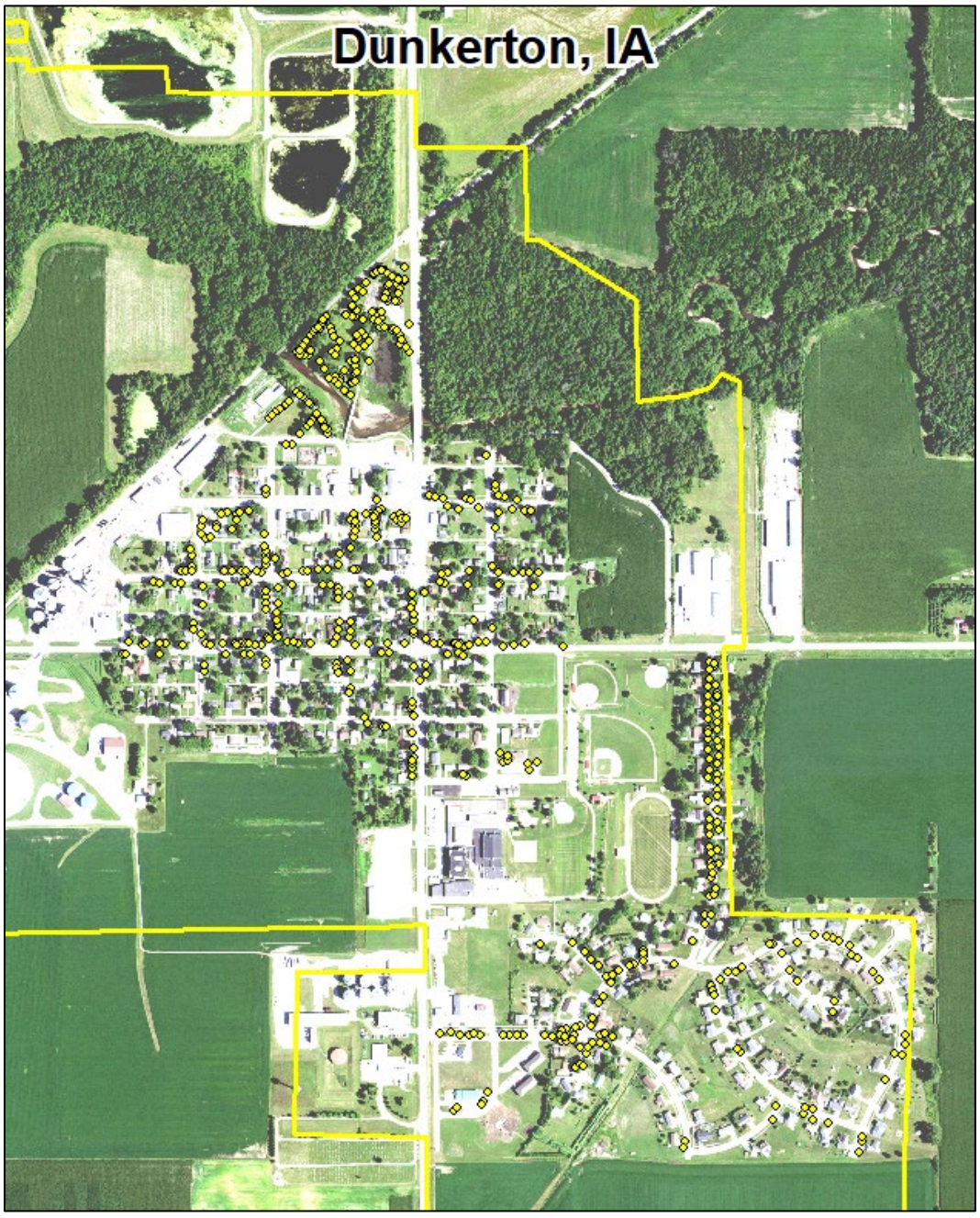
Dunkerton, IA



2021 Urban Forest Management Plan
Prepared by Gabriele Edwards
Iowa Department of Natural Resources

Table of Contents

Executive Summary

Overview

This plan was developed to assist the City of Dunkerton 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 17% of Dunkerton'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 2020, 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 549 trees inventoried.

- Dunkerton's trees provide $100,291 of benefits annually, an average of $182 a tree
- There are over 35 species of trees
- The top three genera are: Maple 52%, Ash 17%, and Apple (Crab) 5%
- 27% of trees are in need of some type of management
- 74 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 74 trees needing removal, 24 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*
- 86 of the 98 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
- Suggestion: request a budget increase to $18,535 annually and apply for grants to plant replacement trees. This budget allows for removal of all poor quality ash (86 total) as well as 26 other recommended removal trees, treating 12 good condition ash trees, and planting a total of 78 trees as replacements.

Introduction

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

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

Inventory

In 2020, 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 549 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. Dunkerton's trees reduce energy related costs by approximately $25,378 annually (Appendix A, Table 1). These savings are both in Electricity (122.1 MWh) and in Natural Gas (16,442.9 Therms).

Annual Stormwater Benefits

Dunkerton's trees intercept about 1,339,870 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $36,310 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 Dunkerton, it is estimated that trees remove 1,535 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 $4,299 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Dunkerton, trees sequester about 338,729 lbs of carbon a year with an associated value of $2,540 (Appendix A, Table 5). In addition, the trees store 4,838,995 lbs of carbon, with a yearly benefit of $36,292 (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. Dunkerton receives $30,412 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, Dunkerton's trees provide $100,291 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 549 trees in Dunkerton provide approximately $182 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Dunkerton has over 35 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genera is as follows:

Maple	289	52%
Ash	98	17%
Apple (Crab)	28	5%
Oak	26	4%
Linden/Basswood	14	2%
Walnut	13	2%
Pine	11	2%
Birch	11	2%
Cedar	8	1%
Hickory	6	1%
Hackberry	5	<1%
Locust	5	<1%
Elm	5	<1%
Cottonwood	3	<1%
Mulberry	3	<1%
Spruce	2	<1%
Tulip Tree	2	<1%
Buckeye	1	<1%
Catalpa	1	<1%
Japanese Tree Lilac	1	<1%
Willow	1	<1%
Cherry	1	<1%
Broadleaf Deciduous Medium	2	<1%

Age Class

Most of Dunkerton's trees (44%) are between 12 and 24 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. Dunkerton's size curve is on the larger side, indicating an older than average stand.

Condition: Wood and Foliage

Both wood condition and leaf condition are good indicators of the overall health of the urban forest. The foliage condition results for Dunkerton indicate that 66% of the trees are in good health, with only 14% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 80% of Dunkerton'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 6% of the population. These are 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).

Tree Removal	74	13%
Crown Cleaning	57	10%
Treat Pest/Disease	16	2%
Crown Raising	6	1%

Canopy Cover

The total canopy with both private and public trees is 17%, 110 acres. The canopy cover on city own properties included in the Dunkerton inventory includes approximately 13 acres (Appendix A, Figure 4). The City's Canopy goal is to increase canopy by 3%, in 30 years on all lands. To achieve this goal it is estimated that 46 trees need to be planted annually on public and/or private lands.

Land Use and Location

The majority of Dunkerton's city and park trees are in planting strips in single family residential neighborhoods (Appendix A, Figure 6 & Appendix A, Figure7). The following describes the land use and locations for the street and park trees.

Land Use	
Single family residential	63%
Park/vacant/other	33%
Small commercial	2%
Industrial/Large commercial	<1%

Location	
Front Yard	53%
Planting strip	43%
Median	2%

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

Dunkerton 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 are 2 critical concern trees that need

crown cleaning. The 4 critical concern trees 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 149 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 74 removals, 48 are ash trees. There are a total of 98 ash trees, and 86 of those have signs and symptoms that have been associated with EAB. *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 Dunkerton.

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 (52%) (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.

Budget and Emerald Ash Borer Plan

Six Year Maintenance Plan with a slight budget increase: average annual budget of $18,535
Current Budget $17,000/year, Total $102,000 over 6 years

FY 2021: $17,460

Removal: 2 critical concern trees plus 16 other recommended removal trees*	$12,600
Prune: 2 critical concern trees	$60
Treat 6 ash trees for EAB (1st batch)	$1,800
Planting and Replacement: 20 trees to be planted in open locations	$2,000
Young Tree Pruning & Maintenance:	$1,000
Visual Survey for signs and symptoms of EAB	

FY 2022: $19,650

Removal: 18 recommended removal trees*	$12,600
Treat 6 ash trees (2nd batch)	$1,800
Planting and Replacement: 6 trees in open locations from year one removals	$600
Young Tree Pruning & Maintenance	$300
Routine trimming: Contract to trim 1/3 of the city trees	$4,350
Visual Survey for signs and symptoms of EAB	

FY 2023: $17,400

Removal: 18 recommended removal trees*	$12,600
Treat 6 ash trees (1st batch, 2nd dose)	$1,800
Planting and Replacement: 20 trees to be planted in open locations and locations from previous removals	$2,000
Young Tree Pruning & Maintenance:	$1,000
Visual Survey for signs and symptoms of EAB	

FY 2024: $19,650

Removal: 18 recommended removal trees*	$12,600
Treat 6 ash trees (2nd batch, 2nd dose)	$1,800
Planting and Replacement: 6 trees in open locations from previous removals	$600
Routine trimming: Contract to trim 1/3 of the city trees	$4,350
Young Tree Pruning & Maintenance:	$300
Visual Survey for signs and symptoms of EAB	

FY 2025: $17,400

Removal: 18 recommended removal trees*	$12,600
Treat 6 ash trees (1st batch, 3rd dose)	$1,800
Planting and Replacement: 20 trees to be planted in open locations and locations from previous removals	$2,000
Young Tree Pruning & Maintenance:	$1,000
Visual Survey for signs and symptoms of EAB	

FY 2026: $19,650

Removal: 18 recommended removal trees*	$12,600
Treat 6 ash trees (2nd batch, 3rd dose)	$1,800
Planting and Replacement: 6 trees in open locations from previous removals	$600
Routine trimming: Contract to trim 1/3 of the city trees	$4,350
Young Tree Pruning & Maintenance:	$300
Visual Survey for signs and symptoms of EAB	

*This proposed budget removes 86 of the 98 ash trees (saving 12 ash to treat for EAB). EAB could potentially kill all ash within 4 to 15 years of its arrival if not treated. Another 26 trees recommended for removal that are not ash are also removed.

Estimates based on the following costs: tree removal $700/tree, planting and replacement $100/tree, young tree pruning and maintenance $50/tree, routine trimming $30/tree. Actual costs could be different.

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 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 (trees or shrubs in the City reported or suspected to be infected with or damaged by any disease or insect or disease pests) on private property and that the danger to other trees or to adjoining property or passing motorists or pedestrians is imminent, the Council shall notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within fourteen (14) days of said notification. If such owner, occupant or person in charge of said property fails to comply within 14 days of receipt of notice, the Council may cause the condition to be corrected and the cost assessed against the property.”

Proposed Budget Increase

EAB could potentially kill all ash trees in Dunkerton within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to $18,191 (total ash + all other removals *removal cost + (planting and maintenance *1.2 of removals) /6) a year. Additionally, it is recommended that Dunkerton 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 4 trees could be treated per year (every other year treatment) would be $1,200. There are 12 ash trees that could be selected for treatment instead of removal, and Dunkerton would still need to find $60,200 (total ash - 12 *removal cost) for removal. Alternatively, if there are 12 treatable trees, it would cost approximately $1,800 a year for treatment. 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 Dunkerton. 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

Dunkerton

Annual Energy Benefits of Public Trees

3/25/2021

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Silver maple	45.9	3,485	6,068.5	5,947	9,432	(N/A)	26.0	37.2	65.96
Green ash	24.4	1,856	3,325.0	3,259	5,114	(N/A)	16.9	20.2	54.99
Norway maple	13.3	1,012	1,882.4	1,845	2,857	(N/A)	12.0	11.3	43.28
Red maple	3.7	283	494.4	485	767	(N/A)	7.3	3.0	19.18
Apple	1.1	85	186.3	183	267	(N/A)	5.1	1.1	9.55
Boxelder	4.1	310	534.6	524	834	(N/A)	4.0	3.3	37.92
Sugar maple	3.6	277	482.1	472	749	(N/A)	3.3	3.0	41.63
American basswood	1.7	132	252.1	247	379	(N/A)	2.6	1.5	27.07
Black walnut	3.8	292	528.2	518	810	(N/A)	2.4	3.2	62.28
Pin oak	3.4	255	440.1	431	686	(N/A)	2.4	2.7	52.79
Norway spruce	1.6	123	215.3	211	334	(N/A)	2.4	1.3	25.70
Eastern white pine	1.5	112	196.0	192	304	(N/A)	2.0	1.2	27.65
Eastern red cedar	0.8	60	117.6	115	176	(N/A)	1.5	0.7	21.95
Paper birch	0.5	40	76.0	75	115	(N/A)	1.3	0.5	16.40
Northern red oak	0.8	60	103.4	101	161	(N/A)	1.3	0.6	23.00
Hickory	1.4	109	173.1	170	278	(N/A)	1.1	1.1	46.41
Northern hackberry	1.5	112	199.2	195	307	(N/A)	0.9	1.2	61.48
Honeylocust	1.6	121	203.9	200	321	(N/A)	0.9	1.3	64.18
White ash	1.0	75	111.8	110	185	(N/A)	0.9	0.7	36.91
Bur oak	1.1	81	144.2	141	222	(N/A)	0.7	0.9	55.48
American elm	1.5	113	191.6	188	300	(N/A)	0.7	1.2	75.10
River birch	1.0	75	141.2	138	213	(N/A)	0.7	0.8	53.23
Cottonwood	1.2	91	163.6	160	252	(N/A)	0.5	1.0	83.85
Mulberry	0.2	17	38.5	38	55	(N/A)	0.5	0.2	18.19
Broadleaf Deciduous Mediu	0.0	1	1.6	2	2	(N/A)	0.4	0.0	1.10
White oak	0.2	14	27.5	27	41	(N/A)	0.4	0.2	20.64
Tulip tree	0.0	2	4.2	4	6	(N/A)	0.4	0.0	3.24
Ohio buckeye	0.0	3	6.2	6	9	(N/A)	0.2	0.0	8.99
Chinese elm	0.0	2	3.7	4	6	(N/A)	0.2	0.0	5.82
Northern catalpa	0.3	20	38.1	37	57	(N/A)	0.2	0.2	57.32
Spruce	0.1	4	9.5	9	14	(N/A)	0.2	0.1	13.58
Blue spruce	0.1	5	10.2	10	15	(N/A)	0.2	0.1	14.80
Japanese tree lilac	0.0	0	0.6	1	1	(N/A)	0.2	0.0	0.87
Willow	0.3	24	47.4	46	71	(N/A)	0.2	0.3	70.84
Black cherry	0.2	14	24.7	24	38	(N/A)	0.2	0.2	38.13
Total	122.1	9,264	16,442.9	16,114	25,378	(N/A)	100.0	100.0	46.23

Table 2: Annual Stormwater Benefits

Dunkerton

Annual Stormwater Benefits of Public Trees

3/25/2021

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Silver maple	613,819	16,635	(N/A)	26.0	45.8	116.33
Green ash	257,440	6,977	(N/A)	16.9	19.2	75.02
Norway maple	101,723	2,757	(N/A)	12.0	7.6	41.77
Red maple	22,362	606	(N/A)	7.3	1.7	15.15
Apple	3,854	104	(N/A)	5.1	0.3	3.73
Boxelder	34,648	939	(N/A)	4.0	2.6	42.68
Sugar maple	42,396	1,149	(N/A)	3.3	3.2	63.83
American basswood	12,615	342	(N/A)	2.6	0.9	24.42
Black walnut	41,512	1,125	(N/A)	2.4	3.1	86.54
Pin oak	26,793	726	(N/A)	2.4	2.0	55.85
Norway spruce	28,822	781	(N/A)	2.4	2.2	60.08
Eastern white pine	28,324	768	(N/A)	2.0	2.1	69.78
Eastern red cedar	11,625	315	(N/A)	1.5	0.9	39.38
Paper birch	3,383	92	(N/A)	1.3	0.3	13.10
Northern red oak	5,308	144	(N/A)	1.3	0.4	20.55
Hickory	9,918	269	(N/A)	1.1	0.7	44.80
Northern hackberry	10,331	280	(N/A)	0.9	0.8	55.99
Honeylocust	15,389	417	(N/A)	0.9	1.1	83.41
White ash	6,215	168	(N/A)	0.9	0.5	33.68
Bur oak	13,945	378	(N/A)	0.7	1.0	94.48
American elm	12,314	334	(N/A)	0.7	0.9	83.43
River birch	9,524	258	(N/A)	0.7	0.7	64.52
Cottonwood	16,672	452	(N/A)	0.5	1.2	150.61
Mulberry	793	22	(N/A)	0.5	0.1	7.17
Broadleaf Deciduous Medium	24	1	(N/A)	0.4	0.0	0.33
White oak	1,216	33	(N/A)	0.4	0.1	16.47
Tulip tree	190	5	(N/A)	0.4	0.0	2.57
Ohio buckeye	163	4	(N/A)	0.2	0.0	4.41
Chinese elm	172	5	(N/A)	0.2	0.0	4.65
Northern catalpa	2,591	70	(N/A)	0.2	0.2	70.21
Spruce	596	16	(N/A)	0.2	0.0	16.14
Blue spruce	755	20	(N/A)	0.2	0.1	20.47
Japanese tree lilac	7	0	(N/A)	0.2	0.0	0.20
Willow	3,764	102	(N/A)	0.2	0.3	102.01
Black cherry	667	18	(N/A)	0.2	0.0	18.06
Citywide total	1,339,870	36,310	(N/A)	100.0	100.0	66.14

Table 3: Annual Air Quality Benefits

Dunkerton

Annual Air Quality Benefits of Public Trees

3/25/2021

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							
Silver maple	102.6	17.4	51.0	4.6	555	216.8	31.7	30.3	207.7	1,355	-55.7	-209	606.3	1,701 (N/A)	26.0	11.90
Green ash	30.5	4.9	14.8	1.4	163	116.5	17.0	16.2	110.8	726	0.0	0	312.0	889 (N/A)	16.9	9.56
Norway maple	18.1	3.1	9.3	0.8	99	64.3	9.3	8.9	60.5	399	-4.5	-17	169.7	481 (N/A)	12.0	7.29
Red maple	3.9	0.7	2.0	0.2	21	17.6	2.6	2.5	16.9	110	-1.5	-6	44.8	126 (N/A)	7.3	3.15
Apple	0.7	0.1	0.4	0.0	4	5.6	0.8	0.8	5.1	34	0.0	0	13.4	38 (N/A)	5.1	1.36
Boxelder	3.8	0.6	1.9	0.2	21	19.3	2.8	2.7	18.5	121	-1.7	-7	48.1	135 (N/A)	4.0	6.12
Sugar maple	5.8	1.0	2.9	0.3	31	17.2	2.5	2.4	16.5	108	-4.5	-17	44.1	122 (N/A)	3.3	6.78
American basswood	1.2	0.2	0.7	0.1	7	8.4	1.2	1.2	7.9	52	-1.2	-4	19.7	55 (N/A)	2.6	3.90
Black walnut	5.0	0.8	2.4	0.2	26	18.4	2.7	2.6	17.4	114	0.0	0	49.4	141 (N/A)	2.4	10.84
Pin oak	3.8	0.7	2.1	0.2	21	15.8	2.3	2.2	15.2	99	-7.5	-28	34.8	92 (N/A)	2.4	7.09
Norway spruce	3.3	0.7	2.7	0.4	22	7.7	1.1	1.1	7.3	48	-13.3	-50	11.0	20 (N/A)	2.4	1.54
Eastern white pine	3.3	0.7	2.7	0.4	22	7.0	1.0	1.0	6.7	44	-14.0	-53	8.7	13 (N/A)	2.0	1.15
Eastern red cedar	2.4	0.5	1.9	0.3	16	3.9	0.6	0.5	3.6	24	-6.4	-24	7.2	16 (N/A)	1.5	1.94
Paper birch	0.1	0.0	0.1	0.0	1	2.6	0.4	0.4	2.4	16	0.0	0	6.0	17 (N/A)	1.3	2.39
Northern red oak	0.9	0.2	0.5	0.0	5	3.7	0.5	0.5	3.6	23	-1.3	-5	8.7	23 (N/A)	1.3	3.35
Hickory	0.8	0.1	0.5	0.0	5	6.6	1.0	0.9	6.5	42	0.0	0	16.5	46 (N/A)	1.1	7.74
Northern hackberry	1.3	0.2	0.7	0.1	7	7.0	1.0	1.0	6.7	44	0.0	0	18.0	51 (N/A)	0.9	10.21
Honeylocust	2.9	0.5	1.4	0.1	16	7.5	1.1	1.0	7.2	47	-2.2	-8	19.5	54 (N/A)	0.9	10.83
White ash	0.4	0.1	0.2	0.0	2	4.5	0.7	0.6	4.5	29	0.0	0	11.0	31 (N/A)	0.9	6.15
Bur oak	2.4	0.4	1.1	0.1	13	5.1	0.7	0.7	4.8	32	0.0	0	15.3	44 (N/A)	0.7	11.06
American elm	4.0	0.7	1.9	0.2	21	7.0	1.0	1.0	6.7	44	0.0	0	22.4	65 (N/A)	0.7	16.22
River birch	2.0	0.3	1.0	0.1	11	4.8	0.7	0.7	4.5	29	-0.5	-2	13.5	39 (N/A)	0.7	9.64
Cottonwood	2.9	0.5	1.3	0.1	15	5.7	0.8	0.8	5.4	36	0.0	0	17.5	51 (N/A)	0.5	16.91
Mulberry	0.1	0.0	0.1	0.0	1	1.1	0.2	0.2	1.0	7	0.0	0	2.7	8 (N/A)	0.5	2.55
Broadleaf Deciduous Medium	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)	0.4	0.14
White oak	0.0	0.0	0.0	0.0	0	0.9	0.1	0.1	0.9	6	0.0	0	2.1	6 (N/A)	0.4	2.99
Tulip tree	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)	0.4	0.48
Ohio buckeye	0.0	0.0	0.0	0.0	0	0.2	0.0	0.0	0.2	1	0.0	0	0.4	1 (N/A)	0.2	1.21
Chinese elm	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	1	0.0	0	0.3	1 (N/A)	0.2	0.87
Northern catalpa	0.3	0.0	0.1	0.0	1	1.3	0.2	0.2	1.2	8	0.0	0	3.3	9 (N/A)	0.2	9.34
Spruce	0.1	0.0	0.1	0.0	0	0.3	0.0	0.0	0.3	2	-0.2	-1	0.6	1 (N/A)	0.2	1.48
Blue spruce	0.1	0.0	0.1	0.0	0	0.3	0.0	0.0	0.3	2	-0.2	-1	0.6	2 (N/A)	0.2	1.53
Japanese tree lilac	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
Willow	0.9	0.1	0.4	0.0	5	1.6	0.2	0.2	1.5	10	-0.2	-1	4.7	14 (N/A)	0.2	13.58
Black cherry	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
Citywide total	203.6	34.4	104.3	9.8	1,111	579.9	84.6	80.7	552.9	3,619	-115.0	-431	1,535.2	4,299 (N/A)	100.0	7.83

Table 4: Annual Carbon Stored

Dunkerton

Stored CO2 Benefits of Public Trees

3/25/2021

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Silver maple	2,395,502	17,966	(N/A)	26.0	49.5	125.64
Green ash	994,131	7,456	(N/A)	16.9	20.5	80.17
Norway maple	299,809	2,249	(N/A)	12.0	6.2	34.07
Red maple	47,514	356	(N/A)	7.3	1.0	8.91
Apple	13,261	99	(N/A)	5.1	0.3	3.55
Boxelder	103,697	778	(N/A)	4.0	2.1	35.35
Sugar maple	170,664	1,280	(N/A)	3.3	3.5	71.11
American basswood	45,400	341	(N/A)	2.6	0.9	24.32
Black walnut	159,824	1,199	(N/A)	2.4	3.3	92.21
Pin oak	93,259	699	(N/A)	2.4	1.9	53.80
Norway spruce	31,828	239	(N/A)	2.4	0.7	18.36
Eastern white pine	34,548	259	(N/A)	2.0	0.7	23.56
Eastern red cedar	7,757	58	(N/A)	1.5	0.2	7.27
Paper birch	5,544	42	(N/A)	1.3	0.1	5.94
Northern red oak	16,818	126	(N/A)	1.3	0.3	18.02
Hickory	26,817	201	(N/A)	1.1	0.6	33.52
Northern hackberry	17,228	129	(N/A)	0.9	0.4	25.84
Honeylocust	37,307	280	(N/A)	0.9	0.8	55.96
White ash	13,085	98	(N/A)	0.9	0.3	19.63
Bur oak	83,994	630	(N/A)	0.7	1.7	157.49
American elm	78,268	587	(N/A)	0.7	1.6	146.75
River birch	33,285	250	(N/A)	0.7	0.7	62.41
Cottonwood	97,698	733	(N/A)	0.5	2.0	244.24
Mulberry	2,724	20	(N/A)	0.5	0.1	6.81
Broadleaf Deciduous	34	0	(N/A)	0.4	0.0	0.13
White oak	2,069	16	(N/A)	0.4	0.0	7.76
Tulip tree	198	1	(N/A)	0.4	0.0	0.74
Ohio buckeye	218	2	(N/A)	0.2	0.0	1.64
Chinese elm	185	1	(N/A)	0.2	0.0	1.39
Northern catalpa	8,458	63	(N/A)	0.2	0.2	63.43
Spruce	257	2	(N/A)	0.2	0.0	1.93
Blue spruce	284	2	(N/A)	0.2	0.0	2.13
Japanese tree lilac	14	0	(N/A)	0.2	0.0	0.10
Willow	14,280	107	(N/A)	0.2	0.3	107.10
Black cherry	3,037	23	(N/A)	0.2	0.1	22.78
Citywide total	4,838,995	36,292	(N/A)	100.0	100.0	66.11

Table 5: Annual Carbon Sequestered

Dunkerton

Annual CO Benefits of Public Trees

3/25/2021

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
Silver maple	183,501	1,376	-11,498	-495	-90	77,010	578	248,517	1,864 (N/A)	26.0	47.9	13.03
Green ash	57,335	430	-4,772	-252	-38	41,009	308	93,320	700 (N/A)	16.9	18.0	7.53
Norway maple	22,002	165	-1,440	-131	-12	22,362	168	42,793	321 (N/A)	12.0	8.2	4.86
Red maple	6,523	49	-228	-38	-2	6,248	47	12,505	94 (N/A)	7.3	2.4	2.34
Apple	1,771	13	-64	-20	-1	1,874	14	3,561	27 (N/A)	5.1	0.7	0.95
Boxelder	10,291	77	-498	-45	-4	6,858	51	16,606	125 (N/A)	4.0	3.2	5.66
Sugar maple	8,440	63	-821	-41	-6	6,118	46	13,696	103 (N/A)	3.3	2.6	5.71
American basswood	3,422	26	-218	-21	-2	2,914	22	6,098	46 (N/A)	2.6	1.2	3.27
Black walnut	9,321	70	-767	-39	-6	6,453	48	14,968	112 (N/A)	2.4	2.9	8.64
Pin oak	10,006	75	-448	-32	-4	5,635	42	15,161	114 (N/A)	2.4	2.9	8.75
Norway spruce	1,885	14	-153	-29	-1	2,722	20	4,425	33 (N/A)	2.4	0.9	2.55
Eastern white pine	1,273	10	-166	-29	-1	2,476	19	3,554	27 (N/A)	2.0	0.7	2.42
Eastern red cedar	142	1	-37	-14	0	1,334	10	1,425	11 (N/A)	1.5	0.3	1.34
Paper birch	1,192	9	-27	-7	0	891	7	2,050	15 (N/A)	1.3	0.4	2.20
Northern red oak	1,207	9	-81	-9	-1	1,318	10	2,435	18 (N/A)	1.3	0.5	2.61
Hickory	2,886	22	-129	-12	-1	2,406	18	5,151	39 (N/A)	1.1	1.0	6.44
Northern hackberry	1,452	11	-83	-12	-1	2,480	19	3,838	29 (N/A)	0.9	0.7	5.76
Honeylocust	4,856	36	-179	-12	-1	2,676	20	7,342	55 (N/A)	0.9	1.4	11.01
White ash	1,845	14	-63	-8	-1	1,657	12	3,432	26 (N/A)	0.9	0.7	5.15
Bur oak	1,856	14	-403	-12	-3	1,780	13	3,221	24 (N/A)	0.7	0.6	6.04
American elm	1,832	14	-376	-15	-3	2,489	19	3,930	29 (N/A)	0.7	0.8	7.37
River birch	1,350	10	-160	-10	-1	1,648	12	2,828	21 (N/A)	0.7	0.5	5.30
Cottonwood	2,295	17	-469	-14	-4	2,015	15	3,828	29 (N/A)	0.5	0.7	9.57
Mulberry	342	3	-13	-4	0	372	3	697	5 (N/A)	0.5	0.1	1.74
Broadleaf Deciduous Medi	11	0	0	0	0	14	0	25	0 (N/A)	0.4	0.0	0.09
White oak	418	3	-10	-2	0	318	2	723	5 (N/A)	0.4	0.1	2.71
Tulip tree	77	1	-1	-1	0	53	0	128	1 (N/A)	0.4	0.0	0.48
Ohio buckeye	96	1	-2	-1	0	65	0	158	1 (N/A)	0.2	0.0	1.18
Chinese elm	74	1	-1	-1	0	49	0	121	1 (N/A)	0.2	0.0	0.91
Northern catalpa	660	5	-41	-3	0	441	3	1,058	8 (N/A)	0.2	0.2	7.93
Spruce	53	0	-1	-1	0	94	1	145	1 (N/A)	0.2	0.0	1.08
Blue spruce	39	0	-1	-1	0	106	1	142	1 (N/A)	0.2	0.0	1.07
Japanese tree lilac	9	0	0	0	0	6	0	14	0 (N/A)	0.2	0.0	0.10
Willow	0	0	-69	-4	-1	539	4	466	3 (N/A)	0.2	0.1	3.49
Black cherry	268	2	-15	-2	0	308	2	560	4 (N/A)	0.2	0.1	4.20
Citywide total	338,729	2,540	-23,232	-1,318	-184	204,740	1,536	518,919	3,892 (N/A)	100.0	100.0	7.09

Table 6: Annual Social and Aesthetic Benefits

Dunkerton

Annual Aesthetic/Other Benefits of Public Trees

3/25/2021

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Silver maple	14,485	(N/A)	26.0	47.6	101.29
Green ash	4,897	(N/A)	16.9	16.1	52.66
Norway maple	2,220	(N/A)	12.0	7.3	33.64
Red maple	971	(N/A)	7.3	3.2	24.27
Apple	96	(N/A)	5.1	0.3	3.43
Boxelder	904	(N/A)	4.0	3.0	41.11
Sugar maple	861	(N/A)	3.3	2.8	47.86
American basswood	301	(N/A)	2.6	1.0	21.53
Black walnut	764	(N/A)	2.4	2.5	58.76
Pin oak	917	(N/A)	2.4	3.0	70.50
Norway spruce	452	(N/A)	2.4	1.5	34.77
Eastern white pine	331	(N/A)	2.0	1.1	30.08
Eastern red cedar	54	(N/A)	1.5	0.2	6.80
Paper birch	172	(N/A)	1.3	0.6	24.61
Northern red oak	108	(N/A)	1.3	0.4	15.40
Hickory	287	(N/A)	1.1	0.9	47.83
Northern hackberry	235	(N/A)	0.9	0.8	46.91
Honeylocust	1,178	(N/A)	0.9	3.9	235.56
White ash	258	(N/A)	0.9	0.8	51.61
Bur oak	152	(N/A)	0.7	0.5	38.07
American elm	240	(N/A)	0.7	0.8	59.98
River birch	128	(N/A)	0.7	0.4	32.07
Cottonwood	161	(N/A)	0.5	0.5	53.59
Mulberry	19	(N/A)	0.5	0.1	6.40
Broadleaf Deciduous Medium	5	(N/A)	0.4	0.0	2.74
White oak	57	(N/A)	0.4	0.2	28.56
Tulip tree	20	(N/A)	0.4	0.1	10.00
Ohio buckeye	13	(N/A)	0.2	0.0	12.89
Chinese elm	15	(N/A)	0.2	0.0	14.73
Northern catalpa	58	(N/A)	0.2	0.2	57.69
Spruce	15	(N/A)	0.2	0.1	15.42
Blue spruce	21	(N/A)	0.2	0.1	21.08
Japanese tree lilac	0	(N/A)	0.2	0.0	0.03
Willow	0	(N/A)	0.2	0.0	0.00
Black cherry	15	(N/A)	0.2	0.1	15.48
Citywide total	30,412	(N/A)	100.0	100.0	55.39

Table 7: Summary of Benefits in Dollars

Dunkerton

Total Annual Benefits of Public Trees by Species ($)

3/25/2021

Species	Energy	CO_2	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Silver maple	9,432	1,864	1,701	16,635	14,485	44,117	(N/A)	44.0
Green ash	5,114	700	889	6,977	4,897	18,577	(N/A)	18.5
Norway maple	2,857	321	481	2,757	2,220	8,635	(N/A)	8.6
Red maple	767	94	126	606	971	2,564	(N/A)	2.6
Apple	267	27	38	104	96	533	(N/A)	0.5
Boxelder	834	125	135	939	904	2,937	(N/A)	2.9
Sugar maple	749	103	122	1,149	861	2,984	(N/A)	3.0
American basswood	379	46	55	342	301	1,123	(N/A)	1.1
Black walnut	810	112	141	1,125	764	2,952	(N/A)	2.9
Pin oak	686	114	92	726	917	2,535	(N/A)	2.5
Norway spruce	334	33	20	781	452	1,620	(N/A)	1.6
Eastern white pine	304	27	13	768	331	1,442	(N/A)	1.4
Eastern red cedar	176	11	16	315	54	571	(N/A)	0.6
Paper birch	115	15	17	92	172	411	(N/A)	0.4
Northern red oak	161	18	23	144	108	454	(N/A)	0.5
Hickory	278	39	46	269	287	919	(N/A)	0.9
Northern hackberry	307	29	51	280	235	902	(N/A)	0.9
Honeylocust	321	55	54	417	1,178	2,025	(N/A)	2.0
White ash	185	26	31	168	258	668	(N/A)	0.7
Bur oak	222	24	44	378	152	821	(N/A)	0.8
American elm	300	29	65	334	240	968	(N/A)	1.0
River birch	213	21	39	258	128	659	(N/A)	0.7
Cottonwood	252	29	51	452	161	944	(N/A)	0.9
Mulberry	55	5	8	22	19	108	(N/A)	0.1
Broadleaf Deciduous M	2	0	0	1	5	9	(N/A)	0.0
White oak	41	5	6	33	57	143	(N/A)	0.1
Tulip tree	6	1	1	5	20	34	(N/A)	0.0
Ohio buckeye	9	1	1	4	13	29	(N/A)	0.0
Chinese elm	6	1	1	5	15	27	(N/A)	0.0
Northern catalpa	57	8	9	70	58	202	(N/A)	0.2
Spruce	14	1	1	16	15	48	(N/A)	0.0
Blue spruce	15	1	2	20	21	59	(N/A)	0.1
Japanese tree lilac	1	0	0	0	0	1	(N/A)	0.0
Willow	71	3	14	102	0	190	(N/A)	0.2
Black cherry	38	4	7	18	15	82	(N/A)	0.1
Citywide Total	25,378	3,892	4,299	36,310	30,412	100,291	(N/A)	100.0

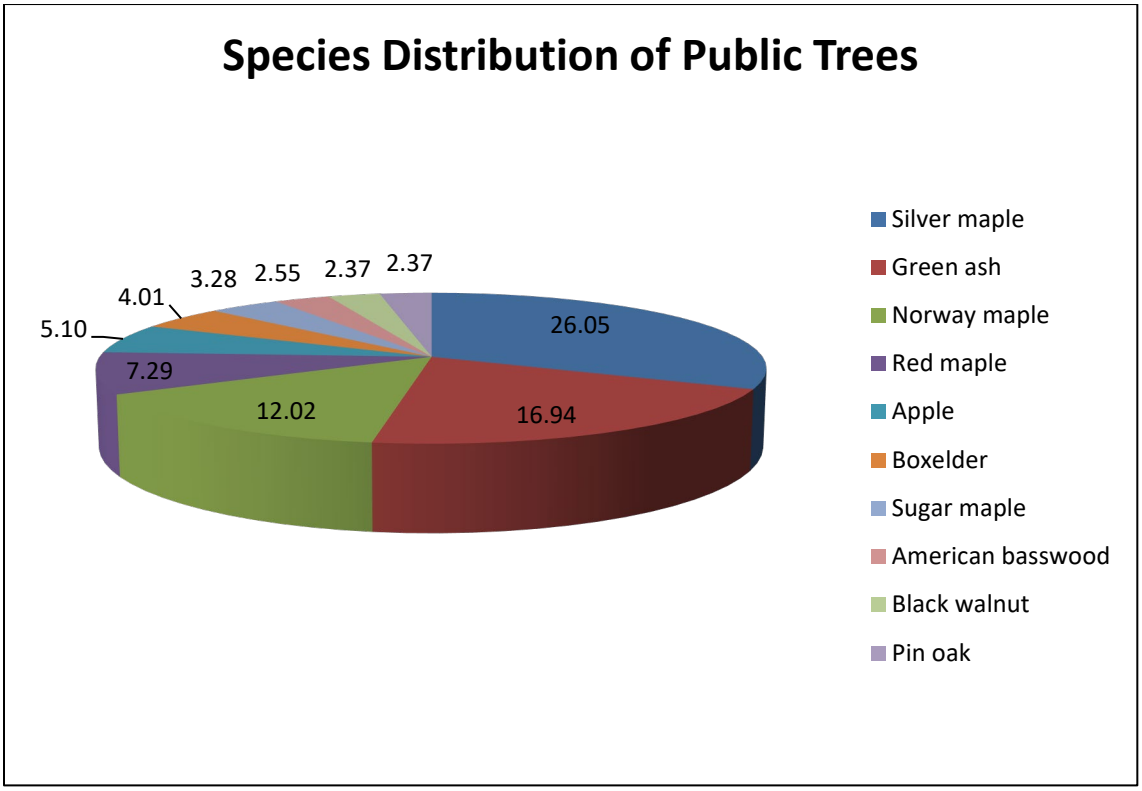


Figure 1: Species Distribution

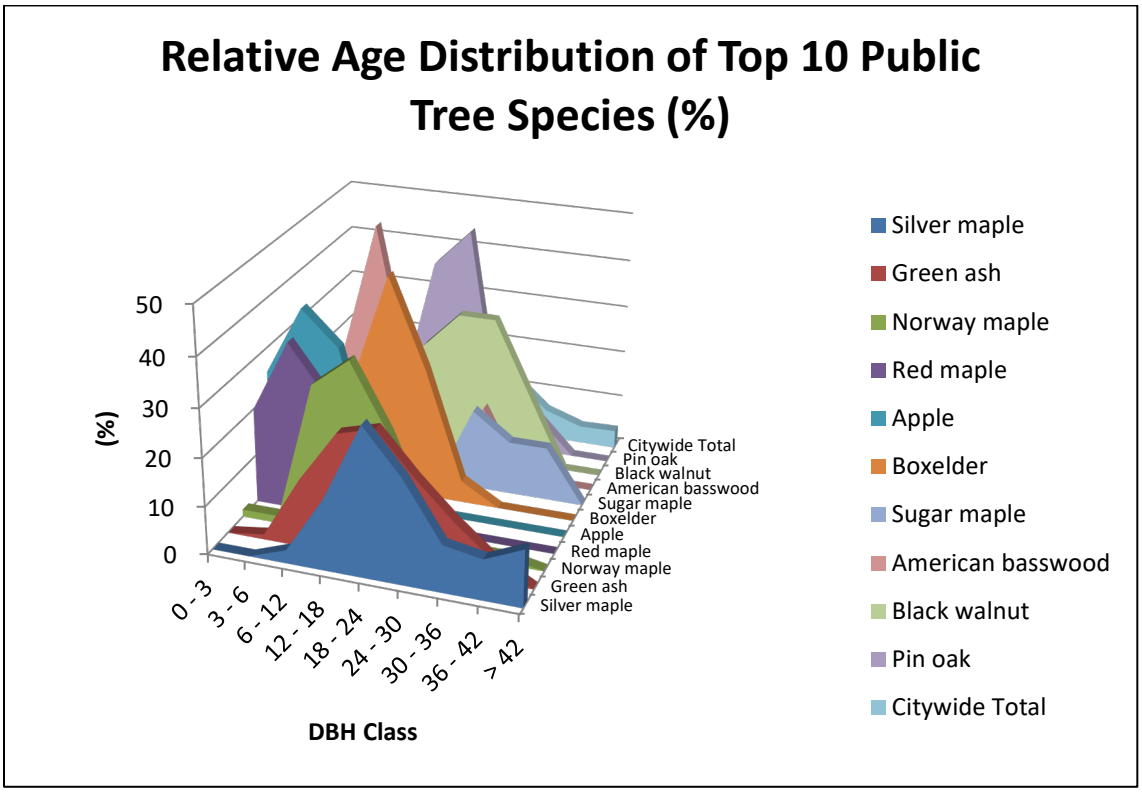


Figure 2: Relative Age Class

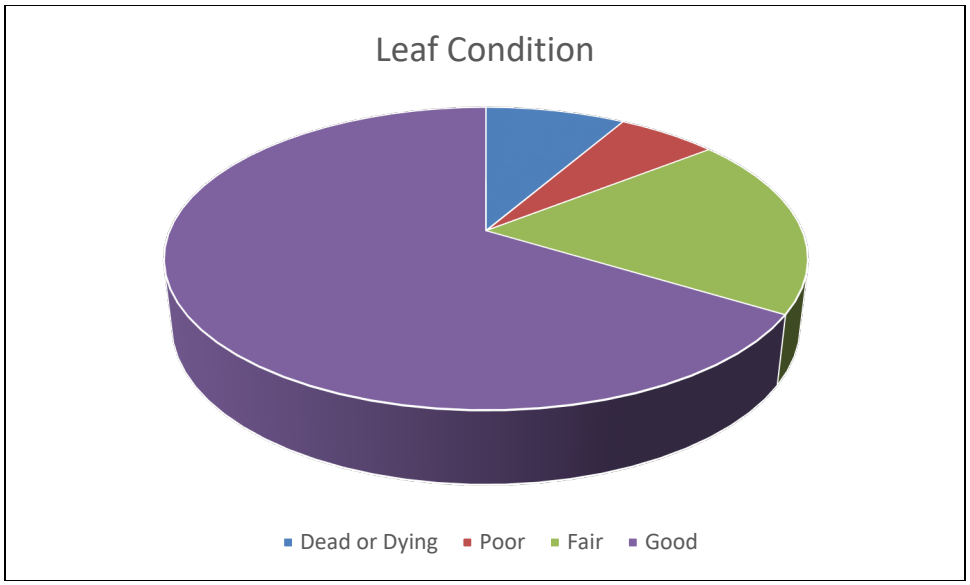


Figure 3: Foliage Condition

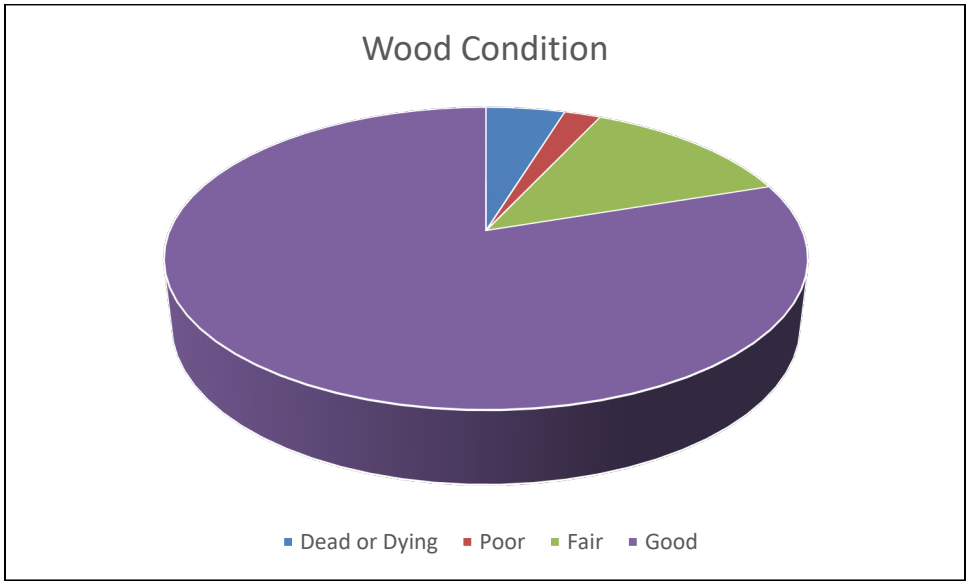


Figure 4: Wood Condition

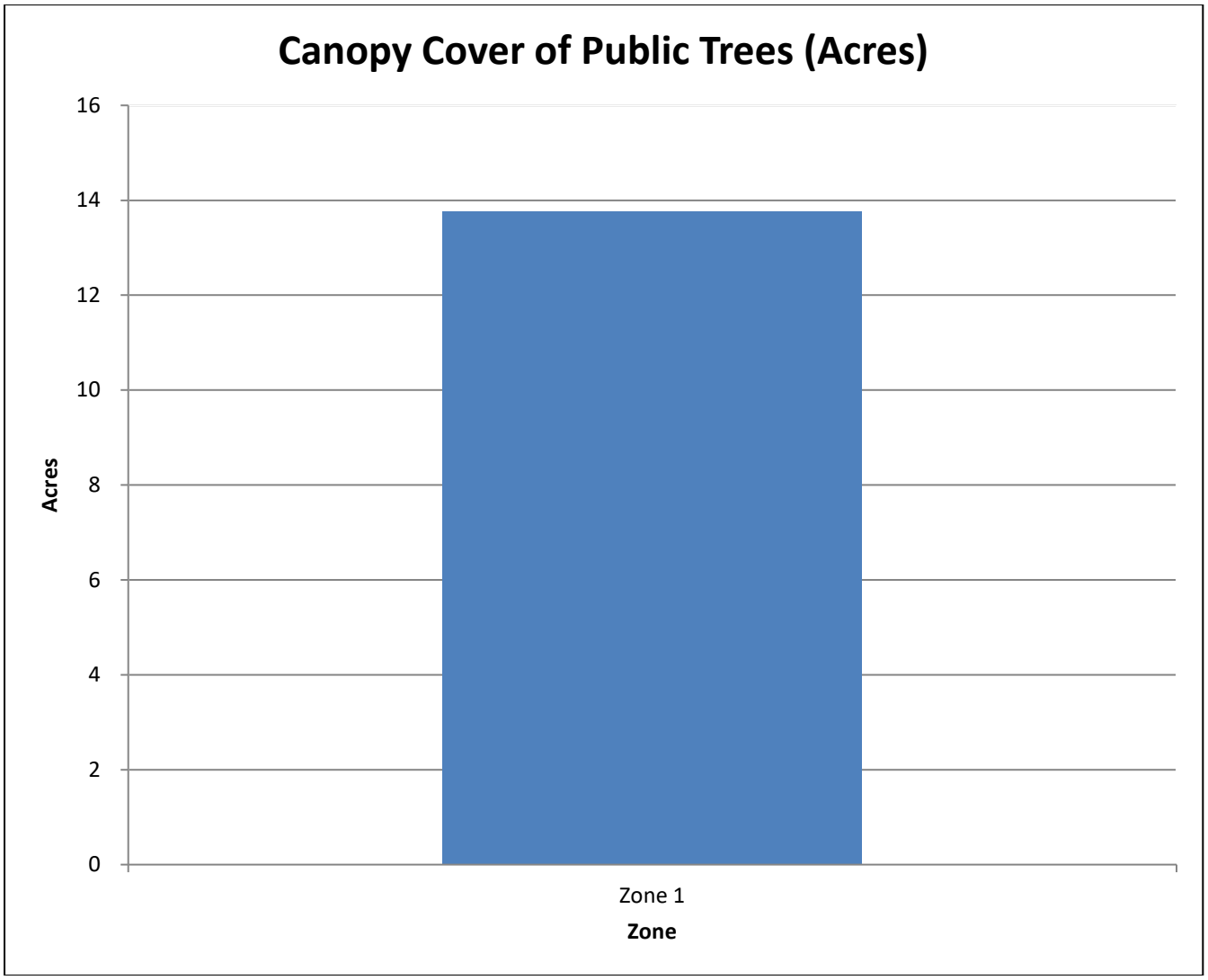


Figure 5: Canopy Cover in Acres

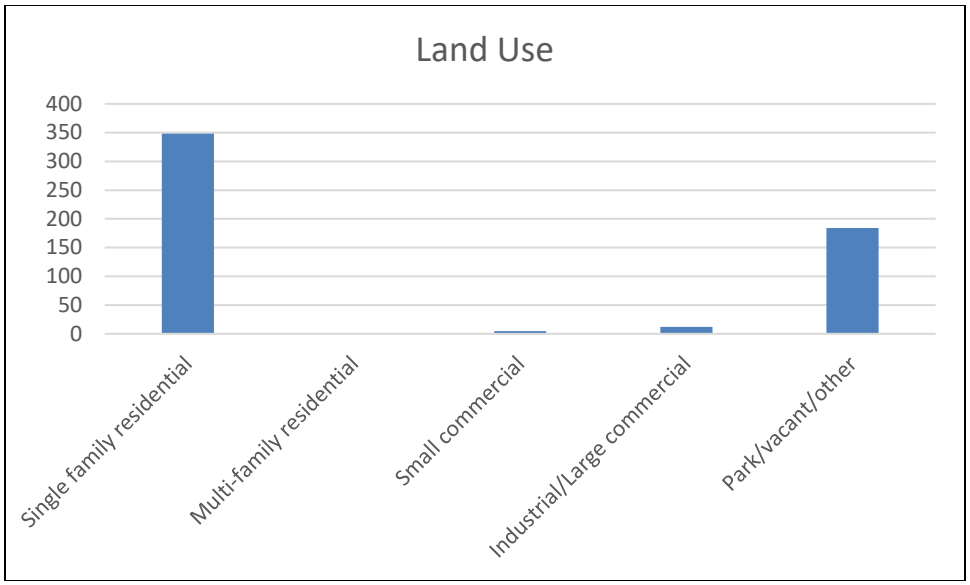


Figure 6: Land Use of city/park trees

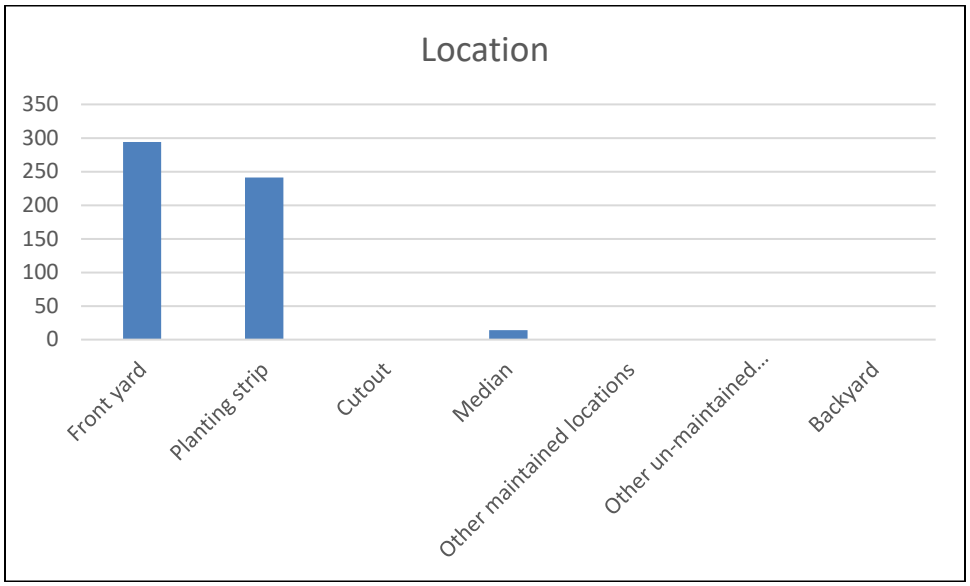


Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

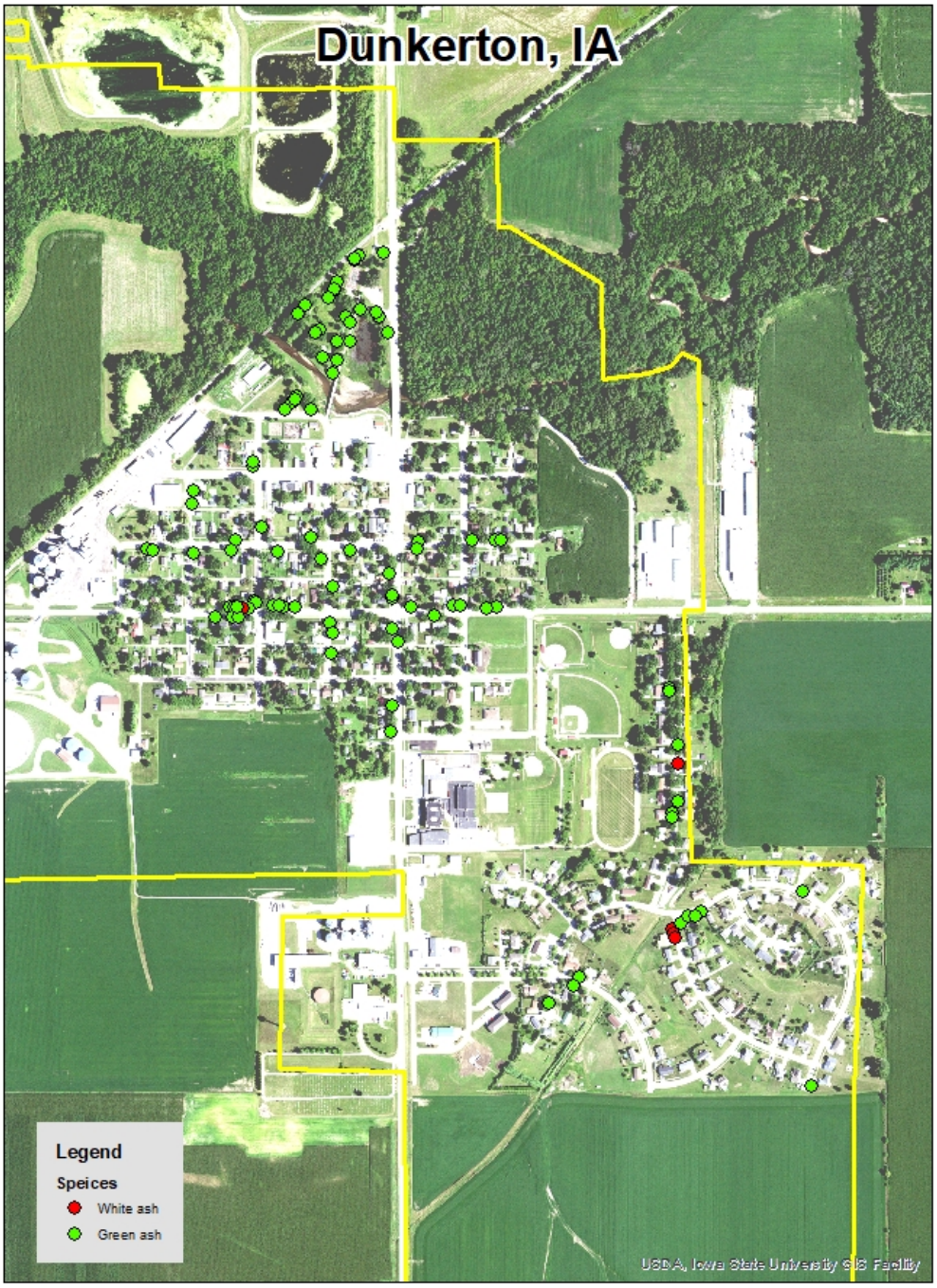


Figure 1: Location of Ash Trees

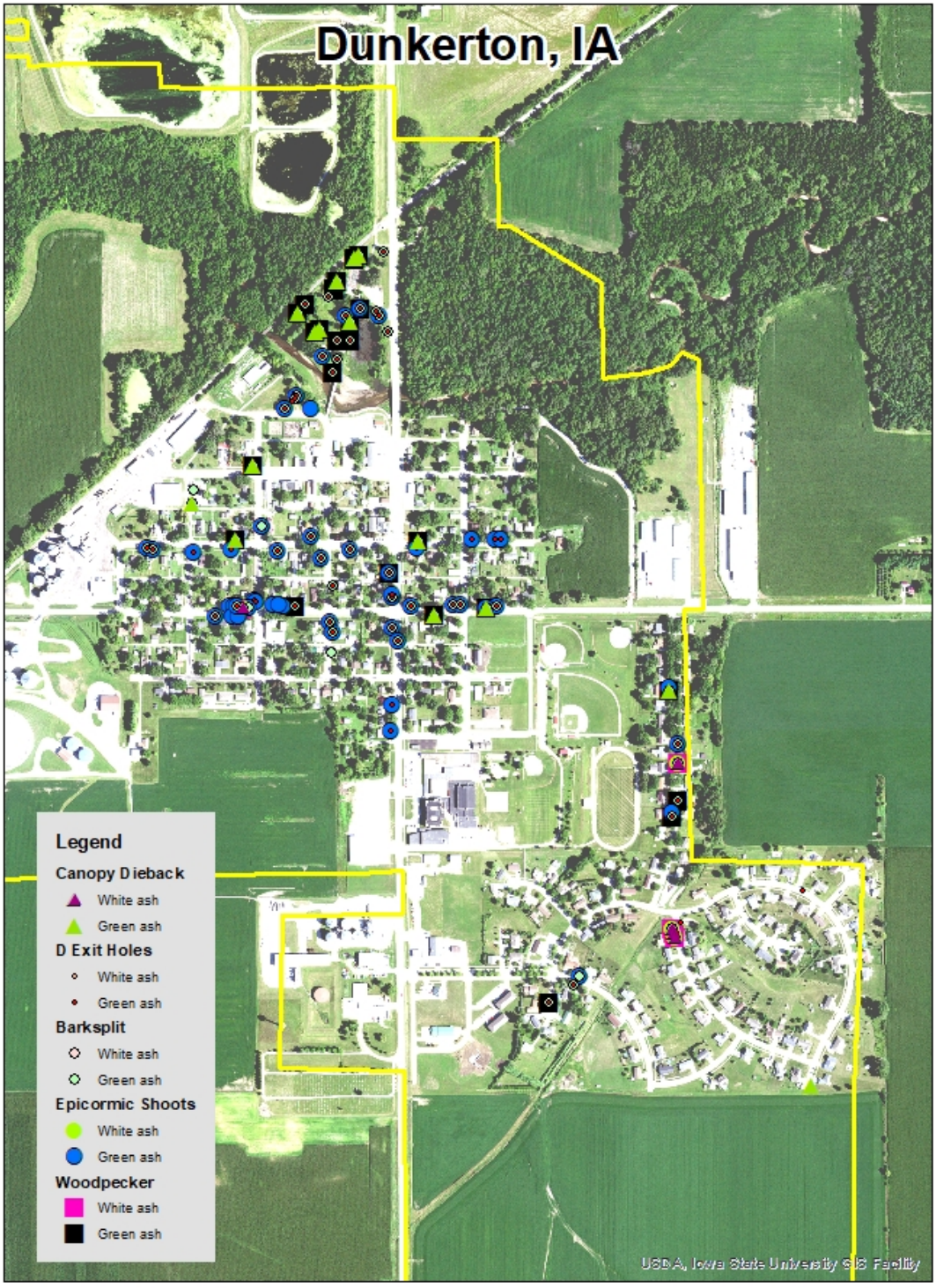


Figure 2: Location of EAB symptoms

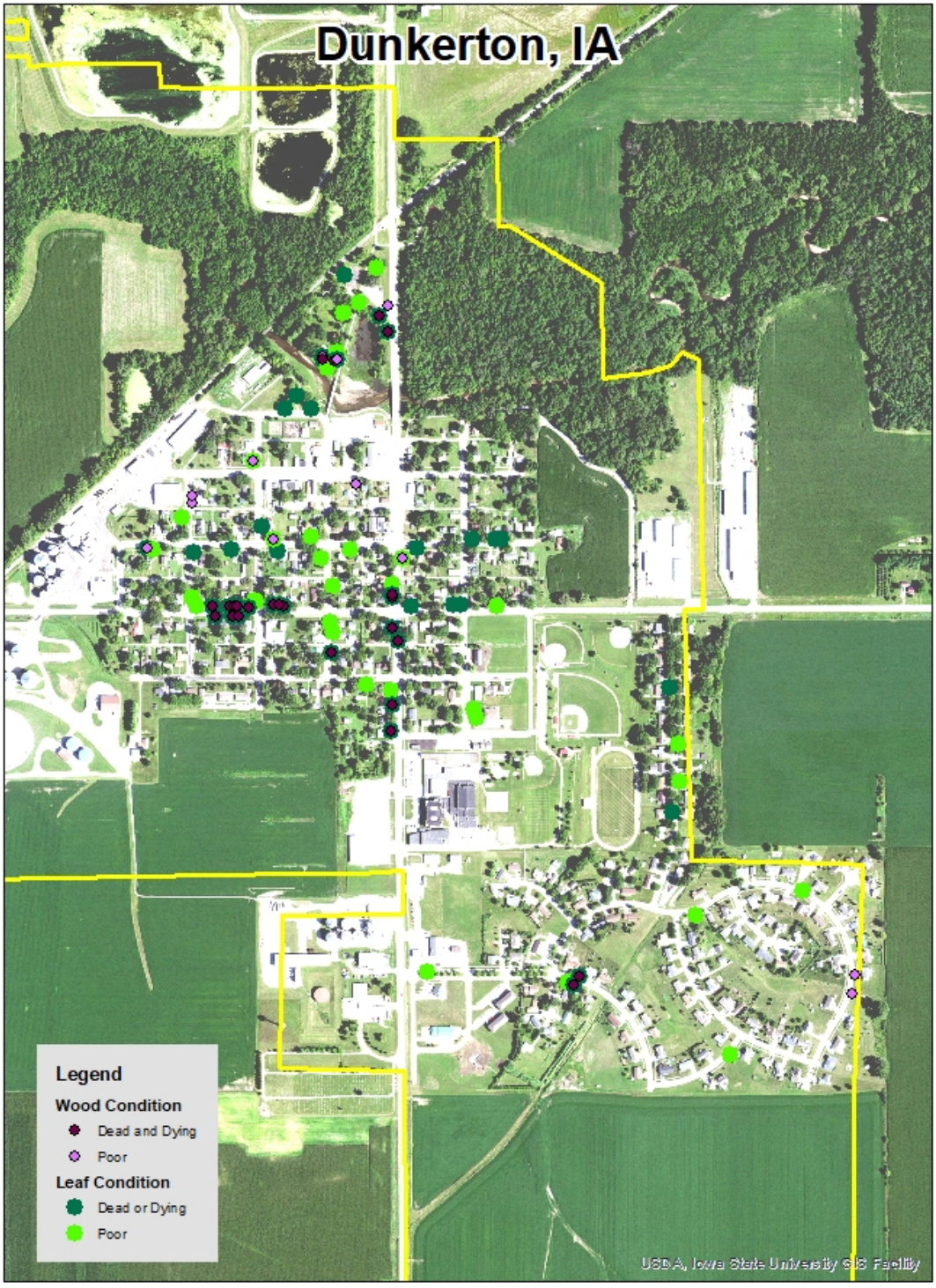


Figure 3: Location of Poor Condition Trees

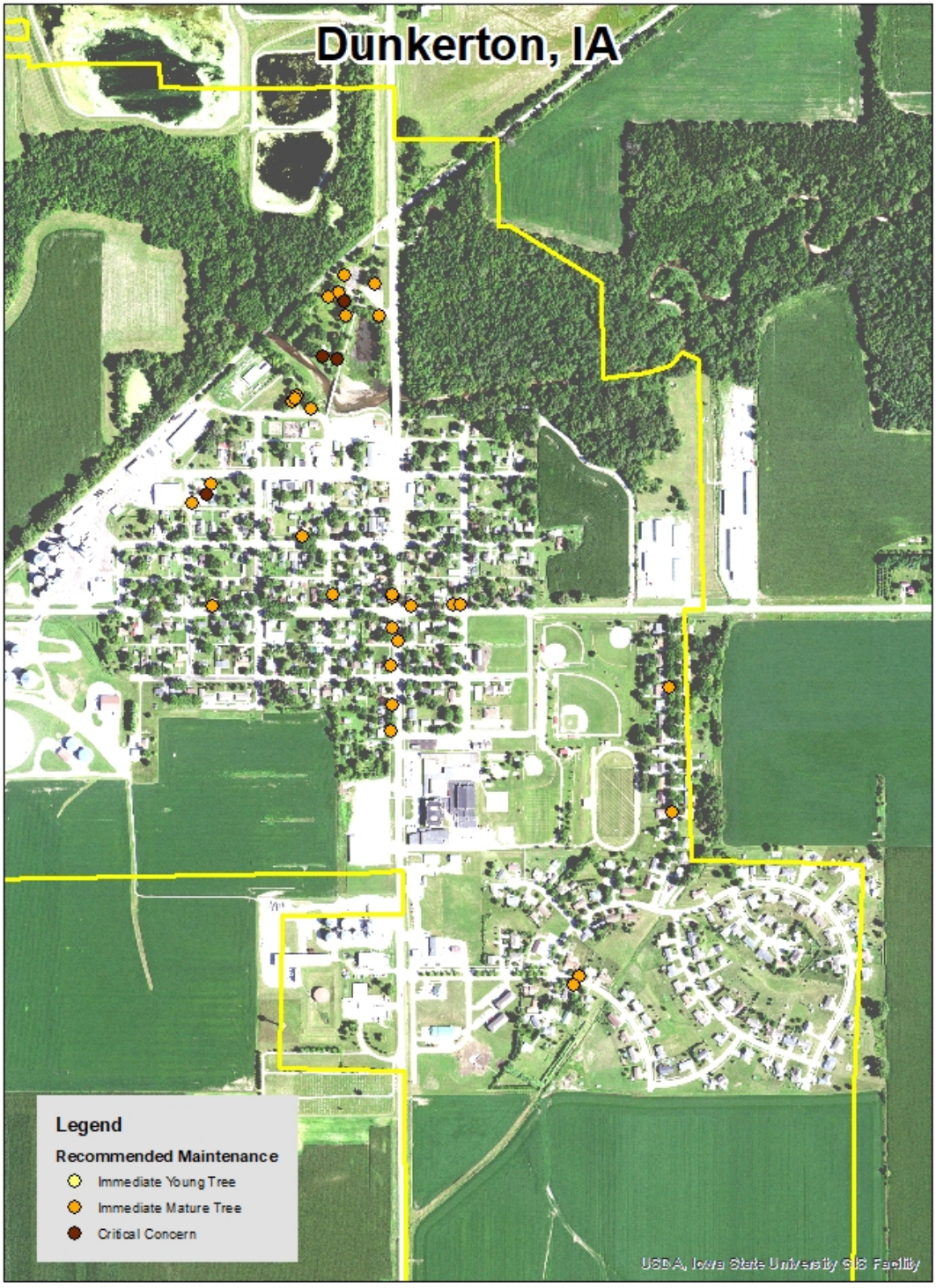


Figure 4: Location of Trees with Recommended Maintenance

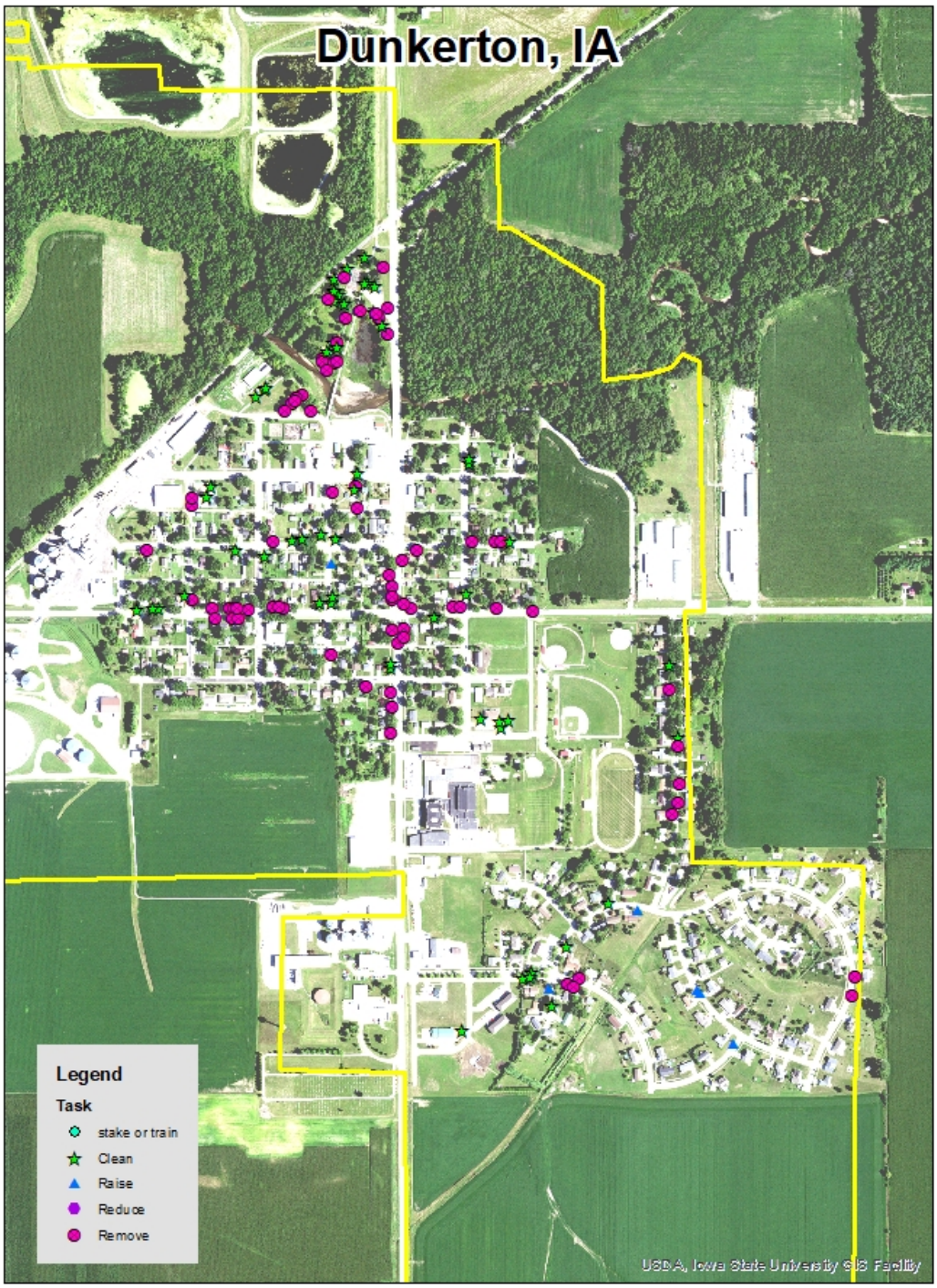


Figure 5: Maintenance Tasks ***City ownership of the trees recommended for removal should be verified prior to any removal***

Appendix C: Dunkerton Tree Ordinances

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 10 feet from the property line.

2. Spacing. Trees shall not be planted on any parking that is less than nine feet in width, or contains less than 81 square feet of exposed soil surface per tree. Trees shall not be planted closer than 20 feet from street intersections (property lines extended) and 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 15 feet above the surface of the street and eight 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 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 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.

151.05 EMERGENCY TREE REMOVAL. The Public Works Director shall have the authority to remove trees that are deemed to pose an immediate risk to health of persons or property.

151.06 INSPECTION AND REMOVAL. The Public Works Director shall inspect or cause to be inspected any trees or shrubs within the City that may need removal for any reason. After full investigation, if the Public Works Director believes that the tree or shrub must be removed, then the Public Works Director shall report to the Council at the next scheduled meeting. At said meeting, the Council shall have the tree or shrub removed under either of the following conditions:

1. Removal from City Property. If it is determined that a tree or shrub needs removal 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 which interfere with the making of improvements to City streets or travel thereon or that the Council otherwise deems necessary for the improvement of City property.

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 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 nuisance to be removed and the cost assessed against the property.

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

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.