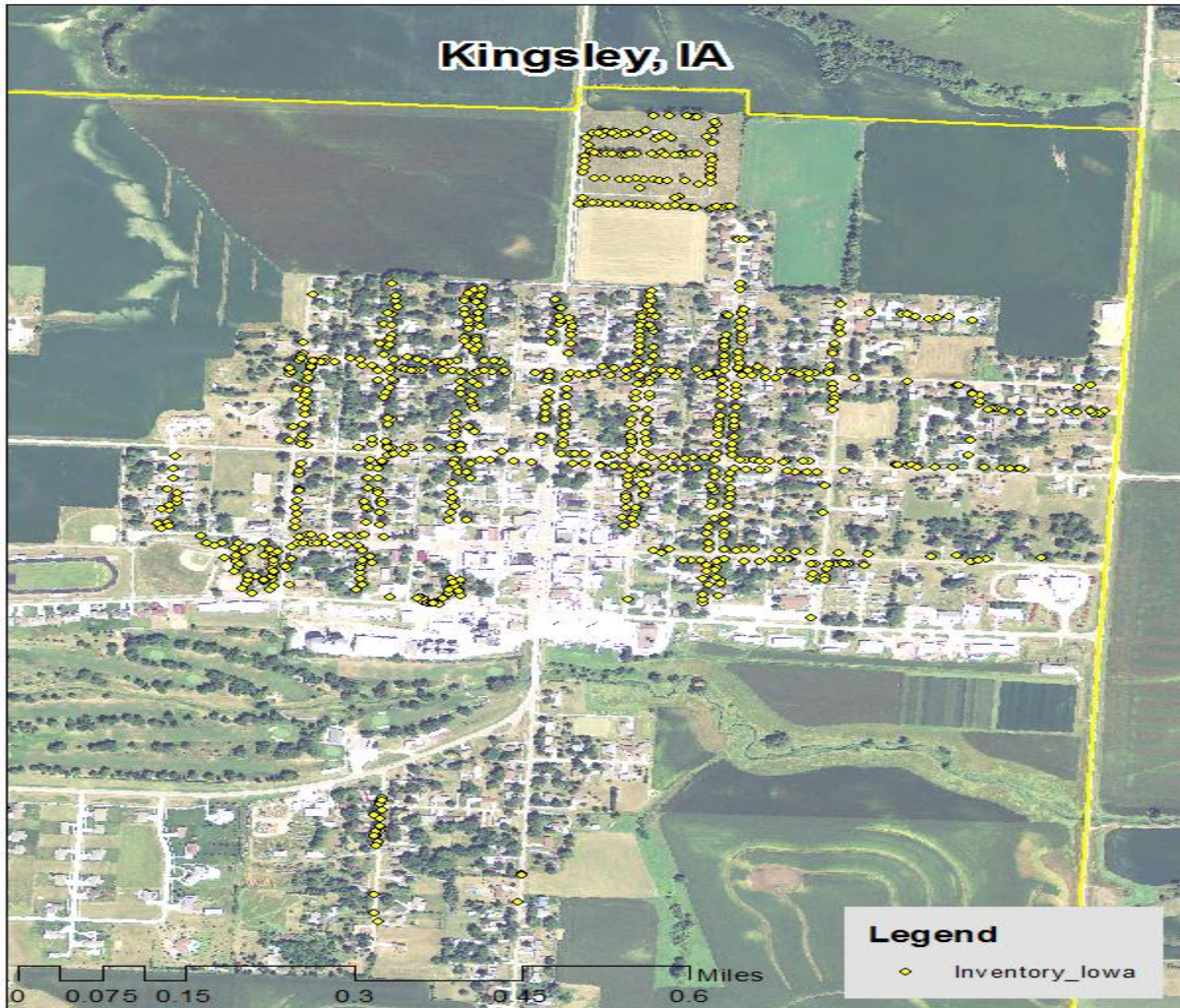


KINGSLEY, IA



2014 Management Plan
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Executive Summary

Overview

This plan was developed to assist the City of Kingsley 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 in North America (this does not include mountain ash). There is a strong possibility that 27% of Kingsley'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 August 2013, a tree inventory was conducted using Global Positioning System (GPS) data collectors. The inventory was a complete inventory of street and park trees. Listed below are (some) of the key findings of the 635 'public' trees within the 729 trees inventoried. When street curbs and sidewalks were not present, trees were tallied as 'privately' managed trees and are 'only' included in the total number of trees counted (and not in the iTree data nor the Appendices A & B in the back of this plan).

- Kingsley's trees provide \$119,923 of benefits annually, an average of \$189 a tree.
- There are over 27 species of trees.
- The top three genus are: Maple 41%, Ash 29%, and Linden 5%.
- 50% of trees are in need of some type of management.
- 42 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 42 trees needing removal, 17 trees are over 24 inches in diameter at 4.5 ft. and must be addressed immediately. See Appendix B, Figure 5. [*City ownership of the trees recommended for removal should be verified prior to any removal*](#)
- 53 of the 176 ash trees are in need of follow-up because they are displaying signs and symptoms associated with EAB. See Appendix B, Figure 2.
- 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. See Appendix B, Figures 1 & 2, for visual locations.
- The current budget does not contain a budget item for tree removals on public land. If EAB begins to affect the 176 'public' ash trees, a regular line item would provide the city with an indication of how many years it will take to remove the infested trees. So far,

state forestry has found a state-wide tree removal cost of \$550 to \$1000 per tree for all tree species. If Kingsley sets an annual tree removal line item of \$2000, 3 to 4 infested ash trees could be removed per year. If 3 to 4 ashes were removed each year, it could take 44 to 58 years just to remove infested trees along city streets. This does not include trees in the city park and cemetery.

- There are 95 ash trees in town where curbs and sidewalks do not exist. These ash trees are considered 'private' trees in this plan and the responsibility of the homeowner. Fifty-three (53) of the 95 private trees show some EAB symptoms (at least 3 of the 5 symptoms).
- Review a later section on pages 8 & 9 entitled "Other Hazardous Ash Trees with Decay."

Introduction

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

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

Inventory

In 2013, a tree inventory was conducted that included 100% of the city owned trees along city streets. 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 feet, 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 829 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. Kingsley's trees reduce energy related costs by approximately \$29,201 annually (Appendix A, Table 1). These savings are both in Electricity (140.2 MWh) and in Natural Gas (18,989 Therms).

Annual Stormwater Benefits

Kingsley's trees intercept about 1,548,683 gallons of rainfall or snowmelt a year (Appendix A, Table 2). This interception provides \$41,972 of benefits to the city.

Annual Air Quality Benefits

Air quality is a persistent public health issue in Iowa. The urban forest improves air quality by removing pollutants, lowering air temperature, and reducing energy consumption, which in turn reduces emissions from power plants, and emitting volatile organic matter (ozone). In Kingsley, it is estimated that trees remove 1,735 lbs of air pollution (ozone (O₃), particulate matter less than 10 microns (PM10), carbon monoxide (CO), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂)) per year with a net value of \$4,836 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Kingsley, trees sequester about 350,950 lbs of carbon a year with an associated value of \$4,337 (Appendix A, Table 5). In addition, the trees store 5,326,025 lbs of carbon, with a yearly benefit of \$39,945 (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. Kingsley receives \$31,711 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, Kingsley’s trees provide \$111,923 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 635 trees in Kingsley provide approximately \$176 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

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

Maple	204	32%
Ash	183	29%
Spruce	113	18%
Linden/Basswood	29	5%
Apple	15	2%
Broadleaf Deciduous	15	2%
Northern Red Oak	9	1%
Callery Pear	7	1%
Other tree species	60	10%

Of the 635 street trees, the following list is a breakdown of the 5 most abundant tree species:

Green ash	27.6%
Silver maple	16.9%
Blue spruce	13.7%
Norway maple	9.1%
Other spruce	4.1%

See also, Appendix A, Figure 1 showing the ten most common PUBLIC street trees (by species).

Age Class

Most of Kingsley’s trees (54%) are between 12 and 24 inches in diameter when measured at 4.5 ft. (Appendix A, Figure 2 and Appendix A, Table 9). And, 79% of your trees are between 6 and 30 inches in diameter when measured at 4.5 feet above the ground (Appendix A, Figure 2 and Appendix A, Table 9). With regard to age/size, it is preferred that the highest number of trees be in the smaller diameters, so younger and smaller trees will replace natural mortality and to maintain tree canopy cover. Kingsley’s size curve is on the smaller side, indicating a younger than average stand.

Condition: Wood and Foliage

Both wood condition and leaf condition are good indicators of the overall health of the urban forest. The **foliage** condition results for Kingsley indicate that 61% of the trees are in good health, with only 8% of the foliage in poor health, dead or dying (Appendix A, Figure 3 &

Appendix B, Figure 3). Similarly, 59% of Kingsley’s trees are in good health for wood condition (Appendix A, Figure 4 & Appendix B, Figure 3). **Wood** condition falling into poor, dead or dying areas is about 16% of the population. This 16% 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	230	36%
Crown Raising	37	6%
Tree Staking/Training	0	0
Tree Removal	42	7%
Crown Reduction	11	2%

Canopy Cover

The canopy cover of Kingsley is approximately 15.5 acres (Appendix A, Figure 5). According to the 2010 census, Kingsley occupies 1,030 acres. Thus the canopy cover on city land is about 1.5%.

Land Use and Location

The majority of Kingsley’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	80%
Park/vacant/other	20%
Industrial/Large commercial	0%
Small commercial	0%
Multifamily residential	0%

Location

Planting strip	98%
Other maintained locations	0%
Cutout (surrounded by pavement)	1%
Front yard	1%

Recommendations

Risk Management

Hazardous trees can be a significant threat to both people and property. Trees that are dead or dying, or that have large issues such as trunk cracks longer than 24 inches should be removed. A few trees have main trunks which are forked between 2 feet and 8 feet above the ground. Any

of these forked trees, with open splits exposing interior wood, 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

Kingsley has 50 'critical concern' trees that need immediate removal without regard to the species. These trees can be seen as dark purple diamonds on the map titled Location of Trees with Recommended Maintenance (Appendix B, Figure 4). See also Appendix B, Figure 5 titled Maintenance Tasks. By comparing figures 4 & 5, you will notice that some of the 'critical concern' trees on figure 4 are also 'removal' trees on figure 5. It is recommended to start with the large diameter critical concern trees first. There are 23 trees over 24 inches in diameter at 4.5 ft. that should be addressed immediately. Please refer to the six year maintenance plan at the end of this section. After all 23 of the larger critical concern trees are addressed, continue removing the 27 smaller diameter 'critical concern' trees (where trimming is not needed). Please see Appendix A, Table 9 for a complete breakdown of the city trees in Kingsley. The last line 'critical concern' shows the 50 trees over their range of diameters. Appendix B, Figure 5 shows the 'removal' trees in red circles on a city map.

Poor and Dead /Dying Tree

After the removal of the critical concern trees, ash trees in poor health should be assessed for removal (Appendix B, Figure 3 & Appendix B, Figure 4). Of the 42 removals, 27 are ash trees (26 Green ash and 1 White ash). There are a total of 183 (Green and White) ash trees, 53 have signs and symptoms that have been associated with EAB. In addition, there are 14 ash trees that are in poor health from the condition of the wood. [*City ownership of the trees recommended for removal should be verified prior to any removal*](#)

Other Hazardous Green Ash trees with Decay

Ash trees are listed by their addresses, or house color if no address was found, or position on the city block. In some cases, the entire tree is recommended for removal by the district forester; or the homeowner should remove the ash tree since the main trunk or the main forks are decaying. These trees are brought to your attention because decay caused by a fungus dissolves the cellulose portion of the wood fibers, resulting in weakened branches, limbs, or main trunks. Once weakened, the decayed portion simply breaks off without the benefit of winds, ice or snow, and fall onto anything below it.

Tree number:

1. 419 Burlington Street, ½ of tree, north of driveway.
2. 226 Third Avenue, tree west of driveway, on limb hanging over driveway.
3. 225 Burlington Street, north parking, limb hanging over sidewalk.
4. 224 Rutland, 1 old ash tree, inside of sidewalk on private land.
5. 414 Rutland, middle ash tree, lot of visible fungal conks.
6. 416 Rutland, middle ash tree, some visible fungal conks.
7. 201 4th Street, second tree from alley, ash, hanging over sidewalk.
8. 209 4th Street, 2 very large Green ash, conks in tree tops.

9. Large white, corner home, once owned by Kinipplemeyer, 1 ash tree by driveway, west side.
10. 213 Charedon Street, 1 tree, large, east side.
11. 315 3rd Street, 1 mature ash, conks visible on trunk.
12. 323 Barre Street, north side by driveway.
13. 207 4th Street, west, 18 inch diameter ash tree, front yard.
14. Kingsley Nursing Home, 1 large ash, east side, along street.
15. Cemetery: long ash row, running uphill from pavement, 3rd tree, 12th tree, and 14th tree.
16. No number, Yellow and brown house just north of Galles home, 18 inch diameter ash in front yard.

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 Kingsley.

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, Kingsley is heavily planted with Maple (32%), Ash (28%), and Spruce (18%) (Appendix A, Figure 1). Maples, ash and spruce should not be planted until their percentages can be lowered. Also, ash trees have not been recommended since 2002, due to the threat of EAB. Other species to avoid because they are public nuisances include: cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut. Recommended and nuisance trees are normally listed in the tree section of the city code. Kingsley does not have any code section dealing with trees in any form. Code suggestions will be made in later section.

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 death and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

Seven Year Maintenance Plan with Emergency Funding

Year 1

Removal: 6 largest critical concern trees.

Planting and Replacement: 6 to 9 trees to be planted in open locations using the annual \$1000 utility grant.

Visual Survey for signs and symptoms of EAB.

Year 2

Removal: 6 critical concern trees and 4 additional ash trees with poor health.

Planting and Replacement: 6 trees in open locations using grant funds.

Visual Survey for signs and symptoms of EAB.

Year 3

Removal: 6 trees - removal of critical concern trees.

Planting and Replacement: 9 trees to be planted in open locations and locations from previous removals with grant funds.

Visual Survey for signs and symptoms of EAB.

Year 4

Removal: 6 trees - removal of any new critical concern trees and ash in poor health

Planting and Replacement: 7 trees in open locations with grant funds.

Visual Survey for signs and symptoms of EAB.

Year 5

Removal: 8 trees - removal of the 3 remaining critical concern trees plus any new critical concern trees and ash in poor health.

Planting and Replacement: 9 trees to be planted in open locations with grant funds.

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

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 7

Start routine trimming of 1/5 to 1/6 of the street trees per year.

Removal: continue to remove declining trees along streets.

Visual Survey for signs and symptoms of EAB.

*Reduction of ash over 7 years: Approximately 38 to 40 ash trees would be removed (approximately 22% of ash). It will take approximately 30 years to remove all ash using just emergency funding. EAB could potentially kill all ash within 4 years of its arrival.

** To remove all ash trees within 6 or 7 years, a line item in the budget would need to be added from \$14,400 to \$16,800 a year. If the budget were increased to \$10,000 a year all ash could be removed in 10 years based on an estimated cost of \$550 per tree.

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, spreading removal costs out over several years while allowing trees to continue to provide benefits. For example, chemical treatment is being used in Burlington, Iowa to postpone immediate tree removal and higher costs. Each ash tree in Burlington was appraised for immediate removal or for treatment and located by GPS coordinates or by street address. Kingsley has the benefit of not finding any actual infestations of EAB, so the yearly removal of the worst trees now can lower future removal costs. Chemical 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 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 Emma, do we have a standard wording since Quarantine has started???

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? Since the entire state of Iowa 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 will be replaced. Sample city tree codes can be found in Appendix C for Kingsley. Chapter 5 is being used by the City of Paullina. Chapter 151 is from the state code book. All trees will meet the restrictions in city ordinance if adopted. The new tree plantings will be a diverse mix and will not include ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut.

Postponed Work

While finances, staffing and equipment are focused on the management of ash, usual services may be delayed. Tree removal requests on genus 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 151.06 states "If it is determined with reasonable certainty that any such condition exists (trees or shrubs in the City reported or suspected to be infected with or damaged by any disease or insect or disease pests) on private property and that the danger to other trees or to adjoining property or passing motorists or pedestrians is imminent, the Council shall notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within fourteen (14) days of said notification. If such owner, occupant or person in charge of said property fails to comply within 14 days of receipt of notice, the Council may cause the condition to be corrected and the cost assessed against the property."

Budget

Current Budget

Kingsley does not have a line item in the city budget for trees, maintenance, or insect and disease problems. Instead, tree work has been funded as needed. The following brief list have been tree expenditures since 2007:

2007	tree removal	4,800.00
2010	tree removal	350.00
2012	tree removal	390.00
2014	tree removal	420.00

Future Budget Taking Insect and Disease Problems into Account

FY 2015 Budget

Removal: \$1,100
Planting: \$1000 utility grant
Watering & Maintenance: \$500

FY 2016 Budget

Removal: \$1,100
Planting: \$1000 utility grant
Routine trimming: \$1,700
Watering & Maintenance: \$500

FY 2017 Budget

Removal: \$1,100
Planting: \$1000 utility grant
Watering & Maintenance: \$500

FY 2018 Budget

Removal: \$1,100
Planting: \$1000 utility grant
Routine trimming: \$500
Watering & Maintenance: \$500

FY 2019 Budget

Removal: \$1,100
Planting: \$1000 utility grant
Watering & Maintenance: \$500

FY 2020 Budget

Removal: \$1,100
Planting: \$1000 utility grant
Routine trimming: \$500
Watering & Maintenance: \$500

*Reduction of ash along city streets over 6 years: approximately 12 of the worst ash trees will be removed. The District Forester is estimating that privately-owned ash trees in Kingsley number twice to 2.5 times more that the number of city streets, or 400 trees.

Purposed Budget Increase

EAB could potentially kill all ash trees in Kingsley within 4 years of its arrival. To remove all ash trees along city streets within 6 years the budget would need to be increased to \$16,775 a year. If the budget were increased to \$10,000 a year all ash could be removed within 10 years.

Additionally, it is recommended that Kingsley continue to apply for annual utility 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.

Works Cited

Census Bureau. 2010. <http://censtats.census.gov/data/IA/1601964290.pdf> (April, 2013)

USDA Forest Service, et al. 2006. i-Tree Software Suite v1.0 User's Manual. Pp. 27-40.

McPherson EG, Simpson JR, Peper PJ, Gardner SL, Vargas KE, Ho J, Maco S, Xiao Q. 2005b. City of Charleston, South Carolina, municipal forest resource analysis. Internal Tech Rep. Davis, CA: U.S. Department of Agriculture, Center for Urban Forest Research. p. 57

Nowak, D.J. and J.F. Dwyer. 2007. Understanding the benefits and costs of urban forest ecosystems. In: Kuser, J. (ed.) Urban and Community Forestry in the Northeast. New York: Springer. Pp. 25-46.

Peper, Paula J.; McPherson, E. Gregory; Simpson, James R.; Vargas, Kelaine E.; Xiao, Qingfu 2009. Lower Midwest community tree guide: benefits, costs, and strategic planting. Gen. Tech. Rep. PSW-GTR-219. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. p.115

Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Kingsley

Annual Energy Benefits of Public Trees by Species

2/24/2014

Species	Total Electricity (MWh)	Electricity (\$)	Total Natural Gas (Therms)	Natural Gas (\$)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Green ash	49.8	3,779	6,812.3	6,676	10,455	(N/A)	27.6	35.8	59.74
Silver maple	35.6	2,704	4,702.5	4,608	7,313	(N/A)	16.9	25.0	68.34
Blue spruce	9.1	694	1,191.7	1,168	1,861	(N/A)	13.7	6.4	21.40
Norway maple	12.2	928	1,707.6	1,673	2,602	(N/A)	9.1	8.9	44.86
Spruce	3.5	266	442.1	433	699	(N/A)	4.1	2.4	26.89
Sugar maple	3.6	275	458.2	449	724	(N/A)	3.8	2.5	30.17
American basswood	5.7	434	815.0	799	1,233	(N/A)	3.3	4.2	58.69
Broadleaf Deciduous	1.4	107	214.3	210	317	(N/A)	2.4	1.1	21.14
Apple	1.6	124	238.0	233	357	(N/A)	2.4	1.2	23.80
Northern red oak	1.7	126	223.5	219	346	(N/A)	1.4	1.2	38.39
Littleleaf linden	1.3	102	179.4	176	278	(N/A)	1.4	1.0	30.91
Red maple	1.3	102	173.5	170	272	(N/A)	1.3	0.9	34.05
White ash	0.3	21	38.1	37	58	(N/A)	1.3	0.2	7.31
Maple	0.8	62	104.3	102	164	(N/A)	1.1	0.6	23.40
Callery pear	0.4	31	64.7	63	94	(N/A)	1.1	0.3	13.41
Other street trees	11.7	886	1,573.6	1,542	2,428	(N/A)	9.3	8.3	41.16
Citywide total	140.2	10,641	18,939.0	18,560	29,201	(N/A)	100.0	100.0	45.99

Table 2: Annual Stormwater Benefits

Kingsley

Annual Stormwater Benefits of Public Trees by Species

2/24/2014

Species	Total rainfall interception (Gal)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Green ash	532,414	14,429	(N/A)	27.6	34.4	82.45
Silver maple	492,654	13,352	(N/A)	16.9	31.8	124.78
Blue spruce	119,267	3,232	(N/A)	13.7	7.7	37.15
Norway maple	94,597	2,564	(N/A)	9.1	6.1	44.20
Spruce	61,071	1,655	(N/A)	4.1	3.9	63.66
Sugar maple	26,683	723	(N/A)	3.8	1.7	30.13
American basswood	57,724	1,564	(N/A)	3.3	3.7	74.50
Broadleaf Deciduous	6,421	174	(N/A)	2.4	0.4	11.60
Apple	7,225	196	(N/A)	2.4	0.5	13.05
Northern red oak	14,413	391	(N/A)	1.4	0.9	43.40
Littleleaf linden	9,247	251	(N/A)	1.4	0.6	27.84
Red maple	9,203	249	(N/A)	1.3	0.6	31.18
White ash	1,489	40	(N/A)	1.3	0.1	5.04
Maple	4,744	129	(N/A)	1.1	0.3	18.37
Callery pear	1,985	54	(N/A)	1.1	0.1	7.69
Other street trees	109,547	2,969	(N/A)	9.3	7.1	50.32
Citywide total	1,548,683	41,972	(N/A)	100.0	100.0	66.10

Table 3: Annual Air Quality Benefits

Annual Air Quality Benefits of Public Trees by Species

6/29/2009

Species	Deposition (lb)				Total Depos. (\$)	Avoided (lb)				Total Avoided (\$)	BVOC Emissions (lb)	BVOC Emissions (\$)	Total (lb)	Total Standard (\$)	Standard Error	% of Total Trees	Avg. \$/tree
	O ₃	NO ₂	PM ₁₀	SO ₂		NO ₂	PM ₁₀	VOC	SO ₂								
Green ash	25.5	4.1	13.0	1.1	138	125.4	18.4	17.6	120.8	786	0.0	0	325.8	924 (N/A)	15.0	7.57	
Norway maple	48.3	8.3	23.8	2.1	261	123.5	17.9	17.0	115.6	765	-11.3	-43	345.2	984 (N/A)	14.1	8.55	
Sugar maple	62.5	10.7	30.1	2.8	336	155.9	22.8	21.8	149.4	975	-48.5	-182	407.4	1,128 (N/A)	13.9	9.99	
Maple	17.5	3.0	8.4	0.8	94	49.8	7.3	6.9	47.5	311	-6.1	-23	135.0	382 (N/A)	7.3	6.47	
Silver maple	59.4	10.1	28.6	2.6	319	91.0	13.3	12.7	87.3	569	-31.7	-119	273.4	769 (N/A)	6.8	13.99	
Broadleaf Deciduous	5.4	0.9	2.7	0.2	29	16.7	2.4	2.3	15.5	103	-1.3	-5	44.9	128 (N/A)	4.7	3.36	
Conifer Evergreen Large	3.9	0.8	3.6	0.5	27	15.8	2.3	2.2	15.2	99	-12.8	-48	31.4	78 (N/A)	4.7	2.04	
Northern red oak	5.0	0.9	2.6	0.2	28	16.7	2.4	2.3	15.9	104	-7.2	-27	38.9	105 (N/A)	3.8	3.38	
Apple	1.8	0.3	0.9	0.1	10	9.1	1.3	1.2	8.4	56	0.0	0	23.3	66 (N/A)	3.0	2.76	
Norway spruce	9.4	1.9	7.4	1.2	61	15.9	2.3	2.2	15.2	99	-43.9	-165	11.6	-4 (N/A)	2.5	-0.22	
Red maple	1.9	0.3	1.0	0.1	10	9.4	1.4	1.3	9.0	59	-0.7	-3	23.6	66 (N/A)	2.2	3.69	
Blue spruce	1.6	0.3	1.5	0.2	11	6.3	0.9	0.9	5.8	39	-5.2	-20	12.3	31 (N/A)	2.2	1.70	
White ash	0.3	0.1	0.3	0.0	2	5.6	0.8	0.8	5.5	35	0.0	0	13.4	37 (N/A)	1.7	2.67	
Spruce	0.1	0.0	0.2	0.0	1	1.1	0.2	0.1	0.9	6	-0.6	-2	2.0	5 (N/A)	1.6	0.39	
Swamp white oak	0.2	0.0	0.2	0.0	1	2.6	0.4	0.4	2.4	16	-0.1	0	6.1	17 (N/A)	1.6	1.32	
White oak	6.0	1.0	2.7	0.3	32	14.3	2.1	2.0	13.6	89	0.0	0	41.9	121 (N/A)	1.5	10.06	
Mountain ash	1.4	0.2	0.7	0.1	7	6.3	0.9	0.9	5.8	38	0.0	0	16.1	46 (N/A)	1.4	4.17	
Northern hackberry	0.1	0.0	0.1	0.0	1	3.1	0.4	0.4	2.8	19	0.0	0	7.0	20 (N/A)	1.2	1.96	
Black walnut	5.5	0.9	2.5	0.2	29	15.3	2.2	2.1	14.6	95	0.0	0	43.4	124 (N/A)	1.2	12.43	
Littleleaf linden	2.4	0.4	1.2	0.1	13	7.5	1.1	1.0	7.1	47	-1.2	-4	19.6	55 (N/A)	1.2	5.51	
Other street trees	17.0	2.9	8.7	0.9	93	51.3	7.5	7.1	49.0	320	-10.5	-39	133.8	374 (N/A)	8.5	5.42	
Citywide total	275.3	46.9	140.1	13.5	1,502	742.4	108.3	103.3	707.2	4,631	-181.1	-679	1,955.9	5,454 (N/A)	100.0	6.71	

Table 4: Annual Carbon Stored

Kingsley

Stored CO2 Benefits of Public Trees by Species

2/24/2014

Species	Total Stored CO2 (lbs)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Green ash	2,132,614	15,995	(N/A)	27.6	40.0	91.40
Silver maple	1,908,644	14,315	(N/A)	16.9	35.8	133.78
Blue spruce	96,308	722	(N/A)	13.7	1.8	8.30
Norway maple	282,501	2,119	(N/A)	9.1	5.3	36.53
Spruce	69,030	518	(N/A)	4.1	1.3	19.91
Sugar maple	80,707	605	(N/A)	3.8	1.5	25.22
American	272,502	2,044	(N/A)	3.3	5.1	97.32
Broadleaf	32,310	242	(N/A)	2.4	0.6	16.16
Apple	36,569	274	(N/A)	2.4	0.7	18.28
Northern red oak	58,910	442	(N/A)	1.4	1.1	49.09
Littleleaf linden	26,697	200	(N/A)	1.4	0.5	22.25
Red maple	21,456	161	(N/A)	1.3	0.4	20.12
White ash	1,986	15	(N/A)	1.3	0.0	1.86
Maple	9,903	74	(N/A)	1.1	0.2	10.61
Callery pear	3,294	25	(N/A)	1.1	0.1	3.53
Other street trees	132,720	2,194	(N/A)	9.3	5.5	37.19
Citywide total	5,326,025	39,945	(N/A)	100.0	100.0	62.91

Table 5: Annual Carbon Sequestered

Kingsley

Annual CO₂ Benefits of Public Trees by Species

2/24/2014

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	116,227	872	-10,237	-34	-77	83,508	626	189,465	1,421 (N/A)	27.6	33.8	8.12
Silver maple	144,396	1,083	-9,161	-21	-69	59,761	448	194,974	1,462 (N/A)	16.9	34.8	13.67
Blue spruce	7,045	53	-462	-17	-4	15,327	115	21,893	164 (N/A)	13.7	3.9	1.89
Norway maple	19,873	149	-1,356	-11	-10	20,520	154	39,025	293 (N/A)	9.1	7.0	5.05
Spruce	3,713	28	-331	-5	-3	5,879	44	9,255	69 (N/A)	4.1	1.7	2.67
Sugar maple	6,065	45	-387	-5	-3	6,079	46	11,752	88 (N/A)	3.8	2.1	3.67
American basswood	16,779	126	-1,308	-4	-10	9,587	72	25,054	188 (N/A)	3.3	4.5	8.95
Broadleaf Deciduous	2,183	16	-155	-3	-1	2,368	18	4,392	33 (N/A)	2.4	0.8	2.20
Apple	2,012	15	-176	-3	-1	2,736	21	4,570	34 (N/A)	2.4	0.8	2.28
Northern red oak	2,550	19	-283	-2	-2	2,795	21	5,060	38 (N/A)	1.4	0.9	4.22
Littleleaf linden	3,739	28	-128	-2	-1	2,262	17	5,871	44 (N/A)	1.4	1.1	4.89
Red maple	2,781	21	-103	-2	-1	2,261	17	4,938	37 (N/A)	1.3	0.9	4.63
White ash	521	4	-10	-2	0	466	3	975	7 (N/A)	1.3	0.2	0.91
Maple	1,377	10	-48	-1	0	1,360	10	2,689	20 (N/A)	1.1	0.5	2.88
Callery pear	926	7	-16	-1	0	674	5	1,583	12 (N/A)	1.1	0.3	1.70
Other street trees	20,754	156	-1,404	-12	-11	19,582	147	38,920	292 (N/A)	9.3	6.9	4.95
Citywide total	350,940	2,632	-25,565	-124	-193	235,165	1,764	560,416	4,203 (N/A)	100.0	100.0	6.62

Table 6: Annual Social and Aesthetic Benefits

Kingsley

Annual Aesthetic/Other Benefits of Public Trees by Species

2/24/2014

Species	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Green ash	9,719	(N/A)	27.6	30.7	55.54
Silver maple	11,315	(N/A)	16.9	35.7	105.75
Blue spruce	1,901	(N/A)	13.7	6.0	21.85
Norway maple	1,975	(N/A)	9.1	6.2	34.05
Spruce	900	(N/A)	4.1	2.8	34.61
Sugar maple	701	(N/A)	3.8	2.2	29.19
American basswood	1,232	(N/A)	3.3	3.9	58.67
Broadleaf Deciduous	125	(N/A)	2.4	0.4	8.37
Apple	115	(N/A)	2.4	0.4	7.66
Northern red oak	198	(N/A)	1.4	0.6	22.04
Littleleaf linden	427	(N/A)	1.4	1.4	47.41
Red maple	381	(N/A)	1.3	1.2	47.62
White ash	100	(N/A)	1.3	0.3	12.53
Maple	206	(N/A)	1.1	0.7	29.44
Callery pear	117	(N/A)	1.1	0.4	16.70
Other street trees	2,298	(N/A)	9.3	7.3	38.95
Citywide total	31,711	(N/A)	100.0	100.0	49.94

Table 7: Summary of Benefits in Dollars

Average Annual Benefits of Public Trees by Species

Species	Energy	CO2	Air Quality	Stormwater	Aesthetic/Other	Total (\$)	Standard Error	% of Total \$
Green ash	10455	1421	1829	14429	9719	\$37,853.53	(±0)	33.82
Silver maple	7313	1462	1335	13352	11315	\$34,777.47	(±0)	31.07
Blue spruce	1861	164	210	3232	1901	\$7,369.39	(±0)	6.58
Norway maple	2602	293	443	2564	1975	\$7,876.50	(±0)	7.04
Spruce	699	69	42	1655	900	\$3,366.04	(±0)	3.01
Sugar maple	724	88	113	723	701	\$2,349.35	(±0)	2.10
American basswood	1233	188	187	1564	1232	\$4,404.29	(±0)	3.94
Broadleaf Deciduous Small	317	33	54	174	125	\$703.15	(±0)	0.63
Apple	357	34	62	196	115	\$763.53	(±0)	0.68
Northern red oak	346	38	50	391	198	\$1,022.13	(±0)	0.91
Littleleaf linden	278	44	44	251	427	\$1,043.56	(±0)	0.93
Red maple	272	37	47	249	381	\$987.14	(±0)	0.88
White ash	58	7	8	40	100	\$214.87	(±0)	0.19
Maple	164	20	27	129	206	\$545.73	(±0)	0.49
Callery pear	94	12	13	54	117	\$289.41	(±0)	0.26
Other street trees	2428	292	371	2969	2298	\$8,357.49	(±0)	7.47
Citywide total	29201	4203	4836	41972	31711	\$111,923.60	(±0)	100.00

Table 8: Priority Task Summary for Public Trees

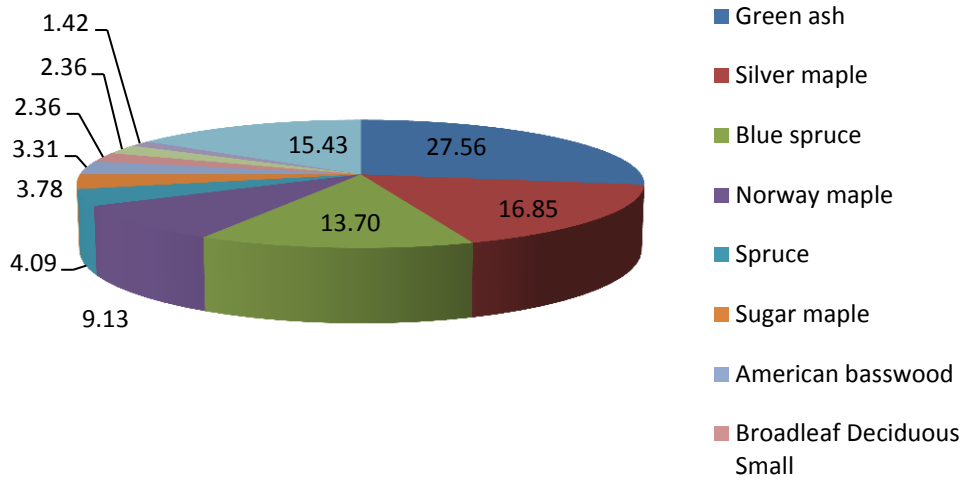
Maintenance Type	DBH (diameter at breast height of 4.5 feet) Classer in inches									Total	%of trees
	0-3	3-6inch	6-12inch	12-18inch	18-24inch	24-30inch	30-35inch	36-42inch	>42inch		
None	26	25	46	104	67	25	10	7	5	315	49.61
Stake/Train	0	0	0	0	0	0	0	0	0	0	0
Clean Crown	2	2	12	57	67	54	17	12	7	230	36.22
Raise Crown	0	2	5	16	7	3	2	1	1	37	5.83
Reduce Crown	0	0	0	2	6	2	0	0	1	11	1.73
Remove Tree	4	0	1	8	12	9	5	3	0	42	6.61
City Total	32	29	64	187	159	93	34	23	14	635	100

Table 9: Recommended Maintenance for Public Trees

Maintenance Type	DBH Classes in Inches (diameter at breast height, 4.5 feet)									Total	%of trees
	0-3 inch	3to6 inch	6to12 inch	12to18 inch	18to24 inch	24to30 inch	30to36 inch	36to42 inch	>42 inch		
None	0	0	0	1	2	1	0	0	0	4	0.63
Young Tree	26	27	55	100	19	3	0	1	0	231	36.38
routine Young Tree	0	0	3	7	0	0	0	0	0	10	1.57
immediate Mature Tree	2	1	5	58	87	47	21	15	8	244	38.43
routine Mature Tree	0	0	0	15	36	28	8	4	5	96	15.12
immediate Critical Concern (public safety)	4	1	1	6	15	14	5	3	1	50	7.87
City Total	32	29	64	187	159	93	34	23	14	635	100

Appendix A

Figure 1: Species Distribution

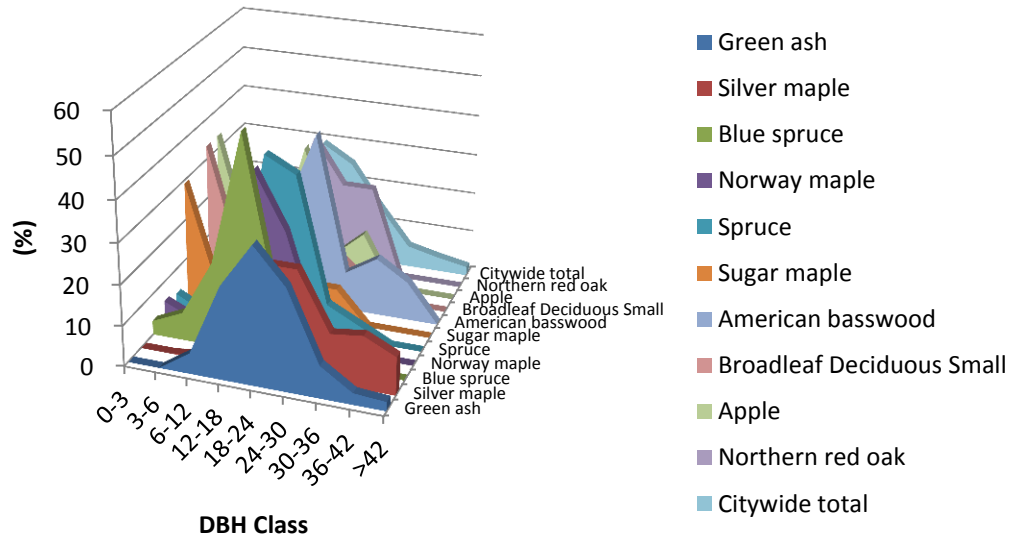


**Species Distribution of Public Trees (%)
2/24/2014**

Species	Percent
Green ash	27.56
Silver maple	16.85
Blue spruce	13.70
Norway maple	9.13
Spruce	4.09
Sugar maple	3.78
American basswood	3.31
Broadleaf Deciduous Small	2.36
Apple	2.36
Northern red oak	1.42
Other species	15.43
Total	100.00

Figure 2: Relative Age Class

Relative Age Distribution of Top 10 Public Tree Species (%)

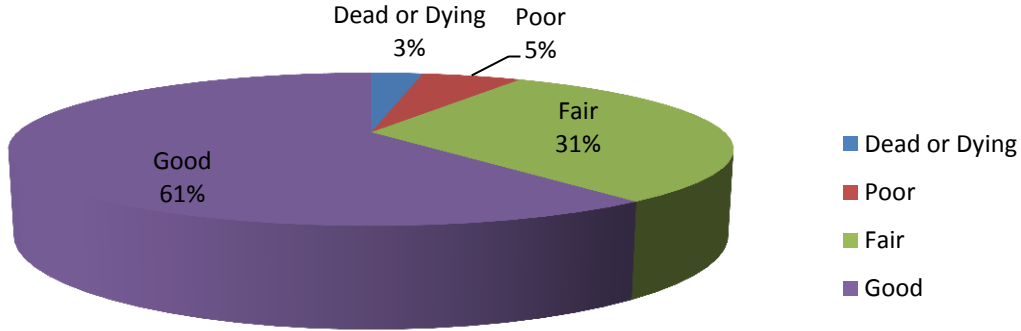


Relative Age Distribution of Top 10 Public Tree Species (%)
2/24/2014

Species	DBH class (in)								
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42
Green ash	0.00	0.00	5.14	22.86	33.71	25.14	8.00	2.86	2.29
Silver maple	0.00	0.00	0.93	12.15	26.17	26.17	12.15	13.08	9.35
Blue spruce	3.45	6.90	20.69	52.87	14.94	1.15	0.00	0.00	0.00
Norway maple	5.17	1.72	17.24	41.38	27.59	3.45	3.45	0.00	0.00
Spruce	3.85	0.00	3.85	42.31	38.46	7.69	3.85	0.00	0.00
Sugar maple	29.17	4.17	12.50	37.50	8.33	8.33	0.00	0.00	0.00
American basswood	0.00	0.00	0.00	23.81	42.86	9.52	14.29	9.52	0.00
Broadleaf Deciduous Small	33.33	6.67	20.00	20.00	13.33	6.67	0.00	0.00	0.00
Apple	33.33	6.67	6.67	33.33	6.67	13.33	0.00	0.00	0.00
Northern red oak	0.00	11.11	11.11	33.33	22.22	22.22	0.00	0.00	0.00
Citywide total	5.04	4.57	10.08	29.45	25.04	14.65	5.35	3.62	2.20

Figure 3: Foliage Condition

Leaf Condition

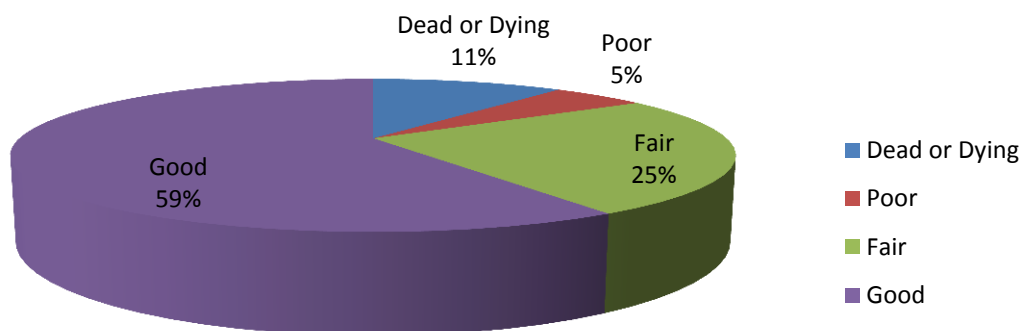


Condition (Foliage) of Public Trees by Species (%)
2/24/2014

Species Name	Dead or Dying	Poor	Fair	Good
Green ash	7.56	9.88	44.19	38.37
Silver maple	0.00	1.87	24.30	73.83
Blue spruce	2.30	2.30	29.89	65.52
Norway maple	1.72	3.45	18.97	75.86
Spruce	0.00	19.23	61.54	19.23
Sugar maple	0.00	0.00	4.17	95.83
American basswood	0.00	0.00	14.29	85.71
Broadleaf Deciduous				
Small	0.00	6.67	33.33	60.00
Apple	0.00	0.00	33.33	66.67
Northern red oak	0.00	0.00	11.11	88.89
Littleleaf linden	0.00	0.00	11.11	88.89
Red maple	0.00	12.50	12.50	75.00
White ash	0.00	12.50	12.50	75.00
Maple	0.00	0.00	0.00	100.00
Callery pear	0.00	0.00	0.00	100.00
Citywide total	2.85	5.54	31.01	60.60

Figure 4: Wood Condition

Wood Condition

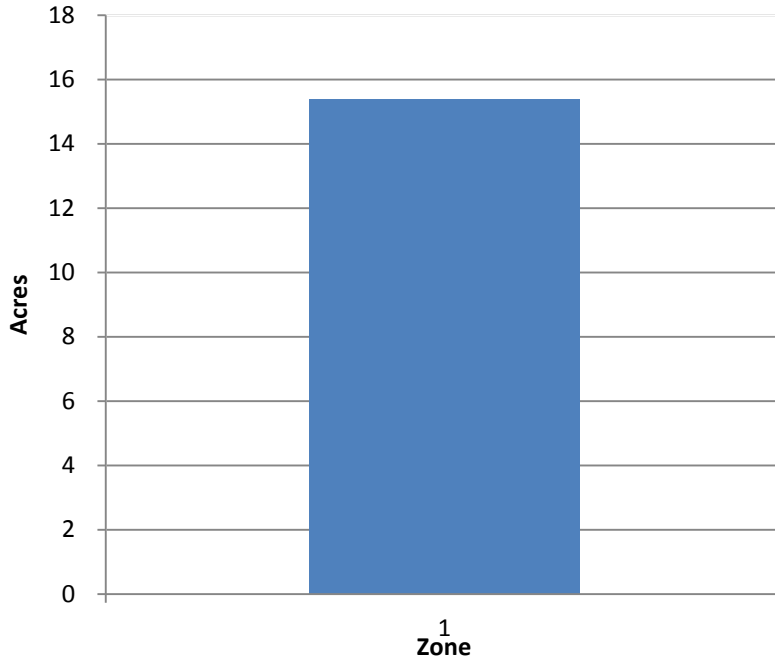


Condition (Woody) of Public Trees by Species (%)
2/24/2014

Species Name	Dead or Dying	Poor	Fair	Good
Green ash	21.26	7.47	34.48	36.78
Silver maple	14.95	4.67	28.97	51.40
Blue spruce	1.15	0.00	5.75	93.10
Norway maple	10.34	6.90	31.03	51.72
Spruce	0.00	3.85	15.38	80.77
Sugar maple	4.17	0.00	16.67	79.17
American basswood	0.00	10.00	40.00	50.00
Broadleaf Deciduous Small	6.67	13.33	26.67	53.33
Apple	0.00	0.00	33.33	66.67
Northern red oak	0.00	0.00	11.11	88.89
Littleleaf linden	0.00	0.00	22.22	77.78
Red maple	0.00	12.50	25.00	62.50
White ash	0.00	12.50	25.00	62.50
Maple	0.00	0.00	14.29	85.71
Callery pear	0.00	0.00	0.00	100.00
Citywide total	10.58	5.21	25.12	59.08

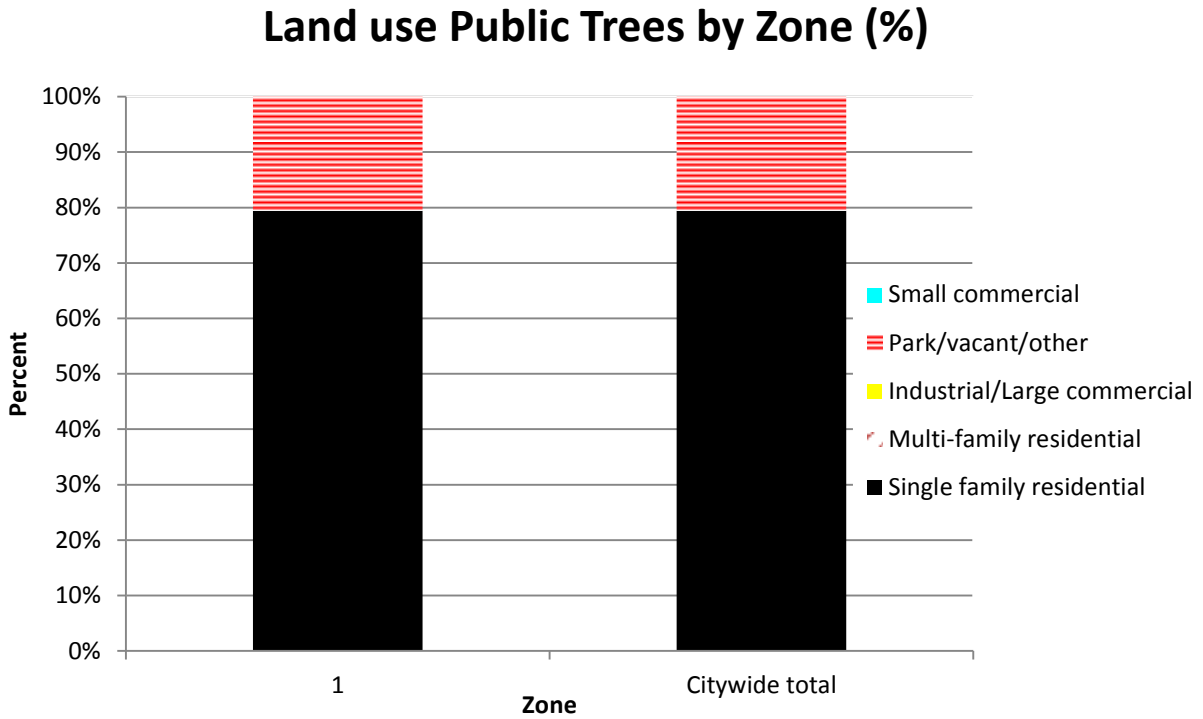
Figure 5: Canopy Cover in Acres

Canopy Cover



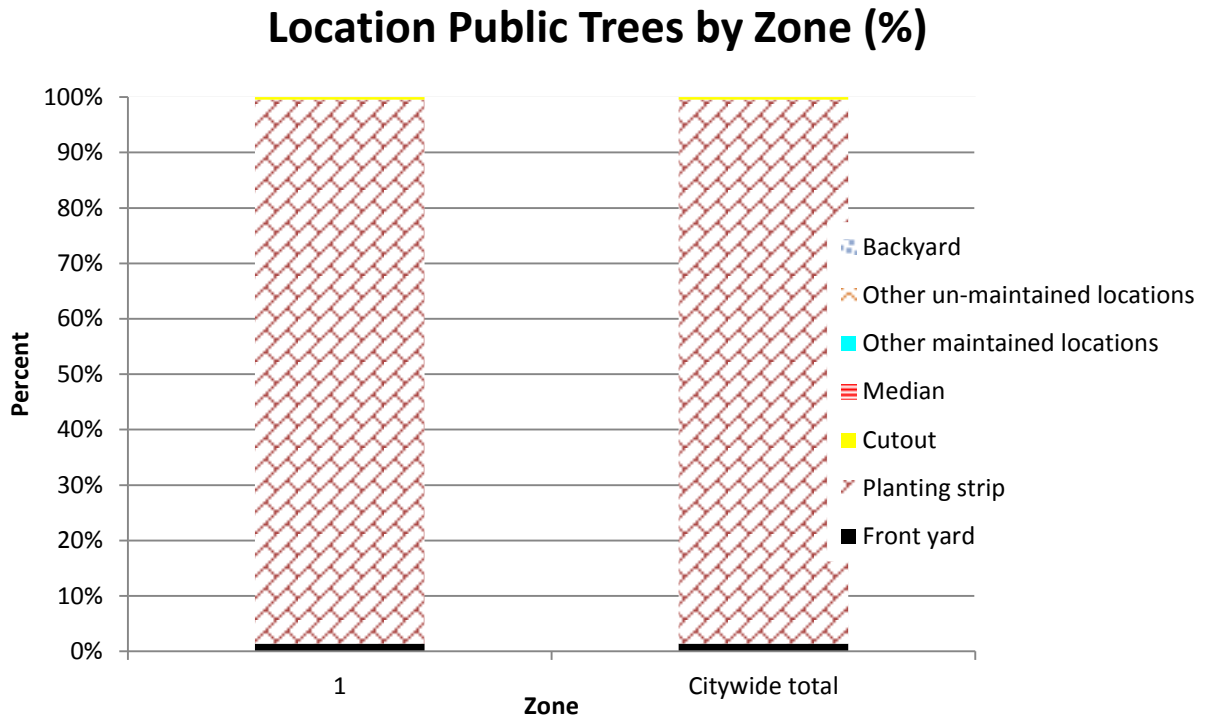
	Total Land Area	Total Canopy Cover	Total Canopy Cover as % of Total Land Area	Canopy Cover as % of Total Streets and Sidewalks
Citywide total	1,030.00	15.38		1.49%

Figure 6: Land Use of city/park trees



Zone	Single family residential	Multi-family residential	Industrial/Large commercial	Park/vacant/other	Small commercial
1	79.40	0.00	0.00	20.60	0.00
Citywide total	79.40	0.00	0.00	20.60	0.00

Figure 7: Location of city/park trees



Zone	Front yard	Planting strip	Cutout	Median	Other maintained locations	Other un-maintained locations	Backyard
1	1.42	98.11	0.47	0.00	0.00	0.00	0.00
Citywide total	1.42	98.11	0.47	0.00	0.00	0.00	0.00

Appendix B: ArcGIS Mapping

Figure 1: Location of Ash Trees

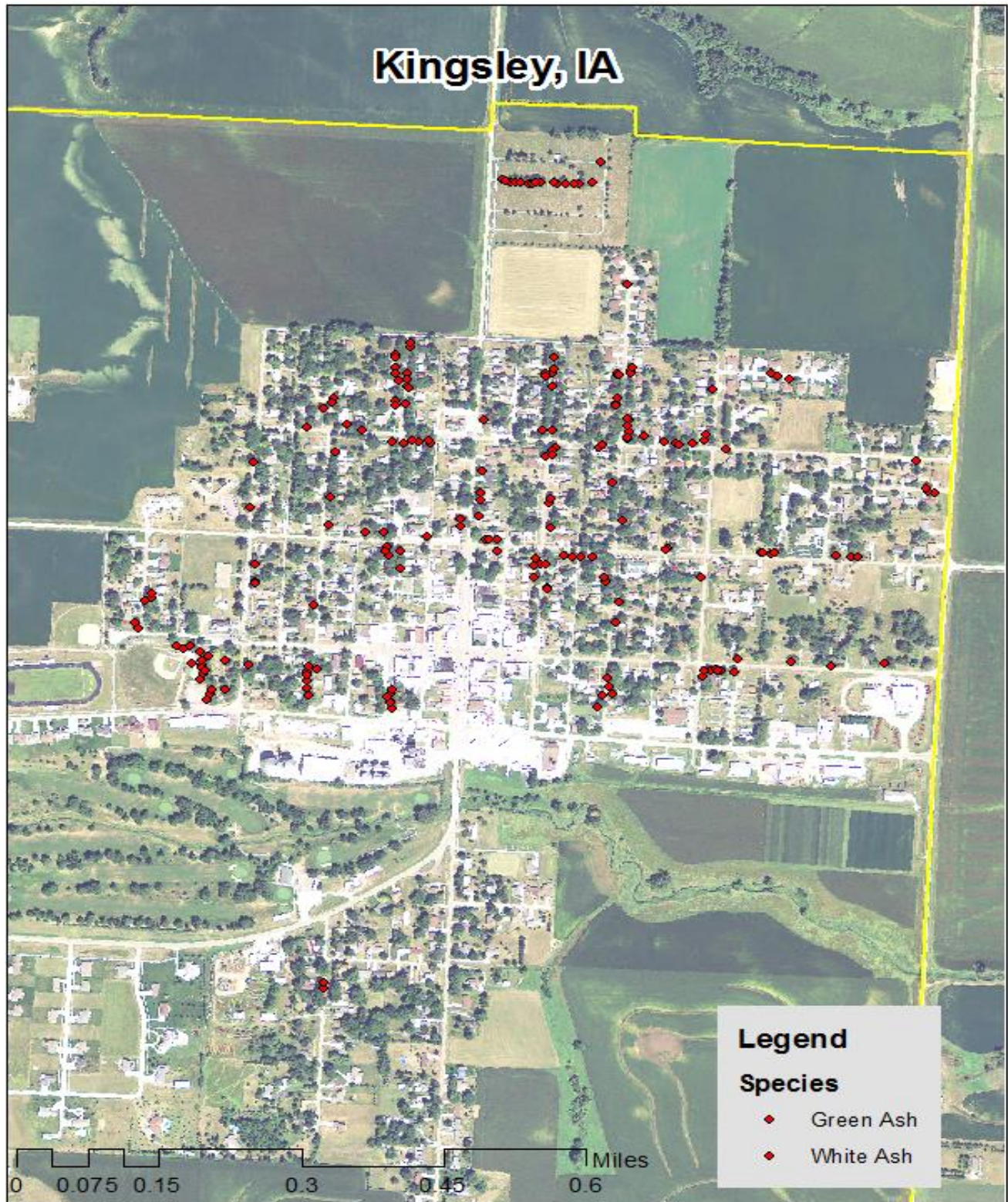


Figure 2: Location of EAB symptoms

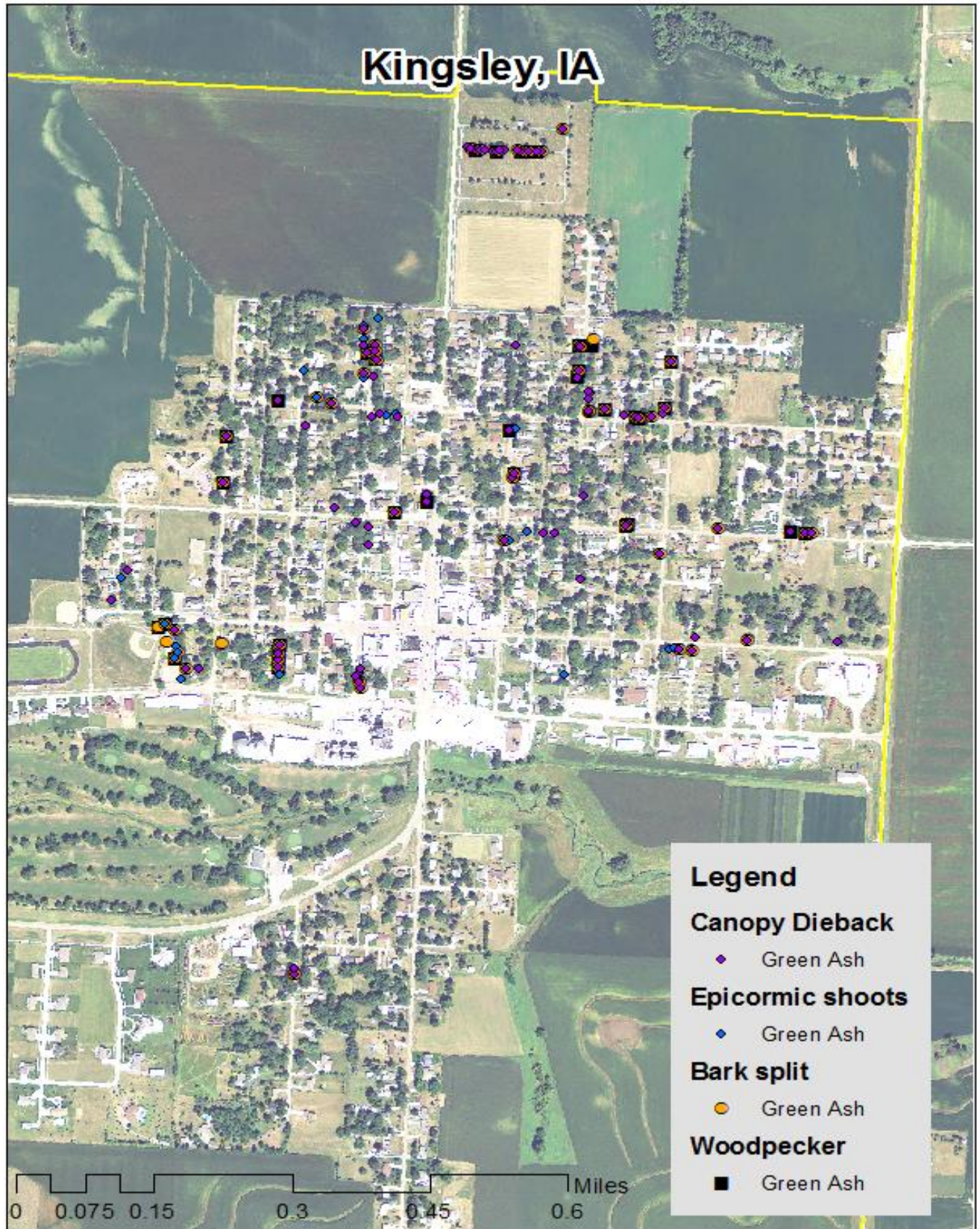


Figure 3: Location of Poor Condition Trees

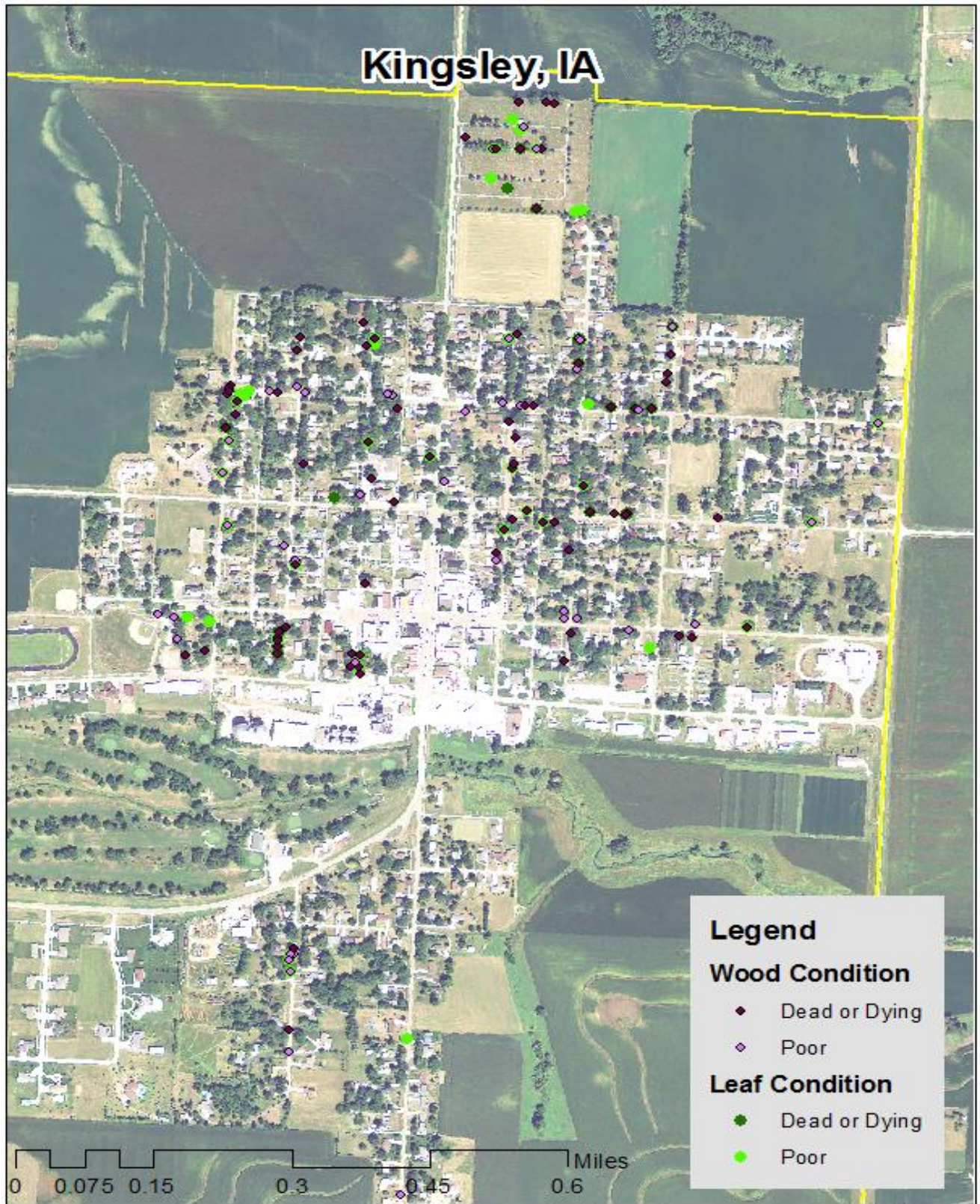


Figure 4: Location of Trees with Recommended Maintenance

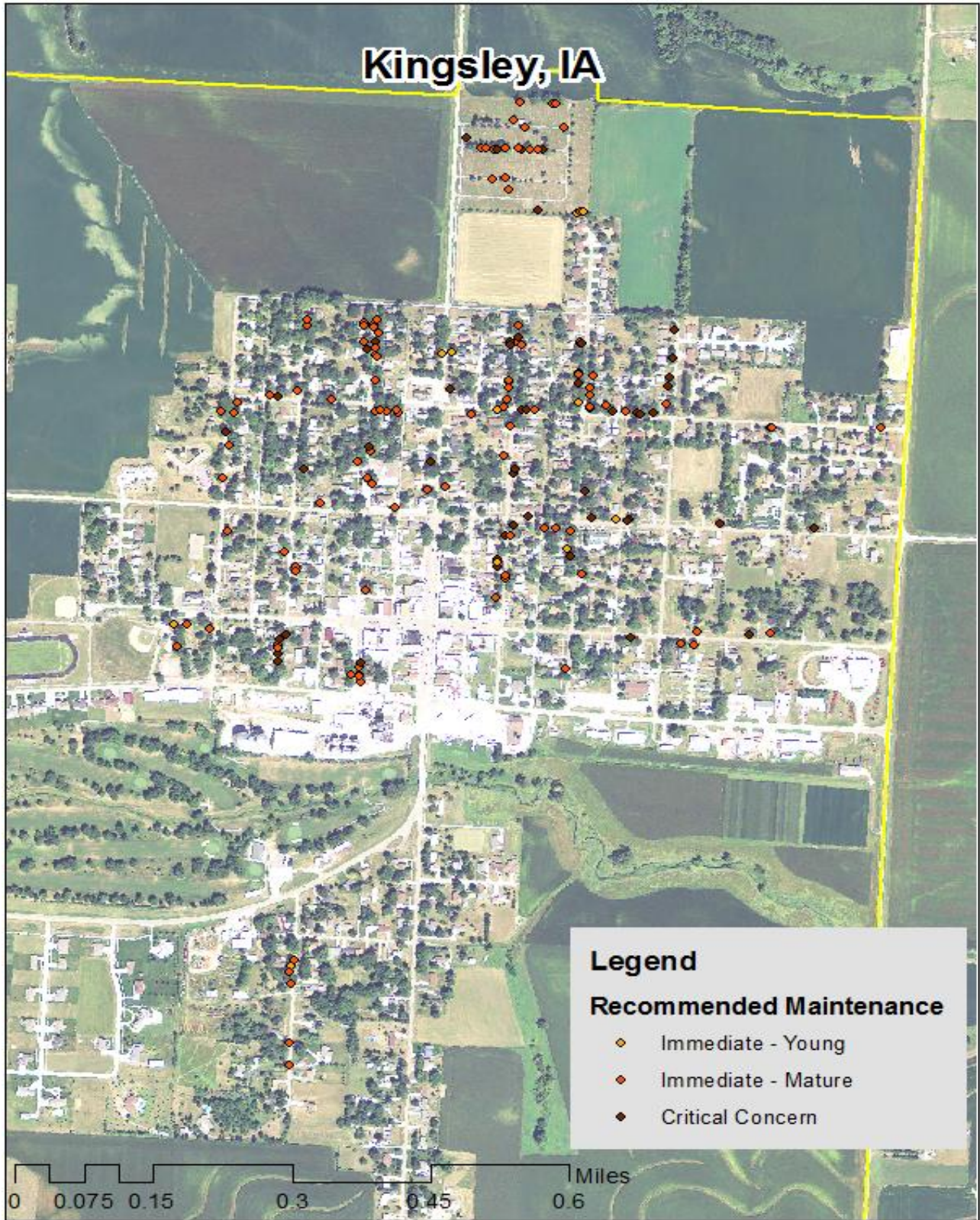
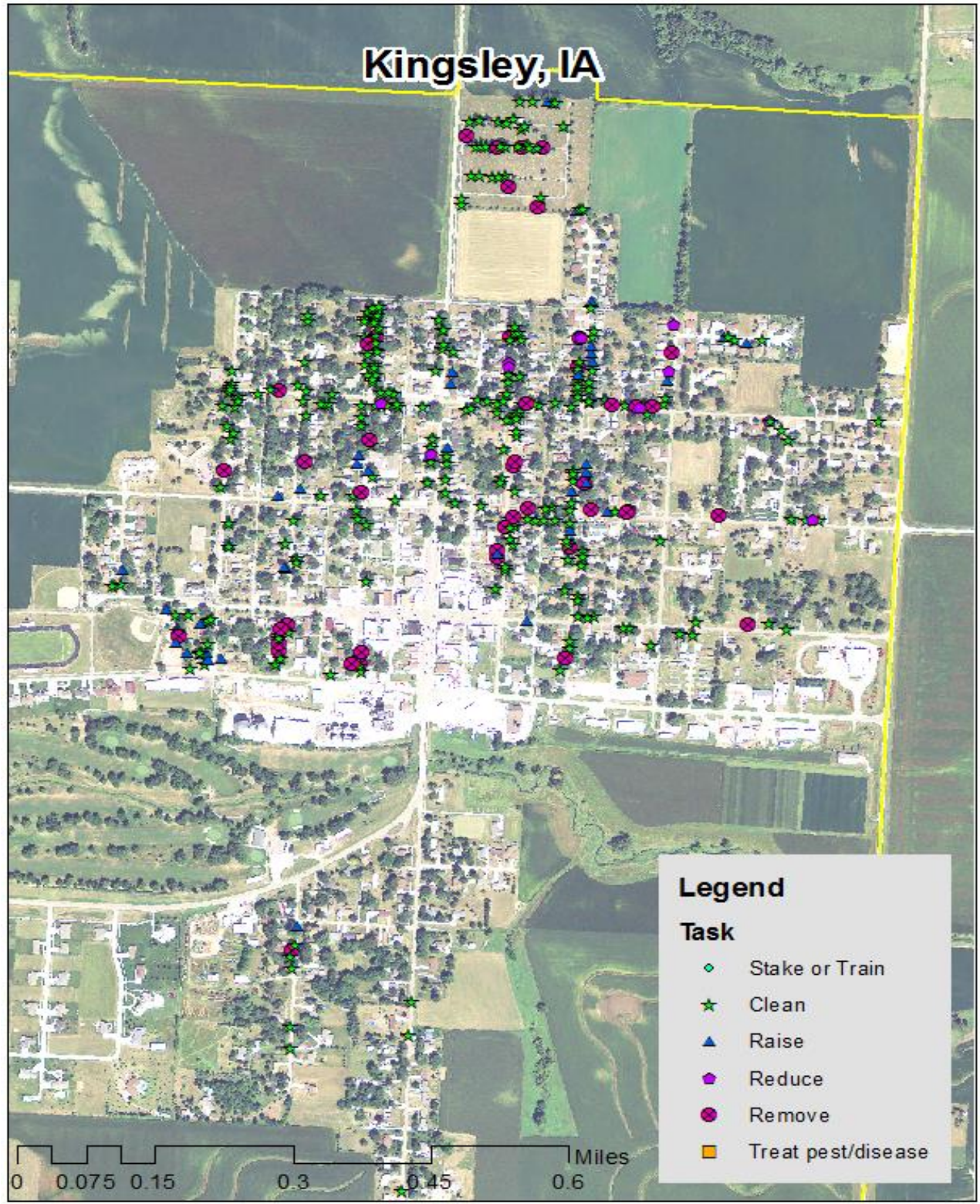


Figure 5: Maintenance Tasks *City ownership of the trees recommended for removal should be verified prior to any removal*



Appendix C: Sample Kingsley Tree Ordinances

CHAPTER 5: TREES

ARTICLE 7 - GENERAL PROVISIONS

- 7.01 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.
- 7.02 DEFINITIONS. For use in this chapter, the following term is defined:
1. "Parking" means that part of the street, avenue or highway in the city not covered by sidewalk and lying between the lot line and the curb line, or, on unpaved streets, that part of the street, avenue or highway lying between the lot line and that portion of the street usually traveled by vehicular traffic.
 2. "Superintendent": shall mean the superintendent of utilities or such other person as may be designated by the council.
- 7.03 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 evergreen.
- 7.04 DUTY TO TRIM TREES. The owner or agent of the abutting property shall keep the trees on or overhanging the street trimmed to 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, Sec. 364.12 (2)(c) and 364.12(3)(g))
- 7.05 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 the owner to do so within five (5) days. If the property owner 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, Sec. 364.12(2)(d) & (e) and 364.12(3)(g) & (h))

7.06 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.

7.07 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. The superintendent 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, Sec. 364.12(2)(c) & 372.13(4))

CHAPTER 5: TREES

ARTICLE 8 - DUTCH ELM DISEASE CONTROL

8.01 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:

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 be removed and burned or sprayed with an effective elm bark beetle destroying insecticide.

8.02 DUTY TO REMOVE. No person, firm or corporation shall permit any tree or material infected with Dutch elm disease to remain on the premises owned, controlled or occupied by him within the city.

(Code of Iowa, Sec, 364.12(3b))

8.03 INSPECTION. The city shall inspect or cause to be inspected all premises and places within the city to determine whether any condition as defined in Article 7.01 of this ordinance 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.

8.04 REMOVAL FROM CITY PROPERTY. If the city, upon inspection or examination, in person or by some qualified person acting for the city, 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 or she 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.

- 8.05 REMOVAL FROM PRIVATE PROPERTY. If the city upon inspection or examination, in person or by some qualified person acting for the city, 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 or she shall immediately notify by certified mail the occupant or person in charge of such property, to correct such condition within 14 days of said notification. If such owner, occupant or person in charge of said property fails to comply within 14 days of receipt thereof, the council may cause the nuisance to be removed and the cost assessed against the property for collection in the same manner as a property tax.

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

- 8.06 REASONABLE CERTAINTY. If the city is unable to determine with reasonable certainty whether or not a tree in or upon private premises is infected with Dutch elm disease, a city representative is authorized to remove or cut specimens from said tree, and obtain a diagnosis of such specimens.

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