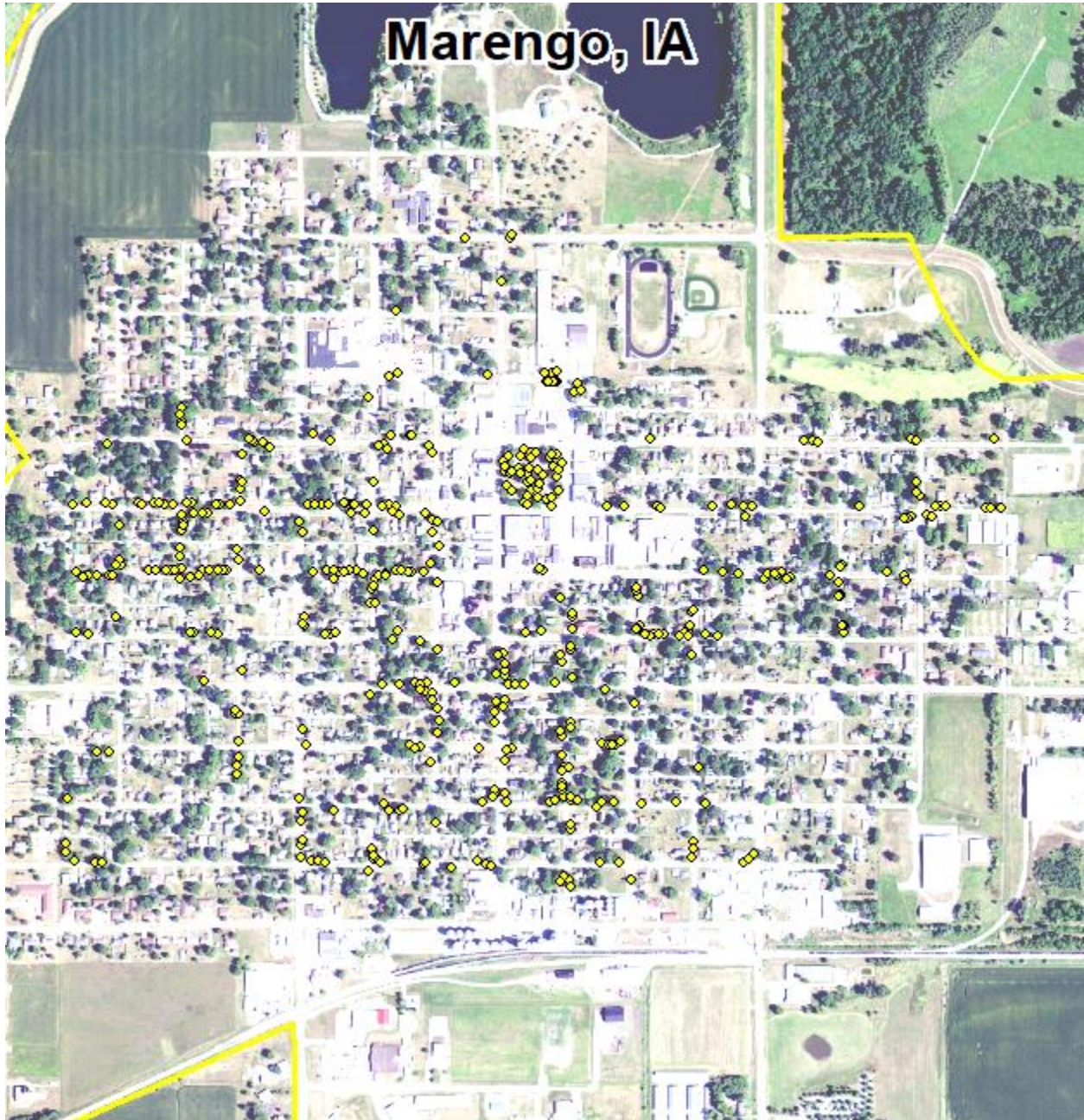


Marengo, IA



2022 Urban Forest Management Plan
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Table of Contents

Executive Summary.....	1
Overview	1
Inventory and Results	1
Recommendations	1
Introduction	2
Inventory.....	2
Inventory Results	3
Annual Benefits.....	3
Annual Energy Benefits.....	3
Annual Stormwater Benefits.....	3
Annual Air Quality Benefits.....	3
Annual Carbon Benefits	3
Annual Aesthetics Benefits	3
Financial Summary of all Benefits.....	3
Forest Structure	4
Species Distribution	4
Age Class	4
Condition: Wood and Foliage	4
Management Needs.....	4
Canopy Cover	4
Land Use and Location.....	5
Changes in Forest Structure Since plan in 2014	5
Recommendations	5
Risk Management	5
Pruning Cycle.....	6
Planting	6
Budget and Emerald Ash Borer Plan.....	7
Maintenance Plan 6 years General Estimates	7
Ash Tree Removal	8
Treatment of Ash Trees	8
EAB Quarantines	8
Wood Disposal	8
Canopy Replacement	8
Postponed Work	8
Monitoring	8
Private Ash Trees	9
Works Cited.....	9
Appendix A: i-Tree Data	10
Table 1: Annual Energy Benefits	10
Table 2: Annual Stormwater Benefits.....	11
Table 3: Annual Air Quality Benefits	12
Table 4: Annual Carbon Stored	13
Table 5: Annual Carbon Sequestered	14
Table 6: Annual Social and Aesthetic Benefits.....	15

Table 7: Summary of Benefits in Dollars.....	16
Figure 1: Species Distribution	17
Figure 2: Relative Age Class	17
.....	18
Figure 3: Foliage Condition	18
Figure 4: Wood Condition.....	18
Figure 5: Canopy Cover in Acres	19
Figure 6: Land Use of city/park trees.....	20
Figure 7: Location of city/park trees.....	20
Appendix B: ArcGIS Mapping	21
Figure 1: Location of Ash Trees.....	21
Figure 2: Location of EAB symptoms	22
Figure 3: Location of Poor Condition Trees	23
Figure 4: Location of Trees with Recommended Maintenance.....	24
Figure 5: Maintenance Tasks *City ownership of the trees recommended for removal should be verified prior to any removal*	25
Appendix C: Marengo Tree Ordinances.....	26

Executive Summary

Overview

This plan was developed to assist the City of Marengo 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 loss of ash due to the Emerald Ash Borer (EAB). EAB has been established in Marengo for multiple years and over 50% of the ash identified in the 2014 inventory have been removed/lost and many of the remaining ash were showing EAB related infestation symptoms in the fall of 2022, and another 37 ash are being considered for removal. Between the 2014 inventory and the 2022 inventory 17% (89) of the public trees were removed/lost in Marengo. Since tree planting is no longer allowed in the public right-of-way the number of public trees along the streets will continue to decline, and eventually the only remaining public trees will be located in the public parks of Marengo. To maintain quality tree canopy cover in the community, management of park trees will be important and promotion of proper tree planting and care on private property will be significantly beneficial.

Inventory and Results

In 2022, 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 429 trees inventoried.

- Marengo's trees provide \$100,393 of benefits annually, an average of \$234 a tree
- There are over 36 species of trees
- The top three genera are: Maple 49%, Oak 14%, and Ash 11%
- 52% of public trees are in need of some type of management
- 59 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 59 trees needing removal, 26 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*](#)
- In this inventory 37 of the 49 remaining ash trees are recommended for removal. Most of the remaining public ash will be dead in the next year or two most likely and will require removal.
- Check any remaining public ash trees with a visual survey yearly
- All trees should be pruned on a routine schedule- one third of the city every other year
- Plant a diverse mix of trees in park areas that do not include: ash, cottonwood, poplar, boxelder, Siberian elm, black locust, Norway maple, callery pear, Amur corktree, Amur maple, and tree-of-heaven (because they can have issues or be invasive).
- With the current budget the declining ash should be removed within the next few years.

Introduction

This plan was developed to assist Marengo with the management, budgeting and future planning of their urban forest. The impact of the Emerald Ash Borer (EAB) infestation and some weather events has caused some public and private tree loss in Marengo. Any remaining ash that is not treated will most likely die within the next few years and require removal. Continued management and planning will be needed in Marengo to manage future tree loss and maintain any remaining public trees.

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

Inventory

In 2022, 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 429 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. Marengo's trees reduce energy related costs by approximately \$25,104 annually (Appendix A, Table 1). These savings are both in Electricity (119.7 MWh) and in Natural Gas (16,345.3 Therms).

Annual Stormwater Benefits

Marengo's trees intercept about 1,444,465 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides \$39,145 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 Marengo, it is estimated that trees remove 1,560 lbs of air pollution (ozone (O₃), particulate matter less than 10 microns (PM₁₀), carbon monoxide (CO), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂)) per year with a net value of \$4,370 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Marengo, trees sequester about 318,822 lbs of carbon a year with an associated value of \$3,674 (Appendix A, Table 5). In addition, the trees store 5,908,653 lbs of carbon, with a yearly benefit of \$44,315 (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. Marengo receives \$28,100 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, Marengo's trees provide \$100,393 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 429 trees in Marengo provide approximately \$234 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Marengo has over 36 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genera is as follows:

Maple	209	49%
Oak	60	14%
Ash	49	11%
Apple (Crab)	16	4%
Honeylocust	15	3%
Hackberry	14	3%
Spruce	11	2%
Black Walnut	11	2%
Callery Pear	9	2%
Linden/Basswood	8	2%
Other		8%

Age Class

Most of Marengo's trees (69%) are 18 inches or greater 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. Marengo'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 Marengo indicate that 66% of the trees are in good health, with 9% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 29% of Marengo'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 20% of the population. This 20% is an estimate of trees that need management follow up.

Management Needs

The following outlines the specific management needs of the street and park trees by number of trees and percent of canopy (Appendix B, Figure 5).

None	205	48%
Crown Cleaning	105	24%
Tree Removal	59	14%
Tree Raising	59	14%
Crown Reduction	1	<1%

Canopy Cover

The total canopy with both private and public trees is 11%, 155 acres. The canopy cover on city own properties included in the Marengo inventory includes approximately 14.5 acres (Appendix A, Figure 5). If the City's Canopy goal is to increase tree canopy by 1%, in 30 years on all lands it is estimated that 33 trees (990 total) need to be planted annually on public and/or private lands.

Land Use and Location

The majority of Marengo’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	87%
Park/vacant/other	11%
Industrial/Large commercial	1%
Multifamily residential	<1%

Location

Planting strip	72%
Front Yard	26%
Cutout (surrounded by pavement)	<1%
Other maintained locations	<1%

Changes in Forest Structure Since plan in 2014

The Emerald Ash Borer (EAB) infestation and some wind events have caused some public and private tree loss in Marengo since 2014. Between the 2014 inventory and the 2022 inventory 17% (89) of the public trees were removed/lost in Marengo. EAB has been established in Marengo for multiple years and over 50% of the public ash identified in the 2014 inventory have been removed/lost and many of the remaining ash were showing EAB related infestation symptoms in the summer of 2022. Also in 2022 numerous (~37) public ash were marked for removal. In recent years the city tree ordinance has been updated and trees are no longer allowed to be planted in the public right-of-way, which means that as trees along the streets are removed they will no longer be allowed to be replaced, and without new planting in parks and on private property the overall canopy cover will decrease within the community.

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

Marengo has 3 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 26 trees 24 inches or over in diameter at 4.5 ft that should be addressed immediately. Please refer to the six year maintenance plan at the end of this section. After all of the critical concern trees are addressed, there should be follow up on the trees marked as needing maintenance. There are a total of 59 trees needing removal.

Poor tree species

After the removal of the critical concern trees, all tree species in poor health should be assessed for removal (Appendix B, Figure 3 & Appendix B, Figure 4). Of the 59 removals, 37 are ash trees. There are a total of 49 remaining ash trees, and 37 of those are identified for removal in the 2022 inventory.

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

Since tree planting is no longer allowed in the public right-of-way it will be very difficult to meet the recommended goal to plant 1.2 trees for every tree removed, since survival rates will not be 100%. Where feasible attempt to plant new trees within the parks in plantable spaces over the next 5 to 10 years. Attempting to replace some of the removed public trees will help promote the benefits of the existing forest in Marengo. There are some community forestry grants available at different times through the Iowa Department of Natural Resources for public tree plantings and information on these programs can be found at <https://www.iowadnr.gov/Conservation/Forestry/Urban-Forestry>.

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 10 to 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 (49%) (Appendix A, Figure 1). Maples should not be planted on public property 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 can have issues or be invasive include: cottonwood, poplar, boxelder, Siberian elm, black locust, Norway maple, callery pear, Amur corktree, Amur maple, or tree-of-heaven. Under section 151.02 of the city ordinance (Appendix C) trees can no longer be planted in the city right-of-way.

Budget and Emerald Ash Borer Plan

Maintenance Plan 6 years General Estimates

Current Budget \$30,000 FY2023

FY 2023

Removal: 43 largest critical concern trees, \$30,000 @Estimate of \$700/tree
Visual Survey for signs and symptoms of EAB

FY 2024

Removal: 16 critical concern trees, \$11,200 @Estimate of \$700/tree
Planting and Replacement: Replace lost trees in parks, \$600
Young Tree Pruning & Maintenance: \$500
Routine trimming: Contract to trim 1/3 of the city trees, \$2,000 to \$5,000
Visual Survey for signs and symptoms of EAB

FY 2025

Removal: Removal of any remaining ash and any other trees of concern, \$9,800 @Estimate of \$700/tree
Planting and Replacement: Replace lost trees in parks, \$600
Young Tree Pruning & Maintenance: \$500
Visual Survey for signs and symptoms of EAB

FY 2026

Removal: Removal of any trees of concern, \$7,000 @Estimate of \$700/tree
Planting and Replacement: Replace lost trees in parks, \$600
Young Tree Pruning & Maintenance: \$500
Routine trimming: Contract to trim 1/3 of the city trees, \$2,000 to \$5,000
Visual Survey for signs and symptoms of EAB

FY 2027

Removal: Removal of any trees of concern, \$4,900 @Estimate of \$700/tree
Planting and Replacement: Replace lost trees in parks, \$600
Young Tree Pruning & Maintenance: \$500

FY 2028

Removal: Removal of any trees of concern, \$4,900 @Estimate of \$700/tree
Planting and Replacement: Replace lost trees in parks, \$600
Young Tree Pruning & Maintenance: \$500
Routine trimming: Contract to trim 1/3 of the city trees, \$2,000 to \$5,000

Ash Tree Removal

Tree removal will be prioritized with dead, dying, risk 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

If chemical treatment has not already been started on an individual tree in Marengo, it is most likely too late for treatment.

EAB Quarantines

There are no longer USDA domestic quarantine regulations for EAB. It should be noted there are individual states (not Iowa) that still have some regulations.

Wood Disposal

There are no longer USDA domestic quarantine regulations for EAB. It should be noted there are individual states (not Iowa) that still have some regulations. Wood waste can be disposed of as you normally would since there are no EAB quarantines in Iowa. With that said attempt to utilize ash wood waste locally.

Canopy Replacement

As budget permits, attempt to increase the amount of trees planted in the public park areas to maintain canopy cover within the community. 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, boxelder, Siberian elm, black locust, Norway maple, callery pear, Amur corktree, Amur maple, or tree-of-heaven.

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 risk.

Monitoring

It is recommended that any remaining public 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. In Marengo 37 of the remaining 49 public ash trees were identified for removal.

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

Proposed Budget Increase

EAB could potentially kill all remaining untreated ash trees in Marengo within the next 2 to 3 years. Depending on how many trees are removed in 2023 there will be continued funding needed to remove any remaining trees of concern in future years. Additionally, it is recommended that Marengo 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. There are also community forestry grants available at different times through the Iowa Department of Natural Resources and information on these programs can be found at <https://www.iowadnr.gov/Conservation/Forestry/Urban-Forestry>.

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Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Marengo

Annual Energy Benefits of Public Trees

2/1/2023

Species	Total Electricity (MWh)	Electricity (\$)	Total Natural Gas (Therms)	Natural Gas (\$)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Silver maple	31.7	2,408	4,197.1	4,113	6,521	(N/A)	20.5	26.0	74.10
Norway maple	17.9	1,358	2,607.8	2,556	3,914	(N/A)	16.6	15.6	55.12
Green ash	12.1	922	1,654.0	1,621	2,543	(N/A)	10.0	10.1	59.14
Sugar maple	10.9	828	1,469.9	1,441	2,269	(N/A)	7.7	9.0	68.76
Pin oak	9.8	747	1,281.1	1,255	2,002	(N/A)	5.6	8.0	83.41
Apple	1.4	106	215.1	211	317	(N/A)	3.7	1.3	19.83
Northern pin oak	4.5	344	661.7	648	993	(N/A)	3.7	4.0	62.04
Honeylocust	4.7	360	620.0	608	967	(N/A)	3.5	3.9	64.49
Northern hackberry	5.0	381	716.9	703	1,083	(N/A)	3.3	4.3	77.37
Northern red oak	2.9	222	406.0	398	620	(N/A)	3.0	2.5	47.72
Black walnut	3.0	226	406.7	399	625	(N/A)	2.6	2.5	56.81
Red maple	2.5	188	306.7	301	489	(N/A)	2.3	1.9	48.86
Callery pear	1.8	136	267.2	262	398	(N/A)	2.1	1.6	44.24
Blue spruce	0.6	43	81.4	80	123	(N/A)	1.6	0.5	17.57
Maple	1.1	83	136.0	133	216	(N/A)	1.4	0.9	36.07
White ash	1.0	78	126.4	124	202	(N/A)	1.2	0.8	40.41
American basswood	1.0	76	143.6	141	217	(N/A)	0.9	0.9	54.13
Littleleaf linden	0.8	63	105.6	104	166	(N/A)	0.9	0.7	41.61
Oak	0.3	25	41.2	40	66	(N/A)	0.7	0.3	21.84
Siberian elm	1.0	75	129.0	126	201	(N/A)	0.7	0.8	67.02
White mulberry	0.3	21	44.5	44	64	(N/A)	0.5	0.3	32.17
Ohio buckeye	0.3	26	46.3	45	71	(N/A)	0.5	0.3	35.62
Spruce	0.1	9	19.0	19	27	(N/A)	0.5	0.1	13.58
White oak	0.4	27	50.5	50	77	(N/A)	0.5	0.3	38.36
Ginkgo	0.2	18	28.8	28	46	(N/A)	0.5	0.2	23.09
Northern catalpa	0.5	36	54.0	53	88	(N/A)	0.5	0.4	44.23
Broadleaf Deciduous Small	0.1	6	13.5	13	19	(N/A)	0.5	0.1	9.53
River birch	0.4	28	56.4	55	83	(N/A)	0.5	0.3	41.58
Broadleaf Deciduous Large	0.7	53	97.1	95	148	(N/A)	0.5	0.6	74.17
Red pine	0.3	22	39.4	39	61	(N/A)	0.5	0.2	30.47
Bur oak	0.4	27	51.8	51	78	(N/A)	0.5	0.3	38.98
Southern magnolia	0.0	1	2.8	3	4	(N/A)	0.2	0.0	3.94
Eastern cottonwood	0.4	33	59.0	58	91	(N/A)	0.2	0.4	91.02
Amur maple	0.2	15	31.6	31	46	(N/A)	0.2	0.2	46.14
American sycamore	0.4	33	59.0	58	91	(N/A)	0.2	0.4	91.02
Cherry plum	0.0	2	3.8	4	5	(N/A)	0.2	0.0	5.40
Black spruce	0.0	0	1.2	1	2	(N/A)	0.2	0.0	1.65
Norway spruce	0.1	4	9.5	9	14	(N/A)	0.2	0.1	13.58
Elm	0.3	20	38.1	37	57	(N/A)	0.2	0.2	57.32
Eastern red cedar	0.0	0	0.7	1	1	(N/A)	0.2	0.0	0.93
Lilac	0.0	0	0.6	1	1	(N/A)	0.2	0.0	0.87
Ash	0.3	20	39.6	39	59	(N/A)	0.2	0.2	58.69
Eastern redbud	0.2	14	24.7	24	38	(N/A)	0.2	0.2	38.13
Total	119.7	9,086	16,345.3	16,018	25,104	(N/A)	100.0	100.0	58.52

Table 2: Annual Stormwater Benefits

Marengo

Annual Stormwater Benefits of Public Trees

2/1/2023

Species	Total rainfall interception (Gal)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Silver maple	490,679	13,297	(N/A)	20.5	34.0	151.11
Norway maple	175,364	4,752	(N/A)	16.6	12.1	66.93
Green ash	133,552	3,619	(N/A)	10.0	9.2	84.17
Sugar maple	141,994	3,848	(N/A)	7.7	9.8	116.61
Pin oak	137,448	3,725	(N/A)	5.6	9.5	155.20
Apple	5,886	160	(N/A)	3.7	0.4	9.97
Northern pin oak	49,162	1,332	(N/A)	3.7	3.4	83.27
Honeylocust	55,023	1,491	(N/A)	3.5	3.8	99.41
Northern hackberry	51,985	1,409	(N/A)	3.3	3.6	100.63
Northern red oak	31,717	860	(N/A)	3.0	2.2	66.12
Black walnut	29,770	807	(N/A)	2.6	2.1	73.34
Red maple	17,586	477	(N/A)	2.3	1.2	47.66
Callery pear	15,140	410	(N/A)	2.1	1.0	45.59
Blue spruce	6,866	186	(N/A)	1.6	0.5	26.58
Maple	7,828	212	(N/A)	1.4	0.5	35.35
White ash	7,778	211	(N/A)	1.2	0.5	42.15
American basswood	8,739	237	(N/A)	0.9	0.6	59.21
Littleleaf linden	6,145	167	(N/A)	0.9	0.4	41.63
Oak	2,091	57	(N/A)	0.7	0.1	18.89
Siberian elm	12,539	340	(N/A)	0.7	0.9	113.27
White mulberry	1,439	39	(N/A)	0.5	0.1	19.49
Ohio buckeye	1,995	54	(N/A)	0.5	0.1	27.03
Spruce	1,191	32	(N/A)	0.5	0.1	16.14
White oak	4,115	112	(N/A)	0.5	0.3	55.75
Ginkgo	1,019	28	(N/A)	0.5	0.1	13.81
Northern catalpa	2,931	79	(N/A)	0.5	0.2	39.72
Broadleaf Deciduous Small	272	7	(N/A)	0.5	0.0	3.68
River birch	3,065	83	(N/A)	0.5	0.2	41.53
Broadleaf Deciduous Large	9,830	266	(N/A)	0.5	0.7	133.19
Red pine	5,938	161	(N/A)	0.5	0.4	80.46
Bur oak	3,199	87	(N/A)	0.5	0.2	43.34
Southern magnolia	56	2	(N/A)	0.2	0.0	1.53
Eastern cottonwood	7,239	196	(N/A)	0.2	0.5	196.17
Amur maple	1,174	32	(N/A)	0.2	0.1	31.82
American sycamore	7,239	196	(N/A)	0.2	0.5	196.17
Cherry plum	69	2	(N/A)	0.2	0.0	1.86
Black spruce	38	1	(N/A)	0.2	0.0	1.03
Norway spruce	596	16	(N/A)	0.2	0.0	16.14
Elm	2,591	70	(N/A)	0.2	0.2	70.21
Eastern red cedar	24	1	(N/A)	0.2	0.0	0.66
Lilac	7	0	(N/A)	0.2	0.0	0.20
Ash	2,479	67	(N/A)	0.2	0.2	67.19
Eastern redbud	667	18	(N/A)	0.2	0.0	18.06
Citywide total	1,444,465	39,145	(N/A)	100.0	100.0	91.25

Table 3: Annual Air Quality Benefits

Marengo

Annual Air Quality Benefits of Public Trees

2/1/2023

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	90.7	15.4	43.9	4.0	488	149.7	21.9	20.9	143.5	936	-47.5	-178	442.7	1,246 (N/A)	20.5	14.16
Norway maple	36.7	6.3	17.9	1.6	198	87.0	12.6	11.9	81.2	538	-8.5	-32	246.7	704 (N/A)	16.6	9.92
Green ash	16.8	2.7	8.0	0.8	90	57.9	8.4	8.0	55.1	361	0.0	0	157.8	451 (N/A)	10.0	10.48
Sugar maple	20.1	3.4	9.7	0.9	108	51.8	7.6	7.2	49.4	324	-15.6	-58	134.7	373 (N/A)	7.7	11.31
Pin oak	27.6	4.8	13.7	1.2	150	46.3	6.8	6.5	44.5	290	-50.3	-188	101.3	252 (N/A)	5.6	10.48
Apple	1.7	0.3	0.8	0.1	9	6.9	1.0	0.9	6.4	42	0.0	0	18.0	52 (N/A)	3.7	3.22
Northern pin oak	10.9	1.9	5.3	0.5	59	22.0	3.2	3.0	20.6	136	-2.5	-9	64.9	186 (N/A)	3.7	11.61
Honeylocust	10.8	1.8	4.9	0.5	57	22.3	3.3	3.1	21.5	140	-8.6	-32	59.6	165 (N/A)	3.5	10.98
Northern hackberry	8.9	1.5	4.4	0.4	48	24.3	3.5	3.3	22.7	150	0.0	0	69.1	199 (N/A)	3.3	14.18
Northern red oak	6.9	1.2	3.3	0.3	37	14.0	2.0	1.9	13.3	87	-9.9	-37	33.1	87 (N/A)	3.0	6.70
Black walnut	3.3	0.5	1.7	0.1	18	14.2	2.1	2.0	13.5	89	0.0	0	37.5	107 (N/A)	2.6	9.70
Red maple	3.8	0.7	1.8	0.2	20	11.5	1.7	1.6	11.2	73	-1.4	-5	31.2	88 (N/A)	2.3	8.80
Callery pear	2.8	0.5	1.4	0.1	15	8.8	1.3	1.2	8.1	54	-0.7	-3	23.5	67 (N/A)	2.1	7.43
Blue spruce	0.7	0.1	0.7	0.1	5	2.7	0.4	0.4	2.6	17	-2.3	-9	5.4	13 (N/A)	1.6	1.92
Maple	1.7	0.3	0.8	0.1	9	5.1	0.8	0.7	5.0	32	-0.6	-2	13.8	39 (N/A)	1.4	6.51
White ash	0.6	0.1	0.4	0.0	4	4.8	0.7	0.7	4.7	30	0.0	0	11.9	34 (N/A)	1.2	6.73
American basswood	1.0	0.2	0.5	0.0	5	4.8	0.7	0.7	4.5	30	-0.9	-3	11.6	32 (N/A)	0.9	8.01
Littleleaf linden	0.9	0.1	0.5	0.0	5	3.9	0.6	0.5	3.8	24	-0.5	-2	9.8	28 (N/A)	0.9	6.88
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)	0.7	3.50
Siberian elm	2.5	0.4	1.2	0.1	13	4.6	0.7	0.6	4.5	29	0.0	0	14.7	42 (N/A)	0.7	14.15
White mulberry	0.5	0.1	0.2	0.0	3	1.4	0.2	0.2	1.2	8	0.0	0	3.8	11 (N/A)	0.5	5.45
Ohio buckeye	0.3	0.0	0.2	0.0	2	1.6	0.2	0.2	1.5	10	-0.1	0	4.0	11 (N/A)	0.5	5.69
Spruce	0.1	0.0	0.1	0.0	1	0.6	0.1	0.1	0.5	3	-0.3	-1	1.1	3 (N/A)	0.5	1.48
White oak	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)	0.5	6.67
Ginkgo	0.2	0.0	0.1	0.0	1	1.1	0.2	0.2	1.1	7	-0.1	0	2.7	8 (N/A)	0.5	3.78
Northern catalpa	0.2	0.0	0.1	0.0	1	2.1	0.3	0.3	2.1	14	0.0	0	5.3	15 (N/A)	0.5	7.42
Broadleaf Deciduous Small	0.0	0.0	0.0	0.0	0	0.4	0.1	0.1	0.4	2	0.0	0	0.9	3 (N/A)	0.5	1.33
River birch	0.5	0.1	0.3	0.0	3	1.8	0.3	0.2	1.7	11	-0.1	-1	4.8	14 (N/A)	0.5	6.81
Broadleaf Deciduous Large	1.4	0.2	0.6	0.1	7	3.4	0.5	0.5	3.2	21	0.0	0	9.9	28 (N/A)	0.5	14.19
Red pine	0.7	0.1	0.6	0.1	5	1.4	0.2	0.2	1.3	9	-2.8	-10	1.8	3 (N/A)	0.5	1.45
Bur oak	0.3	0.0	0.2	0.0	2	1.7	0.3	0.2	1.6	11	0.0	0	4.4	12 (N/A)	0.5	6.17
Southern magnolia	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	0	0.0	0	0.2	0 (N/A)	0.2	0.47
Eastern cottonwood	1.2	0.2	0.5	0.1	6	2.1	0.3	0.3	2.0	13	0.0	0	6.6	19 (N/A)	0.2	19.04
Amur maple	0.4	0.1	0.2	0.0	2	1.0	0.1	0.1	0.9	6	0.0	0	2.9	8 (N/A)	0.2	8.35
American sycamore	1.2	0.2	0.5	0.1	6	2.1	0.3	0.3	2.0	13	0.0	0	6.6	19 (N/A)	0.2	19.04
Cherry plum	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	0.71
Black spruce	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)	0.2	0.18
Norway 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
Elm	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
Eastern red cedar	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	0.09
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
Ash	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)	0.2	10.16
Eastern redbud	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	257.3	43.7	125.4	11.6	1,386	570.8	83.1	79.3	542.3	3,557	-152.8	-573	1,560.8	4,370 (N/A)	100.0	10.19

Table 4: Annual Carbon Stored

Marengo

Stored CO2 Benefits of Public Trees

2/1/2023

Species	Total Stored CO2 (lbs)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Silver maple	2,175,265	16,314	(N/A)	20.5	36.8	185.39
Norway maple	604,483	4,534	(N/A)	16.6	10.2	63.85
Green ash	552,129	4,141	(N/A)	10.0	9.3	96.30
Sugar maple	585,838	4,394	(N/A)	7.7	9.9	133.14
Pin oak	776,302	5,822	(N/A)	5.6	13.1	242.59
Apple	27,473	206	(N/A)	3.7	0.5	12.88
Northern pin oak	180,811	1,356	(N/A)	3.7	3.1	84.76
Honeylocust	140,057	1,050	(N/A)	3.5	2.4	70.03
Northern hackberry	137,174	1,029	(N/A)	3.3	2.3	73.49
Northern red oak	152,571	1,144	(N/A)	3.0	2.6	88.02
Black walnut	109,478	821	(N/A)	2.6	1.9	74.64
Red maple	42,360	318	(N/A)	2.3	0.7	31.77
Callery pear	45,770	343	(N/A)	2.1	0.8	38.14
Blue spruce	3,657	27	(N/A)	1.6	0.1	3.92
Maple	19,053	143	(N/A)	1.4	0.3	23.82
White ash	17,870	134	(N/A)	1.2	0.3	26.81
American basswood	35,270	265	(N/A)	0.9	0.6	66.13
Littleleaf linden	19,003	143	(N/A)	0.9	0.3	35.63
Oak	4,719	35	(N/A)	0.7	0.1	11.80
Siberian elm	61,901	464	(N/A)	0.7	1.0	154.75
White mulberry	7,651	57	(N/A)	0.5	0.1	28.69
Ohio buckeye	4,725	35	(N/A)	0.5	0.1	17.72
Spruce	513	4	(N/A)	0.5	0.0	1.93
White oak	15,958	120	(N/A)	0.5	0.3	59.84
Ginkgo	2,261	17	(N/A)	0.5	0.0	8.48
Northern catalpa	7,344	55	(N/A)	0.5	0.1	27.54
Broadleaf Deciduous	922	7	(N/A)	0.5	0.0	3.46
River birch	9,046	68	(N/A)	0.5	0.2	33.92
Broadleaf Deciduous	47,716	358	(N/A)	0.5	0.8	178.94
Red pine	6,685	50	(N/A)	0.5	0.1	25.07
Bur oak	9,492	71	(N/A)	0.5	0.2	35.60
Southern magnolia	3	0	(N/A)	0.2	0.0	0.02
Eastern cottonwood	39,259	294	(N/A)	0.2	0.7	294.44
Amur maple	6,743	51	(N/A)	0.2	0.1	50.57
American sycamore	39,259	294	(N/A)	0.2	0.7	294.44
Cherry plum	178	1	(N/A)	0.2	0.0	1.33
Black spruce	2	0	(N/A)	0.2	0.0	0.02
Norway spruce	257	2	(N/A)	0.2	0.0	1.93
Elm	8,458	63	(N/A)	0.2	0.1	63.43
Eastern red cedar	3	0	(N/A)	0.2	0.0	0.02
Lilac	14	0	(N/A)	0.2	0.0	0.10
Ash	7,945	60	(N/A)	0.2	0.1	59.59
Eastern redbud	3,037	23	(N/A)	0.2	0.1	22.78
Citywide total	5,908,653	44,315	(N/A)	100.0	100.0	103.30

Table 5: Annual Carbon Sequestered

Marengo

Annual CO₂ Benefits of Public Trees

2/1/2023

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	147,547	1,107	-10,441	-368	-81	53,211	399	189,948	1,425 (N/A)	20.5	38.8	16.19
Norway maple	24,221	182	-2,904	-191	-23	30,012	225	51,137	384 (N/A)	16.6	10.4	5.40
Green ash	28,175	211	-2,650	-126	-21	20,376	153	45,775	343 (N/A)	10.0	9.3	7.98
Sugar maple	27,322	205	-2,812	-122	-22	18,309	137	42,696	320 (N/A)	7.7	8.7	9.70
Pin oak	32,633	245	-3,726	-112	-29	16,498	124	45,292	340 (N/A)	5.6	9.2	14.15
Apple	2,481	19	-132	-20	-1	2,352	18	4,681	35 (N/A)	3.7	1.0	2.19
Northern pin oak	1,590	12	-868	-57	-7	7,605	57	8,270	62 (N/A)	3.7	1.7	3.88
Honeylocust	10,022	75	-673	-36	-5	7,952	60	17,265	129 (N/A)	3.5	3.5	8.63
Northern hackberry	6,748	51	-658	-49	-5	8,410	63	14,451	108 (N/A)	3.3	2.9	7.74
Northern red oak	1,319	10	-732	-38	-6	4,917	37	5,465	41 (N/A)	3.0	1.1	3.15
Black walnut	6,866	51	-525	-30	-4	5,003	38	11,313	85 (N/A)	2.6	2.3	7.71
Red maple	4,471	34	-203	-20	-2	4,155	31	8,403	63 (N/A)	2.3	1.7	6.30
Callery pear	3,279	25	-220	-19	-2	3,011	23	6,051	45 (N/A)	2.1	1.2	5.04
Blue spruce	374	3	-18	-10	0	957	7	1,304	10 (N/A)	1.6	0.3	1.40
Maple	2,414	18	-92	-9	-1	1,837	14	4,150	31 (N/A)	1.4	0.8	5.19
White ash	2,196	16	-86	-9	-1	1,727	13	3,829	29 (N/A)	1.2	0.8	5.74
American basswood	2,435	18	-169	-11	-1	1,676	13	3,930	29 (N/A)	0.9	0.8	7.37
Littleleaf linden	2,332	17	-91	-9	-1	1,390	10	3,623	27 (N/A)	0.9	0.7	6.79
Oak	657	5	-23	-3	0	556	4	1,187	9 (N/A)	0.7	0.2	2.97
Siberian elm	1,941	15	-297	-11	-2	1,649	12	3,281	25 (N/A)	0.7	0.7	8.20
White mulberry	114	1	-37	-5	0	459	3	531	4 (N/A)	0.5	0.1	1.99
Ohio buckeye	610	5	-23	-3	0	571	4	1,155	9 (N/A)	0.5	0.2	4.33
Spruce	105	1	-2	-2	0	189	1	289	2 (N/A)	0.5	0.1	1.08
White oak	931	7	-77	-4	-1	601	5	1,451	11 (N/A)	0.5	0.3	5.44
Ginkgo	192	1	-11	-3	0	397	3	574	4 (N/A)	0.5	0.1	2.15
Northern catalpa	891	7	-35	-4	0	786	6	1,637	12 (N/A)	0.5	0.3	6.14
Broadleaf Deciduous Smal	123	1	-4	-1	0	130	1	246	2 (N/A)	0.5	0.1	0.92
River birch	694	5	-43	-4	0	616	5	1,262	9 (N/A)	0.5	0.3	4.73
Broadleaf Deciduous Larg	1,572	12	-229	-8	-2	1,176	9	2,511	19 (N/A)	0.5	0.5	9.42
Red pine	375	3	-32	-5	0	493	4	830	6 (N/A)	0.5	0.2	3.11
Bur oak	868	7	-46	-4	0	600	5	1,419	11 (N/A)	0.5	0.3	5.32
Southern magnolia	1	0	0	0	0	26	0	27	0 (N/A)	0.2	0.0	0.20
Eastern cottonwood	912	7	-188	-5	-1	734	6	1,453	11 (N/A)	0.2	0.3	10.90
Amur maple	0	0	-32	-4	0	335	3	299	2 (N/A)	0.2	0.1	2.24
American sycamore	912	7	-188	-5	-1	734	6	1,453	11 (N/A)	0.2	0.3	10.90
Cherry plum	38	0	-1	-1	0	37	0	74	1 (N/A)	0.2	0.0	0.55
Black spruce	2	0	0	0	0	10	0	12	0 (N/A)	0.2	0.0	0.09
Norway spruce	53	0	-1	-1	0	94	1	145	1 (N/A)	0.2	0.0	1.08
Elm	660	5	-41	-3	0	441	3	1,058	8 (N/A)	0.2	0.2	7.93
Eastern red cedar	1	0	0	0	0	6	0	6	0 (N/A)	0.2	0.0	0.05
Lilac	9	0	0	0	0	6	0	14	0 (N/A)	0.2	0.0	0.10
Ash	470	4	-38	-3	0	440	3	869	7 (N/A)	0.2	0.2	6.52
Eastern redbud	268	2	-15	-2	0	308	2	560	4 (N/A)	0.2	0.1	4.20
Citywide total	318,822	2,391	-28,366	-1,319	-223	200,791	1,506	489,928	3,674 (N/A)	100.0	100.0	8.57

Table 6: Annual Social and Aesthetic Benefits

Marengo

Annual Aesthetic/Other Benefits of Public Trees

2/1/2023

Species	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Silver maple	10,843	(N/A)	20.5	38.6	123.22
Norway maple	2,270	(N/A)	16.6	8.1	31.97
Green ash	2,335	(N/A)	10.0	8.3	54.29
Sugar maple	2,709	(N/A)	7.7	9.6	82.08
Pin oak	2,357	(N/A)	5.6	8.4	98.19
Apple	144	(N/A)	3.7	0.5	9.00
Northern pin oak	162	(N/A)	3.7	0.6	10.14
Honeylocust	2,476	(N/A)	3.5	8.8	165.03
Northern hackberry	847	(N/A)	3.3	3.0	60.49
Northern red oak	101	(N/A)	3.0	0.4	7.77
Black walnut	600	(N/A)	2.6	2.1	54.52
Red maple	600	(N/A)	2.3	2.1	60.01
Callery pear	320	(N/A)	2.1	1.1	35.53
Blue spruce	156	(N/A)	1.6	0.6	22.27
Maple	314	(N/A)	1.4	1.1	52.34
White ash	296	(N/A)	1.2	1.1	59.14
American basswood	193	(N/A)	0.9	0.7	48.37
Littleleaf linden	247	(N/A)	0.9	0.9	61.69
Oak	80	(N/A)	0.7	0.3	26.56
Siberian elm	127	(N/A)	0.7	0.5	42.25
White mulberry	6	(N/A)	0.5	0.0	3.20
Ohio buckeye	65	(N/A)	0.5	0.2	32.69
Spruce	31	(N/A)	0.5	0.1	15.42
White oak	80	(N/A)	0.5	0.3	40.16
Ginkgo	19	(N/A)	0.5	0.1	9.42
Northern catalpa	92	(N/A)	0.5	0.3	45.86
Broadleaf Deciduous Small	6	(N/A)	0.5	0.0	3.22
River birch	69	(N/A)	0.5	0.2	34.64
Broadleaf Deciduous Large	116	(N/A)	0.5	0.4	58.01
Red pine	94	(N/A)	0.5	0.3	47.08
Bur oak	86	(N/A)	0.5	0.3	43.12
Southern magnolia	0	(N/A)	0.2	0.0	0.01
Eastern cottonwood	58	(N/A)	0.2	0.2	58.34
Amur maple	0	(N/A)	0.2	0.0	0.00
American sycamore	58	(N/A)	0.2	0.2	58.34
Cherry plum	2	(N/A)	0.2	0.0	2.06
Black spruce	5	(N/A)	0.2	0.0	5.03
Norway spruce	15	(N/A)	0.2	0.1	15.42
Elm	58	(N/A)	0.2	0.2	57.69
Eastern red cedar	4	(N/A)	0.2	0.0	4.27
Lilac	0	(N/A)	0.2	0.0	0.03
Ash	43	(N/A)	0.2	0.2	43.05
Eastern redbud	15	(N/A)	0.2	0.1	15.48
Citywide total	28,100	(N/A)	100.0	100.0	65.50

Table 7: Summary of Benefits in Dollars

Marengo

Total Annual Benefits of Public Trees by Species (\$)

2/1/2023

Species	Energy	CO ₂	Air Quality	Stormwater	Aesthetic/Other	Total (\$)	Standard Error	% of Total \$
Silver maple	6,521	1,425	1,246	13,297	10,843	33,332	(N/A)	33.2
Norway maple	3,914	384	704	4,752	2,270	12,023	(N/A)	12.0
Green ash	2,543	343	451	3,619	2,335	9,291	(N/A)	9.3
Sugar maple	2,269	320	373	3,848	2,709	9,519	(N/A)	9.5
Pin oak	2,002	340	252	3,725	2,357	8,675	(N/A)	8.6
Apple	317	35	52	160	144	707	(N/A)	0.7
Northern pin oak	993	62	186	1,332	162	2,735	(N/A)	2.7
Honeylocust	967	129	165	1,491	2,476	5,228	(N/A)	5.2
Northern hackberry	1,083	108	199	1,409	847	3,646	(N/A)	3.6
Northern red oak	620	41	87	860	101	1,709	(N/A)	1.7
Black walnut	625	85	107	807	600	2,223	(N/A)	2.2
Red maple	489	63	88	477	600	1,716	(N/A)	1.7
Callery pear	398	45	67	410	320	1,240	(N/A)	1.2
Blue spruce	123	10	13	186	156	488	(N/A)	0.5
Maple	216	31	39	212	314	813	(N/A)	0.8
White ash	202	29	34	211	296	771	(N/A)	0.8
American basswood	217	29	32	237	193	708	(N/A)	0.7
Littleleaf linden	166	27	28	167	247	634	(N/A)	0.6
Oak	66	9	10	57	80	221	(N/A)	0.2
Siberian elm	201	25	42	340	127	735	(N/A)	0.7
White mulberry	64	4	11	39	6	125	(N/A)	0.1
Ohio buckeye	71	9	11	54	65	211	(N/A)	0.2
Spruce	27	2	3	32	31	95	(N/A)	0.1
White oak	77	11	13	112	80	293	(N/A)	0.3
Ginkgo	46	4	8	28	19	105	(N/A)	0.1
Northern catalpa	88	12	15	79	92	287	(N/A)	0.3
Broadleaf Deciduous Sn	19	2	3	7	6	37	(N/A)	0.0
River birch	83	9	14	83	69	259	(N/A)	0.3
Broadleaf Deciduous La	148	19	28	266	116	578	(N/A)	0.6
Red pine	61	6	3	161	94	325	(N/A)	0.3
Bur oak	78	11	12	87	86	274	(N/A)	0.3
Southern magnolia	4	0	0	2	0	6	(N/A)	0.0
Eastern cottonwood	91	11	19	196	58	375	(N/A)	0.4
Amur maple	46	2	8	32	0	89	(N/A)	0.1
American sycamore	91	11	19	196	58	375	(N/A)	0.4
Cherry plum	5	1	1	2	2	11	(N/A)	0.0
Black spruce	2	0	0	1	5	8	(N/A)	0.0
Norway spruce	14	1	1	16	15	48	(N/A)	0.0
Elm	57	8	9	70	58	202	(N/A)	0.2
Eastern red cedar	1	0	0	1	4	6	(N/A)	0.0
Lilac	1	0	0	0	0	1	(N/A)	0.0
Ash	59	7	10	67	43	186	(N/A)	0.2
Eastern redbud	38	4	7	18	15	82	(N/A)	0.1
Citywide Total	25,104	3,674	4,370	39,145	28,100	100,393	(N/A)	100.0

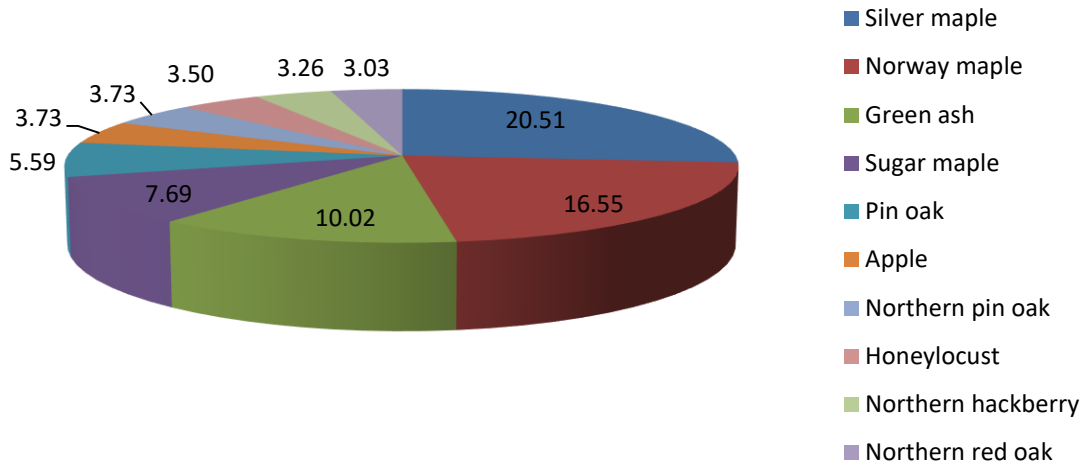


Figure 1: Species Distribution

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

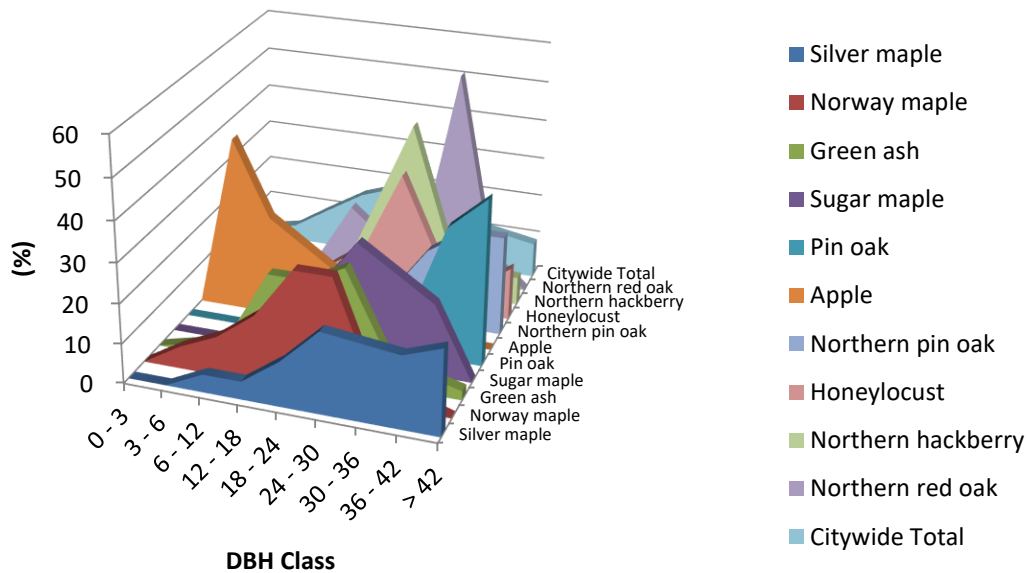


Figure 2: Relative Age Class

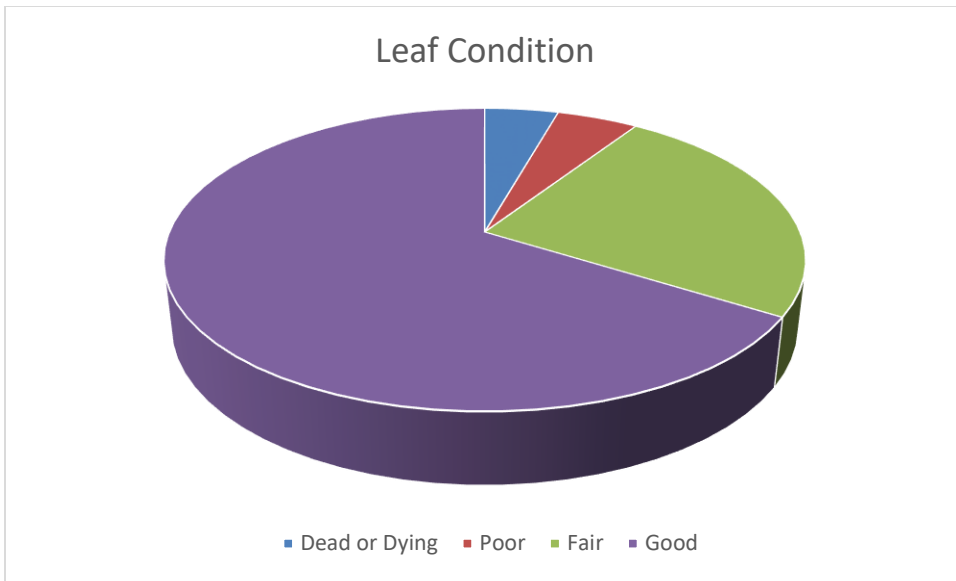


Figure 3: Foliage Condition

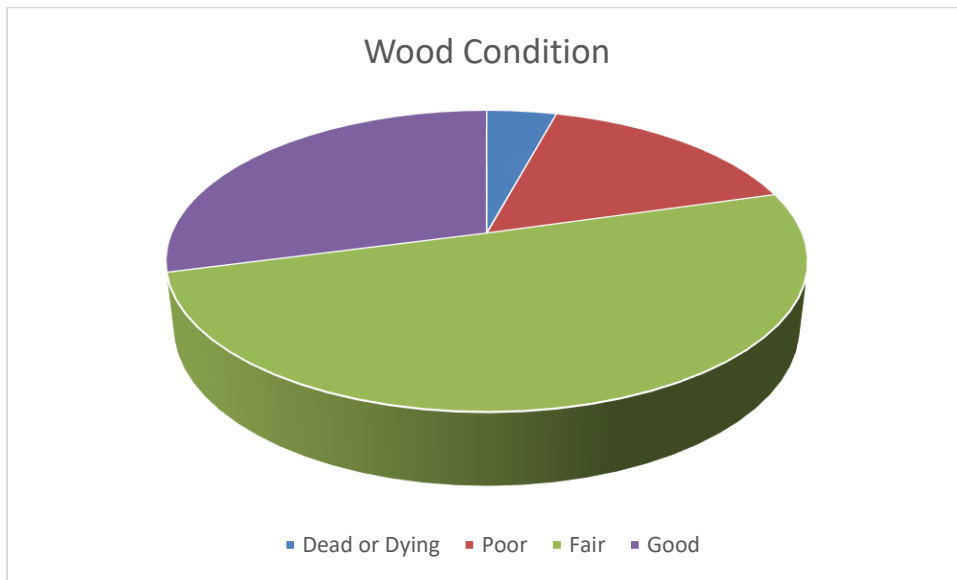


Figure 4: Wood Condition

Canopy Cover of Public Trees (Acres)

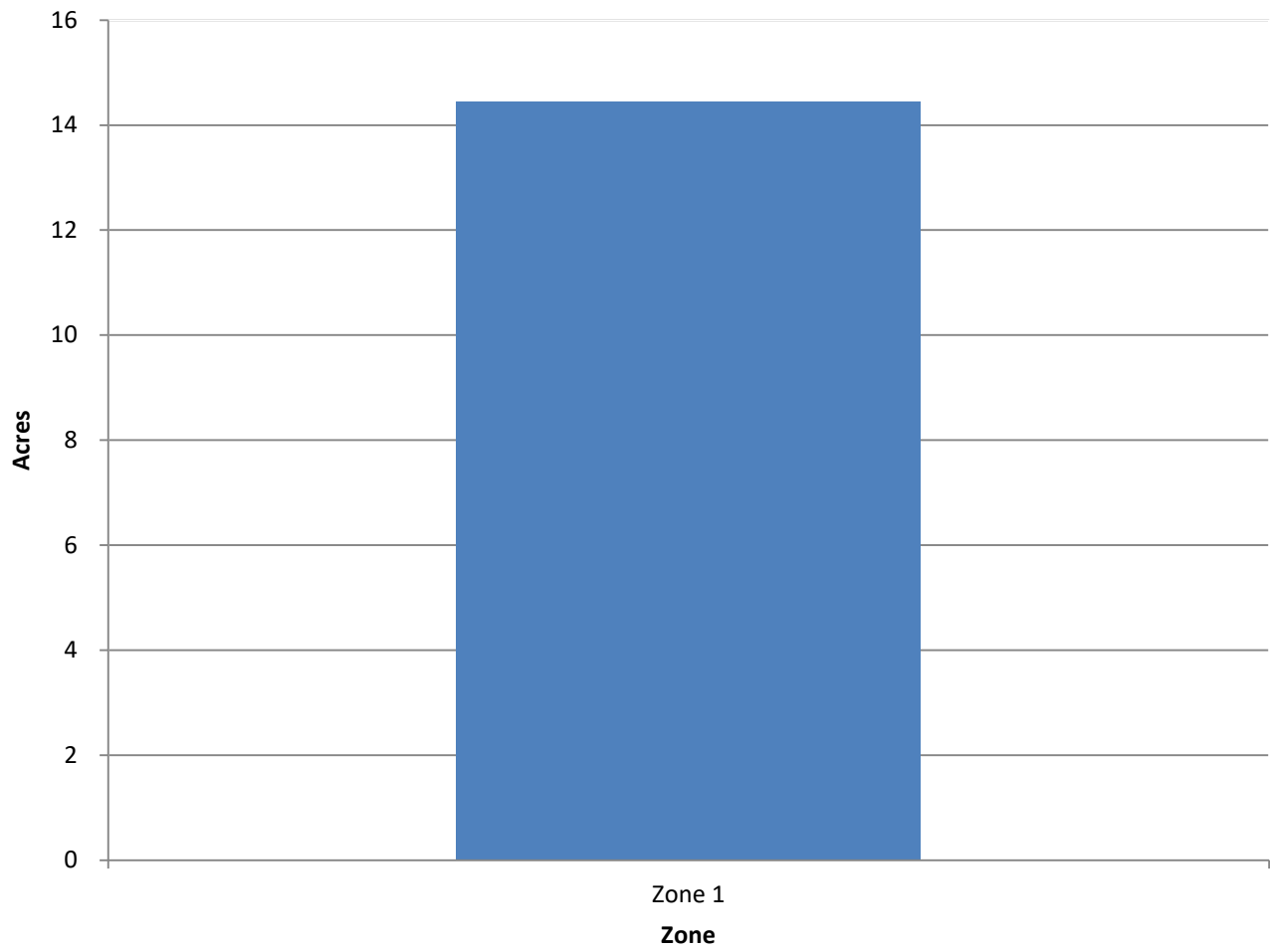


Figure 5: Canopy Cover in Acres

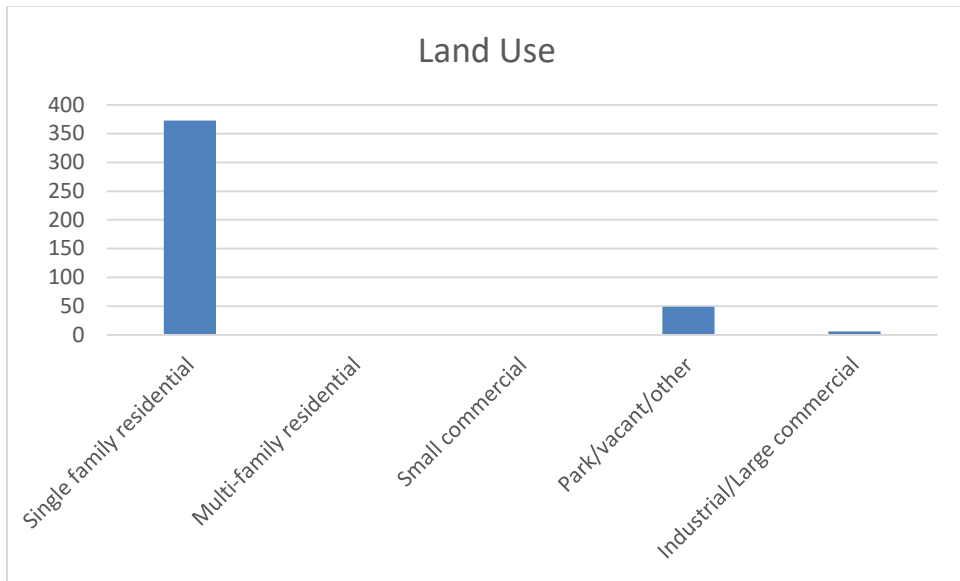


Figure 6: Land Use of city/park trees

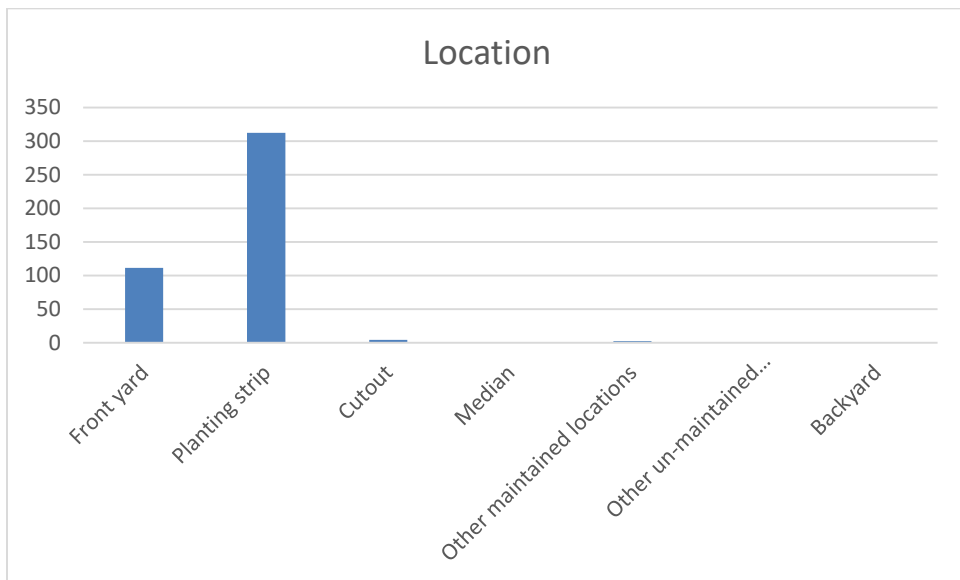


Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

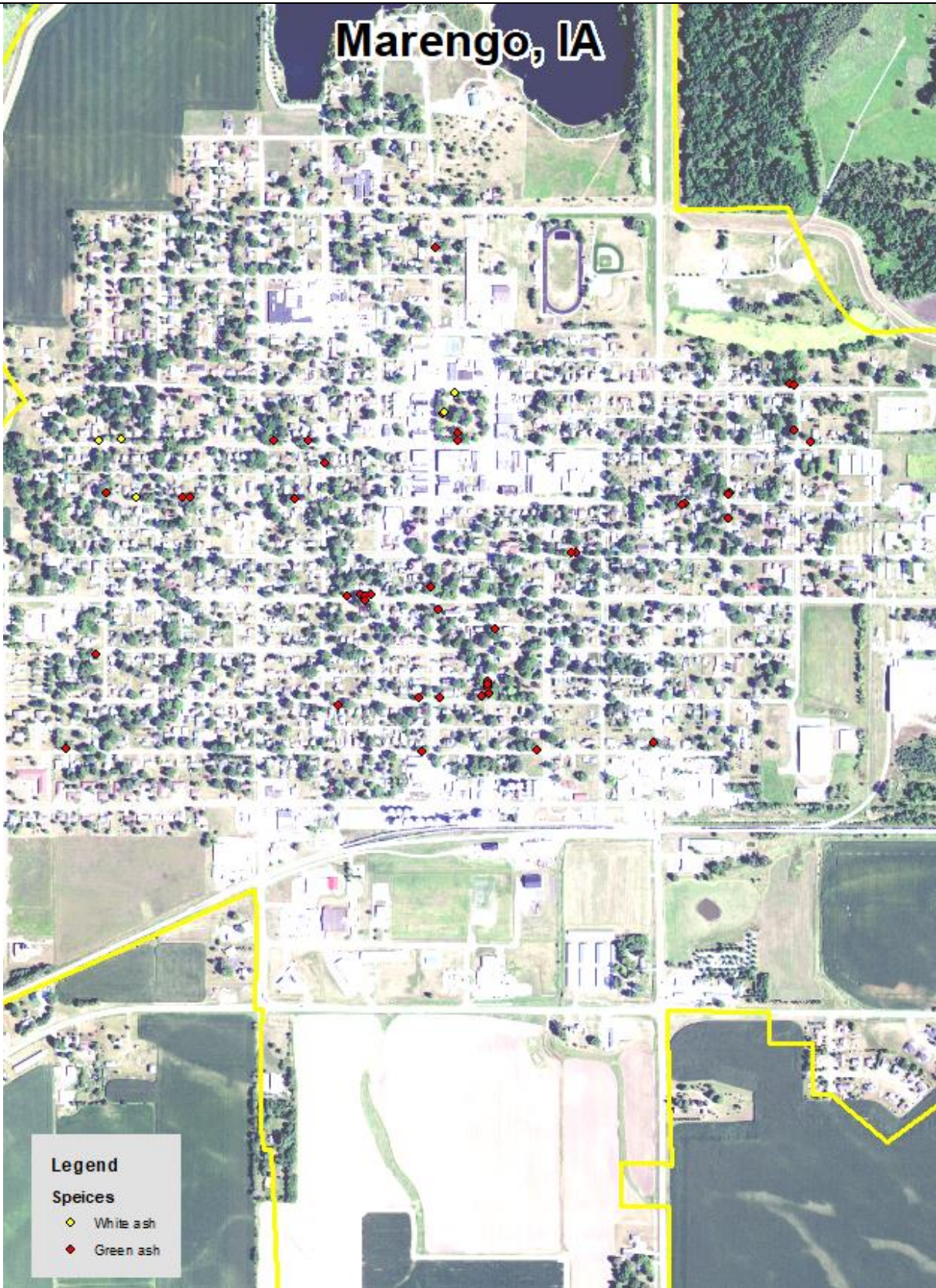


Figure 1: Location of Ash Trees

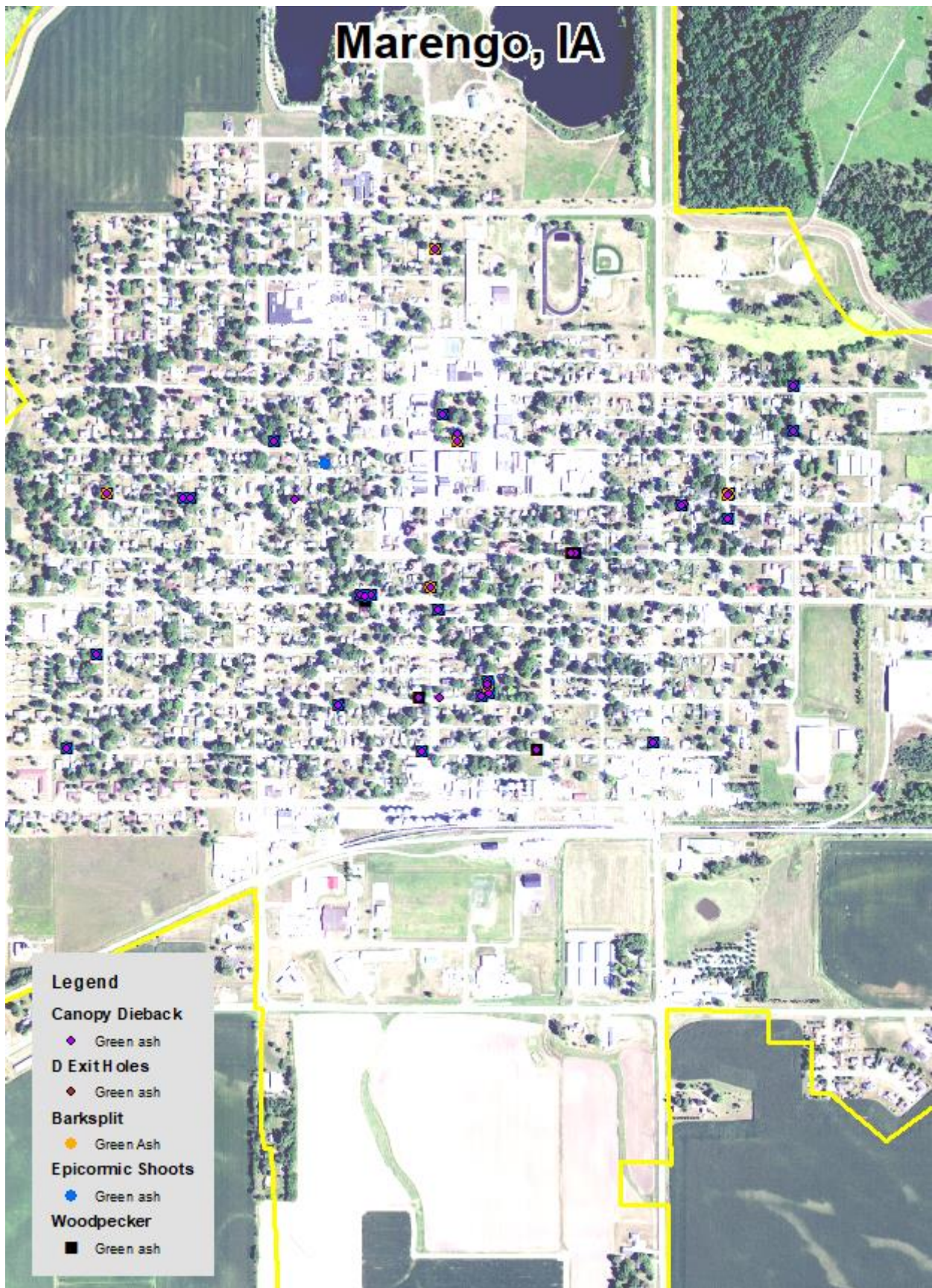


Figure 2: Location of EAB symptoms



Figure 3: Location of Poor Condition Trees

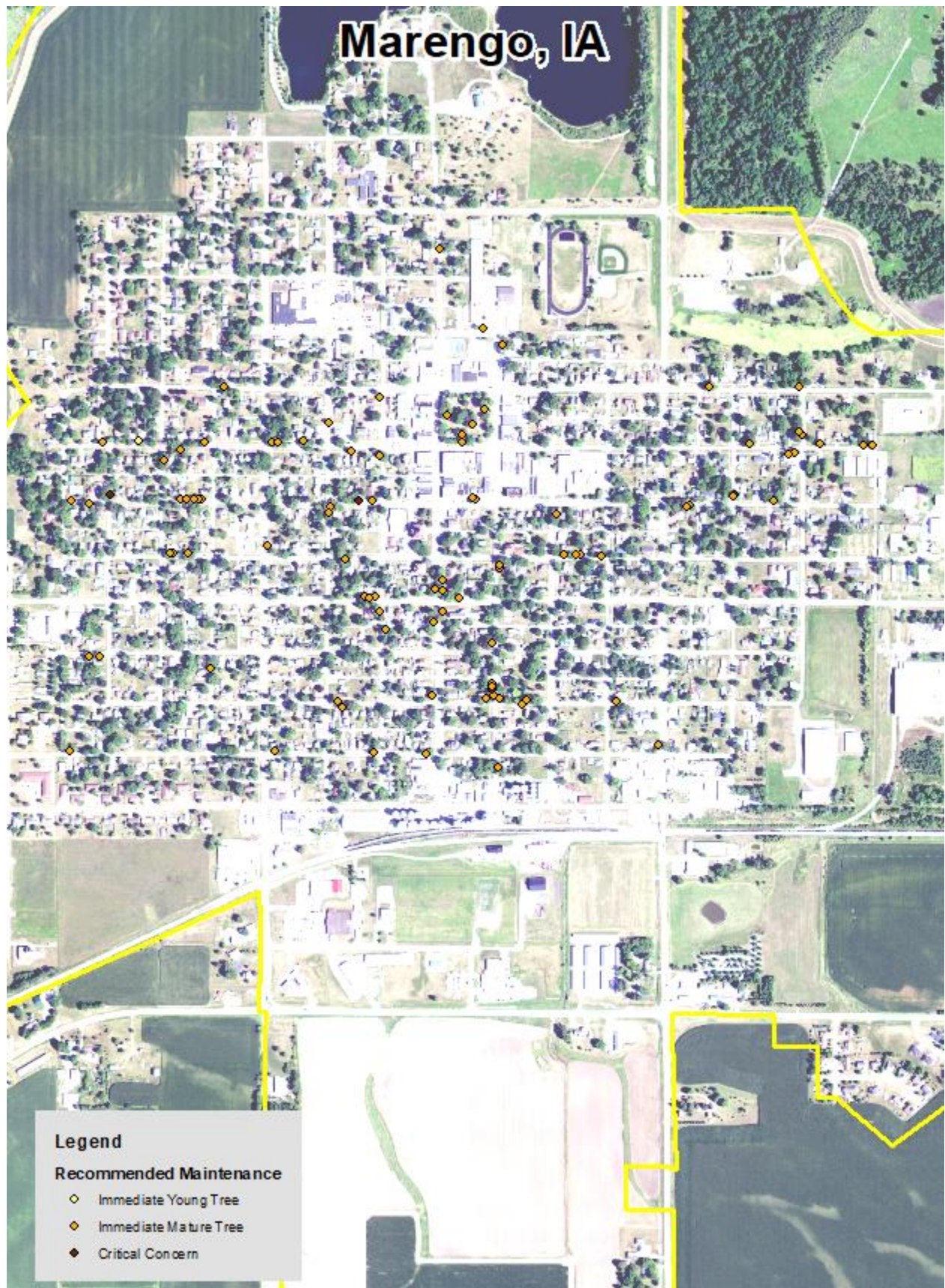


Figure 4: Location of Trees with Recommended Maintenance

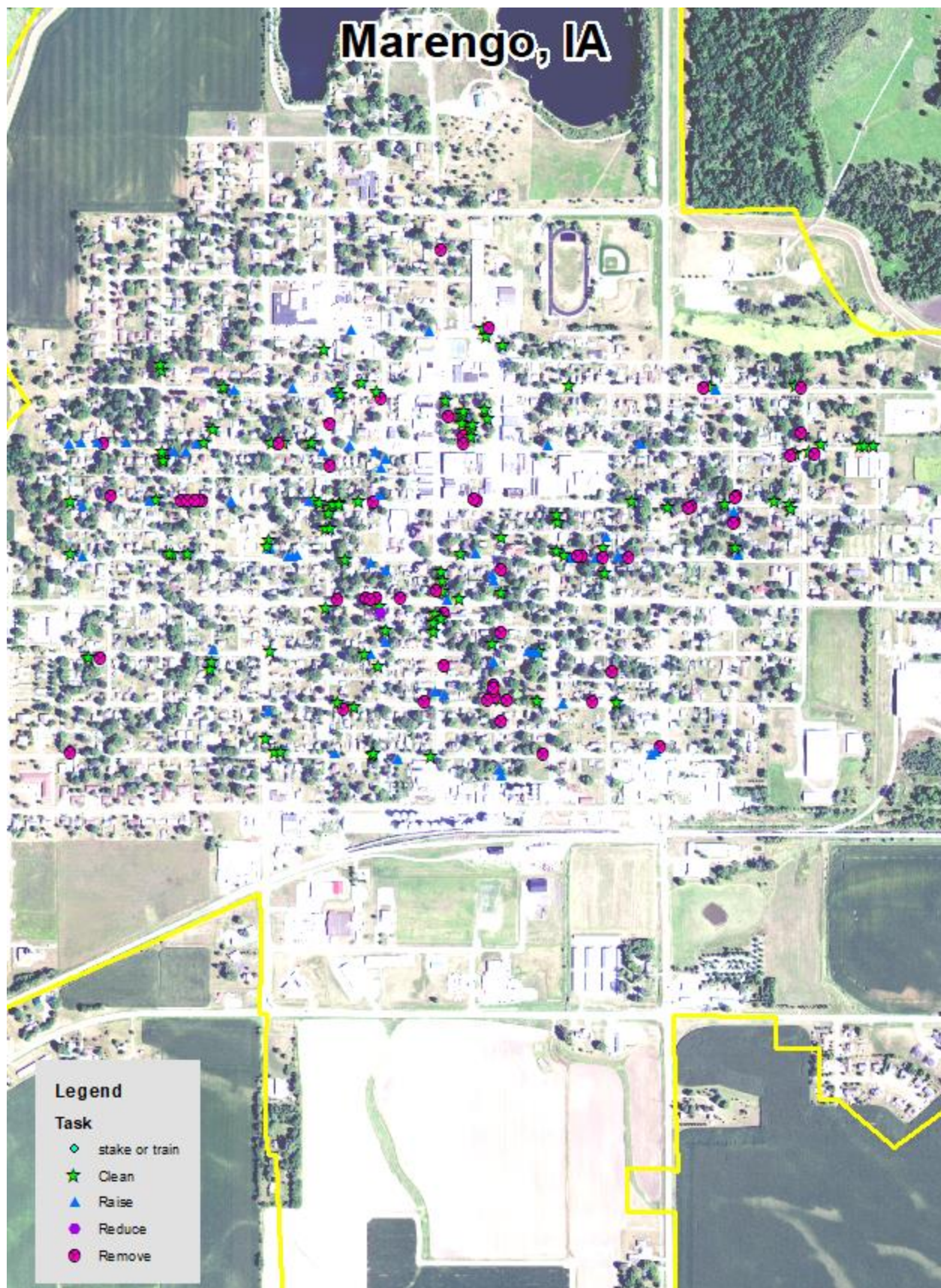


Figure 5: Maintenance Tasks *City ownership of the trees recommended for removal should be verified prior to any removal*

Appendix C: Marengo Tree Ordinances

Building and Property Regulations

Trees

CHAPTER 151

TREES

151.01 Definition	151.05 Disease Control
151.02 Planting Restrictions	151.06 Inspection and Removal
151.03 Duty to Trim Trees	151.07 Planting Permit Required
151.04 Trimming Trees to be Supervised	

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. If the abutting property owner fails to comply, the City may serve notice on the abutting property owner requiring action be taken within ninety (90) 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.

151.03 DUTY TO TRIM TREES. No tree may interfere with any legally placed city signage. The owner or agent of the abutting property shall keep the trees on, or overhanging the street, trimmed so that all branches will be at least fifteen (15) feet above the surface of the street and eight (8) feet above the sidewalks. If the abutting property owner fails to trim the trees, the City may serve notice on the abutting property owner requiring that such action be taken within five (5) days. If such action is not taken within that time, the City may perform the required action and assess the costs against the abutting property for collection in the same manner as a property tax.

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

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

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

1. City Property. If it is determined that any such condition exists on any public property, including the strip between the curb and the lot line of private property, the Council may cause such condition to be corrected by treatment or removal. The Council may also order the removal of any trees on the streets of the City

which interfere with the making of improvements or with travel thereon.

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

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

151.07 PLANTING PERMIT REQUIRED. No permits required.

151.08 DUTY TO CUT GRASS. The owner or agent of any property shall ensure that the height of any grass on the property, excluding ornamental grass, natural prairie or agricultural land, shall not exceed six (6) inches. If the grass, including trimming areas, on any property, excluding natural prairie and agricultural land, exceeds six inches, the City may, after giving the owner at least three days' notice, enter onto the property for the purpose of cutting the grass to conform to this section. The costs to the City of cutting such grass shall be billed or assessed to the owner of the property as directed by the Council and may be included as an additional charge on any utility bill for the property or shall constitute a lien upon the premises served and shall be certified to the County Treasurer for collection in the same manner as property taxes.

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.