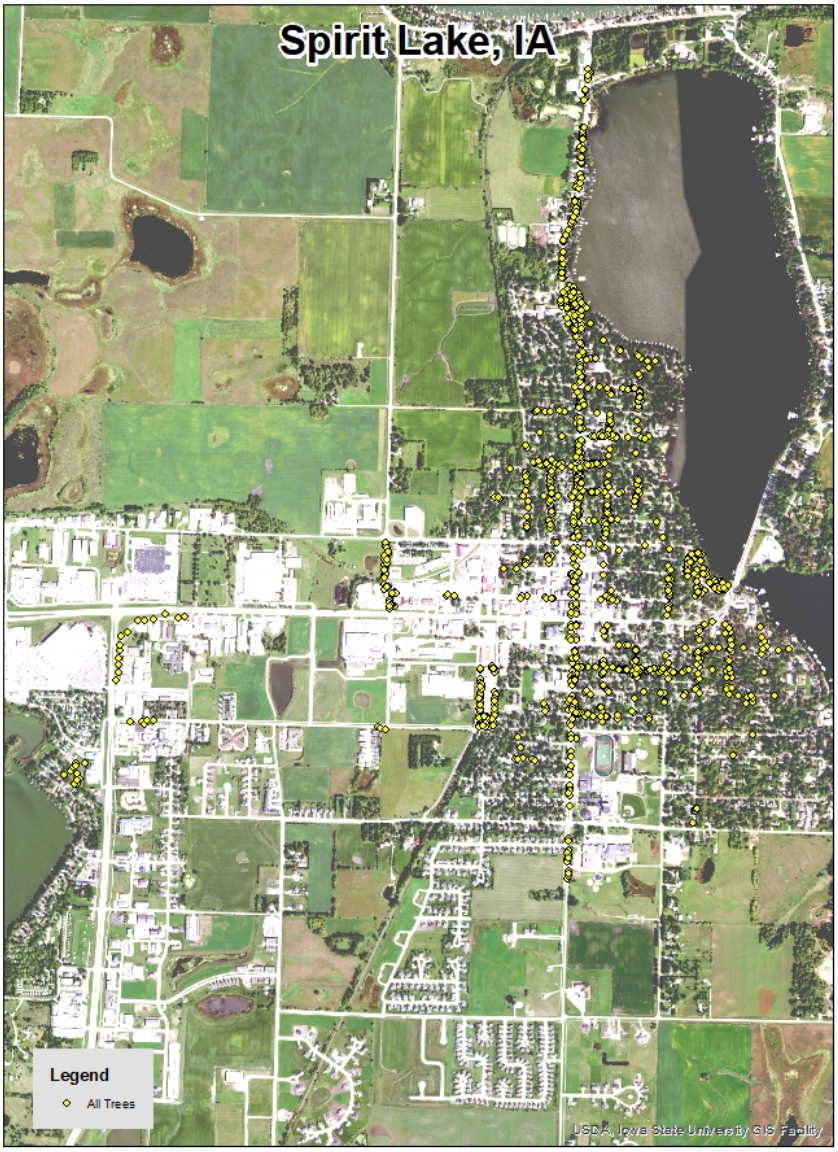
Spirit Lake, IA



2020 Urban Forest Management Plan
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Executive Summary

Overview

This plan was developed to assist the City of Spirit Lake with managing its urban forest, including budgeting and future planning. Trees can provide a multitude of benefits to the community, and sound management allows a community to best take advantage of these benefits. Management is especially important considering the serious threats posed by forest pests such as the emerald ash borer (EAB). EAB is an invasive insect imported from Eastern Asia on wood shipping crates that kills all species of ash trees (this does not include mountain ash). There is a strong possibility that 30% of Spirit Lake's city owned trees (ash) will die once EAB becomes established in the community, unless preventative treatment is used. With proper planning and management, the costs of removing dead and dying trees can be extended over years, mitigating public safety issues.

Inventory and Results

In 2018, 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 1139 trees inventoried.

- Spirit Lake's trees provide $183,097 of benefits annually, an average of $160.75 a tree
- More than 42 species of trees were identified from across at least 23 different genera.
- The top three genera are: Ash 30%, Maple 26%, and Apple 14%
- None of the trees were reported to need of any type of management other than routine maintenance.
- No data was collected for which trees are recommended for removal or where they are located. Additionally, no data was collected as to the maintenance priority of any given tree.

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.

- EAB was not recorded when the inventory was conducted. There are 346 ash trees within Spirit Lake and it is likely that some are currently displaying symptoms of EAB. It is recommended that a visual inspection of all ash trees be conducted annually.
- All trees should be pruned on a routine schedule - one sixth of the city every 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

Introduction

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

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

Inventory

In 2018, 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 1139 city trees was entered into the USDA Forest service program Street Tree Resource Analysis Tool for Urban forestry Management as part of the i-Tree suite. The following are results from the i-Tree STREETS analysis.

Annual Benefits

Annual Energy Benefits

Trees conserve energy by shading buildings and blocking winds. Spirit Lake's trees reduce energy related costs by approximately $48,750 annually (Appendix A, Table 1). These savings are both in Electricity (231.3 MWh) and in Natural Gas (17,552 Therms).

Annual Stormwater Benefits

Spirit Lake's trees intercept about 2,572,375 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $69,711 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 Spirit Lake, it is estimated that trees remove 3,033.5 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 $8,607 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Spirit Lake, trees sequester about 552,899 lbs of carbon a year with an associated value of $4,147 (Appendix A, Table 5). In addition, the trees store 10,417,413 lbs of carbon, with a yearly benefit of $78,131 (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. Spirit Lake receives $47,127 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, Spirit Lake's trees provide $183,097 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 1139 trees in Spirit Lake provide approximately $160.75 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Spirit Lake has over 43 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genera is as follows:

Age Class

Spirit Lake's trees have roughly even distribution of trees in age classes between 3 and 30 inches in diameter at 4.5 ft (80%) (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. This downward trajectory is observed in Spirit Lake's tree stand, with the largest single age class being between 3 and 6 inches in diameter at 4.5 feet (18%). Spirit Lake's size curve is on the smaller side, which indicates 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 Spirit Lake indicate that 91% of the trees are in good health, with only 3% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 91% of Spirit Lake's trees are in good health for wood condition (appendix A, Figure 4 & Appendix B, Figure 3). Wood condition that is in poor health, dead or dying is about 3% of the population. This 3% is an estimate of trees that need management follow up.

Management Needs

There were no specific management needs recorded for Spirit Lake's trees.

Canopy Cover

The total canopy with both private and public trees is 9%, 278.45 acres. The canopy cover included in the Spirit Lake inventory includes approximately 26.73 acres, which is roughly 1% of the total land area of Spirit Lake (Appendix A, Figure 4). The City's Canopy goal is to increase canopy by 3%, in 30 years. To achieve this goal it is estimated that 217 trees need to be planted annually on public and private lands.

Land Use and Location

The majority of Spirit Lake'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	Count	Percent
Single Family Res.	782	69%
Park/Vacant/Other	209	18%
Small Commercial	148	13%

Location	Count	Percent
Planting Strip	740	65%
Other Maintained	247	22%
Median	106	9%
Cutout	46	4%

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

Detailed information was not collected on which trees are potentially hazardous or where they might be located.

Poor tree species

The data collectors did not collect appropriate data on this, however it was noted that 346 trees in Spirit Lake are ash trees, which is 30% of the total trees inventoried. While the collectors did not gather data on EAB, it is common though out the region and very likely affecting many of the ash trees in Spirit Lake. Visual inspections of ash trees should be conducted annually in order track their conditions. Treatment for EAB is an effective preventative measure that can be taken to prevent the death of healthy ash trees. It is not recommended to be used on ash trees already displaying two or more symptoms of EAB. Since data for EAB was not collected, we will present two separate scenarios regarding ash management versus removal. If all 346 ash trees in Spirit Lake are healthy and could be treated, it would cost an estimated $100,800 every two years, which is an average of $291.33 per tree. If all 346 ash trees in Spirit Lake are suffering from EAB, it would cost an estimated $276,800 to remove them, which is an average of $800 per tree. These scenarios represent two different extremes and while it is likely that many ash trees within Spirit Lake are displaying signs of EAB, it is also likely that many are not and would therefore be eligible for treatment. It is recommended that Spirit Lake treat many of its larger, healthier ash trees and begin removing dead or dying ash trees, as well as those found to be displaying 2 or more symptoms of EAB.

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 Spirit Lake.

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 most heavily planted with ash, which due to the threats of EAB, have not been recommended since 2002. Additionally, maple, which makes up 26% of Spirit Lake's stand (Appendix A, Figure 1) should not be planted further until the percentage can be lowered. 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.

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 151.08 states “If it is determined with reasonable certainty that any such condition exists on private property and that the danger to other trees within the City is imminent, the Council shall immediately notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within thirty (30) days of said notification. If such owner, occupant or person in charge of said property fails to comply within thirty (30) days of receipt of notice, the Council may cause the nuisance to be removed and the cost assessed against the property.”

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Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Spirit Lake

Annual Energy Benefits of Public Trees

12/10/2019

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standar d Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	87.3	6,626	11,897.9	11,660	18,286	(N/A)	31.4	37.5	51.08
Apple	6.7	510	1,104.3	1,082	1,592	(N/A)	13.5	3.3	10.34
Silver maple	38.2	2,902	5,043.6	4,943	7,845	(N/A)	10.4	16.1	65.92
Norway maple	25.5	1,933	3,684.9	3,611	5,544	(N/A)	9.1	11.4	53.31
Bur oak	33.2	2,523	4,578.9	4,487	7,011	(N/A)	8.9	14.4	69.41
Plum	0.3	25	58.7	58	83	(N/A)	3.9	0.2	1.88
Amur maple	0.8	62	140.7	138	200	(N/A)	2.3	0.4	7.69
Red maple	1.9	141	265.5	260	402	(N/A)	2.0	0.8	17.46
Black maple	5.9	449	818.2	802	1,251	(N/A)	1.8	2.6	59.57
Ginkgo	0.9	67	128.3	126	193	(N/A)	1.8	0.4	9.65
Scarlet oak	0.8	58	93.9	92	150	(N/A)	1.8	0.3	7.48
Northern hackberry	4.7	360	672.6	659	1,019	(N/A)	1.2	2.1	72.81
Black walnut	3.5	264	478.3	469	733	(N/A)	1.1	1.5	56.37
Northern red oak	0.9	69	128.2	126	195	(N/A)	1.1	0.4	14.97
Blue spruce	1.1	85	155.4	152	237	(N/A)	1.1	0.5	19.76
American elm	4.6	350	580.1	568	919	(N/A)	1.1	1.9	76.55
Birch	1.1	82	166.0	163	245	(N/A)	1.0	0.5	22.28
American basswood	2.6	194	360.2	353	547	(N/A)	0.8	1.1	60.82
Norway spruce	1.1	84	142.0	139	223	(N/A)	0.7	0.5	27.91
Scotch pine	1.2	92	157.3	154	247	(N/A)	0.7	0.5	30.81
Boxelder	1.6	125	222.6	218	343	(N/A)	0.6	0.7	49.01
White ash	0.9	71	114.3	112	183	(N/A)	0.6	0.4	26.19
Broadleaf Deciduous Large	1.2	93	161.2	158	251	(N/A)	0.4	0.5	50.27
Northern white cedar	0.5	38	62.9	62	100	(N/A)	0.4	0.2	19.91
Siberian elm	1.0	77	125.6	123	200	(N/A)	0.4	0.4	50.03
White oak	0.3	25	41.2	40	66	(N/A)	0.3	0.1	21.84
American sycamore	0.4	27	50.5	50	77	(N/A)	0.2	0.2	38.36
Pin oak	0.5	41	76.8	75	117	(N/A)	0.2	0.2	58.37
Conifer Evergreen Large	0.3	20	29.3	29	48	(N/A)	0.2	0.1	24.14
Mulberry	0.2	17	35.4	35	52	(N/A)	0.2	0.1	25.77
Willow	0.1	8	16.9	17	24	(N/A)	0.1	0.1	24.47
Broadleaf Evergreen Small	0.0	1	1.5	1	2	(N/A)	0.1	0.0	2.12
Chinese elm	0.3	25	46.9	46	71	(N/A)	0.1	0.1	70.91
Black cherry	0.2	15	31.6	31	46	(N/A)	0.1	0.1	46.14
Broadleaf Deciduous Mediu	0.3	20	39.6	39	59	(N/A)	0.1	0.1	58.69
Conifer Evergreen Small	0.1	8	16.4	16	25	(N/A)	0.1	0.1	24.57
Littleleaf linden	0.2	15	23.9	23	39	(N/A)	0.1	0.1	38.70
Paper birch	0.0	2	3.7	4	6	(N/A)	0.1	0.0	5.82
Cottonwood	0.5	37	63.1	62	99	(N/A)	0.1	0.2	98.63
Eastern red cedar	0.1	8	16.4	16	25	(N/A)	0.1	0.1	24.57
Total	231.3	17,552	31,835.0	31,198	48,750	(N/A)	100.0	100.0	42.80

Table 2: Annual Stormwater Benefits

Spirit Lake

Annual Stormwater Benefits of Public Trees

12/10/2019

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	948,226	25,697	(N/A)	31.4	36.9	71.78
Apple	23,921	648	(N/A)	13.5	0.9	4.21
Silver maple	547,654	14,841	(N/A)	10.4	21.3	124.72
Norway maple	236,025	6,396	(N/A)	9.1	9.2	61.50
Bur oak	415,881	11,270	(N/A)	8.9	16.2	111.59
Plum	952	26	(N/A)	3.9	0.0	0.59
Amur maple	2,703	73	(N/A)	2.3	0.1	2.82
Red maple	11,132	302	(N/A)	2.0	0.4	13.12
Black maple	57,680	1,563	(N/A)	1.8	2.2	74.44
Ginkgo	4,720	128	(N/A)	1.8	0.2	6.40
Scarlet oak	4,573	124	(N/A)	1.8	0.2	6.20
Northern hackberry	48,461	1,313	(N/A)	1.2	1.9	93.81
Black walnut	39,985	1,084	(N/A)	1.1	1.6	83.35
Northern red oak	7,755	210	(N/A)	1.1	0.3	16.17
Blue spruce	14,390	390	(N/A)	1.1	0.6	32.50
American elm	37,949	1,028	(N/A)	1.1	1.5	85.70
Birch	5,999	163	(N/A)	1.0	0.2	14.78
American basswood	30,812	835	(N/A)	0.8	1.2	92.78
Norway spruce	20,359	552	(N/A)	0.7	0.8	68.97
Scotch pine	24,163	655	(N/A)	0.7	0.9	81.85
Boxelder	17,581	476	(N/A)	0.6	0.7	68.07
White ash	5,943	161	(N/A)	0.6	0.2	23.01
Broadleaf Deciduous Large	14,974	406	(N/A)	0.4	0.6	81.16
Northern white cedar	5,807	157	(N/A)	0.4	0.2	31.47
Siberian elm	9,265	251	(N/A)	0.4	0.4	62.77
White oak	2,091	57	(N/A)	0.3	0.1	18.89
American sycamore	4,115	112	(N/A)	0.2	0.2	55.75
Pin oak	4,793	130	(N/A)	0.2	0.2	64.95
Conifer Evergreen Large	3,077	83	(N/A)	0.2	0.1	41.70
Mulberry	1,243	34	(N/A)	0.2	0.0	16.84
Willow	586	16	(N/A)	0.1	0.0	15.88
Broadleaf Evergreen Small	24	1	(N/A)	0.1	0.0	0.64
Chinese elm	3,943	107	(N/A)	0.1	0.2	106.85
Black cherry	1,174	32	(N/A)	0.1	0.0	31.82
Broadleaf Deciduous Medium	2,479	67	(N/A)	0.1	0.1	67.19
Conifer Evergreen Small	1,635	44	(N/A)	0.1	0.1	44.30
Littleleaf linden	1,260	34	(N/A)	0.1	0.0	34.14
Paper birch	172	5	(N/A)	0.1	0.0	4.65
Cottonwood	7,239	196	(N/A)	0.1	0.3	196.17
Eastern red cedar	1,635	44	(N/A)	0.1	0.1	44.30
Citywide total	2,572,375	69,711	(N/A)	100.0	100.0	61.20

Table 3: Annual Air Quality Benefits

Spirit Lake

Annual Air Quality Benefits of Public Trees

12/10/2019

Species	Deposition (lb)				Total Depos. ($)	Avoided (lb)				Total Avoided ($)	BVOC Emissions (lb)	BVOC Emissions ($)	Total (lb)	Total ($) Standard Error	% of Total Trees	Avg. $/tree
	O_3	NO_2	PM_{10}	SO_2		NO_2	PM_{10}	VOC	SO_2							
Green ash	119.3	19.1	57.2	5.3	636	416.3	60.6	57.8	395.6	2,595	0.0	0	1,131.4	3,230 (N/A)	31.4	9.02
Apple	4.5	0.7	2.5	0.2	25	33.7	4.8	4.5	30.4	206	0.0	0	81.3	231 (N/A)	13.5	1.50
Silver maple	96.6	16.4	47.3	4.3	521	180.4	26.4	25.2	173.0	1,128	-51.2	-192	518.3	1,457 (N/A)	10.4	12.24
Norway maple	47.8	8.3	23.6	2.1	259	123.6	17.9	17.0	115.5	765	-11.2	-42	344.5	982 (N/A)	9.1	9.44
Bur oak	58.6	9.4	27.0	2.6	309	159.0	23.1	22.0	150.7	990	0.0	0	452.5	1,299 (N/A)	8.9	12.86
Plum	0.1	0.0	0.1	0.0	0	1.7	0.2	0.2	1.5	10	0.0	0	3.8	11 (N/A)	3.9	0.24
Amur maple	0.3	0.1	0.2	0.0	2	4.1	0.6	0.6	3.7	25	0.0	0	9.6	27 (N/A)	2.3	1.04
Red maple	1.8	0.3	1.0	0.1	10	9.0	1.3	1.2	8.4	56	-0.7	-3	22.4	63 (N/A)	2.0	2.74
Black maple	14.9	2.5	6.8	0.7	79	28.3	4.1	3.9	26.8	176	-4.8	-18	83.2	237 (N/A)	1.8	11.27
Ginkgo	0.8	0.1	0.4	0.0	5	4.3	0.6	0.6	4.0	27	-0.3	-1	10.6	30 (N/A)	1.8	1.50
Scarlet oak	0.1	0.0	0.1	0.0	1	3.5	0.5	0.5	3.4	22	0.0	0	8.3	23 (N/A)	1.8	1.16
Northern hackberry	8.3	1.4	4.2	0.4	45	22.9	3.3	3.2	21.5	142	0.0	0	65.2	187 (N/A)	1.2	13.37
Black walnut	5.1	0.8	2.4	0.2	27	16.6	2.4	2.3	15.8	104	0.0	0	45.6	130 (N/A)	1.1	10.03
Northern red oak	1.5	0.3	0.7	0.1	8	4.4	0.6	0.6	4.1	27	-2.1	-8	10.1	27 (N/A)	1.1	2.08
Blue spruce	1.8	0.4	1.5	0.2	12	5.3	0.8	0.7	5.1	33	-5.0	-19	10.8	26 (N/A)	1.1	2.21
American elm	11.9	2.0	5.6	0.5	64	21.6	3.2	3.0	20.9	136	0.0	0	68.8	199 (N/A)	1.1	16.59
Birch	0.6	0.1	0.4	0.0	4	5.3	0.8	0.7	4.9	33	-0.2	-1	12.7	36 (N/A)	1.0	3.26
American basswood	4.5	0.8	2.2	0.2	24	12.3	1.8	1.7	11.6	77	-3.7	-14	31.3	87 (N/A)	0.8	9.62
Norway spruce	2.4	0.5	1.9	0.3	16	5.2	0.8	0.7	5.0	33	-10.3	-39	6.5	10 (N/A)	0.7	1.21
Scotch pine	2.9	0.6	2.3	0.4	19	5.7	0.8	0.8	5.5	36	-12.3	-46	6.6	8 (N/A)	0.7	1.03
Boxelder	2.3	0.4	1.1	0.1	12	7.8	1.1	1.1	7.5	49	-0.9	-3	20.5	58 (N/A)	0.6	8.23
White ash	0.3	0.0	0.2	0.0	2	4.3	0.6	0.6	4.3	27	0.0	0	10.4	29 (N/A)	0.6	4.18
Broadleaf Deciduous Large	2.5	0.4	1.1	0.1	13	5.8	0.9	0.8	5.6	36	0.0	0	17.2	50 (N/A)	0.4	9.91
Northern white cedar	0.6	0.1	0.5	0.1	4	2.3	0.3	0.3	2.3	15	-2.0	-7	4.6	11 (N/A)	0.4	2.28
Siberian elm	1.5	0.2	0.7	0.1	8	4.7	0.7	0.7	4.6	30	0.0	0	13.2	38 (N/A)	0.4	9.40
White oak	0.1	0.0	0.1	0.0	1	1.5	0.2	0.2	1.5	10	0.0	0	3.7	10 (N/A)	0.3	3.50
American sycamore	0.5	0.1	0.2	0.0	3	1.7	0.2	0.2	1.6	11	0.0	0	4.7	13 (N/A)	0.2	6.67
Pin oak	0.7	0.1	0.4	0.0	4	2.6	0.4	0.4	2.5	16	-1.3	-5	5.7	15 (N/A)	0.2	7.54
Conifer Evergreen Large	0.3	0.1	0.3	0.0	2	1.2	0.2	0.2	1.2	7	-1.1	-4	2.3	6 (N/A)	0.2	2.82
Mulberry	0.4	0.1	0.2	0.0	2	1.1	0.2	0.1	1.0	7	0.0	0	3.1	9 (N/A)	0.2	4.53
Willow	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)	0.1	3.47
Broadleaf Evergreen Small	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.1	0 (N/A)	0.1	0.27
Chinese elm	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)	0.1	12.48
Black cherry	0.4	0.1	0.2	0.0	2	1.0	0.1	0.1	0.9	6	0.0	0	2.9	8 (N/A)	0.1	8.35
Broadleaf Deciduous Medium	0.5	0.1	0.2	0.0	3	1.3	0.2	0.2	1.2	8	-0.1	0	3.6	10 (N/A)	0.1	10.16
Conifer Evergreen Small	0.3	0.1	0.3	0.0	2	0.5	0.1	0.1	0.5	3	-0.9	-3	1.0	2 (N/A)	0.1	2.19
Littleleaf linden	0.2	0.0	0.1	0.0	1	0.9	0.1	0.1	0.9	6	-0.1	0	2.3	6 (N/A)	0.1	6.42
Paper birch	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	1	0.0	0	0.3	1 (N/A)	0.1	0.87
Cottonwood	1.6	0.3	0.7	0.1	8	2.3	0.3	0.3	2.2	14	0.0	0	7.7	23 (N/A)	0.1	22.55
Eastern red cedar	0.3	0.1	0.3	0.0	2	0.5	0.1	0.1	0.5	3	-0.9	-3	1.0	2 (N/A)	0.1	2.19
Citywide total	396.9	65.9	194.5	18.4	2,136	1,105.2	160.8	153.3	1,047.8	6,882	-109.4	-410	3,033.5	8,607 (N/A)	100.0	7.56

Table 4: Annual Carbon Stored

Spirit Lake

Stored CO2 Benefits of Public Trees

12/10/2019

Species	Total Stored CO2 (lbs)	Total ($)	Standar d Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	3,952,208	29,642	(N/A)	31.4	37.9	82.80
Apple	86,958	652	(N/A)	13.5	0.8	4.23
Silver maple	2,272,159	17,041	(N/A)	10.4	21.8	143.20
Norway maple	788,936	5,917	(N/A)	9.1	7.6	56.89
Bur oak	1,940,154	14,551	(N/A)	8.9	18.6	144.07
Plum	2,485	19	(N/A)	3.9	0.0	0.42
Amur maple	8,109	61	(N/A)	2.3	0.1	2.34
Red maple	23,013	173	(N/A)	2.0	0.2	7.50
Black maple	158,209	1,187	(N/A)	1.8	1.5	56.50
Ginkgo	12,007	90	(N/A)	1.8	0.1	4.50
Scarlet oak	7,022	53	(N/A)	1.8	0.1	2.63
Northern hackberry	130,254	977	(N/A)	1.2	1.3	69.78
Black walnut	165,826	1,244	(N/A)	1.1	1.6	95.67
Northern red oak	32,356	243	(N/A)	1.1	0.3	18.67
Blue spruce	11,356	85	(N/A)	1.1	0.1	7.10
American elm	235,839	1,769	(N/A)	1.1	2.3	147.41
Birch	11,984	90	(N/A)	1.0	0.1	8.17
American basswood	169,128	1,268	(N/A)	0.8	1.6	140.94
Norway spruce	25,433	191	(N/A)	0.7	0.2	23.84
Scotch pine	30,692	230	(N/A)	0.7	0.3	28.77
Boxelder	74,505	559	(N/A)	0.6	0.7	79.83
White ash	11,667	88	(N/A)	0.6	0.1	12.50
Broadleaf Deciduous	86,817	651	(N/A)	0.4	0.8	130.23
Northern white cedar	4,024	30	(N/A)	0.4	0.0	6.04
Siberian elm	36,335	273	(N/A)	0.4	0.3	68.13
White oak	4,719	35	(N/A)	0.3	0.0	11.80
American sycamore	15,958	120	(N/A)	0.2	0.2	59.84
Pin oak	16,436	123	(N/A)	0.2	0.2	61.63
Conifer Evergreen La	2,340	18	(N/A)	0.2	0.0	8.78
Mulberry	6,921	52	(N/A)	0.2	0.1	25.95
Willow	1,101	8	(N/A)	0.1	0.0	8.26
Broadleaf Evergreen S	14	0	(N/A)	0.1	0.0	0.10
Chinese elm	15,773	118	(N/A)	0.1	0.2	118.30
Black cherry	6,743	51	(N/A)	0.1	0.1	50.57
Broadleaf Deciduous	7,945	60	(N/A)	0.1	0.1	59.59
Conifer Evergreen Sm	1,102	8	(N/A)	0.1	0.0	8.27
Littleleaf linden	3,595	27	(N/A)	0.1	0.0	26.96
Paper birch	185	1	(N/A)	0.1	0.0	1.39
Cottonwood	55,982	420	(N/A)	0.1	0.5	419.86
Eastern red cedar	1,102	8	(N/A)	0.1	0.0	8.27
Citywide total	10,417,413	78,131	(N/A)	100.0	100.0	68.60

Table 5: Annual Carbon Sequestered

Spirit Lake

Annual CO Benefits of Public Trees

12/10/2019

Species	Sequestered (lb)	Sequestered ($)	Decomposition Release (lb)	Maintenance Release (lb)	Total Released ($)	Avoided (lb)	Avoided ($)	Net Total (lb)	Total Standar ($) d Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	198,541	1,489	-18,971	-925	-149	146,427	1,098	325,072	2,438 (N/A)	31.4	36.6	6.81
Apple	10,505	79	-418	-124	-4	11,274	85	21,237	159 (N/A)	13.5	2.4	1.03
Silver maple	163,590	1,227	-10,909	-427	-85	64,132	481	216,385	1,623 (N/A)	10.4	24.4	13.64
Norway maple	36,496	274	-3,787	-265	-30	42,718	320	75,163	564 (N/A)	9.1	8.5	5.42
Bur oak	76,128	571	-9,313	-358	-73	55,763	418	122,220	917 (N/A)	8.9	13.8	9.08
Plum	663	5	-14	-12	0	555	4	1,192	9 (N/A)	3.9	0.1	0.20
Amur maple	1,337	10	-39	-18	0	1,370	10	2,650	20 (N/A)	2.3	0.3	0.76
Red maple	3,196	24	-111	-21	-1	3,124	23	6,188	46 (N/A)	2.0	0.7	2.02
Black maple	5,583	42	-759	-56	-6	9,924	74	14,692	110 (N/A)	1.8	1.7	5.25
Ginkgo	874	7	-58	-17	-1	1,485	11	2,285	17 (N/A)	1.8	0.3	0.86
Scarlet oak	1,783	13	-34	-13	0	1,273	10	3,010	23 (N/A)	1.8	0.3	1.13
Northern hackberry	6,142	46	-625	-46	-5	7,961	60	13,432	101 (N/A)	1.2	1.5	7.20
Black walnut	8,238	62	-796	-37	-6	5,836	44	13,241	99 (N/A)	1.1	1.5	7.64
Northern red oak	926	7	-155	-13	-1	1,524	11	2,282	17 (N/A)	1.1	0.3	1.32
Blue spruce	822	6	-55	-20	-1	1,875	14	2,622	20 (N/A)	1.1	0.3	1.64
American elm	5,556	42	-1,133	-45	-9	7,737	58	12,115	91 (N/A)	1.1	1.4	7.57
Birch	2,240	17	-60	-12	-1	1,820	14	3,988	30 (N/A)	1.0	0.4	2.72
American basswood	9,318	70	-812	-30	-6	4,295	32	12,771	96 (N/A)	0.8	1.4	10.64
Norway spruce	1,286	10	-122	-20	-1	1,859	14	3,003	23 (N/A)	0.7	0.3	2.82
Scotch pine	1,493	11	-147	-22	-1	2,040	15	3,364	25 (N/A)	0.7	0.4	3.15
Boxelder	5,756	43	-358	-21	-3	2,760	21	8,138	61 (N/A)	0.6	0.9	8.72
White ash	1,781	13	-57	-9	0	1,575	12	3,290	25 (N/A)	0.6	0.4	3.53
Broadleaf Deciduous Large	2,167	16	-417	-14	-3	2,063	15	3,799	28 (N/A)	0.4	0.4	5.70
Northern white cedar	452	3	-19	-8	0	838	6	1,263	9 (N/A)	0.4	0.1	1.89
Siberian elm	1,701	13	-174	-10	-1	1,702	13	3,218	24 (N/A)	0.4	0.4	6.03
White oak	657	5	-23	-3	0	556	4	1,187	9 (N/A)	0.3	0.1	2.97
American sycamore	931	7	-77	-4	-1	601	5	1,451	11 (N/A)	0.2	0.2	5.44
Pin oak	1,761	13	-79	-5	-1	916	7	2,592	19 (N/A)	0.2	0.3	9.72
Conifer Evergreen Large	231	2	-11	-4	0	433	3	649	5 (N/A)	0.2	0.1	2.43
Mulberry	38	0	-33	-4	0	372	3	373	3 (N/A)	0.2	0.0	1.40
Willow	224	2	-5	-1	0	176	1	393	3 (N/A)	0.1	0.0	2.95
Broadleaf Evergreen Small	4	0	0	0	0	14	0	18	0 (N/A)	0.1	0.0	0.13
Chinese elm	857	6	-76	-4	-1	552	4	1,330	10 (N/A)	0.1	0.1	9.97
Black cherry	0	0	-32	-4	0	335	3	299	2 (N/A)	0.1	0.0	2.24
Broadleaf Deciduous Medi	470	4	-38	-3	0	440	3	869	7 (N/A)	0.1	0.1	6.52
Conifer Evergreen Small	43	0	-5	-2	0	187	1	222	2 (N/A)	0.1	0.0	1.67
Littleleaf linden	514	4	-17	-2	0	337	3	832	6 (N/A)	0.1	0.1	6.24
Paper birch	74	1	-1	-1	0	49	0	121	1 (N/A)	0.1	0.0	0.91
Cottonwood	479	4	-269	-6	-2	813	6	1,017	8 (N/A)	0.1	0.1	7.63
Eastern red cedar	43	0	-5	-2	0	187	1	222	2 (N/A)	0.1	0.0	1.67
Citywide total	552,899	4,147	-50,012	-2,587	-394	387,897	2,909	888,196	6,661 (N/A)	100.0	100.0	5.85

Table 6: Annual Social and Aesthetic Benefits

Spirit Lake

Annual Aesthetic/Other Benefits of Public Trees

12/10/2019

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	17,163	(N/A)	31.4	36.4	47.94
Apple	584	(N/A)	13.5	1.2	3.80
Silver maple	12,581	(N/A)	10.4	26.7	105.73
Norway maple	3,485	(N/A)	9.1	7.4	33.51
Bur oak	5,838	(N/A)	8.9	12.4	57.80
Plum	20	(N/A)	3.9	0.0	0.45
Amur maple	73	(N/A)	2.3	0.2	2.82
Red maple	501	(N/A)	2.0	1.1	21.79
Black maple	677	(N/A)	1.8	1.4	32.25
Ginkgo	93	(N/A)	1.8	0.2	4.66
Scarlet oak	316	(N/A)	1.8	0.7	15.82
Northern hackberry	797	(N/A)	1.2	1.7	56.89
Black walnut	681	(N/A)	1.1	1.4	52.39
Northern red oak	97	(N/A)	1.1	0.2	7.50
Blue spruce	261	(N/A)	1.1	0.6	21.78
American elm	724	(N/A)	1.1	1.5	60.29
Birch	261	(N/A)	1.0	0.6	23.76
American basswood	638	(N/A)	0.8	1.4	70.85
Norway spruce	259	(N/A)	0.7	0.5	32.38
Scotch pine	305	(N/A)	0.7	0.6	38.18
Boxelder	391	(N/A)	0.6	0.8	55.91
White ash	274	(N/A)	0.6	0.6	39.13
Broadleaf Deciduous Large	184	(N/A)	0.4	0.4	36.86
Northern white cedar	128	(N/A)	0.4	0.3	25.56
Siberian elm	140	(N/A)	0.4	0.3	34.89
White oak	80	(N/A)	0.3	0.2	26.56
American sycamore	80	(N/A)	0.2	0.2	40.16
Pin oak	166	(N/A)	0.2	0.4	83.10
Conifer Evergreen Large	65	(N/A)	0.2	0.1	32.32
Mulberry	2	(N/A)	0.2	0.0	1.03
Willow	26	(N/A)	0.1	0.1	26.22
Broadleaf Evergreen Small	0	(N/A)	0.1	0.0	0.50
Chinese elm	66	(N/A)	0.1	0.1	65.59
Black cherry	0	(N/A)	0.1	0.0	0.00
Broadleaf Deciduous Medium	43	(N/A)	0.1	0.1	43.05
Conifer Evergreen Small	14	(N/A)	0.1	0.0	13.68
Littleleaf linden	55	(N/A)	0.1	0.1	55.09
Paper birch	15	(N/A)	0.1	0.0	14.73
Cottonwood	29	(N/A)	0.1	0.1	28.57
Eastern red cedar	14	(N/A)	0.1	0.0	13.68
Citywide total	47,127	(N/A)	100.0	100.0	41.38

Table 7: Summary of Benefits in Dollars

Spirit Lake

Total Annual Benefits of Public Trees by Species ($)

6/29/2020

Species	Energy	CO_2	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Green ash	17,129	2,281	3,020	23,887	16,130	62,448	(N/A)	34.1
Apple	1,592	159	231	648	584	3,215	(N/A)	1.8
Silver maple	7,845	1,623	1,457	14,841	12,581	38,347	(N/A)	20.9
Norway maple	5,544	564	982	6,396	3,485	16,971	(N/A)	9.3
Bur oak	7,011	917	1,299	11,270	5,838	26,334	(N/A)	14.4
Plum	83	9	11	26	20	148	(N/A)	0.1
Amur maple	200	20	27	73	73	393	(N/A)	0.2
Red maple	402	46	63	302	501	1,314	(N/A)	0.7
Black maple	1,251	110	237	1,563	677	3,838	(N/A)	2.1
Ginkgo	193	17	30	128	93	461	(N/A)	0.3
Scarlet oak	150	23	23	124	316	636	(N/A)	0.3
Honeylocust	1,179	166	201	1,763	3,288	6,597	(N/A)	3.6
Northern hackberry	1,019	101	187	1,313	797	3,417	(N/A)	1.9
Black walnut	733	99	130	1,084	681	2,727	(N/A)	1.5
Northern red oak	195	17	27	210	97	546	(N/A)	0.3
Blue spruce	237	20	26	390	261	935	(N/A)	0.5
American elm	919	91	199	1,028	724	2,960	(N/A)	1.6
Birch	245	30	36	163	261	735	(N/A)	0.4
Scotch pine	247	25	8	655	305	1,240	(N/A)	0.7
Norway spruce	223	23	10	552	259	1,066	(N/A)	0.6
American basswood	541	95	86	832	633	2,187	(N/A)	1.2
Boxelder	343	61	58	476	391	1,330	(N/A)	0.7
White ash	183	25	29	161	274	672	(N/A)	0.4
Northern white cedar	100	9	11	157	128	406	(N/A)	0.2
Broadleaf Deciduous La	251	28	50	406	184	919	(N/A)	0.5
Siberian elm	200	24	38	251	140	653	(N/A)	0.4
White oak	66	9	10	57	80	221	(N/A)	0.1
Conifer Evergreen Large	48	5	6	83	65	207	(N/A)	0.1
Mulberry	52	3	9	34	2	99	(N/A)	0.1
Pin oak	117	19	15	130	166	447	(N/A)	0.2
American sycamore	77	11	13	112	80	293	(N/A)	0.2
Basswood	6	1	1	5	15	27	(N/A)	0.0
Eastern red cedar	25	2	2	44	14	86	(N/A)	0.0
Eastern cottonwood	99	8	23	196	29	354	(N/A)	0.2
Broadleaf Deciduous Sn	1	0	0	0	0	1	(N/A)	0.0
Littleleaf linden	39	6	6	34	55	141	(N/A)	0.1
Chinese elm	71	10	12	107	66	266	(N/A)	0.1
Broadleaf Deciduous Ma	59	7	10	67	43	186	(N/A)	0.1
Willow	24	3	3	16	26	73	(N/A)	0.0
Conifer Evergreen Small	25	2	2	44	14	86	(N/A)	0.0
Black cherry	46	2	8	32	0	89	(N/A)	0.0
Paper birch	6	1	1	5	15	27	(N/A)	0.0
Citywide Total	48,771	6,671	8,598	69,666	49,392	183,097	(N/A)	100.0

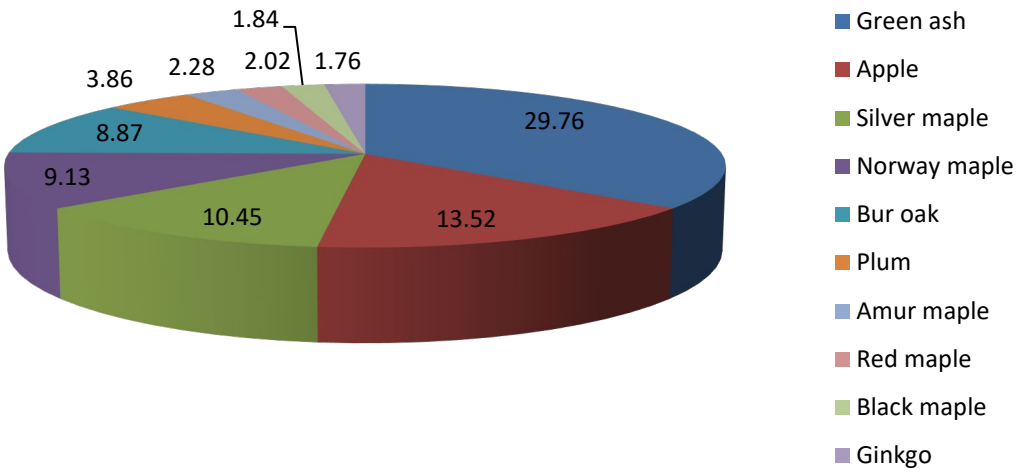

Figure 1: Species Distribution

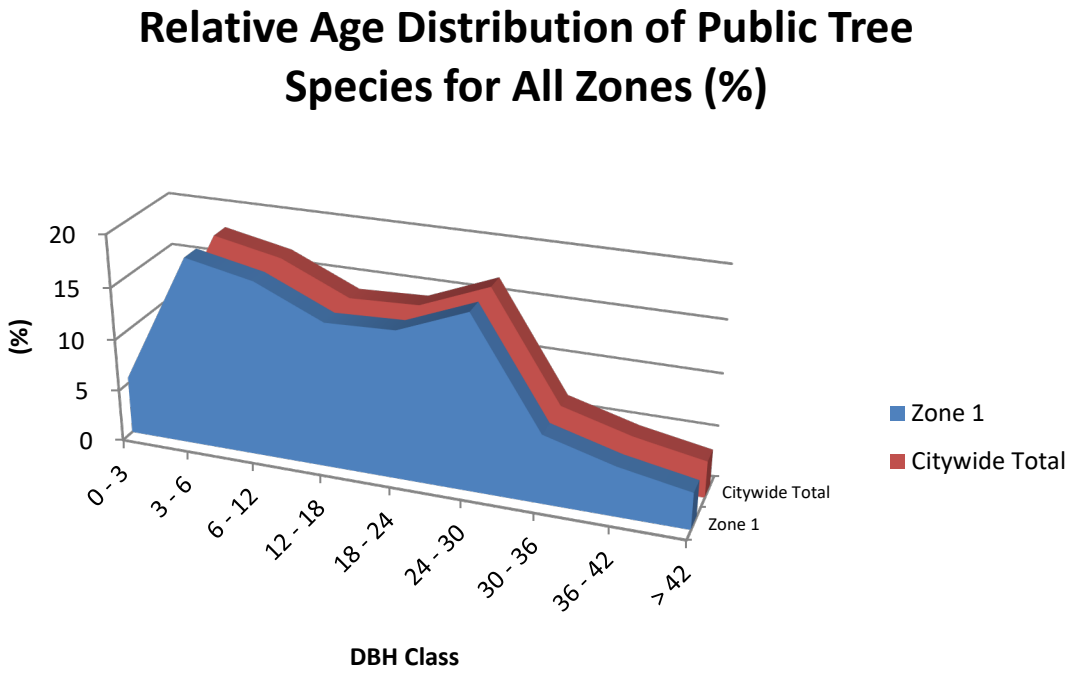

Figure 2: Relative Age Class

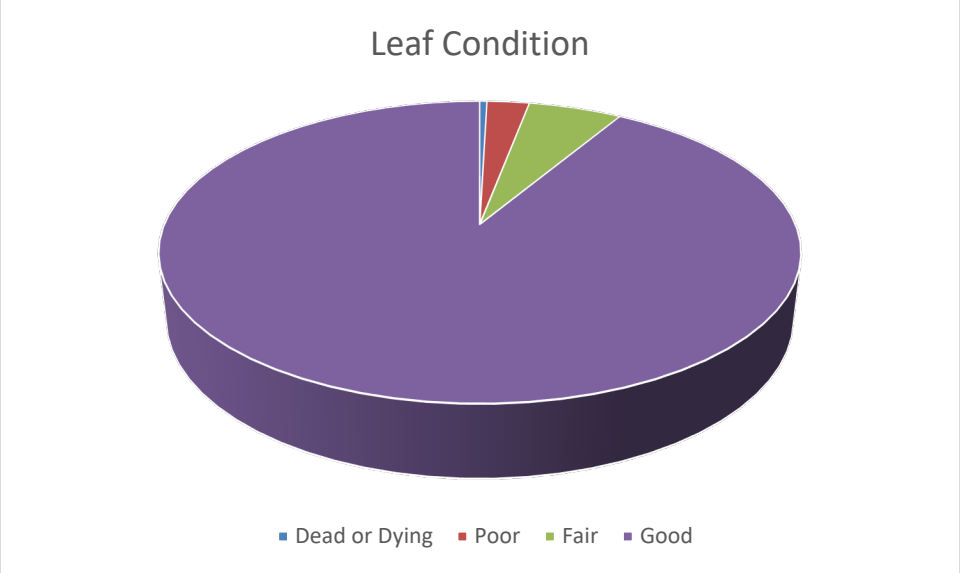

Figure 3: Foliage Condition

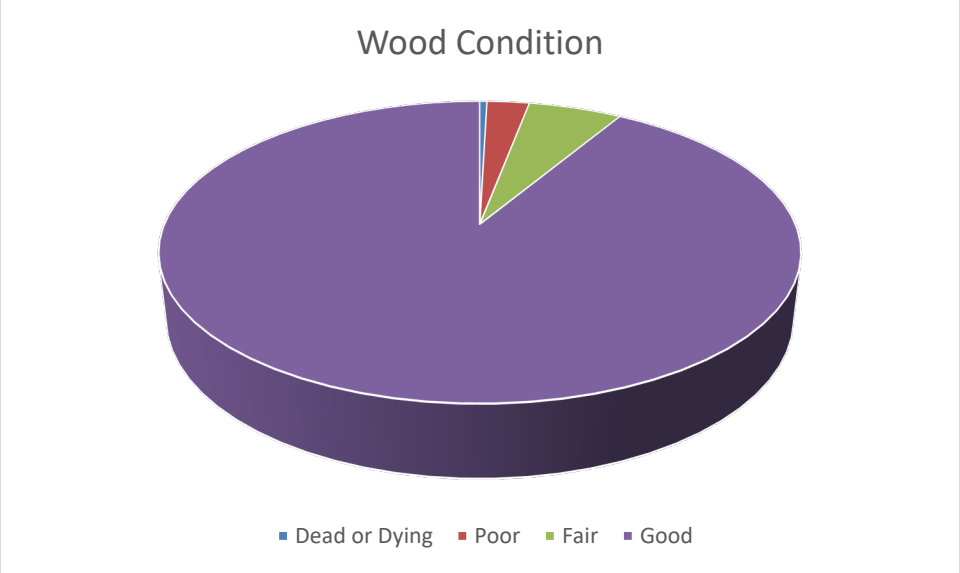

Figure 4: Wood Condition

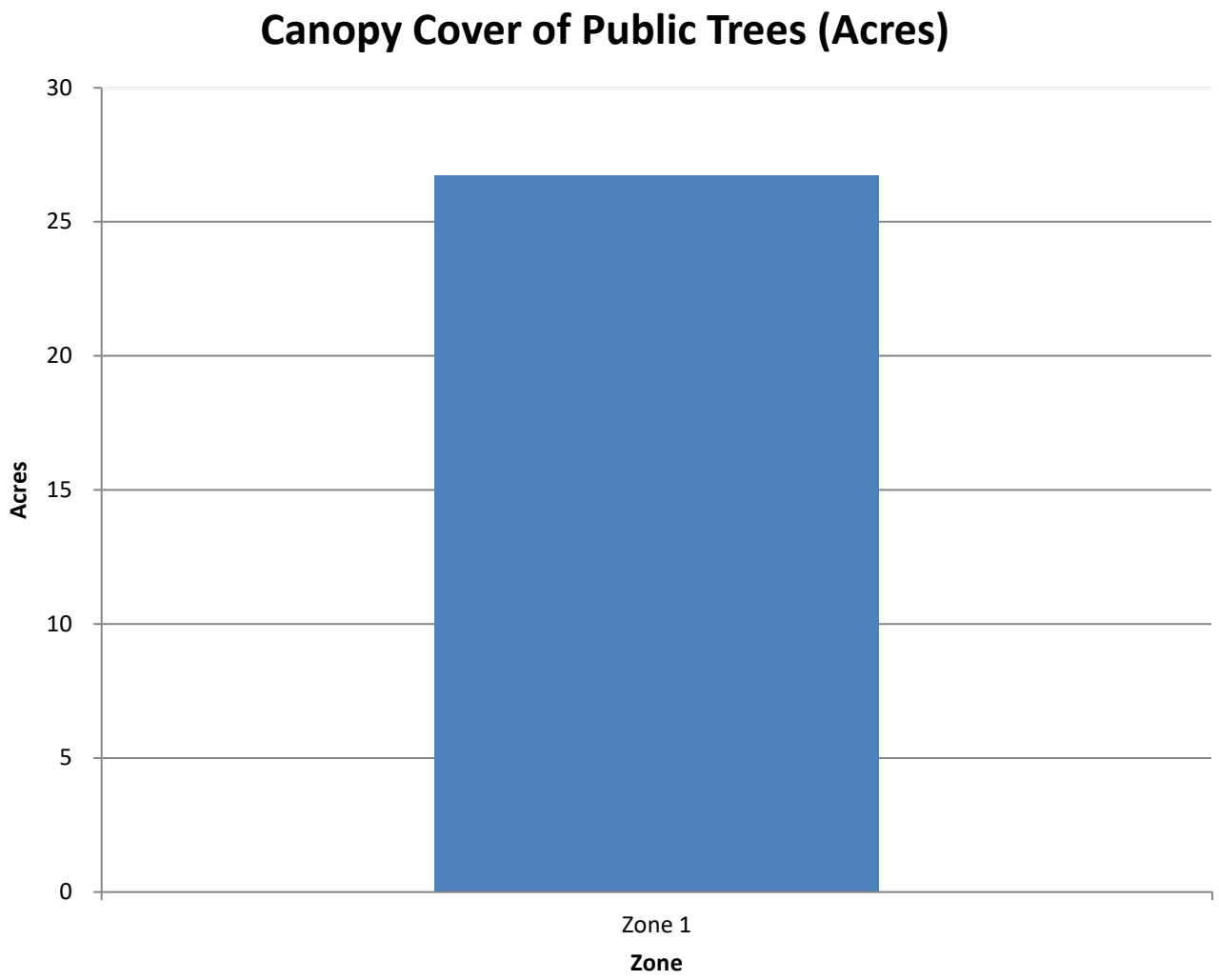

Figure 5: Canopy Cover in Acres

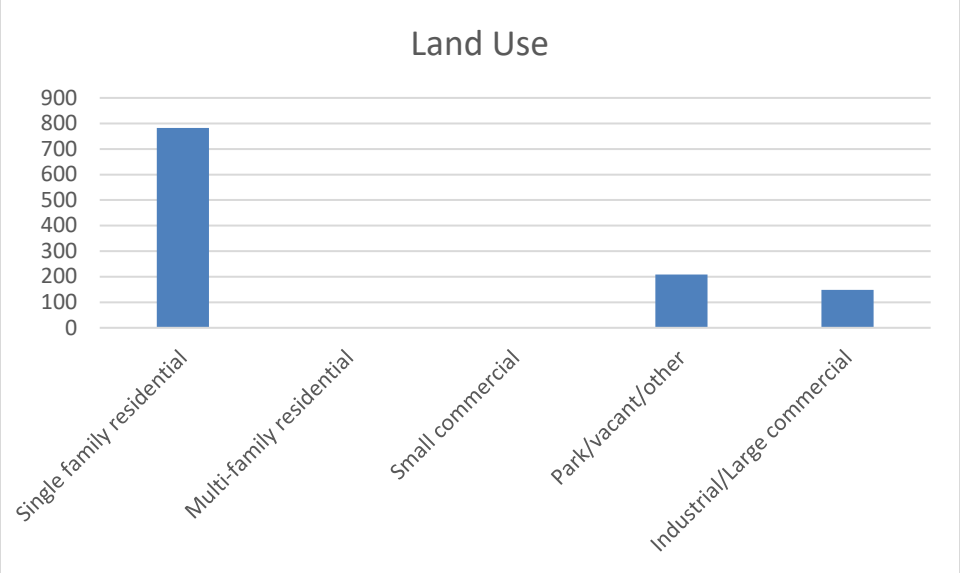

Figure 6: Land Use of city/park trees

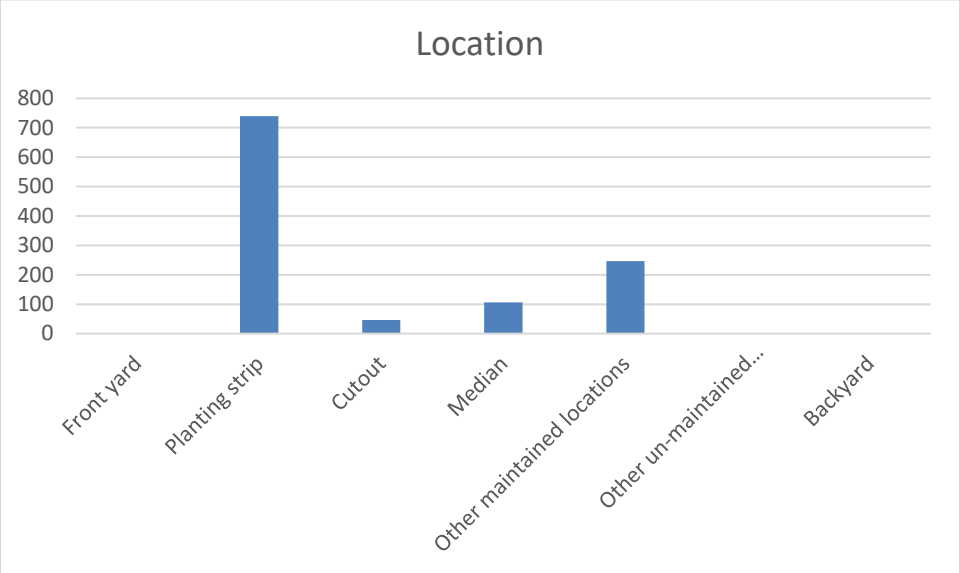

Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

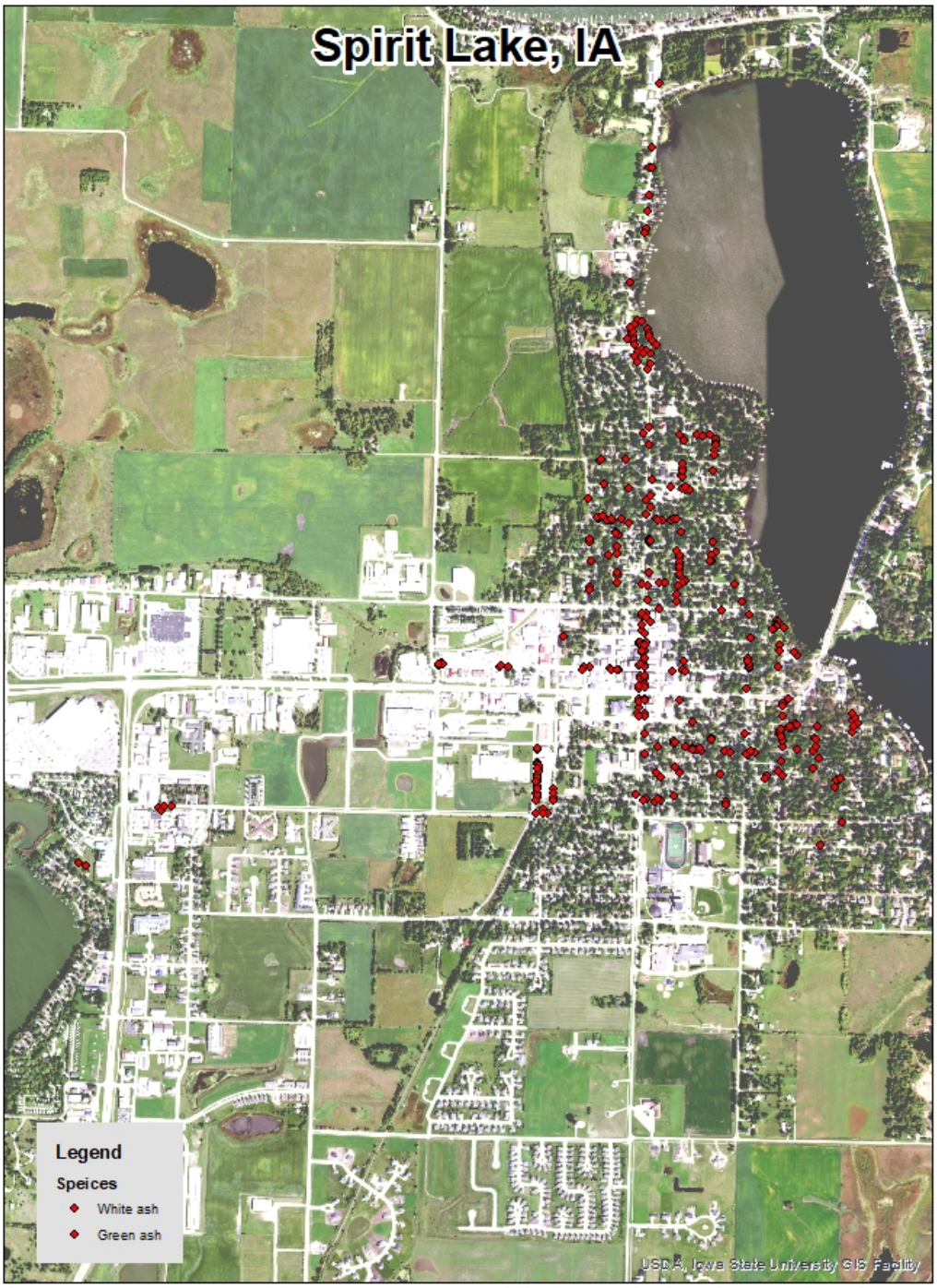

Figure 1: Location of Ash Trees

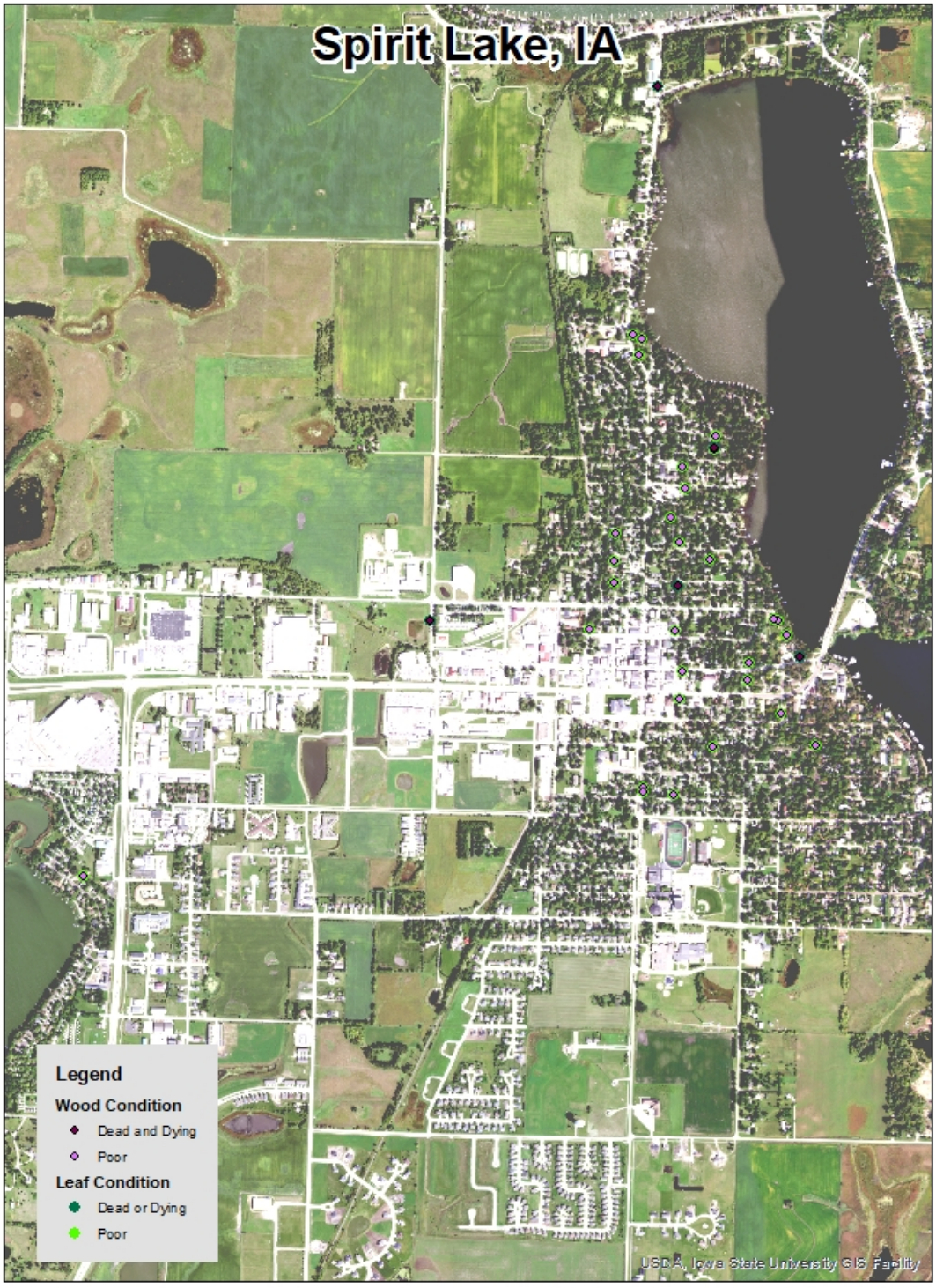

Figure 3: Location of Poor Condition Trees

Appendix C: Spirit Lake Tree Ordinances

CHAPTER 151
TREES

151.01 DEFINITIONS.
1. “Street Trees” are herein defined as trees, shrubs, bushes, and all other woody vegetation on land lying between property lines on either side of all streets, avenues, or formally referred to as public right-of-way.
2. “Park Trees” are herein defined as trees, shrubs, bushes and all other woody vegetation in public parks having individual names, and all areas owned by the City, or to which the public has free access as a park.
151.02 TREE SPECIES TO BE PLANTED. A list of approved tree species is available at City Hall. No species other than those approved by the Parks and Recreation Committee may be planted as Street or Park Trees. Planting of nonapproved Street Trees or Park Trees requires written permission of the Parks and Recreation Committee.

151.03 PLANTING RESTRICTIONS. No Street Tree or Park Tree shall be planted without the permission of the City and in accordance with the following:
1. Spacing. The spacing of Street Trees will be in accordance with the three species size classes included in the City’s approved tree species list. No trees may be planted closer together than the following: Small Trees, 30 feet; Medium Trees, 40 feet; and Large Trees, 50 feet; except in special plantings designed or approved by a landscape architect.
2. Distance from Curb and Sidewalk. The distance trees may be planted from curbs or curb lines and sidewalks will be in accordance with the three species size classes included in the City’s approved tree species list. No trees may be planted closer to any curb or sidewalk than the following: Small Trees, 3 feet; Medium Trees, 4 feet; and Large Trees, 5 feet. In the event a curb line or sidewalk is not established, Street Trees shall be planted on a line ten (10) feet from the property line towards the center of the street. No Street Trees shall be planted closer than 10 feet to any driveway that crosses the City right-of-way.
3. Distance from Street Corners and Fireplugs. No Street Tree shall be planted closer than 35 feet of any street corner, measured from the point of nearest intersecting curbs or curb lines. No Street or Park Tree shall be planted closer than 10 feet of any fireplug.
4. Utilities. No Street Trees other than those species listed as Small Trees in the City of Spirit Lake’s approved tree list may be planted under or within 10 lateral feet of any overhead utility wire, or over or within 5 later feet of any underground water line, sewer line, transmission line or other utility.

151.04 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. Said owners shall remove all dead, diseased or dangerous trees, or broken or decayed limbs which constitute a menace to the safety of the public. 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 twenty (20) 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])

1. The City shall have the right to plant, prune, maintain and remove trees, plants and shrubs within the lines of all streets, alleys, avenues, lanes, squares and public grounds as may be necessary to insure public safety or to preserve or enhance the symmetry and beauty of such public grounds.
2. The City shall have the right to prune any tree or shrub on private property when it interferes with the proper spread of light along the street from a street light or interferes with visibility of any traffic control device or sign.
3. The City may remove or cause or order to be removed, any tree or part thereof which is in an unsafe condition or which by reason of its nature is injurious to sewers, electric power lines, gas lines, water lines, or other public improvements, or is affected with any injurious fungus, insect or other pest. This Section does not prohibit the planting of Street Trees by adjacent property owners providing that the selection and location of said trees shall be in accordance with Section 151.02 and 151.03 of this ordinance.

151.05 TREE TOPPING. It shall be unlawful as a normal practice for any person, firm, or City department to top any Street Tree, Park Tree, or other tree on public property. Topping is defined as the drastic removal or cutting back of large branches in mature trees, with little regard for location of the pruning cut, to such a degree so as to remove the normal canopy and disfigure the tree.
Trees severely damaged by storms or other causes, or certain trees under utility wires or other obstructions where other pruning practices are impractical may be exempted from this ordinance at the determination of the Parks and Recreation Committee.

151.06 TRIMMING TREES TO BE SUPERVISED. Except as allowed in
Section 151.03, it is unlawful for any person to trim or cut any tree in a street or public place unless the work is done under the supervision of the City.

151.07 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.

151.08 INSPECTION AND REMOVAL. The City shall inspect or cause to be inspected any trees or shrubs in the City reported or suspected to be infected with or damaged by any disease or insect or disease pests, and such trees and shrubs shall be subject to removal as follows:
1. Removal from 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, and that danger to other trees within the City is imminent, the Council shall immediately cause such condition to be corrected by treatment or removal so as to destroy or prevent as fully as possible the spread of the disease or the insect or disease pests. The Council may also order the removal of any trees on the streets of the City which interfere with the making of improvements or with travel thereon.
2. Removal from Private Property. If it is determined with reasonable certainty that any such condition exists on private property and that the danger to other trees within the City is imminent, the Council

shall immediately notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within thirty (30) days of said notification. If such owner, occupant or person in charge of said property fails to comply within thirty (30) days of receipt of notice, the Council may cause the nuisance to be removed and the cost assessed against the property.

(Code of Iowa, Sec. 364.12[3b & h])
(Ch. 151 – Ord. 11-10 – Apr. 16 Supp.)

The State of Iowa is an Equal Opportunity Employer and provider of ADA services.

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

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