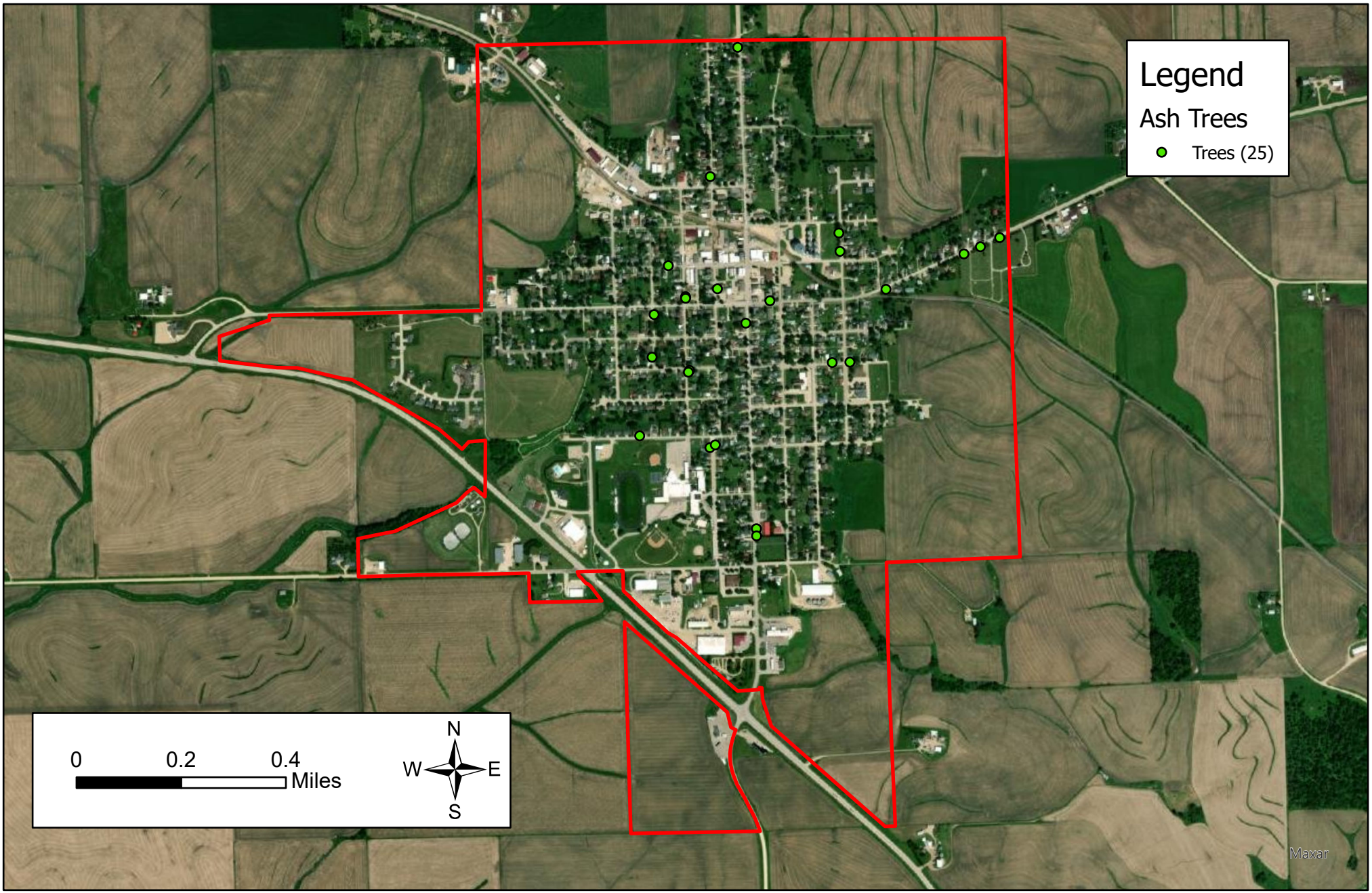
Figure 2: Location of EAB Symptoms

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
Monona, Iowa

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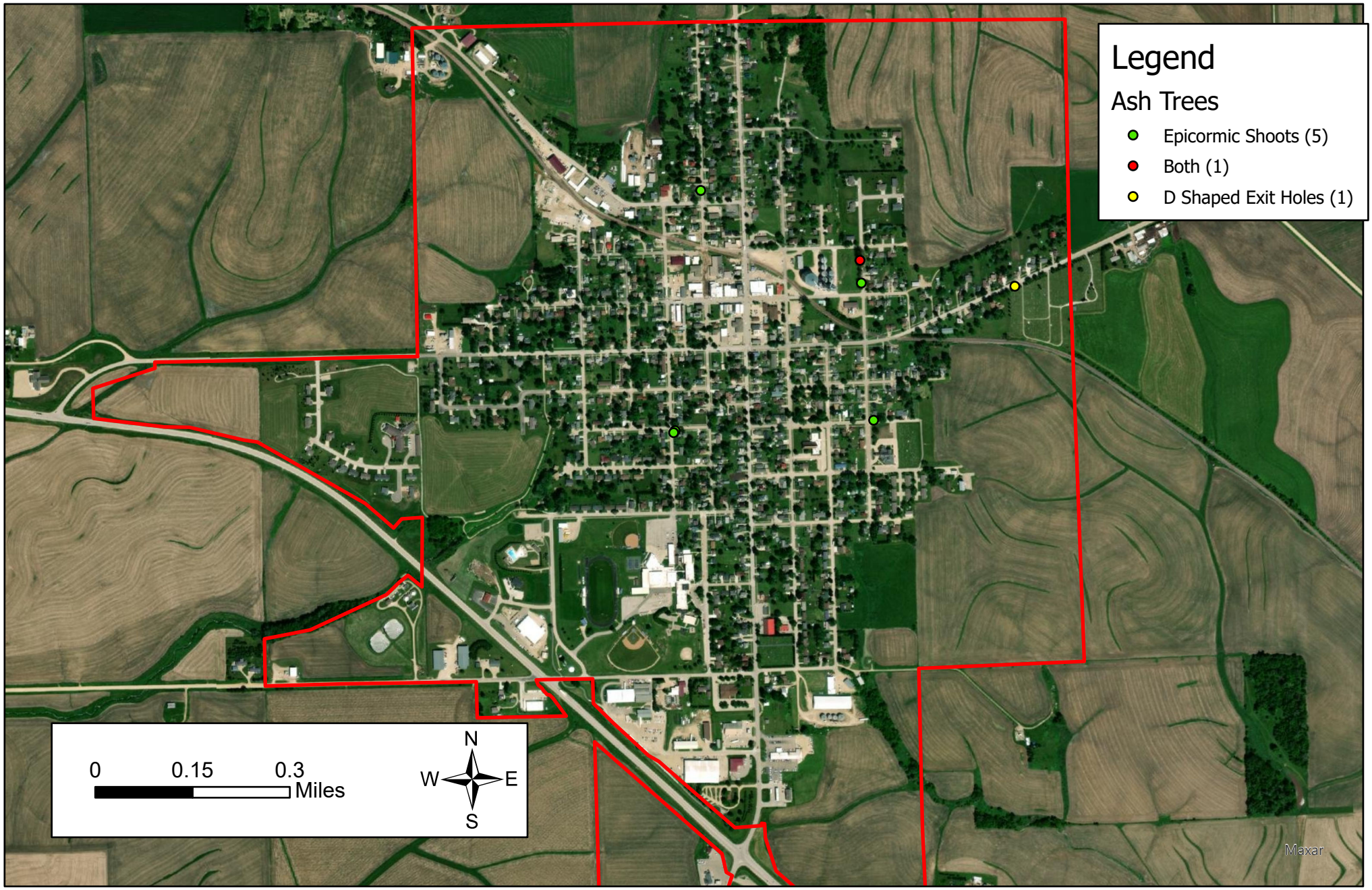

Created By: D. Genereux
Date: 1/26/2023
Software: ArcGIS Pro 3.0.3
File: 2022 IDNR Tree Inventory.aprx

2022 IDNR Tree Inventory

Figure 2 - EAB Symptoms
Monona, Iowa

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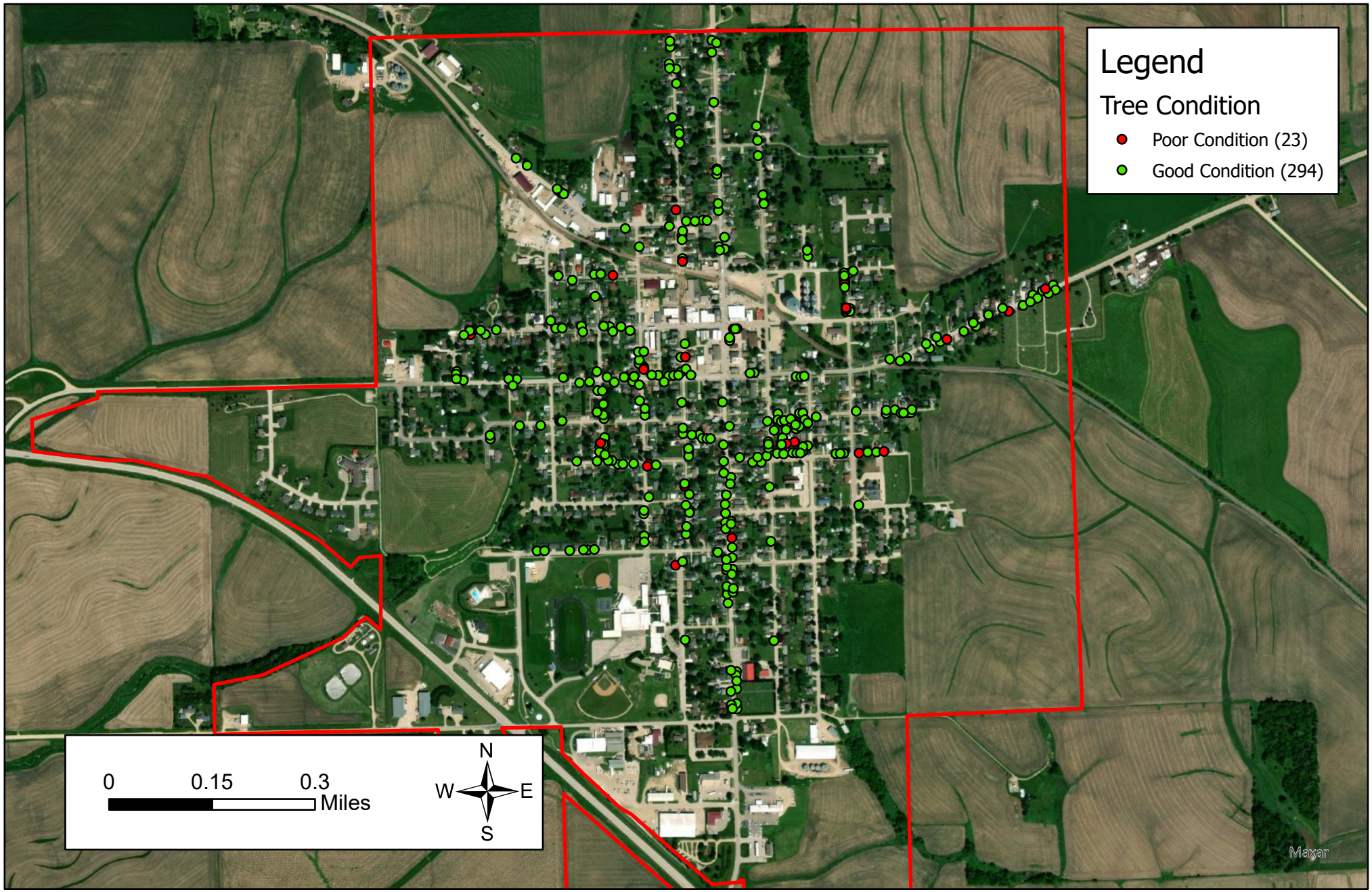

Created By: D. Genereux
Date: 1/26/2023
Software: ArcGIS Pro 3.0.3
File: 2022 IDNR Tree Inventory.aprx

2022 IDNR Tree Inventory

Figure 3 - Poor Condition Trees
Monona, Iowa

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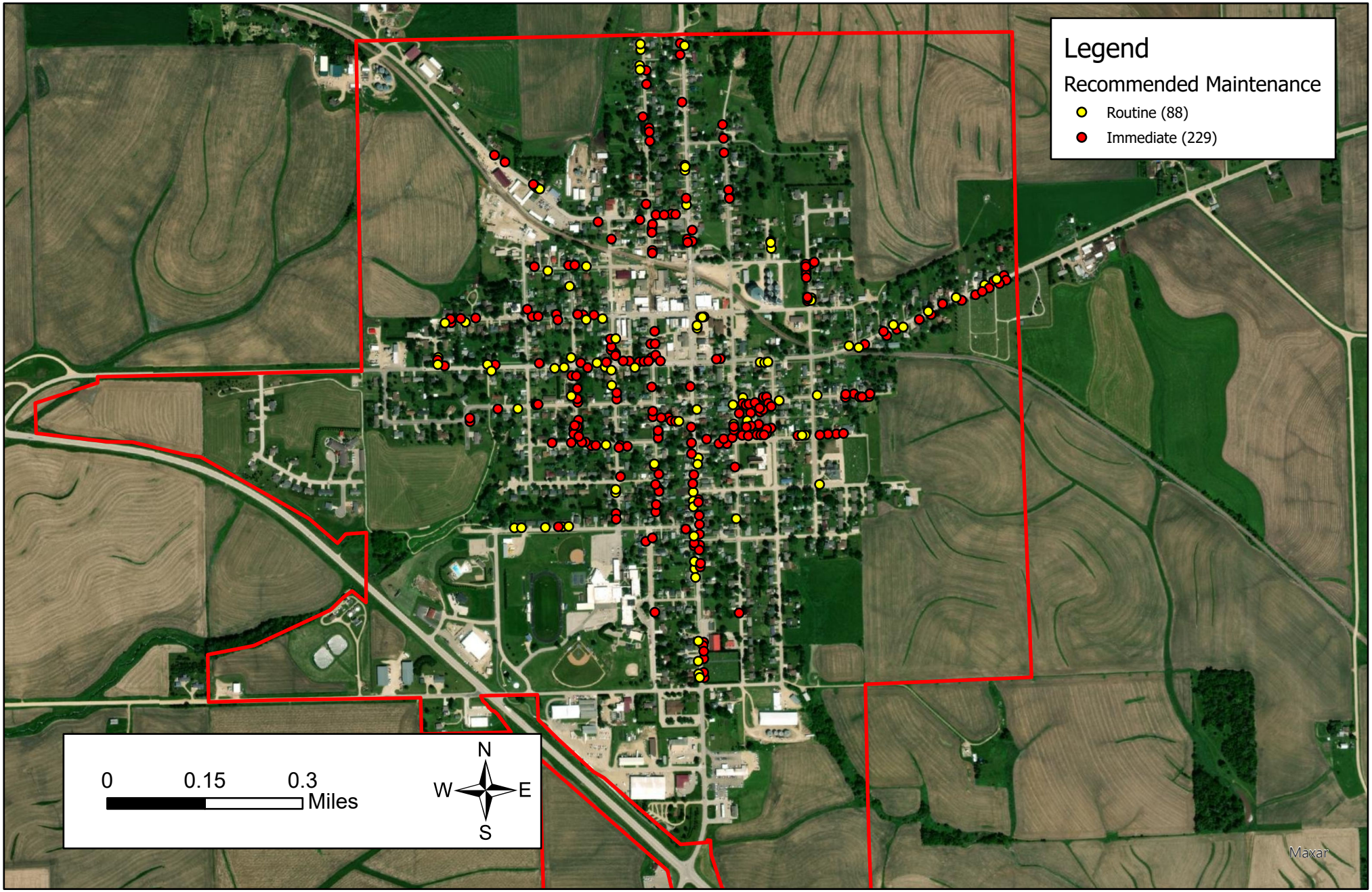

Created By: D. Genereux
Date: 1/26/2023
Software: ArcGIS Pro 3.0.3
File: 2022 IDNR Tree Inventory.aprx

2022 IDNR Tree Inventory

Figure 4 - Recommended Maintenance
Monona, Iowa

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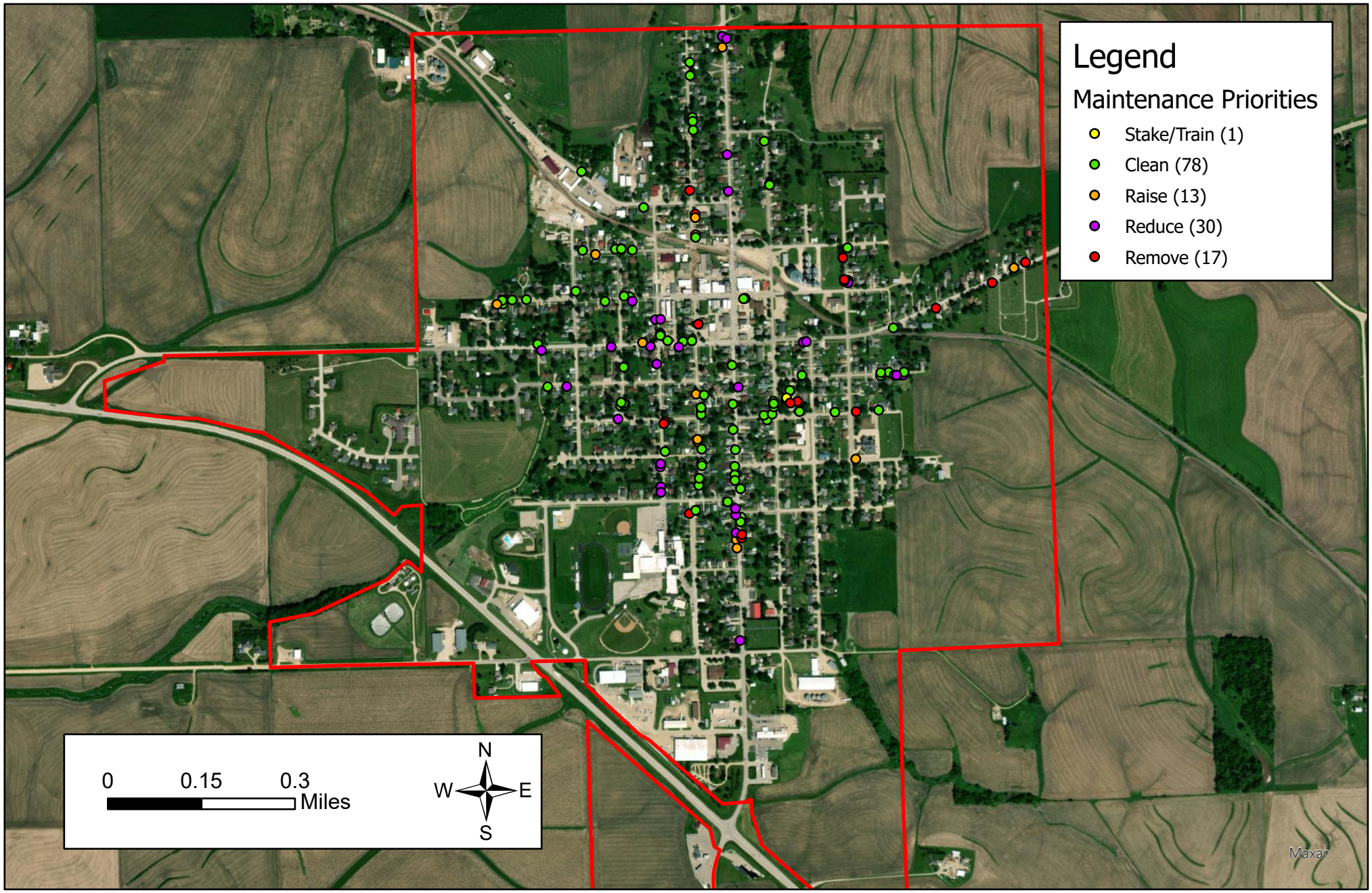

Created By: D. Genereux
Date: 1/26/2023
Software: ArcGIS Pro 3.0.3
File: 2022 IDNR Tree Inventory.aprx

2022 IDNR Tree Inventory

Figure 5 - Maintenance Priorities
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APPENDIX C: MONONA TREE ORDINANCES

CHAPTER 151

TREES

151.01 Definition 151.03 Disease Control

151.02 Planting Restrictions 151.04 Inspection and Removal

151.01 DEFINITION. For use in this chapter, “parking” means that part of the street, avenue or highway in the City not covered by sidewalk and lying between the lot line and the curb line; or, on unpaved streets, that part of the street, avenue or highway lying between the lot line and that portion of the street usually traveled by vehicular traffic.

151.02 PLANTING RESTRICTIONS. No tree shall be planted in any parking or street except in accordance with the following:

1. Alignment. All trees planted in any street shall be planted in the parking midway between the outer line of the sidewalk and the curb. In the event a curb line is not established, trees shall be planted under the supervision and approval of the Public Works Director.

2. Spacing. Trees shall not be planted on any parking which contains less than eighty-one (81) square feet of exposed soil surface per tree. Trees shall not be planted closer than twenty (20) feet from street intersections (property lines extended) and ten (10) feet from driveways. If it is at all possible trees should be planted inside the property lines and not between the sidewalk and the curb.

3. Prohibited Trees. No person shall plant in any street any fruit-bearing tree or any tree of the kinds commonly known as cottonwood,

poplar, box elder, Chinese elm, evergreen, willow or black walnut.

151.03 DISEASE CONTROL. Any dead, diseased or damaged tree or shrub which may harbor serious insect or disease pests or disease injurious to other trees is hereby declared to be a nuisance.

151.04 INSPECTION AND REMOVAL. The Council shall inspect or cause to be inspected any trees or shrubs in the City reported or suspected to be dead, diseased or damaged, and such trees and shrubs shall be subject to the following:

1. City Property. If it is determined that any such condition exists on any public property, including the strip between the curb and the lot line of private property, the Council may cause such condition to be corrected by treatment or removal. The Council may also order the

CHAPTER 151 TREES

CODE OF ORDINANCES, MONONA, IOWA

- 610 -

removal of any trees on the streets of the City which interfere with the making of improvements or with travel thereon.

2. Private Property. If it is determined with reasonable certainty that any such condition exists on private property and that danger to other trees or to adjoining property or passing motorists or pedestrians is imminent, the Council shall notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within fourteen (14) days of said notification. If such owner, occupant or person in charge of said property fails to comply within fourteen (14) days of receipt of notice, the Council may

cause the condition to be corrected and the cost assessed against the property.

(Code of Iowa, Sec. 364.12[3b & h])