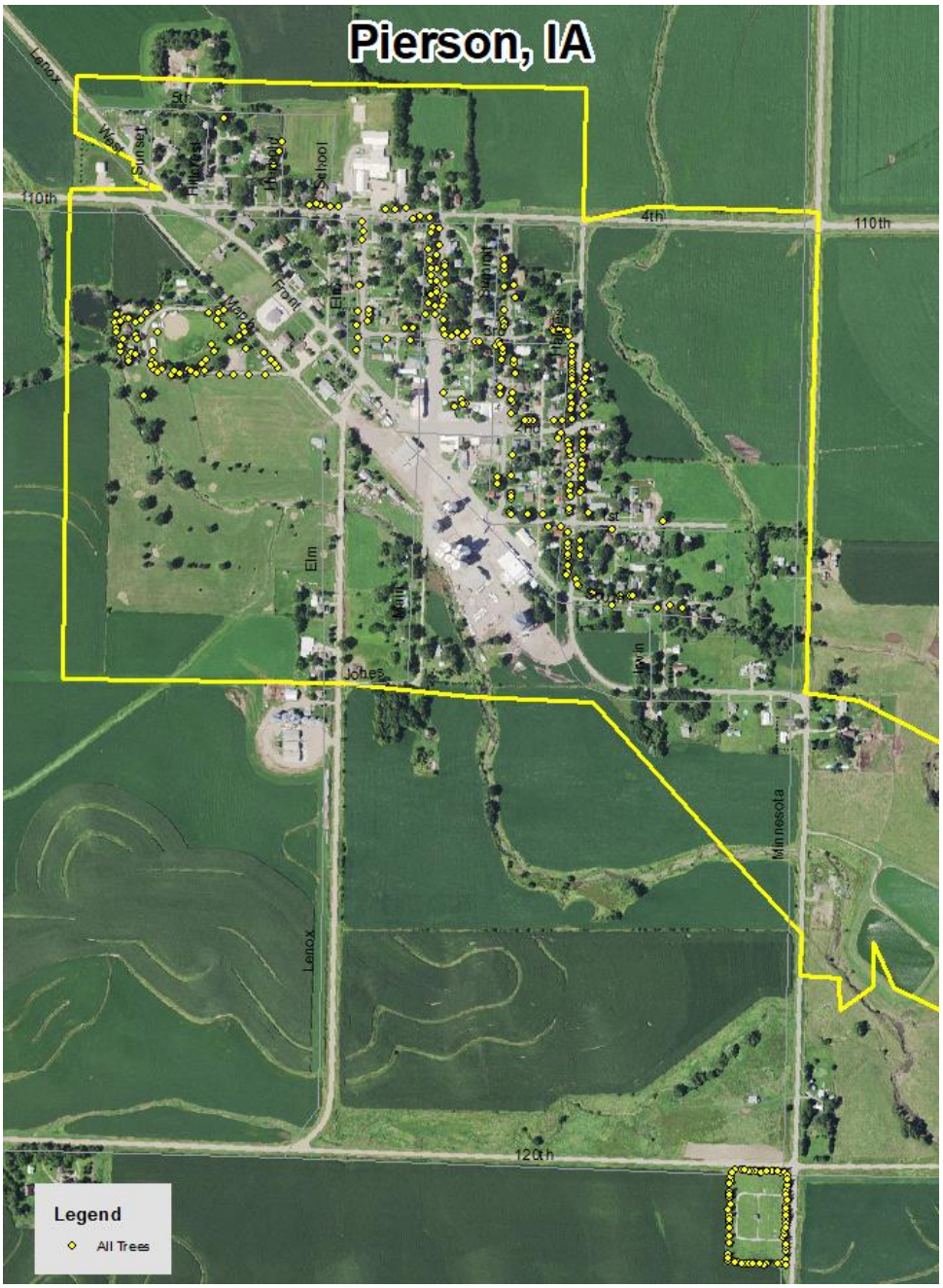
Pierson, IA



2018 Urban Forest Management Plan
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Executive Summary

Overview

This plan was developed to assist the City of Pierson 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 19% of Pierson'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 2017, 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 323 trees inventoried.

- Pierson's trees provide $62,608 of benefits annually, an average of $194 a tree
- There are over 33 species of trees
- The top three genera are: Spruce 25%, Maple 24%, and Ash 19%
- 7% of trees are in need of some type of management
- 13 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 13 trees needing removal, 10 trees are over 24 inches in diameter at 4.5 ft and must be addressed immediately *City ownership of the trees recommended for removal should be verified prior to any removal*
- 4 of the 60 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
- With the current budget it could take 46 years to remove ash – Suggestion: request a budget increase to $10,500 annually and apply for grants to plant replacement trees

Introduction

This plan was developed to assist Pierson 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 Pierson, these costs can be extended over years and public safety issues from dead and dying ash trees mitigated.

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

Inventory

In 2017, 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 324 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. Pierson's trees reduce energy related costs by approximately $14,981 annually (Appendix A, Table 1). These savings are both in Electricity (71.5 MWh) and in Natural Gas (9,752.7 Therms).

Annual Stormwater Benefits

Pierson's trees intercept about 1,025,774 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $27,798 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 Pierson, it is estimated that trees remove 882 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 $2,276 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Pierson, trees sequester about 173,783 lbs of carbon a year with an associated value of $2,063 (Appendix A, Table 5). In addition, the trees store 3,684,928 lbs of carbon, with a yearly benefit of $27,637 (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. Pierson receives $27,637 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, Pierson's trees provide $62,608 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 323 trees in Pierson provide approximately $194 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Pierson has over 33 different tree species along city streets and parks (Appendix A, Figure 1).
The distribution of trees by genera is as follows:

Spruce	81	25%
Maple	77	24%

Ash	60	19%
Oak	14	4%
Pine	12	4%
Hackberry	10	3%
Pear	9	3%
Linden	9	3%
Elm	9	3%
Walnut	8	2%
Cedar	8	2%
Other	7	2%
Honeylocust	6	2%
Apple (crabapple)	5	2%
Kentucky Coffeetree	3	1%
Cottonwood	2	1%
Buckeye	1	<1%
Hickory	1	<1%
Ginkgo	1	<1%

Age Class

Pierson's trees are about the same across size classes (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.

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 Pierson indicate that 97% of the trees are in good health, with only 1% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Also, 42% of Pierson'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 27% of the population. This 27% 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	10	3%
Crown Raising	0	0%
Tree Staking	0	0%
Tree Removal	13	4%
Crown Reduction	0	0%

Canopy Cover

The total canopy with both private and public trees is 12%, 45 acres. The canopy cover included in the Pierson inventory includes approximately 8.5 acres (Appendix A, Figure 4). The City's Canopy goal is to

increase canopy by 1%, in 30 years. To achieve this goal it is estimated that 10 trees need to be planted annually on public and private lands.

Land Use and Location

The majority of Pierson'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	
Single family residential	59%
Park/vacant/other	41%
Industrial/Large commercial	0%
Small commercial	0%
Multifamily residential	0%

Location	
Planting strip	45%
Median	2%
Cutout (surrounded by pavement)	0%
Front yard	53%

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

Pierson has 6 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 trees first. There are 10 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 10 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 13 removals, 4 are ash trees. There are a total of 60 ash trees, and 4 of those have signs and symptoms that have been associated with EAB. In addition, there are 13 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 Pierson.

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 Spruce (25%) maple (24%) (Appendix A, Figure 1). Spruce and 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.

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

Year 1

- Removal: 2 largest trees
- Planting and Replacement: 3 trees to be planted in open locations
- Young Tree Pruning & Maintenance
- Visual Survey for signs and symptoms of EAB

Year 2

- Removal: 1 tree
- *Or saving for ash tree treatment and/or future ash removal
- Planting and Replacement: 2 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: 2 trees
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 3 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: 1 tree
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 2 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 5
Removal: 2 trees
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 3 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: 1 tree
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 2 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

*Reduction of ash over 6 years: Approximately 4 ash trees removed (approximately 7% of ash). It will take approximately 46 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 $10,500 a year. If the budget were increased to $5,000 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 151.02 (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 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 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."

Budget

Current Budget
Total $12,000 over 6 years ($2,000/year)

FY 2018 Budget
Removal: $1600
*Or saving for ash tree treatment and/or future ash removal
Planting: $300
Watering & Maintenance: $100

FY 2019 Budget
Removal: $800
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Routine trimming: $900
Watering & Maintenance: $100

FY 2020 Budget
Removal: $1600
*Or saving for ash tree treatment and/or future ash removal
Planting: $300
Watering & Maintenance: $100

FY 2021 Budget

Removal: $800
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Routine trimming: $900
Watering & Maintenance: $100

FY 2022 Budget
Removal: $1600
*Or saving for ash tree treatment and/or future ash removal
Planting: $300
Watering & Maintenance: $100

FY 2023 Budget
Removal: $800
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Routine trimming: $900
Watering & Maintenance: $100

*Reduction of ash over 6 years: Approximately 4 ash trees removed (approximately 7% of ash). It will take approximately 46 years to remove all ash with the current budget

Purposed Budget Increase

EAB could potentially kill all ash trees in Pierson within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to $10,500 a year. If the budget were increased to $5,000 a year all ash could be removed within 13 years. Additionally, it is recommended that Pierson 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 ($1,200), and Pierson would still need to find $46,800 for removal. Alternatively, if there are 15 treatable trees, it would cost approximately $2,250 a year for treatment and leave $40,500 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 Pierson. It is suggested to consider increasing the budget to plan for this.

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Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Pierson

Annual Energy Benefits of Public Trees

4/1/2018

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Norway spruce	9.6	731	1,285.9	1,260	1,991	(N/A)	20.4	13.3	30.17
Green ash	19.0	1,445	2,599.9	2,548	3,993	(N/A)	18.6	26.7	66.55
Silver maple	14.4	1,097	1,916.8	1,879	2,975	(N/A)	14.2	19.9	64.68
Norway maple	2.9	223	428.6	420	643	(N/A)	5.0	4.3	40.16
Blue spruce	1.3	95	181.2	178	273	(N/A)	4.6	1.8	18.20
Northern hackberry	1.0	73	146.9	144	217	(N/A)	3.1	1.4	21.68
American basswood	2.9	217	410.3	402	619	(N/A)	2.8	4.1	68.75
Sugar maple	2.3	177	313.5	307	484	(N/A)	2.8	3.2	53.83
Austrian pine	0.9	70	136.6	134	204	(N/A)	2.8	1.4	22.69
Pear	0.7	51	115.5	113	164	(N/A)	2.8	1.1	18.19
Eastern red cedar	0.9	68	131.5	129	197	(N/A)	2.5	1.3	24.57
Black walnut	2.2	164	297.0	291	455	(N/A)	2.5	3.0	56.90
Honeylocust	2.0	153	269.2	264	417	(N/A)	1.9	2.8	69.53
Northern red oak	1.4	109	199.5	196	305	(N/A)	1.9	2.0	50.82
Siberian elm	1.7	126	218.4	214	340	(N/A)	1.9	2.3	56.71
Apple	0.1	7	15.3	15	22	(N/A)	1.5	0.1	4.33
Conifer Evergreen Large	0.1	11	16.6	16	27	(N/A)	1.2	0.2	6.73
Bur oak	1.1	83	143.3	140	223	(N/A)	1.2	1.5	55.77
Pin oak	1.2	88	155.4	152	241	(N/A)	0.9	1.6	80.25
Kentucky coffeetree	0.7	56	92.1	90	146	(N/A)	0.9	1.0	48.59
American elm	1.4	108	185.1	181	289	(N/A)	0.9	1.9	96.39
Maple	0.0	1	2.2	2	3	(N/A)	0.9	0.0	1.03
Conifer Evergreen Medium	0.3	21	39.0	38	59	(N/A)	0.6	0.4	29.65
Red maple	0.4	28	46.6	46	74	(N/A)	0.6	0.5	36.76
Eastern cottonwood	0.9	70	122.1	120	190	(N/A)	0.6	1.3	94.83
Red pine	0.4	28	49.2	48	76	(N/A)	0.6	0.5	38.17
Hickory	0.4	29	53.7	53	82	(N/A)	0.3	0.5	82.02
Broadleaf Evergreen Large	0.0	1	1.6	2	2	(N/A)	0.3	0.0	2.26
Ginkgo	0.2	18	32.0	31	49	(N/A)	0.3	0.3	49.28
Swamp white oak	0.3	20	39.6	39	59	(N/A)	0.3	0.4	58.69
Ohio buckeye	0.3	24	47.4	46	71	(N/A)	0.3	0.5	70.84
Boxelder	0.3	22	40.7	40	62	(N/A)	0.3	0.4	62.01
Scotch pine	0.1	11	19.7	19	30	(N/A)	0.3	0.2	30.47
Total	71.5	5,424	9,752.7	9,558	14,981	(N/A)	100.0	100.0	46.38

Table 2: Annual Stormwater Benefits

Pierson

Annual Stormwater Benefits of Public Trees

4/1/2018

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Norway spruce	213,338	5,781	(N/A)	20.4	20.8	87.60
Green ash	262,169	7,105	(N/A)	18.6	25.6	118.41
Silver maple	216,666	5,872	(N/A)	14.2	21.1	127.64
Norway maple	24,593	666	(N/A)	5.0	2.4	41.65
Blue spruce	16,313	442	(N/A)	4.6	1.6	29.47
Northern hackberry	7,491	203	(N/A)	3.1	0.7	20.30
American basswood	39,192	1,062	(N/A)	2.8	3.8	118.01
Sugar maple	29,114	789	(N/A)	2.8	2.8	87.67
Austrian pine	14,251	386	(N/A)	2.8	1.4	42.91
Pear	2,380	65	(N/A)	2.8	0.2	7.17
Eastern red cedar	13,076	354	(N/A)	2.5	1.3	44.30
Black walnut	26,083	707	(N/A)	2.5	2.5	88.35
Honeylocust	22,770	617	(N/A)	1.9	2.2	102.84
Northern red oak	15,353	416	(N/A)	1.9	1.5	69.35
Siberian elm	21,437	581	(N/A)	1.9	2.1	96.82
Apple	294	8	(N/A)	1.5	0.0	1.60
Conifer Evergreen Large	1,685	46	(N/A)	1.2	0.2	11.41
Bur oak	14,367	389	(N/A)	1.2	1.4	97.33
Pin oak	14,829	402	(N/A)	0.9	1.4	133.95
Kentucky coffeetree	5,522	150	(N/A)	0.9	0.5	49.88
American elm	13,653	370	(N/A)	0.9	1.3	123.33
Maple	35	1	(N/A)	0.9	0.0	0.32
Conifer Evergreen Medium	4,625	125	(N/A)	0.6	0.5	62.66
Red maple	2,229	60	(N/A)	0.6	0.2	30.21
Eastern cottonwood	14,478	392	(N/A)	0.6	1.4	196.17
Red pine	9,209	250	(N/A)	0.6	0.9	124.79
Hickory	5,491	149	(N/A)	0.3	0.5	148.79
Broadleaf Evergreen Large	38	1	(N/A)	0.3	0.0	1.02
Ginkgo	1,857	50	(N/A)	0.3	0.2	50.33
Swamp white oak	2,479	67	(N/A)	0.3	0.2	67.19
Ohio buckeye	3,764	102	(N/A)	0.3	0.4	102.01
Boxelder	4,024	109	(N/A)	0.3	0.4	109.04
Scotch pine	2,969	80	(N/A)	0.3	0.3	80.46
Citywide total	1,025,774	27,798	(N/A)	100.0	100.0	86.06

Table 3: Annual Air Quality Benefits

Pierson

Annual Air Quality Benefits of Public Trees

4/1/2018

Species	Deposition (lb)				Total Depos. ($)	Avoided (lb)				Total Avoided ($)	BVOC Emissions (lb)	BVOC Emissions ($)	Total (lb)	Total ($) Standard Error	% of Total Trees	Avg. $/tree
	O_3	NO_2	PM_{10}	SO_2		NO_2	PM_{10}	VOC	SO_2							
Norway spruce	25.7	5.1	20.6	3.2	168	45.6	6.7	6.4	43.6	285	-124.2	-466	32.6	-13 (N/A)	20.4	-0.20
Green ash	37.8	6.0	17.2	1.7	199	90.8	13.2	12.6	86.3	566	0.0	0	265.6	765 (N/A)	18.6	12.74
Silver maple	37.7	6.4	18.4	1.7	203	68.2	10.0	9.5	65.3	427	-19.2	-72	198.1	558 (N/A)	14.2	12.12
Norway maple	4.6	0.8	2.3	0.2	25	14.3	2.1	2.0	13.3	88	-1.1	-4	38.4	109 (N/A)	5.0	6.83
Blue spruce	1.9	0.4	1.7	0.2	13	6.1	0.9	0.8	5.7	38	-5.6	-21	12.1	29 (N/A)	4.6	1.96
Northern hackberry	1.0	0.2	0.5	0.0	5	4.7	0.7	0.6	4.4	29	0.0	0	12.1	34 (N/A)	3.1	3.44
American basswood	6.0	1.0	2.8	0.3	32	13.8	2.0	1.9	12.9	86	-4.9	-18	35.9	99 (N/A)	2.8	11.03
Sugar maple	4.1	0.7	2.0	0.2	22	11.1	1.6	1.5	10.6	69	-3.1	-12	28.6	79 (N/A)	2.8	8.80
Austrian pine	2.1	0.4	1.8	0.3	14	4.5	0.6	0.6	4.2	28	-5.2	-20	9.3	22 (N/A)	2.8	2.47
Pear	0.4	0.1	0.2	0.0	2	3.4	0.5	0.5	3.0	21	0.0	0	8.1	23 (N/A)	2.8	2.55
Eastern red cedar	2.7	0.5	2.2	0.3	18	4.3	0.6	0.6	4.0	27	-7.2	-27	8.1	17 (N/A)	2.5	2.19
Black walnut	3.4	0.5	1.6	0.2	18	10.3	1.5	1.4	9.8	64	0.0	0	28.8	83 (N/A)	2.5	10.32
Honeylocust	4.5	0.7	2.0	0.2	24	9.6	1.4	1.3	9.1	60	-3.4	-13	25.4	70 (N/A)	1.9	11.74
Northern red oak	3.3	0.6	1.6	0.1	18	6.9	1.0	1.0	6.5	43	-4.8	-18	16.3	43 (N/A)	1.9	7.15
Siberian elm	4.4	0.7	2.0	0.2	23	7.9	1.1	1.1	7.5	49	0.0	0	25.0	72 (N/A)	1.9	12.06
Apple	0.0	0.0	0.0	0.0	0	0.4	0.1	0.1	0.4	3	0.0	0	1.0	3 (N/A)	1.5	0.59
Conifer Evergreen Large	0.2	0.0	0.1	0.0	1	0.6	0.1	0.1	0.6	4	-0.6	-2	1.2	3 (N/A)	1.2	0.74
Bur oak	2.1	0.3	0.9	0.1	11	5.1	0.8	0.7	4.9	32	0.0	0	15.0	43 (N/A)	1.2	10.76
Pin oak	2.8	0.5	1.4	0.1	15	5.5	0.8	0.8	5.3	35	-5.1	-19	12.1	31 (N/A)	0.9	10.20
Kentucky coffeetree	0.5	0.1	0.3	0.0	3	3.4	0.5	0.5	3.3	21	0.0	0	8.6	24 (N/A)	0.9	8.06
American elm	3.7	0.6	1.7	0.2	20	6.7	1.0	0.9	6.4	42	0.0	0	21.2	62 (N/A)	0.9	20.50
Maple	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	0	0.0	0	0.1	0 (N/A)	0.9	0.13
Conifer Evergreen Medium	0.7	0.1	0.6	0.1	5	1.3	0.2	0.2	1.3	8	-1.8	-7	2.7	6 (N/A)	0.6	3.10
Red maple	0.4	0.1	0.2	0.0	2	1.7	0.3	0.2	1.7	11	-0.2	-1	4.4	12 (N/A)	0.6	6.20
Eastern cottonwood	2.7	0.4	1.2	0.1	14	4.4	0.6	0.6	4.2	27	0.0	0	14.3	42 (N/A)	0.6	20.79
Red pine	1.1	0.2	0.9	0.1	7	1.8	0.3	0.2	1.7	11	-5.7	-21	0.6	-3 (N/A)	0.6	-1.58
Hickory	0.8	0.1	0.4	0.0	4	1.9	0.3	0.3	1.8	12	0.0	0	5.5	16 (N/A)	0.3	15.71
Broadleaf Evergreen Large	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.1	0 (N/A)	0.3	0.26
Ginkgo	0.5	0.1	0.3	0.0	3	1.1	0.2	0.2	1.1	7	-0.2	-1	3.3	9 (N/A)	0.3	9.29
Swamp white 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)	0.3	10.16
Ohio buckeye	0.9	0.1	0.4	0.0	5	1.6	0.2	0.2	1.5	10	-0.2	-1	4.7	14 (N/A)	0.3	13.58
Boxelder	0.6	0.1	0.3	0.0	3	1.4	0.2	0.2	1.3	9	-0.2	-1	3.9	11 (N/A)	0.3	11.20
Scotch pine	0.3	0.1	0.3	0.0	2	0.7	0.1	0.1	0.7	4	-1.4	-5	0.9	1 (N/A)	0.3	1.45
Citywide total	157.4	27.3	86.2	9.7	882	340.5	49.6	47.3	323.7	2,123	-194.2	-728	847.6	2,276 (N/A)	100.0	7.05

Table 4: Annual Carbon Stored

Pierson

Stored CO2 Benefits of Public Trees

4/1/2018

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Norway spruce	318,942	2,392	(N/A)	20.4	8.7	36.24
Green ash	1,259,176	9,444	(N/A)	18.6	34.2	157.40
Silver maple	837,477	6,281	(N/A)	14.2	22.7	136.55
Norway maple	77,325	580	(N/A)	5.0	2.1	36.25
Blue spruce	11,278	85	(N/A)	4.6	0.3	5.64
Northern hackberry	14,842	111	(N/A)	3.1	0.4	11.13
American basswood	226,788	1,701	(N/A)	2.8	6.2	188.99
Sugar maple	117,460	881	(N/A)	2.8	3.2	97.88
Austrian pine	16,530	124	(N/A)	2.8	0.4	13.78
Pear	8,171	61	(N/A)	2.8	0.2	6.81
Eastern red cedar	8,817	66	(N/A)	2.5	0.2	8.27
Black walnut	113,801	854	(N/A)	2.5	3.1	106.69
Honeylocust	56,963	427	(N/A)	1.9	1.5	71.20
Northern red oak	72,769	546	(N/A)	1.9	2.0	90.96
Siberian elm	107,047	803	(N/A)	1.9	2.9	133.81
Apple	963	7	(N/A)	1.5	0.0	1.44
Conifer Evergreen La	1,178	9	(N/A)	1.2	0.0	2.21
Bur oak	69,059	518	(N/A)	1.2	1.9	129.49
Pin oak	74,855	561	(N/A)	0.9	2.0	187.14
Kentucky coffeetree	15,801	119	(N/A)	0.9	0.4	39.50
American elm	73,237	549	(N/A)	0.9	2.0	183.09
Maple	51	0	(N/A)	0.9	0.0	0.13
Conifer Evergreen M	5,322	40	(N/A)	0.6	0.1	19.96
Red maple	4,725	35	(N/A)	0.6	0.1	17.72
Eastern cottonwood	95,241	714	(N/A)	0.6	2.6	357.15
Red pine	14,981	112	(N/A)	0.6	0.4	56.18
Hickory	25,943	195	(N/A)	0.3	0.7	194.57
Broadleaf Evergreen I	13	0	(N/A)	0.3	0.0	0.09
Ginkgo	7,800	59	(N/A)	0.3	0.2	58.50
Swamp white oak	7,945	60	(N/A)	0.3	0.2	59.59
Ohio buckeye	14,280	107	(N/A)	0.3	0.4	107.10
Boxelder	22,806	171	(N/A)	0.3	0.6	171.04
Scotch pine	3,343	25	(N/A)	0.3	0.1	25.07
Citywide total	3,684,928	27,637	(N/A)	100.0	100.0	85.56

Table 5: Annual Carbon Sequestered

Pierson

Annual CO Benefits of Public Trees

4/1/2018

Species	Sequestered (lb)	Sequestered ($)	Decomposition Release (lb)	Maintenance Release (lb)	Total Released ($)	Avoided (lb)	Avoided ($)	Net Total (lb)	Total Standard ($) Error	% of Total Trees	% of Total $	Avg. $/tree
Norway spruce	11,680	88	-1,531	-183	-13	16,152	121	26,118	196 (N/A)	20.4	9.5	2.97
Green ash	43,490	326	-6,044	-211	-47	31,931	239	69,166	519 (N/A)	18.6	25.1	8.65
Silver maple	61,530	461	-4,021	-163	-31	24,235	182	81,581	612 (N/A)	14.2	29.7	13.30
Norway maple	4,411	33	-371	-31	-3	4,919	37	8,928	67 (N/A)	5.0	3.2	4.18
Blue spruce	926	7	-54	-22	-1	2,108	16	2,957	22 (N/A)	4.6	1.1	1.48
Northern hackberry	946	7	-73	-11	-1	1,609	12	2,472	19 (N/A)	3.1	0.9	1.85
American basswood	12,151	91	-1,089	-35	-8	4,787	36	15,814	119 (N/A)	2.8	5.7	13.18
Sugar maple	5,702	43	-565	-26	-4	3,916	29	9,028	68 (N/A)	2.8	3.3	7.52
Austrian pine	487	4	-79	-18	-1	1,556	12	1,945	15 (N/A)	2.8	0.7	1.62
Pear	1,025	8	-39	-11	0	1,117	8	2,092	16 (N/A)	2.8	0.8	1.74
Eastern red cedar	214	2	-42	-16	0	1,495	11	1,651	12 (N/A)	2.5	0.6	1.55
Black walnut	5,014	38	-546	-23	-4	3,628	27	8,071	61 (N/A)	2.5	2.9	7.57
Honeylocust	4,295	32	-273	-16	-2	3,390	25	7,395	55 (N/A)	1.9	2.7	9.24
Northern red oak	663	5	-349	-19	-3	2,417	18	2,712	20 (N/A)	1.9	1.0	3.39
Siberian elm	3,275	25	-514	-19	-4	2,789	21	5,531	41 (N/A)	1.9	2.0	6.91
Apple	149	1	-5	-2	0	147	1	288	2 (N/A)	1.5	0.1	0.43
Conifer Evergreen Large	126	1	-6	-3	0	235	2	353	3 (N/A)	1.2	0.1	0.66
Bur oak	2,391	18	-331	-12	-3	1,826	14	3,874	29 (N/A)	1.2	1.4	7.26
Pin oak	6,587	49	-359	-13	-3	1,956	15	8,170	61 (N/A)	0.9	3.0	20.43
Kentucky coffeetree	1,550	12	-76	-7	-1	1,227	9	2,695	20 (N/A)	0.9	1.0	6.74
American elm	1,745	13	-352	-14	-3	2,381	18	3,760	28 (N/A)	0.9	1.4	9.40
Maple	8	0	0	-1	0	20	0	28	0 (N/A)	0.9	0.0	0.07
Conifer Evergreen Mediun	294	2	-26	-5	0	465	3	728	5 (N/A)	0.6	0.3	2.73
Red maple	648	5	-23	-3	0	616	5	1,239	9 (N/A)	0.6	0.5	4.65
Eastern cottonwood	1,391	10	-457	-11	-4	1,547	12	2,470	19 (N/A)	0.6	0.9	9.26
Red pine	0	0	-72	-9	-1	622	5	541	4 (N/A)	0.6	0.2	2.03
Hickory	960	7	-125	-4	-1	650	5	1,481	11 (N/A)	0.3	0.5	11.11
Broadleaf Evergreen Large	12	0	0	0	0	15	0	27	0 (N/A)	0.3	0.0	0.20
Ginkgo	0	0	-37	-4	0	396	3	355	3 (N/A)	0.3	0.1	2.66
Swamp white oak	470	4	-38	-3	0	440	3	869	7 (N/A)	0.3	0.3	6.52
Ohio buckeye	0	0	-69	-4	-1	539	4	466	3 (N/A)	0.3	0.2	3.49
Boxelder	1,454	11	-109	-4	-1	490	4	1,830	14 (N/A)	0.3	0.7	13.73
Norway spruce	11,680	88	-1,531	-183	-13	16,152	121	26,118	196 (N/A)	20.4	9.5	2.97
Green ash	43,490	326	-6,044	-211	-47	31,931	239	69,166	519 (N/A)	18.6	25.1	8.65
Silver maple	61,530	461	-4,021	-163	-31	24,235	182	81,581	612 (N/A)	14.2	29.7	13.30
Norway maple	4,411	33	-371	-31	-3	4,919	37	8,928	67 (N/A)	5.0	3.2	4.18
Blue spruce	926	7	-54	-22	-1	2,108	16	2,957	22 (N/A)	4.6	1.1	1.48
Northern hackberry	946	7	-73	-11	-1	1,609	12	2,472	19 (N/A)	3.1	0.9	1.85
American basswood	12,151	91	-1,089	-35	-8	4,787	36	15,814	119 (N/A)	2.8	5.7	13.18
Sugar maple	5,702	43	-565	-26	-4	3,916	29	9,028	68 (N/A)	2.8	3.3	7.52
Austrian pine	487	4	-79	-18	-1	1,556	12	1,945	15 (N/A)	2.8	0.7	1.62
Pear	1,025	8	-39	-11	0	1,117	8	2,092	16 (N/A)	2.8	0.8	1.74
Eastern red cedar	214	2	-42	-16	0	1,495	11	1,651	12 (N/A)	2.5	0.6	1.55
Black walnut	5,014	38	-546	-23	-4	3,628	27	8,071	61 (N/A)	2.5	2.9	7.57
Honeylocust	4,295	32	-273	-16	-2	3,390	25	7,395	55 (N/A)	1.9	2.7	9.24
Northern red oak	663	5	-349	-19	-3	2,417	18	2,712	20 (N/A)	1.9	1.0	3.39
Siberian elm	3,275	25	-514	-19	-4	2,789	21	5,531	41 (N/A)	1.9	2.0	6.91
Apple	149	1	-5	-2	0	147	1	288	2 (N/A)	1.5	0.1	0.43
Conifer Evergreen Large	126	1	-6	-3	0	235	2	353	3 (N/A)	1.2	0.1	0.66
Bur oak	2,391	18	-331	-12	-3	1,826	14	3,874	29 (N/A)	1.2	1.4	7.26
Pin oak	6,587	49	-359	-13	-3	1,956	15	8,170	61 (N/A)	0.9	3.0	20.43
Kentucky coffeetree	1,550	12	-76	-7	-1	1,227	9	2,695	20 (N/A)	0.9	1.0	6.74
American elm	1,745	13	-352	-14	-3	2,381	18	3,760	28 (N/A)	0.9	1.4	9.40
Maple	8	0	0	-1	0	20	0	28	0 (N/A)	0.9	0.0	0.07
Conifer Evergreen Mediun	294	2	-26	-5	0	465	3	728	5 (N/A)	0.6	0.3	2.73
Red maple	648	5	-23	-3	0	616	5	1,239	9 (N/A)	0.6	0.5	4.65
Eastern cottonwood	1,391	10	-457	-11	-4	1,547	12	2,470	19 (N/A)	0.6	0.9	9.26
Red pine	0	0	-72	-9	-1	622	5	541	4 (N/A)	0.6	0.2	2.03
Hickory	960	7	-125	-4	-1	650	5	1,481	11 (N/A)	0.3	0.5	11.11
Broadleaf Evergreen Large	12	0	0	0	0	15	0	27	0 (N/A)	0.3	0.0	0.20
Ginkgo	0	0	-37	-4	0	396	3	355	3 (N/A)	0.3	0.1	2.66
Swamp white oak	470	4	-38	-3	0	440	3	869	7 (N/A)	0.3	0.3	6.52
Ohio buckeye	0	0	-69	-4	-1	539	4	466	3 (N/A)	0.3	0.2	3.49
Boxelder	1,454	11	-109	-4	-1	490	4	1,830	14 (N/A)	0.3	0.7	13.73
Scotch pine	187	1	-16	-3	0	246	2	415	3 (N/A)	0.3	0.2	3.11
Citywide total	173,783	1,303	-17,691	-905	-139	119,866	899	275,053	2,063 (N/A)	100.0	100.0	6.39

Table 6: Annual Social and Aesthetic Benefits

Pierson

Annual Aesthetic/Other Benefits of Public Trees

4/1/2018

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Norway spruce	1,656	(N/A)	20.4	10.7	25.09
Green ash	3,240	(N/A)	18.6	20.9	54.01
Silver maple	4,790	(N/A)	14.2	30.9	104.12
Norway maple	453	(N/A)	5.0	2.9	28.30
Blue spruce	318	(N/A)	4.6	2.1	21.18
Northern hackberry	198	(N/A)	3.1	1.3	19.78
American basswood	786	(N/A)	2.8	5.1	87.32
Sugar maple	566	(N/A)	2.8	3.7	62.93
Austrian pine	145	(N/A)	2.8	0.9	16.15
Pear	58	(N/A)	2.8	0.4	6.40
Eastern red cedar	68	(N/A)	2.5	0.4	8.55
Black walnut	410	(N/A)	2.5	2.6	51.23
Honeylocust	973	(N/A)	1.9	6.3	162.12
Northern red oak	52	(N/A)	1.9	0.3	8.59
Siberian elm	223	(N/A)	1.9	1.4	37.15
Apple	7	(N/A)	1.5	0.0	1.31
Conifer Evergreen Large	50	(N/A)	1.2	0.3	12.40
Bur oak	186	(N/A)	1.2	1.2	46.38
Pin oak	471	(N/A)	0.9	3.0	157.02
Kentucky coffeetree	149	(N/A)	0.9	1.0	49.80
American elm	226	(N/A)	0.9	1.5	75.18
Maple	0	(N/A)	0.9	0.0	0.04
Conifer Evergreen Medium	40	(N/A)	0.6	0.3	19.97
Red maple	96	(N/A)	0.6	0.6	47.86
Eastern cottonwood	87	(N/A)	0.6	0.6	43.45
Red pine	0	(N/A)	0.6	0.0	0.00
Hickory	67	(N/A)	0.3	0.4	66.60
Broadleaf Evergreen Large	8	(N/A)	0.3	0.1	8.32
Ginkgo	0	(N/A)	0.3	0.0	0.00
Swamp white oak	43	(N/A)	0.3	0.3	43.05
Ohio buckeye	0	(N/A)	0.3	0.0	0.00
Boxelder	79	(N/A)	0.3	0.5	78.52
Scotch pine	47	(N/A)	0.3	0.3	47.08
Citywide total	15,489	(N/A)	100.0	100.0	47.95

Table 7: Summary of Benefits in Dollars

Pierson

Total Annual Benefits of Public Trees by Species ($)

4/1/2018

Species	Energy	CO_2	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Norway spruce	1,991	196	-13	5,781	1,656	9,612	(N/A)	15.4
Green ash	3,993	519	765	7,105	3,240	15,621	(N/A)	25.0
Silver maple	2,975	612	558	5,872	4,790	14,806	(N/A)	23.6
Norway maple	643	67	109	666	453	1,938	(N/A)	3.1
Blue spruce	273	22	29	442	318	1,084	(N/A)	1.7
Northern hackberry	217	19	34	203	198	671	(N/A)	1.1
American basswood	619	119	99	1,062	786	2,685	(N/A)	4.3
Sugar maple	484	68	79	789	566	1,987	(N/A)	3.2
Austrian pine	204	15	22	386	145	773	(N/A)	1.2
Pear	164	16	23	65	58	324	(N/A)	0.5
Eastern red cedar	197	12	17	354	68	649	(N/A)	1.0
Black walnut	455	61	83	707	410	1,715	(N/A)	2.7
Honeylocust	417	55	70	617	973	2,133	(N/A)	3.4
Northern red oak	305	20	43	416	52	836	(N/A)	1.3
Siberian elm	340	41	72	581	223	1,258	(N/A)	2.0
Apple	22	2	3	8	7	41	(N/A)	0.1
Conifer Evergreen Large	27	3	3	46	50	128	(N/A)	0.2
Bur oak	223	29	43	389	186	870	(N/A)	1.4
Pin oak	241	61	31	402	471	1,206	(N/A)	1.9
Kentucky coffeetree	146	20	24	150	149	489	(N/A)	0.8
American elm	289	28	62	370	226	974	(N/A)	1.6
Maple	3	0	0	1	0	5	(N/A)	0.0
Conifer Evergreen Medi	59	5	6	125	40	236	(N/A)	0.4
Red maple	74	9	12	60	96	251	(N/A)	0.4
Eastern cottonwood	190	19	42	392	87	729	(N/A)	1.2
Red pine	76	4	-3	250	0	327	(N/A)	0.5
Hickory	82	11	16	149	67	324	(N/A)	0.5
Broadleaf Evergreen La	2	0	0	1	8	12	(N/A)	0.0
Ginkgo	49	3	9	50	0	112	(N/A)	0.2
Swamp white oak	59	7	10	67	43	186	(N/A)	0.3
Ohio buckeye	71	3	14	102	0	190	(N/A)	0.3
Boxelder	62	14	11	109	79	274	(N/A)	0.4
Scotch pine	30	3	1	80	47	163	(N/A)	0.3
Citywide Total	14,981	2,063	2,276	27,798	15,489	62,608	(N/A)	100.0

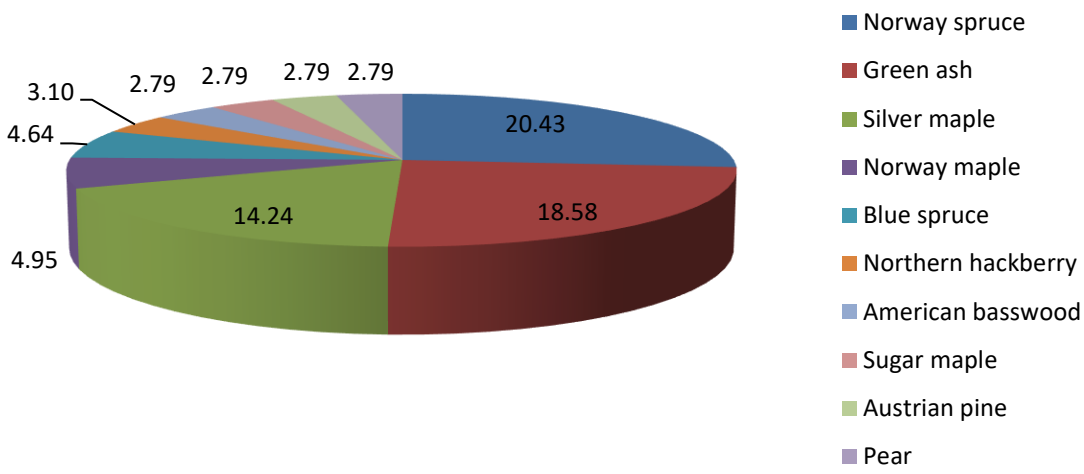

Figure 1: Species Distribution

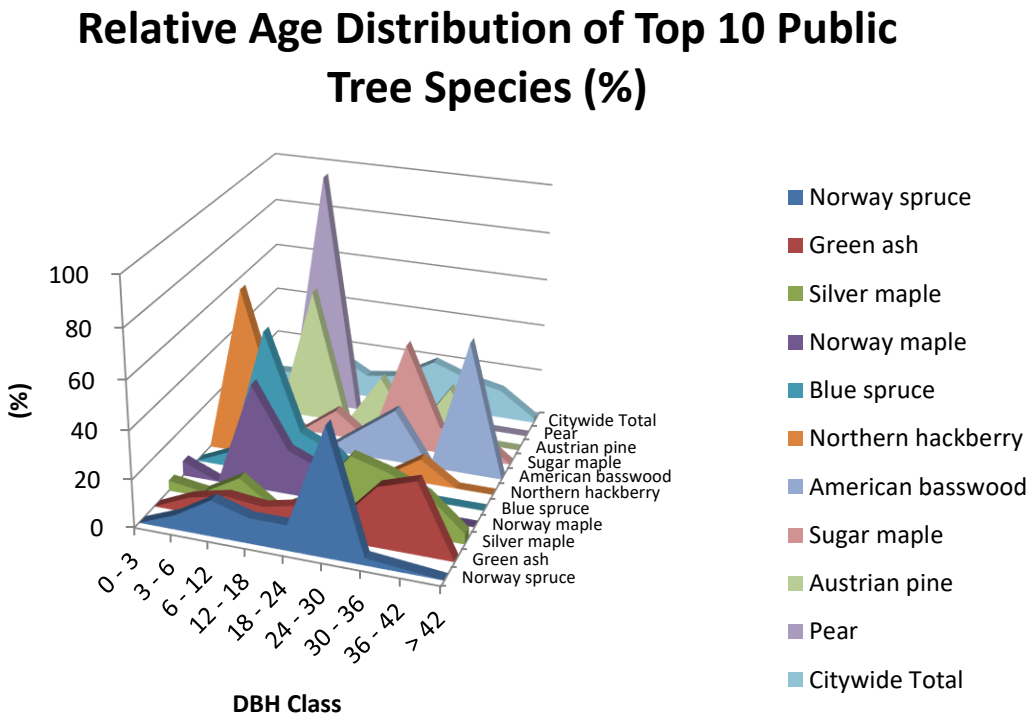

Figure 2: Relative Age Class

Figure 3: Foliage Condition

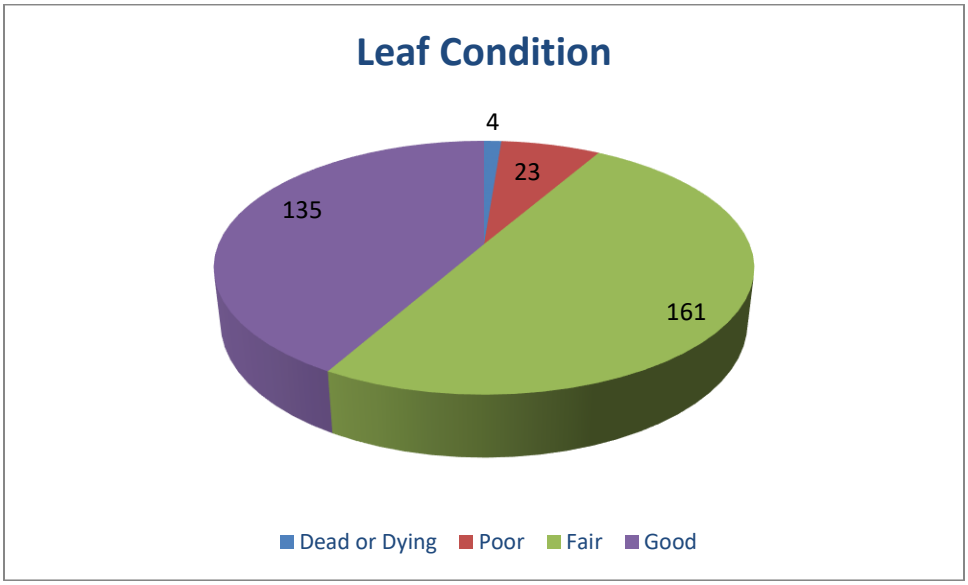

Figure 4: Wood Condition

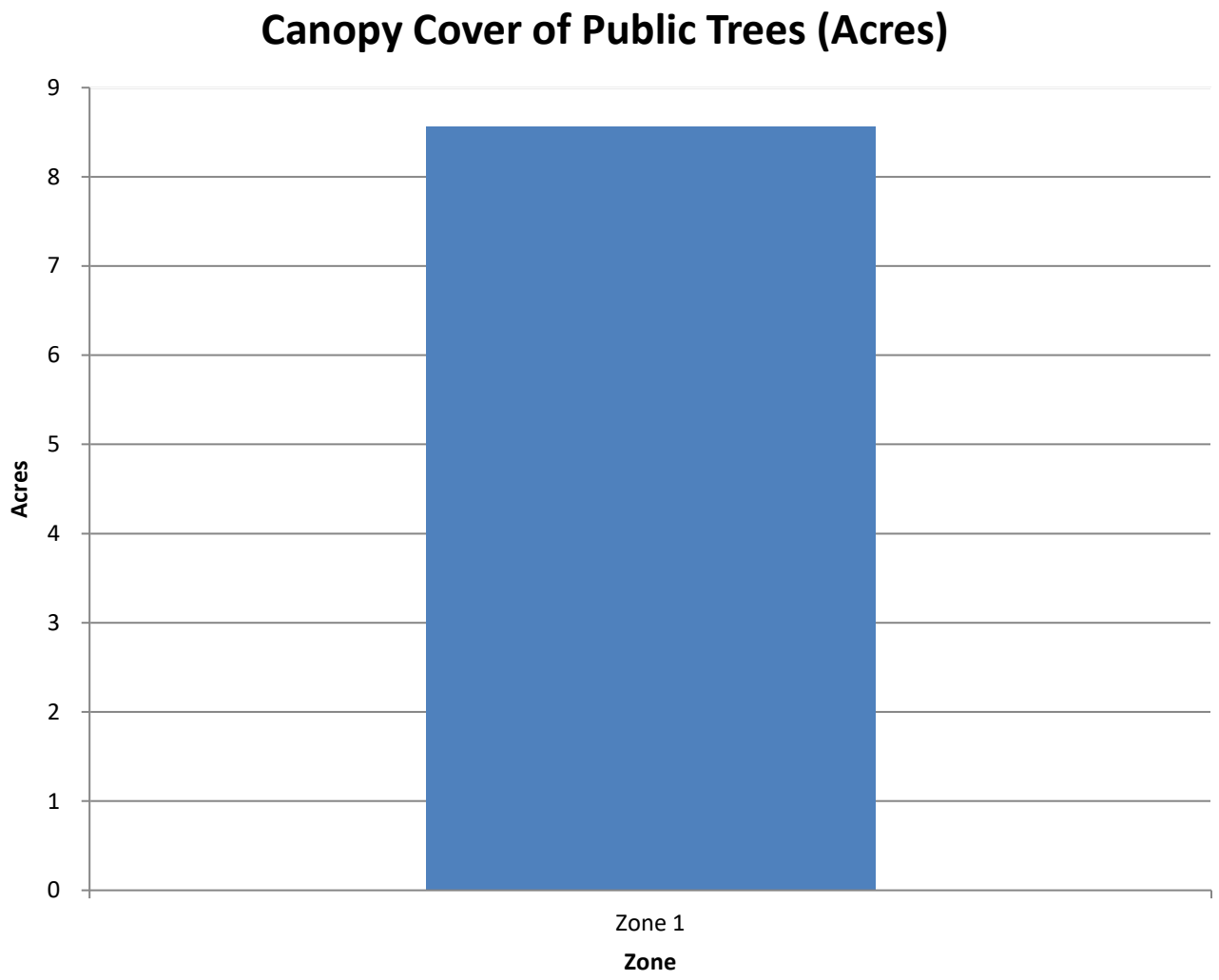

Figure 5: Canopy Cover in Acres

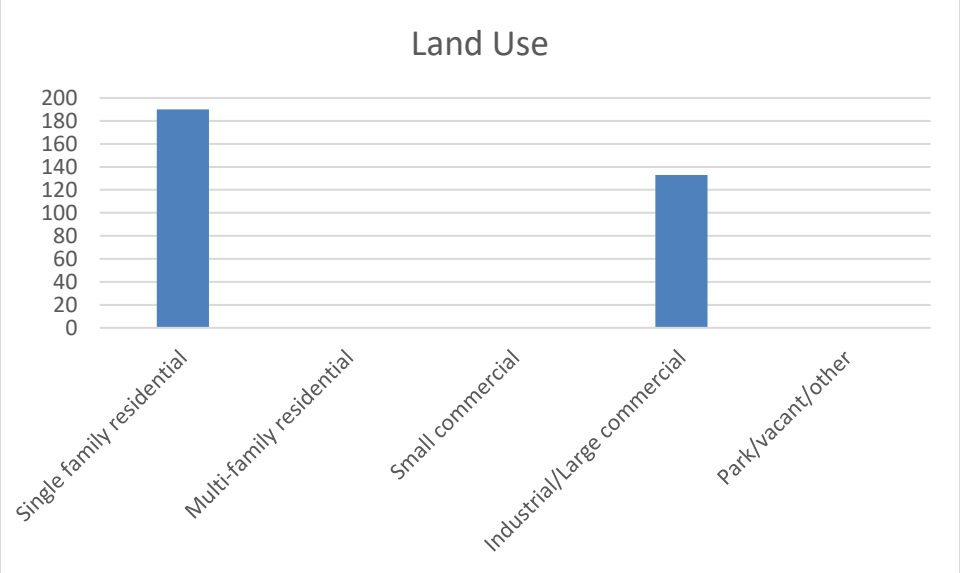

Figure 6: Land Use of city/park trees

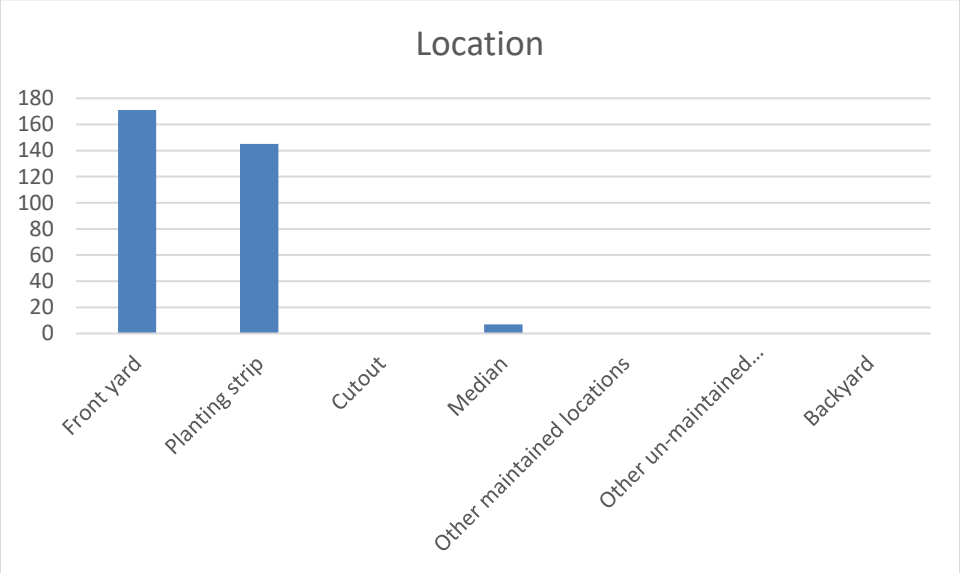

Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

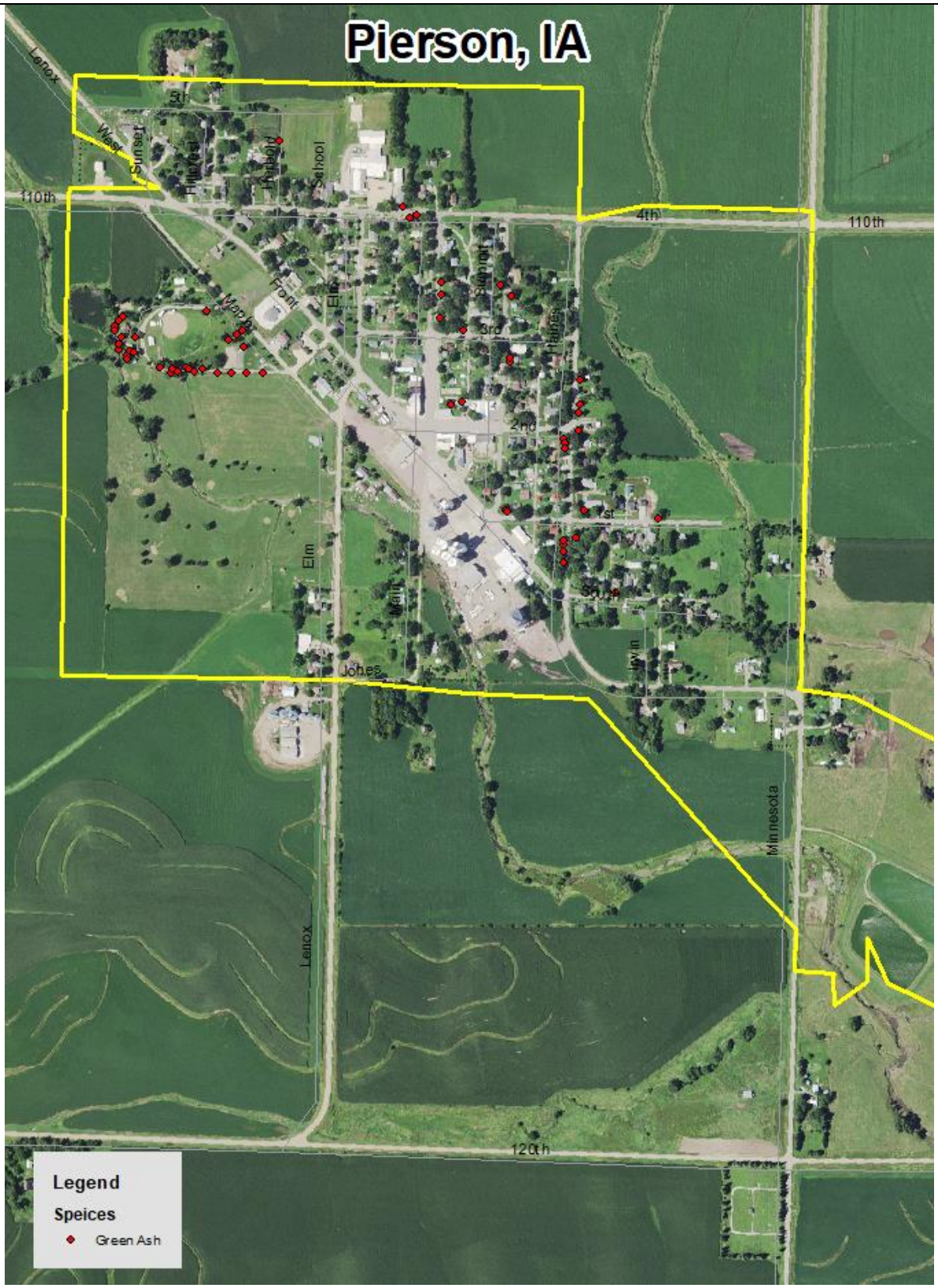

Figure 1: Location of Ash Trees

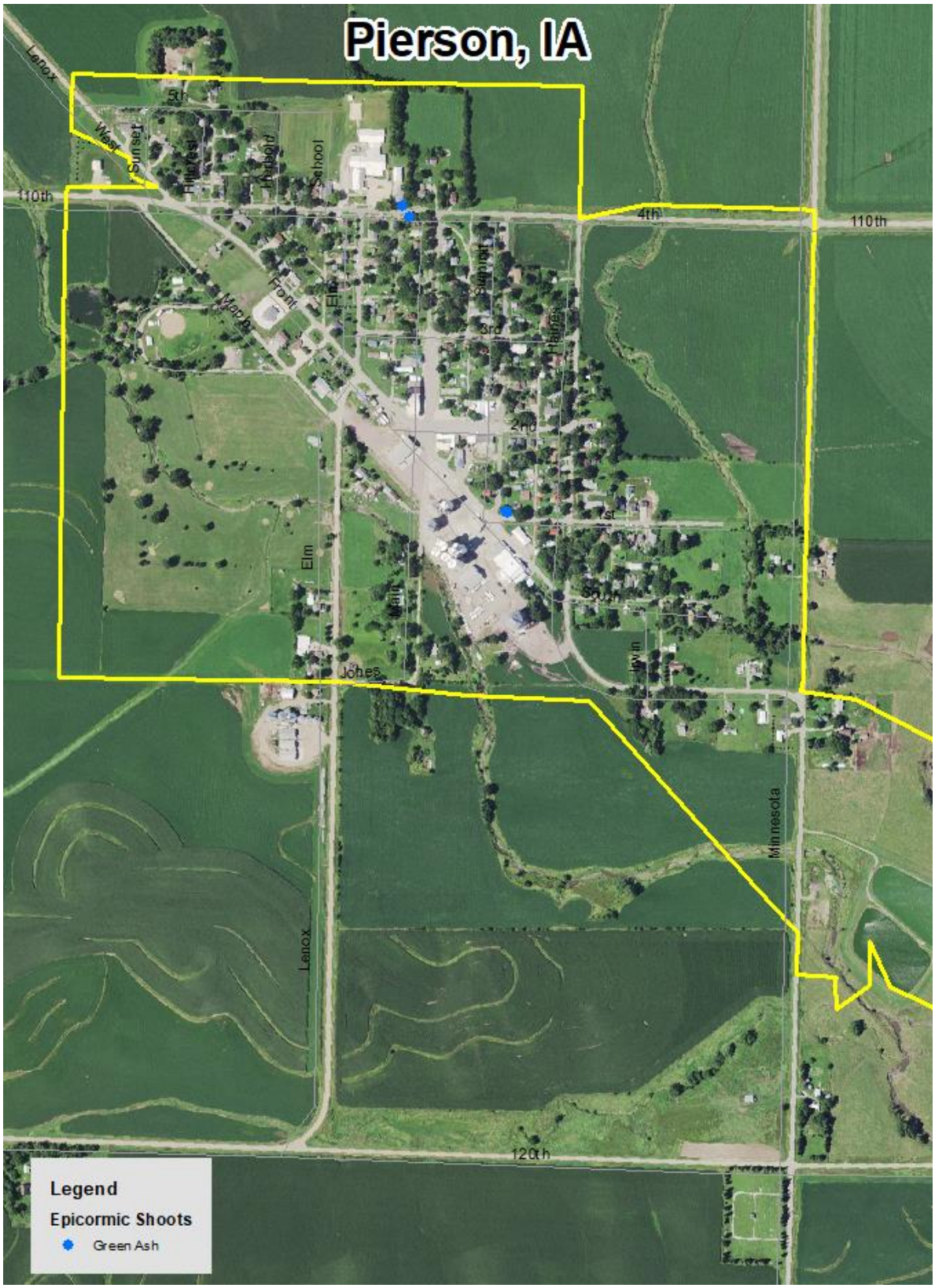

Figure 2: Location of EAB symptoms

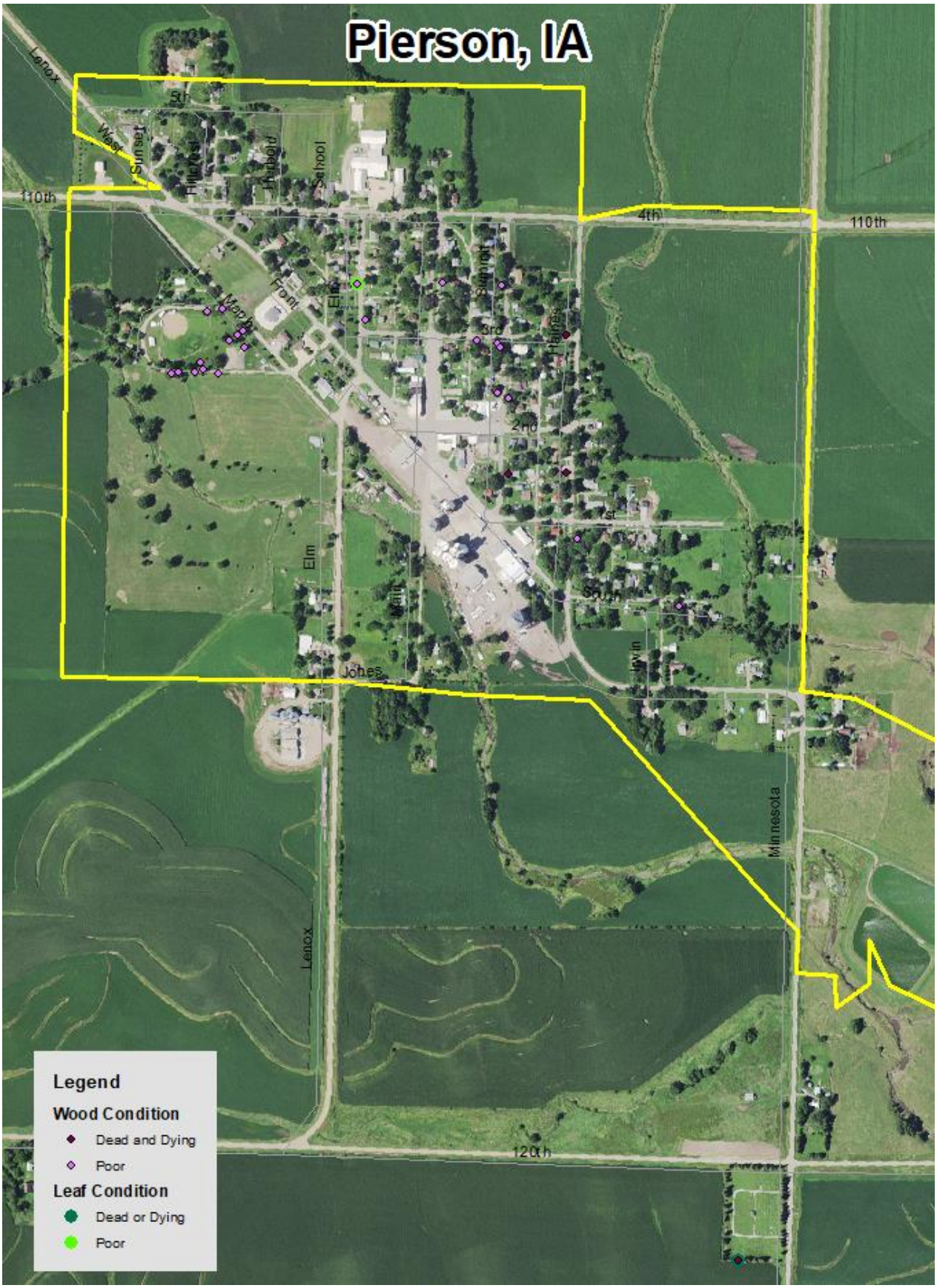

Figure 3: Location of Poor Condition Trees

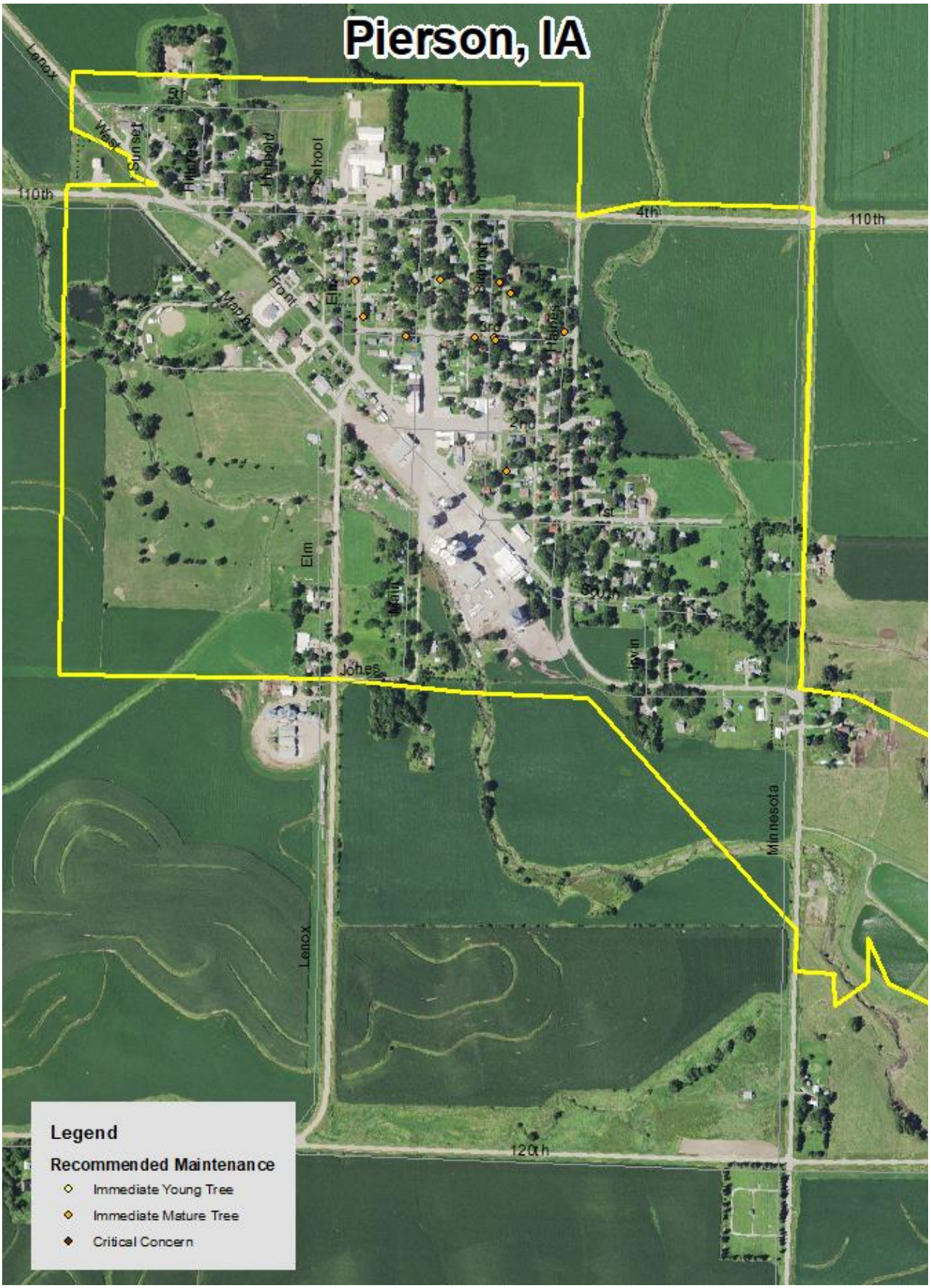

Figure 4: Location of Trees with Recommended Maintenance

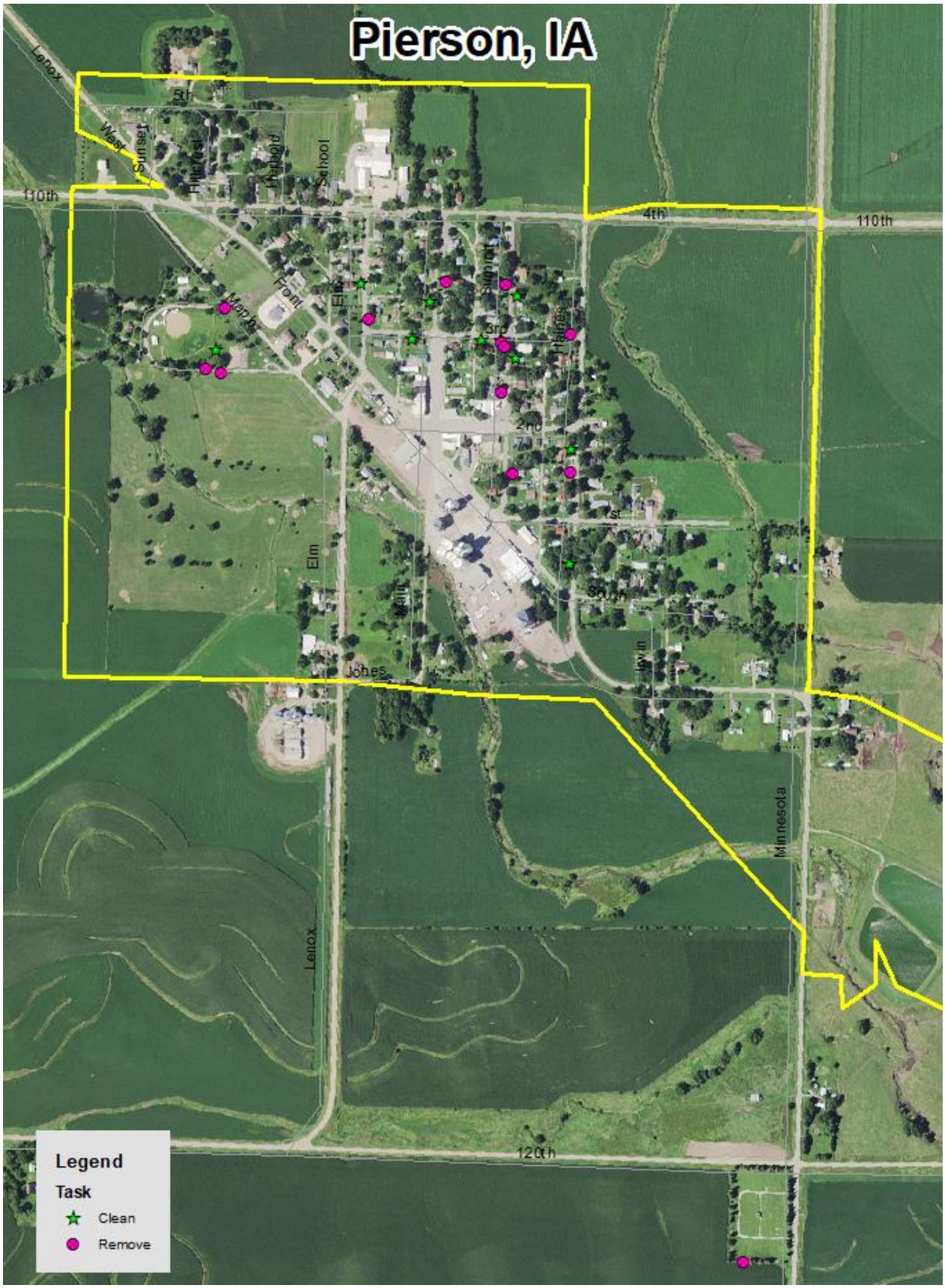

Figure 5: Maintenance Tasks *City ownership of the trees recommended for removal should be verified prior to any removal*

CHAPTER 151

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 which 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 which 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 next page is 601]

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