

City of Guelph

EMERALD ASH BORER PLAN



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GUELPH'S EMERALD ASH BORER PLAN

1.0 Background:

The emerald ash borer (EAB) is an insect native to eastern Asia that attacks and kills most ash trees in an area within five years of its initial detection. It has killed upwards of 100 million ash trees throughout eastern and mid-western North America since it was first discovered in 2002 and threatens billions of trees. Costs to affected municipalities and property owners can be considerable and cannot be avoided.

EAB cannot be eradicated. Despite a coordinated effort by various levels of government in Canada and the US to manage the pest, and millions of dollars being invested into scientific research, EAB continues to spread with devastating environmental and economic impacts.

While traps are available to detect the presence of the adult beetle, they are of limited effectiveness. For this reason, EAB cannot be accurately detected at low population levels and can be in an area for four or five years before signs and symptoms are in evidence. By this time, it is often too late to implement effective controls.

EAB was first confirmed in the southern end of Wellington County and Waterloo Region in 2010 and in the City of Guelph in the fall of 2011 in several recently planted trees in the south end of the City. Although traps placed by the City in 2012 failed to detect any EAB within the City's perimeter, infested trees were found at several locations in the south end. The City deployed 40 traps in 2013 throughout the community, and all of them were strongly "positive". This indicates that adult EAB was distributed throughout the city in 2013. It does not indicate the degree of infestation or how that infestation varies from place to place within Guelph. Thirty-five EAB-killed City-owned boulevard trees were removed from the Clairfields neighbourhood near Clair Road at Gordon Street in the summer of 2013, with 80 more in the removal queue. Many more ash trees are heavily infested in the greenspaces behind homes in that neighbourhood. Based on comparisons with other southern Ontario municipalities which have experienced EAB infestations, it is likely that most of Guelph's public and privately owned ash trees will die over the next five years as a result of EAB.

The urban forest is important, and ash is an important component of it. There are so many benefits of urban forests that listing them all is a daunting task. Suffice to say that the most desirable residential neighbourhoods, parks, and commercial areas are normally those with the best tree cover. Trees improve the microclimate and UV rates, air and water quality, aesthetics, property values, habitat, and individual and community well-being. In short, trees are good, and Guelph wants more, not less.

Having a sound management plan in place is a cost-effective strategy that will allow the City to prepare for the financial and environmental impacts of EAB and to preserve some of its ash trees. The Urban Forest Management Plan adopted by City Council in 2012 recommends that the City develop a plan specific to the management of EAB.

2.0 Comparison of Approaches

Following are the generalized approaches used in response to EAB.

1. Passive Management
2. Active Management
3. Proactive Management

Some situations demand more proactive attention than others, so a mix of approaches tailored to the situations can be appropriate. The following descriptions and comparisons show that there is no way to evade the costs and a passive approach may be more costly than being more proactive. This may be counterintuitive, which is why the effort is made here to explain it. The cost comparisons are Guelph-specific, for City-owned trees only, based on certain assumptions, as described.

This plan falls closest to “Active Management”, and has been vetted by City staff and the Urban Forest Advisory Committee.

2.1 Passive Management: This option treats ash trees the same as any other tree species and they would only be removed if they die or become hazardous. There would be no surveys specific to EAB, no attempt to save at-risk trees through treatment with registered pest control products and limited public awareness activities. However the City would replace, where possible, City-owned street and park ash trees which have been removed. There would be no financial assistance to private property owners affected by EAB.

2.2 Active Management: The objective of this option is to preserve a percentage of publicly owned street and park ash trees through the use of approved pest control products such as TreeAzin™ (a natural product derived from the neem tree that must be injected into the tree prior to attack by EAB)¹. The City would conduct surveys of infestation and prioritize areas for treatment and removal. All publicly owned street and park ash trees showing signs and symptoms of EAB would be promptly removed. Ash trees not showing visible signs and symptoms would not be pre-emptively removed but would be assessed for possible treatment with TreeAzin™. The City would develop rating criteria whereby candidate trees would be evaluated and prioritized for possible treatment. Preference would be given to larger street and park trees in good health and condition² and apparently free from EAB, and where ash is the dominant species along roadways. It would not be practical or even possible to treat all trees. Although it is generally considered not cost-effective to treat woodland ash trees, the City may elect to treat those trees it considers to be of high value.

Based on comparisons with other EAB-affected municipalities, it can be assumed that all non-treated ash trees will die over the next ten years and that most treated trees will survive.

¹ See Section 3.2, for further details

² Good health and condition means free from external and internal defects such as heart rot, poor branch structure etc. as determined by a professional certified arborist

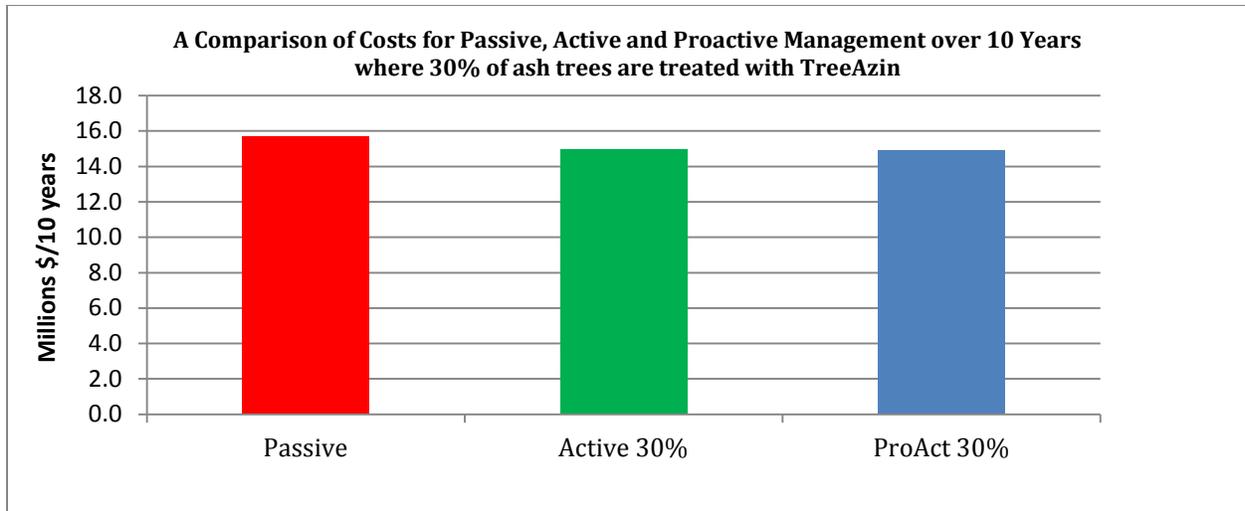
2.3 Proactive Management: This option is fundamentally the same as **Active Management** with the exception that ash trees which have not been identified for treatment with TreeAzin™ would be removed as soon as possible regardless of health or condition. The objectives of this option are to limit the long-term impact to the urban forest and get replacement trees into the ground as soon as possible, and to better manage the costs associated with the death and removal of thousands of trees over a short period. The basic premise of this option is that most untreated ash trees will die over the next five to ten years and publicly owned trees should be removed in a cost-efficient, planned manner, regardless of their infestation status, as soon as possible. In support of this, the City would conduct annual surveys of infestation in order to prioritize areas for treatment and/or removal. The pre-emptive removal of untreated trees would allow for some cost efficiencies and maximize opportunities for replanting and canopy recovery.

While the costs for implementing this option over a 10 year period are similar to those for **Active Management**, most of the cost is “front end loaded” because most untreated trees would be removed and replaced within the first five years. For this reason, this option is usually more expensive when viewed over the initial five year period. The primary benefit of this option is that it calls for the pre-emptive removal of trees which are going to die in any event and allows for a head start on tree replacement and canopy retention/recovery. The primary drawbacks of this option are the aesthetic and environmental impacts associated with large scale tree removal and the upfront costs.

2.4 Costing

Based on detailed analysis of EAB programs in other Ontario municipalities, it is possible to provide a reasonably accurate cost estimate for the implementation of the three management options available to Guelph. In making these comparisons, it is assumed that most of Guelph’s estimated 10,000 street and park trees will die over the next five to ten years as a result of EAB (unless treated), and that it costs, on average \$1,500 to remove, stump, dispose of and replace a tree.

In general, it is less expensive to treat trees with TreeAzin™ than to cut them over the initial 10-15 year period of the infestation. While it is not practical to treat every tree, there is merit in treating some of them. For cost comparison purposes among the options, it is assumed that 30% of Guelph’s publicly owned street and park trees will meet the criteria for treatment (with the remainder dying and having to be removed). Depending on which option is selected by the City, the costs to the City over a 10 year period will range from **\$15-16 million**. For the most part, these costs cannot be avoided or deferred. Reacting only when trees die (**Passive Management**) is often more expensive than treating trees. Note that because the infestation in Guelph is already well-advanced, and because funds are limited, it’s very unlikely now that 30% of City-owned ash trees will be treated. However, for cost comparison purposes, the 30% figure is still illustrative.



Summary of Anticipated Costs: 30% Treatment with TreeAzin™



A comparison of costs associated with three management strategies:

- **Red:** Passive Management (no treatment or survey and limited communications and woodland management)
- **Green:** Active Management (where 30% of trees are treated)
- **Blue:** Pro-active Management (where 30% of trees are treated and the remainder pre-emptively removed over the initial five year period)

3.0 Guelph's EAB Plan Elements

Guelph's EAB Plan was formulated in consultation with EAB experts, Guelph's Urban Forest Advisory Committee, stakeholders and staff.

The basic tenets of this plan are as follows.

1. Ensure safety of people and property, as they relate to dead or dying City-owned ash trees.
2. Reach out to the community to ensure they are aware of the issue, their options, and how to access their options.
3. Treat as many ash trees as feasible, but only invest in the very best candidates.
4. Set recovery into motion as quickly as possible, even before ash-tree decline, if possible.
5. Protect ecological integrity of natural areas from damage by EAB infestation.
6. Leave infested but "green" City-owned ash trees standing as long as they are safe to stand, to gain the longest "service life" from each mature ash.

This plan falls closest to the "Active Management" approach.

3.1 Surveillance and Monitoring

3.1.1 Description

The City will conduct surveys and monitor for EAB for the initial five year period of the infestation.

3.1.2 Objectives	Activities Required to Meet Objectives
Conduct surveys to find new EAB populations to monitor EAB dispersal and the rate of spread	<ul style="list-style-type: none">• Prism traps were deployed at strategic locations throughout the City in 2012 and 2013, and 2013 results indicate adult EAB distributed strongly throughout the city; further use of prism traps will be evaluated• Branch sampling (removal and analysis of branches for EAB presence)• Visual surveys for signs and symptoms such as crown decline• Follow-up on public referrals• Analyse and map data

3.1.3 Comments

Accurate inventory and survey data are very important to make informed management decisions and to set realistic budgets for EAB. Timely detection of EAB pockets will allow for the City to target tree protection, removal and replacement initiatives and will help the City estimate future costs for these. EAB has likely already spread to most or all areas of the City. Once most of the City is determined to be infested there will be no reason to conduct surveys and they can be discontinued.

3.2 Tree Protection

3.2.1 Description

Based on comparisons with similarly infested municipalities in Canada and the US, it can be expected that close to 100% of Guelph's untreated street, park, and woodland ash trees will be killed over the next 10 years as a result of EAB. There is conclusive evidence to show that the timely application of pest control products such as TreeAzin™³ can protect at-risk trees and that over a 10 or even a 15 year period treating trees can be less expensive than removing and replacing them.

Many Ontario municipalities have elected to preserve some of their publicly owned street and park trees through the use of TreeAzin™. TreeAzin™ is the product of choice because it is a natural pest control product registered under the Pest Control Products Act for use against the emerald ash borer. It has low toxicity to mammals and birds and has little effect on non-target organisms such as bees or beneficial insects. The active ingredient is Azadirachtin, derived from the fruit of the neem tree and it kills insects by interfering with their larval development.

TreeAzin™ is currently being used with success by several of Guelph's neighbouring municipalities, the Grand River Conservation Authority, and private landowners. For the product to be effective, it must be injected into the tree by a licensed professional arborist using a special application device. In order to absorb the product, trees must be in good health and relatively free from EAB⁴. Heavily or moderately infested trees are unable to uptake TreeAzin™ and should not be injected. For this reason, treatment must begin before the tree is heavily infested and will have to be continued for as long as EAB remains in the area at high population levels. At present, scientists estimate that this will be for at least the next ten years. EAB cannot survive in the absence of ash trees and EAB populations are eventually expected to crash as the result of the mortality of most of the untreated ash trees in the area over the next ten years and several species of biological control insects which are now starting to have an impact. Costs for TreeAzin™ treatment have dropped significantly in recent years and a 50 cm tree can be treated for as little as \$250 every second year. When costs are calculated over a ten year period this is generally significantly less than the cost associated with cutting, stumping and replacing a tree of this size. The annualized treatment cost is also comparable to the value of services provided by that same tree every year: air and water filtration, moderating stormwater flows, micro-climate amelioration, carbon sequestration, and others. These treatment costs can therefore be seen as a straight-up annual purchase of environmental services from a mature ash tree – an important part of the community's "green infrastructure".

³ While three pest control products are currently registered in Canada by Health Canada for use against EAB, TreeAzin is preferred by most communities and is recommended by the Canadian Forest Service and Ontario Ministry of Natural Resources as the best product available.

⁴ Freedom from EAB may be difficult to determine and may require sampling and analysis of upper branches.

Most municipalities have elected to not treat trees less than 20 cm dbh⁵. Smaller diameter trees are generally younger and less valuable than larger specimens, have a much smaller canopy and can be removed and replaced at less cost to the City.

<i>3.2.2 Objectives</i>	<i>Activities Required to Meet Objectives</i>
Detect and determine extent of EAB populations in Guelph	<ul style="list-style-type: none"> • See section 3.1 (surveys)
Select trees for TreeAzin™ treatment	<ul style="list-style-type: none"> • Develop criteria for selecting trees to be treated • Identify, prioritize and map candidate trees/areas • Develop operational plans for treatment
Cost benefit analysis of treatment vs. non-treatment	<ul style="list-style-type: none"> • Use of Cost-calculator spreadsheets to determine costs for biennial treatment of candidate trees and extrapolate costs over a 10 year period • Examine/compare different treatment scenarios to get the best fit for Guelph
Ensure public is kept informed of EAB infestation status and mitigation activities in the City	<ul style="list-style-type: none"> • Develop a public communications plan • Provide timely and accurate information about EAB through various communications channels (e.g., guelph.ca), social media, print materials etc. • Offer outreach program to ensure that owners of private-land ash trees understand the situation, their options, and how to access them.

3.2.3 Comments

For cost comparison purposes, a target of 30% protection has been selected (a target used by many other Ontario municipalities). It is assumed that treated trees will survive the 10 year treatment period and untreated trees will be killed as a result of EAB attack. Based on an analysis of all costs, it would be significantly less expensive to treat than to cut and replace these trees.

Other factors to consider are that no untreated ash trees would be expected to survive after 10 years, and replacement trees would be unlikely in many instances to grow to the size of the original trees during that period. For there to be any chance of saving any of Guelph’s ash trees, treatments must begin in 2014 and be continued over a ten year period.

3.3 Removal and Replacement

3.3.1 Description

Removal in this document refers to cutting ash trees as a direct result of current or impending EAB infestation. Removal may be reactive (cutting dead or dying trees) or proactive (cutting trees before any signs and symptoms show). The City of Guelph has chosen to remove trees reactively. This approach maximizes the productive life of each ash tree, and therefore the value of services provided. That more than compensates for possibly losing some cost-savings by not pre-emptively removing nearby infested but still “green” trees. Where street and park trees are removed, stumps

⁵ dbh = diameter of the trunk at breast height (usually 150cm)

will be ground up and replacement trees planted where warranted⁶. Branches and small trunks will be chipped on site; large diameter trunks will be moved to a central disposal site and tub ground (at additional expense to the City).

For ash trees in City-owned woodland and natural areas, removal will entail felling hazard trees (those adjacent to public trails and private properties) without removal from the area or stumping.

Replacement refers to the planting of trees to replace City-owned street and park ash trees. While it is desirable to replant at least one tree for each one removed, this is not always possible.

EAB represents a severe setback to Guelph’s aspirations to grow its urban forest. The overall intent of the replacement program will be to work toward at least a break-even situation for “canopy cover”, once the replacement trees mature.

<i>3.3.2 Objectives</i>	<i>Activities Required to Meet Objectives</i>
Identify and determine the number of City-owned street and park ash trees	<ul style="list-style-type: none"> ● Inventory through census (ash and other species?) ● Map
Identify and determine the number of potential hazard trees along Guelph’s pathways and trails in parks and woodlands	<ul style="list-style-type: none"> ● Conduct inventory of at-risk and potential hazard trees along Guelph’s woodland trails and pathways ● Categorize as to risk potential ● Map
Identify street trees to be removed	<ul style="list-style-type: none"> ● Map ● Develop protocol for removal ● Notify adjacent property owners
Develop an action plan for replacing urban trees killed by EAB	<ul style="list-style-type: none"> ● Develop or procure list of suitable replacement species ● Determine schedule for replacement ● Issue contracts consistent with current City policy
Develop site-specific ash tree removal and replacement policies and protocols	<ul style="list-style-type: none"> ● Develop and cost removal strategies specific to street, park and woodland trees

3.3.3 Comments

The City of Guelph estimates that it costs \$1,500 on average, to remove and replace a tree. Based on comparisons with other Ontario municipalities affected by EAB, it can be expected that most of Guelph’s 10,000 publicly owned ash trees will die as a result of EAB, unless they are treated with TreeAzin™. Costs associated with removal, disposal and replacement could exceed \$15 million over the next 10 years. Dead ash trees decay rapidly and soon become hazardous and for this reason must be removed in urban areas before they fall. Woodland trees killed by EAB generally do not have to be removed (or felled) unless they are close to roads or public pathways and otherwise deemed a hazard by a certified arborist.

Many municipalities which have experienced EAB infestation complain about being overwhelmed by the sheer number of dead trees which much be removed in a short period. For this reason, there needs to be a contingency plan for dealing with the large numbers of dead or dying trees that are expected within the next five years. Where removals are pre-emptive, they can be staged over a

⁶ It is not always possible to plant replacement trees especially where site conditions are not favourable

multi-year period based on risk and efficiency of removal. Annual EAB surveys will provide Guelph with data by which to quantify these risks and develop criteria.

3.4 Restoration and Remediation

3.4.1 Description

Restoration and Remediation entail restoring or enhancing areas where there has been damage to the components of the City’s natural heritage systems that are publicly owned and contain ash trees (i.e., woodlands, valley lands, wetlands etc.) or other natural sites which have been severely impacted by EAB, and making them suitable for tree replacement or restoration by using and encouraging desirable species. Where site remediation is necessary due to impacts from large numbers of ash trees having died and/or there has been physical damage to the site (e.g., from erosion or as a result of tree removal activities) mitigation measures will be used to prevent negative impacts. This could include taking preventative measures against the establishment of invasive species such as buckthorn and garlic mustard as the presence of significant numbers of these species in the understorey could jeopardize the ecological integrity of these areas.

3.4.2 Objectives	Activities Required to Meet Objectives
Prevention of overall reduction of urban canopy due to EAB	<ul style="list-style-type: none"> • Develop an accurate, up-to-date tree and land use inventory • Develop criteria or protocols governing site restoration for natural and woodland areas • Collaborate with partners such as Provincial and Federal Governments, Conservation Authorities and private tree planting groups
Mitigation of environmental and ecological impacts	<ul style="list-style-type: none"> • Identify particularly sensitive areas where ash plays a vital role in the ecological function of natural heritage features or areas • Develop a plan to mitigate damage to these sites • Integrate existing strategies for invasive alien species into remediation action plan

3.4.3 Comments

The three native species of ash naturally occurring in Guelph are vital both within natural areas and the rest of the urban forest. Their loss could have significant and lasting impacts on these areas. Additionally, the loss of ash could degrade vulnerable habitats through increased erosion, sedimentation, and stream warming. Furthermore, these areas would also be more vulnerable to colonization by invasive alien plant species such as buckthorn and garlic mustard.

3.5 Communications, outreach and public education

3.5.1 Description

The City will develop a communications plan to educate and engage the public and key stakeholders about EAB and its potential impact on trees within the City of Guelph. The main goal of the

communications plan will be to provide timely and accurate information about EAB. This will be done through various communications channels (e.g. guelph.ca, social media, print materials, etc.).

An outreach program will be established to help landowners understand the situation, their options, and how to access them.

3.5.2 Comments

The loss of trees will be traumatic for many citizens and neighbourhoods. The communication plan is needed to lessen the trauma by providing timely information. It also may lead to ash trees on private land being saved through treatment.

4.0 Summary

EAB will have a profound impact on Guelph over the next 10 years. Based on comparisons with other Ontario municipalities which have already been affected by EAB, immediate action is required if Guelph is to save some of its City-owned street and park ash trees, or privately-owned trees. Detailed analyses of other EAB affected municipalities have shown that it is possible to cost-effectively protect some ash trees, and that treatment is often the least expensive option over the next 10 year period (as compared to cutting, disposal and replacement). Without adequate preparation, Guelph runs the risk of being overwhelmed with the number of dead trees it will have to remove during this period. While the 30% treatment figure used in this document is for discussion and comparison purposes only, and may no longer be achievable in Guelph, other municipalities have been able to treat a large fraction of their ash tree population.