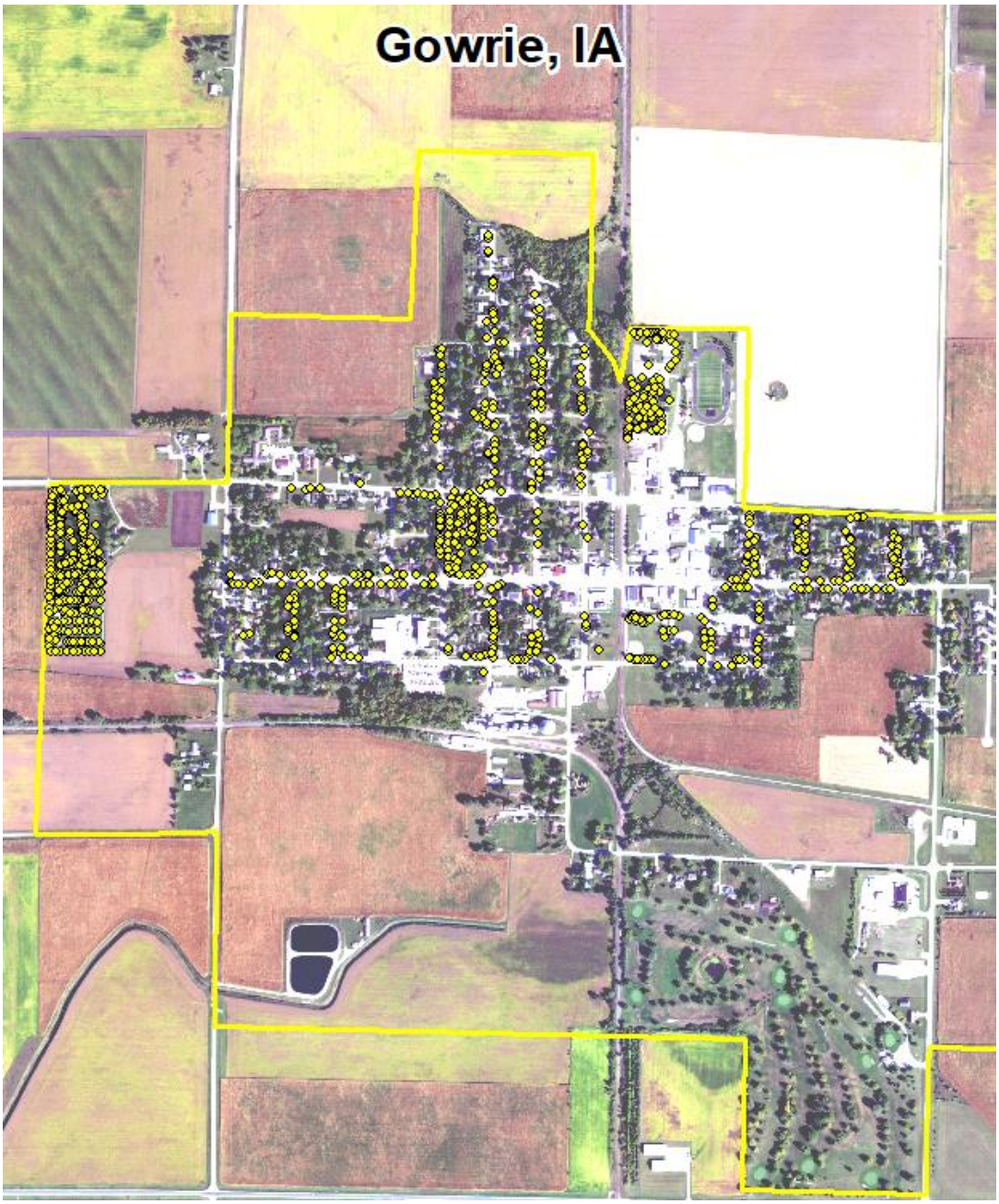
Gowrie, IA



2023 Urban Forest Management Plan
Prepared by Mark Runkel
Iowa Department of Natural Resources

Table of Contents

Executive Summary

Overview

This plan was developed to assist the City of Gowrie with managing its urban forest, including budgeting and future planning. Trees can provide a multitude of benefits to the community, and sound management allows a community to best take advantage of these benefits. Management is especially important considering the serious threats posed by forest pests such as 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 (this does not include mountain ash). There is a strong possibility that 14% of Gowrie's city owned trees (ash) will die once EAB becomes established in the community, unless preventative treatment is used. 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, a tree inventory was conducted 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 904 trees inventoried.

- Gowrie's trees provide $148,285 of benefits annually, an average of $164 a tree
- There are over 21 species of trees
- The top three genera are: Maple 26%, Cedar 23%, and Ash 14%
- 15% of trees are in need of some type of management
- 75 trees are recommended for removal

Recommendations

The core recommendations are detailed in the Recommendations Section. The Emerald Ash Borer Plan includes management recommendations as well. Below are some key recommendations.

- Of the 75 trees needing removal, 32 trees are over 24 inches in diameter at 4.5 ft and must be addressed immediately.
- 108 of the 125 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 with a visual survey yearly

Introduction

This plan was developed to assist Gowrie with the management, budgeting and future planning of their urban forest. Across the state, forestry budgets continue to decrease with more and more of that money spent on tree removal. With the recovery from Emerald Ash Borer (EAB), an invasive pest that kills native ash trees, it is time to prepare for the increased costs of tree removal or treatment and replacement planting. With proper planning and management of the current canopy in Gowrie, these costs can be extended over years and public safety issues from dead and dying ash trees mitigated.

Trees are an important component of Gowrie's infrastructure and one of the greatest assets to the community. The benefits of trees are immense. Trees provide the community with improved air quality, stormwater runoff interception, energy conservation, lower traffic speeds, increased property values, reduced crime, improved mental health and create a desirable place to live, to name just a few benefits. It is essential that these benefits be maintained for the people of Gowrie and future generations through good urban forestry management.

Good urban forestry management involves setting goals and developing management strategies to achieve these goals. An essential part of developing management strategies is a comprehensive public tree inventory. The inventory supplies information that will be used for maintenance, removal schedules, tree planting and budgeting. Basing actions on this information will help meet Gowrie's urban forestry goals.

Inventory

In 2022, a tree inventory was conducted that included 100% of the city owned trees on both streets and parks. The tree data was collected 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 programming used to collect tree information on the data collectors 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, signs and symptoms associated with EAB were noted for all ash trees. The signs and symptoms noted were canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

Inventory Results

The data collected for the 904 city trees was entered into the USDA Forest service program Street Tree Resource Analysis Tool for Urban forestry Management as part of the i-Tree suite. The following are results from the i-Tree STREETS analysis.

Annual Benefits

Annual Energy Benefits

Trees conserve energy by shading buildings and blocking winds. Gowrie's trees reduce energy related costs by approximately $37,713 annually (Appendix A, Table 1). These savings are both in Electricity (179.4 MWh) and in Natural Gas (24,588.1 Therms).

Annual Stormwater Benefits

Gowrie's trees intercept about 2,350,242 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $63,692 of benefits 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 emitting volatile organic matter (ozone). In Gowrie, it is estimated that trees remove 2,020.4 lbs of air pollution (ozone (O_3), particulate matter less than 10 microns (PM10), carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2)) per year with a net value of $5,332 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Gowrie, trees sequester about 375,729 lbs of carbon a year with an associated value of $2,818 (Appendix A, Table 5). In addition, the trees store 6,966,540 lbs of carbon, with a yearly benefit of $52,249 (Appendix A, Table 4).

Annual Aesthetics Benefits

Social benefits of trees are hard to capture. The 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. Gowrie receives $36,741 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, Gowrie's trees provide $148,285 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 904 trees in Gowrie provide approximately $164 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Gowrie has over 21 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genera is as follows:

Maple	235	26%
Cedar	205	23%
Ash	125	14%
Spruce	108	12%
Apple	90	10%
Linden/Basswood	20	2%
Lilac	19	2%
Oak	18	2%
Pine	15	2%
Hackberry	14	1%
Pear	9	1%
Walnut	8	1%
Elm	6	<1%
Locust	6	<1%
Aspen	6	<1%
Mulberry/Boxelder	3	<1%
Ginkgo	2	<1%
Sycamore	1	<1%
Redbud	1	<1%
Ohio buckeye	1	<1%
Willow	1	<1%
Other Broadleaf Deciduous	9	<1%
Other Large Evergreen	2	<1%

Age Class

Most of Gowrie's trees (34%) are between 6 and 18 inches in diameter at 4.5 ft (Appendix A, Figure 2). For age, it is preferred that the highest amounts of trees are in the smallest size category (a downward slope) to prepare for natural mortality and to maintain canopy cover. Gowrie'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 overall health of the urban forest. The foliage condition results for Gowrie indicate that 76% of the trees are in good health, with only 9% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 77% of Gowrie's trees are in good health for wood condition (appendix A, Figure 4 & Appendix B,

Figure 3). Wood condition that is in poor health, dead or dying is about 7% of the population. This 15% 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).

Tree Removal	75	8%
Crown Cleaning	26	3%
Crown Reduction	13	1%
Crown Raising	5	<1%

Canopy Cover

The total canopy with both private and public trees is 11%, 106 acres. The canopy cover on city own properties included in the Gowrie inventory includes approximately 20 acres (Appendix A, Figure 4). The City's Canopy goal is to increase canopy by 1%, in 30 years on all lands. To achieve this goal it is estimated that 23 trees need to be planted annually on public and/or private lands.

Land Use and Location

The majority of Gowrie'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	
Park/vacant/other	53%
Single family residential	47%

Location	
Front yard	67%
Planting strip	33%

Recommendations

Risk Management

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

Hazardous trees

Gowrie has 3 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). It is recommended to start with the large diameter critical concern trees first. There are 6 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 15 trees with these needs.

Poor tree species

After the removal of the critical concern trees, ash trees in poor health should be assessed for removal (Appendix B, Figure 3 & Appendix B, Figure 4). Of the 75 removals, 60 are ash trees. There are a total of 125 ash trees, and 108 of those have signs and symptoms that have been associated with EAB. In addition, there are 60 trees that are in poor health.

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 is the removal of lower branches that are 2 inches in diameter or larger in the case of providing clearance for pedestrians or vehicles. Crown reduction is removing individual limbs from structures or utility wires. It is recommended 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 5 years will replace the trees that are removed. It is recommended to plant 1.2 trees for every tree removed, since survival rates will not be 100%. Please refer to the six year maintenance plan at the end of this section. 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 Gowrie.

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 (26%) (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: cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut, 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. It is recommended 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.

Budget and Emerald Ash Borer Plan

Six Year Maintenance Plan with No Additional Funding

Current Budget $1,900/year, Total $11,400 over 6 years

2023	Quantity	Est. Price
Removal (Schedule based on priority level)	2	$1,400
Planting and Replacement	5	$500
Young Tree Pruning & Maintenance		
Visual Survey for signs and symptoms of EAB		
		$1,900
2024		
Removal (Schedule based on priority level)	2	$1,400
Planting and Replacement		
Young Tree Pruning & Maintenance		
Routine trimming (1/3 of the city trees)		$500
Visual Survey for signs and symptoms of EAB		
		$1,900
2025		
Removal (Schedule based on priority level)	2	$1,400
Planting and Replacement	5	$500
Young Tree Pruning & Maintenance		
Visual Survey for signs and symptoms of EAB		
		$1,900
2026		
Removal (Schedule based on priority level)	2	$1,400
Planting and Replacement		
Young Tree Pruning & Maintenance		
Routine trimming		$500
Visual Survey for signs and symptoms of EAB		
		$1,900

2027		
Removal (Schedule based on priority level)	2	$1,400
Planting and Replacement	5	$500
Young Tree Pruning & Maintenance		
Visual Survey for signs and symptoms of EAB		
		$1,900
2028		
Removal (Schedule based on priority level)	2	$1,400
Planting and Replacement		
Young Tree Pruning & Maintenance		
Routine trimming		$500
Visual Survey for signs and symptoms of EAB		
		$1,900

*Reduction of ash over 6 years: Approximately 31 ash trees removed (approximately 25% of ash). It will take approximately 15 years to remove all ash with the current budget. EAB could potentially kill all ash within 4 to 15 years of its arrival.
**To remove all ash trees within 6 years, the budget would need to be increased to $14,583 a year.

Ash Tree Removal

Tree removal will be prioritized with dead, dying, hazardous trees to be removed first (Appendix B, Figure 4). Next will be all ash in poor condition and displaying signs and symptoms of EAB (Appendix B, Figure 2 & Appendix B, Figure 3).

Treatment of Ash Trees

Chemical treatment can be effective tool for communities to spread removal costs out over several years while allowing trees to continue to provide 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 disposed of as you normally would 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 ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut.

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 the following signs and symptoms: 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 151.06 states “If it is determined with reasonable certainty that any such condition exists (trees or shrubs in the City reported or suspected to be infected with or damaged by any disease or insect or disease pests) on private property and that the 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 14 days of receipt of notice, the Council may cause the condition to be corrected and the cost assessed against the property.”

<u>Proposed Budget Increase</u>

EAB could potentially kill all ash trees in Gowrie within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to $23,333 a year. Additionally, it is

recommended that Gowrie 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 being considered by many communities is treating a number of 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 removed 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 4 trees could be treated per year (every other year treatment) would be $1,200. This would be 8 trees selected for treatment, and Gowrie would still need to find $13,650 per year for removal. Alternatively, if there are 15 treatable trees, it would cost approximately $2,250 a year for treatment and leave $12,833 per year 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 Gowrie. It is suggested to consider increasing the 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

Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Gowrie

Annual Energy Benefits of Public Trees

1/27/2023

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Northern white cedar	27.8	2,111	3,729.8	3,655	5,766	(N/A)	22.7	15.3	28.13
Green ash	35.8	2,719	4,857.2	4,760	7,479	(N/A)	13.7	19.8	60.32
Norway maple	24.8	1,883	3,580.9	3,509	5,392	(N/A)	10.5	14.3	56.76
Apple	8.0	609	1,245.4	1,220	1,830	(N/A)	10.0	4.9	20.33
Silver maple	30.5	2,316	4,050.1	3,969	6,285	(N/A)	9.4	16.7	73.94
Norway spruce	10.0	761	1,317.3	1,291	2,052	(N/A)	6.3	5.4	35.99
Blue spruce	4.8	363	622.3	610	973	(N/A)	4.4	2.6	24.32
Red maple	4.8	364	638.4	626	989	(N/A)	4.0	2.6	27.48
Japanese tree lilac	1.8	140	288.7	283	423	(N/A)	2.1	1.1	22.28
Eastern white pine	1.6	125	208.9	205	330	(N/A)	1.7	0.9	21.97
Northern hackberry	4.5	345	660.0	647	992	(N/A)	1.6	2.6	70.85
Black maple	4.0	300	548.7	538	838	(N/A)	1.6	2.2	59.85
Littleleaf linden	1.7	131	237.3	233	364	(N/A)	1.4	1.0	27.96
Black spruce	1.1	83	149.2	146	229	(N/A)	1.2	0.6	20.85
Northern red oak	1.8	133	245.5	241	374	(N/A)	1.0	1.0	41.55
Callery pear	0.9	71	125.4	123	194	(N/A)	1.0	0.5	21.52
Black walnut	2.7	208	386.6	379	587	(N/A)	0.9	1.6	73.38
American basswood	2.2	170	324.1	318	488	(N/A)	0.8	1.3	69.69
Honeylocust	2.2	167	284.4	279	446	(N/A)	0.7	1.2	74.28
American elm	1.6	124	203.9	200	324	(N/A)	0.7	0.9	53.99
Quaking aspen	0.5	39	67.0	66	104	(N/A)	0.7	0.3	17.36
Broadleaf Deciduous Large	0.3	26	48.3	47	73	(N/A)	0.4	0.2	18.22
Bur oak	1.0	80	130.8	128	208	(N/A)	0.4	0.6	51.93
Amur maple	0.6	43	81.6	80	123	(N/A)	0.4	0.3	30.82
Swamp white oak	0.6	44	75.8	74	118	(N/A)	0.3	0.3	39.34
Broadleaf Deciduous Mediu	0.8	64	126.5	124	188	(N/A)	0.3	0.5	62.74
Conifer Evergreen Large	0.2	14	25.3	25	39	(N/A)	0.2	0.1	19.55
Boxelder	0.5	41	75.1	74	115	(N/A)	0.2	0.3	57.27
Ginkgo	0.0	2	3.4	3	5	(N/A)	0.2	0.0	2.54
White oak	0.3	25	40.7	40	65	(N/A)	0.2	0.2	32.43
White ash	0.3	20	28.4	28	48	(N/A)	0.1	0.1	48.12
Willow	0.1	8	16.9	17	24	(N/A)	0.1	0.1	24.47
Eastern redbud	0.0	0	0.6	1	1	(N/A)	0.1	0.0	0.87
American sycamore	0.3	20	38.1	37	57	(N/A)	0.1	0.2	57.32
Sugar maple	0.4	32	54.5	53	85	(N/A)	0.1	0.2	84.99
Ohio buckeye	0.3	20	39.6	39	59	(N/A)	0.1	0.2	58.69
Mulberry	0.2	15	31.6	31	46	(N/A)	0.1	0.1	46.14
Total	179.4	13,616	24,588.1	24,096	37,713	(N/A)	100.0	100.0	41.81

Table 2: Annual Stormwater Benefits

Gowrie

Annual Stormwater Benefits of Public Trees

1/27/2023

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Northern white cedar	565,533	15,326	(N/A)	22.7	24.1	74.76
Green ash	397,347	10,768	(N/A)	13.7	16.9	86.84
Norway maple	234,323	6,350	(N/A)	10.5	10.0	66.84
Apple	30,083	815	(N/A)	10.0	1.3	9.06
Silver maple	457,530	12,399	(N/A)	9.4	19.5	145.87
Norway spruce	236,789	6,417	(N/A)	6.3	10.1	112.58
Blue spruce	65,424	1,773	(N/A)	4.4	2.8	44.33
Red maple	32,822	889	(N/A)	4.0	1.4	24.71
Japanese tree lilac	7,090	192	(N/A)	2.1	0.3	10.11
Eastern white pine	22,860	620	(N/A)	1.7	1.0	41.30
Northern hackberry	41,080	1,113	(N/A)	1.6	1.7	79.52
Black maple	38,875	1,054	(N/A)	1.6	1.7	75.25
Littleleaf linden	12,467	338	(N/A)	1.4	0.5	25.99
Black spruce	14,692	398	(N/A)	1.2	0.6	36.20
Northern red oak	17,940	486	(N/A)	1.0	0.8	54.02
Callery pear	5,448	148	(N/A)	1.0	0.2	16.40
Black walnut	34,834	944	(N/A)	0.9	1.5	118.00
American basswood	30,114	816	(N/A)	0.8	1.3	116.58
Honeylocust	28,109	762	(N/A)	0.7	1.2	126.96
American elm	13,663	370	(N/A)	0.7	0.6	61.71
Quaking aspen	4,128	112	(N/A)	0.7	0.2	18.64
Broadleaf Deciduous Large	3,997	108	(N/A)	0.4	0.2	27.08
Bur oak	10,778	292	(N/A)	0.4	0.5	73.02
Amur maple	2,515	68	(N/A)	0.4	0.1	17.04
Swamp white oak	3,404	92	(N/A)	0.3	0.1	30.75
Broadleaf Deciduous Medium	8,723	236	(N/A)	0.3	0.4	78.80
Conifer Evergreen Large	4,653	126	(N/A)	0.2	0.2	63.05
Boxelder	7,277	197	(N/A)	0.2	0.3	98.61
Ginkgo	89	2	(N/A)	0.2	0.0	1.20
White oak	2,073	56	(N/A)	0.2	0.1	28.09
White ash	1,663	45	(N/A)	0.1	0.1	45.05
Willow	586	16	(N/A)	0.1	0.0	15.88
Eastern redbud	7	0	(N/A)	0.1	0.0	0.20
American sycamore	2,591	70	(N/A)	0.1	0.1	70.21
Sugar maple	7,083	192	(N/A)	0.1	0.3	191.94
Ohio buckeye	2,479	67	(N/A)	0.1	0.1	67.19
Mulberry	1,174	32	(N/A)	0.1	0.0	31.82
Citywide total	2,350,242	63,692	(N/A)	100.0	100.0	70.61

Table 3: Annual Air Quality Benefits

Gowrie

Annual Air Quality Benefits of Public Trees

1/27/2023

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							
Northern white cedar	66.4	13.1	53.8	8.2	435	131.7	19.3	18.4	126.0	823	-286.0	-1,072	150.8	186 (N/A)	22.7	0.91
Green ash	50.2	8.0	23.9	2.3	267	170.7	24.9	23.7	162.4	1,064	0.0	0	466.1	1,331 (N/A)	13.7	10.74
Norway maple	48.1	8.3	23.6	2.1	260	120.3	17.4	16.5	112.5	745	-11.2	-42	337.7	963 (N/A)	10.5	10.13
Apple	7.5	1.2	3.8	0.3	41	39.6	5.7	5.4	36.4	244	0.0	0	99.9	284 (N/A)	10.0	3.16
Silver maple	84.2	14.3	40.9	3.7	453	144.2	21.1	20.1	138.0	901	-44.7	-168	421.8	1,186 (N/A)	9.4	13.96
Norway spruce	29.0	5.7	23.0	3.6	189	47.3	6.9	6.6	45.4	296	-143.7	-539	23.8	-54 (N/A)	6.3	-0.95
Blue spruce	8.9	1.8	7.4	1.1	59	22.5	3.3	3.1	21.6	141	-23.9	-90	45.7	110 (N/A)	4.4	2.74
Red maple	6.6	1.1	3.2	0.3	35	22.7	3.3	3.2	21.7	142	-2.4	-9	59.7	168 (N/A)	4.0	4.68
Japanese tree lilac	1.8	0.3	0.9	0.1	10	9.1	1.3	1.2	8.4	56	0.0	0	23.2	66 (N/A)	2.1	3.47
Eastern white pine	2.5	0.5	2.2	0.3	17	7.7	1.1	1.1	7.5	48	-9.4	-35	13.4	30 (N/A)	1.7	1.99
Northern hackberry	6.0	1.0	3.1	0.3	33	22.1	3.2	3.0	20.6	137	0.0	0	59.3	169 (N/A)	1.6	12.11
Black maple	10.1	1.7	4.6	0.4	53	18.9	2.8	2.6	17.9	118	-3.3	-12	55.8	159 (N/A)	1.6	11.34
Littleleaf linden	1.6	0.3	0.9	0.1	9	8.3	1.2	1.1	7.8	51	-0.9	-3	20.5	57 (N/A)	1.4	4.41
Black spruce	1.9	0.4	1.6	0.2	13	5.2	0.8	0.7	5.0	32	-5.3	-20	10.6	26 (N/A)	1.2	2.34
Northern red oak	3.8	0.7	1.8	0.2	20	8.4	1.2	1.2	8.0	52	-5.4	-20	19.8	52 (N/A)	1.0	5.83
Callery pear	0.8	0.1	0.4	0.0	4	4.4	0.6	0.6	4.2	28	-0.2	-1	11.1	31 (N/A)	1.0	3.47
Black walnut	4.6	0.7	2.1	0.2	24	13.2	1.9	1.8	12.4	82	0.0	0	37.1	106 (N/A)	0.9	13.30
American basswood	4.5	0.8	2.2	0.2	24	10.9	1.6	1.5	10.2	67	-3.7	-14	28.1	78 (N/A)	0.8	11.09
Honeylocust	5.6	0.9	2.5	0.3	30	10.3	1.5	1.4	9.9	65	-4.6	-17	28.0	77 (N/A)	0.7	12.87
American elm	5.4	0.9	2.5	0.2	28	7.6	1.1	1.1	7.4	48	0.0	0	26.2	76 (N/A)	0.7	12.73
Quaking aspen	0.4	0.1	0.2	0.0	2	2.4	0.4	0.3	2.3	15	0.0	0	6.0	17 (N/A)	0.7	2.85
Broadleaf Deciduous Large	0.5	0.1	0.2	0.0	3	1.6	0.2	0.2	1.5	10	0.0	0	4.4	13 (N/A)	0.4	3.18
Bur oak	1.8	0.3	0.8	0.1	10	4.9	0.7	0.7	4.7	31	0.0	0	14.1	40 (N/A)	0.4	10.10
Amur maple	0.8	0.1	0.4	0.0	4	2.8	0.4	0.4	2.6	17	0.0	0	7.5	22 (N/A)	0.4	5.39
Swamp white oak	0.5	0.1	0.3	0.0	3	2.7	0.4	0.4	2.6	17	-0.1	-1	6.9	19 (N/A)	0.3	6.43
Broadleaf Deciduous Medium	1.8	0.3	0.9	0.1	10	4.1	0.6	0.6	3.8	26	-0.4	-2	11.9	34 (N/A)	0.3	11.30
Conifer Evergreen Large	0.6	0.1	0.4	0.1	4	0.9	0.1	0.1	0.9	6	-2.9	-11	0.3	-2 (N/A)	0.2	-0.76
Boxelder	1.1	0.2	0.5	0.0	6	2.6	0.4	0.4	2.4	16	-0.3	-1	7.2	21 (N/A)	0.2	10.29
Ginkgo	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)	0.2	0.36
White oak	0.1	0.0	0.1	0.0	1	1.5	0.2	0.2	1.5	10	0.0	0	3.7	10 (N/A)	0.2	5.21
White ash	0.1	0.0	0.1	0.0	1	1.2	0.2	0.2	1.2	8	0.0	0	3.0	8 (N/A)	0.1	8.32
Willow	0.1	0.0	0.0	0.0	0	0.5	0.1	0.1	0.5	3	0.0	0	1.2	3 (N/A)	0.1	3.47
Eastern redbud	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)	0.1	0.11
American sycamore	0.3	0.0	0.1	0.0	1	1.3	0.2	0.2	1.2	8	0.0	0	3.3	9 (N/A)	0.1	9.34
Sugar maple	1.1	0.2	0.5	0.0	6	2.0	0.3	0.3	1.9	12	-0.9	-3	5.4	15 (N/A)	0.1	15.01
Ohio buckeye	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)	0.1	10.16
Mulberry	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)	0.1	8.35
Citywide total	359.7	63.7	209.5	24.6	2,060	856.0	124.7	118.9	812.8	5,333	-549.5	-2,060	2,020.4	5,332 (N/A)	100.0	5.91

Table 4: Annual Carbon Stored

Gowrie

Stored CO2 Benefits of Public Trees

1/27/2023

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Northern white cedar	709,044	5,318	(N/A)	22.7	10.2	25.94
Green ash	1,647,078	12,353	(N/A)	13.7	23.6	99.62
Norway maple	790,705	5,930	(N/A)	10.5	11.4	62.42
Apple	124,816	936	(N/A)	10.0	1.8	10.40
Silver maple	2,038,158	15,286	(N/A)	9.4	29.3	179.84
Norway spruce	373,498	2,801	(N/A)	6.3	5.4	49.14
Blue spruce	60,087	451	(N/A)	4.4	0.9	11.27
Red maple	75,596	567	(N/A)	4.0	1.1	15.75
Japanese tree lilac	29,978	225	(N/A)	2.1	0.4	11.83
Eastern white pine	21,478	161	(N/A)	1.7	0.3	10.74
Northern hackberry	86,161	646	(N/A)	1.6	1.2	46.16
Black maple	106,913	802	(N/A)	1.6	1.5	57.27
Littleleaf linden	37,816	284	(N/A)	1.4	0.5	21.82
Black spruce	13,207	99	(N/A)	1.2	0.2	9.00
Northern red oak	82,024	615	(N/A)	1.0	1.2	68.35
Callery pear	13,141	99	(N/A)	1.0	0.2	10.95
Black walnut	149,378	1,120	(N/A)	0.9	2.1	140.04
American basswood	172,488	1,294	(N/A)	0.8	2.5	184.81
Honeylocust	73,469	551	(N/A)	0.7	1.1	91.84
American elm	102,299	767	(N/A)	0.7	1.5	127.87
Quaking aspen	12,178	91	(N/A)	0.7	0.2	15.22
Broadleaf Deciduous	15,809	119	(N/A)	0.4	0.2	29.64
Bur oak	64,360	483	(N/A)	0.4	0.9	120.68
Amur maple	12,831	96	(N/A)	0.4	0.2	24.06
Swamp white oak	8,349	63	(N/A)	0.3	0.1	20.87
Broadleaf Deciduous	30,171	226	(N/A)	0.3	0.4	75.43
Conifer Evergreen La	7,493	56	(N/A)	0.2	0.1	28.10
Boxelder	41,620	312	(N/A)	0.2	0.6	156.07
Ginkgo	82	1	(N/A)	0.2	0.0	0.31
White oak	4,706	35	(N/A)	0.2	0.1	17.65
White ash	3,672	28	(N/A)	0.1	0.1	27.54
Willow	1,101	8	(N/A)	0.1	0.0	8.26
Eastern redbud	14	0	(N/A)	0.1	0.0	0.10
American sycamore	8,458	63	(N/A)	0.1	0.1	63.43
Sugar maple	33,674	253	(N/A)	0.1	0.5	252.56
Ohio buckeye	7,945	60	(N/A)	0.1	0.1	59.59
Mulberry	6,743	51	(N/A)	0.1	0.1	50.57
Citywide total	6,966,540	52,249	(N/A)	100.0	100.0	57.93

Table 5: Annual Carbon Sequestered

Gowrie

Annual CO Benefits of Public Trees

1/27/2023

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
Northern white cedar	31,908	239	-3,403	-526	-29	46,658	350	74,637	560 (N/A)	22.7	11.6	2.73
Green ash	83,019	623	-7,906	-371	-62	60,099	451	134,841	1,011 (N/A)	13.7	21.0	8.16
Norway maple	32,196	241	-3,795	-264	-30	41,610	312	69,747	523 (N/A)	10.5	10.9	5.51
Apple	12,646	95	-599	-111	-5	13,466	101	25,401	191 (N/A)	10.0	4.0	2.12
Silver maple	139,952	1,050	-9,783	-351	-76	51,178	384	180,996	1,357 (N/A)	9.4	28.2	15.97
Norway spruce	7,778	58	-1,793	-207	-15	16,812	126	22,590	169 (N/A)	6.3	3.5	2.97
Blue spruce	3,940	30	-288	-82	-3	8,021	60	11,590	87 (N/A)	4.4	1.8	2.17
Red maple	9,827	74	-363	-46	-3	8,038	60	17,457	131 (N/A)	4.0	2.7	3.64
Japanese tree lilac	2,962	22	-144	-25	-1	3,101	23	5,894	44 (N/A)	2.1	0.9	2.33
Eastern white pine	1,375	10	-103	-29	-1	2,761	21	4,004	30 (N/A)	1.7	0.6	2.00
Northern hackberry	5,633	42	-414	-42	-3	7,628	57	12,805	96 (N/A)	1.6	2.0	6.86
Black maple	4,177	31	-513	-37	-4	6,631	50	10,257	77 (N/A)	1.6	1.6	5.50
Littleleaf linden	4,961	37	-182	-21	-2	2,894	22	7,653	57 (N/A)	1.4	1.2	4.42
Black spruce	676	5	-63	-19	-1	1,837	14	2,431	18 (N/A)	1.2	0.4	1.66
Northern red oak	1,567	12	-394	-23	-3	2,948	22	4,098	31 (N/A)	1.0	0.6	3.42
Callery pear	1,627	12	-63	-9	-1	1,565	12	3,121	23 (N/A)	1.0	0.5	2.60
Black walnut	6,966	52	-717	-30	-6	4,601	35	10,820	81 (N/A)	0.9	1.7	10.14
American basswood	9,213	69	-828	-28	-6	3,762	28	12,119	91 (N/A)	0.8	1.9	12.98
Honeylocust	0	0	-353	-16	-3	3,689	28	3,319	25 (N/A)	0.7	0.5	4.15
American elm	2,037	15	-491	-17	-4	2,742	21	4,271	32 (N/A)	0.7	0.7	5.34
Quaking aspen	1,115	8	-59	-5	0	852	6	1,903	14 (N/A)	0.7	0.3	2.38
Broadleaf Deciduous Larg	865	6	-76	-4	-1	565	4	1,350	10 (N/A)	0.4	0.2	2.53
Bur oak	1,578	12	-309	-11	-2	1,757	13	3,016	23 (N/A)	0.4	0.5	5.65
Amur maple	1,022	8	-62	-7	-1	957	7	1,911	14 (N/A)	0.4	0.3	3.58
Swamp white oak	996	7	-40	-5	0	966	7	1,917	14 (N/A)	0.3	0.3	4.79
Broadleaf Deciduous Medi	1,310	10	-145	-9	-1	1,419	11	2,575	19 (N/A)	0.3	0.4	6.44
Conifer Evergreen Large	4	0	-36	-4	0	317	2	280	2 (N/A)	0.2	0.0	1.05
Boxelder	2,567	19	-200	-8	-2	905	7	3,265	24 (N/A)	0.2	0.5	12.24
Ginkgo	18	0	0	-1	0	39	0	56	0 (N/A)	0.2	0.0	0.21
White oak	654	5	-23	-3	0	552	4	1,180	9 (N/A)	0.2	0.2	4.43
White ash	494	4	-18	-2	0	449	3	923	7 (N/A)	0.1	0.1	6.92
Willow	224	2	-5	-1	0	176	1	393	3 (N/A)	0.1	0.1	2.95
Eastern redbud	9	0	0	0	0	6	0	14	0 (N/A)	0.1	0.0	0.10
American sycamore	660	5	-41	-3	0	441	3	1,058	8 (N/A)	0.1	0.2	7.93
Sugar maple	1,284	10	-162	-5	-1	698	5	1,815	14 (N/A)	0.1	0.3	13.61
Ohio buckeye	470	4	-38	-3	0	440	3	869	7 (N/A)	0.1	0.1	6.52
Mulberry	0	0	-32	-4	0	335	3	299	2 (N/A)	0.1	0.0	2.24
Citywide total	375,729	2,818	-33,441	-2,329	-268	300,916	2,257	640,876	4,807 (N/A)	100.0	100.0	5.33

Table 6: Annual Social and Aesthetic Benefits

Gowrie

Annual Aesthetic/Other Benefits of Public Trees

1/27/2023

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Northern white cedar	7,097	(N/A)	22.7	19.3	34.62
Green ash	6,824	(N/A)	13.7	18.6	55.03
Norway maple	3,046	(N/A)	10.5	8.3	32.06
Apple	721	(N/A)	10.0	2.0	8.01
Silver maple	10,308	(N/A)	9.4	28.1	121.27
Norway spruce	986	(N/A)	6.3	2.7	17.30
Blue spruce	899	(N/A)	4.4	2.4	22.48
Red maple	1,373	(N/A)	4.0	3.7	38.13
Japanese tree lilac	170	(N/A)	2.1	0.5	8.93
Eastern white pine	383	(N/A)	1.7	1.0	25.52
Northern hackberry	777	(N/A)	1.6	2.1	55.50
Black maple	502	(N/A)	1.6	1.4	35.87
Littleleaf linden	576	(N/A)	1.4	1.6	44.31
Black spruce	218	(N/A)	1.2	0.6	19.78
Northern red oak	121	(N/A)	1.0	0.3	13.41
Callery pear	181	(N/A)	1.0	0.5	20.10
Black walnut	520	(N/A)	0.9	1.4	64.98
American basswood	613	(N/A)	0.8	1.7	87.64
Honeylocust	0	(N/A)	0.7	0.0	0.00
American elm	254	(N/A)	0.7	0.7	42.27
Quaking aspen	125	(N/A)	0.7	0.3	20.77
Broadleaf Deciduous Large	81	(N/A)	0.4	0.2	20.34
Bur oak	149	(N/A)	0.4	0.4	37.21
Amur maple	60	(N/A)	0.4	0.2	14.95
Swamp white oak	105	(N/A)	0.3	0.3	34.85
Broadleaf Deciduous Medium	118	(N/A)	0.3	0.3	39.19
Conifer Evergreen Large	6	(N/A)	0.2	0.0	2.88
Boxelder	147	(N/A)	0.2	0.4	73.49
Ginkgo	3	(N/A)	0.2	0.0	1.56
White oak	74	(N/A)	0.2	0.2	37.21
White ash	64	(N/A)	0.1	0.2	63.74
Willow	26	(N/A)	0.1	0.1	26.22
Eastern redbud	0	(N/A)	0.1	0.0	0.03
American sycamore	58	(N/A)	0.1	0.2	57.69
Sugar maple	116	(N/A)	0.1	0.3	116.31
Ohio buckeye	43	(N/A)	0.1	0.1	43.05
Mulberry	0	(N/A)	0.1	0.0	0.00
Citywide total	36,741	(N/A)	100.0	100.0	40.73

Table 7: Summary of Benefits in Dollars

Gowrie

Total Annual Benefits of Public Trees by Species ($)

1/27/2023

Species	Energy	CO_2	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Northern white cedar	5,766	560	186	15,326	7,097	28,936	(N/A)	19.5
Green ash	7,479	1,011	1,331	10,768	6,824	27,414	(N/A)	18.5
Norway maple	5,392	523	963	6,350	3,046	16,274	(N/A)	11.0
Apple	1,830	191	284	815	721	3,841	(N/A)	2.6
Silver maple	6,285	1,357	1,186	12,399	10,308	31,535	(N/A)	21.3
Norway spruce	2,052	169	-54	6,417	986	9,570	(N/A)	6.5
Blue spruce	973	87	110	1,773	899	3,842	(N/A)	2.6
Red maple	989	131	168	889	1,373	3,551	(N/A)	2.4
Japanese tree lilac	423	44	66	192	170	895	(N/A)	0.6
Eastern white pine	330	30	30	620	383	1,392	(N/A)	0.9
Northern hackberry	992	96	169	1,113	777	3,148	(N/A)	2.1
Black maple	838	77	159	1,054	502	2,629	(N/A)	1.8
Littleleaf linden	364	57	57	338	576	1,392	(N/A)	0.9
Black spruce	229	18	26	398	218	889	(N/A)	0.6
Northern red oak	374	31	52	486	121	1,064	(N/A)	0.7
Callery pear	194	23	31	148	181	577	(N/A)	0.4
Black walnut	587	81	106	944	520	2,238	(N/A)	1.5
American basswood	488	91	78	816	613	2,086	(N/A)	1.4
Honeylocust	446	25	77	762	0	1,310	(N/A)	0.9
American elm	324	32	76	370	254	1,056	(N/A)	0.7
Quaking aspen	104	14	17	112	125	372	(N/A)	0.3
Broadleaf Deciduous La	73	10	13	108	81	285	(N/A)	0.2
Bur oak	208	23	40	292	149	712	(N/A)	0.5
Amur maple	123	14	22	68	60	287	(N/A)	0.2
Swamp white oak	118	14	19	92	105	348	(N/A)	0.2
Broadleaf Deciduous M	188	19	34	236	118	595	(N/A)	0.4
Conifer Evergreen Large	39	2	-2	126	6	172	(N/A)	0.1
Boxelder	115	24	21	197	147	504	(N/A)	0.3
Ginkgo	5	0	1	2	3	12	(N/A)	0.0
White oak	65	9	10	56	74	215	(N/A)	0.1
White ash	48	7	8	45	64	172	(N/A)	0.1
Willow	24	3	3	16	26	73	(N/A)	0.0
Eastern redbud	1	0	0	0	0	1	(N/A)	0.0
American sycamore	57	8	9	70	58	202	(N/A)	0.1
Sugar maple	85	14	15	192	116	422	(N/A)	0.3
Ohio buckeye	59	7	10	67	43	186	(N/A)	0.1
Mulberry	46	2	8	32	0	89	(N/A)	0.1
Citywide Total	37,713	4,807	5,332	63,692	36,741	148,285	(N/A)	100.0

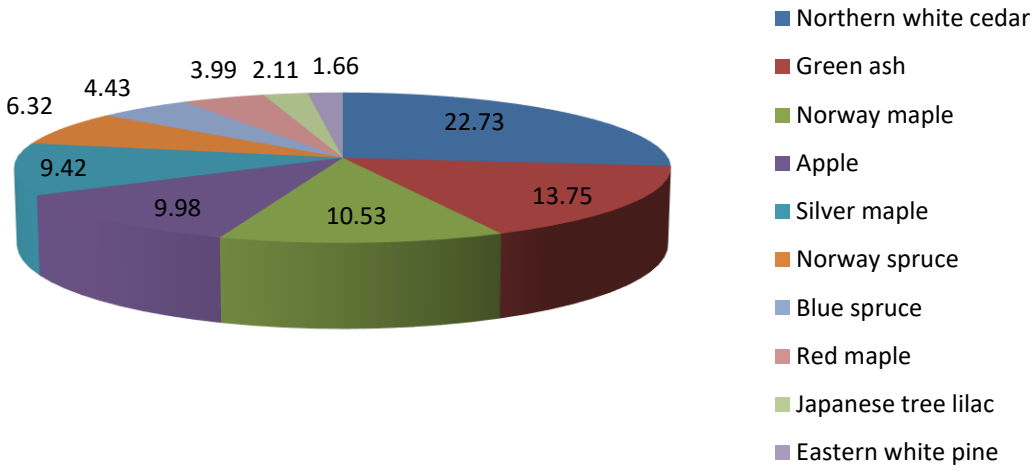


Figure 1: Species Distribution

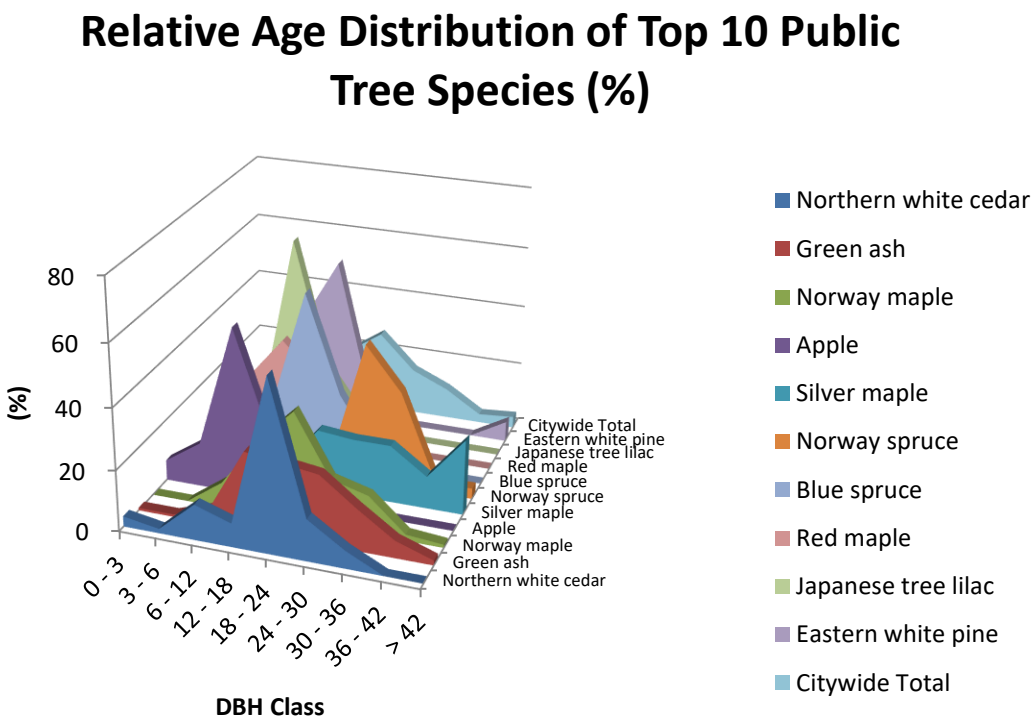


Figure 2: Relative Age Class

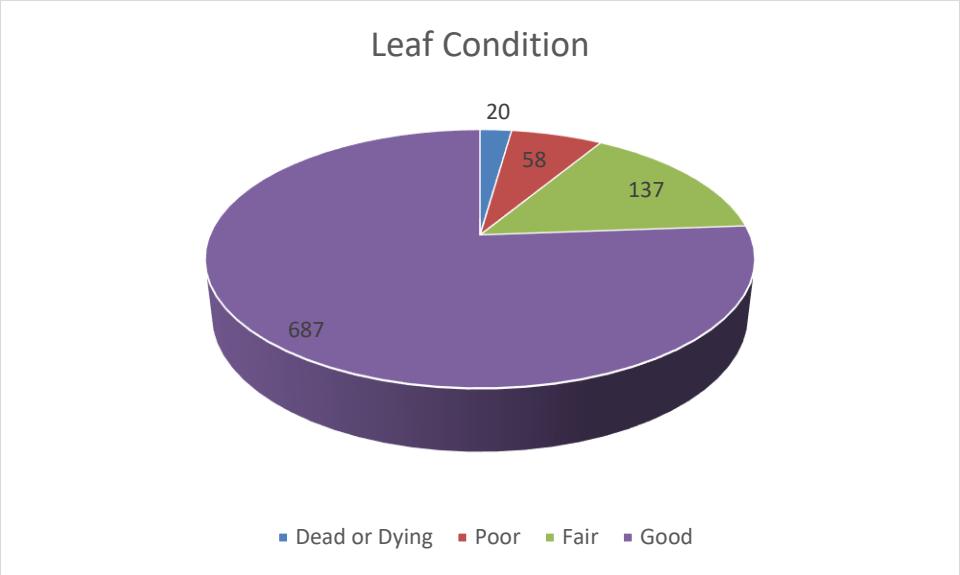


Figure 3: Foliage Condition

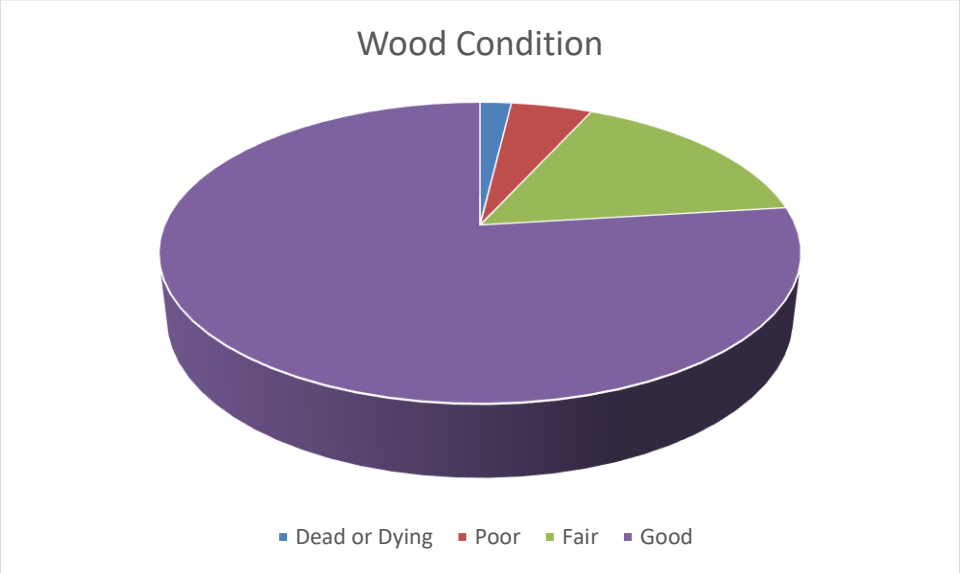


Figure 4: Wood Condition

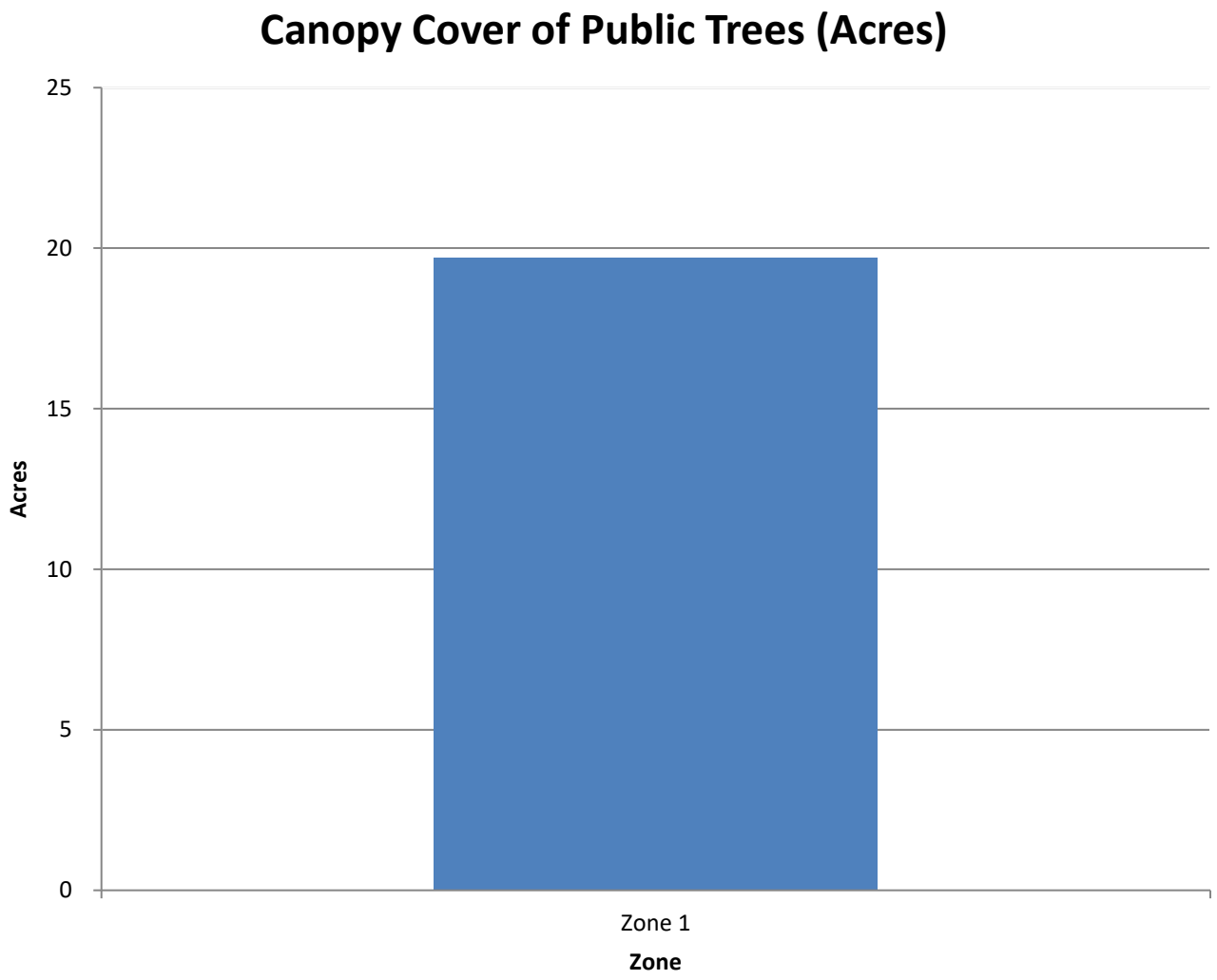


Figure 5: Canopy Cover in Acres

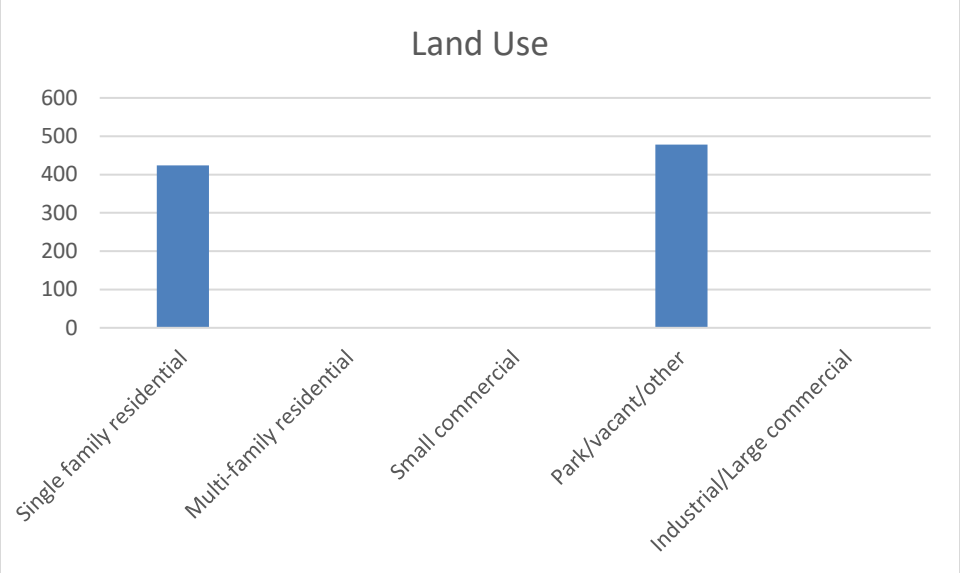


Figure 6: Land Use of city/park trees

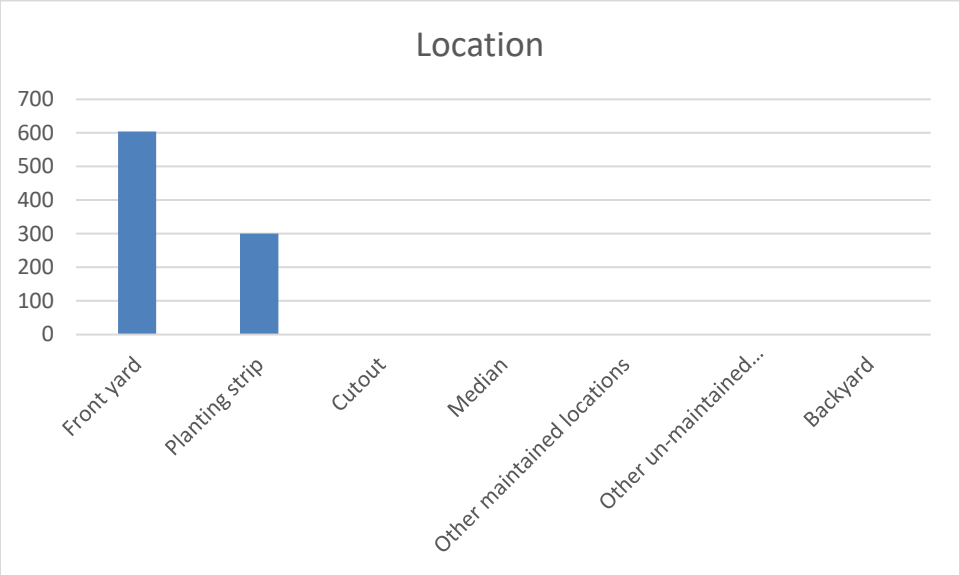


Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

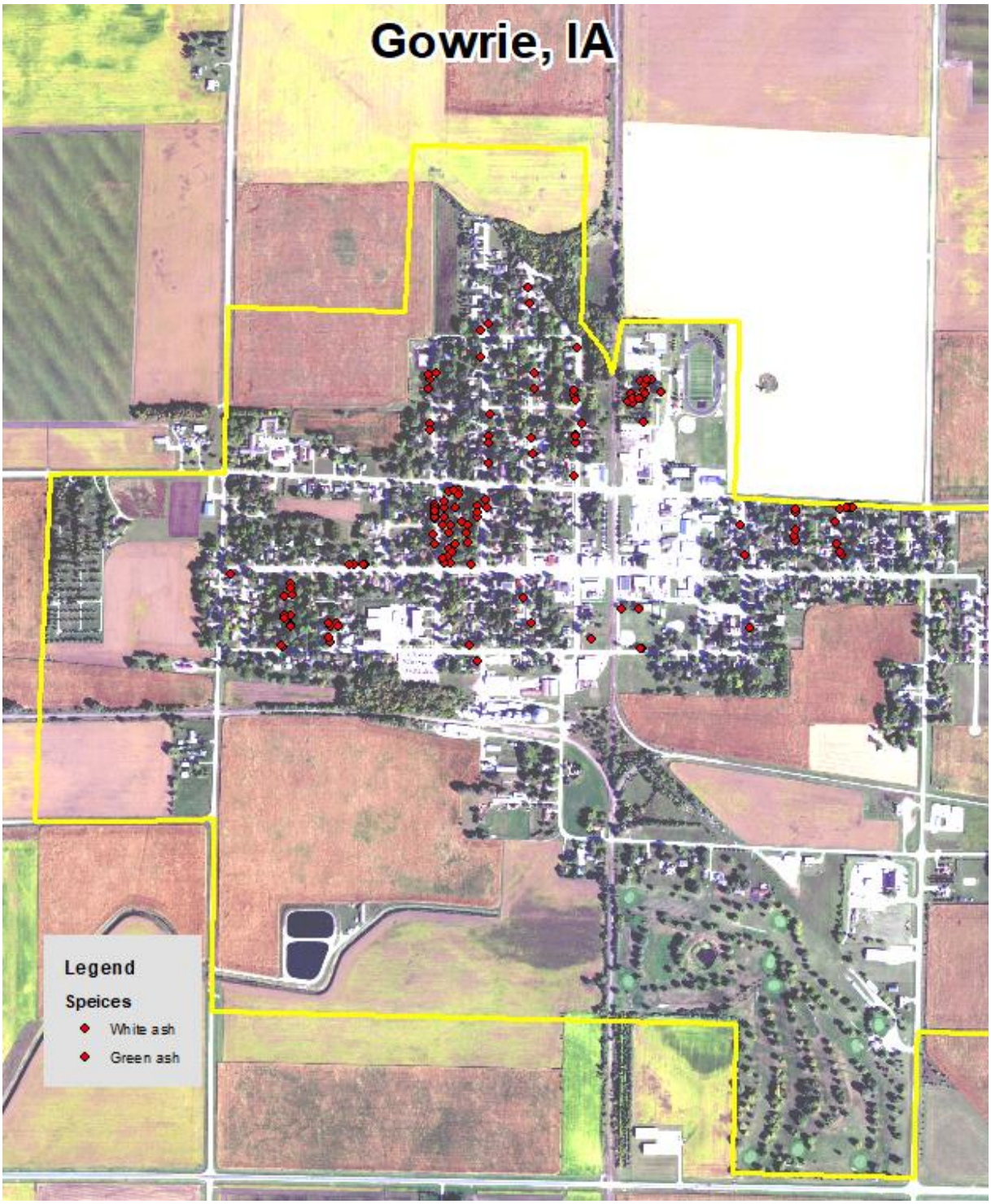


Figure 1: Location of Ash Trees

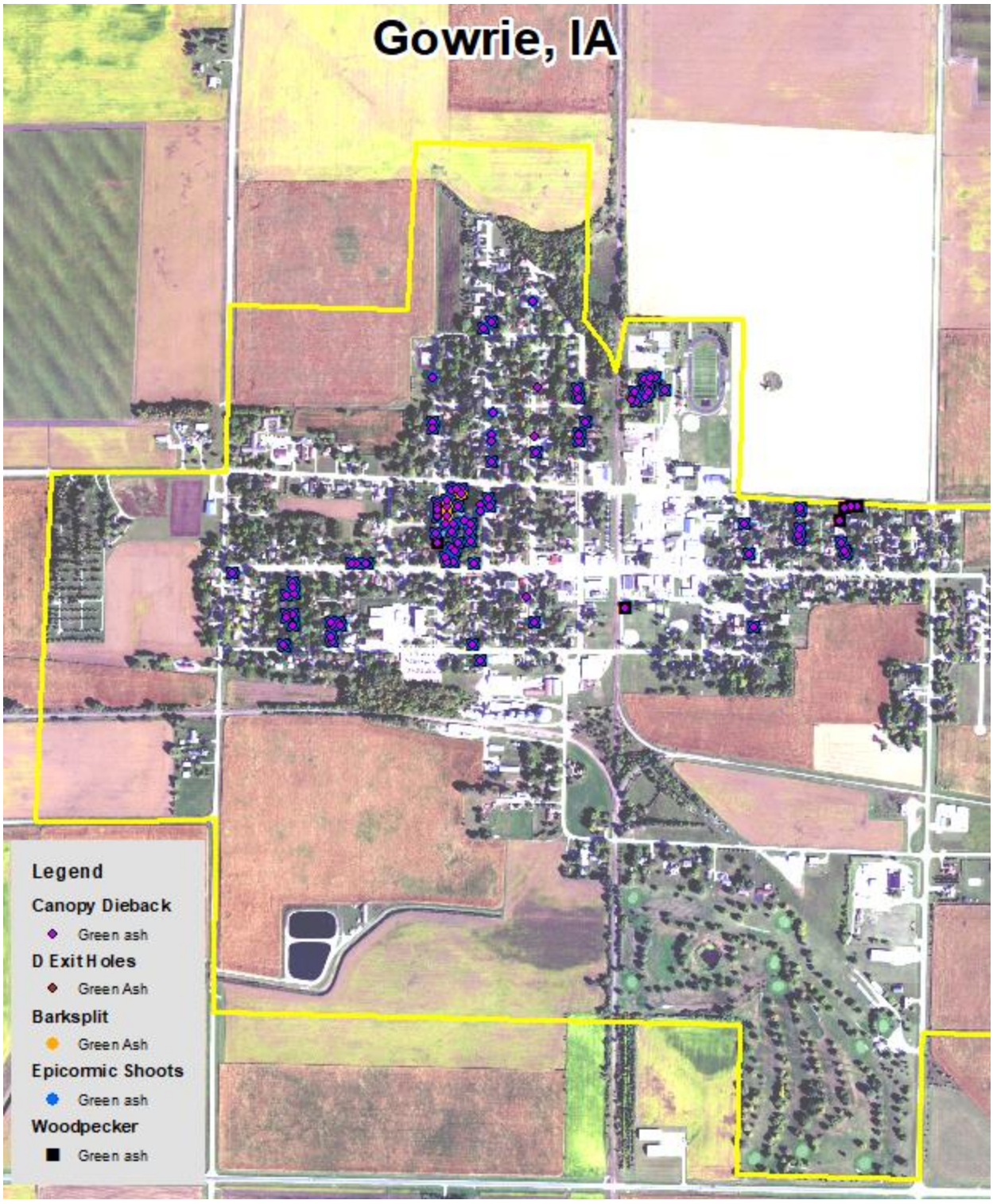


Figure 2: Location of EAB symptoms

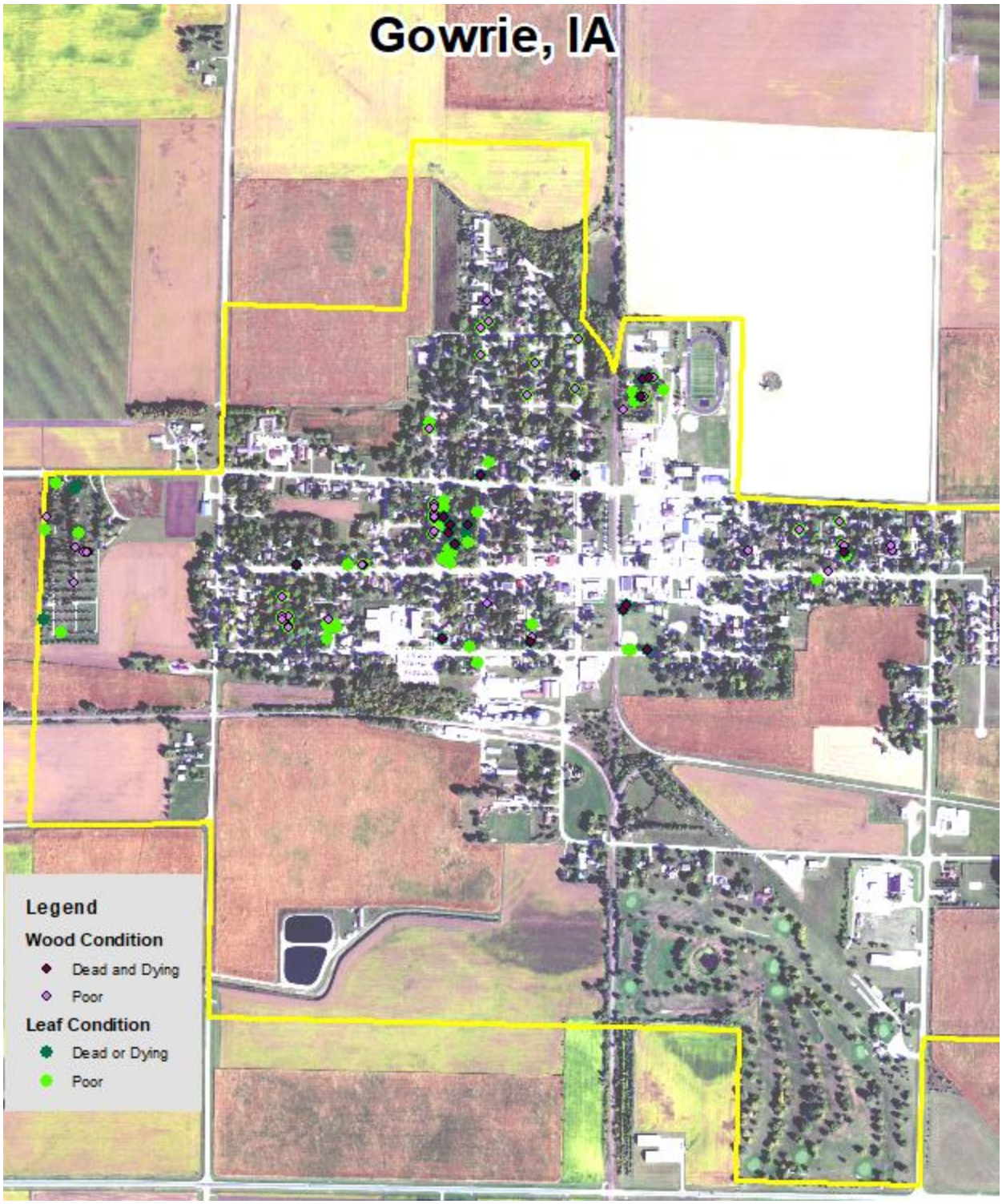


Figure 3: Location of Poor Condition Trees

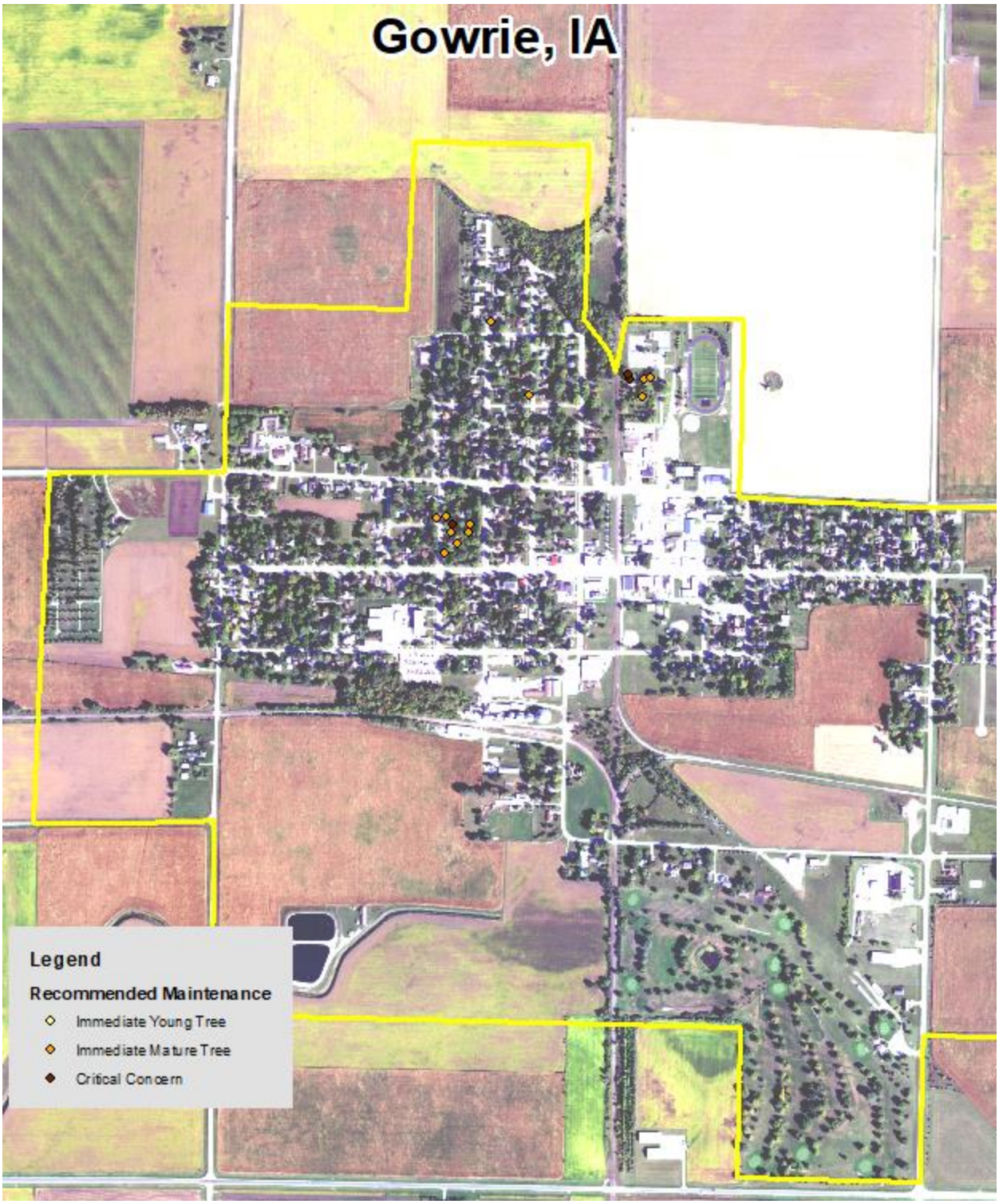


Figure 4: Location of Trees with Recommended Maintenance

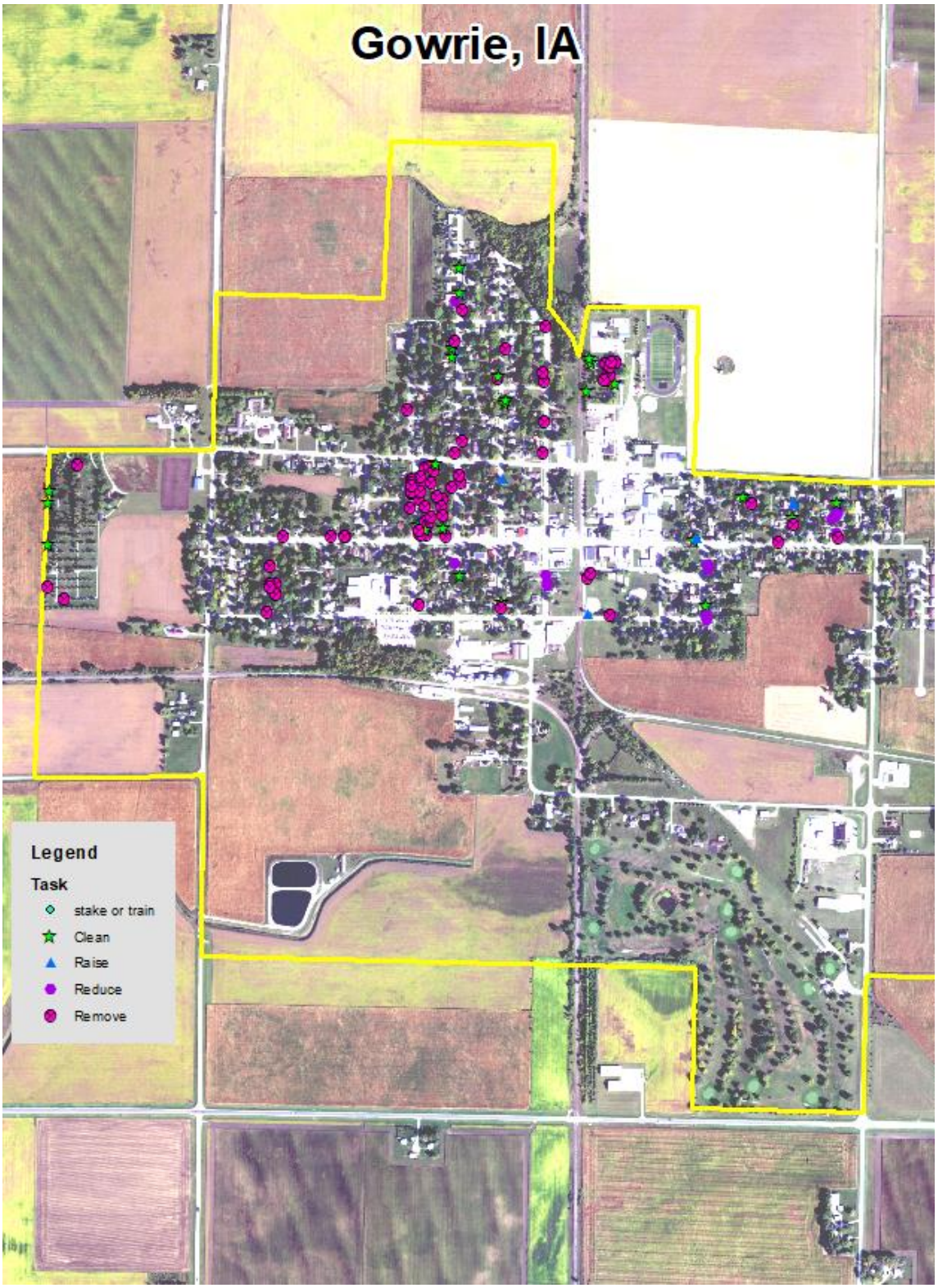


Figure 5: Maintenance Tasks

Appendix C: Gowrie Tree Ordinances

TREES

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 on a line 10 feet from the property line.

2. Spacing. Trees shall not be planted on any parking that is less than nine feet in width, or contains less than 81 square feet of exposed soil surface per tree. Trees shall not be planted closer than 20 feet from street intersections (property lines extended) and 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 DUTY TO TRIM TREES. The owner or agent of the abutting property shall keep the trees on, or overhanging the street, trimmed so that all branches will be at least 15 feet above the surface of the street and eight feet above the sidewalks. If the abutting property owner fails to trim the trees, the City may serve notice on the abutting property owner requiring that such action be taken within five days. If such action is not taken within that time, the City may perform the required action and assess the costs against the abutting property for collection in the same manner as a property tax.

(Code of Iowa, Sec. 364.12[2c, d & e])

151.04 TRIMMING TREES TO BE SUPERVISED. Except as allowed in Section 151.03, it is unlawful for any person to trim or cut any tree in a street or public place unless the work is done under the supervision of the City.

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

151.06 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 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 14 days of said notification. If such owner, occupant, or person in charge of said property fails to comply within 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])

The State of Iowa is an Equal Opportunity Employer and provider of ADA services.

Federal law prohibits employment discrimination on the basis of race, color, age, religion, national origin, sex or disability. State law prohibits employment discrimination on the basis of race, color, creed, age, sex, sexual orientation, gender identity, national origin, religion, pregnancy, or disability. State law also prohibits public accommodation (such as access to services or physical facilities) discrimination on the basis of race, color, creed, religion, sex, sexual orientation, gender identity, religion, national origin, or disability. If you believe you have been discriminated against in any program, activity or facility as described above, or if you desire further information, please contact the Iowa Civil Rights Commission, 1-800-457-4416, or write to the Iowa Department of Natural Resources, Wallace State Office Bldg., 502 E 9th St, Des Moines IA 50319.

If you need accommodations because of disability to access the services of this Agency, please contact the Director at 515-725-8200.