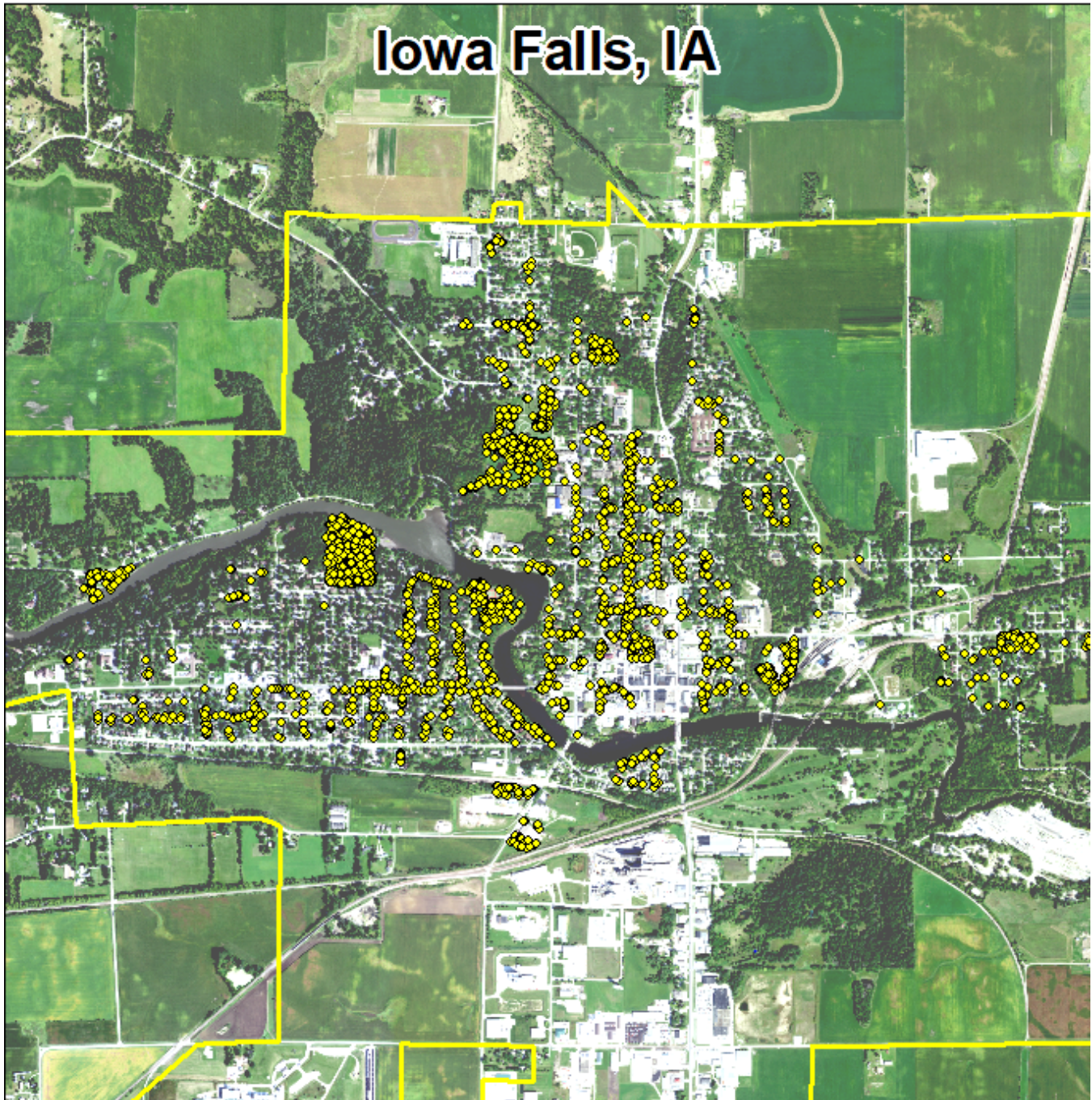# Iowa Falls, IA

2019 Urban Forest Management Plan
Prepared by Emma Hanigan
Iowa Department of Natural Resources

Table of Contents

Executive Summary

Overview

This plan was developed to assist the City of Iowa Falls 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 11% of Iowa Falls' 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 2018, 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 2313 trees inventoried.

- Iowa Falls' trees provide $381,143 of benefits annually, an average of $165 a tree
- There are over 32 species of trees
- The top three genera are: Maple 32%, Ash 11%, and Oak 10%
- 36% of trees are in need of some type of management
- 108 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 108 trees needing removal 12 are critical concerns*City ownership of the trees recommended for removal should be verified prior to any removal*
- 22 of the 254 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 Are included in the recommended planting lists in 151.03
- Check ash trees with a visual survey yearly
- With the current budget it could take 24 years to remove ash – Suggestion: request a budget increase to $10,000 annually and apply for grants to plant replacement trees

Introduction

This plan was developed to assist Iowa Falls 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 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 or treatment and replacement planting. With proper planning and management of the current canopy in Iowa Falls, these costs can be extended over years and public safety issues from dead and dying ash trees mitigated.

Trees are an important component of Iowa Falls'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 Iowa Falls 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 Iowa Falls's urban forestry goals.

Inventory

In 2018, 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 2313 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. Iowa Falls's trees reduce energy related costs by approximately $103,518 annually (Appendix A, Table 1). These savings are both in Electricity (492.3 MWh) and in Natural Gas (67,501.7Therms).

Annual Stormwater Benefits

Iowa Falls's trees intercept about 5,571,668 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $150,992 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 Iowa Falls, it is estimated that trees remove 5,832.4 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 $15,953 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Iowa Falls, trees sequester about 985,226 lbs of carbon a year with an associated value of $7,389 (Appendix A, Table 5). In addition, the trees store 18,024,053 lbs of carbon, with a yearly benefit of $135,180 (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. Iowa Falls receives $97,790 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, Iowa Falls's trees provide $381,143 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 2,313 trees in Iowa Falls provide approximately $165 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Iowa Falls has over 32 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genera is as follows:

Maple	736	32%

Ash	254	11%
Oak	229	10%
Spruce	160	7%
Pine	157	7%
Apple (crab)	146	6%
White Cedar	109	5%
Linden	104	4%
Hackberry	80	3%
Hickory	53	2%
Walnut	46	2%
Other	34	1%
Honeylocust	30	1%
Cedar	23	1%
Pear	22	1%
Plum/Cherry	21	1%
Lilac	21	1%
Birch	15	1%
Elm	15	1%
Mulberry	8	<1%
Catalpa	7	<1%
Redbud	7	<1%
Poplar/Cottonwood	6	<1%
Dogwood	5	<1%
Sycamore	5	<1%
Black Locust	5	<1%
Ginkgo	3	<1%
Tuliptree	3	<1%
Willow	3	<1%
Buckeye	2	<1%
Magnoli	2	<1%
Mountain Ash	2	<1%

Age Class

Most of Iowa Falls's trees (44%) are between 12 and 24 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. Iowa Falls'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 Iowa Falls indicate that 78% of the trees are in good health, with only 4% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 58% of Iowa Falls'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 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).

Crown Cleaning	518	22%
Crown Raising	65	3%
Tree Staking	28	1%
Tree Removal	108	5%
Crown Reduction	111	5%

Canopy Cover

The total canopy with both private and public trees is 26%, 887 acres. The canopy cover included in the Iowa Falls inventory includes approximately 53 acres (Appendix A, Figure 4). The City's Canopy goal is to increase canopy by 3%, in 30 years. To achieve this goal it is estimated that 253 trees need to be planted annually on public and private lands.

Land Use and Location

The majority of Iowa Falls' 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	
Single family residential	46%
Park/vacant/other	51%
Industrial/Large commercial	2%
Small commercial	1%
Multifamily residential	<1%

Location	
Planting strip	44%
Other maintained locations	0%
Cutout (surrounded by pavement)	<1%
Front yard/park	54%
Median	1%

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

Iowa Falls has 7 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 22 trees marked for removal that should be addressed immediately (1 to 3 years). 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 108 trees marked for removal.

<u>Poor tree species</u>
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 7 critical removals none are ash trees. There are a total of 254 ash trees, and 81 of those have signs and symptoms that have been associated with EAB. In addition, there are 22 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 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 Iowa Falls.

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 (32%) (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. All trees planted must meet the restrictions in city ordinance 151.03 (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.

Six Year Maintenance Plan with <u>No Additional Funding</u>

Year 1
    Removal: 8 largest critical concern trees
    Planting and Replacement: 9 trees to be planted in open locations
    Young Tree Pruning & Maintenance:
    Visual Survey for signs and symptoms of EAB

Year 2
    Removal: 2 critical concern trees and 4 additional ash trees with poor health
    *Or saving for ash tree treatment and/or future ash removal
    Planting and Replacement: 6 trees in open locations from year one removals
    Young Tree Pruning & Maintenance:
    Routine trimming: Contract to trim 1/3 of the city trees
    Visual Survey for signs and symptoms of EAB

Year 3
    Removal: 8 trees - removal of any new critical concern trees and ash in poor health
    *Or saving for ash tree treatment and/or future ash removal
    Planting and Replacement: 9 trees to be planted in open locations and locations from previous removals
    Young Tree Pruning & Maintenance:
    Visual Survey for signs and symptoms of EAB

Year 4
    Removal: 6 trees - removal of any new critical concern trees and ash in poor health
    *Or saving for ash tree treatment and/or future ash removal
    Planting and Replacement: 7 trees in open locations from previous removals
    Routine trimming: Contract to trim 1/3 of the city trees
    Young Tree Pruning & Maintenance:
    Visual Survey for signs and symptoms of EAB

Year 5
    Removal: 8 trees - removal of any new critical concern trees and ash in poor health
    *Or saving for ash tree treatment and/or future ash removal
    Planting and Replacement: 9 trees to be planted in open locations and locations from previous removals
    Young Tree Pruning & Maintenance:
    Visual Survey for signs and symptoms of EAB

Year 6
    Removal: 6 trees - removal of any new critical concern trees and ash in poor health
    *Or saving for ash tree treatment and/or future ash removal
    Planting and Replacement: 7 trees in open locations from previous removals
    Routine trimming: Contract to trim 1/3 of the city trees
    Young Tree Pruning & Maintenance:
    Visual Survey for signs and symptoms of EAB

*Reduction of ash over 6 years: Approximately 30 to 38 ash trees removed (approximately 25% of ash). It will take approximately 24 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 $19,500 a year. If the budget were increased to $10,000 a year all ash could be removed in 13 years.

Emerald Ash Borer Plan

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). *City ownership of the tree recommended for removal should be verified prior to any removal*

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 151.03 (Appendix C).

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 151.15 states "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 City 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 City may cause the condition to be corrected and the cost assessed against the property."

Budget

Current Budget
Total $42,000 over 6 years ($7,000/year)

FY 2019 Budget
> Removal: $5,600
> *Or saving for ash tree treatment and/or future ash removal
> Planting: $900
> Watering & Maintenance: $500

FY 2020 Budget
> Removal: $4,200
> *Or saving for ash tree treatment and/or future ash removal
> Planting: $600
> Routine trimming: $1,700
> Watering & Maintenance: $500

FY 2021 Budget
    Removal: $5,600
    *Or saving for ash tree treatment and/or future ash removal
    Planting: $900
    Watering & Maintenance: $500

FY 2022 Budget
    Removal: $4,200
    *Or saving for ash tree treatment and/or future ash removal
    Planting: $600
    Routine trimming: $1,700
    Watering & Maintenance: $500

FY 2023 Budget
    Removal: $5,600
    *Or saving for ash tree treatment and/or future ash removal
    Planting: $900
    Watering & Maintenance: $500

FY 2024 Budget
    Removal: $4,200
    *Or saving for ash tree treatment and/or future ash removal
    Planting: $600
    Routine trimming: $1,700
    Watering & Maintenance: $500

*Reduction of ash over 6 years: approximately 30 to 38 ash trees removed (approximately 25% of ash). **It will take approximately 24 years to remove all ash with the current budget.**

Purposed Budget Increase
EAB could potentially kill all ash trees in Iowa Falls within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to $19,500 a year. If the budget were increased to $10,000 a year all ash could be removed within 13 years. Additionally, it is recommended that Iowa Falls 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). This would be 8 trees selected for treatment, and Iowa Falls would still need to find $8,000 for removal. Alternatively, if there are 15 treatable trees, it would cost approximately $2,250 a year for treatment and leave $1,800 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 Iowa Falls. 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

Iowa Falls

Annual Energy Benefits of Public Trees

2/17/2019

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	72.3	5,489	9,872.7	9,675	15,164	(N/A)	10.4	14.6	62.92
Sugar maple	57.3	4,353	7,627.4	7,475	11,827	(N/A)	10.2	11.4	49.91
Norway maple	50.8	3,853	7,188.5	7,045	10,897	(N/A)	9.6	10.5	49.31
Bur oak	50.4	3,829	6,972.1	6,833	10,662	(N/A)	7.0	10.3	65.81
Apple	11.7	890	1,933.2	1,895	2,784	(N/A)	6.3	2.7	19.07
Silver maple	43.4	3,294	5,717.6	5,603	8,897	(N/A)	6.3	8.6	61.36
Eastern white pine	15.1	1,148	1,988.2	1,948	3,096	(N/A)	5.2	3.0	25.80
Northern white cedar	13.2	1,004	1,750.1	1,715	2,719	(N/A)	4.7	2.6	24.94
Norway spruce	16.7	1,269	2,188.5	2,145	3,413	(N/A)	4.6	3.3	31.90
Northern hackberry	25.7	1,949	3,647.1	3,574	5,524	(N/A)	3.5	5.3	69.04
American basswood	17.7	1,341	2,512.0	2,462	3,803	(N/A)	3.1	3.7	53.56
Hickory	11.7	891	1,476.4	1,447	2,338	(N/A)	2.3	2.3	44.11
Black maple	11.8	894	1,596.4	1,564	2,459	(N/A)	2.1	2.4	51.22
Northern red oak	9.9	755	1,368.2	1,341	2,096	(N/A)	2.0	2.0	44.59
Black walnut	12.0	913	1,620.6	1,588	2,501	(N/A)	2.0	2.4	54.36
Red maple	6.1	464	829.1	812	1,276	(N/A)	1.8	1.2	30.39
Littleleaf linden	5.7	435	786.3	771	1,206	(N/A)	1.4	1.2	36.53
Blue spruce	2.8	215	397.3	389	605	(N/A)	1.4	0.6	18.90
Honeylocust	9.8	746	1,284.1	1,258	2,004	(N/A)	1.3	1.9	66.81
Maple	3.8	288	542.2	531	820	(N/A)	1.3	0.8	28.26
Red pine	3.7	278	476.6	467	745	(N/A)	1.1	0.7	29.82
Eastern red cedar	2.4	180	352.6	346	526	(N/A)	1.0	0.5	22.86
Japanese tree lilac	1.1	80	182.6	179	259	(N/A)	0.8	0.3	14.39
Conifer Evergreen Large	2.5	192	328.6	322	514	(N/A)	0.8	0.5	28.55
Spruce	1.9	144	256.4	251	395	(N/A)	0.8	0.4	21.95
Black cherry	2.3	171	346.6	340	511	(N/A)	0.7	0.5	31.91
Pear	1.0	80	174.7	171	251	(N/A)	0.7	0.2	15.67
Swamp white oak	3.1	235	433.2	425	660	(N/A)	0.6	0.6	47.12
American elm	3.7	279	483.9	474	754	(N/A)	0.5	0.7	62.80
Boxelder	1.9	148	258.6	253	401	(N/A)	0.5	0.4	36.49
White ash	0.8	63	120.0	118	181	(N/A)	0.4	0.2	20.10
Mulberry	0.8	62	117.6	115	178	(N/A)	0.3	0.2	22.20
River birch	1.1	87	168.7	165	252	(N/A)	0.3	0.2	31.53
Paper birch	1.0	74	133.7	131	205	(N/A)	0.3	0.2	29.25
Scotch pine	0.9	70	117.4	115	185	(N/A)	0.3	0.2	26.44
Eastern redbud	0.4	30	68.6	67	97	(N/A)	0.3	0.1	13.89
Callery pear	0.7	52	94.4	93	145	(N/A)	0.3	0.1	24.16
Conifer Evergreen Medium	0.3	22	41.6	41	63	(N/A)	0.2	0.1	12.54
Broadleaf Deciduous Small	0.7	50	97.6	96	146	(N/A)	0.2	0.1	29.20
Black locust	0.8	61	116.8	114	176	(N/A)	0.2	0.2	35.11
American sycamore	1.0	77	134.9	132	209	(N/A)	0.2	0.2	41.76
Austrian pine	0.8	61	112.6	110	172	(N/A)	0.2	0.2	34.30
Northern catalpa	1.1	84	148.1	145	229	(N/A)	0.2	0.2	57.23
Dogwood	0.3	22	51.3	50	73	(N/A)	0.2	0.1	18.19
Ash	1.0	75	141.2	138	213	(N/A)	0.2	0.2	53.23
Catalpa	0.6	45	78.8	77	122	(N/A)	0.1	0.1	40.73
Amur maple	0.2	17	38.5	38	55	(N/A)	0.1	0.1	18.19
Broadleaf Deciduous Medium	0.6	44	75.8	74	118	(N/A)	0.1	0.1	39.34
Pin oak	0.9	66	118.0	116	182	(N/A)	0.1	0.2	60.71
Ginkgo	0.4	34	61.5	60	94	(N/A)	0.1	0.1	31.39
Lilac	0.3	26	57.3	56	83	(N/A)	0.1	0.1	27.51
Tulip tree	0.5	34	65.6	64	99	(N/A)	0.1	0.1	32.86
Plum	0.2	13	29.5	29	42	(N/A)	0.1	0.0	13.93
Willow	1.0	73	142.2	139	213	(N/A)	0.1	0.2	70.84
Black spruce	0.2	14	24.9	24	38	(N/A)	0.1	0.0	12.80
Quaking aspen	0.7	53	81.0	79	133	(N/A)	0.1	0.1	44.23

Common chokecherry	0.1	11	25.7	25	36 (N/A)	0.1	0.0	18.19
Southern magnolia	0.2	13	25.4	25	38 (N/A)	0.1	0.0	18.82
Mountain ash	0.1	11	25.7	25	36 (N/A)	0.1	0.0	18.19
Ohio buckeye	0.2	16	33.7	33	49 (N/A)	0.1	0.0	24.47
Eastern cottonwood	0.7	49	91.8	90	139 (N/A)	0.1	0.1	69.67
Broadleaf Evergreen Medium	0.1	9	18.3	18	27 (N/A)	0.1	0.0	13.46
Chinese elm	0.7	49	91.8	90	139 (N/A)	0.1	0.1	69.67
Elm	0.2	18	27.0	26	44 (N/A)	0.0	0.0	44.23
Oak	0.1	7	13.7	13	21 (N/A)	0.0	0.0	20.64
White oak	0.1	7	13.7	13	21 (N/A)	0.0	0.0	20.64
Northern pin oak	0.3	20	39.6	39	59 (N/A)	0.0	0.1	58.69
Flowering dogwood	0.0	0	0.6	1	1 (N/A)	0.0	0.0	0.87
Conifer Evergreen Small	0.0	1	2.5	2	4 (N/A)	0.0	0.0	3.62
Black poplar	0.5	37	63.1	62	99 (N/A)	0.0	0.1	98.63
Total	492.3	37,366	67,501.7	66,152	103,518 (N/A)	100.0	100.0	44.75

Table 2: Annual Stormwater Benefits

Iowa Falls

Annual Stormwater Benefits of Public Trees

2/17/2019

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	850,020	23,036	(N/A)	10.4	15.3	95.58
Sugar maple	540,367	14,644	(N/A)	10.2	9.7	61.79
Norway maple	426,368	11,555	(N/A)	9.6	7.7	52.28
Bur oak	619,280	16,782	(N/A)	7.0	11.1	103.60
Apple	46,768	1,267	(N/A)	6.3	0.8	8.68
Silver maple	601,188	16,292	(N/A)	6.3	10.8	112.36
Eastern white pine	316,699	8,583	(N/A)	5.2	5.7	71.52
Northern white cedar	250,396	6,786	(N/A)	4.7	4.5	62.25
Norway spruce	372,685	10,100	(N/A)	4.6	6.7	94.39
Northern hackberry	233,907	6,339	(N/A)	3.5	4.2	79.24
American basswood	172,287	4,669	(N/A)	3.1	3.1	65.76
Hickory	87,708	2,377	(N/A)	2.3	1.6	44.85
Black maple	103,546	2,806	(N/A)	2.1	1.9	58.46
Northern red oak	96,786	2,623	(N/A)	2.0	1.7	55.81
Black walnut	119,615	3,242	(N/A)	2.0	2.1	70.47
Red maple	39,354	1,067	(N/A)	1.8	0.7	25.39
Littleleaf linden	48,989	1,328	(N/A)	1.4	0.9	40.23
Blue spruce	38,400	1,041	(N/A)	1.4	0.7	32.52
Honeylocust	114,602	3,106	(N/A)	1.3	2.1	103.52
Maple	25,352	687	(N/A)	1.3	0.5	23.69
Red pine	71,450	1,936	(N/A)	1.1	1.3	77.45
Eastern red cedar	34,668	940	(N/A)	1.0	0.6	40.85
Japanese tree lilac	3,720	101	(N/A)	0.8	0.1	5.60
Conifer Evergreen Large	48,087	1,303	(N/A)	0.8	0.9	72.40
Spruce	32,875	891	(N/A)	0.8	0.6	49.49
Black cherry	10,388	282	(N/A)	0.7	0.2	17.59
Pear	3,728	101	(N/A)	0.7	0.1	6.31
Swamp white oak	23,894	648	(N/A)	0.6	0.4	46.25
American elm	33,830	917	(N/A)	0.5	0.6	76.40
Boxelder	17,116	464	(N/A)	0.5	0.3	42.17
White ash	5,523	150	(N/A)	0.4	0.1	16.63
Mulberry	3,387	92	(N/A)	0.3	0.1	11.47
River birch	9,313	252	(N/A)	0.3	0.2	31.55
Paper birch	7,096	192	(N/A)	0.3	0.1	27.47
Scotch pine	15,754	427	(N/A)	0.3	0.3	60.99
Eastern redbud	1,399	38	(N/A)	0.3	0.0	5.41
Callery pear	3,892	105	(N/A)	0.3	0.1	17.58
Conifer Evergreen Medium	3,350	91	(N/A)	0.2	0.1	18.16
Broadleaf Deciduous Small	2,840	77	(N/A)	0.2	0.1	15.39
Black locust	6,508	176	(N/A)	0.2	0.1	35.27
American sycamore	11,242	305	(N/A)	0.2	0.2	60.93
Austrian pine	14,011	380	(N/A)	0.2	0.3	75.94
Northern catalpa	13,054	354	(N/A)	0.2	0.2	88.44
Dogwood	1,058	29	(N/A)	0.2	0.0	7.17
Ash	9,524	258	(N/A)	0.2	0.2	64.52
Catalpa	4,664	126	(N/A)	0.1	0.1	42.13
Amur maple	793	22	(N/A)	0.1	0.0	7.17
Broadleaf Deciduous Medium	3,404	92	(N/A)	0.1	0.1	30.75
Pin oak	10,581	287	(N/A)	0.1	0.2	95.58

Species					
Ginkgo	3,179	86 (N/A)	0.1	0.1	28.72
Lilac	1,703	46 (N/A)	0.1	0.0	15.38
Tulip tree	3,806	103 (N/A)	0.1	0.1	34.38
Plum	598	16 (N/A)	0.1	0.0	5.40
Willow	11,293	306 (N/A)	0.1	0.2	102.01
Black spruce	2,057	56 (N/A)	0.1	0.0	18.58
Quaking aspen	4,397	119 (N/A)	0.1	0.1	39.72
Common chokecherry	529	14 (N/A)	0.1	0.0	7.17
Southern magnolia	1,354	37 (N/A)	0.1	0.0	18.34
Mountain ash	529	14 (N/A)	0.1	0.0	7.17
Ohio buckeye	1,172	32 (N/A)	0.1	0.0	15.88
Eastern cottonwood	8,081	219 (N/A)	0.1	0.1	109.50
Broadleaf Evergreen Medium	832	23 (N/A)	0.1	0.0	11.28
Chinese elm	8,081	219 (N/A)	0.1	0.1	109.50
Elm	1,466	40 (N/A)	0.0	0.0	39.72
Oak	608	16 (N/A)	0.0	0.0	16.47
White oak	608	16 (N/A)	0.0	0.0	16.47
Northern pin oak	2,479	67 (N/A)	0.0	0.0	67.19
Flowering dogwood	7	0 (N/A)	0.0	0.0	0.20
Conifer Evergreen Small	183	5 (N/A)	0.0	0.0	4.97
Black poplar	7,239	196 (N/A)	0.0	0.1	196.17
Citywide total	5,571,668	150,992 (N/A)	100.0	100.0	65.28

Table 3: Annual Air Quality Benefits

Iowa Falls

Annual Air Quality Benefits of Public Trees

2/17/2019

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								
Green ash	111.8	17.9	52.5	5.0	593	345.1	50.3	47.9	327.8	2,150	0.0	0	958.2	2,743	(N/A)	10.4	11.38
Sugar maple	65.5	11.2	34.2	2.9	359	271.5	39.7	37.9	259.8	1,697	-52.7	-198	670.0	1,858	(N/A)	10.2	7.84
Norway maple	81.7	14.1	40.8	3.6	443	245.0	35.5	33.8	230.3	1,520	-19.6	-74	665.2	1,890	(N/A)	9.6	8.55
Bur oak	83.2	13.3	38.7	3.7	440	241.5	35.1	33.5	228.6	1,503	0.0	0	677.7	1,943	(N/A)	7.0	11.99
Apple	11.2	1.9	5.7	0.5	61	58.8	8.4	7.9	53.1	359	-0.1	0	147.5	420	(N/A)	6.3	2.88
Silver maple	100.9	17.1	50.0	4.5	545	204.7	30.0	28.6	196.4	1,281	-54.3	-204	577.7	1,622	(N/A)	6.3	11.19
Eastern white pine	37.7	7.5	30.4	4.6	247	71.3	10.4	10.0	68.5	446	-173.9	-652	66.5	41	(N/A)	5.2	0.34
Northern white cedar	29.1	5.8	23.8	3.6	191	62.4	9.1	8.7	59.9	391	-123.8	-464	78.6	118	(N/A)	4.7	1.08
Norway spruce	45.2	9.0	36.0	5.6	295	78.7	11.5	11.0	75.7	493	-218.0	-817	54.8	-30	(N/A)	4.6	-0.28
Northern hackberry	35.8	6.2	18.5	1.6	196	124.0	18.0	17.1	116.5	769	0.0	0	337.6	965	(N/A)	3.5	12.07
American basswood	21.7	3.7	11.0	1.0	118	85.4	12.4	11.8	80.2	530	-19.1	-72	208.0	576	(N/A)	3.1	8.11
Hickory	7.6	1.2	4.2	0.3	42	54.9	8.1	7.7	53.2	345	0.0	0	137.3	387	(N/A)	2.3	7.30
Black maple	25.2	4.3	11.7	1.1	134	56.0	8.2	7.8	53.4	350	-8.4	-32	159.3	452	(N/A)	2.1	9.42
Northern red oak	20.3	3.5	9.9	0.9	109	47.5	6.9	6.6	45.0	296	-28.8	-108	111.7	297	(N/A)	2.0	6.31
Black walnut	14.0	2.2	6.9	0.6	75	57.2	8.3	8.0	54.5	357	0.0	0	151.7	432	(N/A)	2.0	9.39
Red maple	7.1	1.2	3.6	0.3	39	29.1	4.2	4.0	27.7	181	-2.7	-10	74.6	210	(N/A)	1.8	5.00
Littleleaf linden	7.5	1.3	3.8	0.3	41	27.4	4.0	3.8	26.0	171	-3.8	-14	70.4	198	(N/A)	1.4	5.99
Blue spruce	5.0	1.0	4.3	0.6	33	13.6	2.0	1.9	12.8	84	-13.7	-51	27.5	67	(N/A)	1.4	2.08
Honeylocust	22.6	3.7	10.2	1.0	119	46.3	6.8	6.5	44.5	290	-17.8	-67	123.8	342	(N/A)	1.3	11.40
Maple	4.6	0.8	2.3	0.2	25	18.3	2.7	2.5	17.2	114	-1.7	-6	46.8	132	(N/A)	1.3	4.55
Red pine	8.4	1.7	6.8	1.0	55	17.2	2.5	2.4	16.6	108	-35.7	-134	21.0	29	(N/A)	1.1	1.17
Eastern red cedar	7.1	1.4	5.6	0.9	46	11.5	1.7	1.6	10.7	71	-19.1	-72	21.3	46	(N/A)	1.0	1.98
Japanese tree lilac	0.6	0.1	0.4	0.0	3	5.4	0.8	0.7	5.4	33	0.0	0	12.7	36	(N/A)	0.8	2.00
Conifer Evergreen Large	5.6	1.1	4.6	0.7	37	11.9	1.7	1.7	11.4	74	-24.2	-91	14.6	21	(N/A)	0.8	1.16
Spruce	3.7	0.7	3.1	0.5	25	9.0	1.3	1.3	8.6	56	-16.0	-60	12.2	21	(N/A)	0.8	1.16
Black cherry	3.3	0.5	1.6	0.2	18	11.1	1.6	1.5	10.2	68	0.0	0	29.9	86	(N/A)	0.7	5.36
Pear	0.7	0.1	0.4	0.0	4	5.3	0.7	0.7	4.8	32	0.0	0	12.8	36	(N/A)	0.7	2.26
Swamp white oak	4.3	0.7	2.2	0.2	23	14.9	2.2	2.1	14.1	93	-1.1	-4	39.6	112	(N/A)	0.6	8.01
American elm	6.3	1.1	3.1	0.3	34	17.4	2.5	2.4	16.7	109	0.0	0	49.9	143	(N/A)	0.5	11.93
Boxelder	1.9	0.3	1.0	0.1	10	9.2	1.3	1.3	8.8	58	-0.9	-3	23.1	65	(N/A)	0.5	5.88
White ash	0.2	0.0	0.2	0.0	1	4.0	0.6	0.6	3.8	25	0.0	0	9.3	26	(N/A)	0.4	2.91
Mulberry	1.1	0.2	0.5	0.0	6	4.0	0.6	0.5	3.7	25	0.0	0	10.6	30	(N/A)	0.3	3.78
River birch	1.7	0.3	0.9	0.1	9	5.6	0.8	0.8	5.2	34	-0.4	-2	14.9	42	(N/A)	0.3	5.28
Paper birch	0.5	0.1	0.3	0.0	3	4.6	0.7	0.6	4.4	29	0.0	0	11.3	32	(N/A)	0.3	4.53
Scotch pine	1.8	0.4	1.5	0.2	12	4.3	0.6	0.6	4.2	27	-7.4	-28	6.2	11	(N/A)	0.3	1.61

Species																
Eastern redbud	0.2	0.0	0.1	0.0	1	2.0	0.3	0.3	1.8	12	0.0	0	4.8	14 (N/A)	0.3	1.94
Callery pear	0.5	0.1	0.3	0.0	3	3.3	0.5	0.5	3.1	21	-0.1	-1	8.2	23 (N/A)	0.3	3.82
Conifer Evergreen Medium	0.3	0.1	0.3	0.0	2	1.4	0.2	0.2	1.3	9	-1.1	-4	2.8	7 (N/A)	0.2	1.38
Broadleaf Deciduous Small	0.9	0.1	0.4	0.0	5	3.2	0.5	0.4	3.0	20	0.0	0	8.6	25 (N/A)	0.2	4.94
Black locust	1.2	0.2	0.6	0.1	7	3.9	0.6	0.5	3.7	24	-0.3	-1	10.4	30 (N/A)	0.2	5.93
American sycamore	1.4	0.2	0.7	0.1	7	4.8	0.7	0.7	4.6	30	0.0	0	13.1	37 (N/A)	0.2	7.47
Austrian pine	2.5	0.5	2.0	0.3	16	3.9	0.6	0.5	3.6	24	-5.4	-20	8.4	20 (N/A)	0.2	3.95
Northern catalpa	1.7	0.3	0.8	0.1	9	5.2	0.8	0.7	5.0	33	0.0	0	14.6	42 (N/A)	0.2	10.46
Dogwood	0.2	0.0	0.1	0.0	1	1.5	0.2	0.2	1.3	9	0.0	0	3.6	10 (N/A)	0.2	2.55
Ash	2.0	0.3	1.0	0.1	11	4.8	0.7	0.7	4.5	29	-0.5	-2	13.5	39 (N/A)	0.2	9.64
Catalpa	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)	0.1	6.58
Amur maple	0.1	0.0	0.1	0.0	1	1.1	0.2	0.2	1.0	7	0.0	0	2.7	8 (N/A)	0.1	2.55
Broadleaf Deciduous Medium	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)	0.1	6.43
Pin oak	2.0	0.3	1.0	0.1	11	4.2	0.6	0.6	4.0	26	-3.6	-14	9.1	23 (N/A)	0.1	7.69
Ginkgo	0.8	0.1	0.4	0.0	5	2.1	0.3	0.3	2.0	13	-0.3	-1	5.9	17 (N/A)	0.1	5.62
Lilac	0.5	0.1	0.2	0.0	3	1.7	0.2	0.2	1.6	11	0.0	0	4.7	13 (N/A)	0.1	4.48
Tulip tree	0.3	0.1	0.2	0.0	2	2.2	0.3	0.3	2.1	14	0.0	0	5.4	15 (N/A)	0.1	5.11
Plum	0.1	0.0	0.1	0.0	1	0.9	0.1	0.1	0.8	5	0.0	0	2.0	6 (N/A)	0.1	1.93
Willow	2.6	0.4	1.2	0.1	14	4.7	0.7	0.6	4.4	29	-0.6	-2	14.2	41 (N/A)	0.1	13.58
Black spruce	0.2	0.0	0.2	0.0	2	0.9	0.1	0.1	0.8	5	-0.7	-3	1.8	4 (N/A)	0.1	1.47
Quaking aspen	0.3	0.1	0.2	0.0	2	3.2	0.5	0.5	3.2	20	0.0	0	7.9	22 (N/A)	0.1	7.42
Common chokecherry	0.1	0.0	0.1	0.0	1	0.8	0.1	0.1	0.7	5	0.0	0	1.8	5 (N/A)	0.1	2.55
Southern magnolia	0.0	0.0	0.1	0.0	0	0.8	0.1	0.1	0.8	5	-0.3	-1	1.6	4 (N/A)	0.1	2.10
Mountain ash	0.1	0.0	0.1	0.0	1	0.8	0.1	0.1	0.7	5	0.0	0	1.8	5 (N/A)	0.1	2.55
Ohio buckeye	0.1	0.0	0.1	0.0	1	1.0	0.1	0.1	1.0	6	0.0	0	2.5	7 (N/A)	0.1	3.47
Eastern cottonwood	1.1	0.2	0.5	0.0	6	3.1	0.5	0.4	2.9	19	0.0	0	8.7	25 (N/A)	0.1	12.53
Broadleaf Evergreen Medium	0.0	0.0	0.1	0.0	0	0.6	0.1	0.1	0.5	4	-0.2	-1	1.2	3 (N/A)	0.1	1.57
Chinese elm	1.1	0.2	0.5	0.0	6	3.1	0.5	0.4	2.9	19	0.0	0	8.7	25 (N/A)	0.1	12.53
Elm	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)	0.0	7.42
Oak	0.0	0.0	0.0	0.0	0	0.5	0.1	0.1	0.4	3	0.0	0	1.1	3 (N/A)	0.0	2.99
White oak	0.0	0.0	0.0	0.0	0	0.5	0.1	0.1	0.4	3	0.0	0	1.1	3 (N/A)	0.0	2.99
Northern pin oak	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)	0.0	10.16
Flowering dogwood	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)	0.0	0.11
Conifer Evergreen Small	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	0	-0.1	0	0.1	0 (N/A)	0.0	0.20
Black poplar	1.6	0.3	0.7	0.1	8	2.3	0.3	0.3	2.2	14	0.0	0	7.7	23 (N/A)	0.0	22.55
Citywide total	808.6	139.5	443.5	47.6	4,524	2,350.5	342.2	326.3	2,231.0	14,642	-856.7	-3,212	5,832.4	15,953 (N/A)	100.0	6.90

Table 4: Annual Carbon Stored

Iowa Falls

Stored CO2 Benefits of Public Trees

2/17/2019

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	3,679,857	27,599	(N/A)	10.4	20.4	114.52
Sugar maple	1,871,695	14,038	(N/A)	10.2	10.4	59.23
Norway maple	1,345,847	10,094	(N/A)	9.6	7.5	45.67
Bur oak	2,732,131	20,491	(N/A)	7.0	15.2	126.49
Apple	195,695	1,468	(N/A)	6.3	1.1	10.05
Silver maple	2,356,200	17,672	(N/A)	6.3	13.1	121.87
Eastern white pine	440,129	3,301	(N/A)	5.2	2.4	27.51
Northern white cedar	303,745	2,278	(N/A)	4.7	1.7	20.90
Norway spruce	561,237	4,209	(N/A)	4.6	3.1	39.34
Northern hackberry	533,436	4,001	(N/A)	3.5	3.0	50.01
American basswood	799,580	5,997	(N/A)	3.1	4.4	84.46
Hickory	249,506	1,871	(N/A)	2.3	1.4	35.31
Black maple	272,240	2,042	(N/A)	2.1	1.5	42.54
Northern red oak	429,416	3,221	(N/A)	2.0	2.4	68.52
Black walnut	459,608	3,447	(N/A)	2.0	2.5	74.94
Red maple	85,062	638	(N/A)	1.8	0.5	15.19
Littleleaf linden	163,837	1,229	(N/A)	1.4	0.9	37.24
Blue spruce	33,406	251	(N/A)	1.4	0.2	7.83
Honeylocust	291,783	2,188	(N/A)	1.3	1.6	72.95
Maple	54,854	411	(N/A)	1.3	0.3	14.19
Red pine	88,185	661	(N/A)	1.1	0.5	26.46
Eastern red cedar	22,873	172	(N/A)	1.0	0.1	7.46
Japanese tree lilac	12,528	94	(N/A)	0.8	0.1	5.22
Conifer Evergreen La	59,725	448	(N/A)	0.8	0.3	24.89
Spruce	38,797	291	(N/A)	0.8	0.2	16.17
Black cherry	52,218	392	(N/A)	0.7	0.3	24.48
Pear	13,407	101	(N/A)	0.7	0.1	6.28
Swamp white oak	71,108	533	(N/A)	0.6	0.4	38.09
American elm	137,463	1,031	(N/A)	0.5	0.8	85.91
Boxelder	55,405	416	(N/A)	0.5	0.3	37.78
White ash	9,311	70	(N/A)	0.4	0.1	7.76
Mulberry	16,401	123	(N/A)	0.3	0.1	15.38
River birch	28,706	215	(N/A)	0.3	0.2	26.91
Paper birch	17,302	130	(N/A)	0.3	0.1	18.54
Scotch pine	17,943	135	(N/A)	0.3	0.1	19.22
Eastern redbud	4,731	35	(N/A)	0.3	0.0	5.07
Callery pear	9,004	68	(N/A)	0.3	0.0	11.26
Conifer Evergreen Me	1,732	13	(N/A)	0.2	0.0	2.60
Broadleaf Deciduous	13,903	104	(N/A)	0.2	0.1	20.85
Black locust	20,324	152	(N/A)	0.2	0.1	30.49
American sycamore	45,759	343	(N/A)	0.2	0.3	68.64
Austrian pine	22,235	167	(N/A)	0.2	0.1	33.35
Northern catalpa	56,593	424	(N/A)	0.2	0.3	106.11
Dogwood	3,632	27	(N/A)	0.2	0.0	6.81
Ash	33,285	250	(N/A)	0.2	0.2	62.41
Catalpa	13,164	99	(N/A)	0.1	0.1	32.91
Amur maple	2,724	20	(N/A)	0.1	0.0	6.81
Broadleaf Deciduous	8,349	63	(N/A)	0.1	0.0	20.87
Pin oak	53,880	404	(N/A)	0.1	0.3	134.70
Ginkgo	12,081	91	(N/A)	0.1	0.1	30.20
Lilac	8,559	64	(N/A)	0.1	0.0	21.40
Tulip tree	10,527	79	(N/A)	0.1	0.1	26.32
Plum	1,994	15	(N/A)	0.1	0.0	4.98
Willow	42,840	321	(N/A)	0.1	0.2	107.10
Black spruce	1,204	9	(N/A)	0.1	0.0	3.01

Quaking aspen	11,016	83	(N/A)	0.1	0.1	27.54
Common chokecherry	1,816	14	(N/A)	0.1	0.0	6.81
Southern magnolia	968	7	(N/A)	0.1	0.0	3.63
Mountain ash	1,816	14	(N/A)	0.1	0.0	6.81
Ohio buckeye	2,201	17	(N/A)	0.1	0.0	8.26
Eastern cottonwood	34,401	258	(N/A)	0.1	0.2	129.00
Broadleaf Evergreen I	557	4	(N/A)	0.1	0.0	2.09
Chinese elm	34,401	258	(N/A)	0.1	0.2	129.00
Elm	3,672	28	(N/A)	0.0	0.0	27.54
Oak	1,035	8	(N/A)	0.0	0.0	7.76
White oak	1,035	8	(N/A)	0.0	0.0	7.76
Northern pin oak	7,945	60	(N/A)	0.0	0.0	59.59
Flowering dogwood	14	0	(N/A)	0.0	0.0	0.10
Conifer Evergreen Sn	43	0	(N/A)	0.0	0.0	0.32
Black poplar	55,982	420	(N/A)	0.0	0.3	419.86
Citywide total	18,024,053	135,180	(N/A)	100.0	100.0	58.44

Table 5: Annual Carbon Sequestered

Iowa Falls

Annual CO₂ Benefits of Public Trees

2/17/2019

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
Green ash	167,913	1,259	-17,663	-763	-138	121,303	910	270,790	2,031 (N/A)	10.4	15.8	8.43
Sugar maple	113,010	848	-8,986	-589	-72	96,193	721	199,628	1,497 (N/A)	10.2	11.6	6.32
Norway maple	77,178	579	-6,465	-510	-52	85,141	639	155,344	1,165 (N/A)	9.6	9.0	5.27
Bur oak	119,558	897	-13,114	-541	-102	84,620	635	190,523	1,429 (N/A)	7.0	8.8	8.82
Apple	17,968	135	-939	-181	-8	19,660	147	36,507	274 (N/A)	6.3	2.1	1.88
Silver maple	176,983	1,327	-11,315	-477	-88	72,798	546	237,990	1,785 (N/A)	6.3	13.8	12.31
Eastern white pine	13,873	104	-2,113	-301	-18	25,367	190	36,827	276 (N/A)	5.2	2.1	2.30
Northern white cedar	13,005	98	-1,458	-255	-13	22,184	166	33,476	251 (N/A)	4.7	1.9	2.30
Norway spruce	10,876	82	-2,694	-347	-23	28,038	210	35,873	269 (N/A)	4.6	2.1	2.51
Northern hackberry	31,226	234	-2,561	-238	-21	43,083	323	71,510	536 (N/A)	3.5	4.2	6.70
American basswood	49,703	373	-3,838	-199	-30	29,637	222	75,303	565 (N/A)	3.1	4.4	7.95
Hickory	24,757	186	-1,198	-108	-10	19,691	148	43,142	324 (N/A)	2.3	2.5	6.11
Black maple	10,496	79	-1,307	-108	-11	19,764	148	28,845	216 (N/A)	2.1	1.7	4.51
Northern red oak	10,777	81	-2,061	-125	-16	16,680	125	25,270	190 (N/A)	2.0	1.5	4.03
Black walnut	27,245	204	-2,206	-122	-17	20,167	151	45,084	338 (N/A)	2.0	2.6	7.35
Red maple	11,444	86	-408	-58	-3	10,250	77	21,227	159 (N/A)	1.8	1.2	3.79
Littleleaf linden	15,436	116	-787	-68	-6	9,612	72	24,193	181 (N/A)	1.4	1.4	5.50
Blue spruce	2,249	17	-160	-51	-2	4,759	36	6,796	51 (N/A)	1.4	0.4	1.59
Honeylocust	17,057	128	-1,402	-76	-11	16,487	124	32,066	240 (N/A)	1.3	1.9	8.02
Maple	6,400	48	-263	-38	-2	6,371	48	12,469	94 (N/A)	1.3	0.7	3.22
Red pine	4,206	32	-423	-67	-4	6,151	46	9,867	74 (N/A)	1.1	0.6	2.96
Eastern red cedar	720	5	-110	-43	-1	3,983	30	4,550	34 (N/A)	1.0	0.3	1.48
Japanese tree lilac	1,641	12	-60	-18	-1	1,768	13	3,331	25 (N/A)	0.8	0.2	1.39
Conifer Evergreen Large	2,763	21	-287	-46	-2	4,240	32	6,670	50 (N/A)	0.8	0.4	2.78
Spruce	1,888	14	-186	-35	-2	3,180	24	4,847	36 (N/A)	0.8	0.3	2.02
Black cherry	3,303	25	-251	-31	-2	3,777	28	6,798	51 (N/A)	0.7	0.4	3.19
Pear	1,613	12	-64	-16	-1	1,760	13	3,292	25 (N/A)	0.7	0.2	1.54
Swamp white oak	5,237	39	-341	-30	-3	5,196	39	10,063	75 (N/A)	0.6	0.6	5.39
American elm	4,402	33	-660	-35	-5	6,176	46	9,883	74 (N/A)	0.5	0.6	6.18
Boxelder	5,167	39	-266	-22	-2	3,269	25	8,148	61 (N/A)	0.5	0.5	5.56
White ash	1,639	12	-45	-11	0	1,400	10	2,983	22 (N/A)	0.4	0.2	2.49
Mulberry	925	7	-79	-11	-1	1,377	10	2,213	17 (N/A)	0.3	0.1	2.07
River birch	1,961	15	-140	-12	-1	1,919	14	3,727	28 (N/A)	0.3	0.2	3.49
Paper birch	2,149	16	-83	-11	-1	1,628	12	3,683	28 (N/A)	0.3	0.2	3.95
Scotch pine	1,030	8	-86	-16	-1	1,548	12	2,476	19 (N/A)	0.3	0.1	2.65
Eastern redbud	616	5	-23	-7	0	664	5	1,250	9 (N/A)	0.3	0.1	1.34
Callery pear	1,283	10	-45	-7	0	1,159	9	2,390	18 (N/A)	0.3	0.1	2.99
Conifer Evergreen Medium	182	1	-8	-5	0	484	4	652	5 (N/A)	0.2	0.0	0.98
Broadleaf Deciduous Small	687	5	-67	-9	-1	1,113	8	1,724	13 (N/A)	0.2	0.1	2.59
Black locust	1,300	10	-98	-8	-1	1,350	10	2,543	19 (N/A)	0.2	0.1	3.81
American sycamore	2,410	18	-220	-11	-2	1,692	13	3,872	29 (N/A)	0.2	0.2	5.81
Austrian pine	713	5	-107	-17	-1	1,352	10	1,941	15 (N/A)	0.2	0.1	2.91
Northern catalpa	2,573	19	-272	-12	-2	1,852	14	4,142	31 (N/A)	0.2	0.2	7.77
Dogwood	455	3	-17	-5	0	497	4	930	7 (N/A)	0.2	0.1	1.74
Ash	1,350	10	-160	-10	-1	1,648	12	2,828	21 (N/A)	0.2	0.2	5.30
Catalpa	1,314	10	-63	-6	-1	993	7	2,238	17 (N/A)	0.1	0.1	5.59
Amur maple	342	3	-13	-4	0	372	3	697	5 (N/A)	0.1	0.0	1.74
Broadleaf Deciduous Medi	996	7	-40	-5	0	966	7	1,917	14 (N/A)	0.1	0.1	4.79
Pin oak	4,566	34	-259	-10	-2	1,469	11	5,768	43 (N/A)	0.1	0.3	14.42
Ginkgo	242	2	-58	-7	0	750	6	927	7 (N/A)	0.1	0.1	2.32
Lilac	706	5	-41	-5	0	583	4	1,243	9 (N/A)	0.1	0.1	3.11
Tulip tree	1,077	8	-51	-5	0	759	6	1,781	13 (N/A)	0.1	0.1	4.45
Plum	266	2	-10	-3	0	285	2	539	4 (N/A)	0.1	0.0	1.35
Willow	740	6	-206	-11	-2	1,616	12	2,139	16 (N/A)	0.1	0.1	5.35
Black spruce	115	1	-6	-3	0	310	2	416	3 (N/A)	0.1	0.0	1.04
Quaking aspen	1,336	10	-53	-6	0	1,179	9	2,456	18 (N/A)	0.1	0.1	6.14
Common chokecherry	228	2	-9	-2	0	248	2	465	3 (N/A)	0.1	0.0	1.74
Southern magnolia	113	1	-5	-2	0	282	2	387	3 (N/A)	0.1	0.0	1.45
Mountain ash	228	2	-9	-2	0	248	2	465	3 (N/A)	0.1	0.0	1.74
Ohio buckeye	448	3	-11	-2	0	352	3	787	6 (N/A)	0.1	0.0	2.95
Eastern cottonwood	1,619	12	-165	-7	-1	1,091	8	2,539	19 (N/A)	0.1	0.1	9.52
Broadleaf Evergreen Medi	72	1	-3	-2	0	200	1	267	2 (N/A)	0.1	0.0	1.00
Chinese elm	1,619	12	-165	-7	-1	1,091	8	2,539	19 (N/A)	0.1	0.1	9.52
Elm	445	3	-18	-2	0	393	3	819	6 (N/A)	0.0	0.0	6.14
Oak	209	2	-5	-1	0	159	1	361	3 (N/A)	0.0	0.0	2.71
White oak	209	2	-5	-1	0	159	1	361	3 (N/A)	0.0	0.0	2.71
Northern pin oak	470	4	-38	-3	0	440	3	869	7 (N/A)	0.0	0.1	6.52

Flowering dogwood	9	0	0	0	0	6	0	14	0 (N/A)	0.0	0.0	0.10
Conifer Evergreen Small	13	0	0	-1	0	26	0	39	0 (N/A)	0.0	0.0	0.29
Black poplar	479	4	-269	-6	-2	813	6	1,017	8 (N/A)	0.0	0.1	7.63
Citywide total	985,226	7,389	-86,535	-5,752	-692	825,779	6,193	1,718,717	12,890 (N/A)	100.0	100.0	5.57

Table 6: Annual Social and Aesthetic Bene

Iowa Falls

Annual Aesthetic/Other Benefits of Public Trees
2/17/2019

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	13,453	(N/A)	10.4	13.8	55.82
Sugar maple	12,473	(N/A)	10.2	12.8	52.63
Norway maple	7,541	(N/A)	9.6	7.7	34.12
Bur oak	9,310	(N/A)	7.0	9.5	57.47
Apple	1,024	(N/A)	6.3	1.0	7.02
Silver maple	14,026	(N/A)	6.3	14.3	96.73
Eastern white pine	2,789	(N/A)	5.2	2.9	23.25
Northern white cedar	3,146	(N/A)	4.7	3.2	28.86
Norway spruce	1,877	(N/A)	4.6	1.9	17.55
Northern hackberry	4,311	(N/A)	3.5	4.4	53.89
American basswood	3,721	(N/A)	3.1	3.8	52.41
Hickory	2,448	(N/A)	2.3	2.5	46.18
Black maple	1,430	(N/A)	2.1	1.5	29.78
Northern red oak	826	(N/A)	2.0	0.8	17.57
Black walnut	2,388	(N/A)	2.0	2.4	51.91
Red maple	1,703	(N/A)	1.8	1.7	40.54
Littleleaf linden	1,685	(N/A)	1.4	1.7	51.05
Blue spruce	630	(N/A)	1.4	0.6	19.68
Honeylocust	4,111	(N/A)	1.3	4.2	137.02
Maple	998	(N/A)	1.3	1.0	34.43
Red pine	926	(N/A)	1.1	0.9	37.06
Eastern red cedar	256	(N/A)	1.0	0.3	11.11
Japanese tree lilac	91	(N/A)	0.8	0.1	5.08
Conifer Evergreen Large	601	(N/A)	0.8	0.6	33.38
Spruce	429	(N/A)	0.8	0.4	23.85
Black cherry	193	(N/A)	0.7	0.2	12.07
Pear	90	(N/A)	0.7	0.1	5.63
Swamp white oak	517	(N/A)	0.6	0.5	36.95
American elm	612	(N/A)	0.5	0.6	51.00
Boxelder	448	(N/A)	0.5	0.5	40.76
White ash	301	(N/A)	0.4	0.3	33.42
Mulberry	53	(N/A)	0.3	0.1	6.58
River birch	205	(N/A)	0.3	0.2	25.60
Paper birch	246	(N/A)	0.3	0.3	35.19
Scotch pine	233	(N/A)	0.3	0.2	33.26
Eastern redbud	34	(N/A)	0.3	0.0	4.87
Callery pear	143	(N/A)	0.3	0.1	23.87
Conifer Evergreen Medium	85	(N/A)	0.2	0.1	16.95
Broadleaf Deciduous Small	39	(N/A)	0.2	0.0	7.89
Black locust	136	(N/A)	0.2	0.1	27.19
American sycamore	208	(N/A)	0.2	0.2	41.50
Austrian pine	58	(N/A)	0.2	0.1	11.68
Northern catalpa	208	(N/A)	0.2	0.2	51.90
Dogwood	26	(N/A)	0.2	0.0	6.40
Ash	128	(N/A)	0.2	0.1	32.07
Catalpa	132	(N/A)	0.1	0.1	44.03
Amur maple	19	(N/A)	0.1	0.0	6.40
Broadleaf Deciduous Medium	105	(N/A)	0.1	0.1	34.85

fits

Pin oak	345 (N/A)	0.1	0.4	115.08
Ginkgo	20 (N/A)	0.1	0.0	6.74
Lilac	42 (N/A)	0.1	0.0	13.87
Tulip tree	115 (N/A)	0.1	0.1	38.27
Plum	15 (N/A)	0.1	0.0	4.95
Willow	63 (N/A)	0.1	0.1	20.97
Black spruce	50 (N/A)	0.1	0.1	16.62
Quaking aspen	138 (N/A)	0.1	0.1	45.86
Common chokecherry	13 (N/A)	0.1	0.0	6.40
Southern magnolia	44 (N/A)	0.1	0.0	21.93
Mountain ash	13 (N/A)	0.1	0.0	6.40
Ohio buckeye	52 (N/A)	0.1	0.1	26.22
Eastern cottonwood	124 (N/A)	0.1	0.1	62.14
Broadleaf Evergreen Medium	31 (N/A)	0.1	0.0	15.70
Chinese elm	124 (N/A)	0.1	0.1	62.14
Elm	46 (N/A)	0.0	0.0	45.86
Oak	29 (N/A)	0.0	0.0	28.56
White oak	29 (N/A)	0.0	0.0	28.56
Northern pin oak	43 (N/A)	0.0	0.0	43.05
Flowering dogwood	0 (N/A)	0.0	0.0	0.03
Conifer Evergreen Small	13 (N/A)	0.0	0.0	13.37
Black poplar	29 (N/A)	0.0	0.0	28.57
Citywide total	97,790 (N/A)	100.0	100.0	42.28

Table 7: Summary of Benefits in Dollars

Iowa Falls

Total Annual Benefits of Public Trees by Species ($)

2/17/2019

Species	Energy	CO$_2$	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Green ash	15,164	2,031	2,743	23,036	13,453	56,427	(N/A)	14.8
Sugar maple	11,827	1,497	1,858	14,644	12,473	42,300	(N/A)	11.1
Norway maple	10,897	1,165	1,890	11,555	7,541	33,048	(N/A)	8.7
Bur oak	10,662	1,429	1,943	16,782	9,310	40,126	(N/A)	10.5
Apple	2,784	274	420	1,267	1,024	5,770	(N/A)	1.5
Silver maple	8,897	1,785	1,622	16,292	14,026	42,622	(N/A)	11.2
Eastern white pine	3,096	276	41	8,583	2,789	14,785	(N/A)	3.9
Northern white cedar	2,719	251	118	6,786	3,146	13,019	(N/A)	3.4
Norway spruce	3,413	269	-30	10,100	1,877	15,630	(N/A)	4.1
Northern hackberry	5,524	536	965	6,339	4,311	17,675	(N/A)	4.6
American basswood	3,803	565	576	4,669	3,721	13,334	(N/A)	3.5
Hickory	2,338	324	387	2,377	2,448	7,873	(N/A)	2.1
Black maple	2,459	216	452	2,806	1,430	7,363	(N/A)	1.9
Northern red oak	2,096	190	297	2,623	826	6,031	(N/A)	1.6
Black walnut	2,501	338	432	3,242	2,388	8,900	(N/A)	2.3
Red maple	1,276	159	210	1,067	1,703	4,415	(N/A)	1.2
Littleleaf linden	1,206	181	198	1,328	1,685	4,597	(N/A)	1.2
Blue spruce	605	51	67	1,041	630	2,393	(N/A)	0.6
Honeylocust	2,004	240	342	3,106	4,111	9,803	(N/A)	2.6
Maple	820	94	132	687	998	2,730	(N/A)	0.7
Red pine	745	74	29	1,936	926	3,711	(N/A)	1.0
Eastern red cedar	526	34	46	940	256	1,801	(N/A)	0.5
Japanese tree lilac	259	25	36	101	91	512	(N/A)	0.1
Conifer Evergreen Large	514	50	21	1,303	601	2,489	(N/A)	0.7
Spruce	395	36	21	891	429	1,773	(N/A)	0.5
Black cherry	511	51	86	282	193	1,122	(N/A)	0.3
Pear	251	25	36	101	90	503	(N/A)	0.1
Swamp white oak	660	75	112	648	517	2,012	(N/A)	0.5
American elm	754	74	143	917	612	2,500	(N/A)	0.7
Boxelder	401	61	65	464	448	1,439	(N/A)	0.4
White ash	181	22	26	150	301	680	(N/A)	0.2
Mulberry	178	17	30	92	53	369	(N/A)	0.1
River birch	252	28	42	252	205	780	(N/A)	0.2
Paper birch	205	28	32	192	246	703	(N/A)	0.2
Scotch pine	185	19	11	427	233	875	(N/A)	0.2
Eastern redbud	97	9	14	38	34	192	(N/A)	0.1
Callery pear	145	18	23	105	143	435	(N/A)	0.1
Conifer Evergreen Medi	63	5	7	91	85	250	(N/A)	0.1
Broadleaf Deciduous Sn	146	13	25	77	39	300	(N/A)	0.1
Black locust	176	19	30	176	136	537	(N/A)	0.1
American sycamore	209	29	37	305	208	787	(N/A)	0.2
Austrian pine	172	15	20	380	58	644	(N/A)	0.2
Northern catalpa	229	31	42	354	208	863	(N/A)	0.2
Dogwood	73	7	10	29	26	144	(N/A)	0.0
Ash	213	21	39	258	128	659	(N/A)	0.2
Catalpa	122	17	20	126	132	417	(N/A)	0.1
Amur maple	55	5	8	22	19	108	(N/A)	0.0
Broadleaf Deciduous M	118	14	19	92	105	348	(N/A)	0.1

Pin oak	182	43	23	287	345	880 (N/A)	0.2
Ginkgo	94	7	17	86	20	224 (N/A)	0.1
Lilac	83	9	13	46	42	193 (N/A)	0.1
Tulip tree	99	13	15	103	115	345 (N/A)	0.1
Plum	42	4	6	16	15	83 (N/A)	0.0
Willow	213	16	41	306	63	638 (N/A)	0.2
Black spruce	38	3	4	56	50	152 (N/A)	0.0
Quaking aspen	133	18	22	119	138	430 (N/A)	0.1
Common chokecherry	36	3	5	14	13	72 (N/A)	0.0
Southern magnolia	38	3	4	37	44	125 (N/A)	0.0
Mountain ash	36	3	5	14	13	72 (N/A)	0.0
Ohio buckeye	49	6	7	32	52	146 (N/A)	0.0
Eastern cottonwood	139	19	25	219	124	527 (N/A)	0.1
Broadleaf Evergreen Me	27	2	3	23	31	86 (N/A)	0.0
Chinese elm	139	19	25	219	124	527 (N/A)	0.1
Elm	44	6	7	40	46	143 (N/A)	0.0
Oak	21	3	3	16	29	71 (N/A)	0.0
White oak	21	3	3	16	29	71 (N/A)	0.0
Northern pin oak	59	7	10	67	43	186 (N/A)	0.0
Flowering dogwood	1	0	0	0	0	1 (N/A)	0.0
Conifer Evergreen Smal	4	0	0	5	13	22 (N/A)	0.0
Black poplar	99	8	23	196	29	354 (N/A)	0.1
Citywide Total	103,518	12,890	15,953	150,992	97,790	381,143 (N/A)	100.0
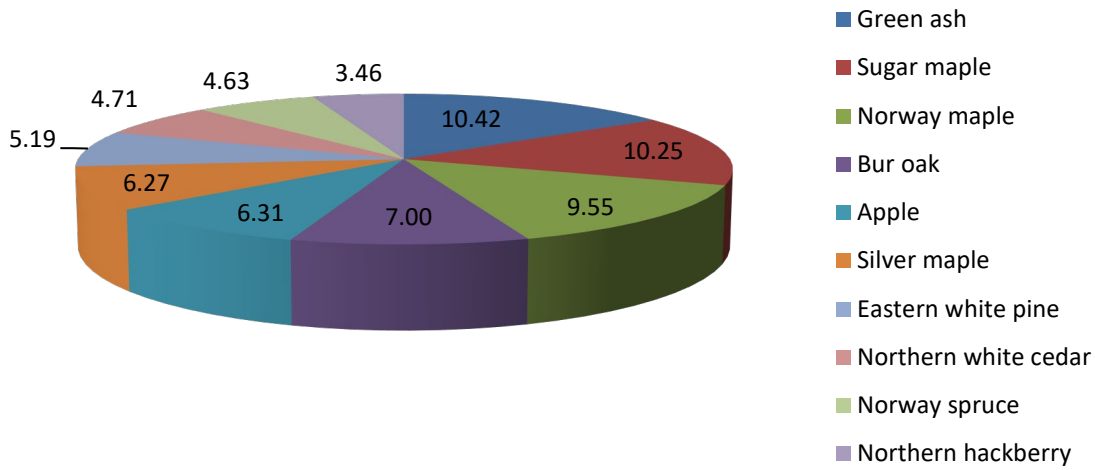
Figure 1: Species Distribution

Relative Age Distribution of Top 10 Public Tree Species (%)
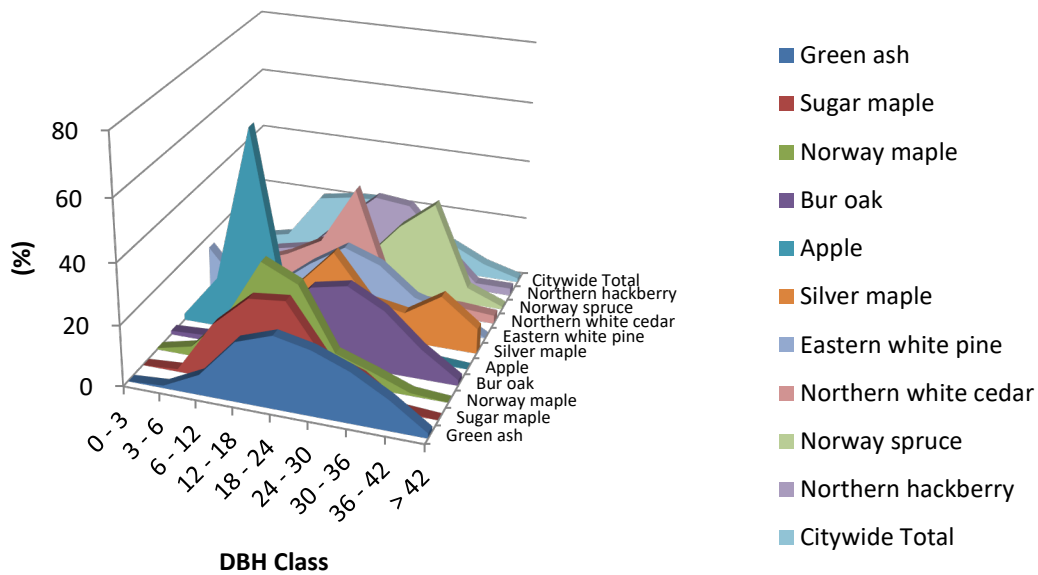
Figure 2: Relative Age Class

Leaf Condition

- Dead or Dying
- Poor
- Fair
- Good
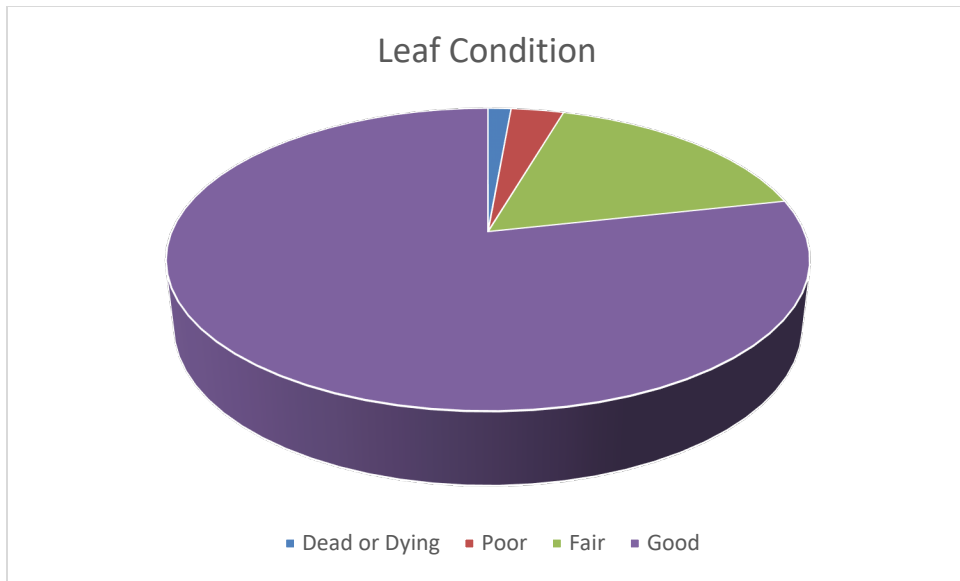
Figure 3: Foliage Condition

Wood Condition

- Dead or Dying
- Poor
- Fair
- Good
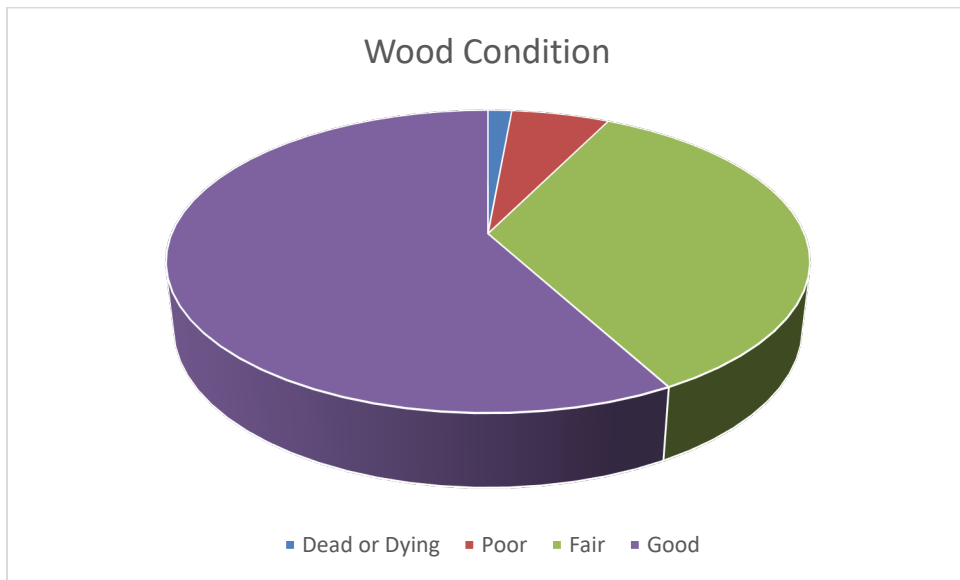
Figure 4: Wood Condition

Canopy Cover of Public Trees (Acres)
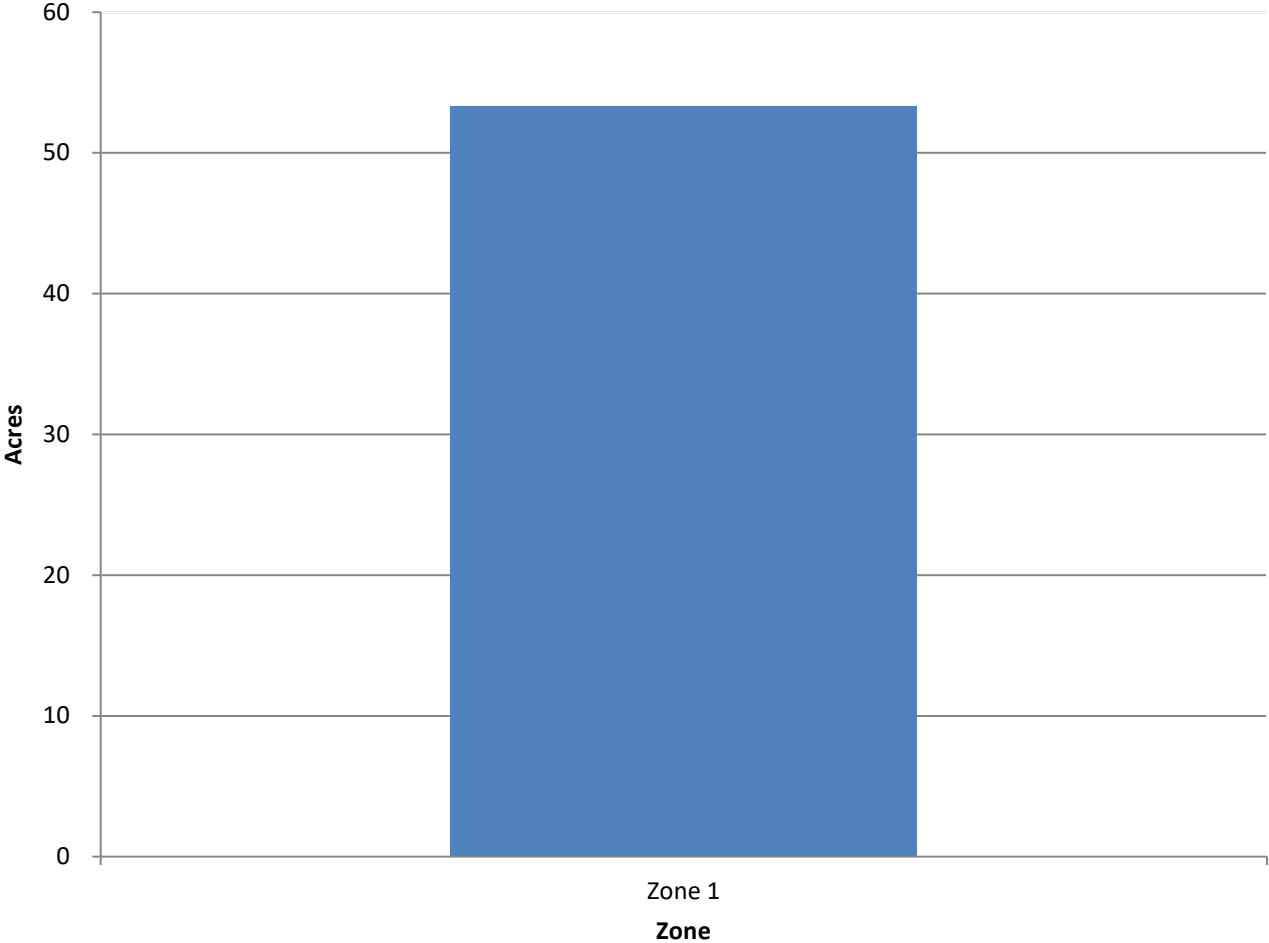
Figure 5: Canopy Cover in Acres
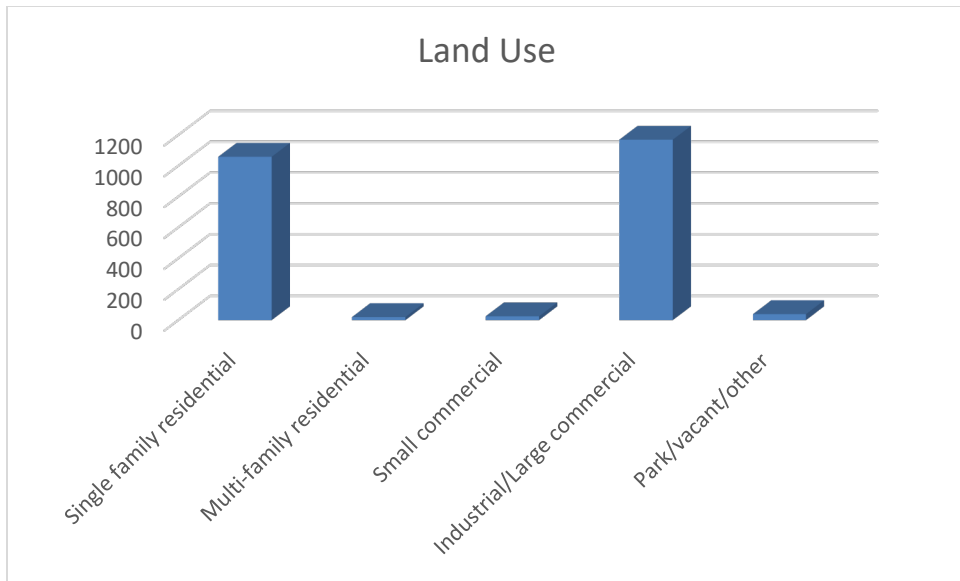
Figure 6: Land Use of city/park trees
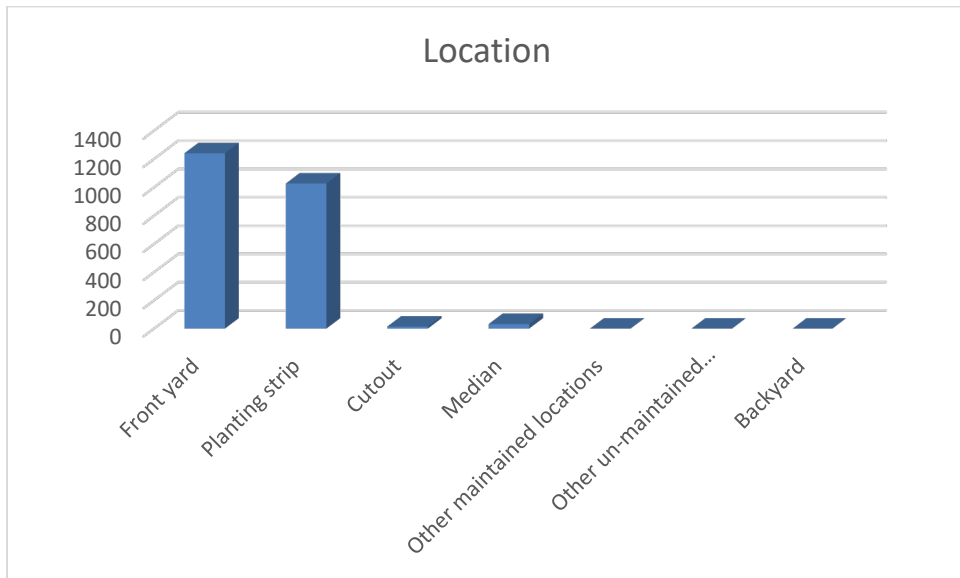
Figure 7: Location of city/park trees
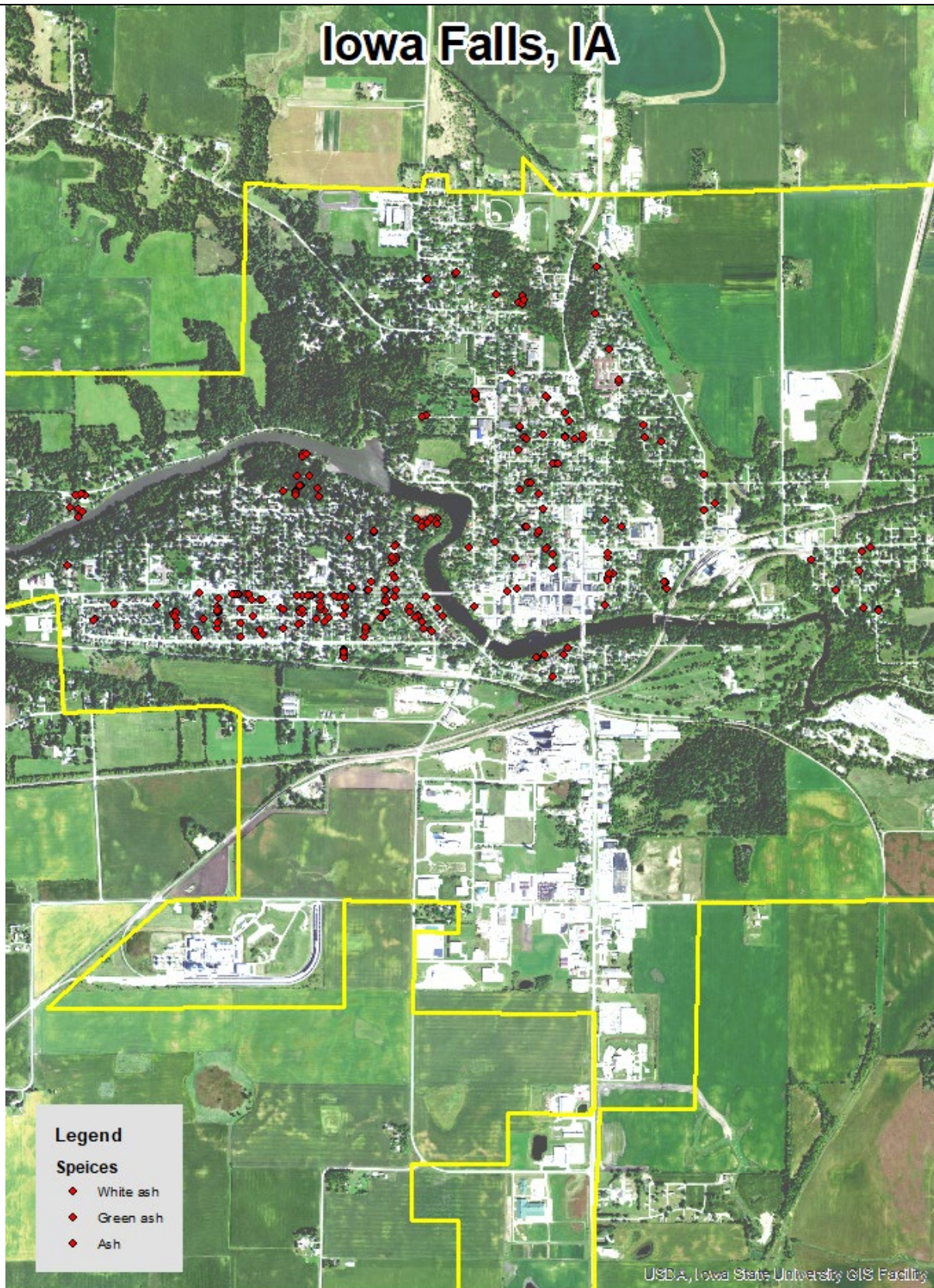
Figure 1: Location of Ash Trees
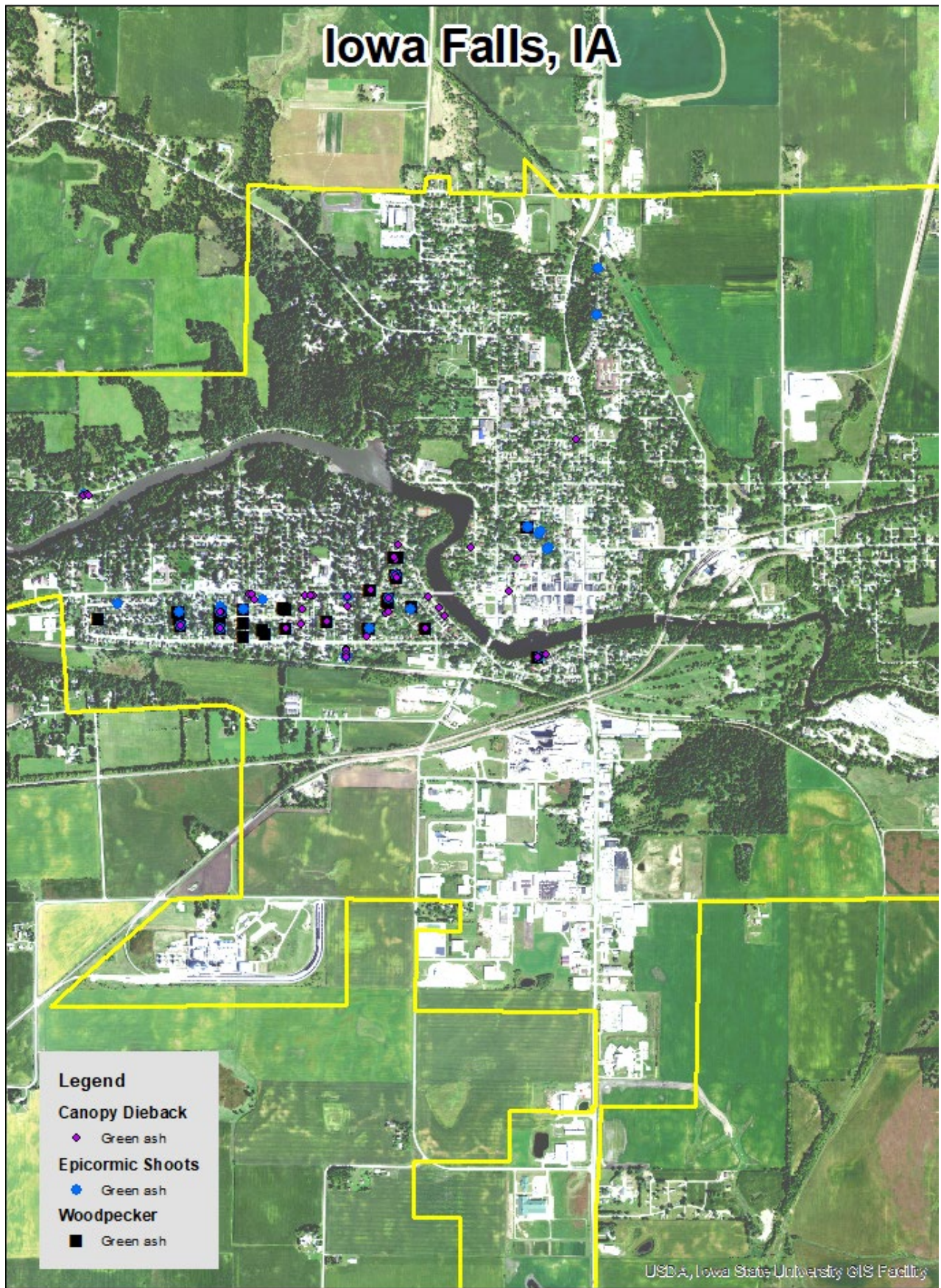
Figure 2: Location of EAB symptoms
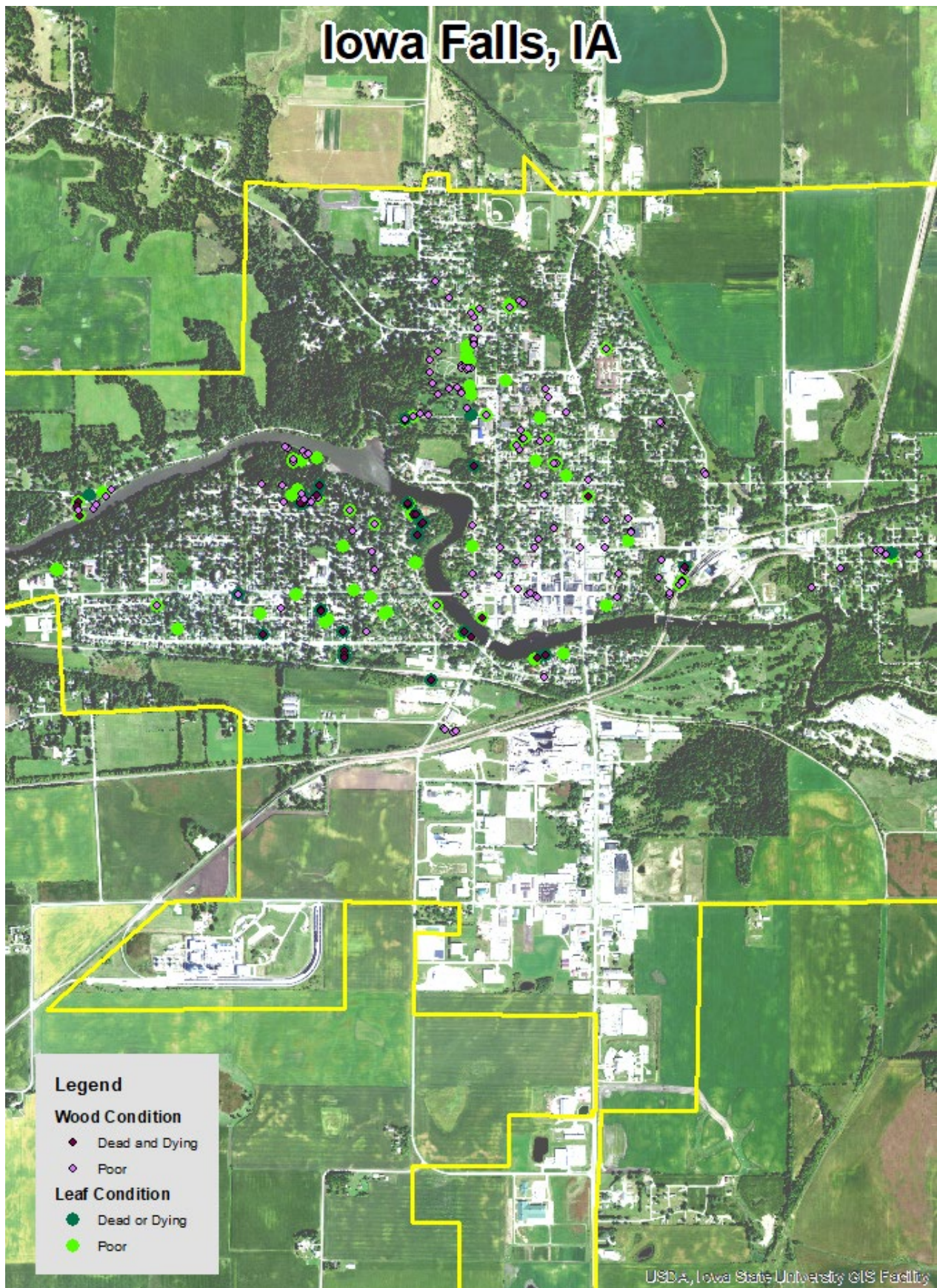
Figure 3: Location of Poor Condition Trees
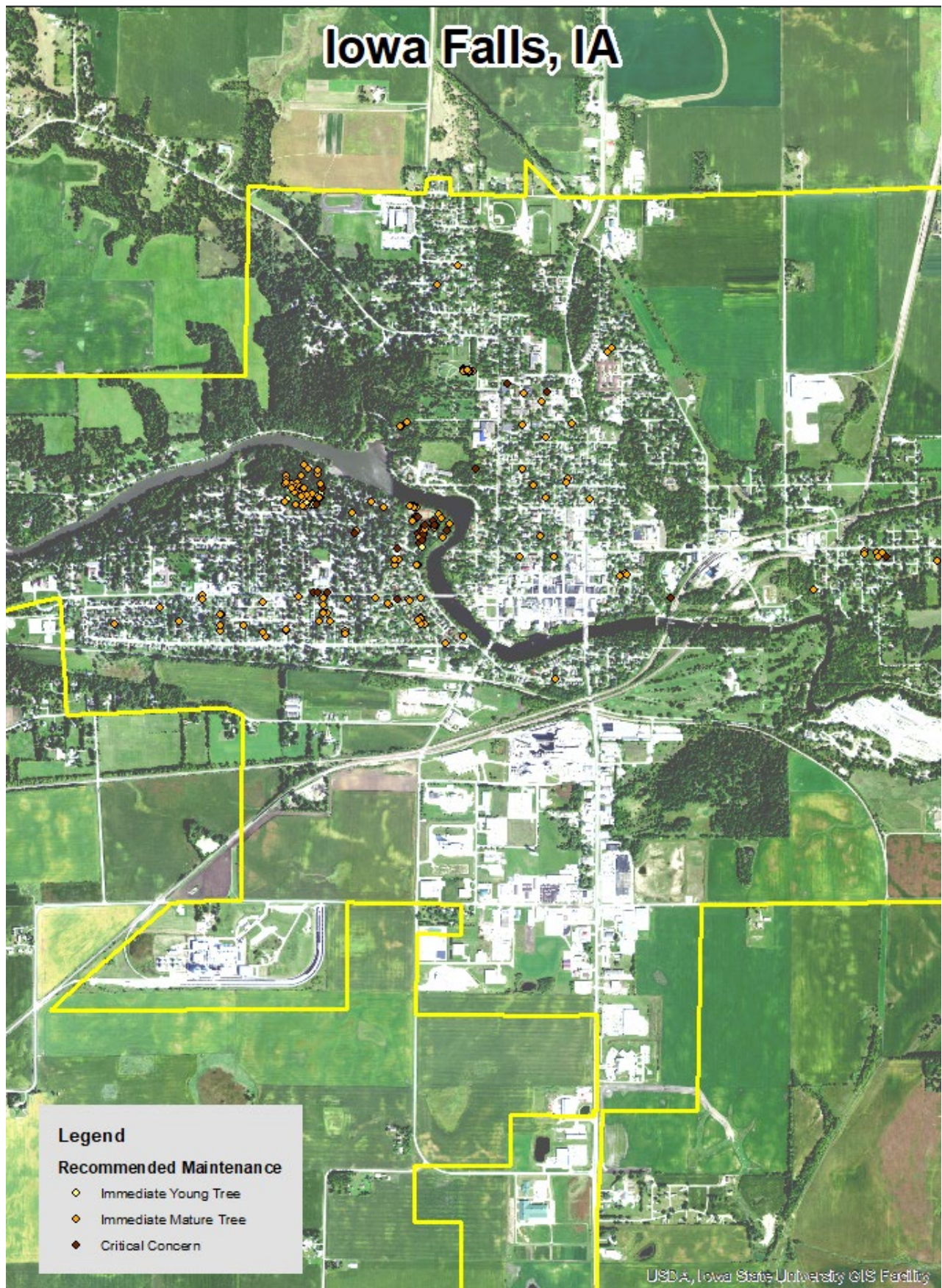
Figure 4: Location of Trees with Recommended Maintenance
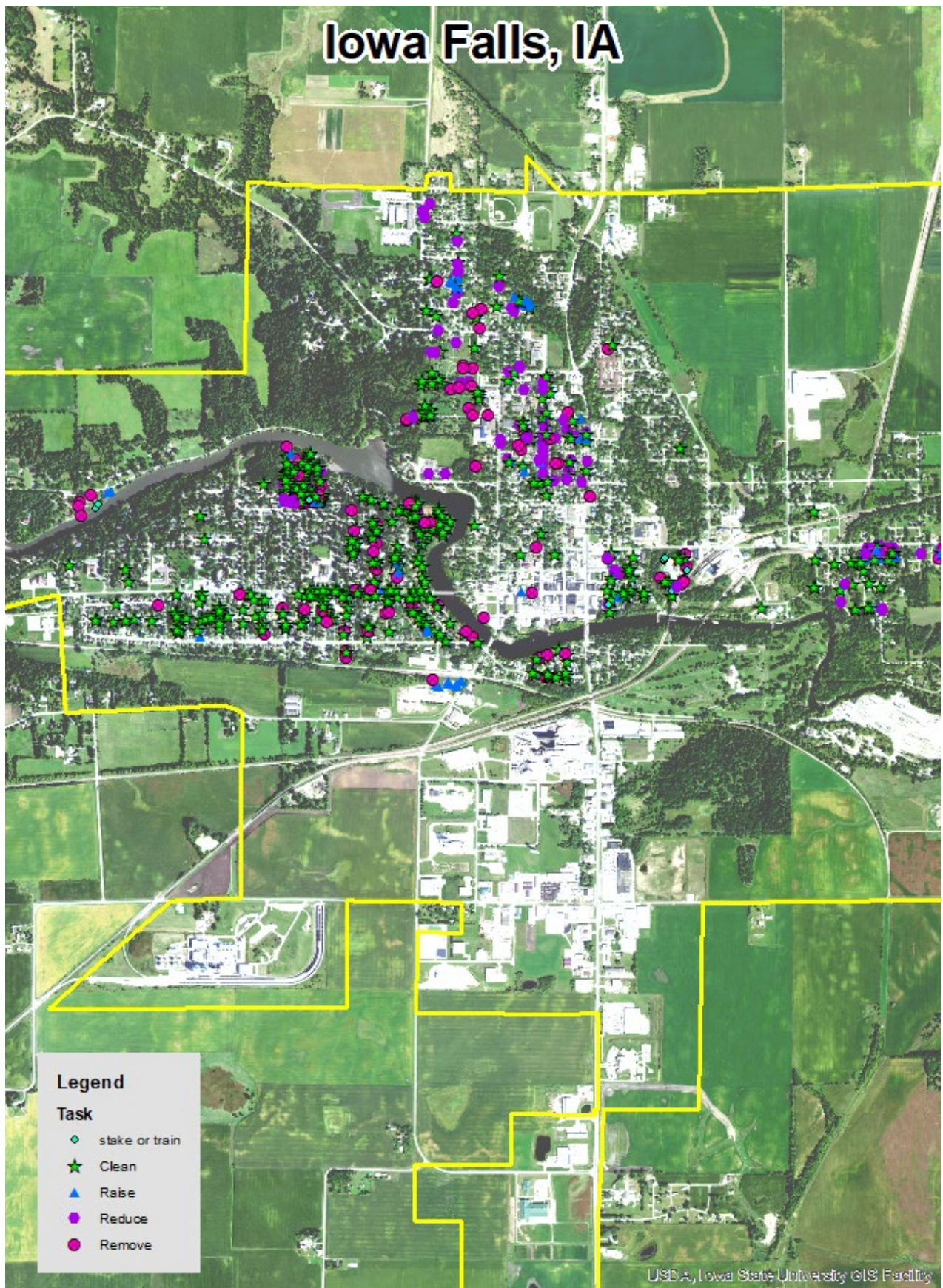
Figure 5: Maintenance Tasks *City ownership of the trees recommended for removal should be verified prior to any removal*

CHAPTER 151

TREES

151.01   PURPOSE. It is the purpose of this chapter to provide for the placement of trees and to regulate the height and spacing of trees in public ways; to provide for permits therefor and to provide for penalties for violations thereof.

151.02   DEFINITIONS. For use in this chapter, the following terms are defined:

1.   "Large tree" means any tree with a mature height of more than 25 feet.

2.   "Park trees" are trees, shrubs and all other woody vegetation in public parks having individual names and in all areas owned by the City or to which the public has free access as a park.

3.   "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.

4.   "Shrub" means any multiple-stemmed woody plant.

5.   "Small tree" means any tree with a mature height of 15 to 25 feet.

6.   "Street trees" are trees on land lying between property lines on either side of all streets, avenues or ways within the City.

7.   "Tree" means a single stemmed woody plant with a mature height of at least 15 feet.

151.03   STREET TREE SPECIES.

1.   The following tree species are <u>not allowed</u> for planting along City streets:

ACER NEGUNDO	BOX ELDER
CATALPA SPECIOSA	CATALPA
POPULUS DELTOIDES	COTTONWOOD
SALIX	WILLOWS
ULMUS	ELMS (except American Elm hybrids resistant to Dutch Elm Disease)
MORUS RUBRA	RED MULBERRY
ACER SACCHARINUM	SILVER MAPLE
Any tree of the order *Coniferales*	CONIFERS – EVERGREENS

CODE OF ORDINANCES, IOWA FALLS, IOWA
- 743 -

2.   The following tree species are recommended for planting along City streets:

Large Trees

ACER NIGRUM	BLACK MAPLE
ACER PLATANOIDES	NORWAY MAPLE
ACER RUBRUM	RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
CELTIS OCCIDENTALIS	HACKBERRY
FRAXINUS AMERICANA	WHITE ASH
FRAXINUS LANCEOLATA	GREEN ASH
FRAXINUS QUADRANGULATA	PURPLE ASH
GINKO BILOBA	GINKO (except female)
GLEDITSIA TRIACANTHOS	HONEYLOCUST (thornless)
LIRIODENDRON TULIPIFERA	TULIP TREE
PHELLODENDRON AMURENSE	CORKTREE
PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE
GYMNOCLADUS DIOICUS	KENTUCKY COFFEETREE
QUERCUS ALBA	WHITE OAK
QUERCUS BOLEALIS	NORTHERN RED OAK
QUERCUS BICOLOR	SWAMP WHITE OAK
QUERCUS MACROCARPA	BUR OAK
TILIA TOMENTOSE	SILVER LINDEN
TILIA REDMOND	REDMOND LINDEN

Small Trees

ACER GINNALA	AMUR MAPLE
CERCIS CANADENSIS	EASTERN REDBUD
CRATAEGUS SPECIES	THORNLESS HAWTHORN VARIETIES
MALUS SPECIES	ORNAMENTAL CRABAPPLE (disease-resistant)
OSTRYA VIRGINANA	HOP HORNBEAM (IRON WOOD)
PRUNUS SARGENTI	DOGWOOD
PYRUS CALLERYANA	BRADFORD PEAR
TILIA CORDATA	LITTLELEAF LINDEN

151.04   SPACING. Small trees shall not be planted closer than twenty (20) feet from one another or closer than thirty (30) feet from a large tree. Large trees shall not be planted closer than thirty (30) feet from one another.

151.05   DISTANCE FROM CURB AND SIDEWALK. No trees shall be planted on parkings that are less than eight (8) feet wide. Small trees shall be planted no closer than four (4) feet to the curb or curbline and no closer than two (2) feet to the sidewalk or property line. No large trees shall be planted on parkings that are less than twelve (12) feet wide. Large trees shall be planted no closer than six (6) feet to the curb or curbline and no closer than five (5) feet to the sidewalk or property line. Whenever possible trees shall be centered between the curb or curbline and the sidewalk or property line.

151.06   DISTANCE FROM STREET CORNERS, ALLEYS AND FIREPLUGS. No street trees shall be planted closer than thirty-five (35) feet to the intersecting lot lines of a corner lot. No street trees shall be planted within five (5) feet of any alley or drive. No street trees shall be planted closer than ten (10) feet to any fireplug or utility pole.

151.07 VISIBILITY AT INTERSECTIONS. On a corner lot in any residential district, nothing shall be erected, placed, planted or allowed to grow in such a manner as to materially impede vision between a height of two and one-half (2½) and ten (10) feet above the centerline grades of the intersecting streets in the area bounded by the street lines of such corner lots and a line joining points along said street lines twenty-five (25) feet from the point of intersection of the right-of-way lines.

151.08 VARIANCES. Any spacing or distance requirements provided by this chapter may be waived and a variance granted by the Council provided that such variance is first presented to and approved by the City Tree Board created and established pursuant to Chapter 28 of this Code of Ordinances. If the Tree Board approves the requested variance, the request shall then be presented to the Council, which may grant such variances which have been recommended by the Tree Board and are, in the opinion of the Council, acceptable variances from the official comprehensive City Tree Plan for the City.

151.09 UTILITIES. No street trees other than those species listed as small trees in Section 151.03 of this chapter may be planted under or within ten (10) lateral feet of any overhead utility wire, or over or within five (5) lateral feet of any underground water line or sewer line. The electric utility shall be given permission to trim trees that are growing into the conductors (wires) of the overhead power lines energized above 600 volts to a sufficient distance from the conductors to provide reliable, uninterrupted service. This shall include private trees that are overhanging the public rights-of-way.

151.10 PERMIT FOR PLANTING OR REMOVAL REQUIRED. No street tree shall be planted unless a permit is obtained. No living tree shall be destroyed or removed from the parking unless a permit is obtained. Permits shall be obtained from the Tree Board at no charge.

151.11 PUBLIC TREE CARE. The City shall have the right to plant, prune, maintain and remove trees, plants and shrubs within the lines of all streets, alleys, avenues, lanes, squares and public grounds, as may be necessary to insure public safety or to preserve or enhance the symmetry and beauty of such public grounds. The City, upon recommendation of the Tree Board, may remove or leave as is any tree or part thereof which is in an unsafe condition or which by reason of its nature is injurious to sewers, electric power lines, gas lines, water lines or public improvements, or is infected with or affected by any injurious fungus, insect or other pest. This section does not prohibit the planting of street trees by adjacent property owners providing that the selection and location of such trees is in accordance with this chapter.

151.12 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 fifteen (15) feet above the surface of the street and eight (8) 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 (5) 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])

151.13 TRIMMING TREES. Except as allowed in Section 151.12, it is unlawful for any person to trim or cut any tree in a street or public place unless the work is done with permission of the City.

CODE OF ORDINANCES, IOWA FALLS, IOWA
- 745 -

151.14   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.

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

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

151.16   REMOVAL OF STUMPS.   All stumps of street and park trees shall be removed below the surface of the ground so that the top of the stump shall not project above the surface of the ground.

151.17   FLOWERS ON RIGHT-OF-WAY.   Flowers may be grown on public right-of-way if maintained under two (2) feet above ground level and if they present no safety hazard. No vegetables may be planted on public right-of-ways.

151.18   ABUSE OR MUTILATION OF PUBLIC TREES.   It is unlawful as a normal practice for any person or City department to top any street, park or other tree on public property. "Topping" is defined as the severe cutting back of limbs to stubs within the tree's crown to such a degree so as to remove the normal canopy and disfigure the tree. Trees severely damaged by storms or other causes, or certain trees under utility wires or other obstructions where other pruning practices are impractical, may be exempted from this chapter at the determination of the Council, upon the recommendation of the City Tree Board. Unless specifically authorized by the City Tree Board, no person shall intentionally damage, cut, carve, transplant or remove any tree on public property; attach any rope, wire, nail, advertising poster, or other contrivance to any tree on public property; allow any gaseous liquid or solid substance that is harmful to such trees to come in contact with them or with their roots; or set fire or permit any fire to burn when such fire or the heat thereof will injure any portion of any tree on public property. Growth retardants approved by the City Tree Board may be utilized and shall not be a violation of this chapter.

151.19   INTERFERENCE WITH CITY TREE BOARD.   It is unlawful for any person to prevent, delay or interfere with the City Tree Board, or any of its agents, while engaging in and about the planting, cultivating, mulching, pruning, spraying or removing of any street trees, park trees or other trees on public property as authorized by this chapter.

151.20   FUNDS RECEIVED FOR DAMAGE OR LOSS OF TREES.   Any funds received or collected by the City for damage or loss of street or park trees shall be designated for the purchase of replacement street and park trees.

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.