Emerald Ash Borer

Management Plan

Borough of Elverson, Pennsylvania

July 2014

Mayor: Bob Broderick

Council Members:

Shirley Crehan, President
Merle Stoltzfus, Vice President
Jack Stewart
Esther Prosser
Bob French
Dwight Frizen
Doug Hoskins

Shade Tree Commission Members:

Esther Prosser
Karen Ely
Angie Fracciolo
Teri Tegtmeier
George Summer

Table of Contents

Administration 3

Executive Summary 3

Authority 4

Introduction 5

Ash Resources 7

EAB Infestation 8

Management Options 8

Management Approaches 9

Community Outreach 11

Wood Utilization and Materials Disposal 11

Cost/Benefit Analysis 12

Fiscal Planning 13

Time Table 14

Data Collection & Reporting 14

Contacts and Information 14

References 15

Acknowledgements 15

Appendices (Maps of EAB Infestation) 16

Inventory of Elverson STC Ash Trees 17

Administration

The Emerald Ash Borer (EAB) Management Plan for the Borough of Elverson is administered by the Elverson Shade Tree Commission which will report to the Elverson Borough Council on this plan. Borough residents are encouraged to contact members of the Shade Tree Commission with any questions or concerns related to this program.

Executive Summary

Elverson Borough recognizes the benefits of Borough trees to the quality of life, air pollution reduction, energy conservation, storm water mitigation, carbon uptake and storage, and property value for its residents. Ash is an important part of our borough tree population with 32 ash trees on the Elverson Tree Commission inventory list. In addition, multiple ash trees are found in public natural areas, woodlots, fence rows, and other private properties within the borough as well as in the surrounding area. The emergence of the emerald ash borer (abbreviated as "EAB") in much of Pennsylvania in recent years, however, threatens the health of all these ash trees.

The purpose of the development of this EAB Management Plan for the Borough of Elverson is to be proactive in providing information and guidelines for our local Borough in preparation for the negative economic, social and environmental impact of emerald ash borer infestation of our ash trees. The procedures and actions set forth in this plan come from the management goals of the Tree Commission to pursue the most fiscally responsible course of action in addressing the imminent EAB infestation while preserving as many of our local ash trees as possible.

To protect our valuable ash trees within the Borough and to mitigate potential damages, the Elverson Shade Tree Commission recommends Management Option "B" be followed. This Option, referred to as "selective management", is briefly explained on pages 9 and 10 of this EAB Management Plan. It is an approach toward the management of this invasive beetle in the next 10 years (2015-2024) within the Borough limits. A total of 32 high-value ash trees on Elverson streets and in Livingood Park have been identified and will hopefully be protected with the systemic insecticide named Emamectin benzoate (also referred to as "Tree-äge"). If left untreated, infested

ash trees that the Shade Tree Commission oversees in the Borough will need to be removed and replaced in the next 10 years to reduce safety risks and to replace lost canopy cover in the community. Attention will be given to future reports from DCNR scientists regarding progress of current research with biological control using parasitoids for the potential long term management of this emerald ash borer pest in our area.

The total cost for this program is estimated at $15,728 over 10 years, with an average annual cost of $1,573. This includes total cost for chemical treatment in the hopes that tree removal and replanting costs will be avoided with proactive action. Awards and grants from federal, state, and local agencies, organizations, and institutions will be actively sought by the Elverson Shade Tree Commission to offset a portion of the cost for this program.

Care for ash trees on private properties is the responsibility of the property owners. Residents of the Borough who choose to protect their ash trees with chemical treatment may contact any member of the Elverson Shade Tree Commission for references or any arborist qualified to perform this service. Any costs involved will be the private property owner's responsibility.

EAB Management Plan reporting will be presented by the Elverson Shade Tree Commission to the Borough Council for their review. Auditing of the program will be conducted by the Borough Council. Necessary adjustments will be recommended as needed based on progress reports on the status of the EAB infestations within the Borough.

Activities of community outreach will be carried out throughout the program period as public support is important to the success of this kind of program. The public will be periodically informed about the progress of the program. Recommendations and suggestions on how to deal with this natural disaster of the ash forests are welcome. If needed, Borough residents will be encouraged to be part of this program through cooperation and volunteering and other types of involvement.

Data for this plan was collected by the Elverson Shade Tree Commission. Decisions as to treatments were made by the Shade Tree Commission with approval from the Elverson Borough Council. The format for this management plan was provided by the Pennsylvania Department of Conservation and Natural Resources (DCNR), Bureau of Forestry. The primary template for our Elverson Borough EAB Management Plan came from the document "Emerald Ash Borer Management Plan for Pennsylvania Communities" prepared by Houping Liu, PhD, Forest Entomologist, PA DCNR, Bureau of Forestry, written July 12, 2013. Special assistance came from Kendra McMillan, PA Urban & Community Forestry Council Project intern.

Authority

1. **Declaration of policy.** The health of the ash trees in the Borough is threatened by the emerald ash borer (EAB). Damages to the ash trees will have a negative impact on public safety and quality of life for borough residents. Federal and state regulations provide local authority to manage this pest and mitigate its damage in Pennsylvania.

2. **Jurisdiction.** It is the function of the Elverson Shade Tree Commission, as established by the Elverson Borough Council, to control and protect street trees within the Borough, which shall include the control of planting, removing, replacing, maintaining, regulating and caring for street trees and the trees in Livingood Park. (See Ordinance No. 2009-02, Shade Tree Commission, Section 8).

3. **Declaration of Public Nuisance**. The Elverson Borough has determined that the health of ash trees on public streets and within Livingood Park are threatened by the destructive emerald ash borer (EAB) and hereby declares the following to be a public nuisance:
   Any living or standing tree or part thereof infested by the emerald ash borer beetle;
   Any dead tree or part thereof, including infested logs, branches, stumps, or other materials;
   Any infested firewood or solid wooden packing or shipping materials infested with this pest.

4. **Nuisance Prohibited.** The Elverson Shade Tree Commission shall not permit any public nuisance as defined in #3 above to remain on any public street or in Livingood Park within the Borough.

5. **Inspection.** The Elverson Shade Tree Commission shall inspect or cause to be inspected all ash trees within Livingood Park and on public streets within the Borough to determine whether any public nuisance as defined herein exists thereon and shall also inspect or cause to be inspected any trees or materials reported or suspected to be infested with EAB listed in #3 above.

6. **Abatement of Nuisance.** If the Elverson Shade Tree Commission, upon inspection or examination, determines that any public nuisance as herein defined exists in or upon any public street or within Livingood Park and that the danger to public safety is imminent, the commission shall:
   Immediately cause the ash tree to be treated or removed;
   Otherwise abate the nuisance in such a manner as to destroy/prevent the spread of EAB.

7. **Cost of Abatement.** The cost of abatement of any public nuisance as described in #3 above shall be the responsibility of the Elverson Borough provided the tree or part thereof is on the inventory list of the Shade Tree Commission. Private property owners bear the cost of abatement of any public nuisance from their property upon which such tree or material stands.

Introduction

Elverson, Pennsylvania, is proudly known as the "greatest square mile" because of its picturesque bucolic landscape and exceptional natural beauty. As part of the piedmont plateau, the trees were here first and the borough was built among the trees, many of which were ash. Many early residents planted additional trees. Trees are an integral part of the borough's infrastructure and identity and their foliage covers a large percent of the Borough. The Elverson Shade Tree Commission currently is responsible for the care of 27 ash trees along public streets and 5 ash trees within Livingood Park. Multiple other ash trees are found on private properties, in fence-rows, and in woodlands within the boundary of the Borough and in all of the surrounding woodlands.

The Emerald Ash Borer, *Agrilus planipennis* Fairmaire, is a destructive, highly invasive, wood-boring, ½-inch long beetle that feeds exclusively on ash trees (Faxinus spp.). Infested trees then die. The adult emerald ash borer is bright metallic green with a flat body. In North America, this ash borer attacks only ash trees. Host species include green ash (Fraxinus pennsylvanica), white ash (Fraxinus americana), black ash (Fraxinus nigra), blue ash (Fraxinus quadrangulata), and pumpkin ash (Fraxinus profunda).

The adult emerald ash borer female lays 50-100 eggs which hatch in 7-10 days as minute larvae. These EAB larvae bore through the bark and feed on the nutrient-rich phloem just under the ash tree's bark which disrupts water and nutrient transportation inside the tree. The larval feeding galleries made by the larvae weave back and forth just under the bark in typically a serpentine pattern which is an identifier of possible EAB infestation as is the presence of woodpeckers which feed on the larvae. Tens of millions of ash trees have been lost to this pest, with an estimated 99% mortality rate in ash trees within 3-4 years of EAB infestation.

This invasive pest poses a threat to Pennsylvania's $25 billion hardwoods industry. The emerald ash borer (commonly abbreviated as EAB) is native to northeast Asia, primarily China. It was unknown in North America until its discovery in southeast Michigan (Detroit area) in 2002. To date, EAB infestations have been detected in at least 23 states as well as Ontario and Quebec, Canada. Signs of emerald ash borer infestation and its' devastating effects are currently seen all along the PA turnpike. As of August 2014, the total number of Pennsylvania counties without confirmed EAB infestation is only 14! EAB infestation was recently detected in Berks County this spring (2014). It now seems inevitable that infestations will soon be found in Lancaster County and Chester County (see Appendix, PA map, page 16).

An estimated 20 to 55 million ash trees have been killed by this pest in the infested areas. The potential economic damage could exceed $10 billion in the states expected to be affected within the next 10 years. (Kovacs et al. 2010).

Managing this pest in North America has been confounded by difficulties in early detection, limitations in control options, and scarcity in available resources. Tree removal is the only option for sick and dying trees, whereas chemical control can be effective on ash trees of high-value.

Pennsylvania had implemented an internal state quarantine restricting the movement of ash within the state due to the number of EAB detections in neighboring states but ended the quarantine in April 2011 due to the number of EAB detections within the state by that time. The federal quarantine on EAB and the external quarantine on firewood from outside Pennsylvania are still in effect.

The Elverson 'Emerald Ash Borer Management Plan' is to serve as the master plan for the Borough to manage its ash trees on public streets and in the Livingood Park over the next 10 years. Private property owners are encouraged to manage their ash trees according to the guidelines set by this document.

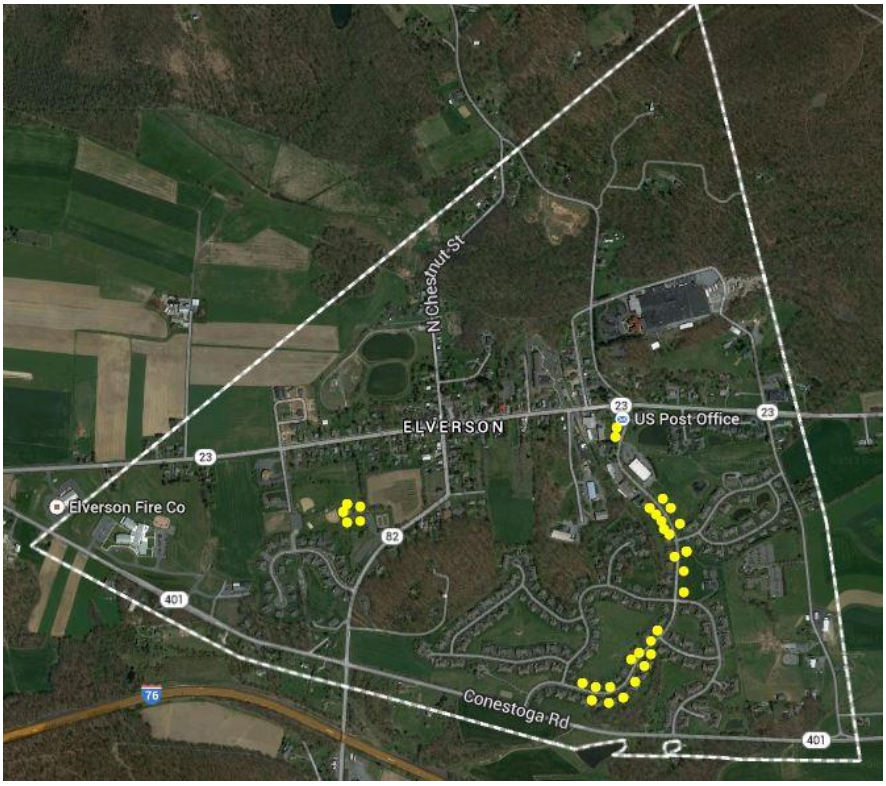
There are three goals for this 'Emerald Ash Borer Management Plan':

- Protect public ash trees in the Borough for their economic, social, and environmental benefits;
- Minimize public safety and liability risk from EAB infestation within the community;
- Replace canopy cover that will be lost to EAB infestation.

The following actions will be carried out in the next 10 years:

1. Maintain an updated ash inventory within the Borough;
2. Annually monitor EAB infestation on Borough street trees and in Livingood Park;
3. Remove dead or dying street ash trees from streets and from Livingood Park;
4. Supervise proper disposal of ash-related infested wood materials from removed trees;
5. Treat valuable ash trees with a chemical insecticide;
6. Replant non-host tree species at locations where ash trees were removed;
7. Conduct outreach and public education;
8. Be a resource for private property owners with questions about the ash infestation.

Ash Resources



Map 1. Distribution of ash trees (marked in yellow) in the Elverson Borough EAB Management plan.

An ash tree inventory was conducted by the Elverson Shade Tree Commission in June 2014 (Map 1). A total of 27 ash trees are recorded on Elverson Borough streets and 5 in Livingood Park. Being less than 25 years old, these particular ash trees are relatively young, ranging in diameter from 5.4 inches (DBH) to 17.8 inches. Table 1 (below) shows these trees categorized by diameter size at breast height (DBH). These ash trees currently show no signs of EAB infestation.

Table 1. Diameter and condition of ash trees in Elverson Borough

Tree Conditions	Diameter class (inches)					Total
	0<10	10-20	21-30	31-40	>41	
Excellent	10	22				32
Good						
Fair						
Poor						
Dead						
Total	10	22				**32**

There are multiple other ash trees found on private property in the Elverson Borough. No inventory was conducted of those ash trees. Private property owners are strongly encouraged to survey the trees on their property so appropriate actions can be taken with this imminent EAB infestation. A local forester or arborist can be contacted for suggested resources for assistance in species identification, inventory, and tree health evaluation.

EAB Infestation

To date, EAB has not yet been detected in Elverson Borough. Trapping for this invasive insect, Emerald Ash Borer, was begun in 2012 in locations in Chester County with plans to continue in the future. Once the EAB arrives and is confirmed to be in Chester County (anticipated in the next 2-4 years), all street and park ash trees in Elverson Borough will be actively monitored for EAB by the Shade Tree Commission. A pest status component will be added to meeting agendas for subsequent meetings of the Elverson Shade Tree Commission with reporting submitted to the Elverson Borough Council as needed.

Management Options*

Trees are a valuable natural resource . . . *in the Borough of Elverson as well as* . . .in urban communities (Dwyer et al. 1992, Nowak et al. 2002) with compensatory values on shade, air quality, storm water discharge, heating/cooling cost, and aesthetic or property value. With the arrival of EAB, all communities will be forced to respond to the infestations in some degree, regardless of the strategies they choose to adopt. Dead trees on streets and in community parks present real threats to public safety. Removing ash from the local ecosystem will permanently alter the natural habitats for related species. Sudden changes in urban canopy cover may result in negative impacts to local communities. Addressing some or all of these concerns requires a well-conceived management plan with specific goals and implementable mechanisms.

As outlined below, there are four management options a community can choose from, each with its own pros and cons.

Option A. No Actions. In this option . . .no survey will be conducted to detect and monitor the spread of EAB, and no control actions will be undertaken even when EAB becomes established in the community . . . As a result, most ash trees will be killed by the end of the infestation. . . Significant changes in neighborhoods and local landscapes can also be expected.

Option B. Selective Management. In this option, high-value ash trees in selected areas (streets . . . parks, etc.) within the community will be managed actively, whereas those in other areas . . . will be left alone. Ash trees will be monitored for their health and levels of EAB infestation. Chemical control and tree removal will be applied wherever appropriate in a cost-effective manner. Tree replacement will be prioritized towards community needs. As a result, most ash trees in the natural areas will be killed by the end of the infestation, whereas a great of high-value ash trees are protected for future generations to enjoy. In addition, dead or dying ash trees in streets and parks will be replaced with non-host species to prevent major canopy gaps in neighborhoods. Annual cost for this option is moderate to the community with minimal disturbance to the urban forests. Habitat change in untreated natural areas is expected.

Option C. Preemptive Management. In this option, ash trees . . . *on streets and in parks* . . . will be removed preemptively and replaced with non-host *tree* species, whereas those in natural areas (e.g. woodlands) will be left alone. No EAB survey activity will be conducted. As a result, treatment areas will contain no ash trees, with no concerns over EAB in the future either. The initial cost of this option could be very high because of expenses associated with tree removal and replacement. Neighborhoods also need to deal with major canopy gaps temporarily at the beginning before replacement trees become well established. However, no annual cost will be incurred after the completion of the project. Habitat change in untreated natural areas is still expected.

Option D. Aggressive Management. In this option, all ash trees in the community will be managed actively with all available management tools. EAB survey activities will be carried out on both roadways and woodlands. Information from the surveys will be used to determine proper management actions across different landscapes. Chemical control will be actively pursued to protect the maximum portion of ash trees and their canopy. Only dead or dying ash trees will be replaced with non-host tree species. Biological control is also considered for ash resources in the natural areas. As a result, most high value ash trees in the streets and parks will be saved from EAB damage, whereas a small portion will be replaced with non-host species. In addition, ash resources in natural areas may have a chance to survive in the long term when effects of introduced natural enemies are realized. Community suffers the least socially and environmentally from the infestation, with less risk of losing urban canopy cover. However, annual cost to the community is the highest among all options.

*(*The four management options outlined above are from "Emerald Ash Borer Management Plan for Pennsylvania Communities" prepared by Houping Liu, PhD, Forest Entomologist, PA DCNR, Bureau of Forestry, Harrisburg, PA, July 12, 2013). Italicized words added for clarification.*

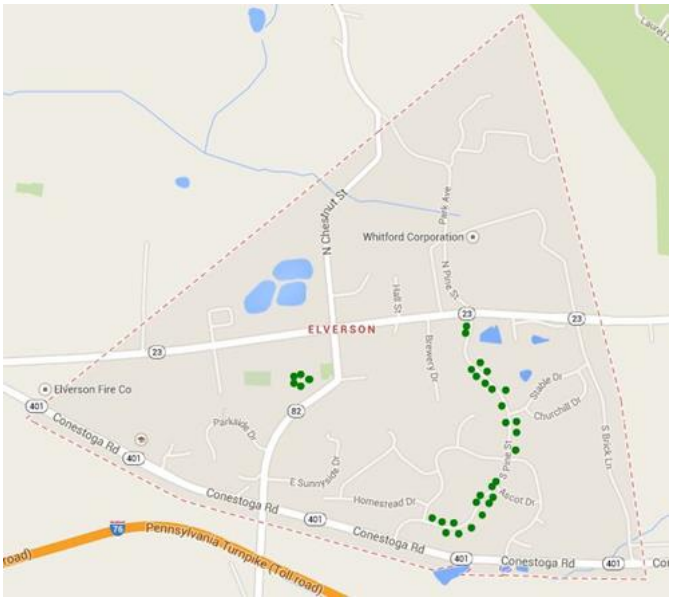
Management Approaches

After considerable investigation and evaluation, the Elverson Shade Tree Commission recommends Management Option B, Selective Management, as the approach to be followed in managing EAB infestation in Elverson Borough. Proposed budget figures for this option will be presented to the Elverson Borough Council in the fall of 2014. Upon Council approval, the three major management tools that will be implemented in the Elverson Borough EAB Management Plan will include chemical treatment with tree removal and tree replacement, if needed. Implementation of this management plan is scheduled to begin in fiscal year 2015.

Chemical Treatment

High-value ash trees in the Borough of Elverson (Map 2.) will be treated with Emamectin benzoate (also known as "Tree-äge") which is a chemical used in the Pennsylvania Forest Service programs to control the emerald ash borer. This chemical (see References, page 15, for the source of a risk assessment done by the Syracuse Environmental Research Associates, Inc.) has been found to provide 99% protection against EAB larval development for 2-3 years with a single application.

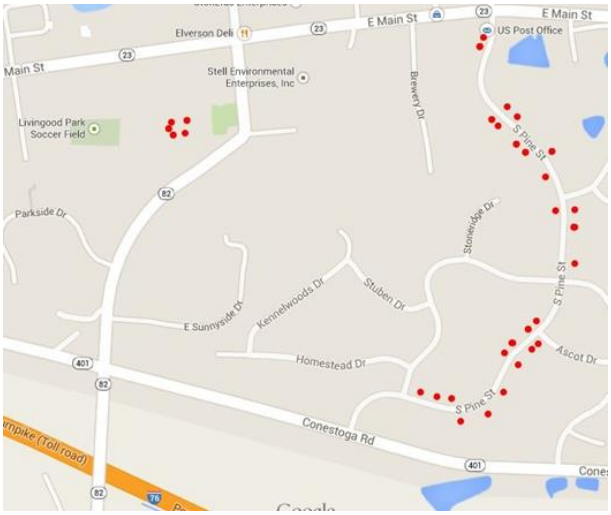
Map 2. Ash trees (marked in green) in the Borough to be treated with Tree-äge (Emamectin benzoate)



Only trees in excellent and good condition will be considered for this treatment since they are better positioned to survive the EAB onslaught. Large diameter trees are favored over small diameter trees as they typically have higher value and provide more benefits to the community. Other factors such as cost, location, and logistics are also considered during the process. A total of 32 trees (see "Inventory of Borough Ash Trees", page 17 of this EAB Plan) with an accumulative total DBH (diameter at breast height) of 371 inches were selected to receive five treatments during the next 10 years (2015-2024).

Tree Removal

Considering the predicted success rate of utilizing Tree-äge in the chemical treatment of the public ash trees in the Elverson Borough, the mortality rate for treated trees should be zero at the end of 10 years. If left untreated, however, Elverson street ash trees and ash trees in Livingood Park would be among those dying off from EAB infestation within the next few years (Map 3). Only trees that are dead or dying would be selected for removal each year. Priority for removal would be given to dead or dying ash trees along sidewalks, trails, streets, in the Park, and on boundary lines as these are especially hazardous to citizens and neighboring properties.



Map 3. Distribution of to-be-removed ash trees (marked in red) if untreated.

As mentioned earlier, once EAB infestation occurs, an ash tree dies within 3-4 years due to the activity of the Emerald Ash Borer larvae. Assuming all untreated ash trees in the Borough will be dead or dying within the next decade, multiple trees within Elverson Borough will need to be removed to protect public safety and reduce liability. To accomplish this goal, any dead or dying ash trees on streets or in Livingood Park for which the Elverson Shade Tree Commission has responsibility will need to be removed and disposed of properly. As with chemical treatment, tree removal and proper disposal of dead or dying ash trees on all private property within and outside Elverson Borough will be the responsibility of the property owners.

Biological Control

Biological control of EAB with parasitoids (i.e. non-stinging wasps) is being researched as a possible long term approach for the management of the EAB although its effectiveness is still under investigation by scientists from universities and governmental agencies. The PA DCNR scientists are establishing parasitoid release sites in various areas of the state of PA. Three hymenopteran parasitoids, including one egg parasitoid, *Oobius agrili* Zhang and Huang (Encyrtidae), and two larval parasitoids, *Tetrastichus planipennisi* Yang (Eulophidae) and *Spathius agrili* Yang (Braconidae) were scheduled for release in 2013 and 2014. Parasitoid establishment and their impact on EAB populations at PA study sites will continue to be monitored and evaluated by researchers in 2015.

Replanting

All removed ash trees in Elverson Borough (see Map 3) will be replaced for canopy cover. A replacement ratio of 1:1 will be used. Temporary reduction of canopy cover is expected on affected streets and in Livingood Park as replacement trees are usually small and not guaranteed at 100% survival rate. Agencies the Tree Commission may work with if replanting efforts are required include the Arbor Day Foundation, Tree City USA, TreeVitalize, Master Gardeners, and other nonprofit organizations. Private citizens may also be encouraged to volunteer if replanting is required.

Community Outreach

Information about the Emerald Ash Borer (EAB), ash trees, quarantine regulations, tree removal, chemical control, replanting, and other program activities is currently available from the DCNR, Dept. of Forestry, the US and the PA Dept. of Agriculture, Penn State Cooperative Extension, and various other governmental agencies. Various computer websites are listed at the end of this management plan under “Contacts and Information” on page 14. Information is also available through news conferences, newspaper articles, seminars, public hearings, trainings, demonstrations, community events, and awareness campaigns throughout the program period in Chester County as well as surrounding counties. Interested individuals may also contact the Elverson Shade Tree Commission.

Since ash trees on private properties are the responsibility of the property owners, it is up to the property owner to decide whether to chemically treat their ash trees, or to remove and replace the ash trees.

Wood Utilization and Materials Disposal

Ash trees are as important economically as they are ecologically in the forests of the eastern United States. Ash wood is valued for flooring, furniture, sports equipment (e.g., baseball bats, hockey sticks, and oars), tool handles, etc. Uninfested ash trees removed from Borough streets or the park, or any removed from private properties may have value as lumber or even as landscape mulch. This harvesting would need to occur prior to major emerald ash borer infestation.

Cost/Benefit Analysis

The total cost for the chemical treatment on ash trees (EAB Management Plan for Elverson using the "Selective Management Option B", from page 10) is estimated at $15,728 over a 10-year period (see Table 2). A bidding process would be conducted to select a tree-care company who is reputable, has the lowest reasonable bid, and who has the proper licensing to use and treat with Emamectin benzoate (Tree-äge). All management activities (i.e. chemical treatment as well as tree removal and replanting) will be conducted by contracted commercial companies under Elverson Shade Tree Commission supervision. If chemical treatment of ash trees (as listed on "Inventory of Borough Ash Trees", page 17 of this plan) was not carried out, 10-year total cost for tree removal and subsequent tree replacement would be in excess of $20,800, as summarized in Table 3 (page 13).

Chemical Treatment

Table 2. Cost of chemical treatment of ash trees in Elverson Borough for 10 years (2015-2024)

Year	No. of Trees	Total DBH (inch)*	Unit price ($) *	**Cost ($)**
2015	32	371	7.50	2,783
2016	0	375	7.65	0
2017	32	378	7.80	2,948
2018	0	382	7.96	0
2019	32	386	8.12	3,134
2020	0	390	8.28	0
2021	32	394	8.45	3,329
2022	0	398	8.62	0
2023	32	402	8.79	3,534
2024	0	406	8.96	0
Total	**32**			**15,728**

***1% annual increase is assumed to total diameters of ash trees and 2% annual increase for cost of chemical treatment.

A total of five treatments per tree are needed for the project period since Emamectin benzoate (Tree-äge) is effective against EAB larvae for at least two (2) years. The total cost for chemical treatment of 32 selected Borough ash trees, with treatment given every other year, is estimated to be $15,728 over a ten-year period as shown in the table above. (Note: Unit price in many PA localities is estimated at $10 which would raise Borough cost to $20,965).

Tree Removal

If Elverson Borough proceeds with the 10-year plan of chemically treating the selected ash trees in the Borough, and if the plan is totally successful, there should be no loss of ash trees due to EAB and therefore no cost for removal.

If Elverson Borough ash trees are left untreated and become infested with EAB, a total of 27 ash street trees on South Pine Street and 5 ash trees in Livingood Park will need to be removed within the next 10 years (2015 – 2024). Because of the location of these trees, they would be considered as hazardous trees due to the foot traffic

around each of them. These could be all removed the same year, removed as they become noticeably infested by EAB, or removed following a predetermined schedule. Based on the 2014 estimated rate of $350 per tree for cutting down of an average sized ash tree (DBH of 14”) and grinding up the stump and roots, projected total removal cost for all 32 ash trees , if all would were to be removed within the same year would be a minimum cost of approximately $11,200. Tree removal in subsequent years would increase in cost as diameter size increases, with cost possibly exceeding $410/tree for removal.

Replanting

If all 32 ash trees being considered in this plan in Elverson Borough die due to EAB infestation and are removed, a total of 32 replacement trees will be replanted with non-host species. If all 32 removed trees were then replaced within one year, the total minimum cost in 2015 would be approximately $9,600 ($300 x 32 trees). Projected increases in material and labor costs will increase replacement costs in future years. Replanting cost includes cost of a 2-3” tree (DBH) (or other forms) and labor.

Fiscal Planning

To support the EAB management plan, the Borough of Elverson will need a new line item in its budget for this 10-year program, with an estimated average annual cost of $1,573 ($15,728 ÷ 10 yrs), to cover the cost of the use of the chemical, Tree-äge, in the treatment of ash trees. Table 3 (below) summarizes the 10-year costs for chemical treatment compared to tree removal and replacement costs.

Table 3. Total cost of Elverson Borough 10-year EAB Management Plan (2015-2024):

Chemical Treatment (from Table 2)	Tree Removal (of 32 ash trees)	Tree Replanting (of 32 non-ash trees)		**Total $ Cost Chemical Treatment (Table 2)**	**Total $ Cost Remove and Replant**
15,728	11,200 – 13,376	9,600 – 11,488		**15,728**	**20,800 – 24,864**

If tree removal and replacement is the decision for dealing with EAB infestation in Elverson Borough rather than chemical treatment, the total cost for dealing with the removal and replacement of 32 ash trees would be somewhere within the range of $20,800 to $24,864 over 10 years. These figures are based on the 2014 removal cost of $11,200 ($350 x 32 trees) and the replanting cost of $9,600 ($300 x 32 trees) which results in the combined total of $20,800 if all removal and replacing of the 32 trees would occur in 2015. Factoring in a 2% per year increase to 2024, the costs would reach $13,376 /32 trees for removal and $11,488/32 trees for replacement. These figures then give the minimum to maximum range over the 10 years of $20,800 to $24,864.

The Elverson Shade Tree Commission will explore potential cost saving measures such as public bidding, in-house absorption and service, corporate and private donations, volunteering, etc. to lower the fiscal burden resulting from this EAB Management Plan implementation. In addition, the Shade Tree Commission will work with federal, state, and local government agencies, organizations, and institutions to secure awards and grants to fund a portion or the entire project in chemical treatment and/or tree removal and replanting.

Time Table

A 10-year time table is needed to carry out this EAB Management Plan and conduct procedures to meet objectives for each year. Activities such as tree inventory, EAB monitoring, chemical treatment, tree removal, replanting, efficacy evaluations, etc. will be included. Necessary adjustments will be made at the beginning of each year to reflect the changes of the field situation.

Data Collection and Reporting

Data from the implementation of the Elverson Borough EAB Management Plan will be collected and documented by the Shade Tree Commission. Status reports will be maintained for all aspects of the program with an annual report used to summarize the program for the current year. Status reports will be submitted to the Borough Council for all aspects of the program with a final report issued at the end of the program.

Contacts and Information

- Pennsylvania Department of Conservation and Natural Resources: www.dcnr.state.pa.us/forestry/insectsdisease/eab/
- Pennsylvania Department of Agriculture EAB hotline: 1-866-253-7189 or www.badbug@state.pa.us
- Pennsylvania State University Extension: http://ento.psu.edu/extension/trees-shrubs/emerald-ash-borer
- Emerald Ash Borer: www.emeraldashborer.info/ or www.paemeraldashborer.psu.edu/
- USDA APHIS: http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/importexport?urile=wcm%3apath%3a%2Faphis_content_library%2Fsa_our_focus%2Fsa_plant_health%2Fsa_domestic_pests_and_diseases%2Fsa_pests_and_diseases%2Fsa_insects%2Fsa_emerald_ash%2Fct_emerald_ash_borer
- USDA Forest Service: http://na.fs.fed.us/fhp/eab/
- i-Tree – Tools for Assessing and Managing Community Forests: http://www.itreetools.org/
- Tree Vitalize – A partnership to restore tree cover in PA communities: http://treevitalize.net/TreeCare/SelectingTrees.aspx
- EAB Cost Calculator: http.//extension.entm.purdue.edu/treecomputer/index.php
- National Tree Benefit Calculator: http//extension.entm.purdue.edu/treecomputer/index.php

REPORT! As requested throughout the state of Pennsylvania, if you think you have found emerald ash borer, report it by contacting:

- ***Pennsylvania Department of Agriculture: 1-(866)-253-7189,***
- ***Pennsylvania Department of Conservation and Natural Resources (DCNR),***
- ***Penn State Cooperative Extension, or***
- ***United States Department of Agriculture***

or, report your sighting by e-mail at:

Badbug@state.pa.us

References

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Human health & ecological risk assessment by Syracuse Environmental Research Associates, Inc. (http://www.fs.fed.us/foresthealth/pesticide/pdfs/052-23-03b_Emamectin-benzoate.pdf)

Acknowledgements

The primary template for our Elverson Borough EAB Management Plan came from the document "Emerald Ash Borer Management Plan for Pennsylvania Communities" prepared by Houping Liu, PhD, Forest Entomologist, PA DCNR, Bureau of Forestry, written July 12, 2013. Special assistance to the Elverson Shade Tree Commission from Kendra McMillan, PA Urban & Community Forestry Council Project intern.

Photo Credits

Page 1: Adult Emerald Ash Borer. Extension Bulletin EAB-2938-PSU. Penn State University.

Page 3: Elverson S. Pine Street Trees – Elverson Borough website, Elverson Shade Tree Commission.

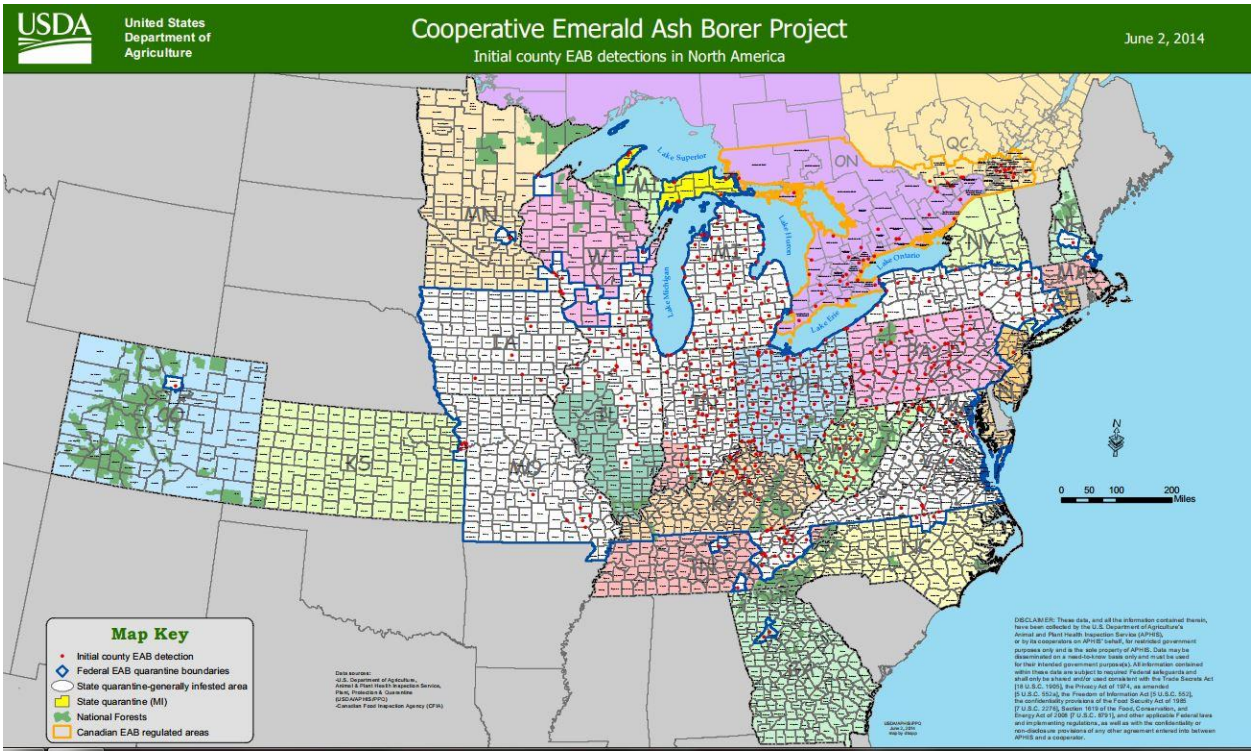
Page 5: Adult Emerald Ash Borer. Extension Bulletin EAB-2938-PSU. Penn State University.

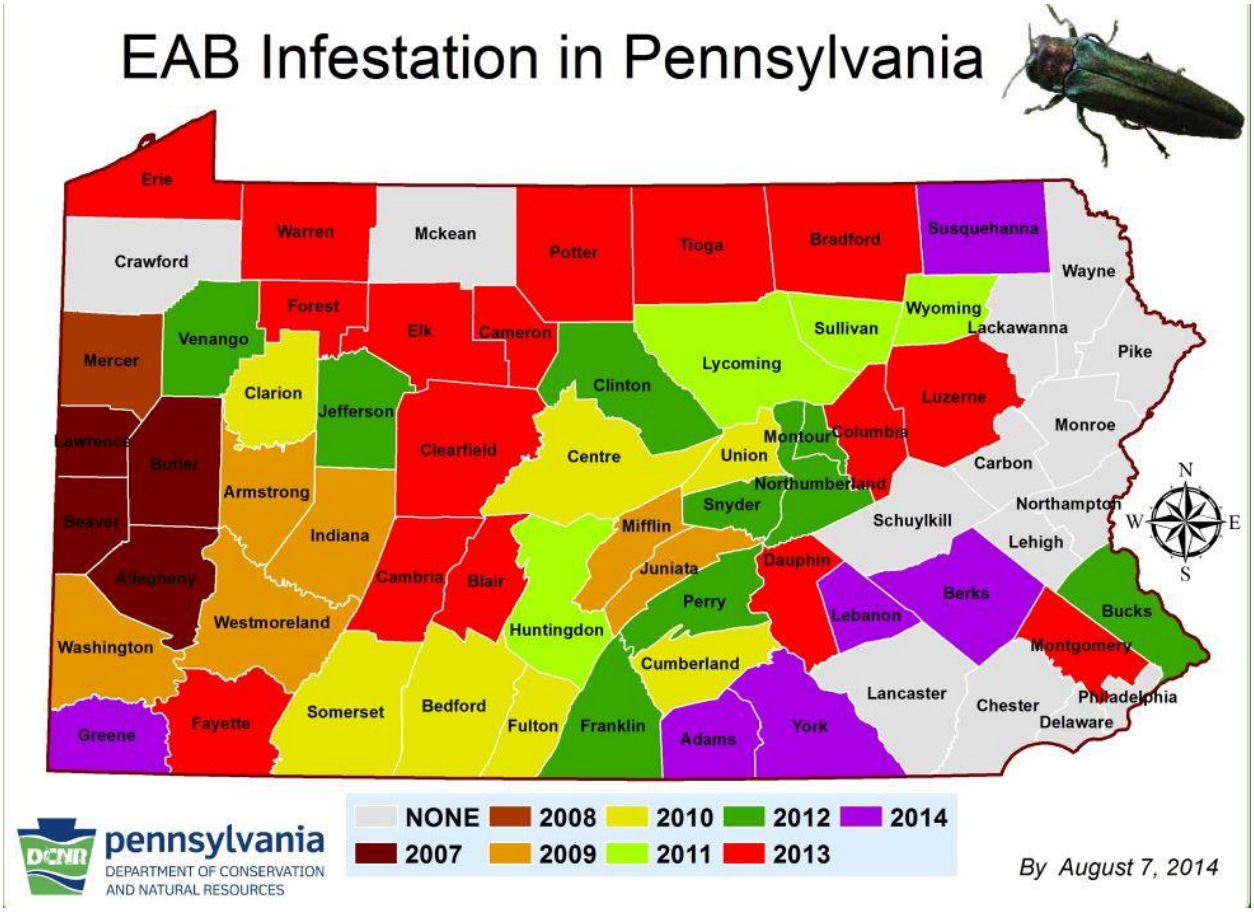
Page 6: EAB larva and larval feeding galleries. Extension Bulletin EAB-2938-PSU. Penn State University.

Page 6: Compound leaf of ash tree (Fraxinus spp). Extension Bulletin EAB-2943-PSU. Penn State University.

Pages 7, 10, 11: Maps of Elverson Borough: Google Maps.

Page 17: Maps of EAB Infestation from: www.dcnr.state.pa.us then "EAB Awareness Tools".


USDA
United States Department of Agriculture
Cooperative Emerald Ash Borer Project
Initial county EAB detections in North America
June 2, 2014
Lake Superior
Lake Michigan
Lake Huron
Lake Ontario
Lake Erie
MN
WI
MI
IL
IN
OH
PA
NY
VT
NH
ME
MA
CT
NJ
DE
MD
WV
VA
NC
SC
GA
FL
AL
MS
LA
TX
KS
MO
KY
TN
ON
QC
0 50 100 200 Miles
Map Key
Initial county EAB detection
Federal EAB quarantine boundaries
State quarantine-generally infested area
State quarantine (MI)
National Forests
Canadian EAB regulated areas


EAB Infestation in Pennsylvania
Erie
Warren
Mckean
Potter
Tioga
Bradford
Susquehanna
Wayne
Crawford
Forest
Elk
Cameron
Wyoming
Sullivan
Lackawanna
Pike
Mercer
Venango
Clarion
Jefferson
Clinton
Lycoming
Luzerne
Lawrence
Butler
Clearfield
Centre
Union
Montour
Columbia
Monroe
Carbon
Armstrong
Northumberland
Snyder
Northampton
Beaver
Indiana
Mifflin
Schuylkill
Lehigh
Allegheny
Cambria
Blair
Juniata
Dauphin
Berks
Perry
Lebanon
Bucks
Westmoreland
Huntingdon
Montgomery
Washington
Cumberland
Lancaster
Chester
Philadelphia
Delaware
Greene
Fayette
Somerset
Bedford
Fulton
Franklin
Adams
York
N
W
E
S
NONE
2008
2010
2012
2014
2007
2009
2011
2013
pennsylvania
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
By August 7, 2014

Inventory of Elverson Borough Ash Trees as of July 2014.