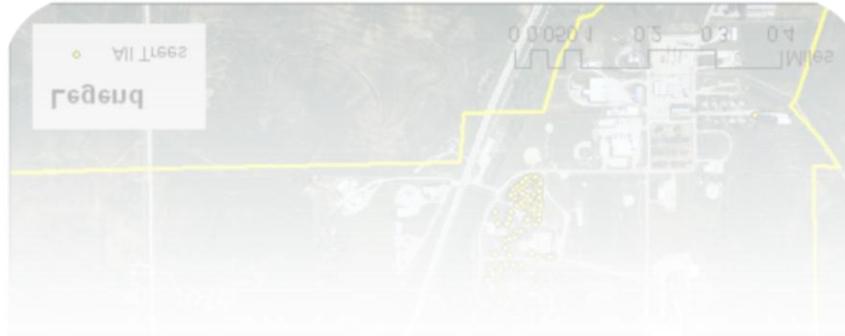


# 2012 COMMUNITY TREE MANAGEMENT PLAN

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# Executive Summary

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## Overview

This plan was developed to assist the City of Audubon with managing its urban forest, including budgeting and future planning. Trees can provide a multitude of benefits to the community, and sound management allows a community to best take advantage of these benefits. Management is especially important considering the serious threats posed by forest pests such as the emerald ash borer (EAB). EAB is an invasive insect imported from Eastern Asia on wood shipping crates that kills all species of ash trees (this does not include mountain ash). There is a strong possibility that 16% of Audubon's city owned trees (ash) will die once EAB becomes established in the community. With proper planning and management, the costs of removing dead and dying trees can be extended over years, mitigating public safety issues.

## Inventory and Results

In 2012, a tree inventory was conducted using Global Positioning System (GPS) data collectors. The inventory was a complete inventory of street right of way trees. Below are some key findings of the 1176 trees inventoried.

- Audubon's trees provide \$226,783 of benefits annually, an average of \$193 a tree
- There are over 50 species of trees
- The top three genus are: Maple 38%, Ash 16%, and Oak 11%
- 11% of trees are in need of some type of management
- 56 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 56 trees needing removal, 46 trees are over 18 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\\*](#)
  - 23 of the 183 ash trees are in need of follow up because they are displaying signs and symptoms associated with EAB
  - 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 or Siberian elm, elm, evergreen, willow, black walnut, tree of heaven, exotic mulberry trees (white mulberry is very common), and Bradford/Callery Pear. Please also be careful not to plant the following shrubs, as they are considered invasive species: autumn olive, honeysuckles, salt cedar, rhododendron, multiflora rose, buckthorn, Japanese Barberry, Burning Bush, and Oriental bittersweet (a vine). For additional information on invasive species and native alternatives, please read my article at:
- [http://api.ning.com/files/upDJWQuP3By62jwQaDQ\\*HlqC08KqOZllyknTylMlfSpJ1cU3EKH\\*F7hmZYMBaDhDCj0jivi-px1jKSL8TEKs7YPG9gU\\*Y9EA/CHECKYOURYARDFORFUGITIVES.pdf](http://api.ning.com/files/upDJWQuP3By62jwQaDQ*HlqC08KqOZllyknTylMlfSpJ1cU3EKH*F7hmZYMBaDhDCj0jivi-px1jKSL8TEKs7YPG9gU*Y9EA/CHECKYOURYARDFORFUGITIVES.pdf).

- Check ash trees with a visual survey yearly
- With the current budget it could take 18 years to remove ash – Suggestion: request a budget increase to \$10,000 annually and apply for grants to plant replacement trees.

## Introduction

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

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

## Inventory

In 2012, 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 of EAB were noted for all ash trees. The signs and symptoms noted were canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage.

## Inventory Results

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The data collected for the 1176 city trees was entered into the USDA Forest service program Street Tree Resource Analysis Tool for Urban forestry Management (STRATUM), part of the i-Tree suite. The following are results from the i-Tree STRATUM analysis. Findings

### **Annual Benefits**

#### **Annual Energy Benefits**

Trees conserve energy by shading buildings and blocking winds. Audubon's trees reduce energy related costs by approximately \$58,206 annually (Appendix A, Table 1). These savings are both in Electricity (273.9 MWh) and in Natural Gas (38,117.2 Therms).

#### **Annual Stormwater Benefits**

Audubon's trees intercept about 3,049,370 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides \$82,644 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 Audubon, it is estimated that trees remove 3,489.5 lbs of air pollution (ozone (O<sub>3</sub>), particulate matter less than 10 microns (PM<sub>10</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), and sulfur dioxide (SO<sub>2</sub>)) per year with a net value of \$9,781 (Appendix A, Table 3).

#### **Annual Carbon Benefits**

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Audubon, trees sequester about 744,362 lbs of carbon a year with an associated value of \$4,337 (Appendix A, Table 4). In addition, the trees store 11,201,646 lbs of carbon, with a yearly benefit of \$84,012 (Appendix A, Table 5).

#### **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. Audubon receives \$67,528 in annual social benefits from trees (Appendix A, Table 6).

## Financial Summary of all Benefits

According to the USDA Forest Service i-Tree STRATUM analysis, Audubon's trees provide \$226,783 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 1176 trees in Audubon provide approximately \$193 annually (Appendix A, Table 7).

## Forest Structure

### Species Distribution

Audubon has over 50 different tree species along city streets and parks (Appendix A, Figure 1).

The distribution of trees by genus is as follows:

GENUS	COUNT	PERCENT OF CANOPY COVER
MAPLE	449	38.18%
ASH	183	15.56%
OAK	126	10.71%
APPLE	71	6.04%
HONEY LOCUST	61	5.19%
HACKBERRY	34	2.89%
SPRUCE	34	2.89%
BASSWOOD/LINDEN	30	2.55%
CATALPA	26	2.21%
BROADLEAF DECIDUOUS	23	1.96%
WALNUT	23	1.96%
REDBUD	15	1.28%
CHERRY/PLUM	15	1.28%
PEAR	15	1.28%
SYCAMORE	12	1.02%
CEDAR	10	0.85%
ELM	10	0.85%
KENTUCKY COFFEE TREE	5	0.43%
PINE	5	0.43%
MOUNTAIN ASH	5	0.43%
BIRCH	4	0.34%
BUCKEYE	3	0.26%
BROADLEAF EVERGREEN	3	0.26%
JUNIPER	3	0.26%
SUMAC	3	0.26%
CONIFER EVERGREEN	2	0.17%
COTTONWOOD	2	0.17%
LILAC	2	0.17%
HICKORY	1	0.09%
GINGKO	1	0.09%
<b>TOTAL</b>	<b>1176</b>	<b>100.00%</b>

## Age Class

Most of Audubon's trees (50%) are between 18 and 30 inches in diameter at 4.5 ft (Appendix A, Figure 2). For age, a Bell Curve is preferred and shows the highest amount of trees around 18 inches in diameter at 4.5 ft. Audubon's size curve is slightly on the larger side, indicating a slightly 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 Audubon indicate that 49% of the trees are in good health, with only 4% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 60% of Audubon'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 11% of the population. This 11% is an estimate of trees that need management follow up.

## Management Needs

The following outlines the specific management needs of the street and park trees by number of trees and percent of canopy (Appendix B, Figure 3).

Crown Cleaning	180	15%
Tree Removal	55	5%
Treat pest/disease	30	2.6%
Crown Raising	26	2%
Tree Staking	8	<1%

## Canopy Cover

The canopy cover of Audubon is approximately 32 acres (Appendix A, Figure 4). According to the 2010 census, Audubon occupies 1203 acres. Thus the canopy cover on city land is about 2.3%.

## Land Use and Location

The majority of Audubon'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	71.6%
Park/vacant/other	25.7%
Small commercial	2.7%

### Location

Front Yard	47.7%
Planting Strip	49.5%

## 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

Audubon has 51 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 46 trees over 18 inches in diameter at 4.5 ft that should be addressed immediately. Please refer to the six year maintenance plan at the end of this section. After all of the critical concern trees are addressed, there should be follow up on the trees marked as needing less immediate removals (10 additional trees). All other trimming, pest/disease treatments, and follow-up tasks (labeled as none under certain priority levels) will need to be relayed to individual homeowners for timely completion (in order to mitigate hazards).

PRIORITY TASK	# BY TASK UNDER CRITICAL CONCERN	# BY TASK UNDER MATURE TREE IMMEDIATE	# BY TASK UNDER MATURE TREE ROUTINE	# BY TASK UNDER YOUNG TREE IMMEDIATE	# BY TASK UNDER YOUNG TREE ROUTINE	NONE	TOTAL
<b>NONE:</b> For immediate and critical concern activities, this means the tree needs follow-up by an arborist, for routine activities this means to treat the trees via routine maintenance	32	12	643		187		874
<b>STAKE/TRAIN</b>				1	7		8
<b>CLEAN</b>	24	46	106	3	3		182
<b>RAISE</b>	1	1	19		5		26
<b>REDUCE</b>							
<b>REMOVE</b>	51	3		2			56
<b>TREAT PEST/DISEASE</b> (For most this means address carpenter ant activity)	27	2			1		30
<b>TOTAL</b>	<b>135</b>	<b>64</b>	<b>768</b>	<b>6</b>	<b>203</b>		<b>1176</b>

### 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 10 removals, 6 are ash trees. There are a total of 183 ash trees, and 23 of those have signs and symptoms that have been associated with EAB. In addition, there are 13 trees that are in poor health. [\\*City ownership of the trees recommended for removal should be verified prior to any removal\\*](#)

### **Pruning Cycle**

Proper pruning can extend the life and good health of trees, as well as reduce public safety issues. In the Management Needs section of the Findings there are four main maintenance issues to be addressed: routine pruning, crown cleaning, crown raising, and crown reduction. Crown cleaning removes dead, diseased, and damaged limbs. Crown raising is the removal of lower branches that are 2 inches in diameter or larger in the case of providing clearance for pedestrians or vehicles. Crown reduction is removing individual limbs from structures or utility wires. It is recommended that all trees be pruned on a routine schedule every five to seven years. Please refer to the six year maintenance plan for further information.

### **Planting**

Most of the planting over the next 5 years will replace the trees that are removed. It is recommended to plant 1.2 trees for every tree removed, since survival rates will not be 100%. Please refer to the twelve 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 Audubon.

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 (38%) (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). The following information should be relayed to homeowners, which can assist them in selecting a trouble free species well adapted to the space and maintenance requirements that they might have.

**Recommended Species to plant in Western Iowa:**

<b>COMMON NAME</b>	<b>SCIENTIFIC NAME</b>	<b>CULTIVARS/SELECTIONS</b>
<b>LARGE SHADE TREES – Plant 35 feet apart and away from overhead power lines.</b>		
Swamp White Oak	<i>Quercus bicolor</i>	
White Oak	<i>Quercus alba</i>	
Bur Oak	<i>Quercus macrocarpa</i>	
Red Oak	<i>Quercus rubra</i>	
Black Oak	<i>Quercus velutina</i>	
Chinkapin Oak	<i>Quercus muehlenbergii</i>	
American Basswood (Linden)	<i>Tilia Americana</i>	Boulevard, Front Yard, Legend, Redmond
Thornless Honeylocust	<i>Gleditsia triacanthos var. inermis</i>	Shademaster, Skyline
American elm	<i>Ulmus Americana</i>	Independence, New harmony, Valley Forge
Cottonwood (seedless) - ***Not recommended for planting near any homes or structures	<i>Populous deltoides</i>	Siouxland
Sycamore	<i>Plantanus occidentalis</i>	
Gingko	<i>Gingko biloba</i>	Male only – Shangri-La, Princeton sentry, Emperor
Ohio Buckeye	<i>Aesculus hippocastanum</i>	
Yellowwood	<i>Cladrastis lutea</i>	
Kentucky coffeetree	<i>Gymnocladus dioicus</i>	Espresso
Black Cherry	<i>Prunus serotina</i>	
Hackberry	<i>Celtis occidentalis</i>	Chicagoland, Prairie Pride, Windy City
<b>LOW GROWING TREES (less than 30 feet tall) planted as close as 12 feet.</b>		
Eastern redbud	<i>Cercis Canadensis</i>	
Thornless cockspur hawthorn or other native hawthorns	<i>Crataegus crusgalli var. inermis</i>	
Ironwood (hop hornbeam)	<i>Ostrya virginiana</i>	
American hornbeam	<i>Carpinus caroliniana</i>	
Serviceberry	<i>Amalanchier arborea</i>	Autumn brilliance, Cumulus, Princess Diana
Flowering crabapple	<i>Malus</i>	Prairiefire, Adams, Sentinel, Snowdrift
Red mulberry	<i>Morus rubra</i>	
American (wild) plum	<i>Prunus americana</i>	
<b>EVERGREEN TREES – planted 25 feet apart and away from overhead power lines.</b>		
Eastern White Pine	<i>Pinus strobes</i>	
Jack pine	<i>Pinus banksiana</i>	
Junipers (Eastern red cedar)	<i>Juniperus virginiana</i>	
Norway spruce	<i>Picea abies</i>	
Concolor fir	<i>Abies concolor</i>	
Bald cypress	<i>Taxodium distichum</i>	
Arborvitae (Northern White cedar)	<i>Thuja occidentalis</i>	Techny, Brandon, Holmstrup

## Continual Monitoring

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

## Emerald Ash Borer Plan

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### 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\\*](#)

### EAB Quarantines

EAB is an extremely destructive plant pest and it is responsible for the death and decline of over 25 million ash trees. Ash in both forested and urban settings constitute a significant portion of the canopy cover in the United States. Current tools to detect, control, suppress and eradicate this pest are not as robust as the USDA would desire. In order to stay ahead of this hard to detect beetle, the USDA is attempting to contain the beetle before it spreads beyond its known positions by regulating articles.

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

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

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

### Wood Disposal

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](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**

Individual landowners will be responsible for replacing existing ash trees (in adherence to Audubon City Tree Ordinances). The City of Audubon will be responsible, as budgets allow, to replace city managed ash trees. All trees will meet the restrictions in city ordinance 151.02 (Appendix C). The new plantings will be a diverse mix and will not include ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut.

### **Postponed Work**

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

### **Monitoring**

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

### **Private Ash Trees**

It is strongly recommended that private property owners start removing ash trees on their property upon arrival of EAB. City Code 151.06 states "If it is determined with reasonable certainty that any such condition exists (trees or shrubs in the City reported or suspected to be infected with or damaged by any disease or insect or disease pests) on private property and that the danger to other trees or to adjoining property or passing motorists or pedestrians is imminent, the Council shall notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within fourteen (14) days of said notification. If such owner, occupant or person in charge of said property fails to comply within 14 days of receipt of notice, the Council may cause the condition to be corrected and the cost assessed against the property."

# Budget and Twelve Year Maintenance Plan

## Current Budget

Total \$50,000,000 over 10 years (\$5,000/year)

YEAR	MAINTENANCE TASK	PRICE PER UNIT	SUBTOTAL	YEARLY EXPENDITURE
2013	<p>CRTICIAL REMOVALS – START WITH C.R.’S &gt;18” DIA (46 TOTAL). CONSIDER USING ALL OF BUDGET TO ADDRESS THESE TREES AS SOON AS POSSIBLE</p> <p>MAKE MAINTENANCE TASK MAP AVAILABLE TO CITY SO THEY CAN TAKE CARE OF THEIR INDIVIDUAL TREE HAZARDS</p> <p>VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS</p>	\$500/TREE X 20 TREES	\$10,000	<p>\$5,000</p> <p>**WOULD RECOMMEND USING ENTIRE \$10,000 BUDGET UNTIL ALL REMOVALS ARE ADDRESSED</p>
2014	<p>CRTICIAL REMOVALS –C.R.’S &gt;18” DIA (26 REMAINING). CONSIDER USING ALL OF BUDGET TO ADDRESS THESE TREES AS SOON AS POSSIBLE</p> <p>MAKE MAINTENANCE TASK MAP AVAILABLE TO CITY SO THEY CAN TAKE CARE OF THEIR INDIVIDUAL TREE HAZARDS</p> <p>VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS</p>	\$500/TREE X 20 TREES	\$10,000	<p>\$5,000</p> <p>**WOULD RECOMMEND USING ENTIRE \$10,000 BUDGET UNTIL ALL REMOVALS ARE ADDRESSED</p>
2015	<p>CRTICIAL REMOVALS –C.R.’S &gt;18” DIA (6 LEFT).</p> <p>10 REMAINING REMOVALS OF OTHER PRIORITY LEVELS</p>	\$500/TREE X 16 TREES	\$8,000	<p>\$5,000</p> <p>**WOULD RECOMMEND USING \$8,000 THIS FINAL YEAR TO TAKE CARE OF</p>

			REMAINING HAZARDOUS REMOVALS
	SCHEDULE 1/3 OF THE COMMUNITY TO TRIM THEIR STREET ROW TREES TO CITY SPECS.		
	VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS		
<b>2016</b>	BUDGET FOR POTENTIAL EAB REMOVALS FOR NEXT 9 YEARS	176 REMAINING ASH TREES AT RISK OF EAB X \$500/TREE = \$88,000  IF USING \$10,000/YEAR, YOU CAN HAVE EAB BUDGETED FOR IN 9 YEARS, AT CURRENT BUDGET IT WILL TAKE 18 YEARS.	\$10,000 (if budget is expanded by \$5,000)
	REPLACE TREES REMOVED FROM PARKS USING A GRANT (SUCH AS TREES FOR KIDS FROM THE IDNR)		
	SURVEY FOR PARK AND STREET HAZARD TREES		
	VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS		
<b>2017</b>	EAB BUDGET	\$10,000	\$10,000
	SCHEDULE 1/3 OF THE COMMUNITY TO TRIM THEIR STREET ROW TREES TO CITY SPECS.		
	VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS		
<b>2018</b>	EAB BUDGET	\$10,000	\$10,000
	SURVEY FOR PARK AND STREET HAZARD TREES		
	VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS		

<b>2019</b>	EAB BUDGET	\$10,000	\$10,000
	SCHEDULE 1/3 OF THE COMMUNITY TO TRIM THEIR STREET ROW TREES TO CITY SPECS.		
	VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS		
<b>2020</b>	EAB BUDGET	\$10,000	\$10,000
	SURVEY FOR PARK AND STREET HAZARD TREES		
	VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS		
<b>2021</b>	EAB BUDGET	\$10,000	\$10,000
	SCHEDULE 1/3 OF THE COMMUNITY TO TRIM THEIR STREET ROW TREES TO CITY SPECS.		
	VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS		
<b>2022-2024</b>	EAB BUDGET	\$10,000 X 3 YEARS	\$30,000
	SURVEY FOR PARK AND STREET HAZARD TREES		
	SCHEDULE 1/3 OF THE COMMUNITY TO TRIM THEIR STREET ROW TREES TO CITY SPECS IN 2023.		
	VISUAL SURVEY FOR EAB SIGNS AND SYMPTOMS		

**BUDGET MAY NOT REFLECT ACTUAL REMOVAL AND REPLANTING VALUES, IF SERVICES ARE PERFORMED MORE AFFORDABLY BY YOUR CITY WORK CREWS. THE EAB FIGURES WERE CALCULATED AS SUCH:**

Maintenance plan and budget formulated on the basis that the City of Audubon is only responsible for removing trees if they are dead or diseased. Individual homeowners are responsible for all other tasks on private R.O.W. trees. Trees in parks and city areas will need to be addressed as needed, for all tasks.

### Proposed Budget Increase

EAB could potentially kill all ash trees in Audubon within 4 years of its arrival. To remove all ash trees within 12 years the budget would need to be increased to \$10,000 a year. If the budget were increased to \$10,000 a year all ash could be removed within 12 years (critical concern hazard tree removals have to be taken care of first for the first 3 years). Additionally, it is recommended that Audubon 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.

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## Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

### Audubon

#### Annual Energy Benefits of Public Trees by Species

1/11/2013

Species	Total Electricity (MWh)	Electricity (\$)	Total Natural Gas (Therms)	Natural Gas (\$)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Norway maple	45.7	3,466	6,638.3	6,506	9,972	(N/A)	15.2	17.1	56.02
Green ash	48.4	3,675	6,758.0	6,623	10,298	(N/A)	14.9	17.7	58.85
Silver maple	52.5	3,986	6,944.0	6,805	10,791	(N/A)	13.1	18.5	70.07
Pin oak	29.5	2,238	4,023.0	3,943	6,181	(N/A)	7.7	10.6	68.68
Apple	6.4	484	995.7	976	1,460	(N/A)	6.1	2.5	20.56
Honeylocust	9.6	730	1,277.5	1,252	1,982	(N/A)	5.2	3.4	32.49
Sugar maple	14.1	1,068	1,910.3	1,872	2,940	(N/A)	4.1	5.1	61.24
Maple	2.4	182	344.4	338	520	(N/A)	3.3	0.9	13.33
Northern hackberry	12.0	910	1,739.9	1,705	2,615	(N/A)	2.9	4.5	76.92
Northern catalpa	9.4	711	1,311.9	1,286	1,997	(N/A)	2.2	3.4	76.80
Broadleaf Deciduous	0.6	43	98.1	96	139	(N/A)	2.0	0.2	6.05
Black walnut	6.2	470	866.7	849	1,319	(N/A)	2.0	2.3	57.36
Northern red oak	2.8	214	392.6	385	599	(N/A)	1.9	1.0	27.21
Blue spruce	1.1	82	163.6	160	242	(N/A)	1.5	0.4	14.24
Littleleaf linden	4.2	321	614.7	602	924	(N/A)	1.5	1.6	54.35
Eastern redbud	0.8	62	133.1	130	193	(N/A)	1.3	0.3	12.84
Cherry plum	0.6	47	107.5	105	152	(N/A)	1.3	0.3	10.16
Pear	0.2	16	37.0	36	52	(N/A)	1.3	0.1	3.48
American basswood	4.2	319	615.1	603	922	(N/A)	1.1	1.6	70.91
Red maple	2.6	198	336.8	330	528	(N/A)	1.0	0.9	43.98
American sycamore	4.3	325	593.9	582	907	(N/A)	1.0	1.6	75.60
Other street trees	16.4	1,246	2,275.0	2,229	3,475	(N/A)	9.6	6.0	30.75
Citywide total	273.9	20,793	38,177.2	37,414	58,206	(N/A)	100.0	100.0	49.62

**Table 2: Annual Stormwater Benefits**

**Audubon**

**Annual Stormwater Benefits of Public Trees by Species**

1/11/2013

Species	Total rainfall interception (Gal)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Norway maple	431,898	11,705	(N/A)	15.2	14.2	65.76
Green ash	516,654	14,002	(N/A)	14.9	16.9	80.01
Silver maple	749,059	20,301	(N/A)	13.1	24.6	131.82
Pin oak	314,615	8,527	(N/A)	7.7	10.3	94.74
Apple	25,039	679	(N/A)	6.1	0.8	9.56
Honeylocust	103,120	2,795	(N/A)	5.2	3.4	45.82
Sugar maple	160,851	4,359	(N/A)	4.1	5.3	90.82
Maple	16,888	458	(N/A)	3.3	0.6	11.74
Northern hackberry	117,325	3,180	(N/A)	2.9	3.9	93.52
Northern catalpa	124,370	3,371	(N/A)	2.2	4.1	129.64
Broadleaf Deciduous	1,873	51	(N/A)	2.0	0.1	2.21
Black walnut	65,368	1,772	(N/A)	2.0	2.1	77.03
Northern red oak	25,931	703	(N/A)	1.9	0.9	31.94
Blue spruce	12,704	344	(N/A)	1.5	0.4	20.25
Littleleaf linden	49,880	1,352	(N/A)	1.5	1.6	79.52
Eastern redbud	4,248	115	(N/A)	1.3	0.1	7.67
Cherry plum	2,156	58	(N/A)	1.3	0.1	3.89
Pear	687	19	(N/A)	1.3	0.0	1.24
American basswood	51,478	1,395	(N/A)	1.1	1.7	107.32
Red maple	20,386	552	(N/A)	1.0	0.7	46.04
American sycamore	59,848	1,622	(N/A)	1.0	2.0	135.17
Other street trees	194,994	5,285	(N/A)	9.6	6.4	46.77
Citywide total	3,049,370	82,644	(N/A)	100.0	100.0	70.45

**Table 3: Annual Air Quality Benefits**

**Audubon**

**Annual Air Quality Benefits of Public Trees by Species**

1/11/2013

Species	Deposition (lb)				Total Depos. (\$)	Avoided (lb)				Total Avoided Emissions (\$)	BVOC Emissions (lb)	BVOC Emissions (\$)	Total (lb)	Total (\$)	Standard Error	% of Total Trees	Avg. \$/tree
	O <sub>3</sub>	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>		NO <sub>2</sub>	PM <sub>10</sub>	VOC	SO <sub>2</sub>								
Norway maple	88.3	15.2	43.3	3.9	477	221.9	32.0	30.5	207.2	1,373	-20.7	-78	621.7	1,773	(N/A)	15.2	9.96
Green ash	60.0	9.6	29.3	2.7	321	232.4	33.7	32.2	219.5	1,445	0.0	0	619.4	1,766	(N/A)	14.9	10.09
Silver maple	127.9	21.7	62.9	5.7	690	247.8	36.3	34.6	237.5	1,550	-65.8	-247	708.6	1,993	(N/A)	13.1	12.94
Pin oak	53.2	9.3	27.5	2.4	292	140.5	20.5	19.5	133.6	876	-99.3	-372	307.2	795	(N/A)	7.7	8.84
Apple	6.6	1.1	3.3	0.3	35	31.5	4.5	4.3	28.9	194	0.0	0	80.3	229	(N/A)	6.1	3.22
Honeylocust	19.9	3.3	9.1	0.9	105	45.5	6.6	6.3	43.5	284	-15.4	-58	119.9	332	(N/A)	5.2	5.44
Sugar maple	21.4	3.6	10.6	0.9	116	66.9	9.8	9.3	63.7	417	-16.7	-63	169.6	470	(N/A)	4.1	9.80
Maple	3.3	0.6	1.7	0.1	18	11.6	1.7	1.6	10.9	72	-1.2	-4	30.3	85	(N/A)	3.3	2.19
Northern hackberry	18.1	3.1	9.3	0.8	99	58.2	8.4	8.0	54.4	360	0.0	0	160.3	459	(N/A)	2.9	13.51
Northern catalpa	17.1	2.7	7.8	0.8	90	45.0	6.5	6.2	42.5	280	0.0	0	128.7	370	(N/A)	2.2	14.22
Broadleaf Deciduous	0.2	0.0	0.2	0.0	1	2.9	0.4	0.4	2.6	18	0.0	0	6.7	19	(N/A)	2.0	0.82
Black walnut	7.5	1.2	3.7	0.3	40	29.7	4.3	4.1	28.1	185	0.0	0	78.9	225	(N/A)	2.0	9.78
Northern red oak	5.2	0.9	2.6	0.2	28	13.5	2.0	1.9	12.8	84	-7.5	-28	31.5	84	(N/A)	1.9	3.82
Blue spruce	1.2	0.2	1.2	0.2	9	5.3	0.8	0.7	4.9	33	-4.1	-15	10.4	26	(N/A)	1.4	1.52
Littleleaf linden	9.1	1.6	4.4	0.4	49	20.6	3.0	2.8	19.2	127	-4.3	-16	56.8	160	(N/A)	1.4	9.43
Eastern redbud	1.4	0.2	0.6	0.1	7	4.1	0.6	0.6	3.7	25	0.0	0	11.3	32	(N/A)	1.3	2.16
Cherry plum	0.3	0.1	0.2	0.0	2	3.2	0.4	0.4	2.8	19	0.0	0	7.4	21	(N/A)	1.3	1.41
Pear	0.1	0.0	0.1	0.0	1	1.1	0.2	0.1	1.0	7	0.0	0	2.5	7	(N/A)	1.3	0.47
American basswood	7.3	1.2	3.5	0.3	39	20.5	3.0	2.8	19.1	127	-6.1	-23	51.6	143	(N/A)	1.1	10.99
Red maple	4.7	0.8	2.2	0.2	25	12.2	1.8	1.7	11.8	77	-1.6	-6	33.9	96	(N/A)	1.0	7.98
American sycamore	8.6	1.4	3.9	0.4	45	20.5	3.0	2.8	19.4	128	0.0	0	60.0	173	(N/A)	1.0	14.40
Other street trees	28.7	5.0	16.4	1.9	163	78.6	11.4	10.9	74.4	489	-34.5	-129	192.6	522	(N/A)	9.6	4.62
Citywide total	490.4	83.0	243.7	22.6	2,654	1,313.3	190.8	181.8	1,241.2	8,167	-277.3	-1,040	3,489.5	9,781	(N/A)	100.0	8.34

**Table 4: Annual Carbon Stored**

**Audubon**

**Stored CO2 Benefits of Public Trees by Species**

1/11/2013

Species	Total Stored CO2 (lbs)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Norway maple	1,450,848	10,881	(N/A)	15.2	13.0	61.13
Green ash	1,931,155	14,484	(N/A)	14.9	17.2	82.76
Silver maple	2,828,620	21,215	(N/A)	13.1	25.3	137.76
Pin oak	1,351,502	10,136	(N/A)	7.7	12.1	112.63
Apple	108,412	813	(N/A)	6.1	1.0	11.45
Honeylocust	255,889	1,919	(N/A)	5.2	2.3	31.46
Sugar maple	609,485	4,571	(N/A)	4.1	5.4	95.23
Maple	39,014	293	(N/A)	3.3	0.4	7.50
Northern	268,994	2,017	(N/A)	2.9	2.4	59.34
Northern catalpa	555,333	4,165	(N/A)	2.2	5.0	160.19
Broadleaf	5,698	43	(N/A)	2.0	0.1	1.86
Black walnut	240,307	1,802	(N/A)	2.0	2.2	78.36
Northern red oak	112,271	842	(N/A)	1.9	1.0	38.27
Blue spruce	5,735	43	(N/A)	1.5	0.1	2.53
Littleleaf linden	193,476	1,451	(N/A)	1.5	1.7	85.36
Eastern redbud	22,510	169	(N/A)	1.3	0.2	11.25
Cherry plum	7,122	53	(N/A)	1.3	0.1	3.56
Pear	2,159	16	(N/A)	1.3	0.0	1.08
American	271,115	2,033	(N/A)	1.1	2.4	156.41
Red maple	51,440	386	(N/A)	1.0	0.5	32.15
American	282,239	2,117	(N/A)	1.0	2.5	176.40
Other street trees	275,929	4,562	(N/A)	9.6	5.4	40.38
Citywide total	11,201,646	84,012	(N/A)	100.0	100.0	71.62

**Table 5: Annual Carbon Sequestered**

**Audubon**

**Annual CO2 Benefits of Public Trees by Species**

1/11/2013

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
Norway maple	68,507	514	-6,964	-35	-52	76,600	574	138,108	1,036	(N/A)	15.2	12.0	5.82
Green ash	119,139	894	-9,270	-34	-70	81,226	609	191,061	1,433	(N/A)	14.9	16.6	8.19
Silver maple	214,019	1,605	-13,577	-30	-102	88,081	661	288,492	2,164	(N/A)	13.1	25.1	14.05
Pin oak	130,860	981	-6,487	-18	-49	49,468	371	173,823	1,304	(N/A)	7.7	15.1	14.49
Apple	10,528	79	-520	-14	-4	10,691	80	20,685	155	(N/A)	6.1	1.8	2.19
Honeylocust	28,459	213	-1,228	-12	-9	16,126	121	43,345	325	(N/A)	5.2	3.8	5.33
Sugar maple	32,114	241	-2,926	-9	-22	23,593	177	52,772	396	(N/A)	4.1	4.6	8.25
Maple	3,183	24	-187	-8	-1	4,030	30	7,018	53	(N/A)	3.3	0.6	1.35
Northern hackberry	15,649	117	-1,291	-7	-10	20,112	151	34,464	258	(N/A)	2.9	3.0	7.60
Northern catalpa	23,622	177	-2,666	-5	-20	15,714	118	36,666	275	(N/A)	2.2	3.2	10.58
Broadleaf Deciduous	942	7	-27	-4	0	951	7	1,861	14	(N/A)	2.0	0.2	0.61
Black walnut	15,299	115	-1,153	-4	-9	10,382	78	24,524	184	(N/A)	2.0	2.1	8.00
Northern red oak	3,779	28	-539	-4	-4	4,725	35	7,961	60	(N/A)	1.9	0.7	2.71
Blue spruce	671	5	-28	-3	0	1,807	14	2,447	18	(N/A)	1.5	0.2	1.08
Littleleaf linden	13,355	100	-929	-3	-7	7,105	53	19,527	146	(N/A)	1.5	1.7	8.61
Eastern redbud	852	6	-108	-3	-1	1,372	10	2,112	16	(N/A)	1.3	0.2	1.06
Cherry plum	984	7	-34	-3	0	1,040	8	1,987	15	(N/A)	1.3	0.2	0.99
Pear	370	3	-10	-3	0	353	3	709	5	(N/A)	1.3	0.1	0.35
American basswood	15,237	114	-1,301	-3	-10	7,051	53	20,984	157	(N/A)	1.1	1.8	12.11
Red maple	6,352	48	-247	-2	-2	4,368	33	10,471	79	(N/A)	1.0	0.9	6.54
American sycamore	10,417	78	-1,355	-2	-10	7,185	54	16,245	122	(N/A)	1.0	1.4	10.15
Other street trees	30,026	225	-2,920	-22	-22	27,529	206	54,612	410	(N/A)	9.6	4.8	3.62
Citywide total	744,362	5,583	-53,768	-229	-405	459,509	3,446	1,149,875	8,624	(N/A)	100.0	100.0	7.35

**Table 6: Annual Social and Aesthetic Benefits**

**Audubon**

**Annual Aesthetic/Other Benefits of Public Trees by Species**

1/11/2013

Species	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Norway maple	6,410	(N/A)	15.2	9.5	36.01
Green ash	9,934	(N/A)	14.9	14.7	56.76
Silver maple	16,793	(N/A)	13.1	24.9	109.04
Pin oak	10,219	(N/A)	7.7	15.1	113.55
Apple	605	(N/A)	6.1	0.9	8.52
Honeylocust	6,809	(N/A)	5.2	10.1	111.62
Sugar maple	3,309	(N/A)	4.1	4.9	68.94
Maple	488	(N/A)	3.3	0.7	12.51
Northern hackberry	2,047	(N/A)	2.9	3.0	60.20
Northern catalpa	1,713	(N/A)	2.2	2.5	65.87
Broadleaf Deciduous	49	(N/A)	2.0	0.1	2.11
Black walnut	1,282	(N/A)	2.0	1.9	55.73
Northern red oak	313	(N/A)	1.9	0.5	14.24
Blue spruce	333	(N/A)	1.5	0.5	19.60
Littleleaf linden	1,316	(N/A)	1.5	2.0	77.38
Eastern redbud	46	(N/A)	1.3	0.1	3.07
Cherry plum	53	(N/A)	1.3	0.1	3.55
Pear	15	(N/A)	1.3	0.0	1.02
American basswood	1,066	(N/A)	1.1	1.6	82.02
Red maple	810	(N/A)	1.0	1.2	67.51
American sycamore	744	(N/A)	1.0	1.1	62.00
Other street trees	3,176	(N/A)	9.6	4.7	28.10
Citywide total	67,528	(N/A)	100.0	100.0	57.57

**Table 7: Summary of Benefits in Dollars**

**Audubon**

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

1/11/201

Species	Energy	CO <sub>2</sub>	Air Quality	Stormwater	Aesthetic/Other	Total (\$)	Standard Error	% of Total \$
Norway maple	9,972	1,036	1,773	11,705	6,410	30,895	(±0)	13.6
Green ash	10,298	1,433	1,766	14,002	9,934	37,433	(±0)	16.5
Silver maple	10,791	2,164	1,993	20,301	16,793	52,041	(±0)	22.9
Pin oak	6,181	1,304	795	8,527	10,219	27,026	(±0)	11.9
Apple	1,460	155	229	679	605	3,127	(±0)	1.4
Honeylocust	1,982	325	332	2,795	6,809	12,242	(±0)	5.4
Sugar maple	2,940	396	470	4,359	3,309	11,475	(±0)	5.1
Maple	520	53	85	458	488	1,604	(±0)	0.7
Northern hackberry	2,615	258	459	3,180	2,047	8,559	(±0)	3.8
Northern catalpa	1,997	275	370	3,371	1,713	7,725	(±0)	3.4
Broadleaf Deciduous	139	14	19	51	49	271	(±0)	0.1
Black walnut	1,319	184	225	1,772	1,282	4,782	(±0)	2.1
Northern red oak	599	60	84	703	313	1,758	(±0)	0.8
Blue spruce	242	18	26	344	333	964	(±0)	0.4
Littleleaf linden	924	146	160	1,352	1,316	3,898	(±0)	1.7
Eastern redbud	193	16	32	115	46	402	(±0)	0.2
Cherry plum	152	15	21	58	53	300	(±0)	0.1
Pear	52	5	7	19	15	98	(±0)	0.0
American basswood	922	157	143	1,395	1,066	3,683	(±0)	1.6
Red maple	528	79	96	552	810	2,065	(±0)	0.9
American sycamore	907	122	173	1,622	744	3,568	(±0)	1.6
Other street trees	3,475	410	522	5,285	3,176	12,867	(±0)	5.7
Citywide Total	58,206	8,624	9,781	82,644	67,528	226,783	(±0)	100.0

**Table 8: Summary of Maintenance Recommendations by Diameter Class**

<b>Audubon</b>										
<b>Recommended Maintenance for Public Trees (None)</b>										
1/11/2013										
DBH Class (in)										
Zone	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	Total
I	0	0	0	0	0	0	0	0	0	0
Citywide total	0	0	0	0	0	0	0	0	0	0

DBH Class (in)											
Maintenance Type	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	Total	% of Total Population
None	0	0	0	0	0	0	0	0	0	0	0.00
Young tree (routine)	106	61	35	0	1	0	0	0	0	203	17.31
Young tree (immediate)	5	0	1	0	0	0	0	0	0	6	0.51
Mature tree (routine)	0	10	93	109	196	268	64	20	7	767	65.39
Mature tree (immediate)	0	0	3	4	9	36	10	0	2	64	5.46
Critical concern (public safety)	0	1	7	11	26	48	29	9	2	133	11.34
Citywide total	111	72	139	124	232	352	103	29	11	1,173	100.00

**Table 9: Summary of Recommended Tasks by Diameter Class**

<b>Audubon</b>										
<b>Priority Task Summary for Public Trees (None)</b>										
1/11/2013										
DBH Class (in)										
Zone	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	Total
I	99	66	119	103	176	220	63	21	7	874
Citywide total	99	66	119	103	176	220	63	21	7	874

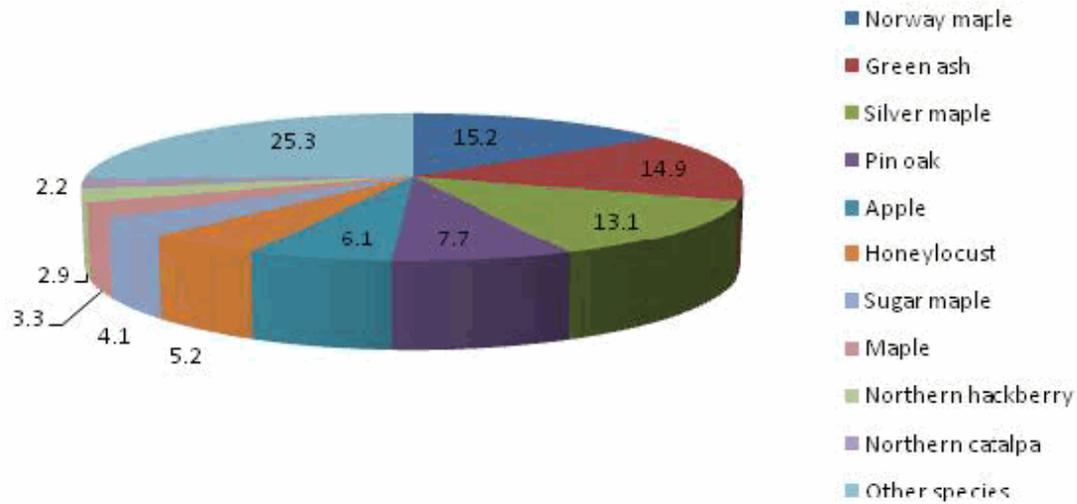
  

DBH Class (in)											
Maintenance Type	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	Total	% of Total Population
None	99	66	119	103	176	220	63	21	7	874	74.51
Stake/Train	7	1	0	0	0	0	0	0	0	8	0.68
Clean	3	1	8	14	32	88	24	7	3	180	15.35
Raise	0	2	6	0	6	10	2	0	0	26	2.22
Reduce	0	0	0	0	0	0	0	0	0	0	0.00
Remove	2	0	2	4	13	23	9	1	1	55	4.69
Treat pest/disease	0	2	4	3	5	11	5	0	0	30	2.56
Citywide total	111	72	139	124	232	352	103	29	11	1,173	100.00

**Audubon**

**Species Distribution of Public Trees (%)**

1/11/2013



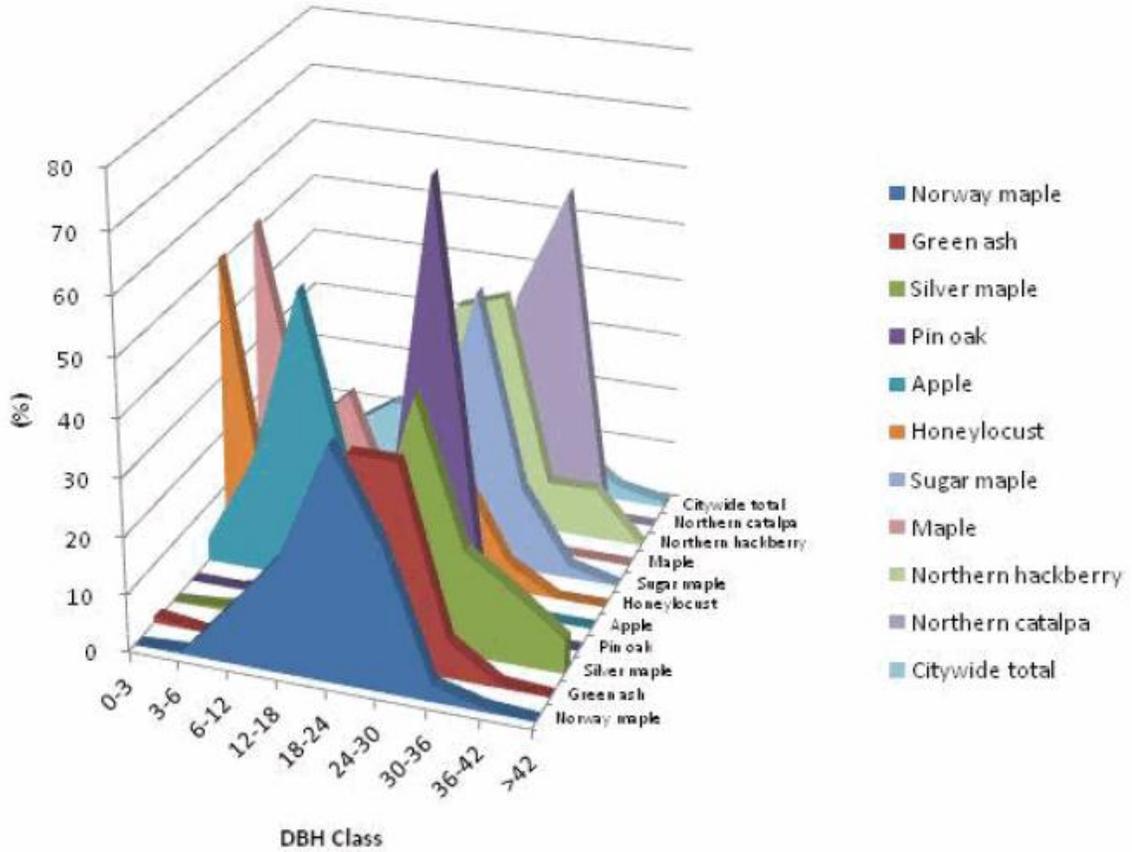
Species	Percent
Norway maple	15.2
Green ash	14.9
Silver maple	13.1
Pin oak	7.7
Apple	6.1
Honeylocust	5.2
Sugar maple	4.1
Maple	3.3
Northern hackberry	2.9
Northern catalpa	2.2
Other species	25.3
Total	100.0

Figure 1: Species Distribution

Audubon

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

1/11/2013



Species	DBH class (in)								
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42
Norway maple	0.0	0.6	10.1	20.2	40.4	25.3	2.8	0.6	0.0
Green ash	1.1	0.0	6.9	14.3	35.4	35.4	6.3	0.6	0.0
Silver maple	0.0	0.6	2.6	5.2	12.3	42.9	18.2	12.3	5.8
Pin oak	0.0	0.0	2.2	4.4	6.7	75.6	11.1	0.0	0.0
Apple	4.2	19.7	50.7	18.3	7.0	0.0	0.0	0.0	0.0
Honeylocust	50.8	1.6	3.3	4.9	14.8	19.7	4.9	0.0	0.0
Sugar maple	0.0	2.1	4.2	12.5	16.7	47.9	14.6	2.1	0.0
Maple	51.3	15.4	23.1	2.6	2.6	5.1	0.0	0.0	0.0
Northern hackberry	0.0	0.0	2.9	0.0	38.2	41.2	8.8	8.8	0.0
Northern catalpa	0.0	0.0	0.0	0.0	3.8	38.5	57.7	0.0	0.0
Citywide total	9.5	6.1	11.8	10.6	19.8	30.0	8.8	2.5	0.9

Figure 2: Relative Age Class

**Functional (Foliage) Condition of Public Trees by Species (%)**

1/11/2013

**Citywide total**

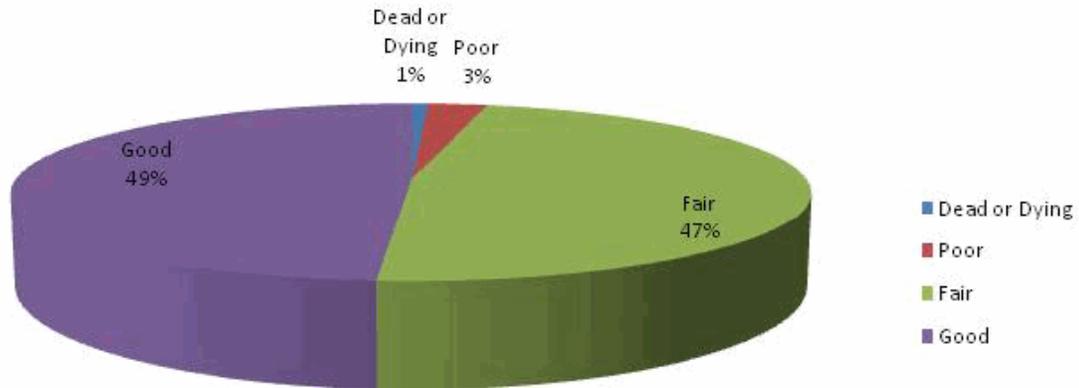


Figure 3: Foliage Condition

**Structural (Woody) Condition of Public Trees by Species (%)**

1/11/2013

**Citywide total**

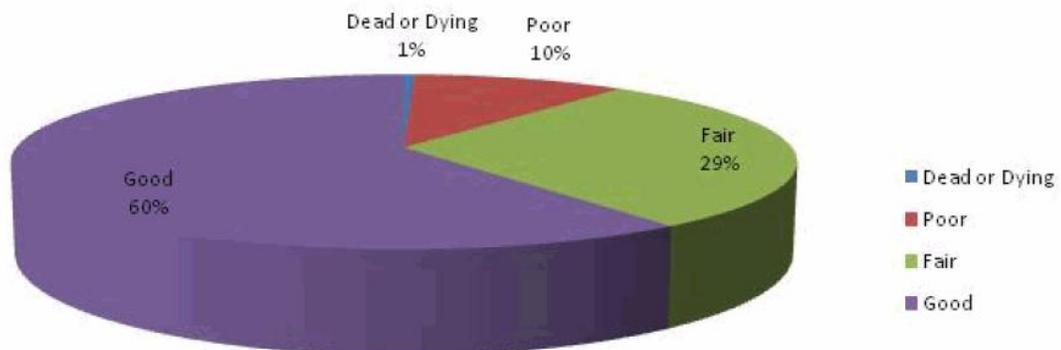
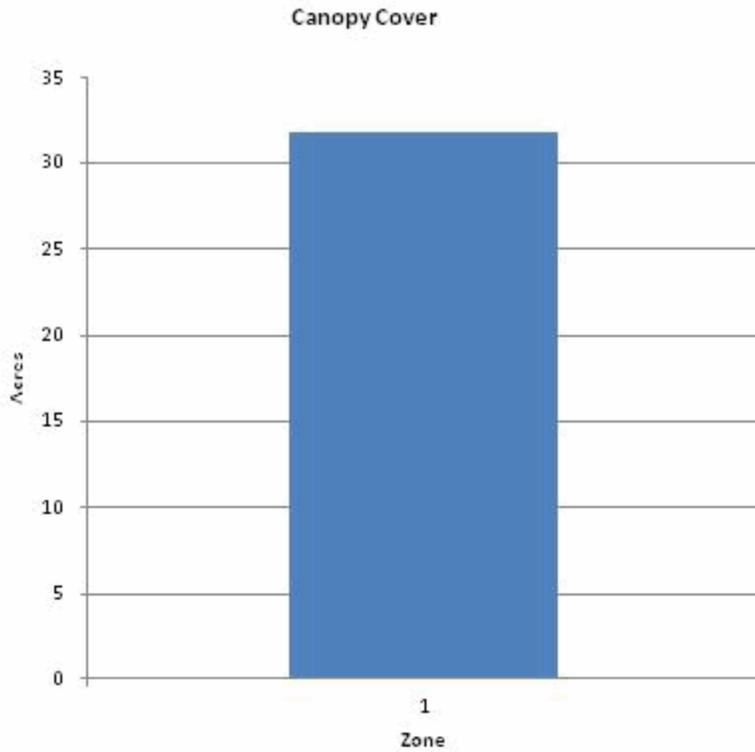


Figure 4: Wood Condition

**Audubon**

**Canopy Cover of Public Trees (Acres)**

1/11/2013



Zone	Acres	% of Total Canopy Cover
1	32	100.0
Citywide total	32	100.0

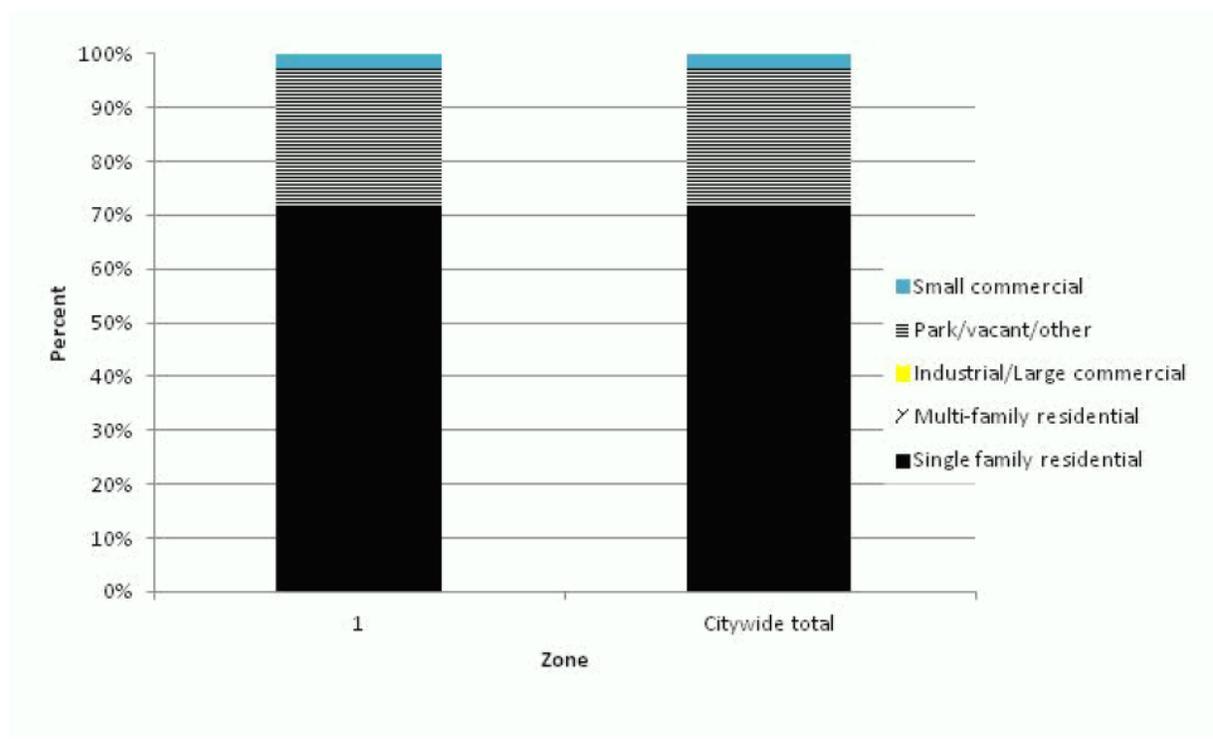
	Total Land Area	Total Street and Sidewalk Area	Total Canopy Cover	Canopy Cover as % of Total Land Area	Canopy Cover as % of Total Streets and Sidewalks
Citywide	0	0	32		

Figure 5: Canopy Cover in Acres

# Audubon

## Land Use of Public Trees by Zone (%)

1/11/2013



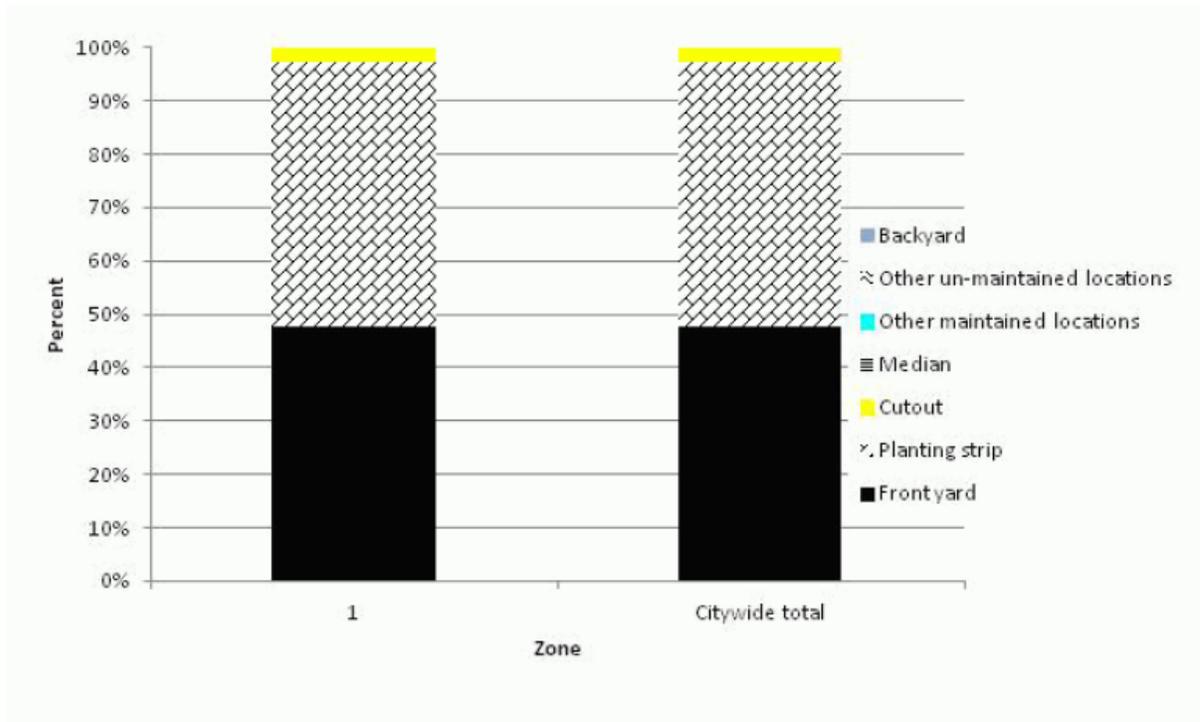
Zone	Single family residential	Multi-family residential	Industrial/ Large commercial	Park/vacant/ other	Small commercial
1	71.6	0.0	0.0	25.7	2.7
Citywide total	71.6	0.0	0.0	25.7	2.7

Figure 6: Land Use of city/park trees

**Audubon**

**Location of Public Trees by Zone (%)**

1/11/2013



Zone	Front yard	Planting strip	Cutout	Median	Other maintained locations	Other un-maintained locations	Backyard
1	47.7	49.5	2.7	0.0	0.0	0.0	0.0
Citywide total	47.7	49.5	2.7	0.0	0.0	0.0	0.0

Figure 7: Location of city/park trees

## Appendix B: ArcGIS Mapping

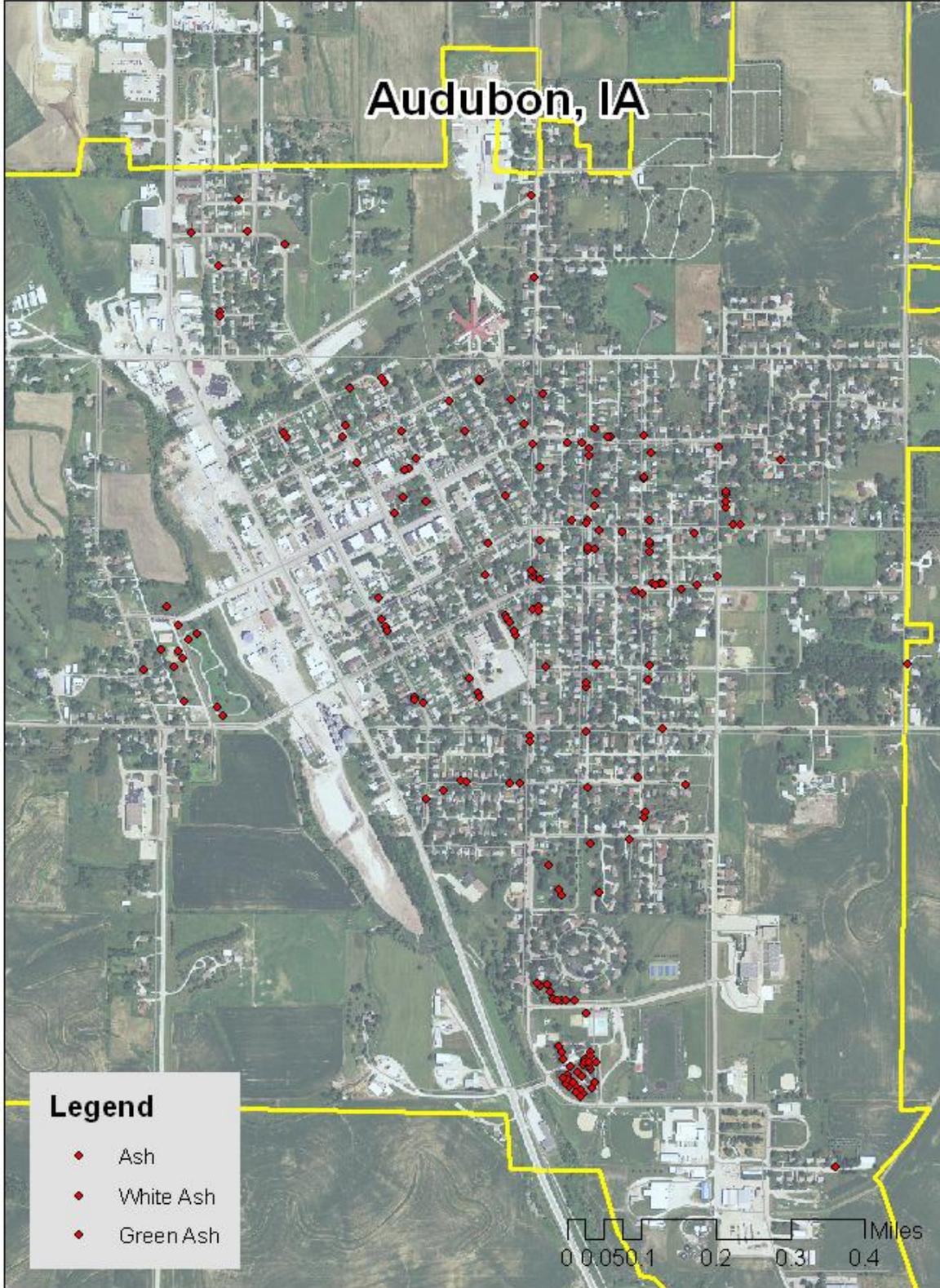


Figure 1: Location of Ash Trees



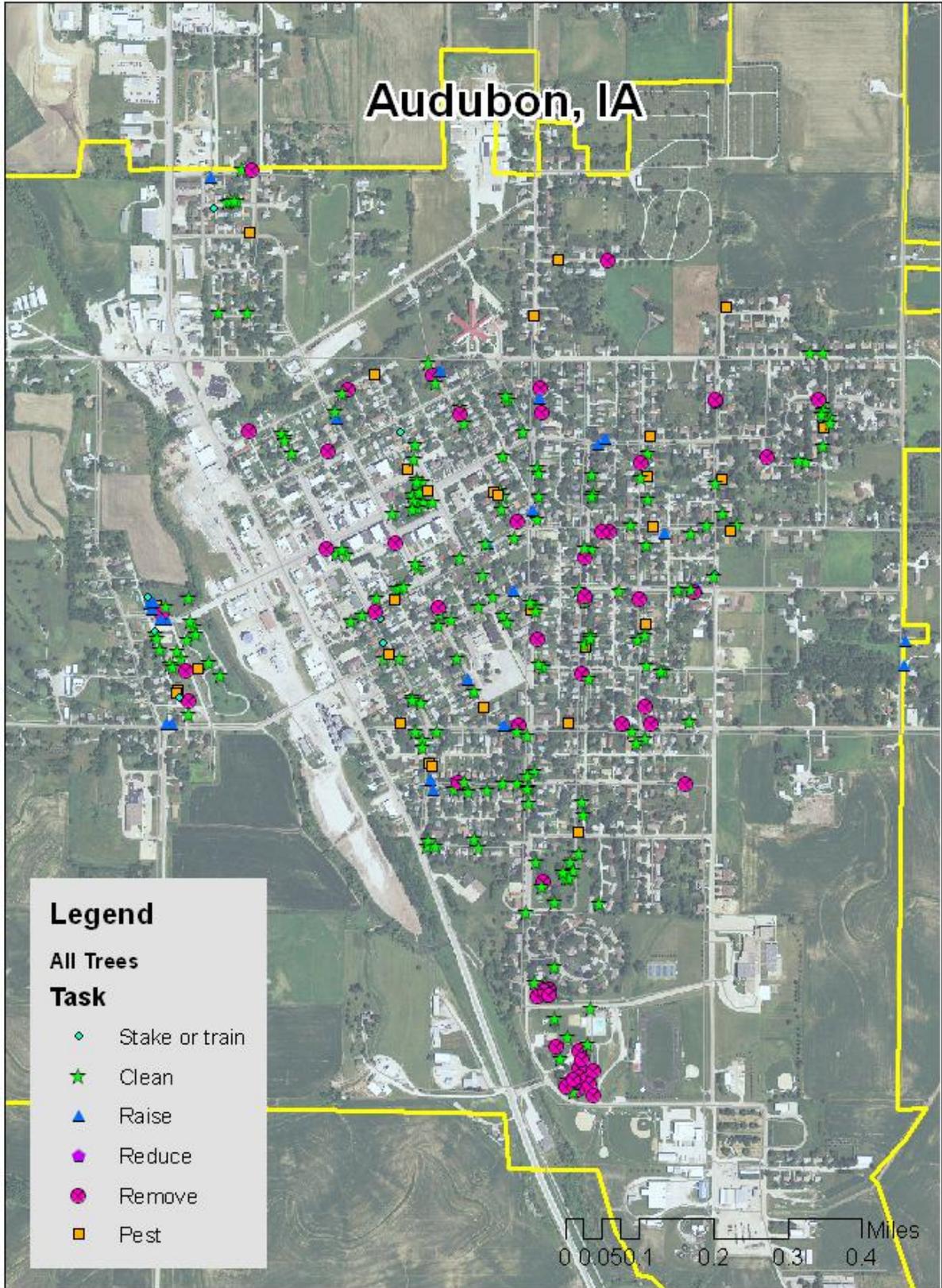
**Figure 2: Location of EAB symptoms**



**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: Audubon Tree Ordinances

### CHAPTER 151 TREES AND GRASS

151.01 Definition 151.05 Disease Control  
151.02 Planting Restrictions 151.06 Inspection and Removal  
151.03 Duty to Trim Trees 151.07 Cutting or Mowing of Grass  
151.04 Trimming Trees to be Supervised

151.01 DEFINITION. For use in this chapter, “boulevard” 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 boulevard or street except in accordance with the following:

1. Alignment. All trees planted in any street shall be planted in the boulevard midway between the outer line of the sidewalk and the curb. In the event a curb line is not established, trees shall be planted on a line ten (10) feet from the property line.
2. Spacing. Trees shall not be planted on any boulevard which is less than nine (9) feet in width, or contains less than eighty-one (81) square feet of exposed soil surface per tree. Trees shall not be planted closer than twenty (20) feet from street intersections (property lines extended) and ten (10) feet from driveways. If it is at all possible trees should be planted inside the property lines and not between the sidewalk and the curb.
3. Prohibited Trees. No person shall plant in any street any fruit-bearing tree or any tree of the kinds commonly known as cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut.

151.03 DUTY TO TRIM TREES. The owner or agent of the abutting property shall keep the trees on, or overhanging the street, trimmed so that all branches will be at least eighteen (18) feet above the surface of a street, twenty (20) feet above the surface of a primary highway, 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 infected with or damaged by any disease or insect or disease pests, and such trees and shrubs shall be subject to removal as follows:

1. 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 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.

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

151.07 CUTTING OR MOWING OF GRASS.

1. Duty to Cut and Mow Lawns and Lots. The owner of any property shall cut and mow all lawns and lots so that such growth shall be less than four (4) inches at all times.

2. Cutting and Mowing by City. If a property owner refuses or fails to cut and mow lawns and lots within forty-eight (48) hours after being delivered a notice from the City to perform such action, the Council may require said work to be done and the cost and expenses thereof shall be assessed to the property owner after due notice is given. The amount of such assessment shall be certified to the County Auditor as provided by law and the same shall be collected with and in the same manner as general property taxes.

**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. 9<sup>th</sup> St., Des Moines, IA 50319.

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