Department of Public Works

Public Works Forestry Division

Emerald Ash Borer Preparedness Plan

January 16, 2015

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Introduction

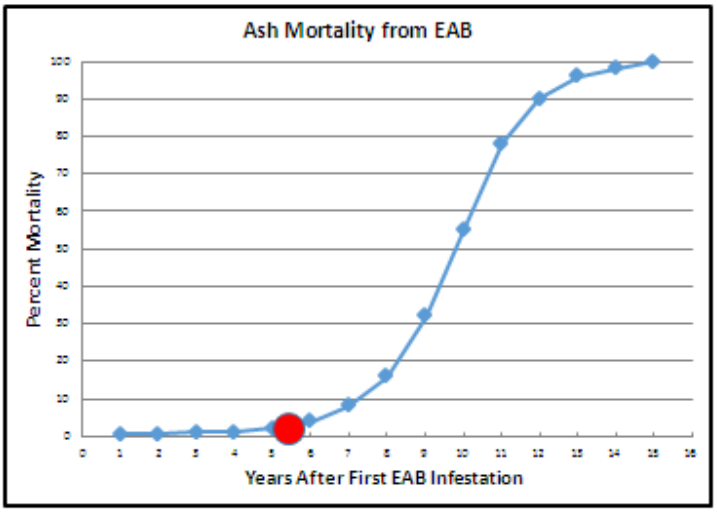
Emerald Ash Borer (*Agrilus planipennis) (EAB),* is an insect native to Asia. It was first discovered in North America in 2002 in the Detroit, Michigan greater metropolitan area. It is believed to have been accidentally introduced here in wooden shipping materials. Since its introduction emerald ash borer has killed millions of ash trees in North America. Areas near the epicenter have seen mortality up to 99% in ash trees larger than 2.5 inches in diameter. All North American ash species are susceptible without reservation, whether perfectly healthy, stressed or declining. This pest has the potential to functionally extirpate ash (*Fraxinus* spp.) from North America. (See appendix A for a map of current infestations). The purpose of this document is to outline how Clayton's Public Works Forestry & Parks Maintenance Divisions plan to address this epidemic.

Fortunately for the St. Louis region extensive scientific studies have been, and still are being performed. So we are equipped with substantially more knowledge than communities who began dealing with EAB just a few years ago. The manner in which EAB moves through an area once it is established has been found to be extremely predictable. Typically, EAB is not detected until infestations have been present for 5-8 years, sometimes with symptoms not becoming evident until there is a high EAB population present and/or sometimes an entire-tree infestation.

The red dot on the graph below (courtesy of Davey Resource Group) is where most experts agree the St. Louis region is currently. As this graph demonstrates, the St. Louis area could potentially be within a few years of a rapid increase in ash mortality rates, which, again, is why it is so important to prepare now to avoid the possibility of being overwhelmed with large numbers of affected ash trees.

It is highly unlikely that Clayton will be the epicenter for the St. Louis region. Experts agree the best chances for the first find will be in the west county area or along one of the major interstates. During the summer of 2014, EAB was found in the Lake St. Louis Area, which is approximately 30 miles from Clayton.

A Predictable Pattern of Losses

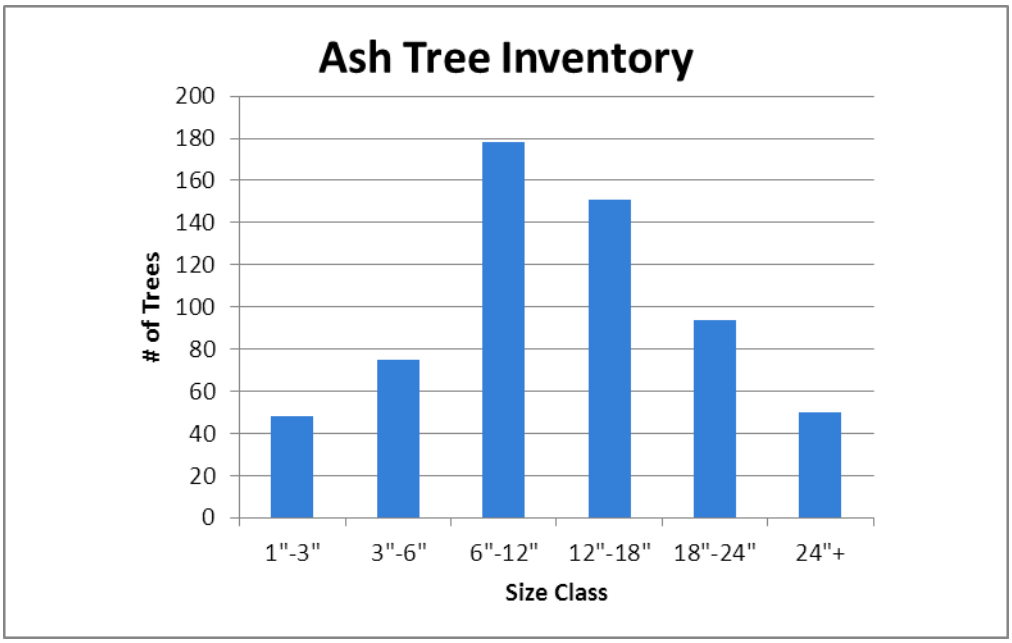


Based on data from Dr. Dan Herms, The Ohio State University

Current Inventory

Currently the City of Clayton's Forestry & Parks Maintenance Divisions are in the final phase of a three phase project of combining and updating the tree inventory to a state of the art GIS based system. This new system is compatible with the asset management system the City already has in place for other resources such as street lighting, street signage, parking meters, and pavement conditions. This updated inventory will and already has been a tremendous asset for the transference of information between and within departments. The updated data in this report has been produced by compiling the information from the two inventories. Because the new inventory is only two-thirds complete, some estimations have been made. The final phase of the tree inventory project is underway and will be completed in the early spring of 2015.

According to our inventory the City owns approximately 10,000 trees. Susceptible ash trees comprise 6.2% of the population which equates to 617 trees. Using industry accepted calculations, the current value of all ash trees city wide is $981,966.35. Of which 596 are within Public Works jurisdiction and valued at $953,325.37. 24 are within the various city parks and valued at $28,640.98. The chart below shows the size class distribution is heavily weighted in the 6"-12" and 12"-18" categories, which can be expected from an established forest.



Assessment / Short & Long Term Plan

Phase 1:

Phase 1 of the plan consists of inspections and preventative removal/replacement.

During Phase 1, City Foresters and the Parks Horticulturalist will inspect ash trees on the rights-of-way and in city parks for signs of infestation. Also, ash trees showing signs of decline or found to be infected with EAB will be listed for removal as “high priority” and be scheduled for removal as soon as possible in an effort to reduce the amount of standing biomass available to the pest, as well as to lower any potential risk of failure associated with these trees.

Additional cost to the City for this portion of Phase 1 is projected to be minimal which is based on the preliminary assessment of trees to be removed. The removal process at all locations will be expedited through collaborative efforts between Public Works and Parks Maintenance staff.

Tree replacement will be a secondary priority to maintaining public safety during the onset of the infestation. The Forestry Division proposes preventative removal/replacement of ash trees in high profile areas of the various business districts and city parks. Replacement trees will be species compatible with the urban streetscape environment. Focus will be placed on maintaining biological diversity to reduce future impacts from invasive species in all replacement locations.

Phase 2:

Phase 2 will begin when the Emerald Ash Borer (EAB) has been detected within 15 miles of the City of Clayton and will be a multi-pronged approach consisting of treatment, removal and replacement.

Projected Phasing Schedule

Ash Tree Treatment & Schedule - (Ememectin Benzoate injections)

Based on the fast decline/death rate of ash from EAB, treating a portion of the ash population with insecticide will slow the spread allowing forestry crews more time to address imminent safety hazards. Based on current research the most effective treatment option is *ememectin benzoate* (brand name TREE-AGË). This is a comparatively safe chemical to use in an urban environment because it is a direct trunk injection, rather than a foliar spray. *Ememectin benzoate* treatments have been proven to be not only effective at staging trees for removal, but also as a long term protective solution for high value trees. Although the City has personnel on staff that are qualified to perform this work, due to time constraints associated with this project this work should be performed by a private and licensed contractor. Estimated cost averages at $15 per diameter inch. This treatment provides protection from EAB for two (2), possibly three (3) years. Some communities that have chosen to treat ash trees have been able to make an agreement with the contracting company to allow residents who chose to threat trees on their property to take advantage of the same unit price the city is paying for treatment.

The Forestry Division proposes treating all suitable ash trees 12”-24” during year one in order to keep the trees alive while crews work on removing the largest and the smallest trees. Treated trees will be reevaluated in year three (3) for retreatment. At this time it is estimated that half of the treated trees could qualify for retreatment.

Ash Tree Treatment Schedule and Cost

Years after detection	Year 1	Year 2	Year 3	Year 4	Total
# of Trees	206	----	103	----	309
Diameter in inches	3576	----	1788	----	5364
Estimated Cost	53,640	----	26,820	----	80,460

It is important to state that insecticide treatment is not required for the Forestry Division to successfully mitigate the threat posed to our urban forest from EAB. Rather, the treatments will allow the removals to be performed systematically and in a timeframe that will allow forestry crews time to perform other work assignments.

Tree Removals & Schedule

Ash trees killed by the Emerald Ash Borer (EAB) quickly become brittle and fall apart, creating potential hazards to public safety. Therefore, the combined Public Works and Parks Maintenance crews will begin by removing all the ash with a condition rating of poor as these trees currently represent the greatest risk to public safety. There are 66 Ash trees in the portion of the city that has been inventoried with a condition rating of poor. There is estimated to be 40 trees in the north-west section of the city, including Shaw Park, with a poor rating. After the trees with a poor condition rating have been removed, the combined department crews will remove all trees greater than 24" in diameter, regardless of condition, as these pose the next greatest risk to public safety. As these largest trees are being removed, crews will also remove the remainder of the 1"-3" size class followed by 20% of the remaining 6"-12" size class. Following this, in year 3, the remainder of the 3"-6" trees will be removed along with 80% of the 6"-12" size class and 20% of the 12"-18" and 18"-24" size classes. The following year the remaining 6"-12" trees will be removed along with 20% of the trees 12"-18" & 18"-24". Ash removals will be completed with the remaining trees being removed over the course of two years. This information is shown in the table below. The highlighted Green signifies when removals of a size class has been completed.

Tree Removal Schedule

Years after Detection	# of Trees	Downtown Removals	Year 1 Poor condition	Year 2	Year 3	Year 4	Year 5	Year 6
size class								
1"-3"	48	22	10	16	0	----	----	----
3"-6"	77	8	15	2	52	----	----	----
6"-12"	180	12	31	30	86	21	----	----
12"-18"	162	----	32	5	25	20	40	40
18"-24"	100	----	16	3	17	13	25	26
24"+	50	----	2	48	----	----	----	----
Totals	617	42	106	104	180	54	65	66

Tree Removal Schedule Cost

Years after Detection	Downtown	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
# of Trees	42	106	104	180	54	65	66	617
Diameter in inches	210	1092.35	1020	1739	762	1125	1146	7094.35
Estimated Costs	5,529	28,761	26,856	45,787	20,063	29,621	30,174	186,791

*Estimated costs are based on average of previous two removal seasons.

Tree Reforestation & Schedule

As can be seen in the preceding tables the scope of this project will be immense. It is expected that tree replacement will need to be suspended until all ash trees have been removed in order to allow crews time to attend to the prioritized tree maintenance throughout the city and parks unrelated to the ash tree removals. Once reforestation begins, city foresters will focus on a biologically diverse planting schedule. By planting and maintaining a diverse selection of urban environmentally compatible trees throughout the city, this process will reduce any future tree devastation of the city tree canopy.

As an option, replacement trees can be purchased by Public Works through the standard procurement process and the installation of the replacements could be handled under contract by a licensed forestry company. Estimated contractual installation costs would be approximately $150.00 per tree.

Reforestation Schedule and Cost

Years after Detection	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total
# of Trees	148	104	180	54	65	66	617
Estimated Cost per tree	175	175	175	200	200	200	----
Estimated Installation Cost	150	150	150	175	175	175	----
Total cost	48,100	33,800	58,500	20,250	24,375	24,750	209,775

*Estimated costs are based on industry standard

Private Property Consultation

Unfortunately the Emerald Ash Borer does not take sides and will infest ash trees not only on public property but private property as well. The City Foresters estimate there are approximately 2 - 3 ash trees on private property for every ash tree on the public right-of-way. Public Works anticipates a substantial number of inquiries from the residential population ranging from; do I have ash trees on my property, to, have the trees been infested and what should I do. Due to the increased workload as outlined above and the potential liability, City Foresters will inform and provide a list of forestry consultants that have been approved and licensed by the Public Works Department to be able to address the nature of their questions and concerns. This list will also be posted on the City's website.

Summary

The total monetary cost to the City for the above outlined 6 year plan is $470,201. Public Works and Parks are aware of the unfavorable and substantial impact that the overall cost and length of the proposed Emerald Ash Borer Plan will pose on the city and its forest canopy. But the reality is that the City and every other community will face this severe problem with or without a plan. Public Works and Parks have been very proactive in staying current on state and federal EAB research and updates, as well as educating staff about the insect and what cost-effective measures can be taken to minimize the devastation resulting from EAB and then to restore and maintain diversity in our future tree canopy. Since EAB was discovered in 2002, staff have attended workshops and seminars presented by the Missouri Department of Conservation, the Davey Resource Consulting Group, the International Society of Arboriculture, and other consulting organizations. With this extensive education, Public Works is confident that this proposal is presently the best (or most cost- and time-effective) plan in addressing the Emerald Ash Borer and its ultimate impact on the City and its tree canopy.

Further questions, comments or concerns involving this plan may be directed to:

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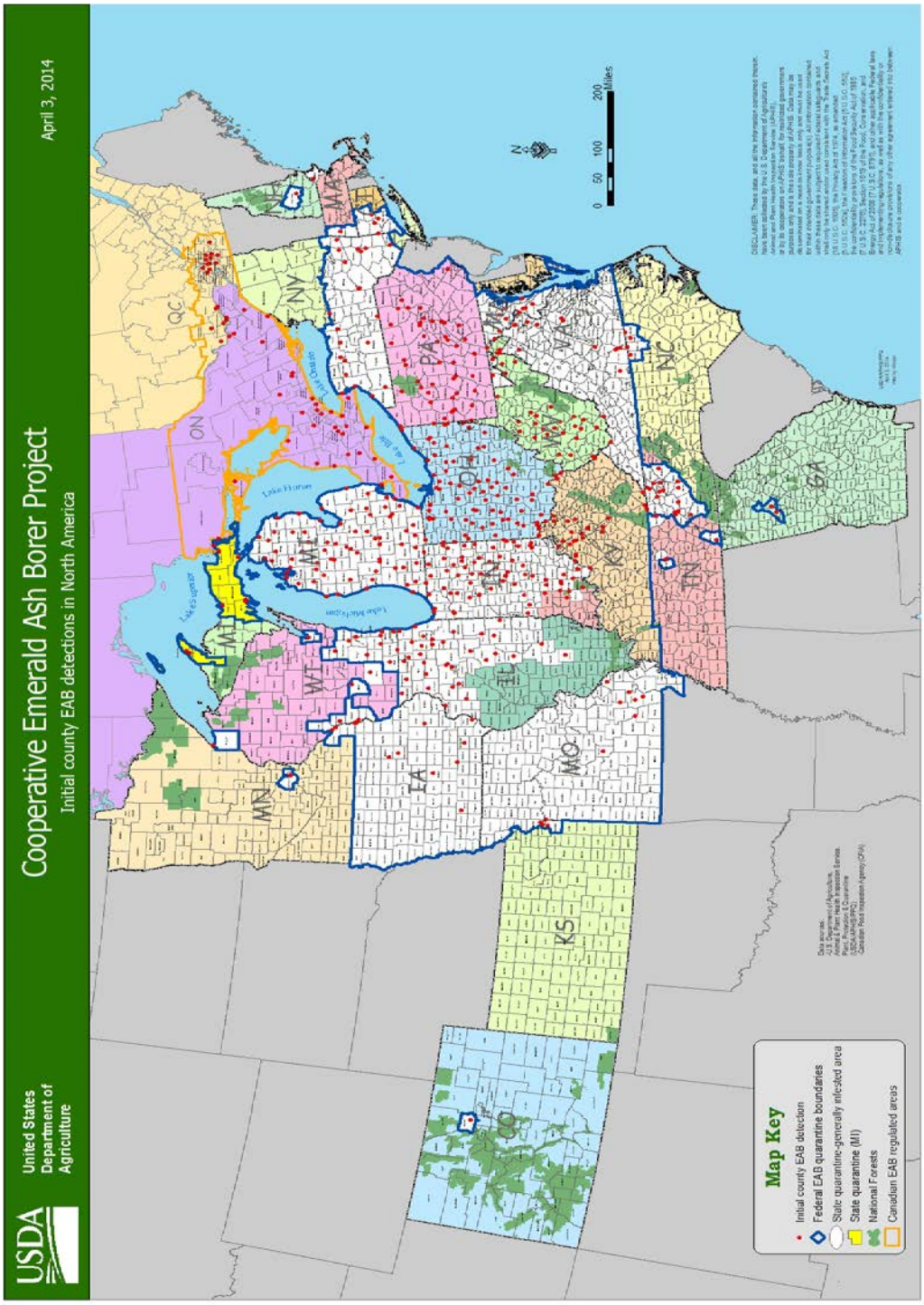
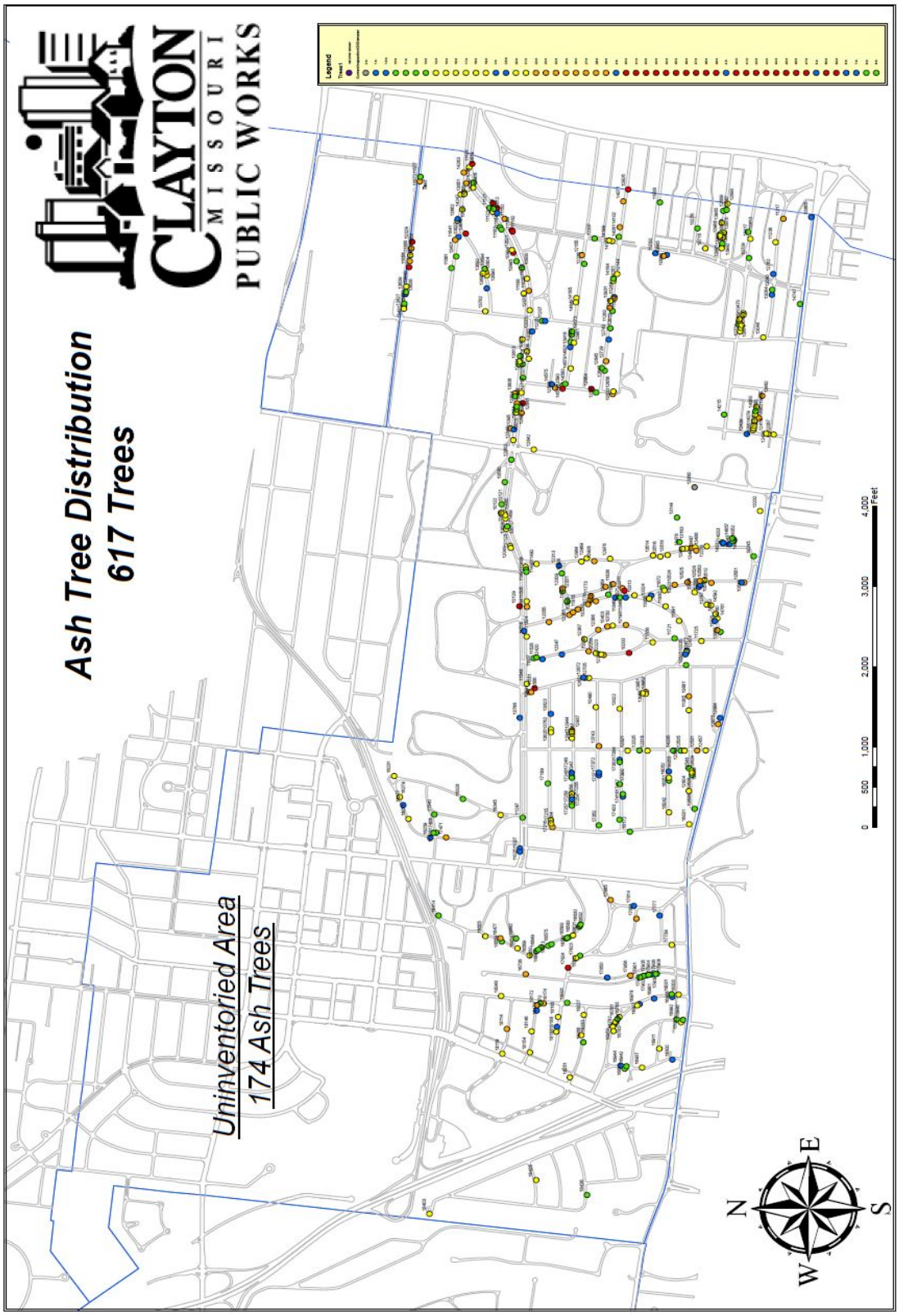
Appendix A:


USDA
United States Department of Agriculture
Cooperative Emerald Ash Borer Project
Initial county EAB detections in North America
April 3, 2014
Map Key
Initial county EAB detection
Federal EAB quarantine boundaries
State quarantine-generally infested area
State quarantine (MI)
National Forests
Canadian EAB regulated areas
MN
WI
MI
IA
IL
IN
OH
KY
TN
MO
KS
OK
PA
NY
WV
VA
NC
GA
ON
QC
MA
Lake Superior
Lake Michigan
Lake Huron
Lake Erie
Lake Ontario
0 50 100 200 Miles
N

Appendix B:


CLAYTON
MISSOURI
PUBLIC WORKS
Ash Tree Distribution
617 Trees
Uninventoried Area
174 Ash Trees
Legend
Trees1
0
500
1,000
2,000
3,000
4,000
Feet
N
E
S
W