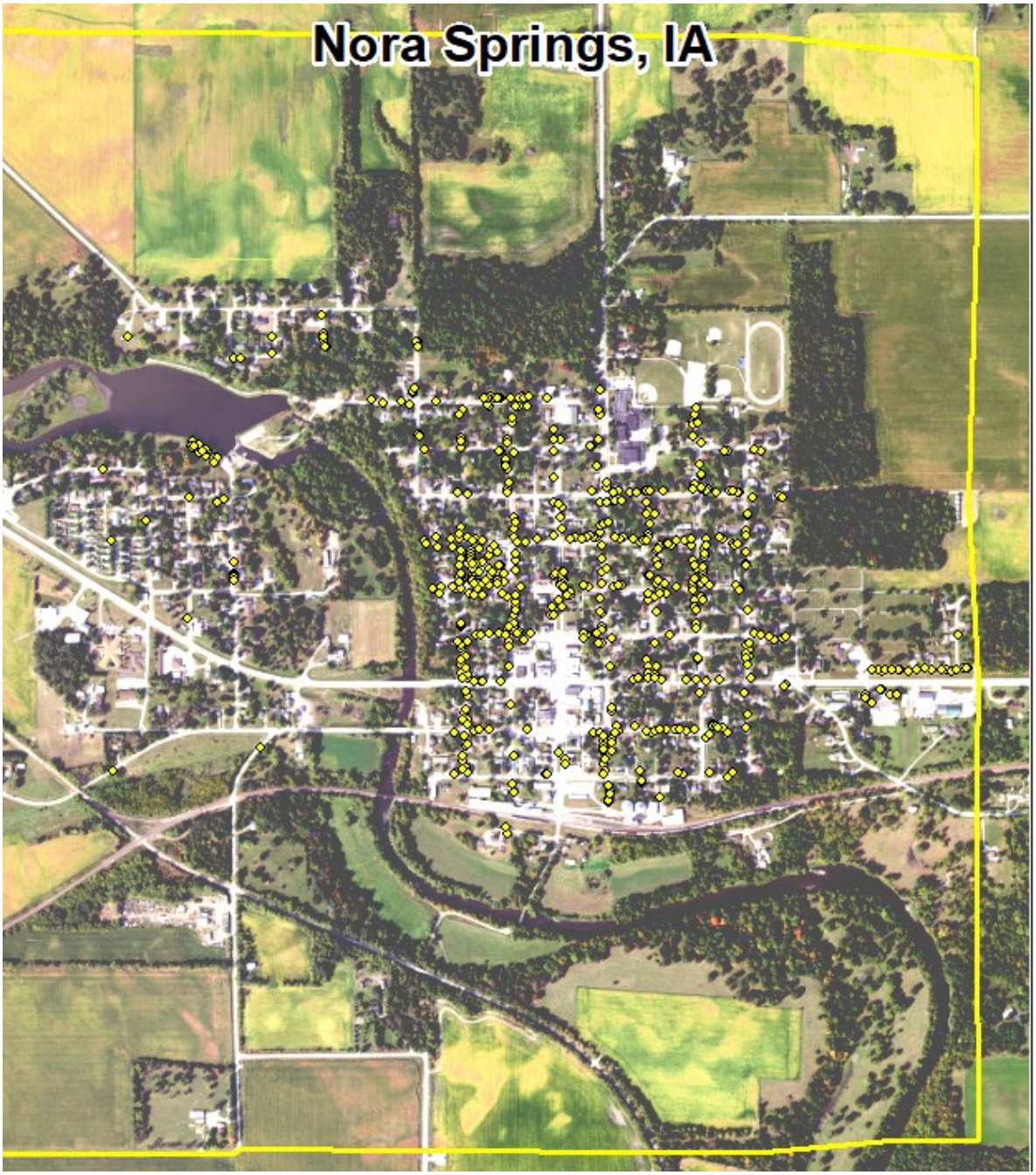
Nora Springs, IA



2020 Urban Forest Management Plan
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Table of Contents

Executive Summary

Overview

This plan was developed to assist the City of Nora Springs 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 16% of Nora Springs' city owned trees (ash) will die once EAB becomes established in the community, unless preventative treatment is used. With proper planning and management, the costs of removing dead and dying trees can be extended over years, mitigating public safety issues.

Inventory and Results

In 2019, a tree inventory was conducted using Global Positioning System (GPS) data collectors. The inventory was a complete inventory of street and park trees. Below are some key findings of the 569 trees inventoried.

- Nora Springs' trees provide $103,207 of benefits annually, an average of $181 a tree
- There are over 37 species of trees
- The top three genera are: Maple 48%, Ash 16%, and Apple 6%
- 39% of trees are in need of some type of management
- 8 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 8 trees needing removal, 1 trees are over 24 inches in diameter at 4.5 ft and must be addressed immediately *City ownership of the trees recommended for removal should be verified prior to any removal*
- 15 of the 91 ash trees should be carefully examined, as they have one or more symptoms that could be related to an EAB infestation
- All trees should be pruned on a routine schedule- one third of the city every other year
- Plant a diverse mix of trees that do not include: ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut
- Check ash trees with a visual survey yearly
- With the current budget it could take 17 years to remove ash – Suggestion: request a budget increase to $10,000 annually and apply for grants to plant replacement trees

Introduction

This plan was developed to assist Nora Springs with the management, budgeting and future planning of their urban forest. Across the state, forestry budgets continue to decrease with more and more of that money spent on tree removal. With the anticipated arrival of Emerald Ash Borer (EAB), an invasive pest that kills native ash trees, it is time to prepare for the increased costs of tree removal or treatment and replacement planting. With proper planning and management of the current canopy in Nora Springs, these costs can be extended over years and public safety issues from dead and dying ash trees mitigated.

Trees are an important component of Nora Springs' 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 Nora Springs 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 Nora Springs' urban forestry goals.

Inventory

In 2019, a tree inventory was conducted that included 100% of the city owned trees on both streets and parks. The tree data was collected using a handheld Global Positioning System (GPS) receiver. The data collector gives Geographic Information Systems (GIS) coordinates with an accuracy of 3 meters, which can be used in Arc GIS as an active GIS data layer. Because the inventory is a digital document the data can be updated with new information and become a working document.

The programming used to collect tree information on the data collectors was written to be compatible with a state-of-the-art software suite called i-Tree. i-Tree was developed by the USDA Forest Service to quantify the structure of community trees and the environmental services that trees provide. The i-Tree suite is a public domain which can be accessed for free.

To quantify the urban forest structure and benefits, specific data is collected for each tree. This data includes: location, land use, species, diameter at 4.5 ft, recommended maintenance, priority of that maintenance, leaf health, and wood condition. Additionally, signs and symptoms associated with EAB were noted for all ash trees. The signs and symptoms noted were canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

Inventory Results

The data collected for the 569 city trees was entered into the USDA Forest service program Street Tree Resource Analysis Tool for Urban forestry Management as part of the i-Tree suite. The following are results from the i-Tree STREETS analysis. Fin

Annual Benefits

Annual Energy Benefits

Trees conserve energy by shading buildings and blocking winds. Nora Springs' trees reduce energy related costs by approximately $27,985 annually (Appendix A, Table 1). These savings are both in Electricity (133.3 MWh) and in Natural Gas (18,229.9 Therms).

Annual Stormwater Benefits

Nora Springs' trees intercept about 1,409,962 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $38,210 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 Nora Springs, it is estimated that trees remove 1,669 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 $4,672 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Nora Springs, trees sequester about 284,623 lbs of carbon a year with an associated value of $2,135 (Appendix A, Table 5). In addition, the trees store 4,907,788 lbs of carbon, with a yearly benefit of $36,808 (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. Nora Springs receives $28,716 in annual social benefits from trees (Appendix A, Table 6).

Financial Summary of all Benefits

According to the USDA Forest Service i-Tree STREETS analysis, Nora Springs' trees provide $103,207 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 569 trees in Nora Springs provide approximately $181 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Nora Springs has over 37 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genera is as follows:

Maple	215	48%
Ash	91	16%
Apple(Crab)	35	7%
Hackberry	25	4%
Black Walnut	19	3%
Bur Oak	12	2%
Honey Locust	12	2%
Boxelder	10	2%

Age Class

Most of Nora Springs' trees (38%) are between 6 and 18 inches in diameter at 4.5 ft (Appendix A, Figure 2). For age, it is preferred that the highest amounts of trees are in the smallest size category (a downward slope) to prepare for natural mortality and to maintain canopy cover. Nora Springs' 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 Nora Springs indicate that 99% of the trees are in good health, with only 1% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 94% of Nora Springs' 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 6% of the population. This 6% 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	153	27%
Crown Raising	49	9%
Tree Staking	4	<2%
Tree Removal	8	1%
Crown Reduction	6	1%

Canopy Cover

The total canopy with both private and public trees is 29%, 407 acres. The canopy cover included in the Nora Springs inventory includes approximately 15 acres (Appendix A, Figure 5). The City's Canopy goal is to increase canopy by 1-3%, in 30 years. To achieve this goal it is estimated that 34 to 103 trees need to be planted annually on public and private lands.

Land Use and Location

The majority of Nora Springs' 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	95%
Park/vacant/other	5%
Industrial/Large commercial	0%
Small commercial	0%
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

Nora Springs has 2 critical concern trees that need immediate removal. These trees can be seen on the Location of Trees with Recommended Maintenance map (Appendix B, Figure 4). It is recommended to start with the large diameter critical concern trees first. There is 1 tree over 18 inches in diameter at 4.5 ft that should be addressed immediately. Please refer to the six year maintenance plan at the end of this section. After all of the critical concern trees are addressed, there should be follow up on the trees marked as needing maintenance. There are a total of 6 trees with these needs.

Poor tree species

After the removal of the critical concern trees, ash trees in poor health should be assessed for removal (Appendix B, Figure 3 & Appendix B, Figure 4). Of the 2 removals, both are ash trees. There are a total of 91 ash trees, and 16 of those have signs and symptoms that have been associated with EAB. In addition, there are 2 trees that are in poor health. *City ownership of the trees recommended for removal should be verified prior to any removal*

Pruning Cycle

Proper pruning can extend the life and good health of trees, as well as reduce public safety issues. In the Management Needs section of the Findings there are four main maintenance issues to be addressed: routine pruning, crown cleaning, crown raising, and crown reduction. Crown cleaning

removes dead, diseased, and damaged limbs. Crown raising is the removal of lower branches that are 2 inches in diameter or larger in the case of providing clearance for pedestrians or vehicles. Crown reduction is removing individual limbs from structures or utility wires. It is recommended that all trees be pruned on a routine schedule every five to seven years. Please refer to the six year maintenance plan for further information.

Planting

Most of the planting over the next 5 years will replace the trees that are removed. It is recommended to plant 1.2 trees for every tree removed, since survival rates will not be 100%. Please refer to the six year maintenance plan at the end of this section. It is not essential that the new trees be planted in the same location of the trees being removed. However, maintaining the same number of trees helps ensure continuation of the benefits of the existing forest in Nora Springs.

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 (48%) (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, Chinese elm, evergreen, willow or black walnut, as outlined in section 151.02 of the city ordinance (Appendix C). All trees planted must meet the restrictions in city ordinance 151.02 (Appendix C).

Continual Monitoring

Due to the threat of EAB, it is important to continuously check the health of ash trees. It is recommended that ash trees be checked with a visual survey every year for tree decline and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

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

Year 1- $5000

Removal: 2 critical concern trees- removal ($1600), 2 Mature Tree Immediate- removal ($1600), 2 Mature Tree Routine- removal ($1600)
Planting and Replacement: Plant 2 Trees ($200)
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

Year 2- $5000

Removal: 1 Mature Tree Routine- removal ($800), Remove 5 ash trees with poor health ($4000)
Planting and Replacement: Plant 2 trees in open locations from year one removals ($200)
Young Tree Pruning & Maintenance:
Routine trimming:
Visual Survey for signs and symptoms of EAB

Year 3- $5000
Removal: Remove 6 ash trees with poor health ($4800)
Planting and Replacement: Plant 2 trees in open locations from year one and two removals ($200)
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

Year 4- $5000
Removal: Remove 6 ash trees with poor health ($4800)
Planting and Replacement: Plant 2 trees in open locations from previous removals ($200)
Routine trimming:
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

Year 5- $5000
Removal: Remove 6 ash trees with poor health ($4800)
Planting and Replacement: Plant 2 trees in open locations from year one and two removals ($200)
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

Year 6
Removal: Remove 6 ash trees with poor health ($4800)
Planting and Replacement: Plant 2 trees in open locations from year one and two removals ($200)
Routine trimming:
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

*Reduction of ash over 6 years: Approximately 31 ash trees removed (approximately 34% of ash). It will take approximately 17 years to remove all ash with the current budget. EAB could potentially kill all ash within 4 to 15 years of its arrival.
**To remove all ash trees within 6 years, the budget would need to be increased to $12,135 a year. If the budget were increased to $10,000 a year all ash could be removed in 8.5 years.

Emerald Ash Borer Plan

Ash Tree Removal

Tree removal will be prioritized with dead, dying, hazardous trees to be removed first (Appendix B, Figure 4). Next will be all ash in poor condition and displaying signs and symptoms of EAB (Appendix B, Figure 2 & Appendix B, Figure 3). *City ownership of the tree recommended for removal should be verified prior to any removal*

Treatment of Ash Trees

Chemical treatment can be effective tool for communities to spread removal costs out over several years while allowing trees to continue to provide benefits. However, treatment is not recommended if EAB is more than 15 miles away from the community. For more information on the cost of treatment strategies visit http://extension.entm.purdue.edu/treecomputer/

EAB Quarantines

EAB is an extremely destructive plant pest and it is responsible for the death and decline of millions of ash trees. Ash in both forested and urban settings constitute a significant portion of the canopy cover in the United States. Current tools to detect, control, suppress and eradicate this pest are not as robust as the USDA would desire. In order to stay ahead of this hard to detect beetle, the USDA is attempting to contain the beetle before it spreads beyond its known positions by regulating articles.

A regulated article under the USDA's quarantine includes any of the following items:

- emerald ash borer
- firewood of all hardwood species (for example ash, oak, maple and hickory)
- nursery stock and green lumber of ash
- any other ash material, whether living, dead, cut or fallen, including logs, stumps, roots, branches, as well as composted and not composted chips of the genus ash (Mountain ash is not included)

In addition, any other article, product or means of conveyance not listed above may be designated as a regulated article if a USDA inspector determines that it presents a risk of spreading EAB once a quarantine is in effect for your county.

Wood Disposal

A very important aspect of planning is determining how wood infested with EAB will be handled, keeping in mind that quarantines will restrict its movement. Consider who will cut and haul the dead and dying trees? Is there an accessible, secured site big enough to store and sort the hundreds of trees and the associated brush and chips? How will wood be disposed of or utilized? Do you have equipment capable of handling the amount and size of ash trees your tree inventory has identified? Once your county is under quarantine for EAB, contact USDA-APHIS-PPQ at 515-251-4083 or visit the website http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/regulatory.shtml. Wood waste can be disposed of as you normally would if your county is not part of a quarantine.

Canopy Replacement

As budget permits, all removed trees will be replaced. All trees will meet the restrictions in city ordinance 151.02 (Appendix C). The new plantings will be a diverse mix and will not include ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut.

Postponed Work

While finances, staffing and equipment are focused on the management of ash, usual services may be delayed. Tree removal requests on genera other than ash will be prioritized by hazardous or emergency situations only.

Monitoring

It is recommended that ash trees be checked with a visual survey every year for tree death and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

Private Ash Trees

It is strongly recommended that private property owners start removing ash trees on their property upon arrival of EAB if preventative treatments are not being used. City Code 151.06 states "If it is determined with reasonable certainty that any such condition exists on private property and that the danger to other trees or to adjoining property or passing motorists or pedestrians is imminent, the Council shall notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within 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

Total $30,000 over 6 years ($5,000/year)

FY 2021 Budget

Removal: $4,800
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Watering & Maintenance: $0
Routine trimming: $0

FY 2022 Budget

Removal: $4,800
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Watering & Maintenance: $0
Routine trimming: $0

FY 2023 Budget

Removal: $4,800
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Watering & Maintenance: $0
Routine trimming: $0

FY 2024 Budget

Removal: $4,800
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Watering & Maintenance: $0
Routine trimming: $0

FY 2025 Budget

Removal: $4,800
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Watering & Maintenance: $0
Routine trimming: $0

FY 2026 Budget

Removal: $4,800
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Watering & Maintenance: $0
Routine trimming: $0

*Reduction of ash over 6 years: Approximately 31 ash trees removed (approximately 34% of ash). **It will take approximately 17 years to remove all ash with the current budget.**

To increase Nora Springs canopy cover by 1% over 30 years, you should be planting 34 trees per year. To increase the canopy cover by 3% (desired goal) you should be planting 103 trees per year. With your current budget you are not meeting planting goals or conducting any Routine trimming.

<u>Purposed Budget Increase</u>

EAB could potentially kill all ash trees in Nora Springs within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to $12,135 a year. If the budget were increased to $10,000 a year all ash could be removed within 8.5 years. Additionally, it is recommended that Nora Springs apply for grants to fund replacement trees. Utility Company grants are usually between $500 and $10,000 for community-based, tree-planting projects that include parks, gateways, cemeteries, nature trails, libraries, nursing homes, and schools.

Another option being considered by many communities is treating a number of selected trees, either to maintain those trees in the landscape or to delay their removal – to spread out the costs and number of trees needing removed all at once. Trunk injection is administered every two years for the life of the tree. If treatment is discontinued, the tree dies. For instance, in this treatment scenario, the average ash diameter is 20 inches and at $15 per inch, about 16 trees could be treated per year (every other year treatment). This would be 32 trees selected for treatment, and Nora Springs would still need to find $7900 over the next 6 years to remove the remaining 59 ash trees. These are alternatives to straight removal of ash trees. However, whether or not the treatment option is selected, there will be an increased cost of dealing with ash trees if EAB is found in Nora Springs. It is suggested to consider increasing the budget to plan for this.

Works Cited

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

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

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

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

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

Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Nora Springs

Annual Energy Benefits of Public Trees

2/21/2020

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Sugar maple	45.7	3,467	6,115.8	5,993	9,461	(N/A)	30.0	33.8	55.65
Ash	21.4	1,626	3,082.2	3,021	4,647	(N/A)	16.1	16.6	51.06
Silver maple	18.3	1,390	2,403.0	2,355	3,744	(N/A)	11.1	13.4	59.44
Norway maple	7.9	599	1,127.4	1,105	1,704	(N/A)	6.9	6.1	43.70
Apple	1.7	131	270.1	265	396	(N/A)	6.2	1.4	11.31
Northern hackberry	8.5	646	1,211.2	1,187	1,833	(N/A)	4.4	6.5	73.30
Black walnut	5.3	404	714.3	700	1,104	(N/A)	3.4	3.9	58.09
Bur oak	3.8	292	516.7	506	798	(N/A)	2.1	2.9	66.51
Honeylocust	3.8	291	494.5	485	776	(N/A)	2.1	2.8	64.67
Boxelder	2.1	156	268.5	263	419	(N/A)	1.8	1.5	41.94
Northern white cedar	1.0	76	128.0	125	202	(N/A)	1.8	0.7	20.19
Northern red oak	1.7	127	238.7	234	361	(N/A)	1.6	1.3	40.06
Blue spruce	0.9	70	131.3	129	199	(N/A)	1.4	0.7	24.89
American basswood	1.1	83	152.6	150	232	(N/A)	1.1	0.8	38.70
Norway spruce	0.9	70	123.2	121	191	(N/A)	1.1	0.7	31.75
Red maple	0.6	42	83.3	82	124	(N/A)	1.1	0.4	20.65
Elm	1.8	139	253.5	248	387	(N/A)	1.1	1.4	64.50
River birch	1.0	74	128.0	125	199	(N/A)	0.7	0.7	49.75
Ohio buckeye	0.6	49	92.1	90	139	(N/A)	0.7	0.5	34.73
Littleleaf linden	0.6	45	82.2	81	125	(N/A)	0.7	0.4	31.36
Cottonwood	0.9	65	119.6	117	183	(N/A)	0.5	0.7	60.86
Siberian elm	0.8	64	111.3	109	173	(N/A)	0.5	0.6	57.58
Eastern white pine	0.4	29	43.9	43	72	(N/A)	0.5	0.3	24.14
Callery pear	0.2	18	30.3	30	48	(N/A)	0.4	0.2	23.94
Eastern red cedar	0.2	17	32.9	32	49	(N/A)	0.4	0.2	24.57
Mountain ash	0.1	6	13.5	13	19	(N/A)	0.4	0.1	9.53
Hickory	0.5	38	65.1	64	102	(N/A)	0.4	0.4	50.77
Buckthorn	0.0	0	0.6	1	1	(N/A)	0.2	0.0	0.87
Basswood	0.4	29	53.7	53	82	(N/A)	0.2	0.3	82.02
Alder	0.1	6	12.8	13	18	(N/A)	0.2	0.1	18.19
Swamp white oak	0.1	8	16.9	17	24	(N/A)	0.2	0.1	24.47
Catalpa	0.3	25	46.9	46	71	(N/A)	0.2	0.3	70.91
Broadleaf Deciduous Small	0.1	6	12.8	13	18	(N/A)	0.2	0.1	18.19
Black poplar	0.2	18	27.0	26	44	(N/A)	0.2	0.2	44.23
Amur maple	0.2	14	24.7	24	38	(N/A)	0.2	0.1	38.13
Eastern redbud	0.0	0	0.6	1	1	(N/A)	0.2	0.0	0.87
Birch	0.0	0	0.8	1	1	(N/A)	0.2	0.0	1.10
Total	133.3	10,119	18,229.9	17,865	27,985	(N/A)	100.0	100.0	49.44

Table 2: Annual Stormwater Benefits

Nora Springs

Annual Stormwater Benefits of Public Trees

2/21/2020

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Sugar maple	490,949	13,305	(N/A)	30.0	34.8	78.26
Ash	192,482	5,216	(N/A)	16.1	13.7	57.32
Silver maple	247,723	6,713	(N/A)	11.1	17.6	106.56
Norway maple	63,195	1,713	(N/A)	6.9	4.5	43.91
Apple	5,982	162	(N/A)	6.2	0.4	4.63
Northern hackberry	79,189	2,146	(N/A)	4.4	5.6	85.84
Black walnut	52,360	1,419	(N/A)	3.4	3.7	74.68
Bur oak	52,880	1,433	(N/A)	2.1	3.8	119.42
Honeylocust	40,997	1,111	(N/A)	2.1	2.9	92.58
Boxelder	18,646	505	(N/A)	1.8	1.3	50.53
Northern white cedar	16,652	451	(N/A)	1.8	1.2	45.13
Northern red oak	17,266	468	(N/A)	1.6	1.2	51.99
Blue spruce	14,284	387	(N/A)	1.4	1.0	48.39
American basswood	7,590	206	(N/A)	1.1	0.5	34.28
Norway spruce	19,451	527	(N/A)	1.1	1.4	87.85
Red maple	3,138	85	(N/A)	1.1	0.2	14.17
Elm	25,126	681	(N/A)	1.1	1.8	113.49
River birch	6,707	182	(N/A)	0.7	0.5	45.44
Ohio buckeye	4,637	126	(N/A)	0.7	0.3	31.42
Littleleaf linden	5,558	151	(N/A)	0.7	0.4	37.65
Cottonwood	11,790	320	(N/A)	0.5	0.8	106.50
Siberian elm	7,020	190	(N/A)	0.5	0.5	63.41
Eastern white pine	4,616	125	(N/A)	0.5	0.3	41.70
Callery pear	1,421	39	(N/A)	0.4	0.1	19.26
Eastern red cedar	3,269	89	(N/A)	0.4	0.2	44.30
Mountain ash	272	7	(N/A)	0.4	0.0	3.68
Hickory	4,056	110	(N/A)	0.4	0.3	54.96
Buckthorn	7	0	(N/A)	0.2	0.0	0.20
Basswood	5,491	149	(N/A)	0.2	0.4	148.79
Alder	264	7	(N/A)	0.2	0.0	7.17
Swamp white oak	586	16	(N/A)	0.2	0.0	15.88
Catalpa	3,943	107	(N/A)	0.2	0.3	106.85
Broadleaf Deciduous Small	264	7	(N/A)	0.2	0.0	7.17
Black poplar	1,466	40	(N/A)	0.2	0.1	39.72
Amur maple	667	18	(N/A)	0.2	0.0	18.06
Eastern redbud	7	0	(N/A)	0.2	0.0	0.20
Birch	12	0	(N/A)	0.2	0.0	0.33
Citywide total	1,409,962	38,210	(N/A)	100.0	100.0	67.51

Table 3: Annual Air Quality Benefits

Nora Springs

Annual Air Quality Benefits of Public Trees

2/21/2020

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								
Sugar maple	63.9	10.9	32.1	2.8	347	216.6	31.6	30.2	206.9	1,353	-50.4	-189	544.7	1,511	(N/A)	30.0	8.89
Ash	38.4	6.6	19.0	1.7	208	103.8	15.0	14.3	97.2	643	-9.1	-34	286.9	817	(N/A)	16.1	8.97
Silver maple	40.8	6.9	20.3	1.8	220	86.3	12.6	12.1	82.8	540	-21.7	-81	241.8	679	(N/A)	11.1	10.78
Norway maple	11.6	2.0	5.9	0.5	63	38.2	5.5	5.3	35.8	237	-2.8	-11	102.0	289	(N/A)	6.9	7.42
Apple	1.2	0.2	0.7	0.1	7	8.5	1.2	1.2	7.8	53	0.0	0	20.9	59	(N/A)	6.2	1.69
Northern hackberry	12.9	2.2	6.6	0.6	70	41.1	6.0	5.7	38.6	255	0.0	0	113.6	325	(N/A)	4.4	13.01
Black walnut	5.9	0.9	2.9	0.3	31	25.3	3.7	3.5	24.1	158	0.0	0	66.5	189	(N/A)	3.4	9.96
Bur oak	7.7	1.2	3.5	0.3	40	18.3	2.7	2.5	17.4	114	0.0	0	53.6	154	(N/A)	2.1	12.86
Honeylocust	8.0	1.3	3.6	0.4	42	18.0	2.6	2.5	17.4	113	-6.2	-23	47.6	132	(N/A)	2.1	10.98
Boxelder	2.2	0.4	1.1	0.1	12	9.7	1.4	1.4	9.3	61	-1.0	-4	24.5	69	(N/A)	1.8	6.88
Northern white cedar	1.9	0.4	1.6	0.2	13	4.7	0.7	0.7	4.6	30	-8.3	-31	6.5	11	(N/A)	1.8	1.12
Northern red oak	3.6	0.6	1.8	0.2	20	8.0	1.2	1.1	7.6	50	-5.3	-20	18.8	50	(N/A)	1.6	5.53
Blue spruce	2.2	0.4	1.8	0.3	14	4.5	0.6	0.6	4.2	28	-5.3	-20	9.2	22	(N/A)	1.4	2.75
American basswood	0.7	0.1	0.4	0.0	4	5.2	0.8	0.7	4.9	33	-0.7	-3	12.2	34	(N/A)	1.1	5.65
Norway spruce	2.3	0.5	1.8	0.3	15	4.4	0.6	0.6	4.2	27	-9.7	-37	4.9	6	(N/A)	1.1	0.94
Red maple	0.4	0.1	0.2	0.0	2	2.7	0.4	0.4	2.5	17	-0.2	-1	6.5	18	(N/A)	1.1	3.06
Elm	3.6	0.6	1.6	0.2	19	8.8	1.3	1.2	8.3	54	0.0	0	25.4	73	(N/A)	1.1	12.21
River birch	1.1	0.2	0.6	0.1	6	4.6	0.7	0.6	4.4	29	-0.3	-1	12.0	34	(N/A)	0.7	8.48
Ohio buckeye	0.8	0.1	0.4	0.0	4	3.1	0.4	0.4	2.9	19	-0.2	-1	8.0	23	(N/A)	0.7	5.69
Littleleaf linden	0.9	0.2	0.5	0.0	5	2.8	0.4	0.4	2.7	18	-0.4	-2	7.5	21	(N/A)	0.7	5.24
Cottonwood	1.7	0.3	0.8	0.1	9	4.1	0.6	0.6	3.9	26	0.0	0	12.0	35	(N/A)	0.5	11.50
Siberian elm	0.9	0.2	0.5	0.0	5	4.0	0.6	0.6	3.8	25	0.0	0	10.5	30	(N/A)	0.5	9.90
Eastern white pine	0.5	0.1	0.4	0.1	3	1.8	0.3	0.3	1.8	11	-1.6	-6	3.5	8	(N/A)	0.5	2.82
Callery pear	0.2	0.0	0.1	0.0	1	1.1	0.2	0.2	1.1	7	-0.1	0	2.9	8	(N/A)	0.4	4.03
Eastern red cedar	0.7	0.1	0.5	0.1	4	1.1	0.2	0.1	1.0	7	-1.8	-7	2.0	4	(N/A)	0.4	2.19
Mountain ash	0.0	0.0	0.0	0.0	0	0.4	0.1	0.1	0.4	2	0.0	0	0.9	3	(N/A)	0.4	1.33
Hickory	0.4	0.1	0.2	0.0	2	2.3	0.3	0.3	2.3	15	0.0	0	5.9	17	(N/A)	0.4	8.38
Buckthorn	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	0.11
Basswood	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
Alder	0.0	0.0	0.0	0.0	0	0.4	0.1	0.1	0.3	2	0.0	0	0.9	3	(N/A)	0.2	2.55
Swamp white oak	0.1	0.0	0.0	0.0	0	0.5	0.1	0.1	0.5	3	0.0	0	1.2	3	(N/A)	0.2	3.47
Catalpa	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
Broadleaf Deciduous Small	0.0	0.0	0.0	0.0	0	0.4	0.1	0.1	0.3	2	0.0	0	0.9	3	(N/A)	0.2	2.55
Black poplar	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
Amur maple	0.2	0.0	0.1	0.0	1	0.9	0.1	0.1	0.8	5	0.0	0	2.3	7	(N/A)	0.2	6.56
Eastern redbud	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	0.11
Birch	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
Citywide total	216.1	36.9	109.7	10.2	1,178	636.1	92.6	88.3	604.1	3,964	-125.2	-469	1,669.0	4,672	(N/A)	100.0	8.25

Table 4: Annual Carbon Stored

Nora Springs

Stored CO2 Benefits of Public Trees

2/21/2020

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Sugar maple	1,836,721	13,775	(N/A)	30.0	37.4	81.03
Ash	633,576	4,752	(N/A)	16.1	12.9	52.22
Silver maple	919,712	6,898	(N/A)	11.1	18.7	109.49
Norway maple	192,778	1,446	(N/A)	6.9	3.9	37.07
Apple	22,279	167	(N/A)	6.2	0.5	4.77
Northern hackberry	196,655	1,475	(N/A)	4.4	4.0	59.00
Black walnut	188,571	1,414	(N/A)	3.4	3.8	74.44
Bur oak	256,055	1,920	(N/A)	2.1	5.2	160.03
Honeylocust	102,476	769	(N/A)	2.1	2.1	64.05
Boxelder	63,672	478	(N/A)	1.8	1.3	47.75
Northern white cedar	20,180	151	(N/A)	1.8	0.4	15.13
Northern red oak	80,293	602	(N/A)	1.6	1.6	66.91
Blue spruce	17,080	128	(N/A)	1.4	0.3	16.01
American basswood	25,675	193	(N/A)	1.1	0.5	32.09
Norway spruce	24,204	182	(N/A)	1.1	0.5	30.26
Red maple	5,520	41	(N/A)	1.1	0.1	6.90
Elm	118,706	890	(N/A)	1.1	2.4	148.38
River birch	18,818	141	(N/A)	0.7	0.4	35.28
Ohio buckeye	12,889	97	(N/A)	0.7	0.3	24.17
Littleleaf linden	20,045	150	(N/A)	0.7	0.4	37.58
Cottonwood	56,066	420	(N/A)	0.5	1.1	140.16
Siberian elm	22,025	165	(N/A)	0.5	0.4	55.06
Eastern white pine	3,511	26	(N/A)	0.5	0.1	8.78
Callery pear	3,641	27	(N/A)	0.4	0.1	13.65
Eastern red cedar	2,204	17	(N/A)	0.4	0.0	8.27
Mountain ash	922	7	(N/A)	0.4	0.0	3.46
Hickory	12,130	91	(N/A)	0.4	0.2	45.49
Buckthorn	14	0	(N/A)	0.2	0.0	0.10
Basswood	25,943	195	(N/A)	0.2	0.5	194.57
Alder	908	7	(N/A)	0.2	0.0	6.81
Swamp white oak	1,101	8	(N/A)	0.2	0.0	8.26
Catalpa	15,773	118	(N/A)	0.2	0.3	118.30
Broadleaf Deciduous	908	7	(N/A)	0.2	0.0	6.81
Black poplar	3,672	28	(N/A)	0.2	0.1	27.54
Amur maple	3,037	23	(N/A)	0.2	0.1	22.78
Eastern redbud	14	0	(N/A)	0.2	0.0	0.10
Birch	17	0	(N/A)	0.2	0.0	0.13
Citywide total	4,907,788	36,808	(N/A)	100.0	100.0	65.03

Table 5: Annual Carbon Sequestered

Nora Springs

Annual CO Benefits of Public Trees

2/21/2020

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
Sugar maple	99,245	744	-8,818	-485	-70	76,624	575	166,565	1,249 (N/A)	30.0	34.5	7.35
Ash	28,122	211	-3,042	-228	-25	35,933	269	60,785	456 (N/A)	16.1	12.6	5.01
Silver maple	71,635	537	-4,415	-197	-35	30,709	230	97,732	733 (N/A)	11.1	20.2	11.63
Norway maple	12,788	96	-925	-79	-8	13,247	99	25,030	188 (N/A)	6.9	5.2	4.81
Apple	2,690	20	-107	-29	-1	2,901	22	5,455	41 (N/A)	6.2	1.1	1.17
Northern hackberry	10,502	79	-944	-80	-8	14,269	107	23,747	178 (N/A)	4.4	4.9	7.12
Black walnut	12,517	94	-905	-53	-7	8,921	67	20,479	154 (N/A)	3.4	4.2	8.08
Bur oak	8,708	65	-1,229	-42	-10	6,446	48	13,883	104 (N/A)	2.1	2.9	8.68
Honeylocust	8,504	64	-492	-29	-4	6,439	48	14,422	108 (N/A)	2.1	3.0	9.01
Boxelder	5,737	43	-306	-23	-2	3,453	26	8,861	66 (N/A)	1.8	1.8	6.65
Northern white cedar	831	6	-97	-18	-1	1,689	13	2,404	18 (N/A)	1.8	0.5	1.80
Northern red oak	959	7	-385	-22	-3	2,800	21	3,351	25 (N/A)	1.6	0.7	2.79
Blue spruce	878	7	-82	-18	-1	1,556	12	2,334	18 (N/A)	1.4	0.5	2.19
American basswood	2,066	15	-123	-12	-1	1,827	14	3,758	28 (N/A)	1.1	0.8	4.70
Norway spruce	1,193	9	-116	-17	-1	1,543	12	2,602	20 (N/A)	1.1	0.5	3.25
Red maple	829	6	-27	-6	0	935	7	1,731	13 (N/A)	1.1	0.4	2.16
Elm	4,272	32	-570	-20	-4	3,063	23	6,745	51 (N/A)	1.1	1.4	8.43
River birch	1,628	12	-90	-9	-1	1,625	12	3,154	24 (N/A)	0.7	0.7	5.91
Ohio buckeye	1,175	9	-63	-6	-1	1,075	8	2,182	16 (N/A)	0.7	0.5	4.09
Littleleaf linden	1,915	14	-97	-7	-1	992	7	2,803	21 (N/A)	0.7	0.6	5.26
Cottonwood	1,978	15	-269	-10	-2	1,445	11	3,144	24 (N/A)	0.5	0.7	7.86
Siberian elm	1,439	11	-106	-8	-1	1,406	11	2,731	20 (N/A)	0.5	0.6	6.83
Eastern white pine	347	3	-17	-6	0	649	5	973	7 (N/A)	0.5	0.2	2.43
Callery pear	391	3	-18	-2	0	402	3	774	6 (N/A)	0.4	0.2	2.90
Eastern red cedar	43	0	-11	-4	0	374	3	402	3 (N/A)	0.4	0.1	1.51
Mountain ash	123	1	-4	-1	0	130	1	246	2 (N/A)	0.4	0.1	0.92
Hickory	1,105	8	-58	-5	0	834	6	1,876	14 (N/A)	0.4	0.4	7.04
Buckthorn	9	0	0	0	0	6	0	14	0 (N/A)	0.2	0.0	0.10
Basswood	960	7	-125	-4	-1	650	5	1,481	11 (N/A)	0.2	0.3	11.11
Alder	114	1	-4	-1	0	124	1	232	2 (N/A)	0.2	0.0	1.74
Swamp white oak	224	2	-5	-1	0	176	1	393	3 (N/A)	0.2	0.1	2.95
Catalpa	857	6	-76	-4	-1	552	4	1,330	10 (N/A)	0.2	0.3	9.97
Broadleaf Deciduous Smal	114	1	-4	-1	0	124	1	232	2 (N/A)	0.2	0.0	1.74
Black poplar	445	3	-18	-2	0	393	3	819	6 (N/A)	0.2	0.2	6.14
Amur maple	268	2	-15	-2	0	308	2	560	4 (N/A)	0.2	0.1	4.20
Eastern redbud	9	0	0	0	0	6	0	14	0 (N/A)	0.2	0.0	0.10
Birch	5	0	0	0	0	7	0	12	0 (N/A)	0.2	0.0	0.09
Citywide total	284,623	2,135	-23,563	-1,433	-187	223,632	1,677	483,260	3,624 (N/A)	100.0	100.0	6.40

Table 6: Annual Social and Aesthetic Benefits

Nora Springs

Annual Aesthetic/Other Benefits of Public Trees

2/21/2020

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Sugar maple	10,442	(N/A)	30.0	36.4	61.42
Ash	2,756	(N/A)	16.1	9.6	30.28
Silver maple	5,799	(N/A)	11.1	20.2	92.05
Norway maple	1,284	(N/A)	6.9	4.5	32.92
Apple	150	(N/A)	6.2	0.5	4.29
Northern hackberry	1,422	(N/A)	4.4	5.0	56.87
Black walnut	1,070	(N/A)	3.4	3.7	56.29
Bur oak	643	(N/A)	2.1	2.2	53.58
Honeylocust	2,090	(N/A)	2.1	7.3	174.15
Boxelder	458	(N/A)	1.8	1.6	45.80
Northern white cedar	198	(N/A)	1.8	0.7	19.79
Northern red oak	89	(N/A)	1.6	0.3	9.87
Blue spruce	154	(N/A)	1.4	0.5	19.25
American basswood	179	(N/A)	1.1	0.6	29.77
Norway spruce	262	(N/A)	1.1	0.9	43.61
Red maple	149	(N/A)	1.1	0.5	24.87
Elm	320	(N/A)	1.1	1.1	53.38
River birch	161	(N/A)	0.7	0.6	40.13
Ohio buckeye	121	(N/A)	0.7	0.4	30.33
Littleleaf linden	203	(N/A)	0.7	0.7	50.71
Cottonwood	152	(N/A)	0.5	0.5	50.83
Siberian elm	118	(N/A)	0.5	0.4	39.32
Eastern white pine	97	(N/A)	0.5	0.3	32.32
Callery pear	42	(N/A)	0.4	0.1	20.95
Eastern red cedar	14	(N/A)	0.4	0.0	6.84
Mountain ash	6	(N/A)	0.4	0.0	3.22
Hickory	104	(N/A)	0.4	0.4	51.77
Buckthorn	0	(N/A)	0.2	0.0	0.03
Basswood	67	(N/A)	0.2	0.2	66.60
Alder	6	(N/A)	0.2	0.0	6.40
Swamp white oak	26	(N/A)	0.2	0.1	26.22
Catalpa	66	(N/A)	0.2	0.2	65.59
Broadleaf Deciduous Small	6	(N/A)	0.2	0.0	6.40
Black poplar	46	(N/A)	0.2	0.2	45.86
Amur maple	15	(N/A)	0.2	0.1	15.48
Eastern redbud	0	(N/A)	0.2	0.0	0.03
Birch	3	(N/A)	0.2	0.0	2.74
Citywide total	28,716	(N/A)	100.0	100.0	50.74

Table 7: Summary of Benefits in Dollars

Nora Springs

Total Annual Benefits of Public Trees by Species ($)

2/21/2020

Species	Energy	CO_2	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Sugar maple	9,461	1,249	1,511	13,305	10,442	35,967	(N/A)	34.8
Ash	4,647	456	817	5,216	2,756	13,891	(N/A)	13.5
Silver maple	3,744	733	679	6,713	5,799	17,669	(N/A)	17.1
Norway maple	1,704	188	289	1,713	1,284	5,178	(N/A)	5.0
Apple	396	41	59	162	150	808	(N/A)	0.8
Northern hackberry	1,833	178	325	2,146	1,422	5,904	(N/A)	5.7
Black walnut	1,104	154	189	1,419	1,070	3,935	(N/A)	3.8
Bur oak	798	104	154	1,433	643	3,133	(N/A)	3.0
Honeylocust	776	108	132	1,111	2,090	4,217	(N/A)	4.1
Boxelder	419	66	69	505	458	1,518	(N/A)	1.5
Northern white cedar	202	18	11	451	198	880	(N/A)	0.9
Northern red oak	361	25	50	468	89	992	(N/A)	1.0
Blue spruce	199	18	22	387	154	780	(N/A)	0.8
American basswood	232	28	34	206	179	679	(N/A)	0.7
Norway spruce	191	20	6	527	262	1,004	(N/A)	1.0
Red maple	124	13	18	85	149	389	(N/A)	0.4
Elm	387	51	73	681	320	1,512	(N/A)	1.5
River birch	199	24	34	182	161	599	(N/A)	0.6
Ohio buckeye	139	16	23	126	121	425	(N/A)	0.4
Littleleaf linden	125	21	21	151	203	521	(N/A)	0.5
Cottonwood	183	24	35	320	152	713	(N/A)	0.7
Siberian elm	173	20	30	190	118	531	(N/A)	0.5
Eastern white pine	72	7	8	125	97	310	(N/A)	0.3
Callery pear	48	6	8	39	42	142	(N/A)	0.1
Eastern red cedar	49	3	4	89	14	159	(N/A)	0.2
Mountain ash	19	2	3	7	6	37	(N/A)	0.0
Hickory	102	14	17	110	104	346	(N/A)	0.3
Buckthorn	1	0	0	0	0	1	(N/A)	0.0
Basswood	82	11	16	149	67	324	(N/A)	0.3
Alder	18	2	3	7	6	36	(N/A)	0.0
Swamp white oak	24	3	3	16	26	73	(N/A)	0.1
Catalpa	71	10	12	107	66	266	(N/A)	0.3
Broadleaf Deciduous Sn	18	2	3	7	6	36	(N/A)	0.0
Black poplar	44	6	7	40	46	143	(N/A)	0.1
Amur maple	38	4	7	18	15	82	(N/A)	0.1
Eastern redbud	1	0	0	0	0	1	(N/A)	0.0
Birch	1	0	0	0	3	4	(N/A)	0.0
Citywide Total	27,985	3,624	4,672	38,210	28,716	103,207	(N/A)	100.0

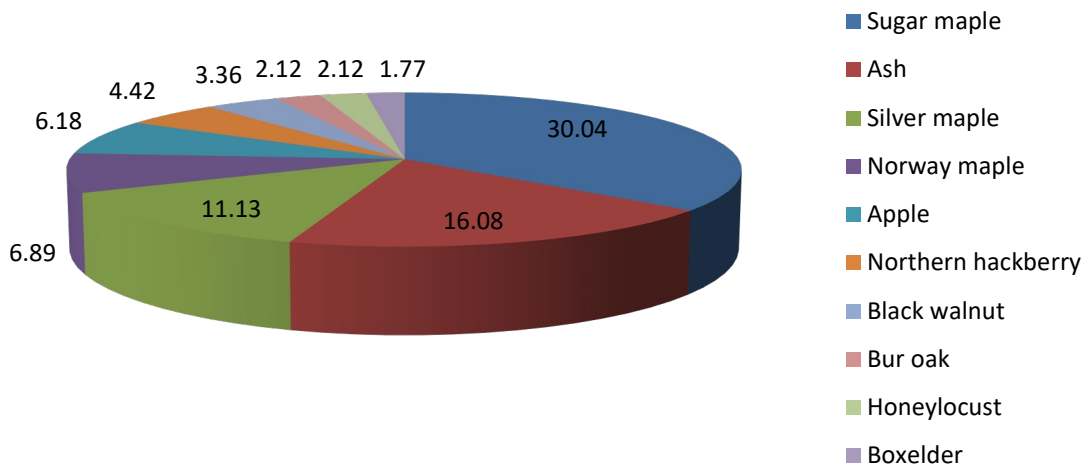

Figure 1: Species Distribution

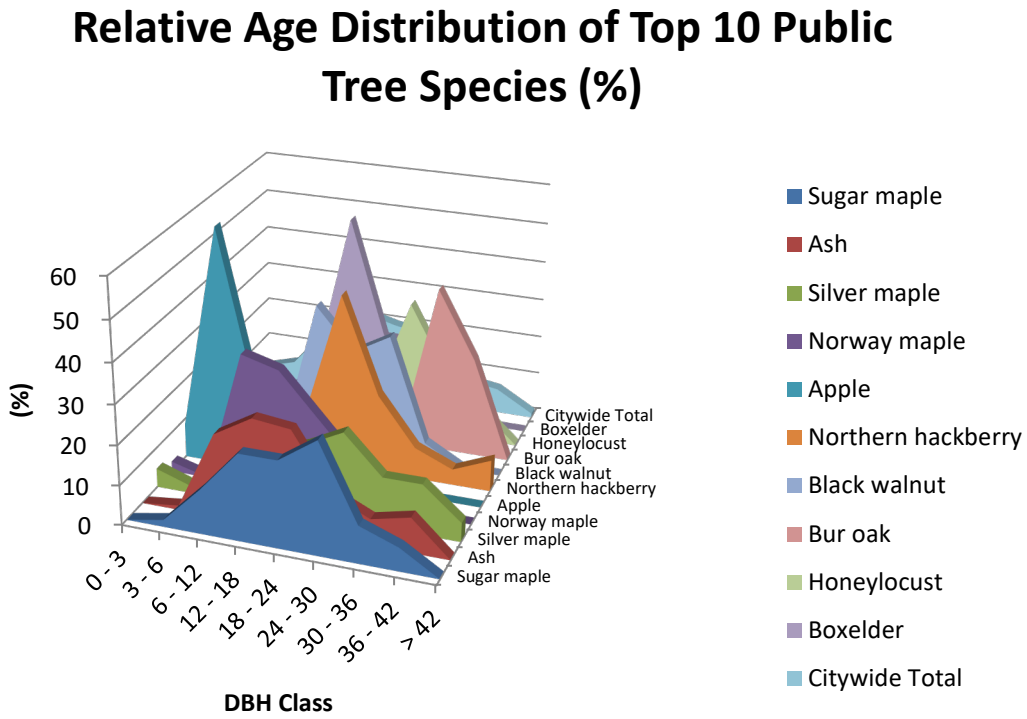

Figure 2: Relative Age Class

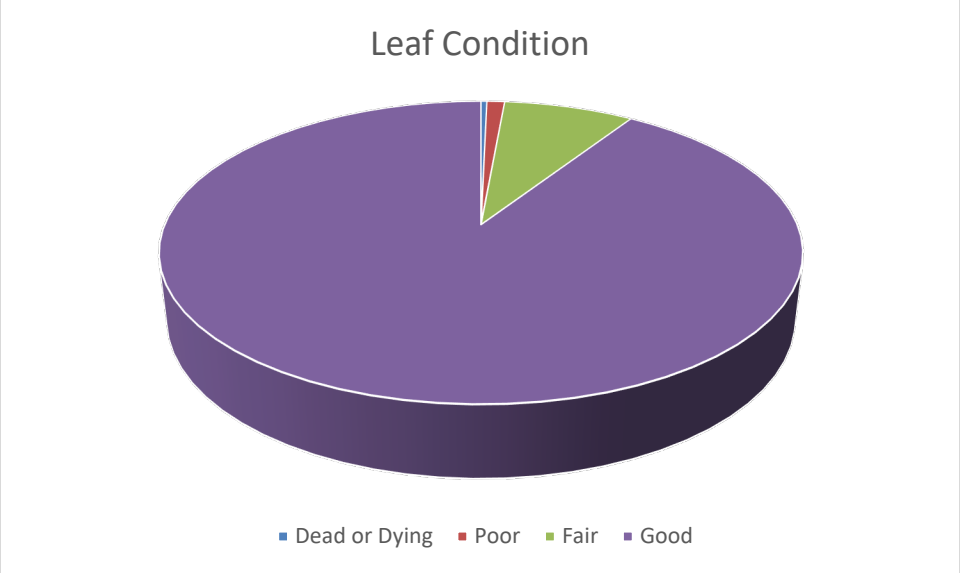

Figure 3: Foliage Condition

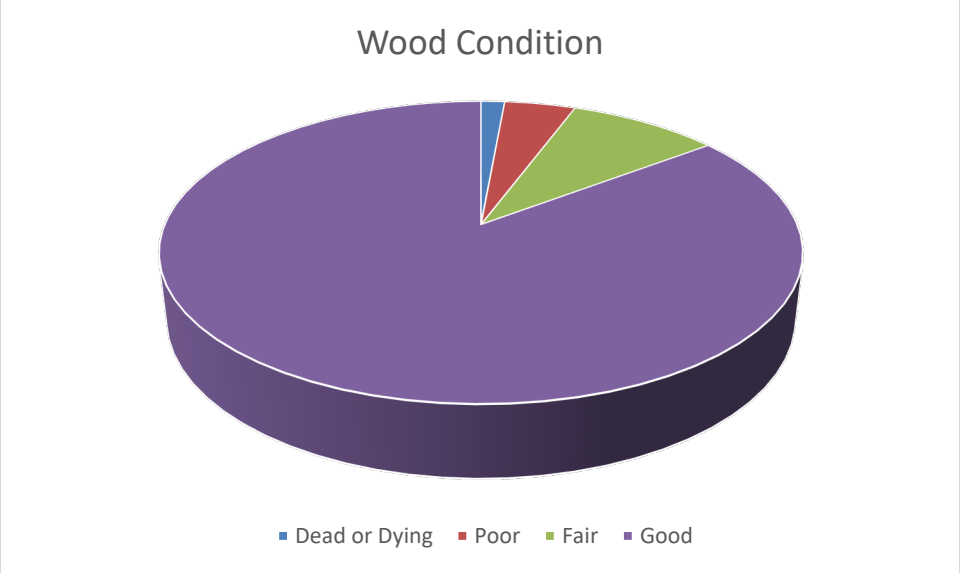

Figure 4: Wood Condition

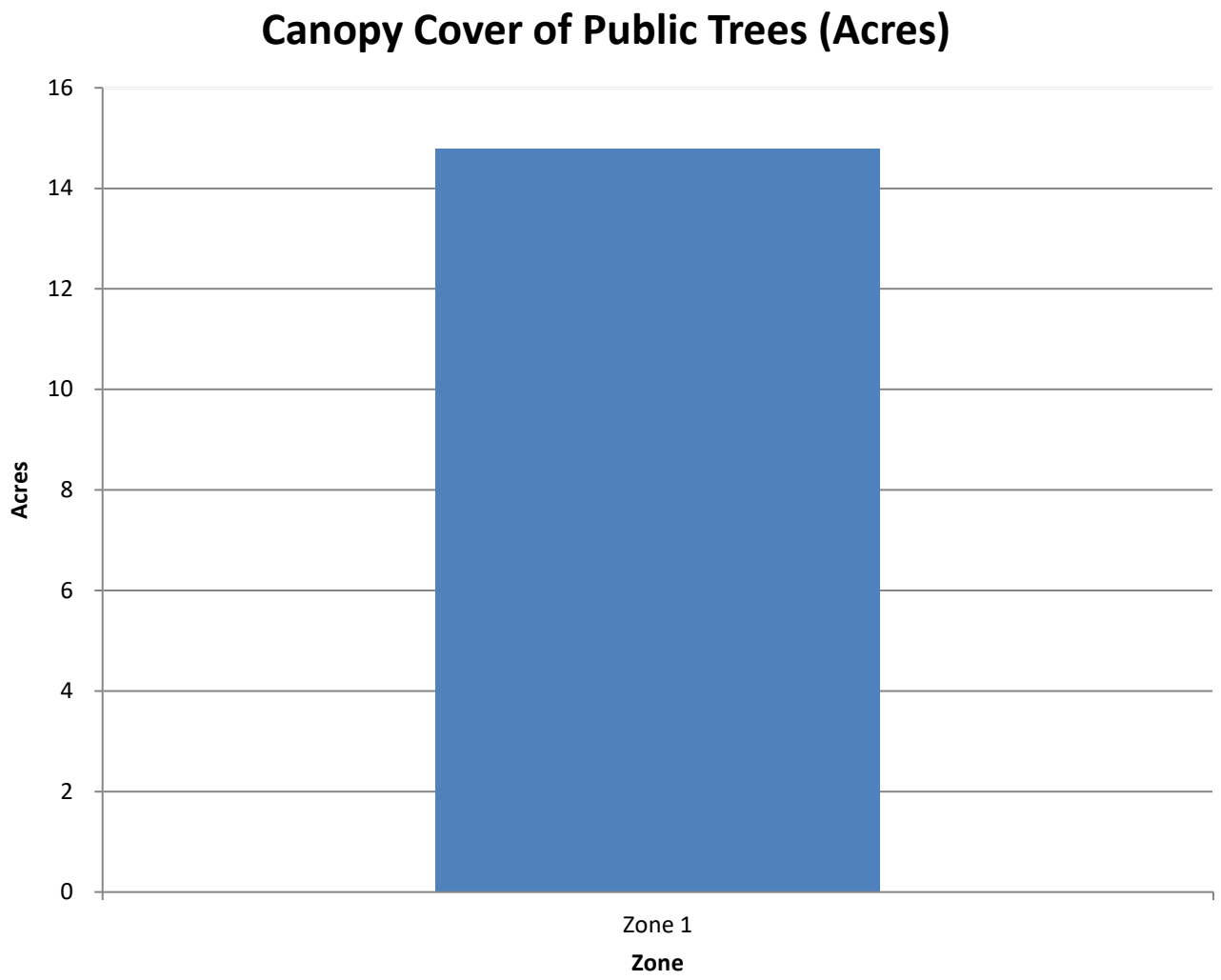

Figure 5: Canopy Cover in Acres

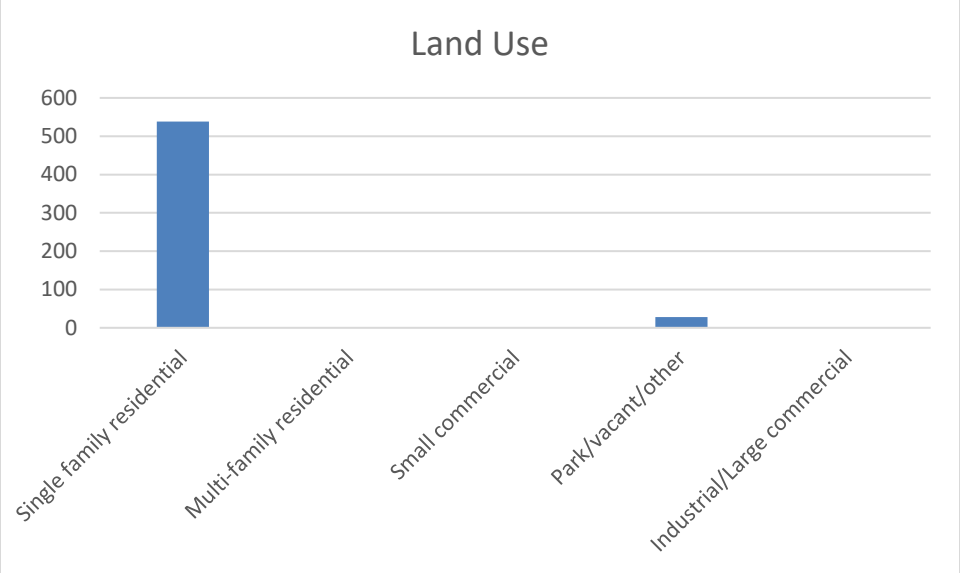

Figure 6: Land Use of city/park trees

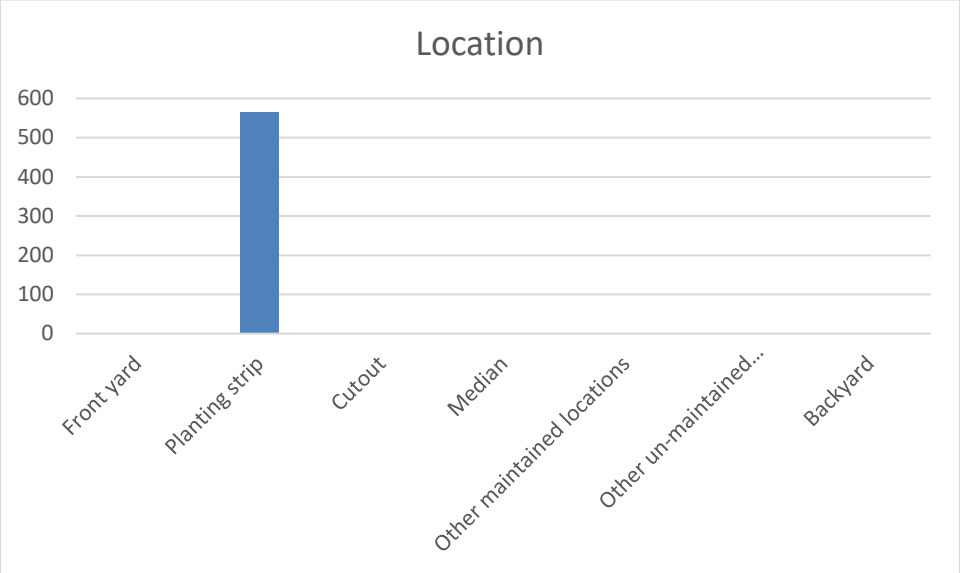

Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

Figure 1: Location of Ash Trees

Figure 2: Location of EAB symptoms

Figure 3: Location of Poor Condition Trees

Figure 4: Location of Trees with Recommended Maintenance

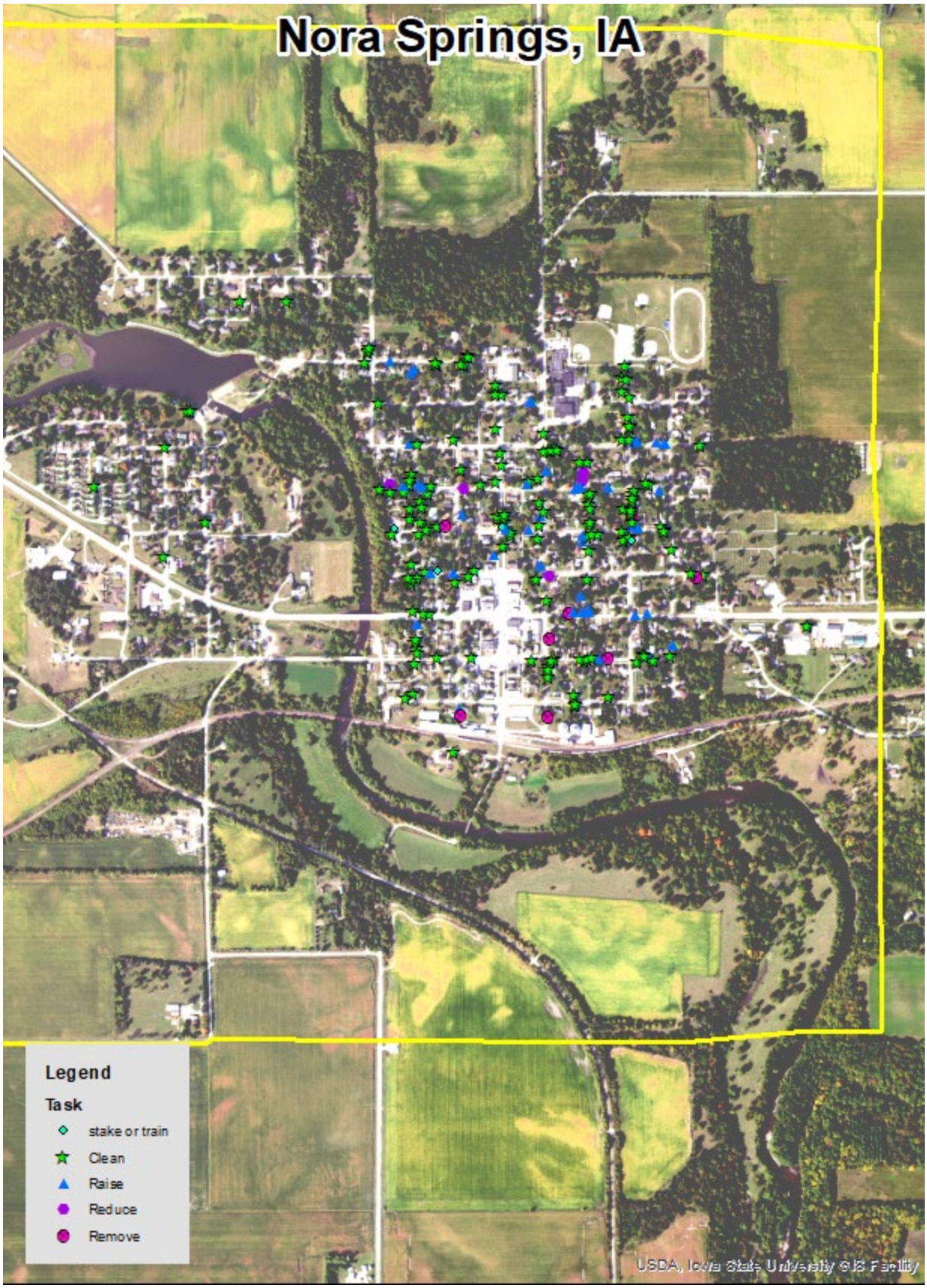

Figure 5: Maintenance Tasks ***City ownership of the trees recommended for removal should be verified prior to any removal***

CHAPTER 151

TREES

151.01 DEFINITION. For use in this chapter, "parking" means that part of the street, avenue or highway in the City not covered by sidewalk and lying between the lot line and the curb line; or, on unpaved streets, that part of the street, avenue or highway lying between the lot line and that portion of the street usually traveled by vehicular traffic.

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

1. Alignment. All trees planted in any street shall be planted in the parking midway between the outer line of the sidewalk and the curb. In the event a curb line is not established, trees shall be planted on a line ten (10) feet from the property line.

2. Spacing. Trees shall not be planted on any parking which 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 from street intersections (property lines extended) and ten (10) feet from driveways. If it is at all possible trees should be planted inside the property lines and not between the sidewalk and the curb.

3. Prohibited Trees. No person shall plant in any street any fruit-bearing tree or any tree of the kinds commonly known as cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut.

151.03 DUTY TO TRIM TREES. The owner or agent of the abutting property shall keep the trees on, or overhanging the street, trimmed so that all branches will be at least fifteen (15) feet above the surface of the street and eight (8) feet above the sidewalks. If the abutting property owner fails to trim the trees, the City may serve notice on the abutting property owner requiring that such action be taken within five (5) days. If such action is not taken within that time, the City may perform the required action and assess the costs against the abutting property for collection in the same manner as a property tax.

(Code of Iowa, Sec. 364.12[2c, d & e])

151.04 TRIMMING TREES. Except as allowed in Section 151.03, the City shall be responsible for trimming or cutting trees in a street or public place.

151.05 DISEASE CONTROL. Any dead, diseased or damaged tree or shrub which may harbor serious insect or disease pests or disease injurious to other trees is hereby declared to be a nuisance.

151.06 INSPECTION AND REMOVAL. The Council shall inspect or cause to be inspected any trees or shrubs in the City reported or suspected to be dead, diseased or damaged, and such trees and shrubs shall be subject to the following:

1. City Property. If it is determined that any such condition exists on any public property, including the strip between the curb and the lot line of private property, the Council may cause such condition to be corrected by treatment or removal. The Council may also order the removal of any trees on the streets of the City which interfere with the making of improvements or with travel thereon. In the event a property owner requests the removal of a tree located on City property, the tree must first be inspected by the Tree Committee, which will then make a recommendation to the City Administrator to approve or deny the request. The City Administrator shall then issue approval or denial of the request for removal based on the recommendation of the Tree Committee.

2. Private Property. If it is determined with reasonable certainty that any such condition exists on private property and that danger to other trees or to adjoining property or passing motorists or pedestrians is imminent, the Council shall notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within fourteen (14) days of said notification. If such owner, occupant or person in charge of said property fails to comply within fourteen (14) days of receipt of notice, the Council may cause the condition to be corrected and the cost assessed against the property.

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

[The next page is 671]

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