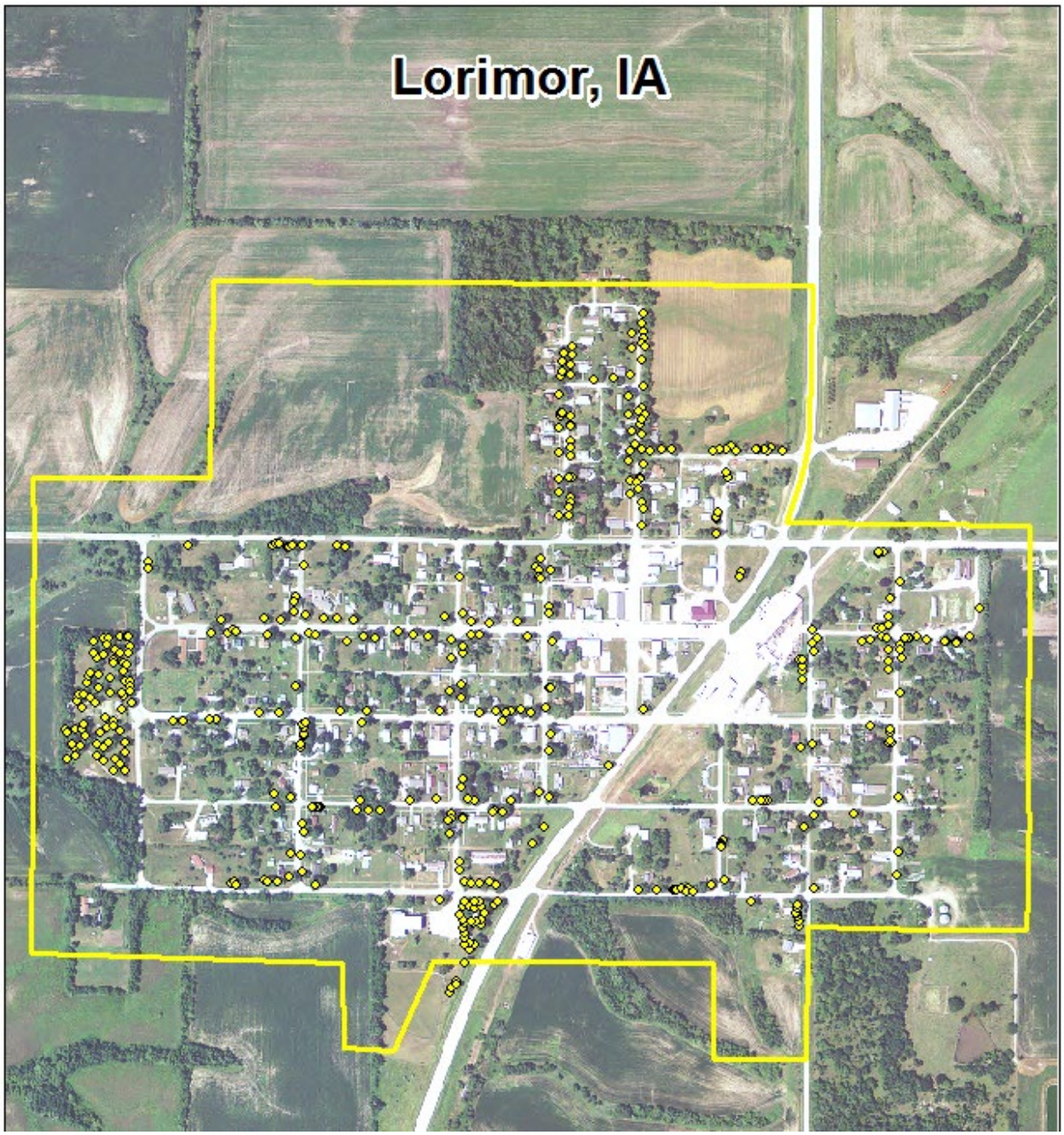

2014 Management Plan

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Executive Summary

Overview

This plan was developed to assist the City of Lorimor 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 30% of Lorimor's city owned trees (ash) will die once EAB becomes established in the community. 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 2014, a tree inventory was conducted using Global Positioning System (GPS) data collectors. The inventory was a complete inventory of street (city ROW) and park trees. Below are some key findings of the 420 trees inventoried.

- Lorimor's trees provide $83,930 of benefits annually, an average of $100 a tree
- There are over 25 species of trees
- The top three genus are: Ash 30%, Maple 23%, and Black Walnut 8%
- 49% of trees are in need of some type of maintenance (See Fig. 4 & 5, Append. B)
- 85 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 85 trees recommended for removal, 46 are "critical concern" trees and should be removed immediately (See Fig. 4, Append. B, and attached listing and map). *City ownership of the trees recommended for removal should be verified prior to any removal*
- 34 of the 126 ash trees are in need of follow up because they are displaying signs and symptoms associated with EAB (Fig. 2, Append. B) All ash trees (Fig. 1, Append. B)
- 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 an estimated removal cost of $ 900 per tree (contracted), it could take $113,400 or more to remove the 126 ash trees if EAB damage occurs. Suggestion: begin by requesting a budget increase to $12,000 annually for tree removal and apply for grants to help plant replacement trees, or treat ash like any other tree and remove when tree health declines or infestations occur and replace trees as needed.

Introduction

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

Trees are an important component Lorimor'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 Lorimor 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 Lorimor's urban forestry goals.

Inventory

In 2014, a tree inventory was conducted that included 100% of the city owned trees on streets and city 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 of 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 420 city trees was entered into the USDA Forest service program Street Tree Resource Analysis Tool for Urban forestry Management (STRATUM), part of the i-Tree suite. The following are results from the i-Tree STRATUM analysis.

Annual Benefits

Annual Energy Benefits

Trees conserve energy by shading buildings and blocking winds. Lorimor's trees reduce energy related costs by approximately $22,155 annually (Appendix A, Table 1). These savings are both in Electricity (106 MWh) and in Natural Gas (14,417 Therms).

Annual Stormwater Benefits

Lorimor's trees intercept about 1,207,301 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $32,718 of benefits to the city annually.

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 Lorimor, it is estimated that trees remove 1,373 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 $3,872 (Appendix A, Table 3) annually.

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Lorimor, trees sequester about 264,502 lbs of carbon a year with an associated value of $1,803 (Appendix A, Table 5). In addition, the trees store 4,774,312 lbs of carbon, with a yearly benefit of $35,807 (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. Lorimor receives $23,382 in annual social benefits from trees (Appendix A, Table 6).

Financial Summary of all Benefits

According to the USDA Forest Service i-Tree STRATUM analysis, Lorimor's trees provide $83,930 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 420 trees in Lorimor provide approximately $100 annually.

Forest Structure

Species Distribution

Lorimor has over 25 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genus is as follows:

Ash	126	30.0%
Maple	98	23.3%
Black Walnut	34	8.1%
Elm	20	4.7%
Eastern Redcedar	14	3.3%
Honeylocust	12	2.9%
Other Species	116	27.7%

Other species include: birch, pines, spruce, mulberry, redbud, cherry, apple, oaks, hickory, willow, basswood, hackberry, sycamore, boxelder, and catalpa.

Age Class

Most of Lorimor's trees (44%) are between 12-24 inches in diameter at 4.5 ft (Appendix A, Figure 2). Approximately 38.4% of the trees are in the 24" and over diameter class. For age, it is preferred that smaller size classes have the highest amount of trees to prepare for natural mortality and to maintain canopy cover. Lorimor's size curve is a little above average for age distribution.

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 Lorimor indicate that 77% of the trees are in good health, with only 2% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 65% of Lorimor'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 17% of the tree population. At least 50% of these trees need management follow up evaluation for possible removal.

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, Figures 4 & 5).

Crown Cleaning	107	25%
Crown Raising	0	0%
Tree Staking	6	1%
Tree Removal	85	20%
Crown Reduction	5	1%

Canopy Cover

The city owned canopy cover of Lorimor is approximately 12 acres (Appendix A, Figure 5). The total canopy cover for Lorimor is 65.5 acres. According to the 2014 Canopy Statistics, Lorimor occupies 242.34 acres. Thus the canopy cover on city land is about 5%.

Land Use and Location

The majority of Lorimor'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	76.50%
Park/vacant/other	23.26%
Industrial/Large commercial	0%
Small commercial	.24%
Multifamily residential	0%

Location	
Planting strip	100%
Other maintained locations	0%
Cutout (surrounded by pavement)	0%
Front yard	0%

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

Lorimor has 46 "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) and in a detailed listing provided with this plan. It is recommended to start with the large diameter critical concern trees first. After the removal of the critical concern trees, there are 39 trees that are recommended for removal/evaluation for removal within the next 3-5 years (locations listed on the map, Append. B, Figure 5).

Poor tree species

After the removal of the 46 critical concern trees (9 are ash), 39 other trees in poor health should be assessed for removal (Appendix B, Figures 3, 4, & 5). 17 of these "other trees" are ash. After that, other ash trees in poor health should be assessed for removal. Lorimor has a total of 126 city owned ash trees, and 34 of those have signs and symptoms that have been associated with EAB. Ash trees should be inspected on a yearly basis for decline. Trees exhibiting the poorest wood conditions are ash, maples, elms, E. white pine, mulberry, and Northern catalpa. Siberian elms have the highest percentage of dead and dying trees. *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. There are approximately 118 trees in Lorimor in need of some kind of pruning, mostly foliage cleaning.

Planting

Most of the planting should be done annually to 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%. 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 Lorimor.

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 (23.3%) and Green Ash (30.0%) (Appendix A, Figure 1). Maples should not be planted until this percentage can be lowered. Also, ash trees have not been recommended since 2002, due to the threat of EAB. Other species to avoid because they are public nuisances include: cottonwood, poplar, box elder, Siberian elm, evergreen, willow or black walnut or any tree species restricted by Lorimor's city tree ordinance code. An acceptable tree species listing for tree planting is attached with this plan.

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 (bark flecking).

Six Year Maintenance Plan – Proposed (no set tree maintenance budget)

Remove all "critical concern" trees first (46 total; there are 9 ash in this group). Then, concentrate on the other poor condition trees recommended for removal evaluation/removal and remove them before they become critical concern trees (39 total; 17 of these are ash). Treat ash like any other tree species, removing the trees in poorest health and those having the most public hazard potential first. Replanting should be done yearly and ash trees should be inspected yearly for signs and symptoms of EAB. * An option instead of removing some non- critical concern ash trees may be to save them for treatment.

Year 1
- Removal: 20 of the largest critical concern trees
- Planting and Replacement: none
- Visual Survey for signs and symptoms of EAB

Year 2
- Removal: 20 remaining critical concern trees
- Planting and Replacement: 24 trees in open locations from year one removals
- Routine trimming: trim 24-30 of the city trees needing pruning of some type
- Visual Survey for signs and symptoms of EAB

Year 3
- Removal: 6 remaining critical concern trees; 9 trees in poor health/recommended for removal
- Planting and Replacement: 24 trees in open locations from year 2 removals
- Routine trimming: trim 24-30 of the city trees needing pruning of some type
- Visual Survey for signs and symptoms of EAB

Year 4
- Removal: 10 trees in poor health/removal recommended
- Planting and Replacement: 18 trees in open locations from year 3 removals
- Routine trimming: trim 24-30 of the city trees needing pruning of some type
- Visual Survey for signs and symptoms of EAB

Year 5
- Removal: 10 trees in poor health/removal recommended
- Planting and Replacement: 12 trees in open locations from year 4 removals
- Routine trimming: trim 24-30 of the city trees needing pruning of some type
- Visual Survey for signs and symptoms of EAB

Year 6
- Removal: 10 trees in poor health/removal recommended
- Planting and Replacement: 12 trees in open locations from year 5 removals
- Routine trimming: trim 24-30 of the city trees needing pruning of some type
- Visual Survey for signs and symptoms of EAB

*Reduction of ash over 6 years will only remove 20% of the ash. EAB could potentially kill all ash within 4 years of infestation. After the 6 year recommended period to remove and trim everything with designated needs, concentrate on removing ash trees if needed, those in poor condition first. Any new critical concern trees and trees evaluated as needing removal are always top candidates for priority management. At the estimated average tree removal rate of $900 per tree, it would take a budget increase of $12,000 annually for 10 years just to remove all of the city owned ash trees in Lorimor.

Emerald Ash Borer Plan

Ash Tree Removal

Tree removal should 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, spreading 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/ For information about available treatments, visit http://extension.iastate.edu/Publications/PM2084.pdf

EAB Quarantines

EAB is an extremely destructive plant pest and it is responsible for the death and decline of over 25 million 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 ash trees should be replaced with a suitable diversity of non-ash tree species. All trees must meet the species restrictions in any existing city ordinance. In lieu of ordinance restrictions, it is recommended that new plantings should be a diverse mix and will not include ash, maple, cottonwood, poplar, box elder, Chinese elm, Siberian 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 genus other than ash should 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. If you suspect that you may have EAB damage, the first step is to contact the ISU Plant and Insect Diagnostic Clinic at 515-294-0581.

Private Ash Trees

It is strongly recommended that private property owners start removing ash trees on their property upon arrival of EAB in accordance with Lorimor's City Tree Ordinance Code (See Appendix C).

Budget

Assuming that the budget for tree maintenance will remain minimal, the following are some estimated costs associated with the recommended maintenance work.

If a budget increase may be possible, a recommendation would be increase the $2 per capita, which is a requirement for becoming a Tree City USA.

Tree removal costs average around $500-$900 per tree, depending on the size and numbers of trees. The estimated range would be $350-$1,500.

Trimming (including cleaning, raising, reducing) averages $75 per tree and can range from $70 to $200 per tree.

New planting averages about $150 per tree (5' trees in 10 gallon containers are about $75-$100 plus the cost of watering).

Purposed Budget Increase

EAB could potentially kill all ash trees in Greenfield within 4 years of its arrival. Realistically, it may take $19,000 of additional funding per year for 6 years to remove all of the ash trees in the city. With a $10,000 per year budget, it may take 10 to 18 years.

It is recommended that Lorimor apply for grants to fund replacement trees and/or continue to work with organizations like Trees Forever. 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. For more information about grants please contact Emma Hanigan, DNR State Urban Forester, at 515-725-8454 or by e-mail at Emma.Hanigan@dnr.iowa.gov

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Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Lorimor

Annual Energy Benefits of Public Trees

1/20/2015

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	34.9	2,650	4,762.7	4,667	7,317	(N/A)	30.0	33.0	58.07
Silver maple	19.8	1,503	2,624.0	2,572	4,075	(N/A)	14.0	18.4	69.07
Black walnut	7.7	585	1,000.5	981	1,565	(N/A)	8.1	7.1	46.04
Norway maple	8.1	613	1,163.3	1,140	1,753	(N/A)	7.4	7.9	56.54
Siberian elm	5.1	387	674.5	661	1,048	(N/A)	3.6	4.7	69.84
Elm	2.5	188	337.3	331	519	(N/A)	3.3	2.3	37.06
Eastern red cedar	1.5	114	221.7	217	331	(N/A)	3.3	1.5	23.63
Honeylocust	3.8	289	492.4	483	771	(N/A)	2.9	3.5	64.28
Eastern white pine	1.6	122	205.8	202	324	(N/A)	2.6	1.5	29.43
Mulberry	1.7	130	264.7	259	389	(N/A)	2.4	1.8	38.95
Sugar maple	2.1	158	281.5	276	434	(N/A)	1.9	2.0	54.25
Northern catalpa	3.2	241	433.5	425	665	(N/A)	1.9	3.0	83.17
Eastern redbud	1.2	91	167.8	164	255	(N/A)	1.7	1.2	36.43
Northern hackberry	1.9	148	270.6	265	413	(N/A)	1.7	1.9	59.00
Northern red oak	0.6	45	85.5	84	128	(N/A)	1.4	0.6	21.41
Apple	0.4	33	67.6	66	99	(N/A)	1.4	0.4	16.50
Blue spruce	0.3	26	55.8	55	81	(N/A)	1.4	0.4	13.49
Black cherry	0.5	37	69.8	68	105	(N/A)	1.2	0.5	21.05
Maple	1.0	77	133.0	130	208	(N/A)	1.2	0.9	41.55
Broadleaf Deciduous Mediu	1.1	81	154.4	151	232	(N/A)	1.2	1.0	46.36
American basswood	1.6	125	231.5	227	352	(N/A)	1.0	1.6	87.96
Willow	1.2	91	171.7	168	259	(N/A)	1.0	1.2	64.82
Broadleaf Deciduous Small	0.2	16	29.1	29	44	(N/A)	0.7	0.2	14.80
Northern pin oak	0.8	64	126.5	124	188	(N/A)	0.7	0.8	62.74
Spruce	0.3	21	33.2	33	54	(N/A)	0.7	0.2	17.96
Birch	0.2	16	33.7	33	49	(N/A)	0.5	0.2	24.47
Norway spruce	0.3	22	39.4	39	61	(N/A)	0.5	0.3	30.47
American sycamore	0.8	58	105.8	104	162	(N/A)	0.5	0.7	80.97
Swamp white oak	0.0	0	0.8	1	1	(N/A)	0.2	0.0	1.10
Oak	0.0	2	3.7	4	6	(N/A)	0.2	0.0	5.82
Broadleaf Deciduous Large	0.4	29	53.7	53	82	(N/A)	0.2	0.4	82.02
Eastern cottonwood	0.3	25	46.9	46	71	(N/A)	0.2	0.3	70.91
Boxelder	0.0	3	6.0	6	9	(N/A)	0.2	0.0	9.27
Buckthorn	0.2	15	31.6	31	46	(N/A)	0.2	0.2	46.14
Scotch pine	0.1	4	9.5	9	14	(N/A)	0.2	0.1	13.58
Hickory	0.2	18	27.0	26	44	(N/A)	0.2	0.2	44.23
Total	105.8	8,027	14,416.7	14,128	22,155	(N/A)	100.0	100.0	52.75

Table 2: Annual Stormwater Benefits

Lorimor

Annual Stormwater Benefits of Public Trees

1/20/2015

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	385,469	10,446	(N/A)	30.0	31.9	82.91
Silver maple	298,643	8,093	(N/A)	14.0	24.7	137.17
Black walnut	64,787	1,756	(N/A)	8.1	5.4	51.64
Norway maple	74,790	2,027	(N/A)	7.4	6.2	65.38
Siberian elm	53,781	1,457	(N/A)	3.6	4.5	97.16
Elm	28,948	784	(N/A)	3.3	2.4	56.04
Eastern red cedar	21,908	594	(N/A)	3.3	1.8	42.41
Honeylocust	36,588	992	(N/A)	2.9	3.0	82.63
Eastern white pine	31,107	843	(N/A)	2.6	2.6	76.64
Mulberry	8,906	241	(N/A)	2.4	0.7	24.14
Sugar maple	18,862	511	(N/A)	1.9	1.6	63.89
Northern catalpa	48,219	1,307	(N/A)	1.9	4.0	163.34
Eastern redbud	4,771	129	(N/A)	1.7	0.4	18.47
Northern hackberry	19,155	519	(N/A)	1.7	1.6	74.16
Northern red oak	4,803	130	(N/A)	1.4	0.4	21.69
Apple	1,536	42	(N/A)	1.4	0.1	6.94
Blue spruce	4,034	109	(N/A)	1.4	0.3	18.22
Black cherry	1,735	47	(N/A)	1.2	0.1	9.40
Maple	7,325	199	(N/A)	1.2	0.6	39.70
Broadleaf Deciduous Medium	9,010	244	(N/A)	1.2	0.7	48.83
American basswood	26,046	706	(N/A)	1.0	2.2	176.46
Willow	12,702	344	(N/A)	1.0	1.1	86.06
Broadleaf Deciduous Small	743	20	(N/A)	0.7	0.1	6.71
Northern pin oak	8,723	236	(N/A)	0.7	0.7	78.80
Spruce	3,290	89	(N/A)	0.7	0.3	29.72
Birch	1,172	32	(N/A)	0.5	0.1	15.88
Norway spruce	5,938	161	(N/A)	0.5	0.5	80.46
American sycamore	11,182	303	(N/A)	0.5	0.9	151.51
Swamp white oak	12	0	(N/A)	0.2	0.0	0.33
Oak	172	5	(N/A)	0.2	0.0	4.65
Broadleaf Deciduous Large	5,491	149	(N/A)	0.2	0.5	148.79
Eastern cottonwood	3,943	107	(N/A)	0.2	0.3	106.85
Boxelder	277	8	(N/A)	0.2	0.0	7.50
Buckthorn	1,174	32	(N/A)	0.2	0.1	31.82
Scotch pine	596	16	(N/A)	0.2	0.0	16.14
Hickory	1,466	40	(N/A)	0.2	0.1	39.72
Citywide total	1,207,301	32,718	(N/A)	100.0	100.0	77.90

Table 3: Annual Air Quality Benefits

Lorimor

Annual Air Quality Benefits of Public Trees

1/20/2015

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	48.8	7.8	23.3	2.2	259	166.5	24.3	23.1	158.2	1,038	0.0	0	454.1	1,297 (N/A)	30.0	10.30
Silver maple	54.9	9.3	26.6	2.4	295	93.5	13.7	13.1	89.6	585	-29.1	-109	274.0	771 (N/A)	14.0	13.06
Black walnut	6.3	1.0	3.4	0.3	35	36.3	5.3	5.1	34.9	227	0.0	0	92.6	262 (N/A)	8.1	7.71
Norway maple	15.2	2.6	7.5	0.7	82	39.1	5.7	5.4	36.6	242	-3.6	-13	109.1	311 (N/A)	7.4	10.03
Siberian elm	9.2	1.6	4.5	0.4	49	24.1	3.5	3.4	23.1	151	0.0	0	69.6	200 (N/A)	3.6	13.33
Elm	4.2	0.7	1.9	0.2	22	11.8	1.7	1.6	11.2	74	0.0	0	33.4	96 (N/A)	3.3	6.85
Eastern red cedar	4.5	0.9	3.6	0.6	29	7.3	1.0	1.0	6.8	45	-12.1	-45	13.6	29 (N/A)	3.3	2.07
Honeylocust	7.0	1.1	3.2	0.3	37	17.9	2.6	2.5	17.2	112	-5.2	-19	46.7	130 (N/A)	2.9	10.79
Eastern white pine	3.7	0.7	3.0	0.5	24	7.5	1.1	1.1	7.3	47	-16.6	-62	8.3	9 (N/A)	2.6	0.85
Mulberry	3.1	0.5	1.4	0.1	16	8.4	1.2	1.1	7.8	52	0.0	0	23.7	68 (N/A)	2.4	6.83
Sugar maple	2.2	0.4	1.2	0.1	12	9.9	1.4	1.4	9.4	62	-1.8	-7	24.2	67 (N/A)	1.9	8.40
Northern catalpa	7.3	1.2	3.3	0.3	38	15.1	2.2	2.1	14.4	94	0.0	0	45.9	133 (N/A)	1.9	16.59
Eastern redbud	1.5	0.2	0.7	0.1	8	5.7	0.8	0.8	5.4	36	0.0	0	15.3	44 (N/A)	1.7	6.24
Northern hackberry	3.5	0.6	1.8	0.2	19	9.4	1.4	1.3	8.8	58	0.0	0	26.9	77 (N/A)	1.7	11.04
Northern red oak	0.9	0.2	0.5	0.0	5	2.8	0.4	0.4	2.7	18	-1.3	-5	6.6	18 (N/A)	1.4	2.95
Apple	0.3	0.1	0.2	0.0	2	2.1	0.3	0.3	2.0	13	0.0	0	5.3	15 (N/A)	1.4	2.50
Blue spruce	0.4	0.1	0.4	0.0	3	1.7	0.2	0.2	1.6	11	-1.2	-5	3.4	8 (N/A)	1.4	1.40
Black cherry	0.5	0.1	0.2	0.0	3	2.3	0.3	0.3	2.2	15	0.0	0	6.0	17 (N/A)	1.2	3.42
Maple	1.5	0.3	0.7	0.1	8	4.8	0.7	0.7	4.6	30	-0.6	-2	12.9	36 (N/A)	1.2	7.27
Broadleaf Deciduous Medium	1.7	0.3	0.9	0.1	9	5.2	0.7	0.7	4.8	32	-0.4	-2	13.9	40 (N/A)	1.2	7.92
American basswood	4.3	0.7	2.0	0.2	23	7.9	1.1	1.1	7.5	49	-3.4	-13	21.4	59 (N/A)	1.0	14.78
Willow	2.8	0.5	1.4	0.1	15	5.8	0.8	0.8	5.4	36	-0.6	-2	17.0	49 (N/A)	1.0	12.17
Broadleaf Deciduous Small	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)	0.7	2.46
Northern pin oak	1.8	0.3	0.9	0.1	10	4.1	0.6	0.6	3.8	26	-0.4	-2	11.9	34 (N/A)	0.7	11.30
Spruce	0.3	0.1	0.3	0.0	2	1.3	0.2	0.2	1.3	8	-1.1	-4	2.6	6 (N/A)	0.7	2.07
Birch	0.1	0.0	0.1	0.0	1	1.0	0.1	0.1	1.0	6	0.0	0	2.5	7 (N/A)	0.5	3.47
Norway spruce	0.7	0.1	0.6	0.1	5	1.4	0.2	0.2	1.3	9	-2.8	-10	1.8	3 (N/A)	0.5	1.45
American sycamore	1.7	0.3	0.7	0.1	9	3.7	0.5	0.5	3.5	23	0.0	0	10.9	32 (N/A)	0.5	15.76
Swamp white 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)	0.2	0.14
Oak	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	1	0.0	0	0.3	1 (N/A)	0.2	0.87
Broadleaf Deciduous Large	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)	0.2	15.71
Eastern cottonwood	0.5	0.1	0.2	0.0	3	1.6	0.2	0.2	1.5	10	0.0	0	4.4	12 (N/A)	0.2	12.48
Boxelder	0.0	0.0	0.0	0.0	0	0.2	0.0	0.0	0.2	1	0.0	0	0.5	1 (N/A)	0.2	1.36
Buckthorn	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)	0.2	8.35
Scotch pine	0.1	0.0	0.1	0.0	0	0.3	0.0	0.0	0.3	2	-0.2	-1	0.6	1 (N/A)	0.2	1.48
Hickory	0.1	0.0	0.1	0.0	1	1.1	0.2	0.2	1.1	7	0.0	0	2.6	7 (N/A)	0.2	7.42
Citywide total	190.5	31.9	95.0	9.3	1,032	504.1	73.4	70.0	479.1	3,142	-80.4	-301	1,373.0	3,872 (N/A)	100.0	9.22

Table 4: Annual Carbon Stored

Lorimor

Stored CO2 Benefits of Public Trees

1/20/2015

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	1,600,875	12,007	(N/A)	30.0	33.5	95.29
Silver maple	1,328,697	9,965	(N/A)	14.0	27.8	168.90
Black walnut	206,798	1,551	(N/A)	8.1	4.3	45.62
Norway maple	248,725	1,865	(N/A)	7.4	5.2	60.18
Siberian elm	223,248	1,674	(N/A)	3.6	4.7	111.62
Elm	142,773	1,071	(N/A)	3.3	3.0	76.49
Eastern red cedar	14,604	110	(N/A)	3.3	0.3	7.82
Honeylocust	88,099	661	(N/A)	2.9	1.8	55.06
Eastern white pine	41,584	312	(N/A)	2.6	0.9	28.35
Mulberry	48,346	363	(N/A)	2.4	1.0	36.26
Sugar maple	61,255	459	(N/A)	1.9	1.3	57.43
Northern catalpa	246,466	1,848	(N/A)	1.9	5.2	231.06
Eastern redbud	22,836	171	(N/A)	1.7	0.5	24.47
Northern hackberry	56,382	423	(N/A)	1.7	1.2	60.41
Northern red oak	18,512	139	(N/A)	1.4	0.4	23.14
Apple	5,952	45	(N/A)	1.4	0.1	7.44
Blue spruce	1,464	11	(N/A)	1.4	0.0	1.83
Black cherry	7,338	55	(N/A)	1.2	0.2	11.01
Maple	17,395	130	(N/A)	1.2	0.4	26.09
Broadleaf Deciduous	27,678	208	(N/A)	1.2	0.6	41.52
American basswood	166,314	1,247	(N/A)	1.0	3.5	311.84
Willow	46,465	348	(N/A)	1.0	1.0	87.12
Broadleaf Deciduous	3,229	24	(N/A)	0.7	0.1	8.07
Northern pin oak	30,171	226	(N/A)	0.7	0.6	75.43
Spruce	2,379	18	(N/A)	0.7	0.0	5.95
Birch	2,201	17	(N/A)	0.5	0.0	8.26
Norway spruce	6,685	50	(N/A)	0.5	0.1	25.07
American sycamore	55,031	413	(N/A)	0.5	1.2	206.37
Swamp white oak	17	0	(N/A)	0.2	0.0	0.13
Oak	185	1	(N/A)	0.2	0.0	1.39
Broadleaf Deciduous	25,943	195	(N/A)	0.2	0.5	194.57
Eastern cottonwood	15,773	118	(N/A)	0.2	0.3	118.30
Boxelder	218	2	(N/A)	0.2	0.0	1.64
Buckthorn	6,743	51	(N/A)	0.2	0.1	50.57
Scotch pine	257	2	(N/A)	0.2	0.0	1.93
Hickory	3,672	28	(N/A)	0.2	0.1	27.54
Citywide total	4,774,312	35,807	(N/A)	100.0	100.0	85.26

Table 5: Annual Carbon Sequestered

Lorimor

Annual CO2 Benefits of Public Trees

1/20/2015

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	80,919	607	-7,684	-364	-3	0	0	72,870	547 (N/A)	30.0	30.3	4.34
Silver maple	90,537	679	-6,378	-228	-2	0	0	83,931	629 (N/A)	14.0	34.9	10.67
Black walnut	16,933	127	-993	-74	-1	0	0	15,866	119 (N/A)	8.1	6.6	3.50
Norway maple	10,754	81	-1,194	-85	-1	0	0	9,475	71 (N/A)	7.4	3.9	2.29
Siberian elm	9,508	71	-1,072	-53	0	0	0	8,383	63 (N/A)	3.6	3.5	4.19
Elm	5,135	39	-685	-29	0	0	0	4,421	33 (N/A)	3.3	1.8	2.37
Eastern red cedar	254	2	-70	-27	0	0	0	158	1 (N/A)	3.3	0.1	0.08
Honeylocust	10,100	76	-423	-30	0	0	0	9,647	72 (N/A)	2.9	4.0	6.03
Eastern white pine	1,402	11	-200	-32	0	0	0	1,170	9 (N/A)	2.6	0.5	0.80
Mulberry	2,198	16	-232	-25	0	0	0	1,941	15 (N/A)	2.4	0.8	1.46
Sugar maple	4,008	30	-294	-21	0	0	0	3,693	28 (N/A)	1.9	1.5	3.46
Northern catalpa	7,037	53	-1,183	-36	0	0	0	5,818	44 (N/A)	1.9	2.4	5.45
Eastern redbud	1,452	11	-110	-14	0	0	0	1,328	10 (N/A)	1.7	0.6	1.42
Northern hackberry	2,443	18	-271	-19	0	0	0	2,153	16 (N/A)	1.7	0.9	2.31
Northern red oak	502	4	-89	-8	0	0	0	405	3 (N/A)	1.4	0.2	0.51
Apple	656	5	-29	-6	0	0	0	621	5 (N/A)	1.4	0.3	0.78
Blue spruce	205	2	-7	-6	0	0	0	192	1 (N/A)	1.4	0.1	0.24
Black cherry	725	5	-35	-6	0	0	0	684	5 (N/A)	1.2	0.3	1.03
Maple	1,297	10	-83	-9	0	0	0	1,204	9 (N/A)	1.2	0.5	1.81
Broadleaf Deciduous Medi	1,891	14	-134	-11	0	0	0	1,747	13 (N/A)	1.2	0.7	2.62
American basswood	8,394	63	-798	-21	0	0	0	7,575	57 (N/A)	1.0	3.2	14.20
Willow	756	6	-223	-14	0	0	0	519	4 (N/A)	1.0	0.2	0.97
Broadleaf Deciduous Smal	314	2	-16	-3	0	0	0	296	2 (N/A)	0.7	0.1	0.74
Northern pin oak	1,310	10	-145	-9	0	0	0	1,156	9 (N/A)	0.7	0.5	2.89
Spruce	249	2	-11	-4	0	0	0	233	2 (N/A)	0.7	0.1	0.58
Birch	448	3	-11	-2	0	0	0	435	3 (N/A)	0.5	0.2	1.63
Norway spruce	375	3	-32	-5	0	0	0	337	3 (N/A)	0.5	0.1	1.26
American sycamore	1,769	13	-264	-9	0	0	0	1,496	11 (N/A)	0.5	0.6	5.61
Swamp white oak	5	0	0	0	0	0	0	5	0 (N/A)	0.2	0.0	0.04
Oak	74	1	-1	-1	0	0	0	73	1 (N/A)	0.2	0.0	0.55
Broadleaf Deciduous Larg	960	7	-125	-4	0	0	0	831	6 (N/A)	0.2	0.3	6.23
Eastern cottonwood	857	6	-76	-4	0	0	0	778	6 (N/A)	0.2	0.3	5.83
Boxelder	57	0	-2	-1	0	0	0	55	0 (N/A)	0.2	0.0	0.41
Buckthorn	478	4	-32	-3	0	0	0	443	3 (N/A)	0.2	0.2	3.33
Scotch pine	53	0	-1	-1	0	0	0	50	0 (N/A)	0.2	0.0	0.38
Hickory	445	3	-18	-2	0	0	0	426	3 (N/A)	0.2	0.2	3.19
Citywide total	264,502	1,984	-22,919	-1,166	-9	0	0	240,417	1,803 (N/A)	100.0	100.0	4.29

Table 6: Annual Social and Aesthetic

Lorimor

Annual Aesthetic/Other Benefits of Public Trees

1/20/2015

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	6,724	(N/A)	30.0	28.8	53.37
Silver maple	6,751	(N/A)	14.0	28.9	114.43
Black walnut	1,598	(N/A)	8.1	6.8	46.99
Norway maple	1,020	(N/A)	7.4	4.4	32.90
Siberian elm	668	(N/A)	3.6	2.9	44.55
Elm	471	(N/A)	3.3	2.0	33.68
Eastern red cedar	90	(N/A)	3.3	0.4	6.41
Honeylocust	2,356	(N/A)	2.9	10.1	196.33
Eastern white pine	291	(N/A)	2.6	1.2	26.49
Mulberry	130	(N/A)	2.4	0.6	13.02
Sugar maple	448	(N/A)	1.9	1.9	56.05
Northern catalpa	482	(N/A)	1.9	2.1	60.20
Eastern redbud	84	(N/A)	1.7	0.4	11.97
Northern hackberry	324	(N/A)	1.7	1.4	46.28
Northern red oak	57	(N/A)	1.4	0.2	9.58
Apple	37	(N/A)	1.4	0.2	6.13
Blue spruce	118	(N/A)	1.4	0.5	19.62
Black cherry	41	(N/A)	1.2	0.2	8.30
Maple	191	(N/A)	1.2	0.8	38.29
Broadleaf Deciduous Medium	181	(N/A)	1.2	0.8	36.24
American basswood	512	(N/A)	1.0	2.2	127.88
Willow	71	(N/A)	1.0	0.3	17.66
Broadleaf Deciduous Small	18	(N/A)	0.7	0.1	5.86
Northern pin oak	118	(N/A)	0.7	0.5	39.19
Spruce	71	(N/A)	0.7	0.3	23.82
Birch	52	(N/A)	0.5	0.2	26.22
Norway spruce	94	(N/A)	0.5	0.4	47.08
American sycamore	124	(N/A)	0.5	0.5	61.96
Swamp white oak	3	(N/A)	0.2	0.0	2.74
Oak	15	(N/A)	0.2	0.1	14.73
Broadleaf Deciduous Large	67	(N/A)	0.2	0.3	66.60
Eastern cottonwood	66	(N/A)	0.2	0.3	65.59
Boxelder	19	(N/A)	0.2	0.1	19.09
Buckthorn	29	(N/A)	0.2	0.1	28.80
Scotch pine	15	(N/A)	0.2	0.1	15.42
Hickory	46	(N/A)	0.2	0.2	45.86
Citywide total	23,382	(N/A)	100.0	100.0	55.67

Table 7: Summary of Benefits in Dollars

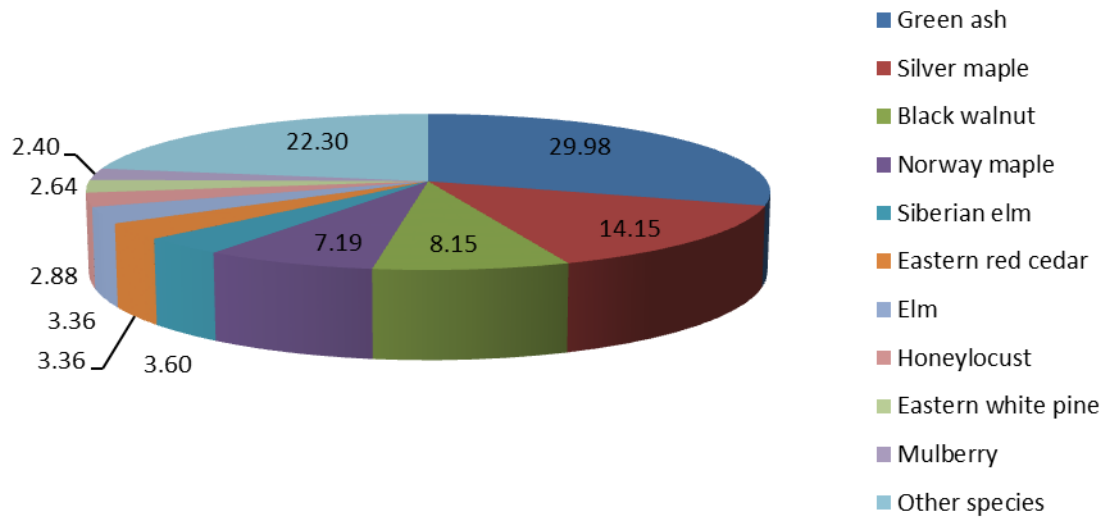
Lorimor

Total Annual Benefits of Public Trees by Species ($)

1/20/2015

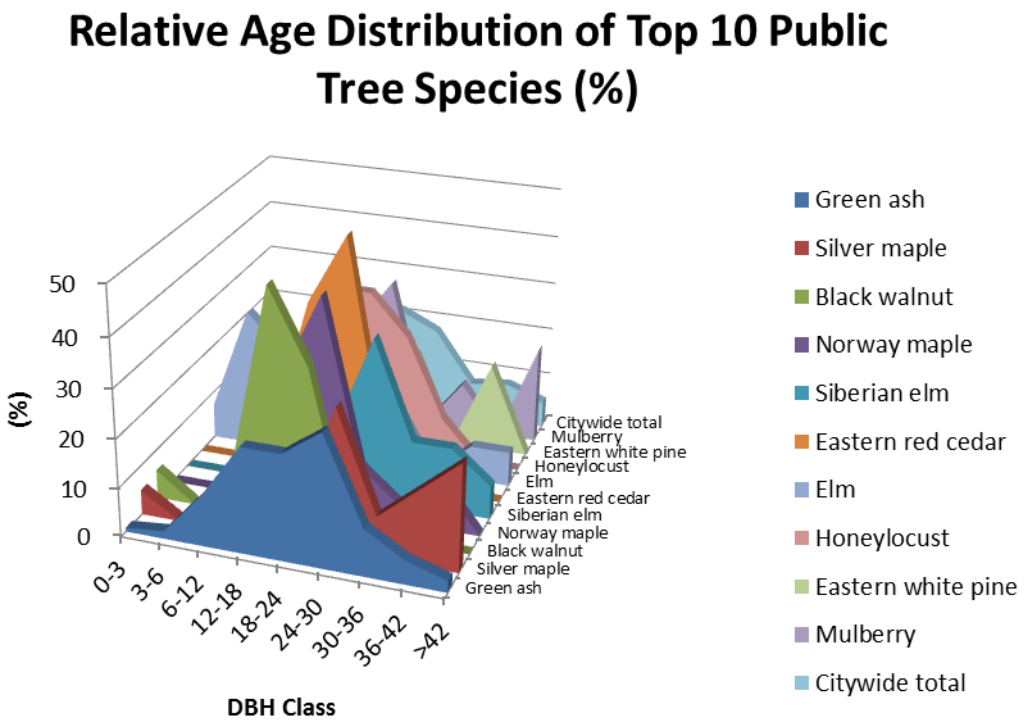
Species	Energy	CO_2	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Green ash	7,317	547	1,297	10,446	6,724	26,331	(N/A)	31.4
Silver maple	4,075	629	771	8,093	6,751	20,320	(N/A)	24.2
Black walnut	1,565	119	262	1,756	1,598	5,300	(N/A)	6.3
Norway maple	1,753	71	311	2,027	1,020	5,181	(N/A)	6.2
Siberian elm	1,048	63	200	1,457	668	3,436	(N/A)	4.1
Elm	519	33	96	784	471	1,904	(N/A)	2.3
Eastern red cedar	331	1	29	594	90	1,045	(N/A)	1.2
Honeylocust	771	72	130	992	2,356	4,321	(N/A)	5.1
Eastern white pine	324	9	9	843	291	1,476	(N/A)	1.8
Mulberry	389	15	68	241	130	844	(N/A)	1.0
Sugar maple	434	28	67	511	448	1,488	(N/A)	1.8
Northern catalpa	665	44	133	1,307	482	2,630	(N/A)	3.1
Eastern redbud	255	10	44	129	84	522	(N/A)	0.6
Northern hackberry	413	16	77	519	324	1,349	(N/A)	1.6
Northern red oak	128	3	18	130	57	337	(N/A)	0.4
Apple	99	5	15	42	37	197	(N/A)	0.2
Blue spruce	81	1	8	109	118	318	(N/A)	0.4
Black cherry	105	5	17	47	41	216	(N/A)	0.3
Maple	208	9	36	199	191	643	(N/A)	0.8
Broadleaf Deciduous M	232	13	40	244	181	710	(N/A)	0.8
American basswood	352	57	59	706	512	1,685	(N/A)	2.0
Willow	259	4	49	344	71	727	(N/A)	0.9
Broadleaf Deciduous Sn	44	2	7	20	18	92	(N/A)	0.1
Northern pin oak	188	9	34	236	118	585	(N/A)	0.7
Spruce	54	2	6	89	71	222	(N/A)	0.3
Birch	49	3	7	32	52	143	(N/A)	0.2
Norway spruce	61	3	3	161	94	321	(N/A)	0.4
American sycamore	162	11	32	303	124	632	(N/A)	0.8
Swamp white oak	1	0	0	0	3	4	(N/A)	0.0
Oak	6	1	1	5	15	27	(N/A)	0.0
Broadleaf Deciduous La	82	6	16	149	67	319	(N/A)	0.4
Eastern cottonwood	71	6	12	107	66	262	(N/A)	0.3
Boxelder	9	0	1	8	19	38	(N/A)	0.0
Buckthorn	46	3	8	32	29	118	(N/A)	0.1
Scotch pine	14	0	1	16	15	47	(N/A)	0.1
Hickory	44	3	7	40	46	140	(N/A)	0.2
Citywide Total	22,155	1,803	3,872	32,718	23,382	83,930	(N/A)	100.0

Tree Species Distribution



Species	Percent
Green ash	29.98
Silver maple	14.15
Black walnut	8.15
Norway maple	7.19
Siberian elm	3.60
Eastern red cedar	3.36
Elm	3.36
Honeylocust	2.88
Eastern white pine	2.64
Mulberry	2.40
Other species	22.30
Total	100.00

Figure 1: Species Distribution



Species	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42
Green ash	0.80	1.60	10.40	21.60	21.60	27.20	9.60	4.80	2.40
Silver maple	5.08	0.00	5.08	6.78	8.47	28.81	8.47	15.25	22.03
Black walnut	5.88	0.00	8.82	47.06	32.35	0.00	5.88	0.00	0.00
Norway maple	0.00	0.00	6.67	26.67	43.33	10.00	3.33	10.00	0.00
Siberian elm	0.00	0.00	0.00	20.00	13.33	33.33	13.33	13.33	6.67
Eastern red cedar	0.00	0.00	7.14	35.71	50.00	7.14	0.00	0.00	0.00
Elm	7.14	28.57	21.43	7.14	7.14	14.29	0.00	7.14	7.14
Honeylocust	0.00	0.00	0.00	33.33	33.33	25.00	8.33	0.00	0.00
Eastern white pine	0.00	0.00	9.09	36.36	18.18	18.18	0.00	18.18	0.00
Mulberry	0.00	0.00	20.00	20.00	30.00	0.00	10.00	0.00	20.00
Citywide total	2.88	4.08	11.03	22.30	21.34	17.75	7.19	8.15	5.28

Figure 2: Relative Age Class

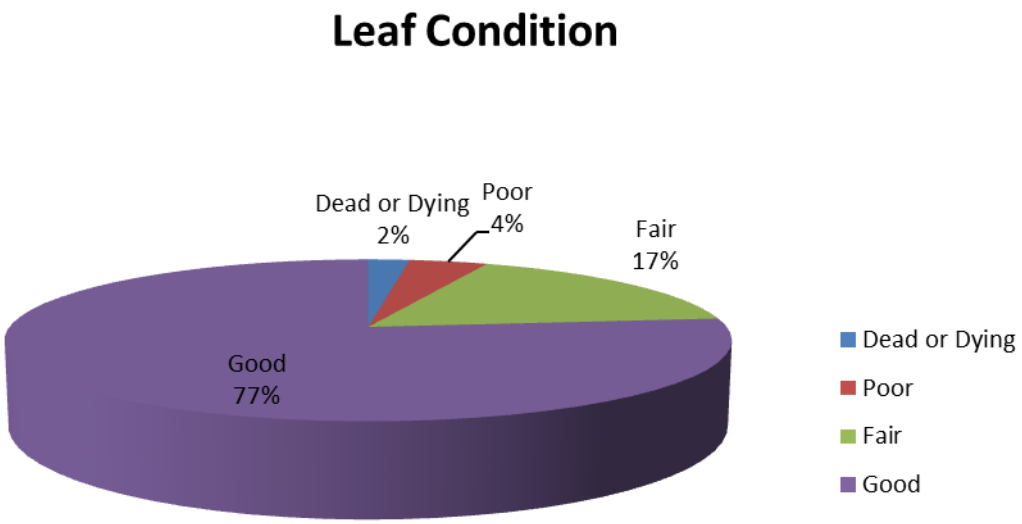


Figure 3: Foliage Condition

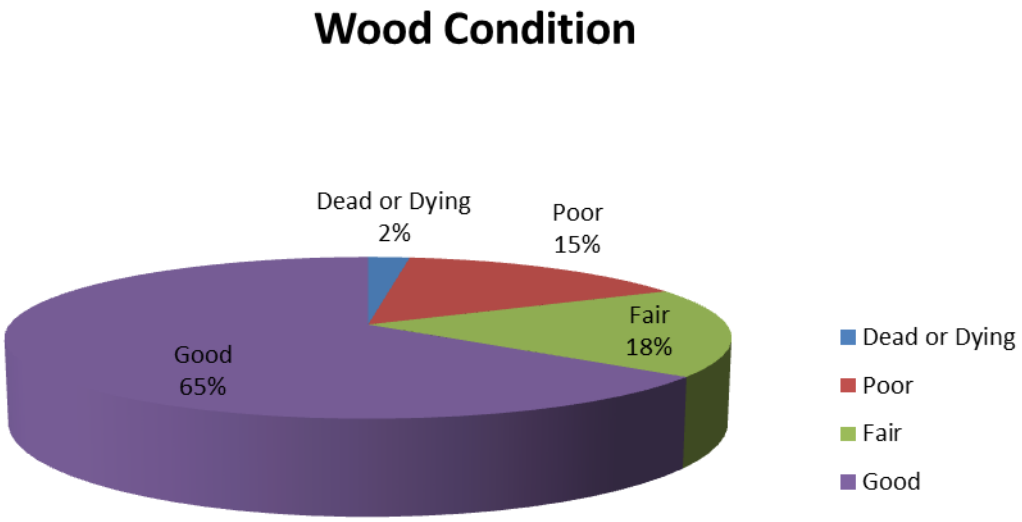
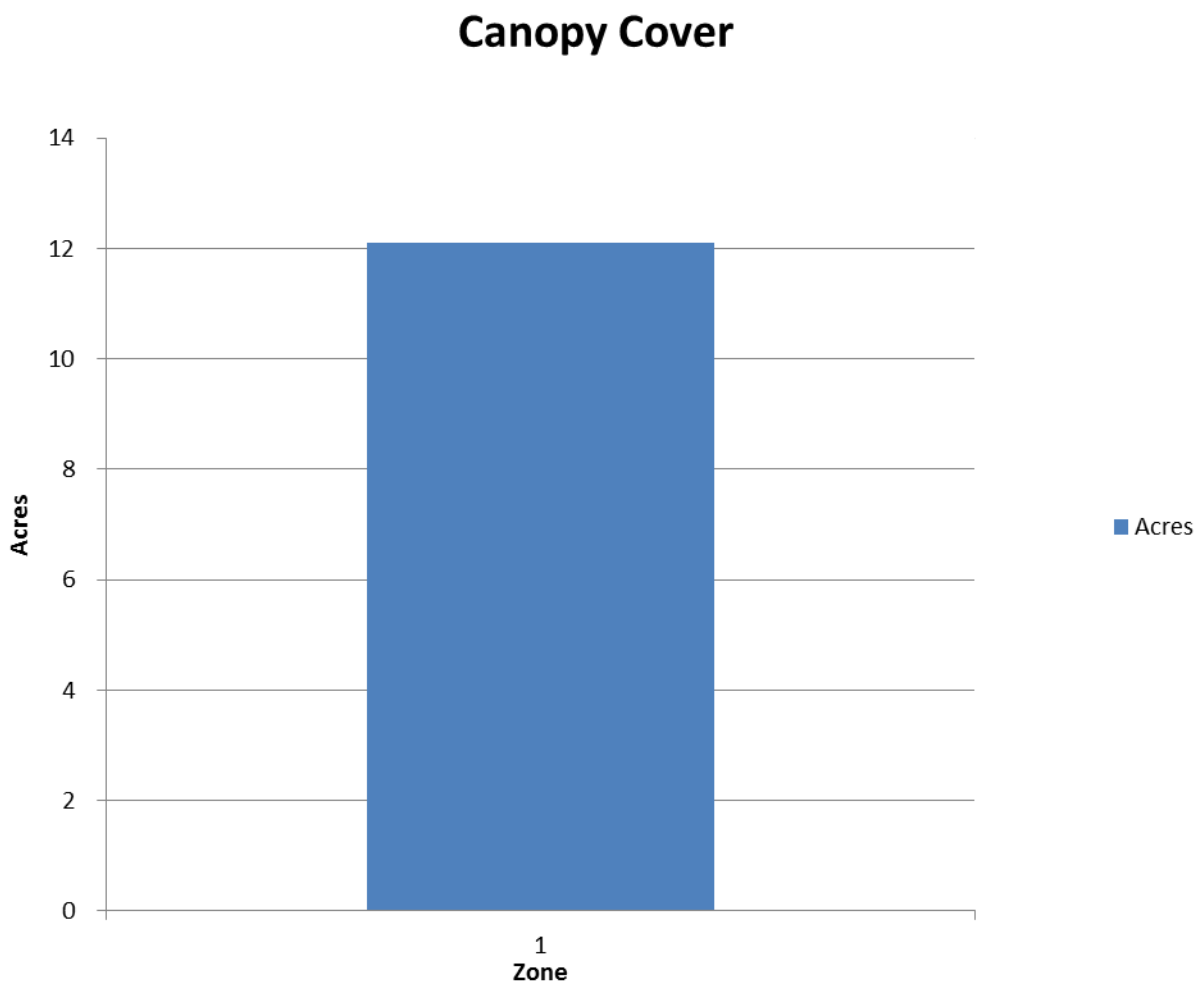
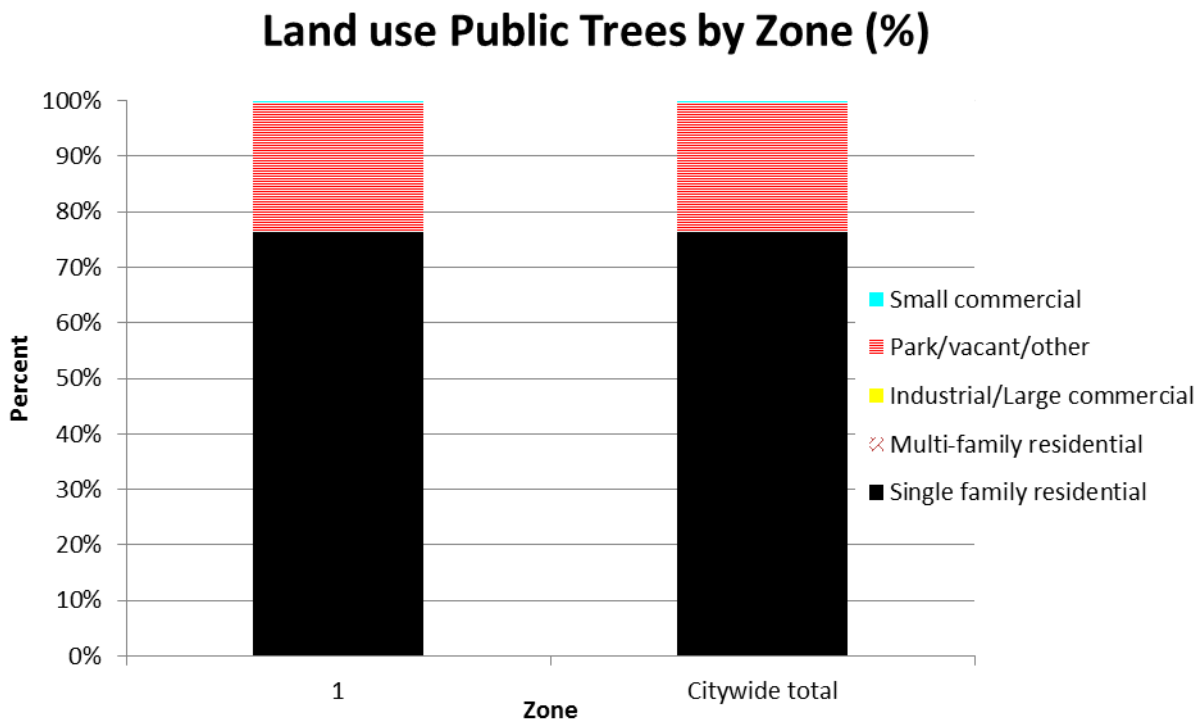


Figure 4: Wood Condition



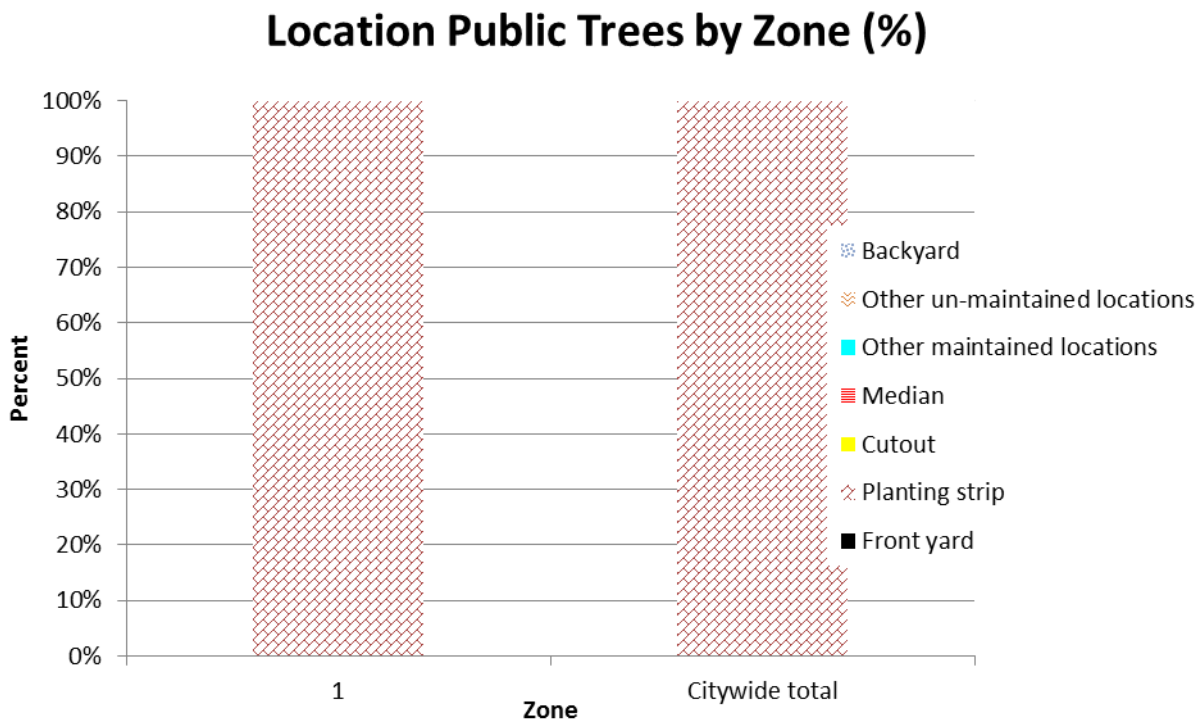
Zone	Acres	% of Total Canopy
1	12.11	100.00
Citywide total	12.11	100.00

Figure 5: Canopy Cover in Acres



Zone	Single family residential	Multi-family residential	Industrial/ Large commercial	Park/vacant/other	Small commercial
1	76.50	0.00	0.00	23.26	0.24
Citywide total	76.50	0.00	0.00	23.26	0.24

Figure 6: Land Use of city/park trees



Zone	Front yard	Planting strip	Cutout	Median	Other maintained locations	Other un-maintained locations	Backyard
1	0.00	100.00	0.00	0.00	0.00	0.00	0.00
Citywide total	0.00	100.00	0.00	0.00	0.00	0.00	0.00

Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

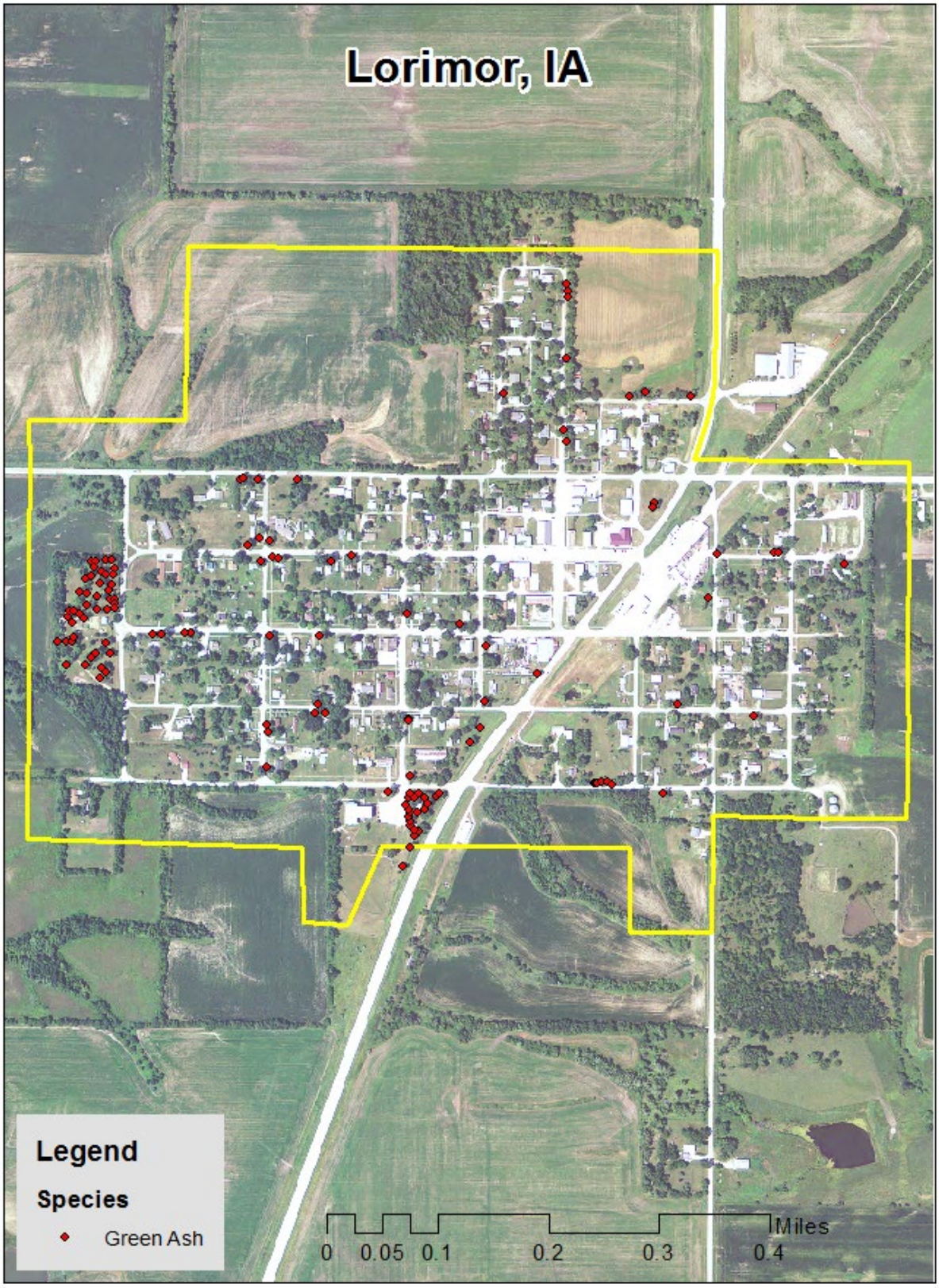


Figure 1: Location of Ash Trees

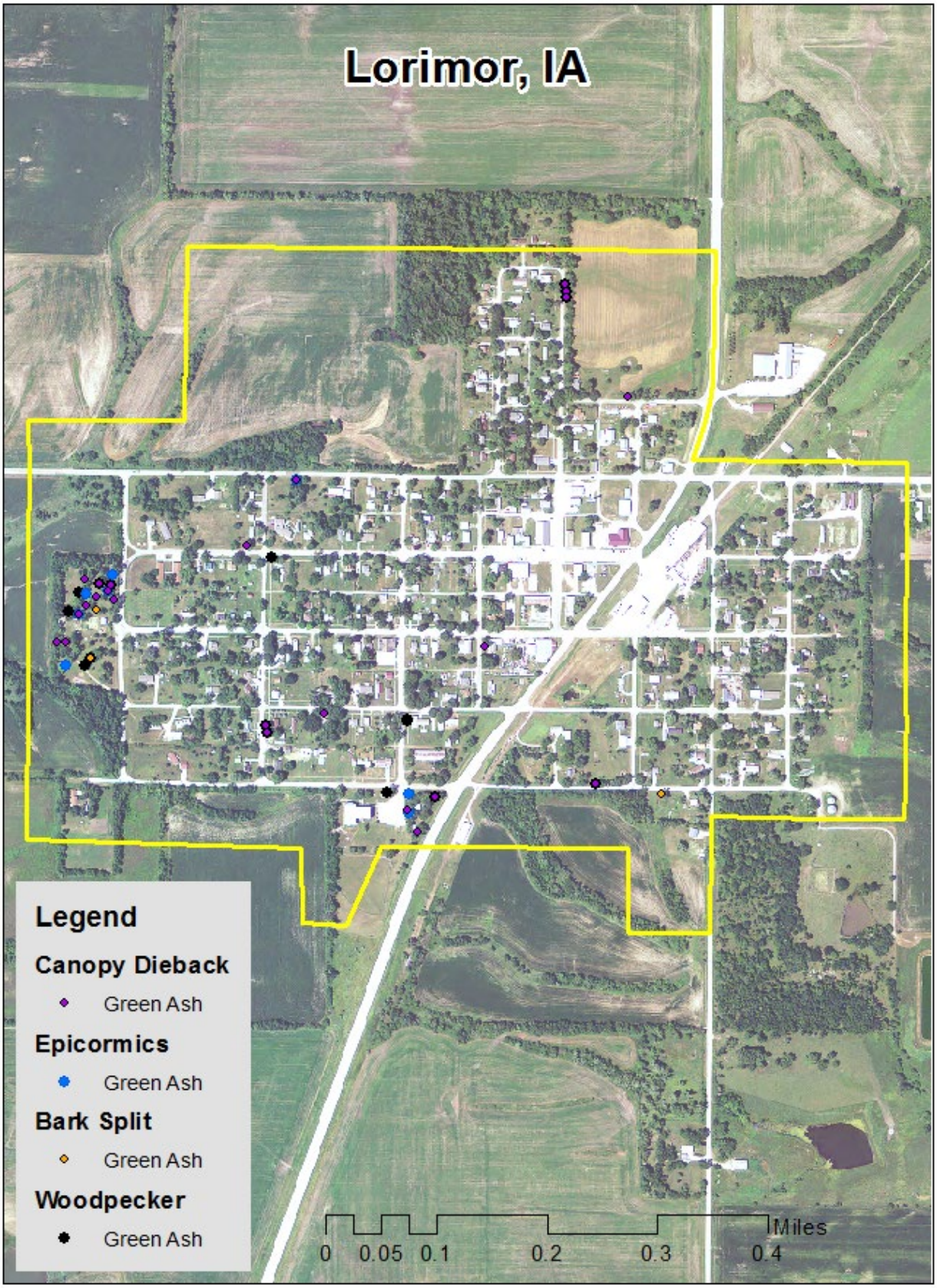


Figure 2: Location of EAB symptoms

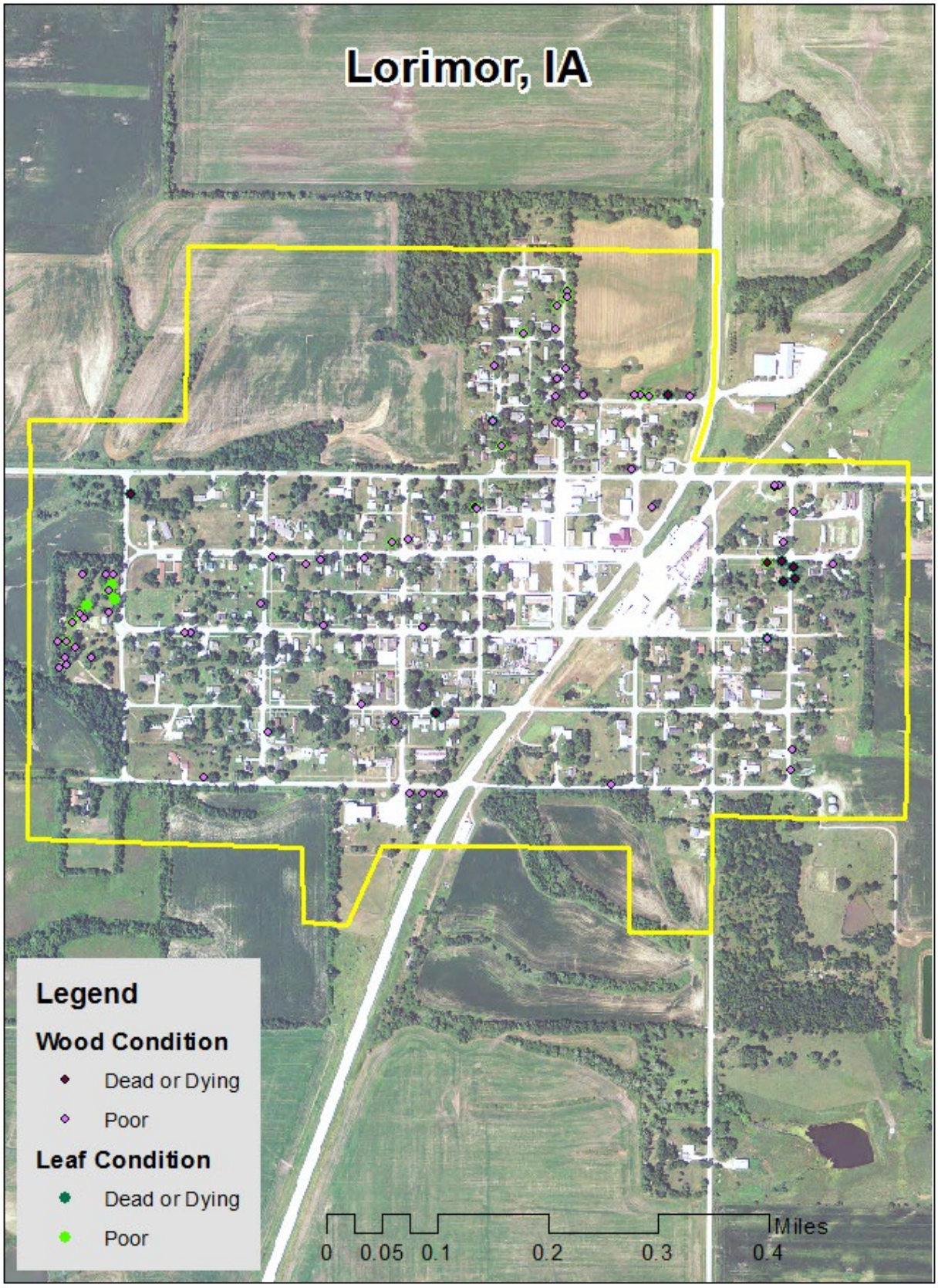


Figure 3: Location of Poor Condition Trees

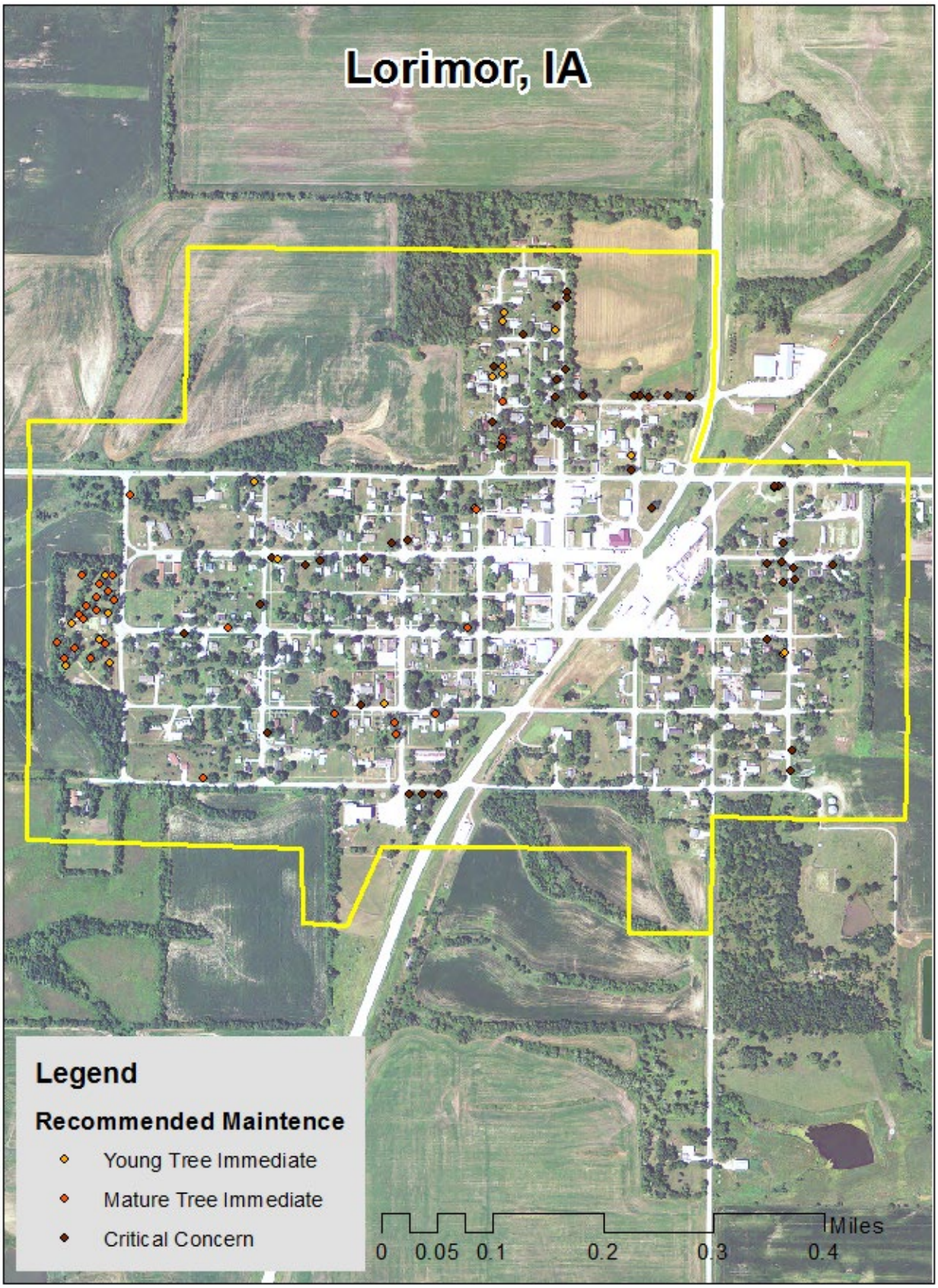


Figure 4: Location of Trees with Recommended Maintenance

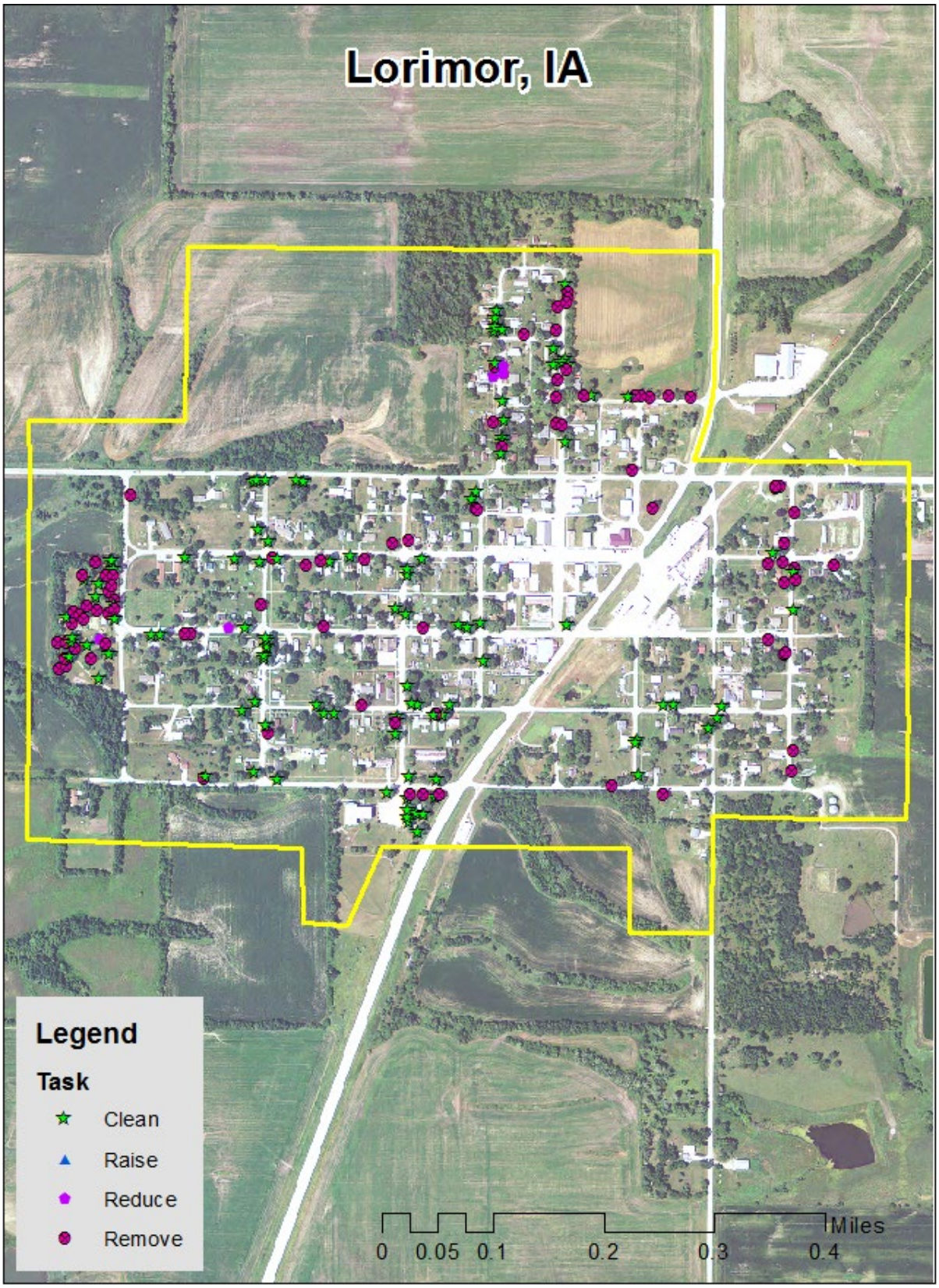


Figure 5: Maintenance Tasks *City ownership of the trees recommended for removal should be verified prior to any removal*

Appendix C: Lorimor Tree Ordinances

TITLE VI
PHYSICAL ENVIRONMENT
CHAPTER 12

TREES

6-12-1 Purpose
6-12-2 Definitions
6-12-3 Arboriculture Specifications and Standards of Practice
6-12-4 Removal of Trees
6-12-5 Duty to Trim Trees
6-12-6 Trimming of Trees Under Supervision of Mayor
6-12-7 Eradication and Control of Dutch Elm Disease
6-12-8 Notification of Diseased Trees
6-12-9 Removal by City
6-12-10 Written Complaints

6-12-1 PURPOSE. The purpose of this Ordinance is to beautify and preserve the appearance of the City by requiring street trees to be uniformly located and maintained. The primary responsibility for maintaining street trees is placed upon the abutting property owner or his agent, but the City shall personally supervise any Cutting or trimming of said tree.

6-12-2 DEFINITIONS. For use in this Ordinance, the following terms are defined:

1. The term "person" shall mean any individual, firm, Corporation, trust, association or any other organized group.
2. The term "street" shall mean the entire width between property lines of avenues or highways.
3. The term "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.
4. The term "property owner" shall mean a person owning private property in the City as shown by the County Auditor's plat of the City.
5. The term "public property" shall mean any and all property located within the confines of the City and owned by the City or held in the name of the City by any of the departments, commissions or agencies within the City government.

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6-12-3 ARBORICULTURE SPECIFICATIONS AND STANDARDS OF PRACTICE

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1. Spacing. All trees hereafter planted in any street shall be planted

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 four and one half (4 1/2) feet from the property line.

2. Planting.

a. Size. All trees planted on the streets shall be of sufficient size to warrant satisfactory results and stand the abuse common to street signs.
b. Grade. Unless otherwise allowed for substantial reasons, all standard sized trees shall be comparatively straight trunks, well-developed leaders, and top and root characteristics of the species or variety showing evidence of proper nursery pruning. All trees must be free of insect, disease, mechanical injuries and other objectionable features at the time of planting. To compensate for any serious loss of roots, the top of the tree should be reduced by thinning or cutting back as determined by the growth characteristics of the tree species. The leader shall not be cut off in such trimming.
c. Planting. Trees shall not be planted on the parking if it is less than nine (9) feet in width, or contains less than eight-one (81) square feet of exposed soil surface, or if a hazard to public utilities is present. 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. If trees are planted between property line and curb it shall be done with Council approval.
d. Method of support. Trees may be guyed or supported in an upright position according to accepted arboriculture practices. The guys or supports shall be fastened in such a way that they will not girdle or cause serious injury to the trees or endanger public safety.

3. Trimming or pruning.

a. All cuts are to be made sufficiently close to the parent stem so that healing can readily start under normal conditions.
b. All dead and diseased wood shall be removed.

c. All limbs one inch in diameter or more must be pre-cut to prevent splitting. All branches in danger of injuring the tree in falling shall be lowered by rope.
d. A crossed or rubbing branch shall be removed where practicable, but removal shall not leave large holes in the general outline of the tree. Crossed or rubbing branches may be cabled apart.
e. All cuts, old and new, one inch in diameter or more, shall be painted with an approved tree wound dressing. On old wounds care shall be taken to paint exposed wood only.
f. Where there is a known danger of transmitting disease by tools, they shall be disinfected with alcohol before use on another tree.

g. Improperly healed scars, where callous growth is not established, are to be traced and painted, unless the Mayor designates other treatment.
h. No topping or dehorning of trees shall be permitted except by special written permission of the Mayor. Trees becoming stagheaded may have the dead portions removed back to sound green wood, with a proper forty-five (45) degree cut only.
i. Elm wood trimmed, pruned or removed shall not be used for any purpose, but shall be disposed of immediately by burning or burying.

6-12-4 REMOVAL OF TREES. The City shall remove, on the order of the Council, any tree on the streets of this municipality which interferes with the making of improvements or with travel thereon. The City shall additionally remove any trees on the street, not on private property, which have become diseased, or which constitutes a danger to the public, or which may otherwise be declared a nuisance.

6-12-5 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 sidewalk.

6-12-6 TRIMMING OF TREES UNDER SUPERVISION OF CITY. Except as allowed in Section 4, no person may trim or cut any tree in a street or public place unless the work is done under the supervision of the City.
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6-12-7 ERADICATION AND CONTROL OF DUTCH ELM DISEASE. In accordance with Section 368.3 of the Code of Iowa, any owner, occupant or person, in charge of any property shall remove at his own expense any tree, brush, wood or debris infected with Dutch Elm disease, when so notified to remove same by the Clerk of the City of Lorimor as hereinafter provided.

6-12-8 NOTIFICATION OF DISEASED TREES. Such owner, occupant or person in charge of such property shall be served with written notice by the City Clerk to remove said tree, brush, wood or debris within thirty (30) days from the date of service of such written notice. If such owner, occupant or person fails to comply with said notice to remove such tree, brush, wood or debris within thirty (30) days from service of said notice, the City Council shall order the City Clerk to cause the same to be removed and the cost of such removal assessed against the said real estate.

6-12-9 REMOVAL BY CITY. In carrying out said order of the City Council, the City Clerk may accomplish such removal by utilizing City employees or equipment, or may contract for such removal by private persons.

6-12-10 WRITTEN COMPLAINTS. Any citizen of the City of Lorimor having cause to believe that any tree, brush, wood or debris located within the City of

Lorimor is infected with Dutch Elm disease may file a written complaint with the City Clerk, setting forth the location and description of such tree, brush, wood or debris. Upon such filing of written complaint, the City Clerk shall cause a specimen of such tree, brush, wood or debris to be tested by such technological facilities or testing procedures as the City Clerk shall select. Such test may also be carried out without the filing of such written complaint upon the initiative or request of any City employee or of the City Council. Upon being advised that such tree, brush, wood or debris is infected with Dutch Elm disease, the City Clerk shall proceed under the provisions of this ordinance.
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The State of Iowa is an Equal Opportunity Employer and provider of ADA services.

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

If you need accommodations because of disability to access the services of this Agency, please contact the Director at 515-281-5918.