Community Tree Fact Sheet
Prepared for: Ely, Minnesota
Date: 11-20-2013
By:

The University of Minnesota
Department of Forest Resources
Urban and Community Forestry
Community Engagement and Preparedness Project Team

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Executive Summary:

From 2009 through 2013, the University of Minnesota, Department of Forest Resources collaborated with the University of Minnesota Extension, the Minnesota Department of Natural Resources Division of Forestry, and the U.S. Forest Service to assist selected communities in Greater Minnesota prepare for potential significant losses to their urban forests. The immediate concern was for potential losses due to infestations of emerald ash borer (EAB), an invasive, exotic insect pest that was first identified in Minnesota during the spring of 2009. Since 2002 when it was first identified near Detroit, Michigan, EAB has been responsible for the loss of tens of millions of ash trees (Fraxinus species) in 15 northeastern states in the U.S.

In order to best prepare for and manage infestations of invasive pests, diseases or other natural disasters that can wreak havoc with a community's street, park and landscape trees, an inventory of its tree assets must be accomplished. The inventory reveals the vulnerability of a community to a particular problem by the character of its tree diversity, the age of the tree population and the relative condition of the trees. A community that has access to this information can develop a proactive management plan that allows for predictable losses yet sets a course of action for minimizing the losses and replanting a public and private landscape that is healthier, more genetically diverse and more resilient.

Emerald ash borer is specific to Minnesota's native ash trees: white, black and green ash. The best estimates for both urban, rural and forest ash trees places the Minnesota population at approximately 900 million trees, the most in the United States. The great unknown is the relative dependence of Minnesota communities on ash trees as providers of shade, as community wind break trees, as the portion of tree canopies that slow down rain water and lessen strains on their storm water systems, or as part of the overall value of a residential landscape.

The Community Engagement and Preparedness (CEP) team from the University of Minnesota's Department of Forest Resources served as mentors, technical support staff and data analysts for fourteen communities in greater Minnesota during the original project time-period. Community volunteers were coordinated by the project team, received training for conducting tree inventories or surveys, and were provided with technical support throughout the process. At the conclusion of the tree inventories that took place on both public and private properties for a complete analysis of a community's urban forest, the CEP team analyzed the data and assembled the results in a clear, user-friendly format for the community to use as a management tool.

Ely Community Tree Fact Sheet elaborates on the following bulleted inventory results:

- Number of Trees in Community: ~3,610
  - Privately Owned: ~3,324
  - Publicly Owned: ~286
- Percentage of all Trees that are Ash: ~9.3 %
  - On Private Property: ~8%
  - On Public Property: ~24%
- Significant Trees*: Pine, Spruce, Maple, Ash, Apple, Cedar, Birch
- Average Size (age) of Significant Trees: ~12.5" DBH
- Average Condition of Significant Trees: Canopy - 3.4; Stem - 3.5

*Trees representing 5% or more of the entire tree population are considered "Significant Trees."

Project Description:

The Inventory. Depending on the projected number of trees in each community, either a complete inventory or a randomized sampling was conducted. If a community's tree population (both public and private) was estimated to be no more than 3,000 trees, a complete inventory was conducted. For a complete inventory, all trees in boulevards, street right-of-ways, and private properties were counted, identified, measured and with the exception of privately-owned trees, condition-rated.

For larger tree-populated communities, a sampling of trees on public and private properties was inventoried, with the data extrapolated to estimate the character of the community's urban forest. The technique used for sampling is a time-tested, very accurate sampling technique that involves a pre-sampling inventory of the community conducted by the CEP team. Based on this pre-sample, a protocol was developed that randomly selected entire block segments throughout the city for sampling that was representative of where most community trees occurred. As an example, the least number of block segments inventoried were typically in the business districts where the fewest trees normally grow. This sampling technique, described as a weighted/stratified/randomized sampling has an accuracy rate within 10% of real counts, which is an accuracy standard that most inventories ever achieve.

Inventory information collected included the following:

1. **Tree identification**, usually to the genus (e.g., Maple), occasionally to the species (e.g., Silver Maple). The specificity was determined by the individual cities.

2. **Size.** Two measurements were taken for size. D.B.H., which is the measurement of the diameter (width) of the tree trunk at a height of 4.5 feet above ground. This measurement is used to approximate the age of the tree as well as the potential cost for removal or chemical treatment for EAB in the case of ash trees. The second measurement was the width of the tree crown, which can be used to calculate overall canopy spread of trees for purposes of storm water management, carbon sequestration, or potential energy savings (winter fuel use, summer air conditioning).

3. **Condition.** Condition of trees was determined for public trees only. Each inventoried tree was evaluated for the condition of the stem (trunk) and the condition of the canopy (the leafy crown of a tree). Condition is an evaluation of both tree health and the integrity of its overall structure. To that end, measurable key factors are evaluated for the trunk that are different from the canopy. The evaluation is based on a point-system, rather than a descriptive-system; therefore, each tree has a recorded condition-rating ranging from 0 (dead) to 4 (no apparent defects) for both the trunk and the canopy. For example, a single tree may have a rating of 2.5:3.5, which translates to more de fects were present on the trunk (2.5 out of 4) than on the canopy (3.5 out of 4). This is a University of Minnesota, Department of Forest Resources system that is a modification of the US Forest Ser vice condition-rating system. Condition is not an evaluation of tree safety.

Project Description:

The Community Inventory Team. All tree inventory information was collected by trained community volunteers under the direction of the University of Minnesota, Department of Forest Resources' Community Engagement and Preparedness (CEP) team. Locally, the volunteers were supported by community officials, ranging from City Administrators to Departments of Public Works or Parks and Recreation.

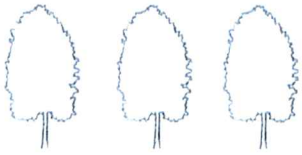
Community Inventory Team members were provided with training on tree identification, tree measurements, tree condition evaluation, data entry and interacting with the public. This training was provided by the CEP team and ranged from 12 –16 classroom hours, depending on the level of experience that each community inventory team members brought to the training. Upon completion of the training, Community Inventory Team leaders, those that completed the training, were issued green "Community Trees Inventory Team" tee shirts, identification badges, measurement equipment, tree identification books and "flash cards," complete training and resource manuals and data sheets necessary to complete the inventory.

The CEP Technical Support Team. Support team members from the University of Minnesota, Department of Forest Resources were available to assist with the inventories or surveys throughout the duration of the project and the completion of the data entry and evaluation. This support ranged from maintaining a dedicated tutorial web site for the project to on-site visits with the community volunteers if they encountered situations that necessitated technical guidance. The CEP technical support team did not enter private property or collect information as a rule. Rather, their role was to guide and support not conduct the inventory. Members of the support team included undergraduate and graduate students, research technicians and research fellows. All team members were trained and supervised by the project's principle investigator, a faculty member of the University of Minnesota's Department of Forest Resources, Urban and Community Forestry program.

Volunteer Photo

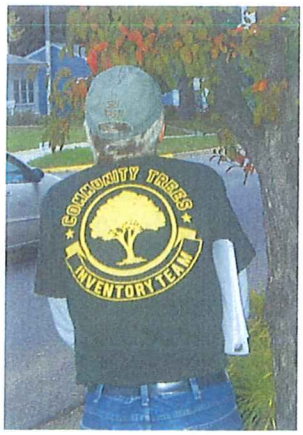
Community Trees

Inventory Team



Name:_____

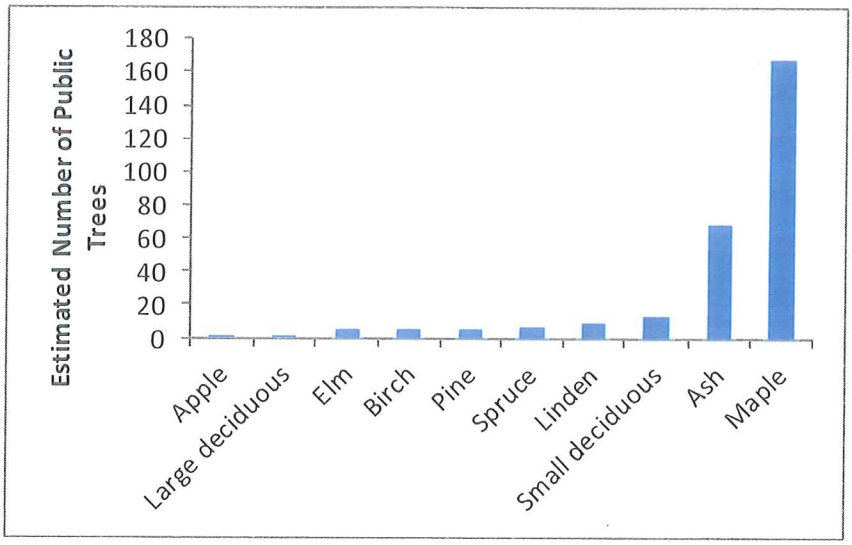
City:_____



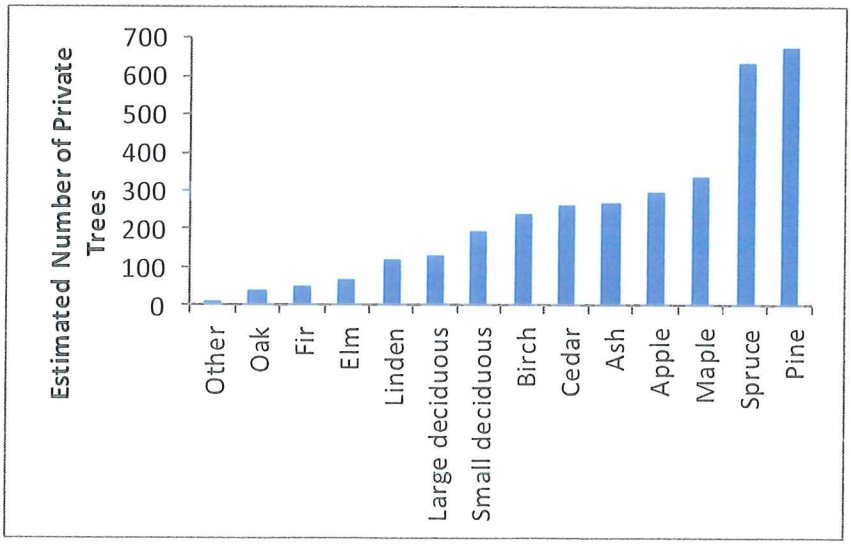
Community Tree Data Summaries: Community Tree Population

Table 1 Tree Population by Ownership*

A. Public



B. Private

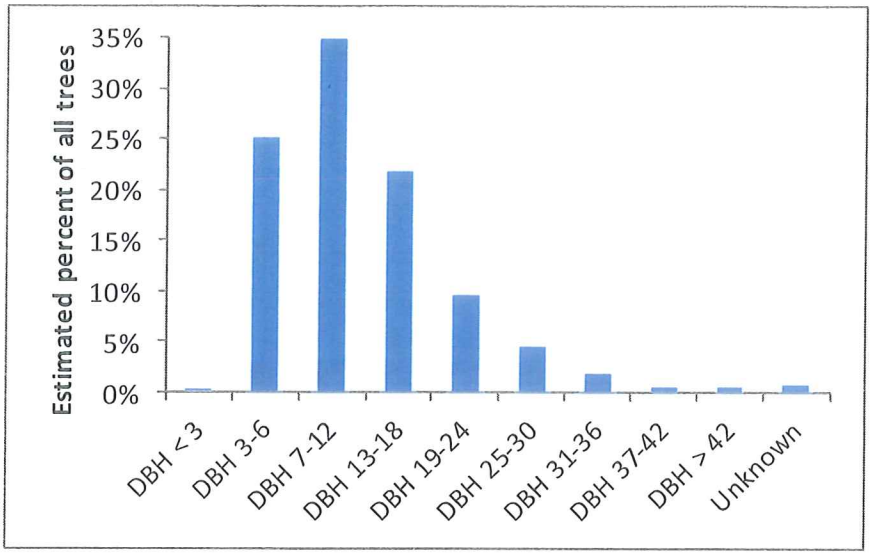


*Tree population is an estimate based on the community tree inventory or survey. Accuracy is reliably within 10%..

Ownership refers to trees located either on private property (residential, business) or public property (boulevards, schools, parks, government).

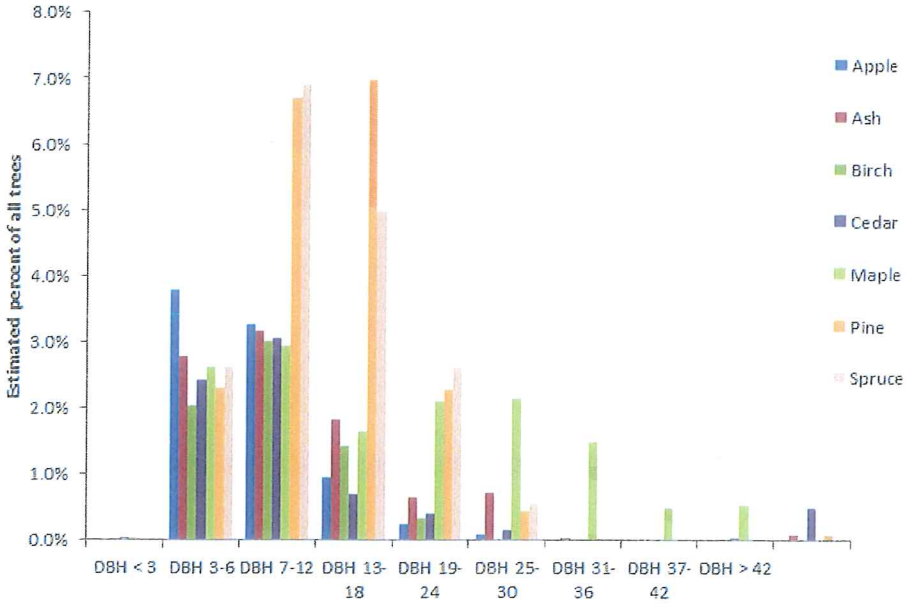
Community Tree Data Summaries: Community Tree Size Classes

Table 2 Tree Size—Trunk Diameter Classes*
A. Trunk Diameter Classes—All Genera**



*Trunk Diameter, also referred to as d.b.h. or diameter in inches at breast height, is a gauge of tree age. Larger sizes, older trees. **Genera is a scientific name for a group of trees with similar features, such as oaks, maples, ash, pines.

Table 2 Tree Size—Trunk Diameter Classes
B. Trunk Diameter Classes—By Significant Genera*



*Significant Genera are those that make up at least 5% of the entire tree population.

Community Tree Data Summaries: Community Tree Size Classes

Table 2 Tree Size—Trunk Diameter Classes
C. Trunk Diameter Classes—By Ownership

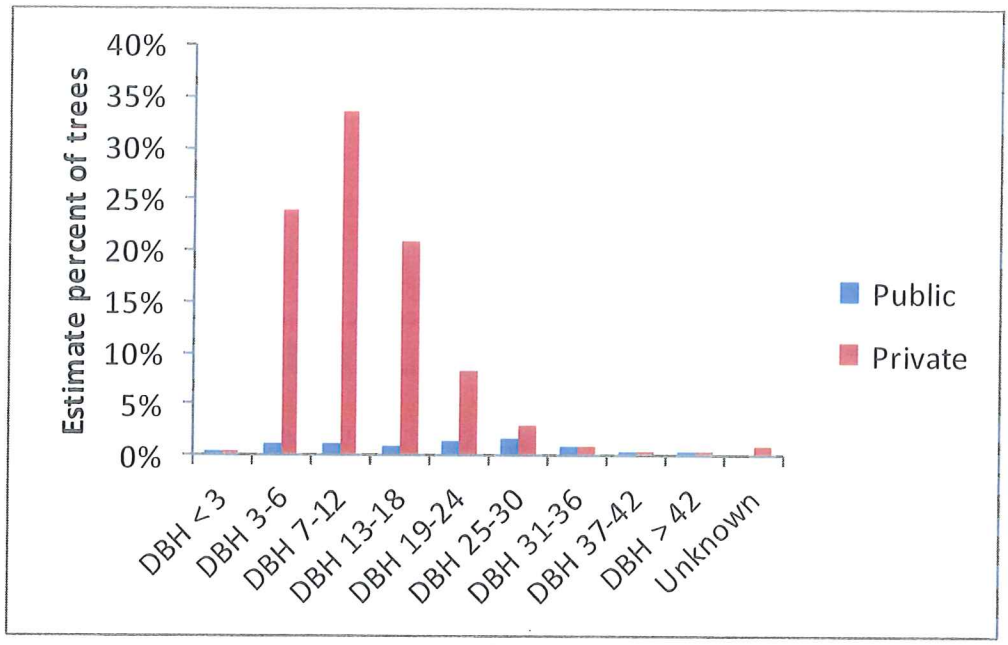
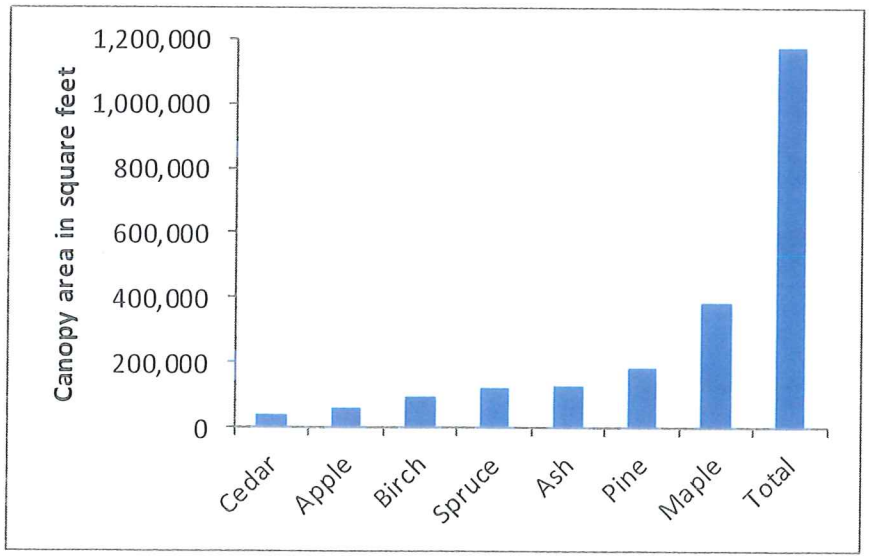


Table 3 Tree Size—Relative Crown Spread (RCS)* by Significant Genera

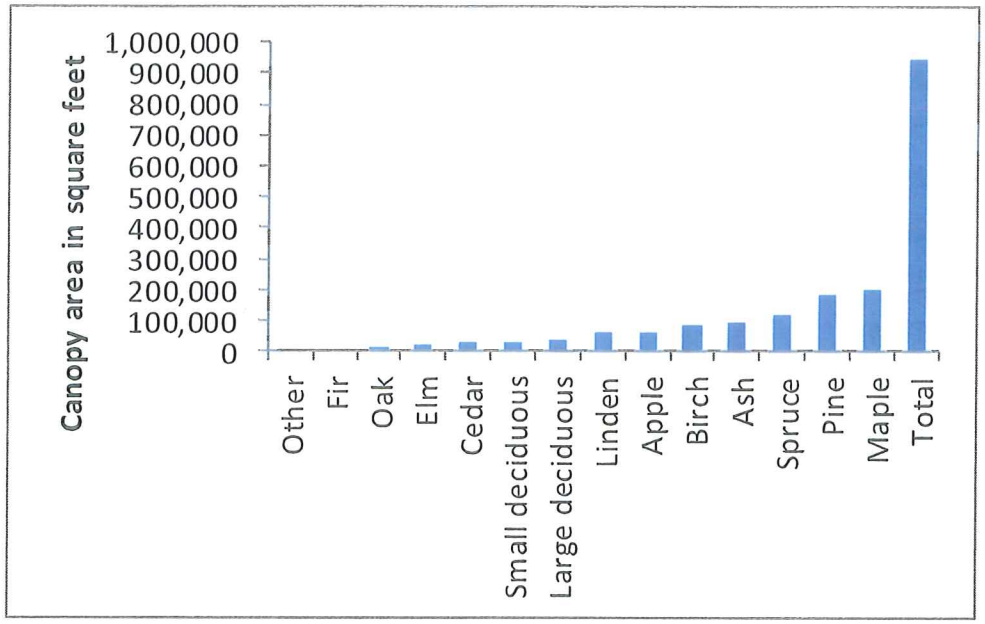


*Relative Crown Spread (RCS) refers to the average crown (canopy) area for a significant genera. This is then combined with the frequency of each genera to present a relative crown spread that gauges the impact one tree genera has on the canopy cover of an entire community.

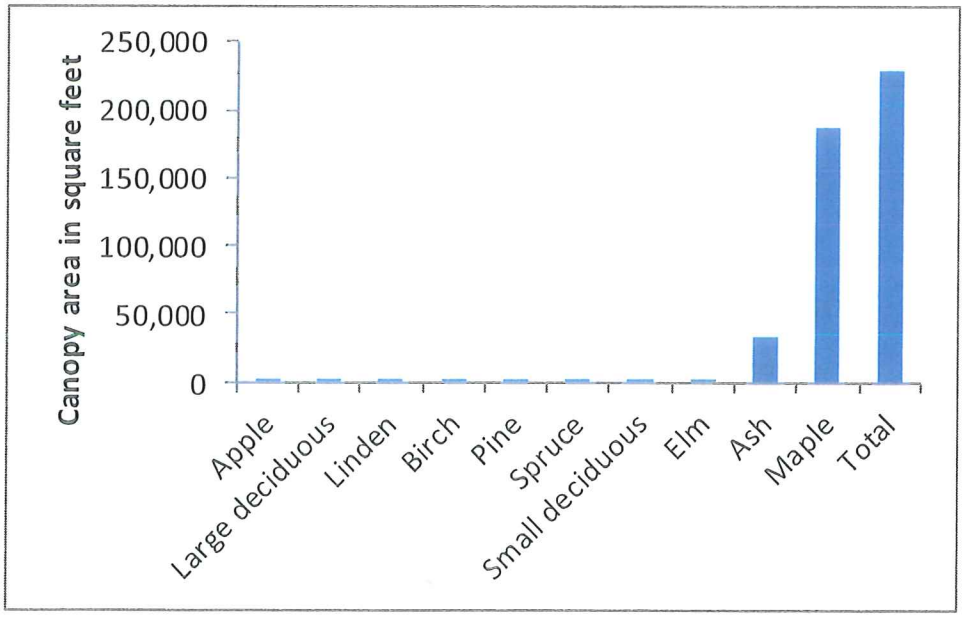
Community Tree Data Summaries: Community Tree Size Classes

Table 4 Tree Size—Relative Crown Spread (RCS) by Ownership

A. Private



B. Public



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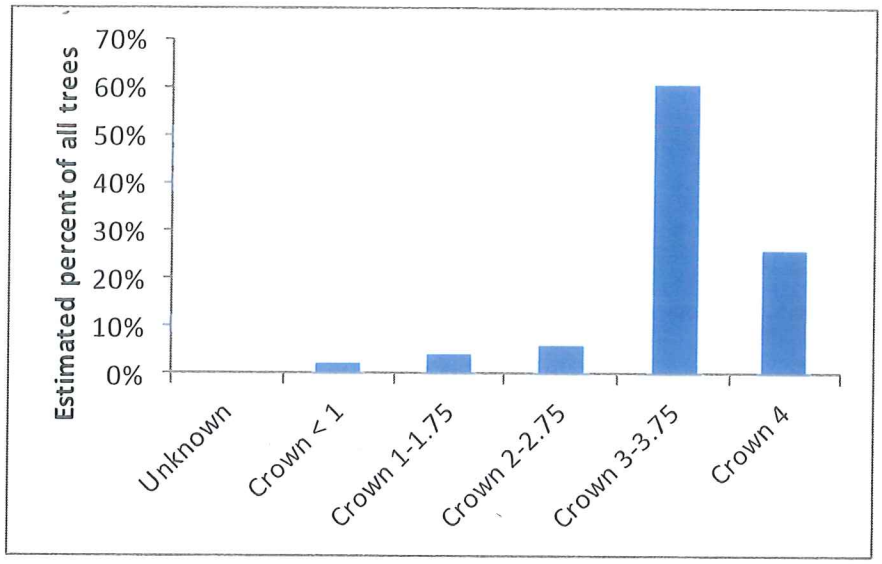
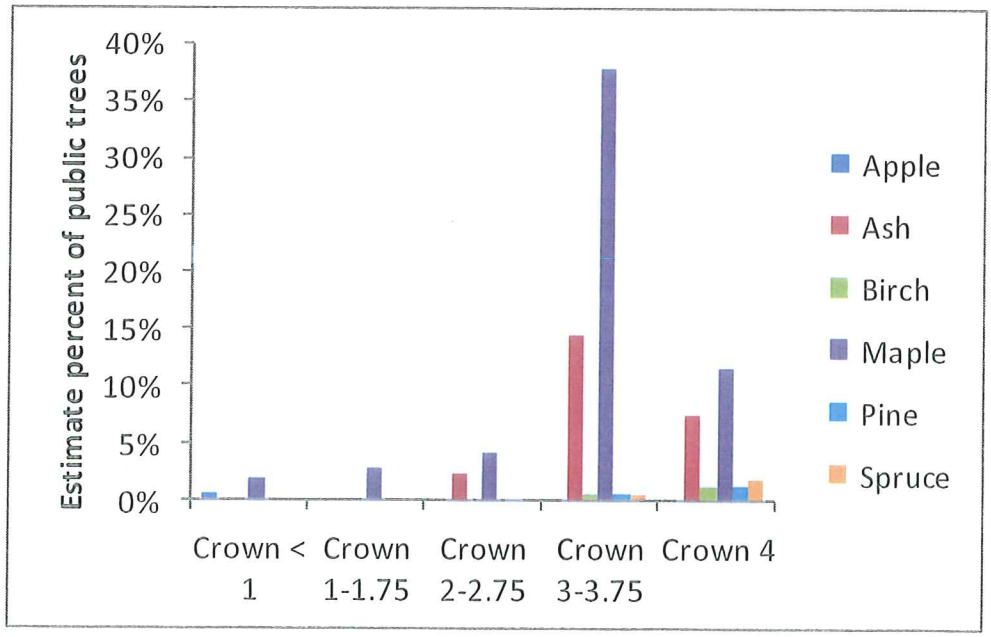
Community Tree Data Summaries: Tree Condition Ratings

Table 5 Tree Crown Condition Ratings*:
A. All tree genera



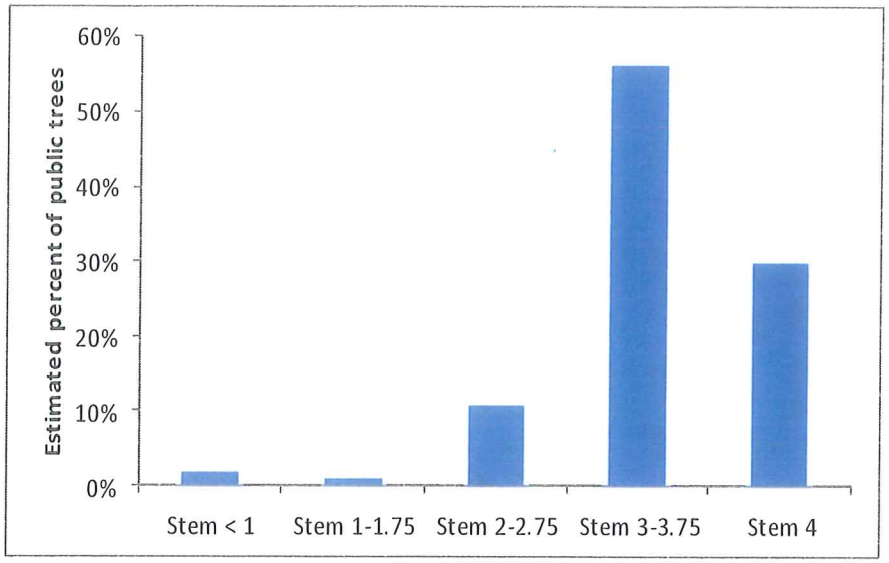
*Tree condition ratings were separately conducted on tree stems and tree crowns (canopies). The rating system is based on a 0-4 point system, with 4 points representing "no apparent defects." Only public trees were condition-rated.

Table 5 Tree Crown Condition Ratings*:
B. Significant genera only



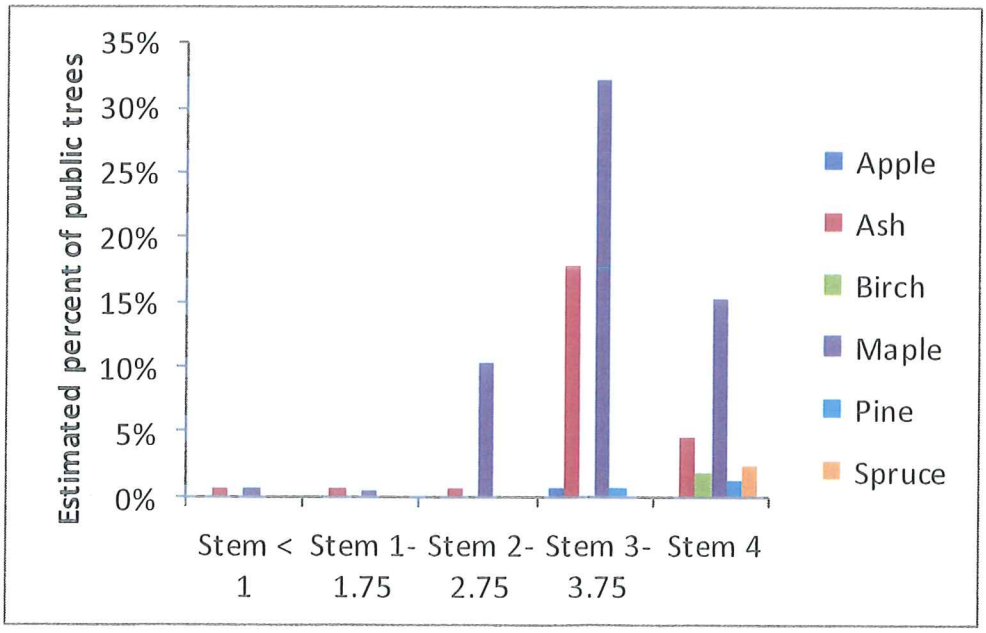
Community Tree Data Summaries: Tree Condition Ratings

Table 6 Tree Stem Condition Ratings*:
A. All tree genera



*Tree condition ratings were separately conducted on tree stems and tree crowns (canopies). The rating system is based on a 0-4 point system, with 4 points representing "no apparent defects." Only public trees were condition-rated.

Table 6 Tree Stem Condition Ratings*:
B. Significant genera only



Helpful Resources

1. The EAB Cost Calculator. This free, on-line software calculates the costs of removing trees, chemically treating trees or all combinations in between for long-term emerald ash borer management plans. The software can be accessed by: http://extension.entm.purdue.edu/treecomputer/.

2. For tree selections in Minnesota, there is a series of Recommended Trees for Minnesota, available on the University of Minnesota Extension web site: http://www.extension.umn.edu/gardeninfo/components/info_trees.html#selection.

3. For the most up-to-date information on Emerald Ash Borer Management tactics, the Minnesota Department of Agriculture offers this extensive web site: http://www.mda.state.mn.us/en/plants/pestmanagement/eab.aspx.

4. The U.S.D.A. Forest Service offers the Tree Owners Manual on-line, the most comprehensive "starter guide" for establishing trees available at: http://na.fs.fed.us/pubs/uf/tom_natl/tree_owners_manual_web_res.pdf.

5. To learn more about the ongoing research and outreach education offered by the University of Minnesota, access the Urban Forestry and Horticulture Institute's web site: www.trees.umn.edu.

6. To learn more about the ongoing community preparedness projects that are coordinated by the University of Minnesota, Department of Forest Resources, access the web site: www.mntreesource.com.

7. To learn more about Minnesota's volunteer program in urban forestry (Tree Care Advisors), one of the oldest programs in the United States, access their web site at: www.mntca.org.

8. To learn more about the Minnesota state tree board Minnesota Shade Tree Advisory Committee, access their web site at: www.mnstac.org.

9. To learn more about tree identification, the Beginner's Guide to Minnesota Trees is available from the University of Minnesota Extension on-line store www.extension.umn.edu/distribution. Follow this link to natural resources and then to trees and shrubs.

10. For guidance in diagnosing tree problems, connect with "What's Wrong With My Plant?" This on-line diagnostic tool is found on the University of Minnesota Extension web site under gardening information www.extension.umn.edu/gardeninfor/diagnostics.

11. To learn more about community gravel beds, www.trees.umn.edu, select "products" for the primer.

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