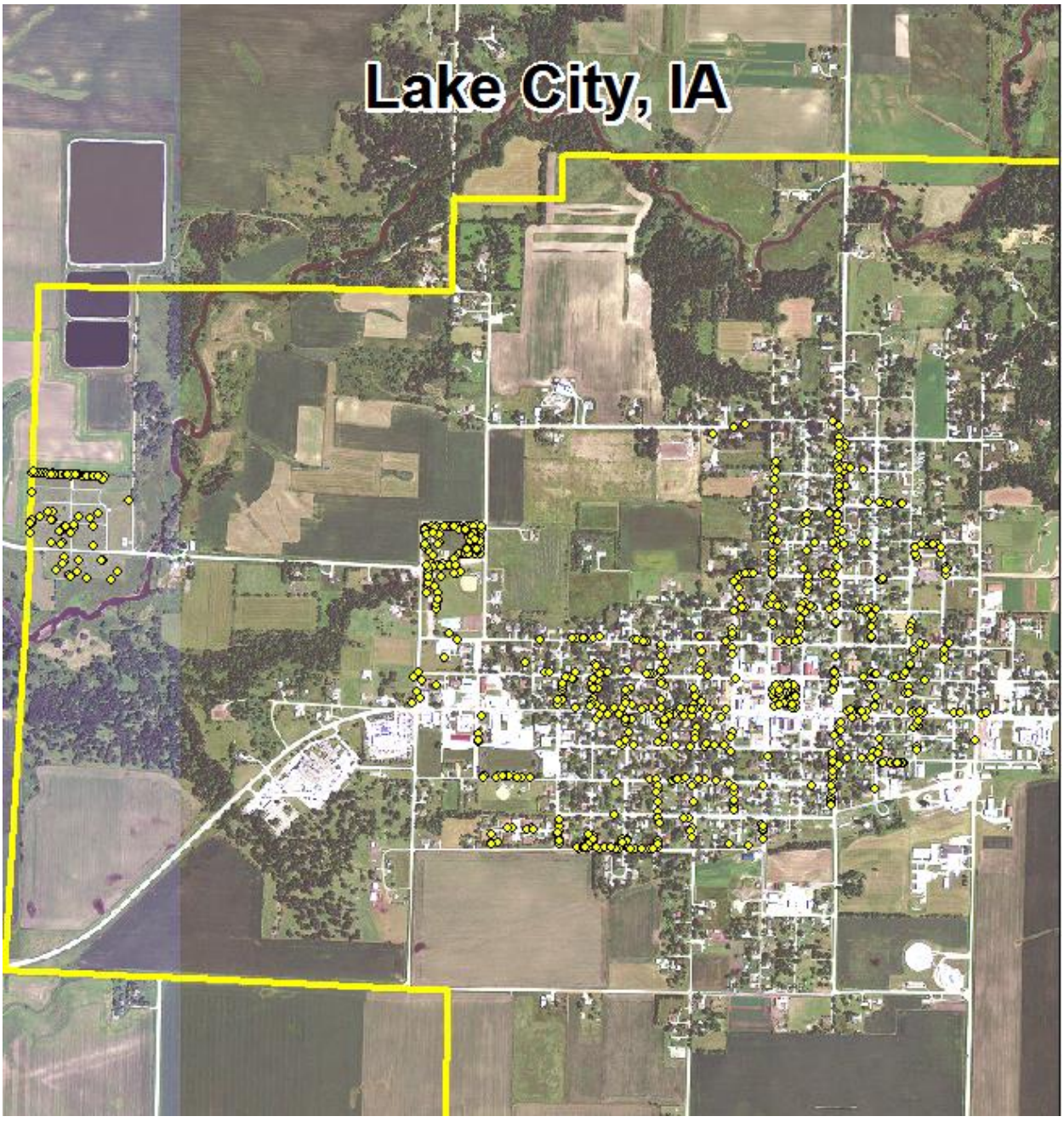
Lake City, IA



2016 Urban Forest Management Plan

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Executive Summary

Overview

This plan was developed to assist the City of Lake City 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 20% of Lake City'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 2015, 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 760 trees inventoried.

- Lake City's trees provide $137,655 of benefits annually, an average of $181 a tree
- There are over 38 species of trees
- The top three genera are: Maple 31%, Ash 20% and Hackberry 16%
- 8% of trees are in need of some type of management
- 21 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 21 trees needing removal, 4 are of critical concern*City ownership of the trees recommended for removal should be verified prior to any removal*
- 4 of the 151 ash trees should be carefully examined, as they have one symptom 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, or evergreens.
- Check ash trees with a visual survey yearly

Introduction

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

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

Inventory

In 2015, 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 760 city trees was entered into the USDA Forest service program STREETS, 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. Lake City's trees reduce energy related costs by approximately $38,504 annually (Appendix A, Table 1). These savings are both in Electricity (182.5 MWh) and in Natural Gas (25,151.1 Therms).

Annual Stormwater Benefits

Lake City's trees intercept about 2,011,380 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $54,508 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 mater (ozone). In Lake City, it is estimated that trees remove 2,338 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 $6,575 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Lake City, trees sequester about 327,203 lbs of carbon a year with an associated value of $2,454 (Appendix A, Table 5). In addition, the trees store 6,675,635 lbs of carbon, with a yearly benefit of $50,067 (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. Lake City receives $35,614 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, Lake City's trees provide $137,655 of benefits annually. Benefits of individual trees vary based on size, species, health

and location, but on average each of the 760 trees in Lake City provide approximately $181 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Lake City has over 38 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genera is as follows:

Maple	233	31%
Ash	151	20%
Hackberry	125	16%
Spruce	76	1%
Walnut	28	<1%
Apple	26	<1%
Cedar	26	<1%
Abortivae	19	<1%
Oak	17	<1%
Honey Locust	14	<1%
Linden	12	<1%
Elm	10	<1%
Pine	6	<1%
Hickory	3	<1%
Redbud	3	<1%
Cherry	2	<1%
Cottonwood	2	<1%
Lilac	2	<1%
Birch	1	<1%
Catalpa	1	<1%
Mountain Ash	1	<1%
Mulberry	1	<1%
Sycamore	1	<1%

Age Class

Most of Lake City's trees (37%) are between 24 and 36 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. Lake City's size curve is on the larger side, indicating an older 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 Lake City indicate that 96% of the trees are in good health, with only 1% of the foliage in poor health, dead or dying (Appendix A, Figure 3 &

Appendix B, Figure 3). Similarly, 70% of Lake City'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 9% of the population. This 9% 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	34	4%
Tree Removal	21	3%
Tree Staking	7	1%
Crown Reduction	1	<1%

Canopy Cover

The total canopy with both private and public trees is 13%, 412 acres. The canopy cover included in the Lake City inventory includes approximately 21 acres (Appendix A, Figure 4).

Land Use and Location

The majority of Lake City's street 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	64%
Park/vacant/other	33%
Multifamily residential	3%
Small commercial	<1%

Location	
Front yard/Park	57%
Planting strip	43%

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

Lake City has 4 critical concern trees that need immediate removal. These trees can be seen on the Location of Trees with Recommended Maintenance map (Appendix B, Figure 4). It is recommended after addressing those 4 trees, to start with the large diameter critical concern trees first. There are 8 trees marked for removal and should be addressed immediately after critical concern trees. There are a total of 18 trees needing immediate trimming. Please refer to the six year maintenance plan at the end of this section.

Poor tree species

After the removal of the critical concern and immediate maintenance trees, ash trees in poor health should be assessed for removal (Appendix B, Figure 3 & Appendix B, Figure 4). Of the 10 removals, 5 are ash trees. There are a total of 151 ash trees, and 3 of those have epicormics shots which is one of five and symptoms associated with EAB that were assessed. In addition to those marked for removal, there are 15 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 Lake City.

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 (31%) (Appendix A, Figure 1). Maples should not be planted until this percentage can be lowered. In addition I would lower the amount of planting of Hackberry as it is 16% or the composition. 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, or evergreens, as outlined in section 6-2.01032 of the city ordinance (Appendix C). All trees planted must meet the restrictions in city ordinance (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.

PROPOSED WORK SCHEDULE AND ESTIMATED COSTS ASSOCIATED WITH ASH

Year 1

Removal: 4 critical concern trees and 3 immediate
Planting and Replacement: 8 trees to be planted in open locations
Visual Survey for signs and symptoms of EAB

Year 2

Removal: 5 other immediate removals 1 routine removal
Planting and Replacement: 7 trees in open locations from year one removals
Routine trimming: Contract to trim 1/3 of the city trees
Visual Survey for signs and symptoms of EAB

Year 3

Removal: 7 trees
Planting and Replacement: 8 trees to be planted in open locations and locations from previous removals
Visual Survey for signs and symptoms of EAB

Year 4

Removal: 6 trees
Planting and Replacement: 7 trees in open locations from previous removals
Routine trimming: Contract to trim 1/3 of the city trees
Visual Survey for signs and symptoms of EAB

Year 5

Removal: 7 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: 8 trees to be planted in open locations and locations from previous removals
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
Visual Survey for signs and symptoms of EAB

In addition to the removals listed in year 1-4 there are 146 other ash trees that will need to be removed upon arrival of EAB if they are not preemptively treated. The estimated total cost is about $102,200 if not done with current staff.

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 11 trees could be treated per year (every other year treatment). This would be 22 trees selected for treatment, and Lake City would still need to find $86,800 for removal. Alternatively, if there are 100 treatable trees, it would cost approximately $15,000 a year for treatment and leave $32,200 for removal. These are alternatives to straight removal of ash trees. However, whether or not the treatment option is selected, there will be an increased cost of dealing with ash trees if EAB is found in Lake City. It is suggested to consider increasing the budget to plan for this.

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 6-2.0103(Appendix C). The new plantings will be a diverse mix and will not include ash, maple, cottonwood, poplar, box elder, Chinese elm, or evergreens.

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. City Code 6-2.0315 “The City shall have the right to cause the removal of any dead or diseased trees on private property within the City, when such trees constitute a hazard to life and property, or harbor insects or disease which constitute a potential threat to other trees with the City. The City Tree Board will notify in writing the owners of such trees. Removal shall be done by said owners at their own expense within sixty days after the date provisions, the City shall have the authority to remove such trees and charge the cost of removal on the owners property tax notice.”

Purposed Budget Increase

EAB could potentially kill all ash trees in Lake City within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to $12,334 a year. If the budget were increased to $10,000 a year all ash could be removed within 7.5 years. Additionally, it is recommended that Lake City 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 11 trees could be treated per year (every other year treatment). This would be 22 trees selected for treatment, and Lake City would still need to find $63,000 for removal. Alternatively, if there are 100 treatable trees, it would cost approximately $15,000 a year for treatment and leave $24,000 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 Lake City. 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

Lake City

Annual Energy Benefits of All Trees

12/22/2015

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	42.0	3,191	5,731.4	5,617	8,807	(N/A)	19.9	22.9	58.33
Northern hackberry	43.8	3,323	6,189.4	6,066	9,388	(N/A)	16.4	24.4	75.11
Norway maple	24.9	1,887	3,543.7	3,473	5,360	(N/A)	12.9	13.9	54.69
Silver maple	23.6	1,791	3,058.7	2,998	4,789	(N/A)	9.6	12.4	65.60
Blue spruce	1.9	145	271.8	266	412	(N/A)	5.4	1.1	10.04
Sugar maple	8.4	638	1,113.4	1,091	1,729	(N/A)	3.9	4.5	57.65
Black walnut	8.1	615	1,113.9	1,092	1,706	(N/A)	3.7	4.4	60.95
Apple	2.9	220	452.6	444	663	(N/A)	3.6	1.7	24.57
Eastern red cedar	2.8	215	419.0	411	626	(N/A)	3.4	1.6	24.07
Maple	0.7	56	109.9	108	164	(N/A)	3.2	0.4	6.82
Black spruce	0.8	59	126.3	124	182	(N/A)	3.0	0.5	7.93
Northern white cedar	0.9	71	125.6	123	194	(N/A)	2.5	0.5	10.24
Honeylocust	4.8	367	625.4	613	980	(N/A)	1.8	2.5	69.99
Norway spruce	1.7	127	220.9	216	343	(N/A)	1.3	0.9	34.31
Bur oak	2.3	177	317.0	311	487	(N/A)	0.9	1.3	69.63
American basswood	1.9	145	257.1	252	397	(N/A)	0.9	1.0	56.78
Red maple	0.6	45	87.8	86	131	(N/A)	0.8	0.3	21.79
Northern red oak	1.0	73	137.5	135	208	(N/A)	0.7	0.5	41.58
Elm	1.5	114	199.4	195	310	(N/A)	0.7	0.8	61.96
Eastern white pine	0.9	70	123.0	121	191	(N/A)	0.7	0.5	38.17
Littleleaf linden	0.6	45	76.7	75	120	(N/A)	0.7	0.3	23.95
Siberian elm	1.1	82	146.4	143	225	(N/A)	0.5	0.6	56.27
Pin oak	1.2	95	166.5	163	258	(N/A)	0.5	0.7	64.50
Eastern redbud	0.2	16	29.1	29	44	(N/A)	0.4	0.1	14.80
Eastern cottonwood	0.7	55	90.1	88	143	(N/A)	0.3	0.4	71.43
Spruce	0.2	18	34.1	33	52	(N/A)	0.3	0.1	25.88
Japanese tree lilac	0.3	20	37.5	37	56	(N/A)	0.3	0.1	28.16
Hickory	0.5	36	54.0	53	88	(N/A)	0.3	0.2	44.23
Boxelder	0.5	36	67.1	66	102	(N/A)	0.3	0.3	50.95
Mimosa	0.0	2	3.8	4	5	(N/A)	0.1	0.0	5.40
Cherry plum	0.0	2	3.8	4	5	(N/A)	0.1	0.0	5.40
Mulberry	0.2	14	24.7	24	38	(N/A)	0.1	0.1	38.13
Oak	0.0	0	0.5	0	1	(N/A)	0.1	0.0	0.66
Catalpa	0.3	20	38.1	37	57	(N/A)	0.1	0.1	57.32
American elm	0.2	19	27.5	27	46	(N/A)	0.1	0.1	45.87
Paper birch	0.1	7	13.7	13	21	(N/A)	0.1	0.1	20.64
American sycamore	0.4	33	59.0	58	91	(N/A)	0.1	0.2	91.02
Austrian pine	0.2	13	23.3	23	35	(N/A)	0.1	0.1	35.47
Black cherry	0.2	15	31.6	31	46	(N/A)	0.1	0.1	46.14
Total	182.5	13,855	25,151.1	24,648	38,504	(N/A)	100.0	100.0	50.66

Table 2: Annual Stormwater Benefits

Lake City

Annual Stormwater Benefits of Public Trees

12/22/2015

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	470,943	12,763	(N/A)	19.9	23.4	84.52
Northern hackberry	431,413	11,691	(N/A)	16.4	21.4	93.53
Norway maple	232,801	6,309	(N/A)	12.9	11.6	64.38
Silver maple	307,574	8,335	(N/A)	9.6	15.3	114.18
Blue spruce	21,130	573	(N/A)	5.4	1.1	13.97
Sugar maple	102,861	2,788	(N/A)	3.9	5.1	92.92
Black walnut	92,478	2,506	(N/A)	3.7	4.6	89.51
Apple	13,562	368	(N/A)	3.6	0.7	13.61
Eastern red cedar	41,523	1,125	(N/A)	3.4	2.1	43.28
Maple	3,377	92	(N/A)	3.2	0.2	3.81
Black spruce	7,955	216	(N/A)	3.0	0.4	9.37
Northern white cedar	15,656	424	(N/A)	2.5	0.8	22.33
Honeylocust	55,772	1,511	(N/A)	1.8	2.8	107.96
Norway spruce	38,971	1,056	(N/A)	1.3	1.9	105.61
Bur oak	35,662	966	(N/A)	0.9	1.8	138.06
American basswood	18,745	508	(N/A)	0.9	0.9	72.57
Red maple	3,264	88	(N/A)	0.8	0.2	14.74
Northern red oak	10,148	275	(N/A)	0.7	0.5	55.00
Elm	16,503	447	(N/A)	0.7	0.8	89.45
Eastern white pine	23,023	624	(N/A)	0.7	1.1	124.79
Littleleaf linden	3,534	96	(N/A)	0.7	0.2	19.15
Siberian elm	11,756	319	(N/A)	0.5	0.6	79.65
Pin oak	12,150	329	(N/A)	0.5	0.6	82.31
Eastern redbud	743	20	(N/A)	0.4	0.0	6.71
Eastern cottonwood	8,704	236	(N/A)	0.3	0.4	117.95
Spruce	5,200	141	(N/A)	0.3	0.3	70.46
Japanese tree lilac	931	25	(N/A)	0.3	0.0	12.62
Hickory	2,931	79	(N/A)	0.3	0.1	39.72
Boxelder	5,323	144	(N/A)	0.3	0.3	72.12
Mimosa	69	2	(N/A)	0.1	0.0	1.86
Cherry plum	69	2	(N/A)	0.1	0.0	1.86
Mulberry	667	18	(N/A)	0.1	0.0	18.06
Oak	18	0	(N/A)	0.1	0.0	0.48
Catalpa	2,591	70	(N/A)	0.1	0.1	70.21
American elm	1,391	38	(N/A)	0.1	0.1	37.69
Paper birch	608	16	(N/A)	0.1	0.0	16.47
American sycamore	7,239	196	(N/A)	0.1	0.4	196.17
Austrian pine	2,925	79	(N/A)	0.1	0.1	79.26
Black cherry	1,174	32	(N/A)	0.1	0.1	31.82
Citywide total	2,011,380	54,508	(N/A)	100.0	100.0	71.72

Table 3: Annual Air Quality Benefits

Lake City

Annual Air Quality Benefits of Public Trees

12/22/2015

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	58.6	9.4	28.0	2.6	312	200.5	29.2	27.9	190.5	1,250	0.0	0	546.7	1,562 (N/A)	19.9	10.34
Northern hackberry	68.7	11.9	34.8	3.1	374	211.1	30.6	29.1	198.5	1,310	0.0	0	587.9	1,685 (N/A)	16.4	13.48
Norway maple	48.0	8.3	23.5	2.1	259	120.2	17.4	16.6	112.8	745	-11.2	-42	337.7	962 (N/A)	12.9	9.82
Silver maple	49.8	8.4	24.9	2.2	270	110.9	16.3	15.5	106.8	695	-26.1	-98	308.7	867 (N/A)	9.6	11.87
Blue spruce	2.1	0.4	2.0	0.3	15	9.2	1.3	1.3	8.7	57	-6.9	-26	18.4	46 (N/A)	5.4	1.13
Sugar maple	14.3	2.4	7.0	0.6	77	39.8	5.8	5.6	38.1	249	-11.2	-42	102.5	284 (N/A)	3.9	9.47
Black walnut	11.6	1.9	5.5	0.5	62	38.7	5.6	5.4	36.7	241	0.0	0	105.9	303 (N/A)	3.7	10.81
Apple	4.3	0.7	2.0	0.2	23	14.3	2.0	1.9	13.1	88	0.0	0	38.6	111 (N/A)	3.6	4.10
Eastern red cedar	8.6	1.7	6.8	1.1	56	13.8	2.0	1.9	12.8	85	-22.9	-86	25.8	55 (N/A)	3.4	2.13
Maple	0.3	0.1	0.2	0.0	2	3.6	0.5	0.5	3.3	22	-0.1	-1	8.4	24 (N/A)	3.2	0.98
Black spruce	0.7	0.1	0.7	0.1	5	3.9	0.5	0.5	3.5	24	-2.3	-9	7.7	20 (N/A)	3.0	0.86
Northern white cedar	1.7	0.3	1.4	0.2	11	4.5	0.7	0.6	4.3	28	-7.9	-30	5.8	10 (N/A)	2.5	0.50
Honeylocust	11.0	1.8	5.0	0.5	58	22.7	3.3	3.2	21.9	142	-8.7	-33	60.7	168 (N/A)	1.8	11.98
Norway spruce	4.8	0.9	3.8	0.6	31	7.9	1.2	1.1	7.6	49	-23.6	-89	4.1	-8 (N/A)	1.3	-0.83
Bur oak	5.5	0.9	2.4	0.2	29	11.1	1.6	1.5	10.5	69	0.0	0	33.8	98 (N/A)	0.9	13.98
American basswood	2.5	0.4	1.2	0.1	13	9.1	1.3	1.3	8.7	57	-2.1	-8	22.5	62 (N/A)	0.9	8.90
Red maple	0.4	0.1	0.2	0.0	2	2.9	0.4	0.4	2.7	18	-0.2	-1	6.9	19 (N/A)	0.8	3.22
Northern red oak	2.2	0.4	1.0	0.1	12	4.6	0.7	0.6	4.4	29	-3.1	-12	10.9	29 (N/A)	0.7	5.75
Elm	2.1	0.3	1.0	0.1	11	7.1	1.0	1.0	6.8	45	0.0	0	19.5	56 (N/A)	0.7	11.12
Eastern white pine	2.8	0.6	2.2	0.3	18	4.4	0.6	0.6	4.2	27	-14.3	-54	1.5	-8 (N/A)	0.7	-1.58
Littleleaf linden	0.4	0.1	0.2	0.0	2	2.8	0.4	0.4	2.7	17	-0.2	-1	6.7	19 (N/A)	0.7	3.75
Siberian elm	2.0	0.3	1.0	0.1	11	5.1	0.7	0.7	4.9	32	0.0	0	14.8	43 (N/A)	0.5	10.67
Pin oak	2.0	0.3	1.0	0.1	11	5.9	0.9	0.8	5.7	37	-3.7	-14	13.0	34 (N/A)	0.5	8.47
Eastern redbud	0.2	0.0	0.1	0.0	1	1.0	0.1	0.1	0.9	6	0.0	0	2.6	7 (N/A)	0.4	2.46
Eastern cottonwood	1.7	0.3	0.8	0.1	9	3.4	0.5	0.5	3.3	21	0.0	0	10.4	30 (N/A)	0.3	14.99
Spruce	0.6	0.1	0.5	0.1	4	1.2	0.2	0.2	1.1	7	-3.0	-11	0.9	0 (N/A)	0.3	-0.05
Japanese tree lilac	0.3	0.0	0.1	0.0	1	1.3	0.2	0.2	1.2	8	0.0	0	3.2	9 (N/A)	0.3	4.55
Hickory	0.2	0.0	0.1	0.0	1	2.1	0.3	0.3	2.1	14	0.0	0	5.3	15 (N/A)	0.3	7.42
Boxelder	0.7	0.1	0.3	0.0	4	2.3	0.3	0.3	2.2	14	-0.3	-1	6.0	17 (N/A)	0.3	8.42
Mimosa	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	1	0.0	0	0.3	1 (N/A)	0.1	0.71
Cherry plum	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	1	0.0	0	0.3	1 (N/A)	0.1	0.71
Mulberry	0.2	0.0	0.1	0.0	1	0.9	0.1	0.1	0.8	5	0.0	0	2.3	7 (N/A)	0.1	6.56
Oak	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.0	0 (N/A)	0.1	0.08
Catalpa	0.3	0.0	0.1	0.0	1	1.3	0.2	0.2	1.2	8	0.0	0	3.3	9 (N/A)	0.1	9.34
American elm	0.1	0.0	0.1	0.0	0	1.1	0.2	0.2	1.1	7	0.0	0	2.7	8 (N/A)	0.1	7.68
Paper birch	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)	0.1	2.99
American sycamore	1.2	0.2	0.5	0.1	6	2.1	0.3	0.3	2.0	13	0.0	0	6.6	19 (N/A)	0.1	19.04
Austrian pine	0.5	0.1	0.4	0.1	3	0.8	0.1	0.1	0.8	5	-1.1	-4	1.8	4 (N/A)	0.1	4.16
Black cherry	0.4	0.1	0.2	0.0	2	1.0	0.1	0.1	0.9	6	0.0	0	2.9	8 (N/A)	0.1	8.35
Citywide total	310.8	52.9	159.4	15.6	1,700	873.0	127.0	121.1	827.3	5,435	-149.1	-559	2,338.0	6,575 (N/A)	100.0	8.65

Table 4: Annual Carbon Stored

Lake City

Stored CO2 Benefits of Public Trees

12/22/2015

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	1,918,184	14,386	(N/A)	19.9	28.7	95.27
Northern hackberry	1,041,858	7,814	(N/A)	16.4	15.6	62.51
Norway maple	792,448	5,943	(N/A)	12.9	11.9	60.65
Silver maple	1,074,529	8,059	(N/A)	9.6	16.1	110.40
Blue spruce	11,161	84	(N/A)	5.4	0.2	2.04
Sugar maple	418,320	3,137	(N/A)	3.9	6.3	104.58
Black walnut	377,536	2,832	(N/A)	3.7	5.7	101.13
Apple	68,271	512	(N/A)	3.6	1.0	18.96
Eastern red cedar	27,829	209	(N/A)	3.4	0.4	8.03
Maple	5,672	43	(N/A)	3.2	0.1	1.77
Black spruce	3,605	27	(N/A)	3.0	0.1	1.18
Northern white cedar	18,776	141	(N/A)	2.5	0.3	7.41
Honeylocust	142,008	1,065	(N/A)	1.8	2.1	76.08
Norway spruce	61,349	460	(N/A)	1.3	0.9	46.01
Bur oak	185,046	1,388	(N/A)	0.9	2.8	198.26
American basswood	92,187	691	(N/A)	0.9	1.4	98.77
Red maple	5,722	43	(N/A)	0.8	0.1	7.15
Northern red oak	47,766	358	(N/A)	0.7	0.7	71.65
Elm	67,688	508	(N/A)	0.7	1.0	101.53
Eastern white pine	37,451	281	(N/A)	0.7	0.6	56.18
Littleleaf linden	9,426	71	(N/A)	0.7	0.1	14.14
Siberian elm	48,518	364	(N/A)	0.5	0.7	90.97
Pin oak	49,312	370	(N/A)	0.5	0.7	92.46
Eastern redbud	3,229	24	(N/A)	0.4	0.0	8.07
Eastern cottonwood	59,654	447	(N/A)	0.3	0.9	223.70
Spruce	7,747	58	(N/A)	0.3	0.1	29.05
Japanese tree lilac	3,945	30	(N/A)	0.3	0.1	14.79
Hickory	7,344	55	(N/A)	0.3	0.1	27.54
Boxelder	22,225	167	(N/A)	0.3	0.3	83.35
Mimosa	178	1	(N/A)	0.1	0.0	1.33
Cherry plum	178	1	(N/A)	0.1	0.0	1.33
Mulberry	3,037	23	(N/A)	0.1	0.0	22.78
Oak	12	0	(N/A)	0.1	0.0	0.09
Catalpa	8,458	63	(N/A)	0.1	0.1	63.43
American elm	3,037	23	(N/A)	0.1	0.0	22.78
Paper birch	1,035	8	(N/A)	0.1	0.0	7.76
American sycamore	39,259	294	(N/A)	0.1	0.6	294.44
Austrian pine	4,893	37	(N/A)	0.1	0.1	36.70
Black cherry	6,743	51	(N/A)	0.1	0.1	50.57
Citywide total	6,675,635	50,067	(N/A)	100.0	100.0	65.88

Table 5: Annual Carbon Sequestered

Lake City

Annual CO2 Benefits of Public Trees

12/22/2015

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	99,213	744	-9,207	-439	-3	0	0	89,566	672 (N/A)	19.9	27.4	4.45
Northern hackberry	55,953	420	-5,001	-413	-3	0	0	50,540	379 (N/A)	16.4	15.4	3.03
Norway maple	31,482	236	-3,805	-261	-2	0	0	27,417	206 (N/A)	12.9	8.4	2.10
Silver maple	87,990	660	-5,158	-245	-2	0	0	82,587	619 (N/A)	9.6	25.2	8.48
Blue spruce	1,153	9	-54	-34	0	0	0	1,065	8 (N/A)	5.4	0.3	0.19
Sugar maple	20,063	150	-2,010	-93	-1	0	0	17,961	135 (N/A)	3.9	5.5	4.49
Black walnut	19,479	146	-1,812	-85	-1	0	0	17,582	132 (N/A)	3.7	5.4	4.71
Apple	2,273	17	-328	-46	0	0	0	1,900	14 (N/A)	3.6	0.6	0.53
Eastern red cedar	254	2	-134	-50	0	0	0	71	1 (N/A)	3.4	0.0	0.02
Maple	914	7	-28	-12	0	0	0	875	7 (N/A)	3.2	0.3	0.27
Black spruce	412	3	-17	-16	0	0	0	379	3 (N/A)	3.0	0.1	0.12
Northern white cedar	497	4	-90	-21	0	0	0	386	3 (N/A)	2.5	0.1	0.15
Honeylocust	8,764	66	-682	-37	0	0	0	8,046	60 (N/A)	1.8	2.5	4.31
Norway spruce	1,961	15	-294	-32	0	0	0	1,634	12 (N/A)	1.3	0.5	1.23
Bur oak	5,026	38	-888	-27	0	0	0	4,111	31 (N/A)	0.9	1.3	4.40
American basswood	5,494	41	-442	-21	0	0	0	5,031	38 (N/A)	0.9	1.5	5.39
Red maple	865	6	-27	-6	0	0	0	831	6 (N/A)	0.8	0.3	1.04
Northern red oak	295	2	-229	-13	0	0	0	53	0 (N/A)	0.7	0.0	0.08
Elm	3,470	26	-325	-15	0	0	0	3,129	23 (N/A)	0.7	1.0	4.69
Eastern white pine	0	0	-180	-25	0	0	0	-204	-2 (N/A)	0.7	-0.1	-0.31
Littleleaf linden	1,535	12	-46	-7	0	0	0	1,482	11 (N/A)	0.7	0.5	2.22
Siberian elm	2,093	16	-233	-12	0	0	0	1,848	14 (N/A)	0.5	0.6	3.46
Pin oak	4,947	37	-237	-12	0	0	0	4,698	35 (N/A)	0.5	1.4	8.81
Eastern redbud	314	2	-16	-3	0	0	0	296	2 (N/A)	0.4	0.1	0.74
Eastern cottonwood	924	7	-286	-8	0	0	0	630	5 (N/A)	0.3	0.2	2.36
Spruce	309	2	-37	-5	0	0	0	267	2 (N/A)	0.3	0.1	1.00
Japanese tree lilac	382	3	-19	-3	0	0	0	359	3 (N/A)	0.3	0.1	1.35
Hickory	891	7	-35	-4	0	0	0	852	6 (N/A)	0.3	0.3	3.19
Boxelder	1,733	13	-107	-6	0	0	0	1,620	12 (N/A)	0.3	0.5	6.07
Mimosa	38	0	-1	-1	0	0	0	37	0 (N/A)	0.1	0.0	0.27
Cherry plum	38	0	-1	-1	0	0	0	37	0 (N/A)	0.1	0.0	0.27
Mulberry	268	2	-15	-2	0	0	0	251	2 (N/A)	0.1	0.1	1.88
Oak	3	0	0	0	0	0	0	2	0 (N/A)	0.1	0.0	0.02
Catalpa	660	5	-41	-3	0	0	0	616	5 (N/A)	0.1	0.2	4.62
American elm	222	2	-15	-2	0	0	0	205	2 (N/A)	0.1	0.1	1.54
Paper birch	209	2	-5	-1	0	0	0	203	2 (N/A)	0.1	0.1	1.52
American sycamore	912	7	-188	-5	0	0	0	719	5 (N/A)	0.1	0.2	5.39
Austrian pine	189	1	-23	-4	0	0	0	162	1 (N/A)	0.1	0.0	1.21
Black cherry	0	0	-32	-4	0	0	0	-36	0 (N/A)	0.1	0.0	-0.27
Citywide total	361,222	2,709	-32,048	-1,970	-15	0	0	327,203	2,454 (N/A)	100.0	100.0	3.23

Table 6: Annual Social and Aesthetic Benefits

Lake City

Annual Aesthetic/Other Benefits of Public Trees

12/22/2015

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	8,184	(N/A)	19.9	23.0	54.20
Northern hackberry	7,330	(N/A)	16.4	20.6	58.64
Norway maple	3,009	(N/A)	12.9	8.4	30.70
Silver maple	7,133	(N/A)	9.6	20.0	97.71
Blue spruce	579	(N/A)	5.4	1.6	14.13
Sugar maple	2,019	(N/A)	3.9	5.7	67.31
Black walnut	1,578	(N/A)	3.7	4.4	56.36
Apple	128	(N/A)	3.6	0.4	4.74
Eastern red cedar	90	(N/A)	3.4	0.3	3.45
Maple	163	(N/A)	3.2	0.5	6.78
Black spruce	291	(N/A)	3.0	0.8	12.65
Northern white cedar	185	(N/A)	2.5	0.5	9.74
Honeylocust	2,150	(N/A)	1.8	6.0	153.59
Norway spruce	232	(N/A)	1.3	0.7	23.15
Bur oak	357	(N/A)	0.9	1.0	51.01
American basswood	398	(N/A)	0.9	1.1	56.87
Red maple	156	(N/A)	0.8	0.4	26.08
Northern red oak	32	(N/A)	0.7	0.1	6.50
Elm	283	(N/A)	0.7	0.8	56.52
Eastern white pine	0	(N/A)	0.7	0.0	0.00
Littleleaf linden	183	(N/A)	0.7	0.5	36.62
Siberian elm	154	(N/A)	0.5	0.4	38.42
Pin oak	397	(N/A)	0.5	1.1	99.17
Eastern redbud	18	(N/A)	0.4	0.0	5.86
Eastern cottonwood	74	(N/A)	0.3	0.2	37.21
Spruce	42	(N/A)	0.3	0.1	20.84
Japanese tree lilac	22	(N/A)	0.3	0.1	10.94
Hickory	92	(N/A)	0.3	0.3	45.86
Boxelder	117	(N/A)	0.3	0.3	58.53
Mimosa	2	(N/A)	0.1	0.0	2.06
Cherry plum	2	(N/A)	0.1	0.0	2.06
Mulberry	15	(N/A)	0.1	0.0	15.48
Oak	5	(N/A)	0.1	0.0	5.26
Catalpa	58	(N/A)	0.1	0.2	57.69
American elm	37	(N/A)	0.1	0.1	36.79
Paper birch	29	(N/A)	0.1	0.1	28.56
American sycamore	58	(N/A)	0.1	0.2	58.34
Austrian pine	13	(N/A)	0.1	0.0	12.81
Black cherry	0	(N/A)	0.1	0.0	0.00
Citywide total	35,614	(N/A)	100.0	100.0	46.86

Table 7: Summary of Benefits in Dollars

Lake City

Total Annual Benefits of Public Trees by Species ($)

12/22/201

Species	Energy	CO_2	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Green ash	8,807	672	1,562	12,763	8,184	31,988	(N/A)	23.2
Northern hackberry	9,388	379	1,685	11,691	7,330	30,473	(N/A)	22.1
Norway maple	5,360	206	962	6,309	3,009	15,846	(N/A)	11.5
Silver maple	4,789	619	867	8,335	7,133	21,743	(N/A)	15.8
Blue spruce	412	8	46	573	579	1,617	(N/A)	1.2
Sugar maple	1,729	135	284	2,788	2,019	6,955	(N/A)	5.1
Black walnut	1,706	132	303	2,506	1,578	6,225	(N/A)	4.5
Apple	663	14	111	368	128	1,284	(N/A)	0.9
Eastern red cedar	626	1	55	1,125	90	1,897	(N/A)	1.4
Maple	164	7	24	92	163	448	(N/A)	0.3
Black spruce	182	3	20	216	291	711	(N/A)	0.5
Northern white cedar	194	3	10	424	185	816	(N/A)	0.6
Honeylocust	980	60	168	1,511	2,150	4,870	(N/A)	3.5
Norway spruce	343	12	-8	1,056	232	1,635	(N/A)	1.2
Bur oak	487	31	98	966	357	1,940	(N/A)	1.4
American basswood	397	38	62	508	398	1,404	(N/A)	1.0
Red maple	131	6	19	88	156	401	(N/A)	0.3
Northern red oak	208	0	29	275	32	545	(N/A)	0.4
Elm	310	23	56	447	283	1,119	(N/A)	0.8
Eastern white pine	191	-2	-8	624	0	805	(N/A)	0.6
Littleleaf linden	120	11	19	96	183	428	(N/A)	0.3
Siberian elm	225	14	43	319	154	754	(N/A)	0.5
Pin oak	258	35	34	329	397	1,053	(N/A)	0.8
Eastern redbud	44	2	7	20	18	92	(N/A)	0.1
Eastern cottonwood	143	5	30	236	74	488	(N/A)	0.4
Spruce	52	2	0	141	42	236	(N/A)	0.2
Japanese tree lilac	56	3	9	25	22	115	(N/A)	0.1
Hickory	88	6	15	79	92	281	(N/A)	0.2
Boxelder	102	12	17	144	117	392	(N/A)	0.3
Mimosa	5	0	1	2	2	10	(N/A)	0.0
Cherry plum	5	0	1	2	2	10	(N/A)	0.0
Mulberry	38	2	7	18	15	80	(N/A)	0.1
Oak	1	0	0	0	5	7	(N/A)	0.0
Catalpa	57	5	9	70	58	199	(N/A)	0.1
American elm	46	2	8	38	37	130	(N/A)	0.1
Paper birch	21	2	3	16	29	70	(N/A)	0.1
American sycamore	91	5	19	196	58	370	(N/A)	0.3
Austrian pine	35	1	4	79	13	133	(N/A)	0.1
Black cherry	46	0	8	32	0	86	(N/A)	0.1
Citywide Total	38,504	2,454	6,575	54,508	35,614	137,655	(N/A)	100.0

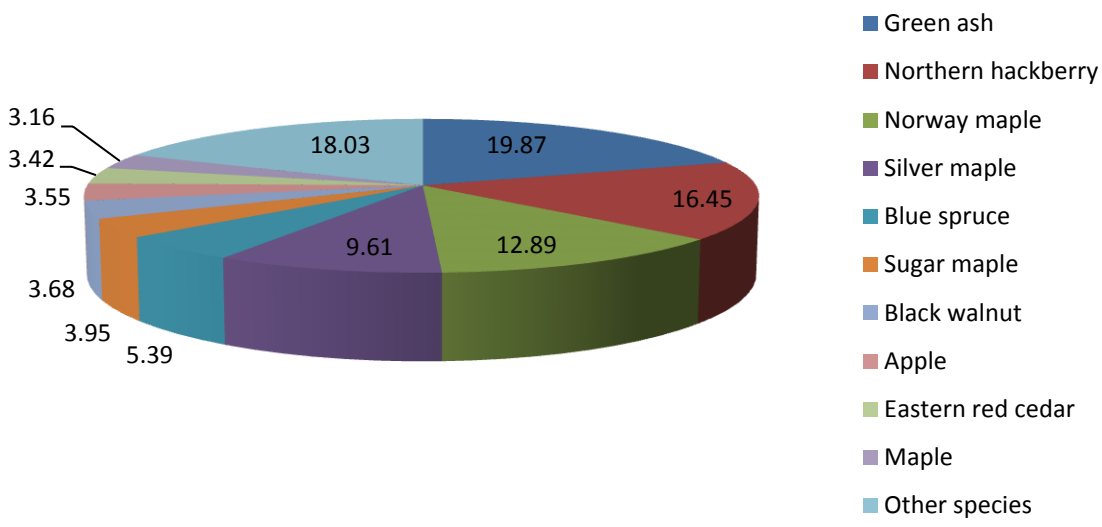

Figure 1: Species Distribution

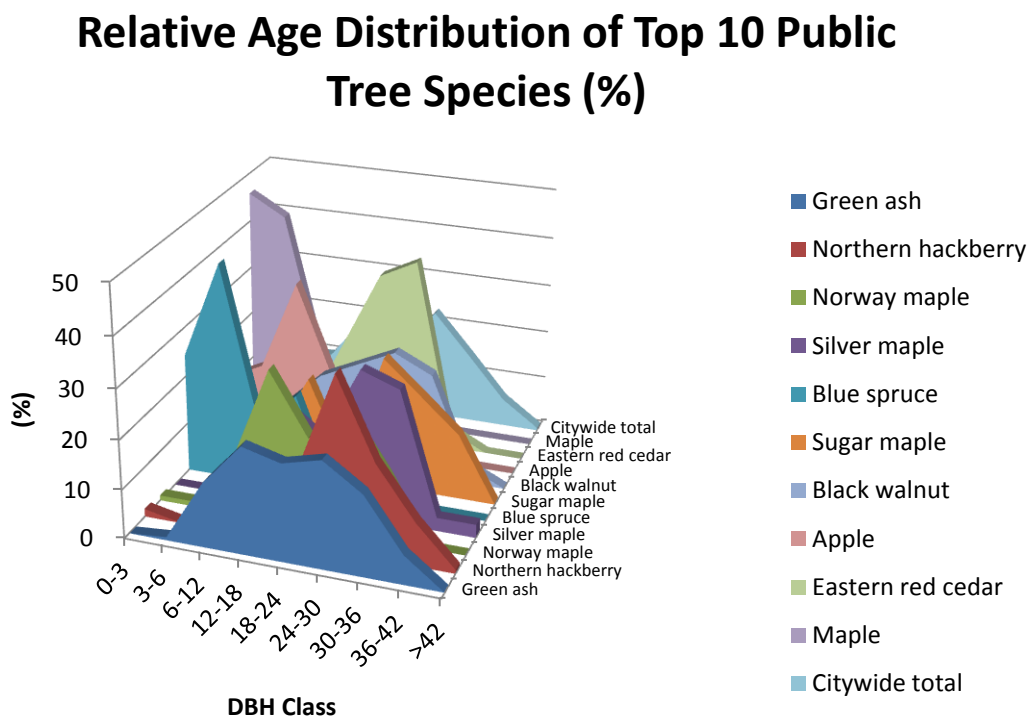

Figure 2: Relative Age Class

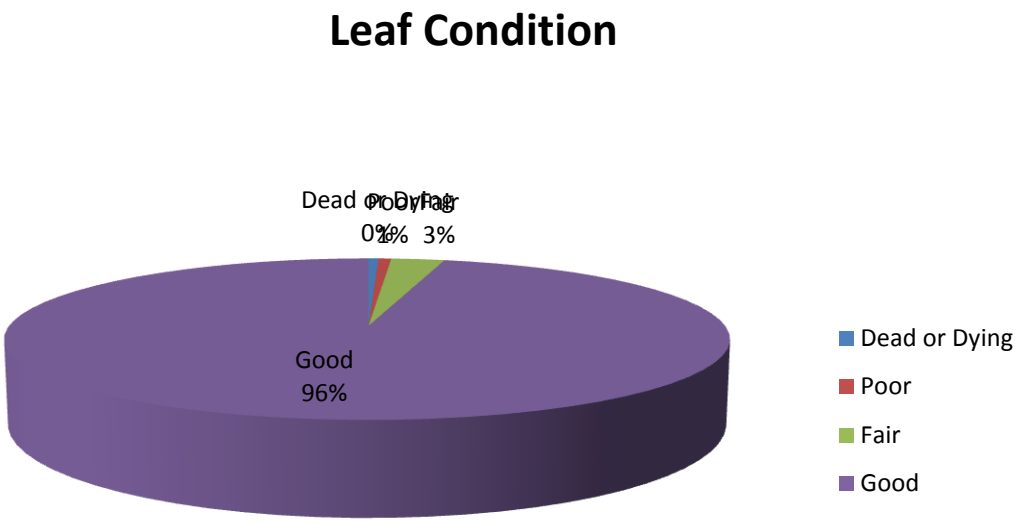

Figure 3: Foliage Condition

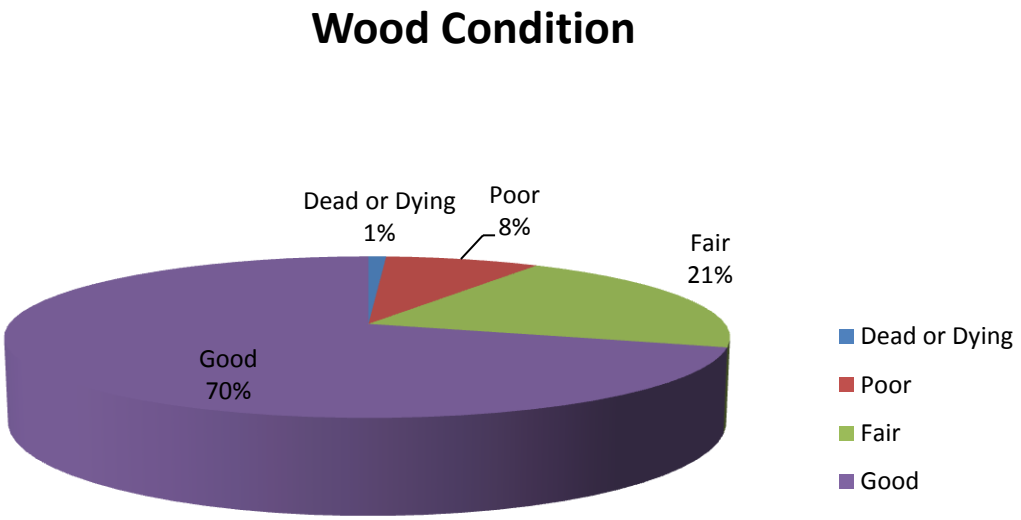

Figure 4: Wood Condition

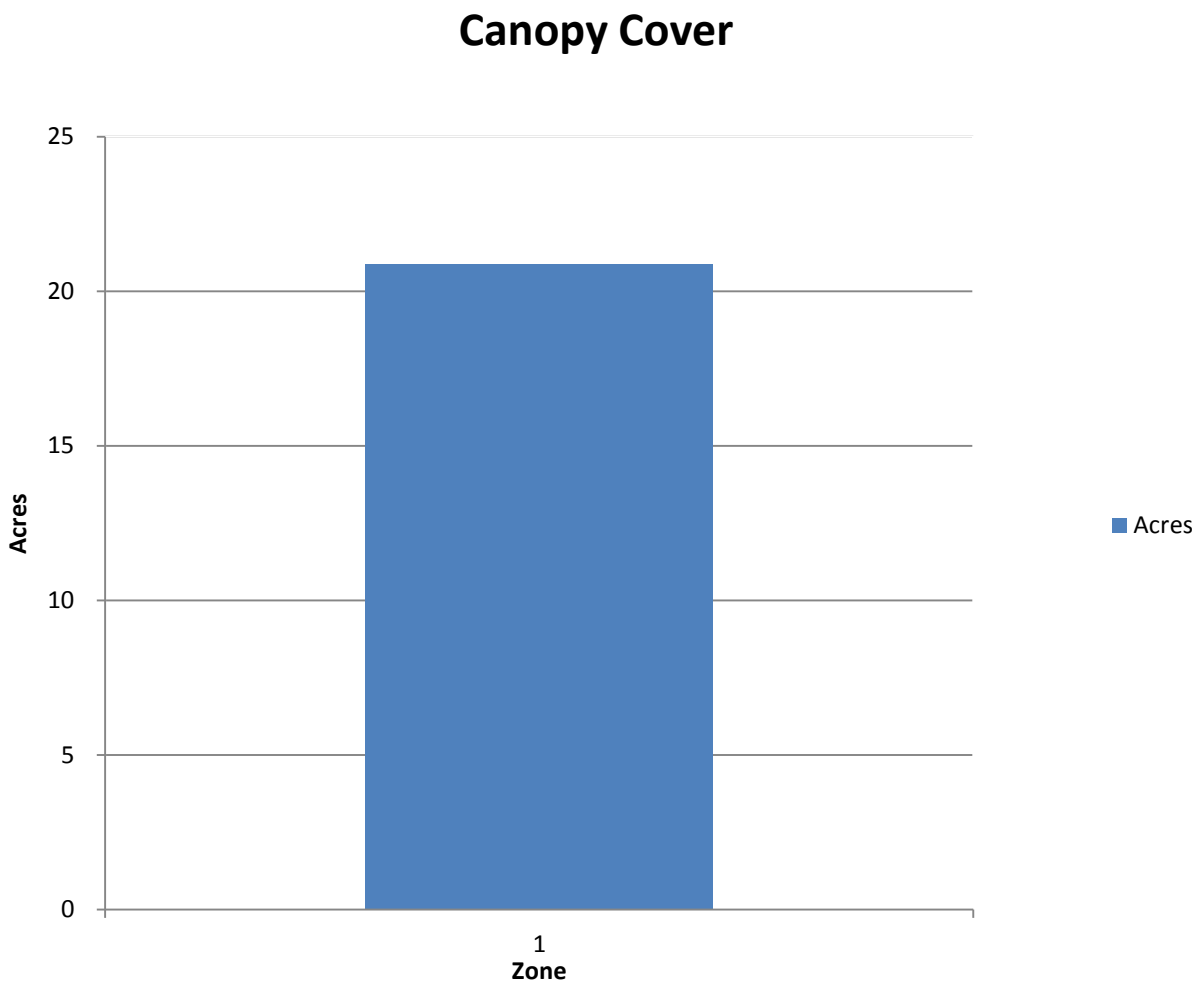

Figure 5: Canopy Cover in Acres

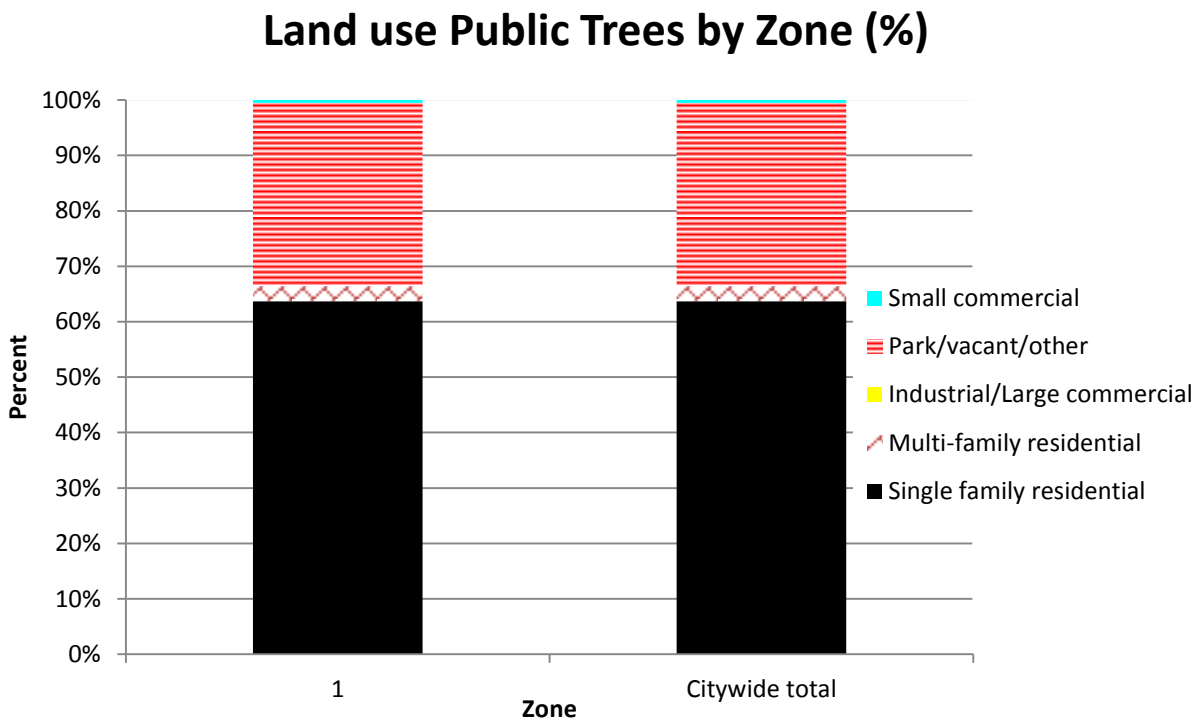

Figure 6: Land Use of city/park trees

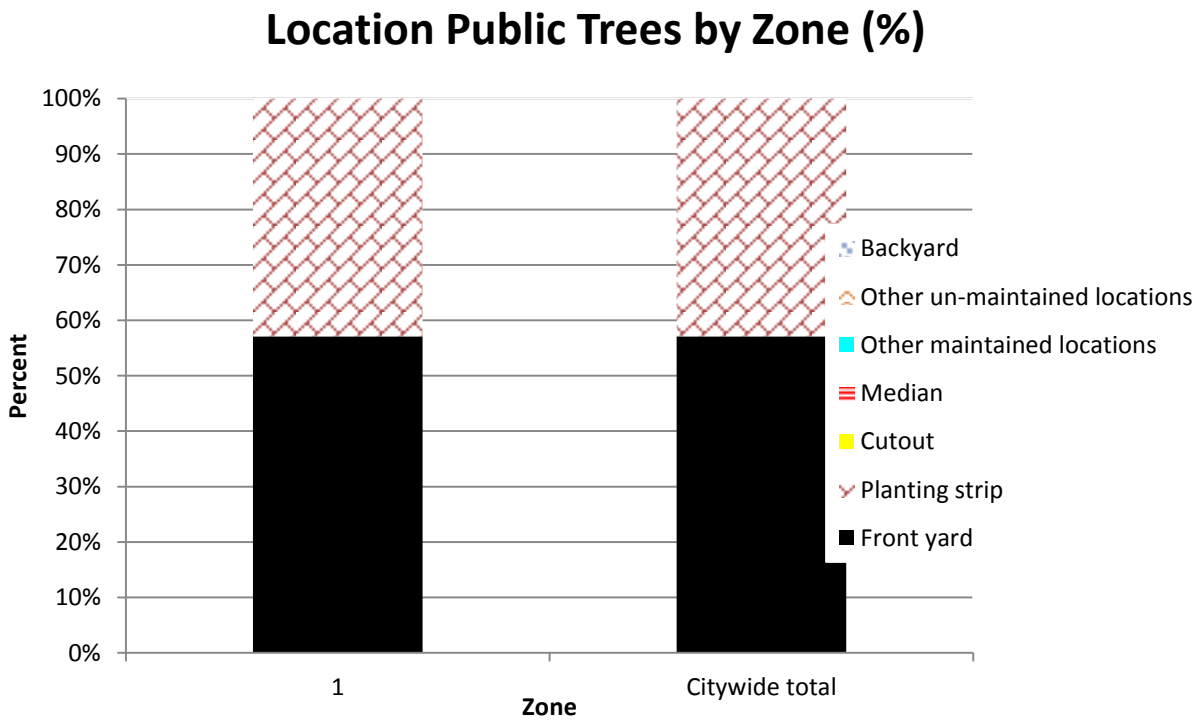

Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

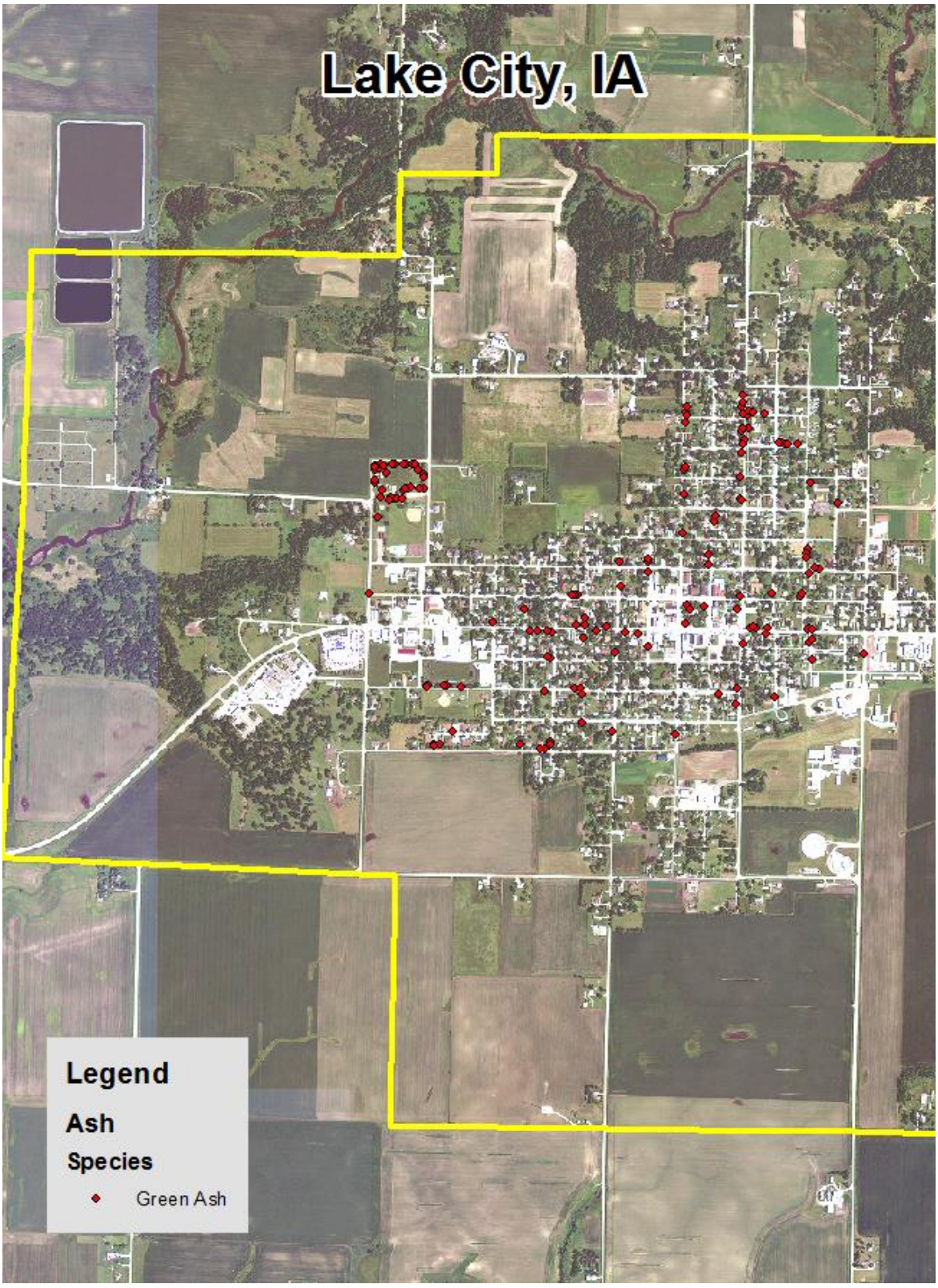

Figure 1: Location of Ash Trees

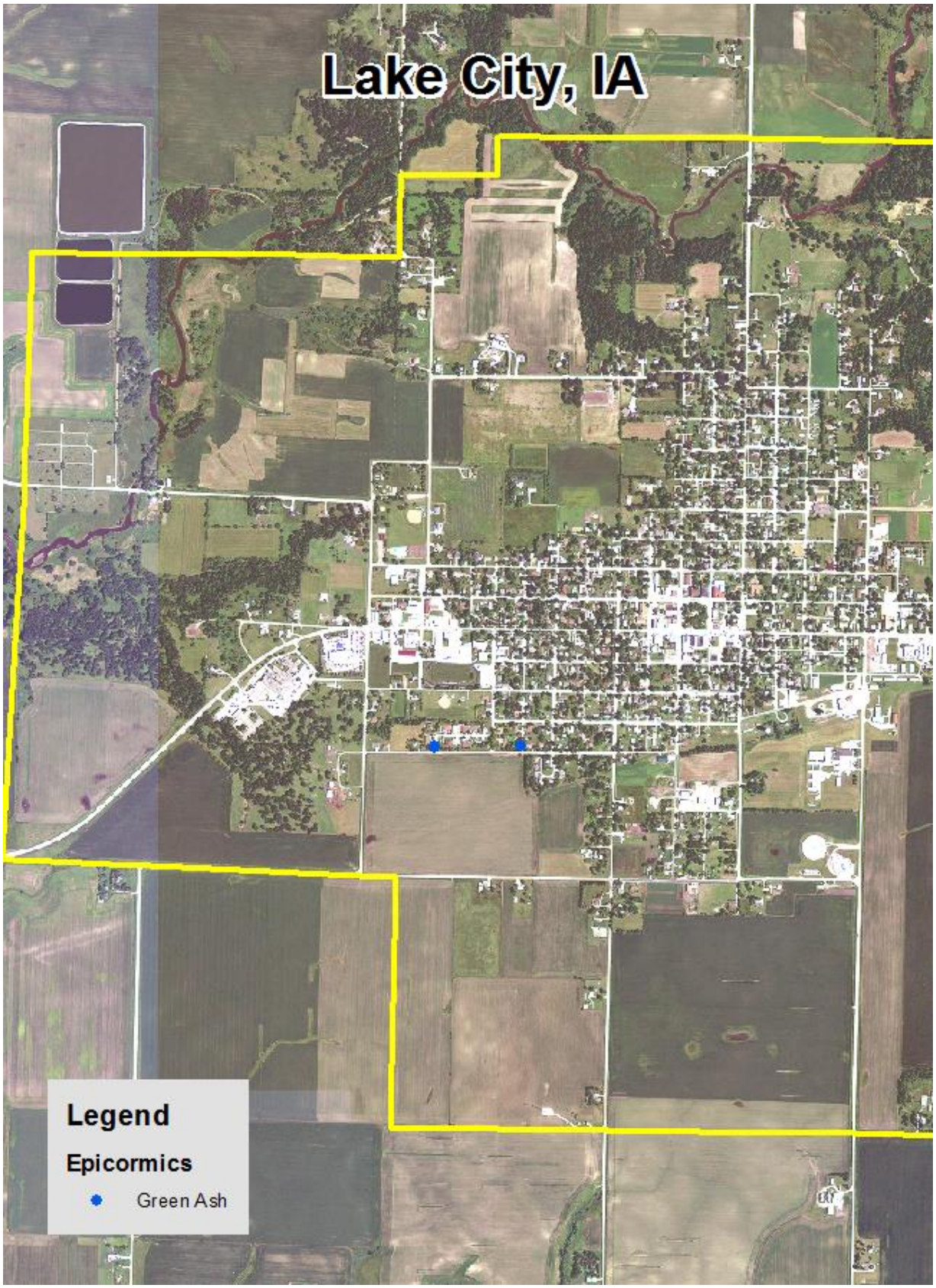

Figure 2: Location of EAB symptoms

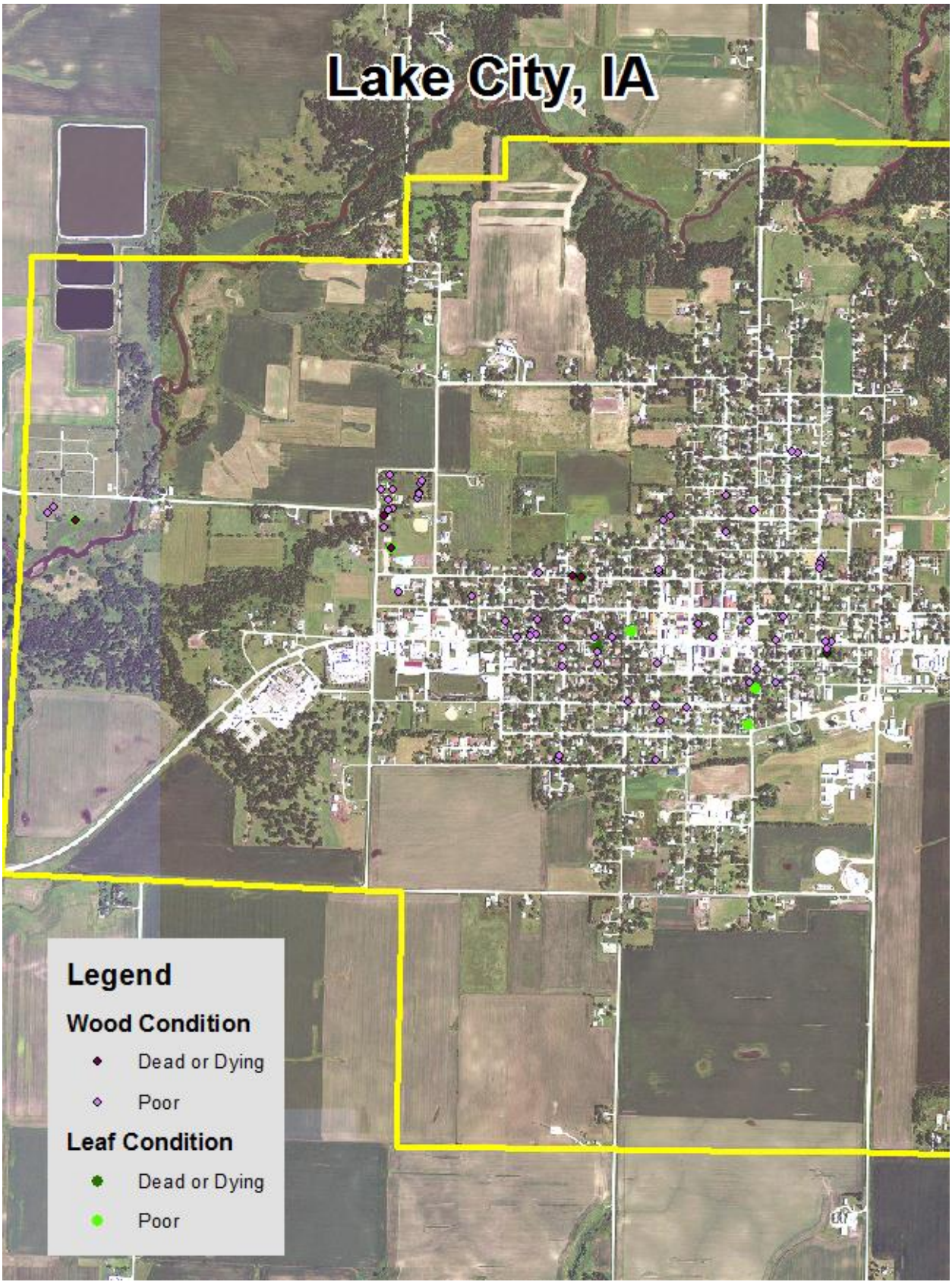

Figure 3: Location of Poor Condition Trees

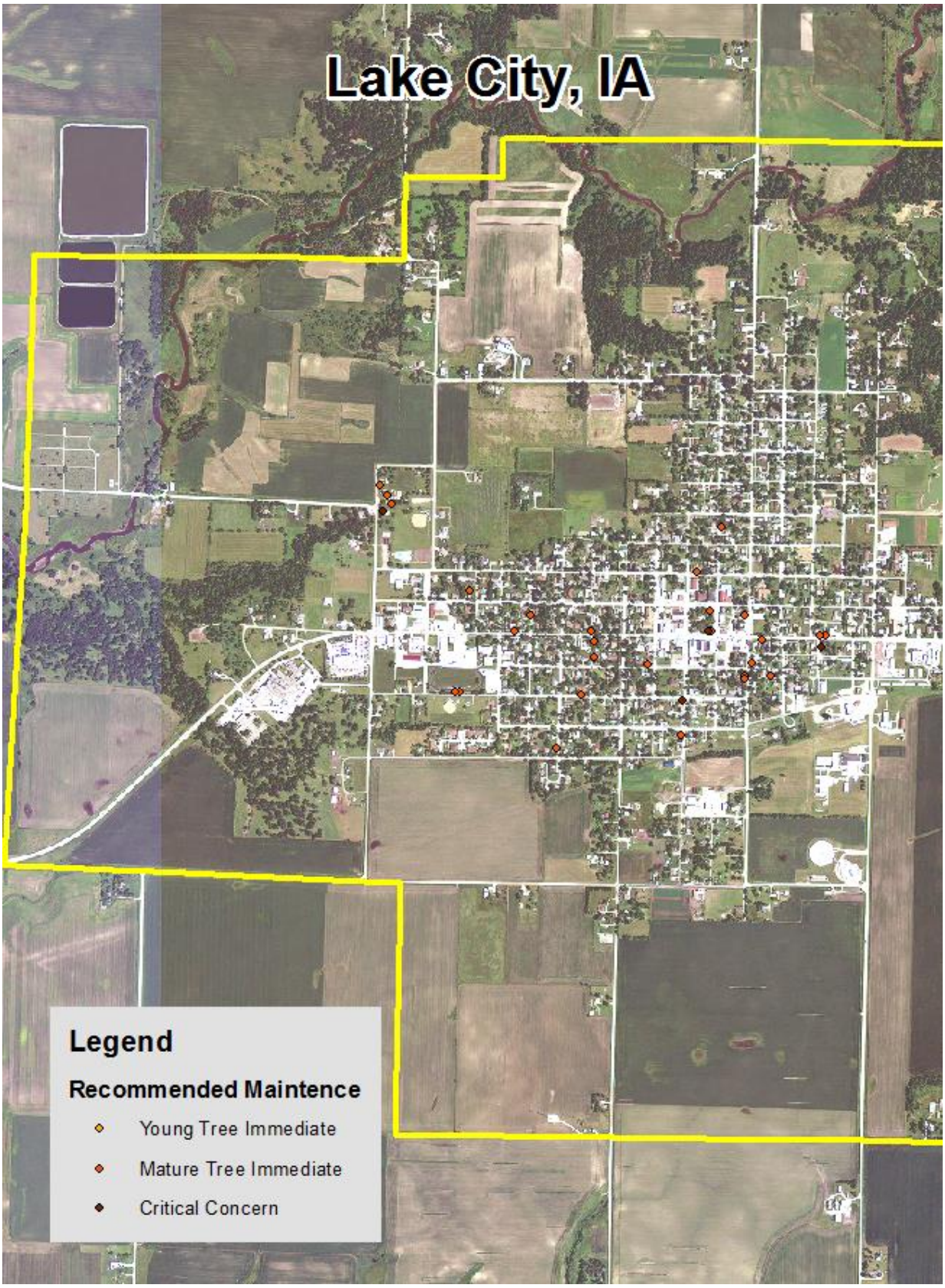

Figure 4: Location of Trees with Recommended Maintenance

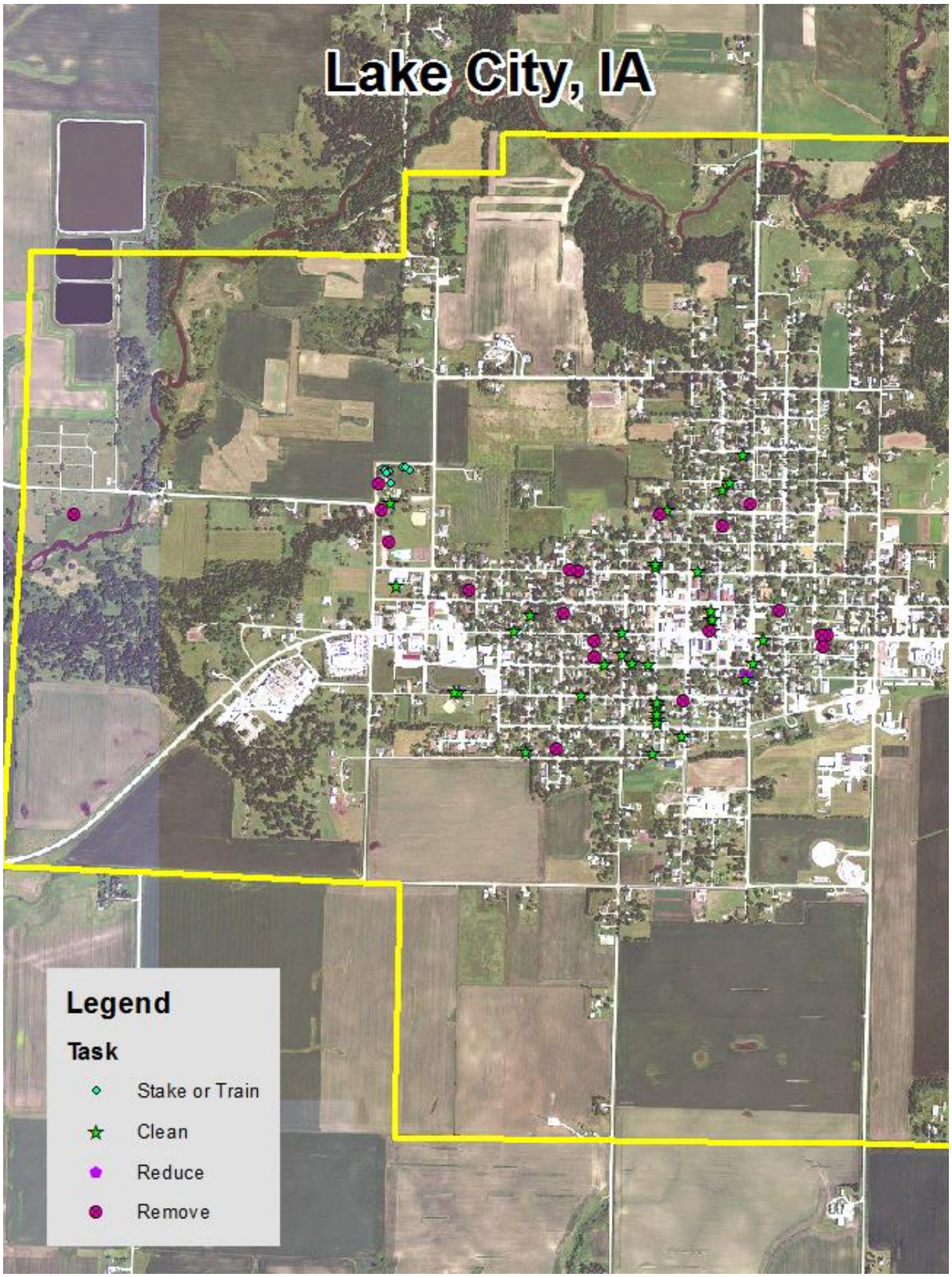

Figure 5: Maintenance Tasks *City ownership of the trees recommended for removal should be verified prior to any removal*

Appendix C: Lake City Tree Ordinances

TITLE VI - COMMUNITY DEVELOPMENT AND ENVIRONMENT
CHAPTER 2- TREES

ARTICLE 1
GENERAL PROVISIONS

6-2.0101 PURPOSE. The purpose of this chapter is to beautify and preserve the appearance of the city by regulating and providing for the planting, care and removal of trees.

6-2.0102 DEFINITIONS. For use in this chapter, the following terms are defined:

1. "Parking": shall mean 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.

2. "Superintendent": shall mean the superintendent of streets or such other person as may be designated by the council.

6-2.0103 PLANTING RESTRICTIONS. No tree shall be planted in any street or parking except in accordance with the following:

1. Alignment. All trees hereafter 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 ten (10) feet from the property line.

2. Spacing. Trees shall not be planted on the parking if it is less than nine (9) feet in width, or contains less than eighty-one (81) square feet of exposed soil surface per tree. Trees shall not be planted closer than twenty (20) feet to street intersections (property lines extended) and ten (10) feet to 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 hereinafter plant in any street, any fruit-bearing tree or any tree of the kinds commonly known as cottonwood, poplar, boxelder, chinese elm, or evergreens.

6-2.0104 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.

(Code of Iowa, 1981, Sec. 364.12[2c])

6-2.0105 ASSESSMENT. If the abutting property owner fails to trim the trees as required in this chapter, the city may serve notice on the abutting property owner requiring him to do so within five (5) days. If he fails to trim the trees 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, 1981, Sec. 364.12[2d & e])

6-2.0106 TRIMMING TREES TO BE SUPERVISED. It shall be 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.

6-2.0107 REMOVAL OF TREES. The superintendent shall remove, on the order of the council, any tree on the streets of the city which interferes with the making of improvements or with travel thereon. He shall additionally remove any trees on the street, not on private property, which have become diseased, or which constitute a danger to the public, or which may otherwise be declared a nuisance.

(Code of Iowa, 1981, Sec. 364.12 [2c] & 372.13 [4])

TITLE VI - COMMUNITY DEVELOPMENT AND ENVIRONMENT
CHAPTER 2- TREES

ARTICLE 2
DUTCH ELM DISEASE CONTROL

6-2.0201 TREES SUBJECT TO REMOVAL. The council having determined that the health of the elm trees within the city is threatened by a fatal disease known as the Dutch Elm Disease hereby declares the following shall be removed:
(Code of Iowa, 1981, Sec. 364.12[3b])

1. Living or Standing Trees. Any living or standing elm tree or part thereof infected with the Dutch Elm Disease fungus or which harbors any of the elm bark beetles, that is scolytus multistriatus (eichb.) or hylurgopinus rufipes (marsh.).

2. Dead Trees. Any dead elm tree or part thereof including logs, branches, stumps, firewood or other elm material from which the bark has not been removed and burned or sprayed with an effective elm bark beetle destroying insecticide.

6-2.0202 DUTY TO REMOVE. No person, firm or corporation shall permit any tree or material as defined in Section 1 of this article to remain on the premises owned, controlled or occupied by him within the city.
(Code of Iowa, 1981, Sec. 364.12[3b])

6-2.0203 INSPECTION. The superintendent shall inspect or cause to be inspected all premises and places within the city to determine whether any condition as defined in Section 1 of this

article exists thereon, and shall also inspect or cause to be inspected any elm trees reported or suspected to be infected with the Dutch Elm Disease or any elm bark bearing material reported or suspected to be infected with the elm bark beetles.

6-2.0204 REMOVAL FROM CITY PROPERTY. If the superintendent upon inspection or examination, in person or by some qualified person acting for him, shall determine that any condition as herein defined exists in or upon any public street, alley, park or any public place, including the strip between the curb and the lot line of private property, within the city and that the danger of other elm trees within the city is imminent, he shall immediately cause it to be removed and burned or otherwise correct the same in such manner as to destroy or prevent as fully as possible the spread of Dutch Elm Disease or the insect pests or vectors known to carry such disease fungus.

6-2.0205 REMOVAL FROM PRIVATE PROPERTY. If the superintendent upon inspection or examination, in person or by some qualified person acting for him, shall determine with reasonable certainty that any condition as herein defined exists in or upon private premises and that the danger to other elm trees within the city is imminent, he shall immediately notify by certified mail the owner, occupant or person in charge of such property, to correct such condition 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 thereof, the council may cause the nuisance to be removed and the cost assessed against the property as provided in Article 2, Chapter 1, of Title III.

(Code of Iowa, 1981, Sec. 364.12[3b & h])

If the superintendent is unable to determine with reasonable certainty whether or not a tree in or upon private premises is

infected with Dutch Elm Disease, he is authorized to remove or cut specimens from said tree, and obtain a diagnosis of such specimens.

TITLE VI – COMMUNITY DEVELOPMENT AND ENVIRONMENT
CHAPTER 2 – TREES

ARTICLE 3
CITY TREE BOARD

6-2.0301 DEFINITIONS.

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

2. "Street Trees." Street trees are herein defined as trees, shrubs, bushes and all other woody vegetation on land lying between property lines on either side of all streets or avenues within the City.

6-2.0302 CREATION AND ESTABLISHMENT OF A CITY TREE BOARD. There is hereby created and established a City Tree Board for the City of Lake City, Iowa, which shall consist of five members, citizens and residents of Lake City, who shall be appointed by the Mayor with the approval of the Council.

6-2.0303 TERM OF OFFICE. The term of the five persons to be appointed by the Mayor shall be three years except that the term of two of the members appointed to the first Board shall be for only one year and the term of two members of the first Board shall be for two years, with the single member fulfilling a three-year term. In the event that a vacancy shall occur during the term of any member, his successor shall be appointed for the unexpired portion of the term.

6-2.0304 COMPENSATION. Members of the Board shall serve without compensation.

6-2.0305 DUTIES AND RESPONSIBILITIES. It shall be the responsibility of the Board to study, investigate and develop and/or update annually and administer a written plan for the care, preservation, pruning, planting, replanting, removal or disposition of trees and shrubs in parks, along streets and in other public areas. Such plan will be presented annually to the City Council and upon their acceptance and approval shall constitute the official comprehensive City Tree Plan for the City of Lake City, Iowa. The Board, when requested by the City Council, shall consider, investigate, make finding, report and recommend upon any special matter of question coming within the scope of work.

6-2.0306 OPERATION. The Board shall choose its own officers, make its own rules and regulations and keep minutes of its proceedings. A majority of the members shall be a quorum for the transaction of business.

6-2.0307 STREET TREE SPECIES TO BE PLANTED. All trees planted will be subject to City Code Title VI, Chapter 2.

6-2.0308 SPACING. The spacing of street trees will be pursuant to City Code Title VI, Chapter 2.

6-2.0309 DISTANCE FROM THE CURB AND SIDEWALK. The distance requirements will be pursuant to City Code Title VI, Chapter 2.

6-2.0310 DISTANCE FROM STREET CORNERS AND FIRE HYDRANTS. The distance requirements will be pursuant to City Code Title VI, Chapter 2.

6-2.0311 UTILITIES. No street trees may be planted under or within 10 lateral feet of any overhead utility wire or over or within 5 lateral feet of any underground water line, sewer line, transmission line or other utility.

6-2.0312 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, squares and public grounds.

The City Tree Board may remove or cause or order to be removed, 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 other public improvements, or is affected with 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 said trees is in accordance with Sections 7 through 11 of this article.

6-2.0313 TREE TOPPING. It shall be unlawful as a normal practice for any person, firm or City department to top any street tree, park tree or other tree on public property. Topping is defined as the severe cutting back of limbs to stubs larger than three inches in diameter with 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 article at the determination of the City Tree Board.

6-2.0314 PRUNING CORNER CLEARANCE. Branches of trees along the street or right-of way within the City shall be pruned so as not to obstruct the view of any street intersection and so that there shall be a clear space of eight feet above the surface of the street or sidewalk. Owners shall remove all dead, diseased or dangerous trees, or broken or decayed limbs which constitute a menace to the safety of the public. The City shall have the right to prune any tree or shrub on private property when it interferes with the proper spread of light along the street from a street light or interferes with visibility of any traffic control device or sign.

6-2.0315 DEAD OR DISEASED TREE REMOVAL ON PRIVATE PROPERTY. The City shall have the right to cause the removal of any dead or diseased trees on private property within the City, when such trees constitute a hazard to life and property, or harbor insects or disease which constitute a potential threat to other trees within the City. The City Tree Board will notify in writing the owners of such trees. Removal shall be done by said owners at their own expense within sixty days after the date of service of notice. In the event of failure of owners to comply with such provisions, the City shall have the authority to remove such trees and charge the cost of removal on the owners property tax notice.

6-2.0316 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.

6-2.0317 INTERFERENCE WITH CITY TREE BOARD. It shall be 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 trees on private grounds, as authorized in this article.

6-2.0318 ARBORISTS LICENSE AND BOND. It shall be unlawful for any person or firm to engage in the business or occupation of pruning, treating, or removing street or park trees within the City without first applying for and procuring a license. The license fee shall be $25.00 annually in advance; provided, however, that no license shall be required of any public service company or City employee doing such work in the pursuit of their public service endeavors. Before any license shall be issued, each applicant shall first file evidence of possession of liability insurance in the minimum amounts of $50,000 for bodily injury and $100,000 property damage indemnifying the City or any person injured or damaged resulting from the pursuit of such endeavors as herein described.

6-2.0319 REVIEW BY CITY COUNCIL. The City Council shall have the right to review the conduct, acts and decisions of the City Tree Board. Any person may appeal from any ruling or order of the City Tree Board to the City Council who may hear the matter and make final decision.

6-2.0320 PENALTY. Any person violating any provisions of this article shall be, upon conviction or a plea of guilty, subject to a fine not to exceed $500.00.

(Article 3 Added by Ord. 06-10 – May 08 Supp.)

6-2.0319 REVIEW BY CITY COUNCIL. The City Council shall have the right to review the conduct, acts and decisions of the City Tree Board. Any person may appeal from any ruling or order of the City Tree Board to the City Council who may hear the matter and make final decision.

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(Article 3 Added by Ord. 06-10 – May 08 Supp.)

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