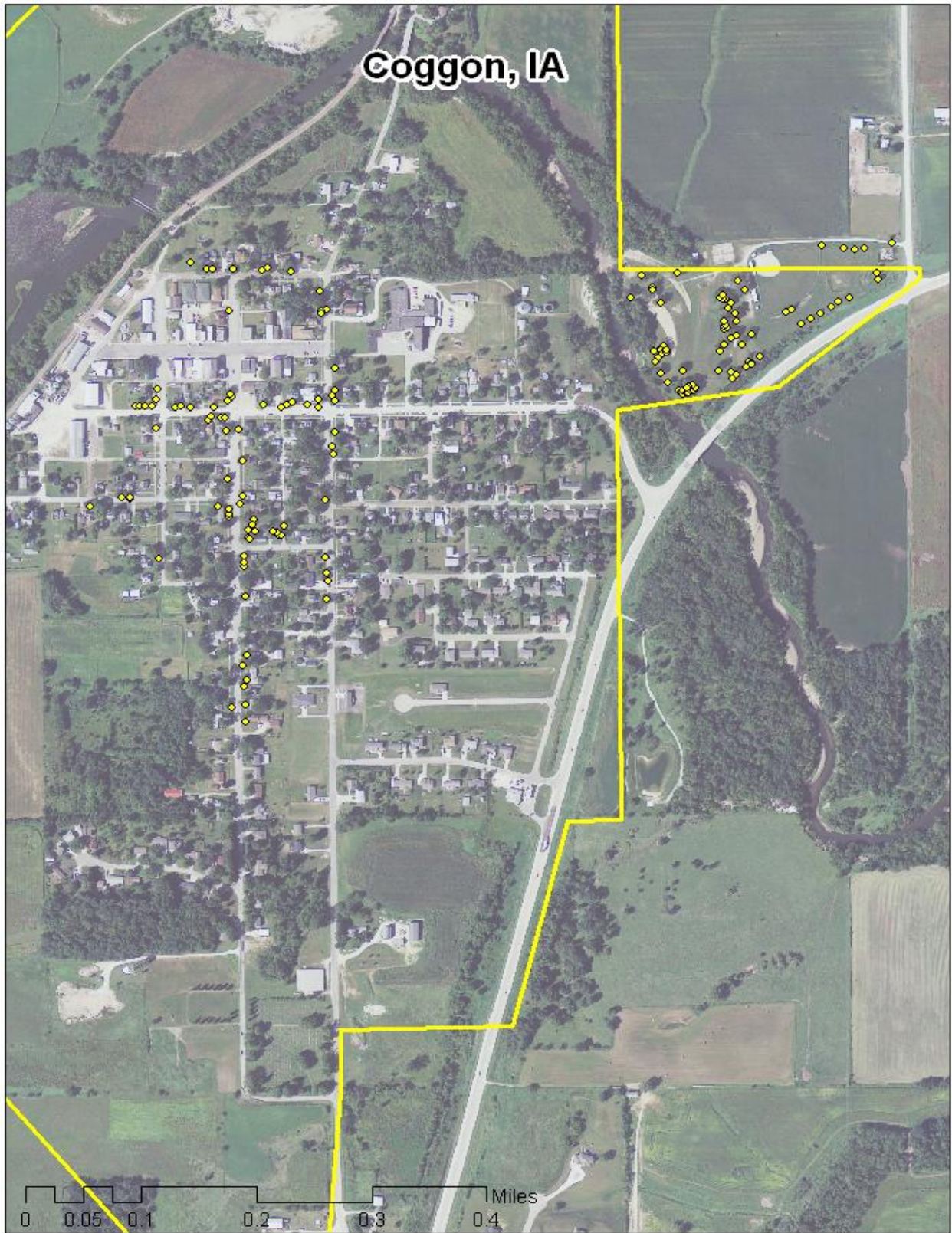


Coggon, IA



2011 Community Street & Park Tree Management Plan
Prepared by Mark A. Vitosh
Bureau of Forestry, Iowa DNR





All trees surveyed fall of 2011

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Executive Summary

Overview

This plan was developed to assist the City of Coggon 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) and gypsy moth. 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). **This pest was found in northeast Iowa in the spring of 2010, but has not been found in your area yet.** There is a strong possibility that ~23 % of Coggon's city owned trees (ash-37) 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. Another concern is that 33% of Coggon's city owned trees are some type of (oak-54) and 29% are some type of (maple-48). This means that 85% of the public tree population is oak, maple, or ash. This is a concern because if any type of insect or disease starts to threaten the health of any of these tree types in the community this could have a significant impact on the community tree population.

Inventory and Results

In the fall of 2011 a tree inventory was conducted using Global Positioning System (GPS) data collectors. The inventory was a complete inventory of street and park trees in the community. Below are some key findings of the 163 trees inventoried.

- Coggon's trees provide \$26,402 of benefits annually, an average of \$162 a tree
- There are ~22 species of trees
- The top three genus are: Oak 33%, maple 29%, and Ash 23%
- 11% of trees are in need of some type of management, the majority of the management is pruning such as raising above streets and sidewalks for safety or cleaning out dead material
- 7 trees are recommended for removal consideration
- There are a total of 12 trees outlined in two letters (9/16/2011 and 9/27/2011) to the City Superintendent from the Iowa DNR District Forester that need to be inspected to see what action (s) is/are needed

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.

- There are 7 trees to be considered for removal, and there are two tree situations that are of critical concern (one removal and one removal of dead material). ***City ownership of the trees recommended for removal should always be verified prior to any removal***
- 5 of the 37 ash trees are in need of follow up at this point.
- Attempt to prune all park trees on a routine schedule (every 5 to 7 years).

- Plant a diverse mix of trees that do not include: ash, maple, bur oak, cottonwood, poplar, boxelder, Chinese elm, willow, black walnut, or evergreen species as street trees. Evergreen species such as Norway spruce, Serbian spruce, white spruce, Eastern white pine, Eastern redcedar, concolor fir, or arborvitae can be considered for park plantings.
- Check ash trees with a visual survey yearly
- EAB could potentially kill all ash trees within 4 to 10 years of its arrival to Coggon. If removal costs range from \$600 to \$1,000 per tree, total estimated costs to remove all 37 ash in the community would be between \$22,200 and \$37,000.

Introduction

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

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

Inventory

In the fall of 2011, 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

The data collected for the 163 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.

Annual Benefits

Annual Energy Benefits

Trees conserve energy by shading buildings and blocking winds. Coggon's trees reduce energy related costs by approximately \$7,389 annually (Appendix A, Table 1). These savings are both in Electricity (35.4 MWh) and in Natural Gas (4,799.3 Therms).

Annual Stormwater Benefits

Coggon's trees intercept about 347,961 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides \$9,430 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 Coggon, it is estimated that trees remove 446.7 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 \$1,266 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Coggon, trees sequester about 81,438 lbs of carbon a year with an associated value of \$1,008 (Appendix A, Table 5). In addition, the trees store 1,324,660 lbs of carbon, with a yearly benefit of \$9,935 (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. Coggon receives \$7,307 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, Coggon's trees provide \$26,402 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 163 trees in Coggon provide approximately \$162 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Coggon has 22 different tree species along city streets and parks (Appendix A, Figure 1).

The distribution of trees by genus is as follows:

Oak	54	33% (Bur, White, and Red))
Maple	48	29% (Sugar, Silver, Red, Norway, and Boxelder)
Ash	37	23% (Green & White)
Apple (Crabapple)	5	3% Species 3% or less are below
Callery Pear		
Black Walnut		
Honeylocust		
Hickory		
Mulberry		
American Basswood (Linden)		
Siberian Elm		
Blue Spruce		
Black Cherry		
Catalpa		

Size Class

In Coggon (~30.7 %) of the public trees are 12 inches and under in diameter at 4.5 ft, while (25.2 %) are between 12 and 18 inches in diameter, and the remaining trees (44.1 %) are 18 inches and greater in diameter (Appendix A, Figure 2).

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 Coggon indicate that 91% of the trees are in good health, with only 1% of the foliage identified as dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3).

Similarly, 56% of Coggon's trees are in good health for wood condition (Appendix A, Figure 4 & Appendix B, Figure 3). Wood condition that is in poor health is about 6%, and dead or dying is 2% of the population.

Management Needs

- In (Appendix B, Figure 4) the specific management needs of the inventoried trees are identified. Management practices needed include crown cleaning, crown raising, crown reduction, and some potential removal. Eleven percent of the inventoried trees are in need of some type of management, the majority of the management is pruning such as raising above streets and sidewalks for safety or cleaning out dead material. There are 7 trees on the map listed for possible removal that should be evaluated as soon as possible to decide if they need to be removed and when, and there are two tree situations that are of critical concern (one removal and one removal of dead material).
City ownership of the trees recommended for removal should be verified prior to any removal

Land Use and Location

In Coggon ~46% of the public trees city trees are in areas of single-family residential homes and are planted within planting strips, while another 53% of the trees are in the parks (Appendix A, Figure 5 & Figure 6).

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 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

- Coggon has 7 trees that need to be considered for removal as soon as possible. These trees can be seen on the Location of Trees with Recommended Maintenance map (Appendix B, Figure 5). There are also 12 trees outlined in two letters (9/16/2011 and 9/27/2011) to the City Superintendent from the Iowa DNR District Forester that need to be inspected to see what action (s) is/are needed. Below is the list of those 12 trees that need to be looked at:

Trees Needing Evaluation Savage Memorial Park

- Couple of bur oak trees just north and northwest of the playground shelter with a number of 3 to 5 inch diameter dead limbs hanging immediately over the animal toys (duck and horse).
- ~18 inch diameter bur oak ~25 feet north of duck toy with 9 inch dead limb.

- Very large bur oak next to electric panel near ball diamond with significant dead material in it. Consider removing this tree.
- Mulberry southeast of swing with split in trunk. Consider removal.
- Large green ash with old trunk wound and severe decay east of playground shelter ~40 feet needs to be evaluated for removal.
- 14 inch green ash south of large utility transformer is being severely girdled by cable and needs to be inspected.
- In this park there are a number of younger trees that have sustained significant trunk damage from mowing equipment. It appears that this damage has occurred over a number of years. Trunk wounds can be entry areas for decay which can minimize the life span of individual trees. A number of trees in the park have been damaged severely enough that their life span will be shortened. One way to eliminate mower damage is to utilize mulch around trees that are 6 inches in diameter or less. Go to the following web site to find guidelines on proper mulching: <http://www.extension.iastate.edu/Publications/PM1591.pdf>.

Trees Needing Evaluation Coggon City Park

- Large dead white oak in the middle of the playground needs to be removed.
- Large white oak adjacent to alley with two 3 to 5 inch dead branches near swing.
- On the west side of the park there is a severely damaged ornamental pear with a crack in the stem that needs to be evaluated for removal.

Trees Needing Evaluation In Other Areas

- 121 2nd Street 10 inch sugar maple with significant dieback over the sidewalk.
- 113 Vinton Street large green ash with a few dead branches over the sidewalk and street.
- 310 3rd street ash with significant storm damage and poor structure should be considered for 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 park trees be pruned on a routine schedule every five to seven years, and if new trees are planted it is critical for the first 5 to 15 years after planting that good maintenance pruning is used to develop quality trees. Please refer to the six year maintenance plan for further information.

Planting

During this process I was never able to obtain budget information for Coggon, but I do know that the community ordinance discourages the planting of trees in the public right-a-way along the streets. If some trees are removed in the next few years consider replacing these trees at a minimum in the parks.

It is recommended to plant 1 to 2 trees for every tree removed, since survival rates will not be 100%. Please refer to the six year maintenance plan at the end of this section. It is not essential that the new trees be planted in the same location of the trees being removed. However, maintaining the same number of trees helps ensure continuation of the benefits of the existing forest in Coggon.

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 15 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 has 33% oak and 29% maple and for this reason consider not planting maple and bur oak on public property until these percentages become lower. Also, ash trees have not been recommended since 2002, due to the threat of EAB. As mentioned above avoid planting more bur oak(23% of total public tree population), but continue planting a mix of other oak species such as swamp white, red, black, chinkapin, and white.

Species to avoid because they can be public nuisances include: cottonwood, poplar, boxelder, Chinese elm, evergreens as street trees, willow or black walnut.

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. With many new potential tree health threats on the horizon attempt to monitor the health of all city owned trees on a regular basis.

Six Year Maintenance Plan

I was not able to obtain a current tree budget from the community, so the maintenance plan below gives general guidelines to consider depending on available funds.

Year 1

Removal: 7 trees (@ estimate \$200 to \$1,000/tree) with the highest concern that have been identified

Planting and Replacement: 5 trees (@ \$50 to \$150/tree) planted in open locations in parks

Visual Survey for signs and symptoms of EAB

Routine trimming: Prune a portion of park trees (@\$20 to \$200/tree)

Year 2

Removal: Removal of any new critical concern trees and ash in poor health as budget permits

Visual Survey for signs and symptoms of EAB

Year 3

Removal: Removal of any new critical concern trees and ash in poor health as budget permits
Planting and Replacement: 5 trees planted in open locations within parks (@ \$50 to \$150/tree)
Routine trimming: Prune a portion of park trees (@\$20 to \$200/tree)
Visual Survey for signs and symptoms of EAB

Year 4

Removal: Removal of any new critical concern trees and ash in poor health as budget permits
Planting and Replacement: 5 to 10 trees planted in open locations within parks (@ \$50 to \$150/tree)
Visual Survey for signs and symptoms of EAB

Year 5

Removal: Removal of any new critical concern trees and ash in poor health as budget permits
Visual Survey for signs and symptoms of EAB

Year 6

Removal: Removal of any new critical concern trees and ash in poor health as budget permits
Planting and Replacement: 5 trees planted in open locations within parks (@ \$50 to \$150/tree)
Routine trimming: Prune a portion of park trees (@\$20 to \$200/tree)
Visual Survey for signs and symptoms of EAB

EAB could potentially kill all ash trees within 4 to 10 years of its arrival to Coggon. If removal costs range from \$600 to \$1,000 per tree, total estimated costs to remove all 37 ash in the community would be between \$22,200 and \$37,000.

Emerald Ash Borer Plan

Ash Tree Removal

There are 5 ash that need more observation and follow-up, and there are two ash at this point that need to be considered for removal. Any tree removal that occurs will be prioritized with hazardous, dead, and dying trees to be removed first. [*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 ash trees and the associated brush and chips? How will wood be disposed of or utilized? Do you have equipment capable of handling the amount and size of ash trees your tree inventory has identified? Once your county is under quarantine for EAB, contact USDA-APHIS-PPQ at 515-251-4083 or visit the website http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/regulatory.shtml. Wood waste can be disposed of as you normally would if your county is not part of a quarantine.

Canopy Replacement

As budget permits, all removed ash trees should be replaced. Since the community is not promoting tree planting along the streets consider planting new trees in some of the parks. New plantings will be a diverse mix and will not include ash, maple at this time, cottonwood, poplar, bur oak, box elder, Chinese elm, evergreens along the streets, 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. There is already an ordinance that relates to nuisance trees that have Dutch Elm Disease, but the community may want to update the ordinance so that any trees on public and/or private property that are a threat can be removed.

Consider something like the following: **“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.

151.10 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:

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. ”

Budget

EAB could potentially kill all ash trees within 4 to 10 years of its arrival to Coggon. If removal costs range from \$600 to \$1,000 per tree, total estimated costs to remove all 37 ash in the community would be between \$22,200 and \$37,000.

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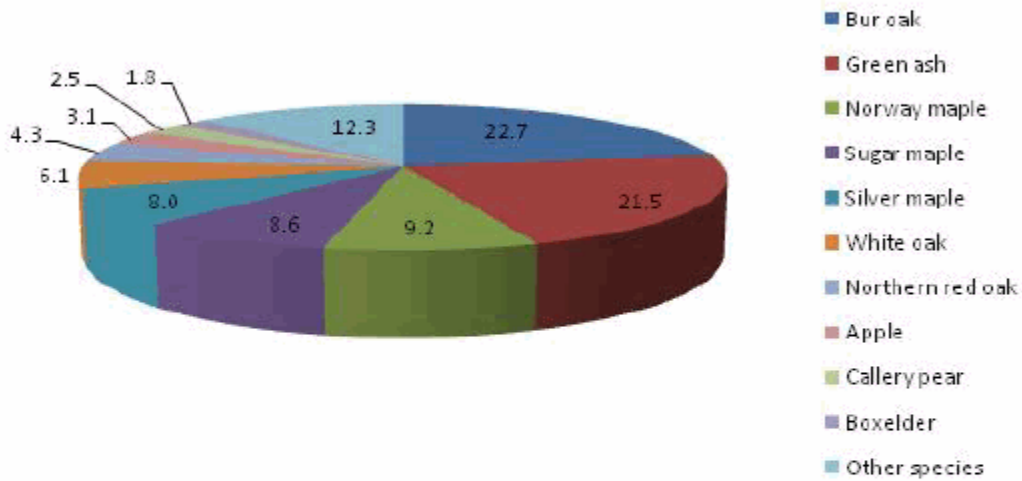
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Appendix A: i-Tree Data

Species Distribution of Public Trees (%)

10/25/2011

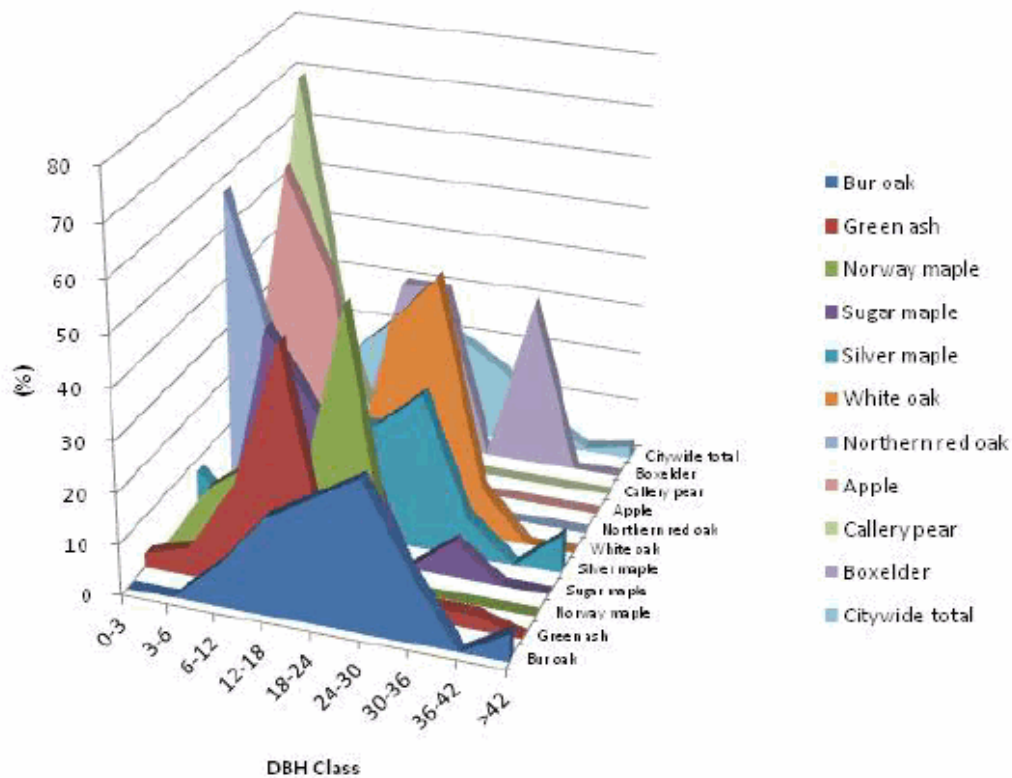


Species	Percent
Bur oak	22.7
Green ash	21.5
Norway maple	9.2
Sugar maple	8.6
Silver maple	8.0
White oak	6.1
Northern red oak	4.3
Apple	3.1
Callery pear	2.5
Boxelder	1.8
Other species	12.3
Total	100.0

Figure 1: Species Distribution

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

10/25/2011



Species	DBH class (in)								
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42
Bur oak	0.0	0.0	8.1	18.9	24.3	29.7	13.5	0.0	5.4
Green ash	2.9	5.7	20.0	48.6	5.7	11.4	2.9	2.9	0.0
Norway maple	0.0	13.3	20.0	13.3	53.3	0.0	0.0	0.0	0.0
Sugar maple	0.0	0.0	42.9	28.6	21.4	0.0	7.1	0.0	0.0
Silver maple	7.7	0.0	0.0	23.1	23.1	30.8	7.7	0.0	7.7
White oak	0.0	0.0	0.0	0.0	40.0	50.0	10.0	0.0	0.0
Northern red oak	57.1	28.6	0.0	14.3	0.0	0.0	0.0	0.0	0.0
Apple	0.0	60.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0
Callery pear	0.0	75.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0
Boxelder	0.0	0.0	0.0	33.3	33.3	0.0	33.3	0.0	0.0
Citywide total	4.3	8.6	17.8	25.2	20.2	14.7	6.1	0.6	2.5

Figure 2: Relative Age Class

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

10/25/2011

Citywide total

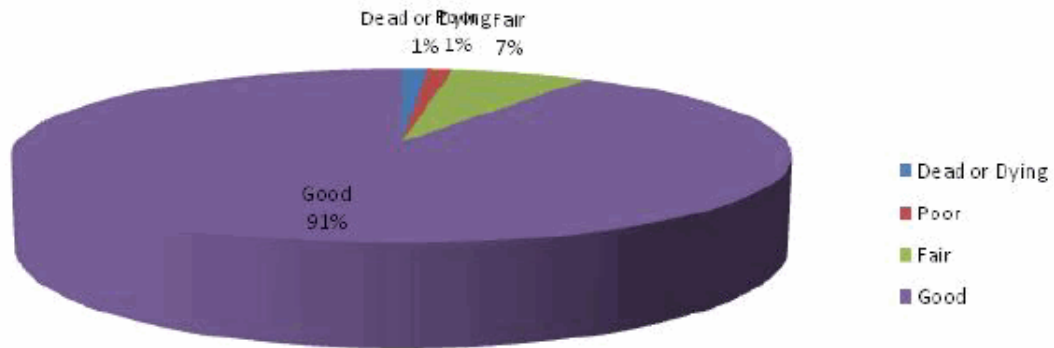


Figure 3: Foliage Condition

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

10/25/2011

Citywide total

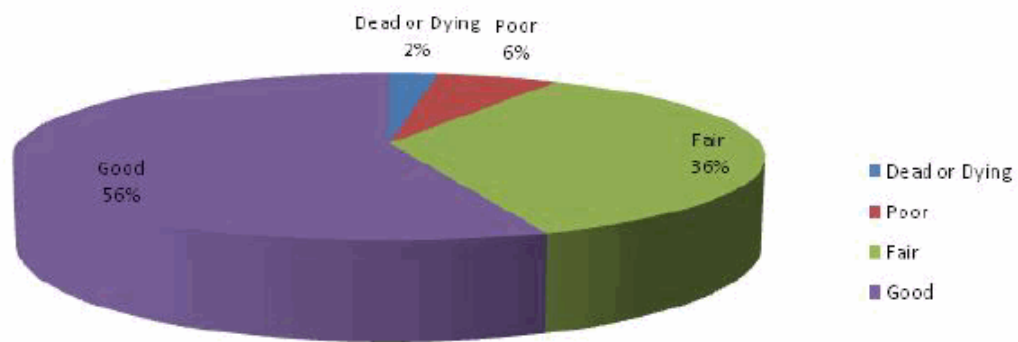
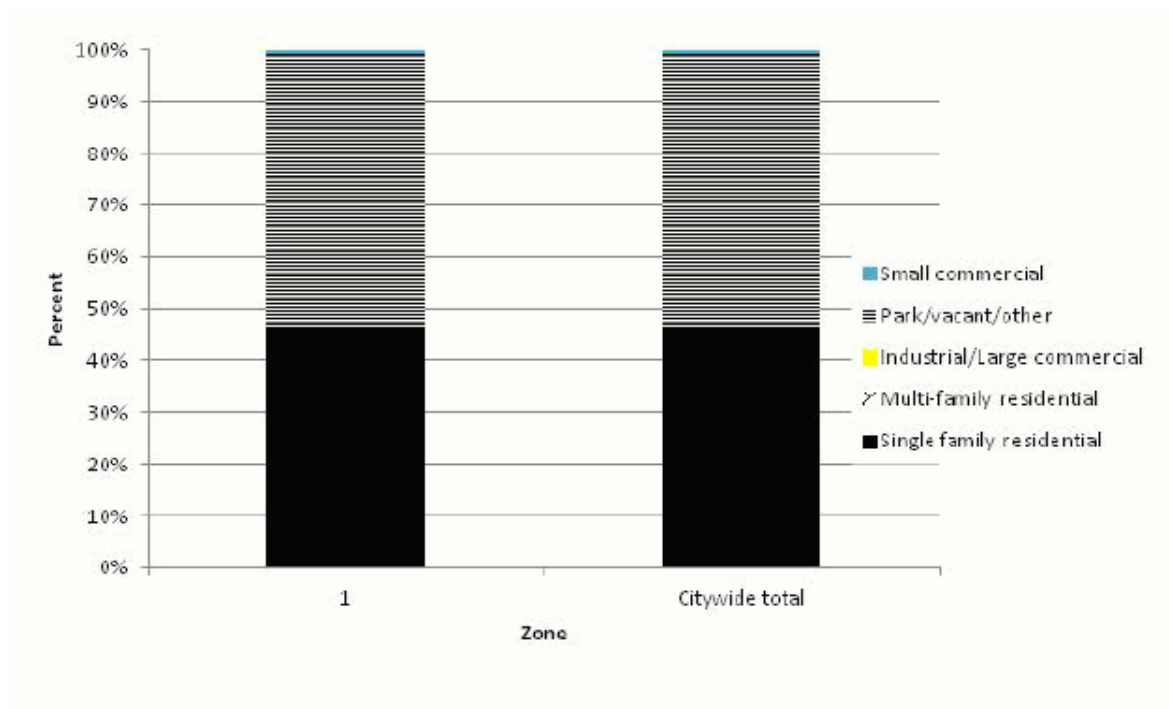


Figure 4: Wood Condition

Land Use of Public Trees by Zone (%)

10/25/2011

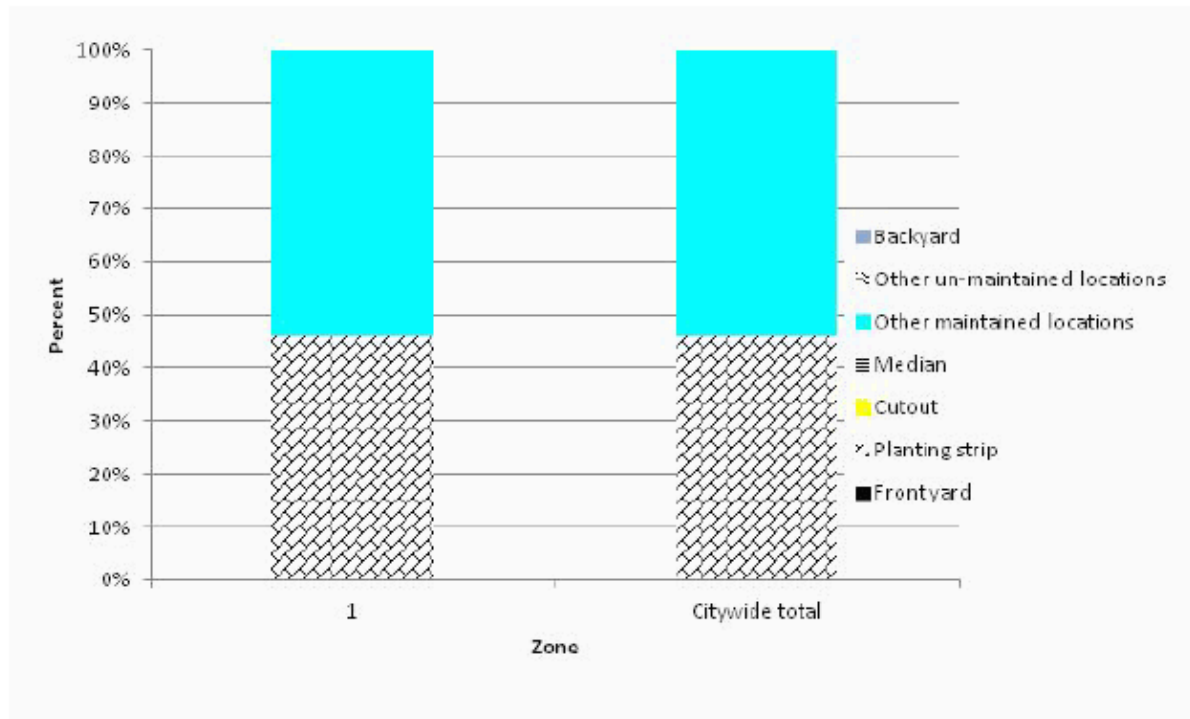


Zone	Single family residential	Multi-family residential	Industrial/ Large commercial	Park/vacant/ other	Small commercial
1	46.0	0.0	0.0	53.4	0.6
Citywide total	46.0	0.0	0.0	53.4	0.6

Figure 5: Land Use of city/park trees

Location of Public Trees by Zone (%)

10/25/2011



Zone	Front yard	Planting strip	Cutout	Median	Other maintained locations	Other un-maintained locations	Backyard
1	0.0	46.0	0.0	0.0	54.0	0.0	0.0
Citywide total	0.0	46.0	0.0	0.0	54.0	0.0	0.0

Figure 6: Location of city/park trees

Appendix B: ArcGIS Mapping

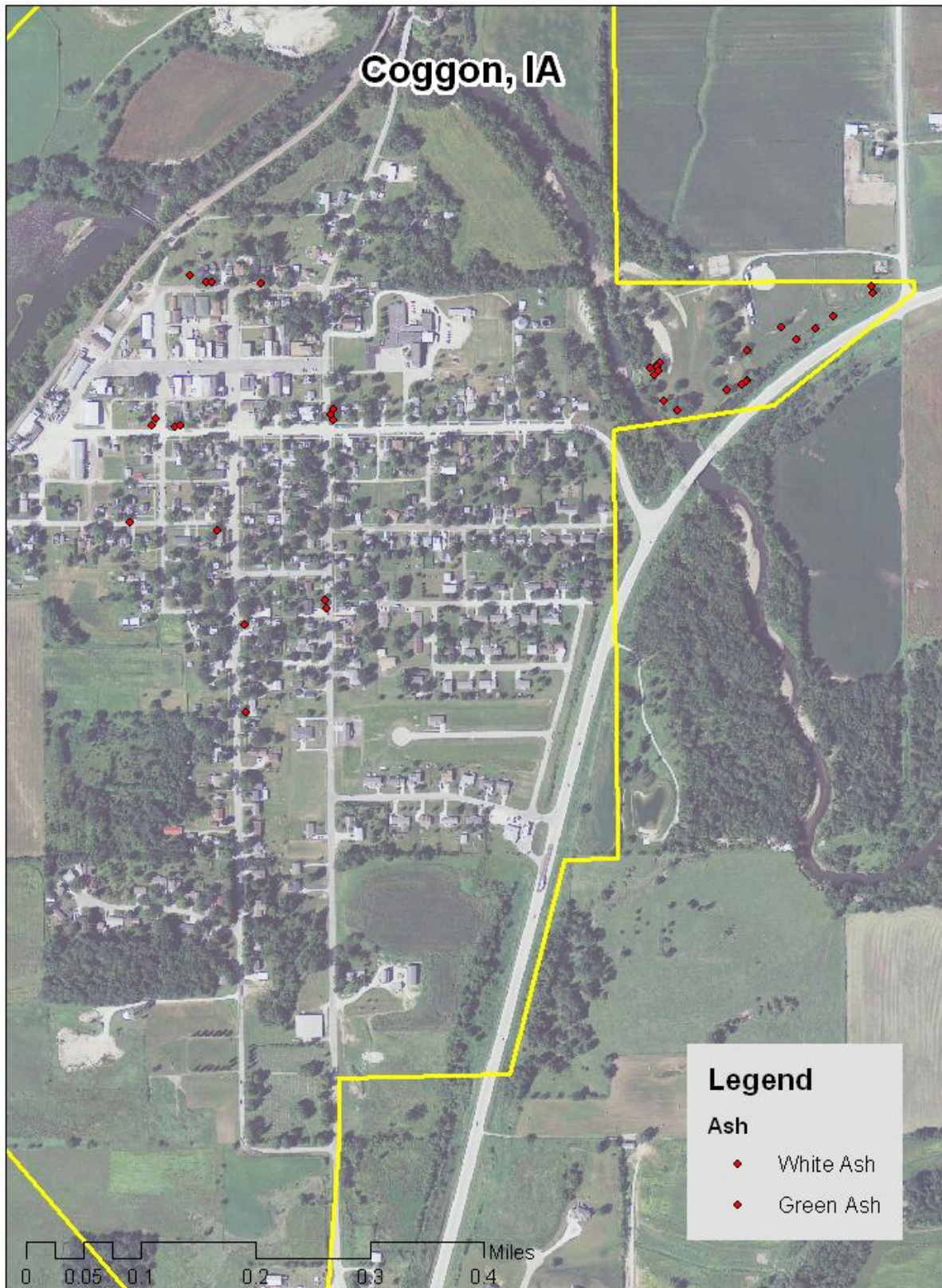


Figure 1: Location of Ash Trees

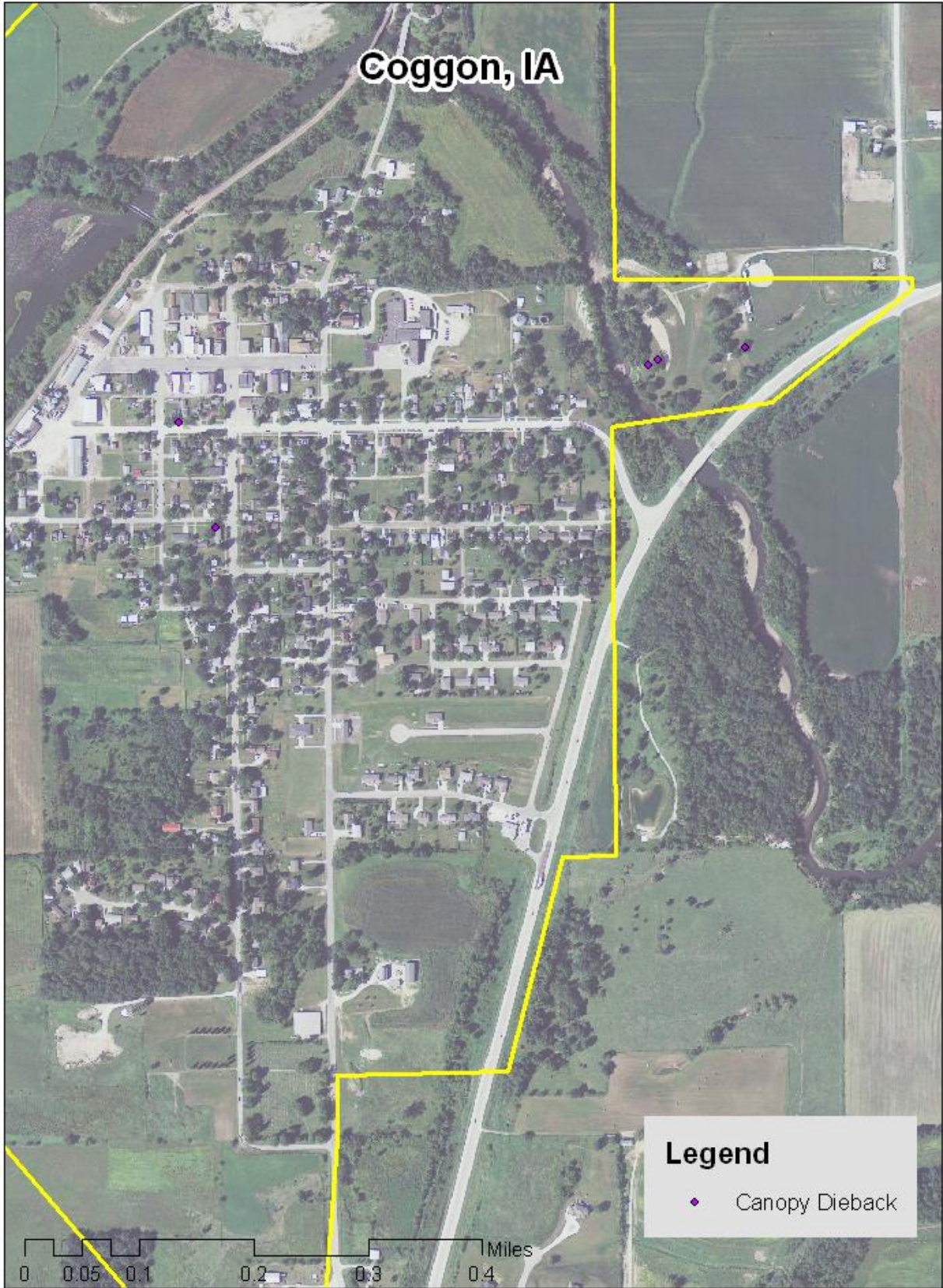


Figure 2: Location of EAB symptoms

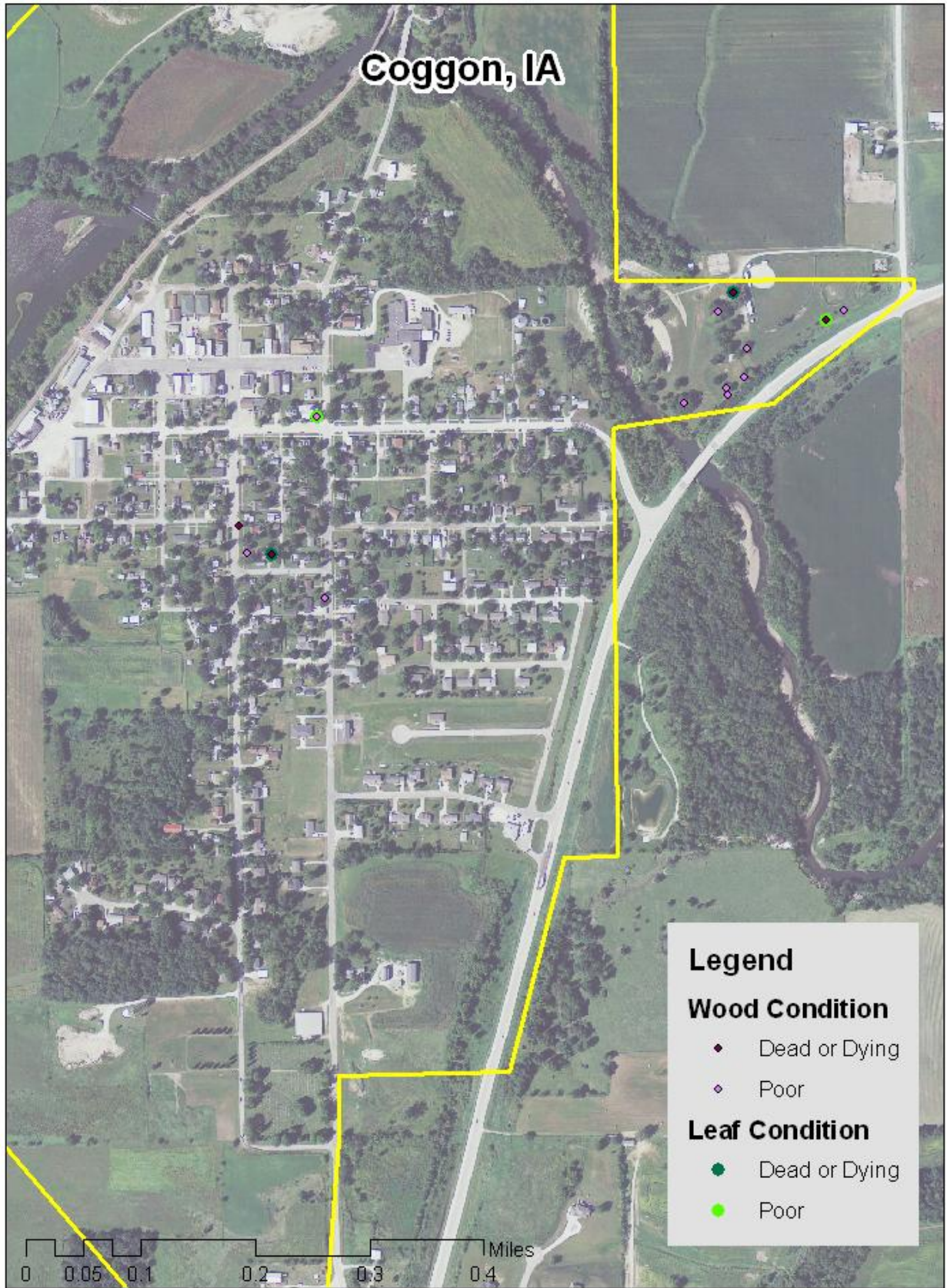


Figure 3: Location of Poor Condition Trees

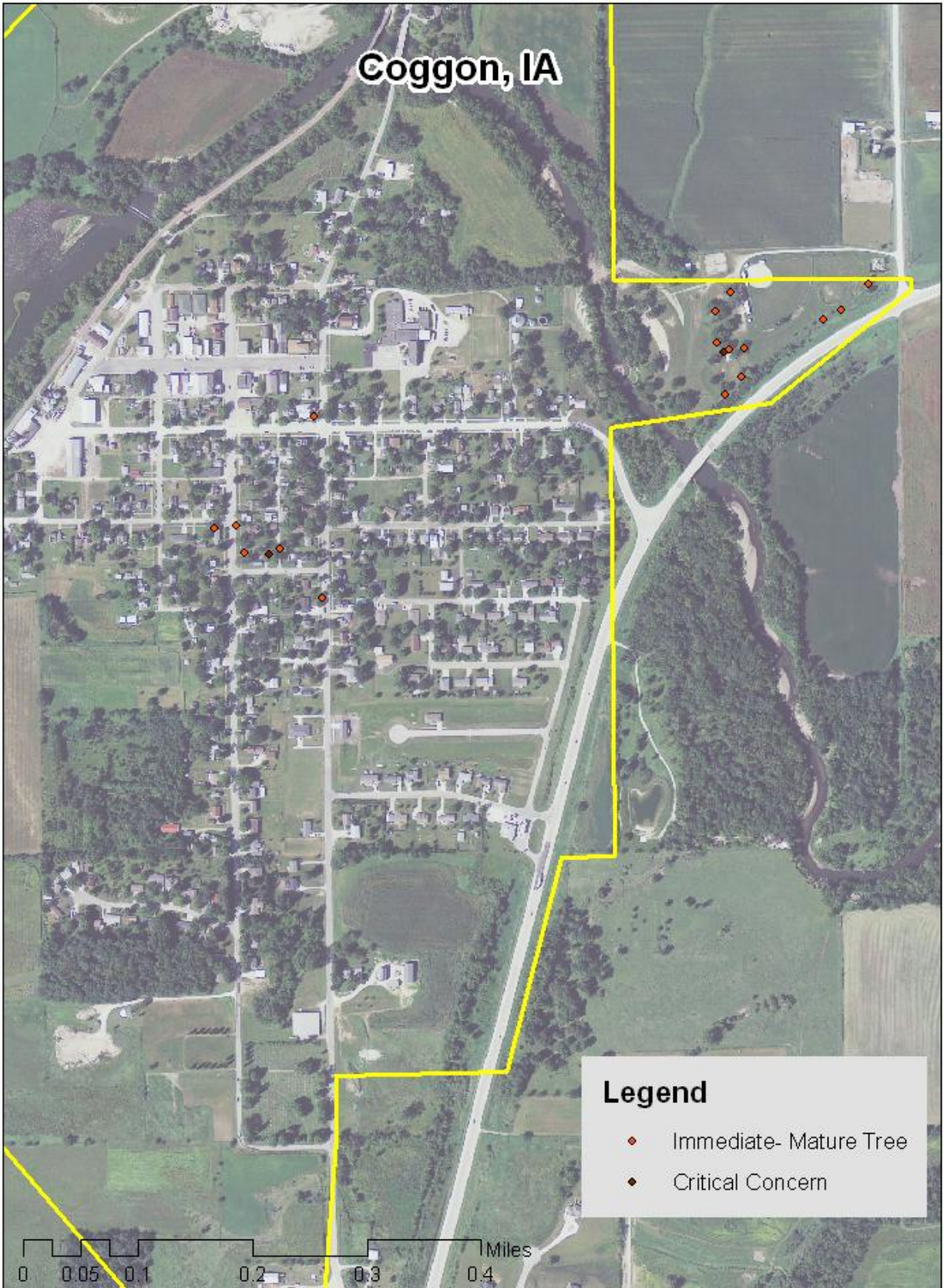


Figure 4: Location of Trees with Recommended Maintenance

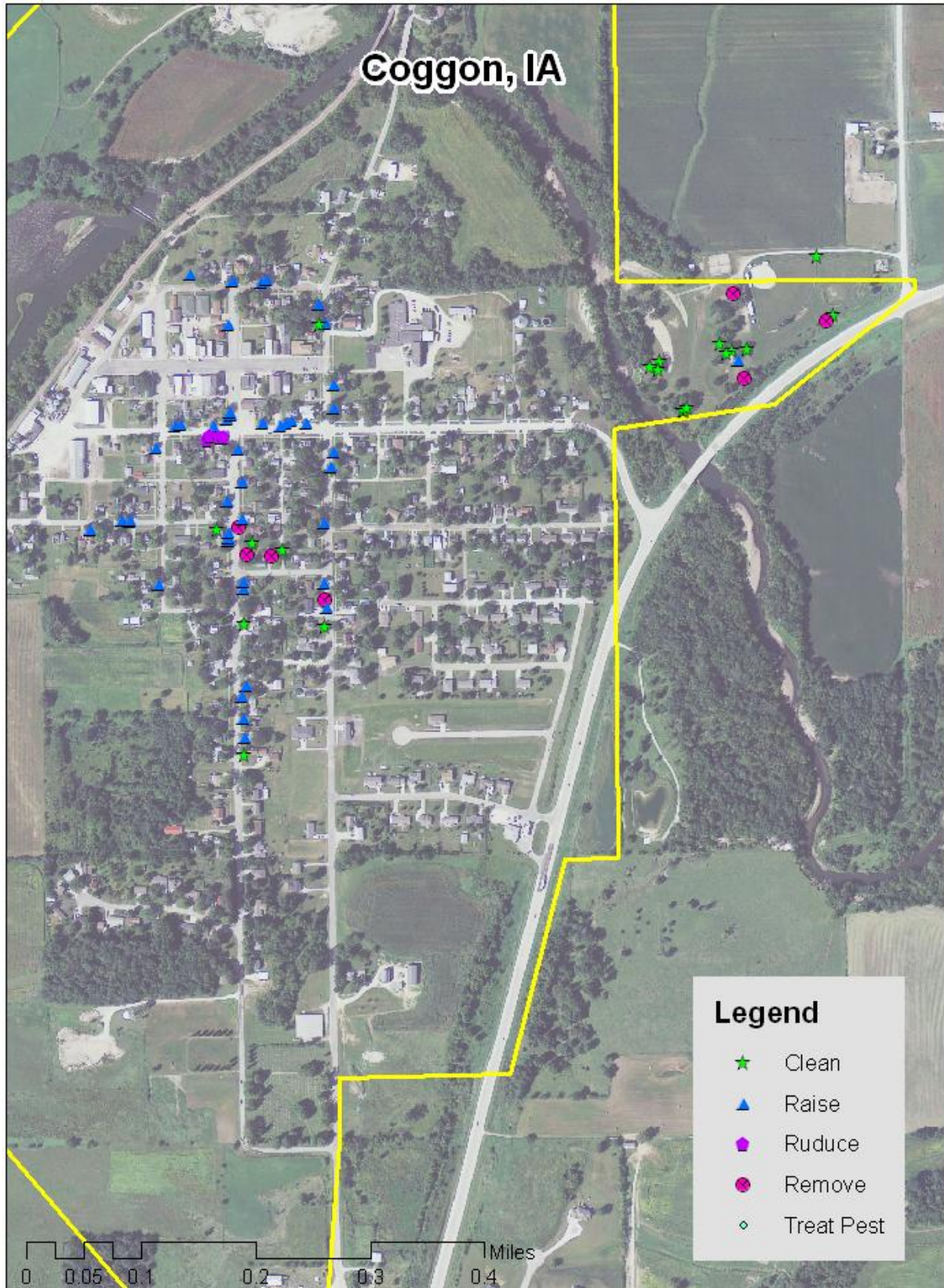


Figure 5: Maintenance Tasks *City ownership of the trees recommended for removal should be verified prior to any removal*

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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 Director Richard Leopold at 515-281-5918.