

10

EMERALD ASH BORER MANAGEMENT PLAN

The Transportation Services Committee recommends the adoption of the recommendations contained in the following report dated May 10, 2011, from the Commissioner of Transportation Services.

1. RECOMMENDATIONS

It is recommended that:

1. Regional Council endorse the York Region Emerald Ash Borer Management Plan.
2. Transportation Services staff be directed to continue working with local municipalities and agencies through the Emerald Ash Borer Technical Working Group.
3. The Regional Clerk forward this Report and the York Region Emerald Ash Borer Management Plan to the local municipalities and Conservation Authorities.

2. PURPOSE

This report provides an update on the status and impacts of emerald ash borer and seeks Regional Council endorsement of an Emerald Ash Borer Management Plan.

3. BACKGROUND

The Emerald Ash Borer beetle was first identified in Windsor, Ontario in 2002 and York Region in 2008

The emerald ash borer is a wood-boring beetle native to China, Japan, Korea, Russia, and Taiwan, that kills all ash trees. In 2002, the emerald ash borer was discovered in Windsor, Ontario (Council Report - June 2003). In August 2008, a beetle infestation was discovered near Highway 7 and Weston Road in the City of Vaughan (Council Report - May 2008). The emerald ash borer has been found at a number of locations in southern Vaughan, Richmond Hill and is also present just south of Markham in the City of Toronto.

Eradication of the emerald ash borer is not possible, and the current Canadian Food Inspection Agency (CFIA) policy is to slow the spread of the pest through the

establishment of quarantine zones in infested areas and public education. York Region is part of a large quarantine zone that extends from Durham Region to Essex County.

The Emerald Ash Borer will have significant impacts on forests and trees throughout York Region resulting in significant financial burden

Ash trees were commonly planted as street trees and form a significant component of the Region's street tree population. There are an estimated total of 2,800,000 mature ash trees in York Region, with 700,000 in the urban forest and 2,100,000 in rural woodlands. There are over 9,600 planted and naturally occurring ash trees in Regional road allowances. It is anticipated that most of these ash trees will be infested and die over the next ten to 15 years having serious environmental and financial impacts.

It is estimated that removal and replacement of ash trees across York Region may cost hundreds of millions of dollars over the next ten to 15 years, depending on removal and replacement strategies. The removal and replacement of street trees alone is estimated at \$7,500,000. In the York Regional Forest there is an estimated 65,000 mature ash trees and in excess of 4,000,000 young ash trees. For the Regional Forest, removal of hazardous trees and selected re-planting is forecasted to cost \$760,000. Attempts will be made to recover some costs through the sale of harvested trees.

Following the April Regional Council meeting, correspondence was sent to the Association of Municipalities of Ontario (AMO) and Federation of Canadian Municipalities asking them to request Federal and Provincial support for municipalities.

In April 2011, Regional Council directed staff to prepare an Emerald Ash Borer Management Plan for York Region

At its meeting on April 21, 2011, Regional Council directed staff to take action to address the significant impact this pest will have on the Region and its residents.

An Emerald Ash Borer Technical Working Group has been formed with staff from the Region, local municipalities, conservation authorities, and the Provincial and Federal governments. An Emerald Ash Borer Management Plan has been prepared to guide the Region's response to managing the impact of this forest pest. The management plan including options considered is presented in the following.

4. ANALYSIS AND OPTIONS

The York Region Emerald Ash Borer Management Plan will guide the Region's response to this significant forest pest

An Emerald Ash Borer Management Plan has been prepared to guide the Region's response to this significant threat over the next ten years (*Attachment 1- Executive*

Summary). The management plan provides direction on mitigating the impacts to Regional assets (street trees and York Regional Forest), monitoring programs, communications and education for the public. The plan has been developed to facilitate local municipalities in the development of their own strategies to manage their trees and reflect their specific needs.

The plan has identified the impacts the emerald ash borer will have over a ten-year horizon, assessed a suite of management options, and provide a recommendation for the option best suited to the Region. For the recommended option, the strategy provides detailed actions to address the impacts and the associated costs.

The Emerald Ash Borer Management Plan presents a suite of four management options

There are four management options which are commonly considered when developing a management plan for an invasive forest pest like emerald ash borer.

1. Do Nothing/Minimal Management
2. Active Management
3. Pre-Emptive Management
4. Aggressive Management

For each of these management options there are a set of common program elements or tactics. The level of effort and associated costs for each of the tactics varies between these management options. The following tactics are considered in the Emerald Ash Borer Management Plan:

- Tree removal
- Tree replacement/restoration
- Public education/communications
- Monitoring
- Tree protection (pesticide application)
- Private land restoration incentives

To assess the appropriateness and suitability of each option a selection matrix was used (Table 1). Each program element has been assigned a High/Medium/Low (H, M, L) ranking based on the level of effort and associated cost. A ten-year cost estimate to implement each management option has been identified.

Table 1
Emerald Ash Borer Management Options Selection Matrix

Management option	Tree removal	Tree planting	Public education and outreach	Monitoring	Tree protection	Private land incentives	10 Yr cost (millions \$)
1. Do Nothing / Minimal	M	N/A	L	N/A	N/A	N/A	\$3 – 4
2. Active	M	L	L	L	L	L	\$10 – 12
3. Pre-Emptive	M	M	M	M	M	M	\$14 – 18
4. Aggressive	H	H	H	H	H	H	\$21 – 24

The Management Plan recommends the Region take an active approach to managing the impacts

There is no expectation that emerald ash borer can be eradicated to allow ash to persist within the Region. Any management actions undertaken will simply manage the results of the infestation, specifically the removal and replacement of Regional-owned trees and the impact to Regional residents. An analysis of the management options has identified an active approach as the most desirable for the York Region.

With the ‘active’ management approach, infested street trees will be removed and replaced. In the York Regional Forest, hazardous trees along trails will be removed and re-planting will occur in significantly impacted areas if required. A comprehensive Emerald Ash Borer communications plan will be developed in collaboration with other agencies and local municipalities. Tree protection (pesticide use) will be considered limited and evaluated on a case-by-case basis for significant trees. Existing private land planting programs and incentives will be increased to assist landowners and offset the impact. Annual surveys will be completed to determine the extent and expansion of the infestation and guide tree management activities.

This ‘active’ approach is well suited to manage the impact on the Region’s ash street tree population. It will ensure that hazardous trees are removed along Regional Roads and in the York Regional Forest along trails. It provides for the timely replacement of ash street trees. The approach will allow for harmonization with local municipal initiatives. Increases to private land tree planting programs through the Region’s Greening Strategy will mitigate some of the ash loss impacts while allowing the Region to ensure the

objectives in the Regional Official Plan are realized. The ten-year cost to implement this option has been estimated in the range of \$10,200,000 - \$11,700,000.

The management strategy has identified key recommendations for public education, monitoring, prevention, removal and restoration

For the preferred management option, recommendations have been provided for each of the key program elements, including timing and associated costs. A summary of these recommendations has been presented below and the estimated ten-year costs in table 2.

- Tree removal – Regional street trees would be removed as they become infested. In the York Regional Forest infested trees that pose a hazard to forest users would be removed.
- Tree replacement/restoration – All street trees removed will be replaced with one or more trees depending on the size of the tree removed. In the York Regional Forest, communities with a significant ash component would be under planted to mitigate the ecological impact.
- Public education/communications – A comprehensive communication's plan will be prepared in co-operation with local municipalities and the Canadian Food Inspection Agency to provide consistent messaging to residences. The plan will use existing resource materials and delivery mechanisms (e.g. Regional Forest Events, York Works, York Region website, newspaper, etc).
- Monitoring – An annual emerald ash borer survey program to monitor the spread of the infestation would begin immediately and be ongoing.
- Tree protection (pesticide application) – The protection of trees through the application of a pesticide is expected to be minimal and would be evaluated on a case-by-case basis to protect Regional street trees of significant value (e.g. large canopy trees, trees of cultural significance).

Table 2

Ten-year Implementation Costs for Active Management of Emerald Ash Borer

Management tactic	Estimated 10 year cost
Tree removal	\$3,500,000 – 4,000,000
Tree replacement/restoration	\$5,000,000 – 6,000,000
Public education/communications	\$100,000
Monitoring	\$400,000
Tree protection	\$200,000
Private land incentives	1,000,000
Estimated total cost	10,200,000 – 11,700,000

Implementation of recommendations would begin immediately including a public information program and a survey to confirm the extent of the infestation in York Region

Implementation of the strategy would begin immediately. In 2011, a survey using the placement of monitoring traps in trees will begin in collaboration with local municipalities to confirm the extent of the infestations. Surveys will continue in subsequent years to monitor the spread of the infestation in the Region. A comprehensive communications plan will be developed and implemented in 2011. Private land tree planting incentives will be implemented through existing partnerships and programs under the Greening Strategy.

Based on the results of survey work, detailed annual work plans will be developed to guide tree removal, tree replacement and, where appropriate, tree protection. It is anticipated removal and replacement activities will significantly increase over the next two – three years as the emerald ash borer population increases.

5. FINANCIAL IMPLICATIONS

Management of emerald ash borer will cost the Region an estimated \$10,200,000 to \$11,700,000 over the next ten years

The spread of emerald ash borer across York Region will have significant financial implications to the Region. Funding will be required to support the overall management, monitoring, tree removal, tree replacement and tree protection. Implementation of the Emerald Ash Borer Management Plan recommendations will require an estimated \$10,200,000 to \$11,700,000 over the next ten years. The budget forecast will be annualized over the ten-year period to reflect the spread of the infestation.

For 2011, \$50,000 in funding is required for the initial survey and communication activities. This funding will be re-allocated from existing forestry programs. Future funding requirements will be identified through the annual multi-year business planning process.

The Region will continue to seek financial support from the Federal and Provincial authorities for management of this significant forest pest.

6. LOCAL MUNICIPAL IMPACT

The management of emerald ash borer will affect all municipalities in York Region. As the infestation spreads, it is anticipated that the City of Vaughan, Town of Markham and the Town of Richmond Hill will represent the initial line of activity. It is expected the

costs associated with management of the emerald ash borer in the local municipalities will be significant. The magnitude of cost will depend on the proportion of ash trees, the rate of death and decline, and the extent of local tree protection and replacement strategies.

The Region's Emerald Ash Borer Management Plan has been developed to provide a framework for local municipalities to develop plans that suit their specific needs. Regional staff will continue work very closely with local counterparts through the Technical Working Group to share best practices and develop operational efficiencies to combat this threat. A comprehensive Emerald Ash Borer Communication Plan will also be developed in collaboration the local municipalities.

7. CONCLUSION

The Emerald Ash Borer Management Plan and associated recommendations provide direction for the Region to mitigate the environmental impacts and minimize the financial burden that the infestation will have over the next ten years. The Plan will provide for the removal and timely replacement of infested trees and assist residents through public education and incentives for replacement plantings. Implementation of the Plan is estimated to cost the Region between \$10,200,000 and \$11,700,000 over the next ten years.

Coordination of Regional and local municipal actions through the Technical Working Group will ensure the delivery of a coordinated and cost effective response to the infestation. The Region should continue to press the Federal and Provincial authorities for financial support to manage this forest pest.

For more information on this report, please contact Ian D. Buchanan, Manager of Natural Heritage and Forestry at Ext. 5204.

The Senior Management Group has reviewed this report.

(The attachment referred to in this clause is attached to this report.)

EXECUTIVE SUMMARY

The Emerald Ash Borer (EAB), *Agrilus planipennis* Fairmaire, is considered to be one of the worst invasive alien forest pests to ever be introduced to North America. EAB has killed or infested, by some reports as many as 70 million ash trees since it was first detected in Michigan, and south-western Ontario in 2002; an estimated 10 billion ash trees in Canada and the US are at risk of infestation and death. Both Canada and the US consider EAB to be a pest of quarantine significance. Slowing its spread and protecting the North American ash resource is a top priority for both countries.

Despite aggressive control, regulatory and communication measures aimed at slowing its spread, new populations continue to be found at numerous locations in both countries and EAB has greatly extended its range in Ontario (mostly as a result of human activities). As of April, 2011, EAB has now been confirmed in most southern Ontario counties and Regional Municipalities and more sites are likely to be detected in 2011. Widespread mortality is already being experienced in several areas of the province. As of March, 2011, the Regional Municipality of York (York Region) is included in a newly expanded federally regulated area (quarantine zone) along with most counties and Regional Municipalities in southern Ontario. Under the provisions of the Ministerial Order applicable to the area, the movement of ash nursery stock and forest products, as well as all species of firewood from the regulated area is restricted.

Over the past few years, there has been considerable progress made with respect to early detection and control. Despite this, the major obstacles to the effective management of EAB continue to be the difficulty of reliably detecting it at low population levels early in the infestation and treating trees in woodland or forest settings. While several pest control products such as TreeAzin™ (a natural pest control product derived from the Neem tree), and Acephate (ACECAP® 97), an organophosphate product are now registered for use in Canada and can protect some trees from infestation, there are limitations on their effectiveness; it continues to be costly and unrealistic to treat large numbers of woodland trees.

The Canadian Food Inspection Agency (CFIA) is the lead agency in Canada with respect to enacting quarantine and slow-the-spread measures. Despite repeated requests from affected municipalities, current federal and provincial government

policy is to not provide financial assistance to affected municipalities in off-setting the costs of dealing with EAB.

This document provides a summary of the pest's history in North America, and a forecast of its anticipated impact on York Region. A range of feasible management options are identified with their estimated costs and impacts, and a recommended option is presented.

Assuming that EAB continues to infest and kill trees at its present rate, that biological control organisms do not emerge as a major control factor and that the current limitations on pesticide efficacy do not change, it can be expected that EAB will become pervasive throughout York Region over the next 10 years and kill most of the ash trees there. While some of the management options listed in this document may delay the onset of widespread mortality, there is little that can be done to prevent this from happening.

The major impacts on York will be both aesthetic and environmental with significant economic consequences. While ash represents, on average only 8% of the woodland overstory in the Region, it comprises 40% of mixed swamplands (primarily in the northern part of the Region) and 20% of the understory regenerating in its maturing red pine plantations.¹ York Region has an estimated 65,000 ash trees growing adjacent to trails in its Regionally owned woodlands (York Regional Forest). In the York Regional Forest, removal of trees which pose a hazard to trail users, and underplanting activities to regenerate the forest is estimated to cost \$750,000. York has 1,030 km of roads that it maintains (504 km rural/526 km urban), along which 5,586 ash trees grow. While most of these trees would have to be cut when they die, the priority will be to replace trees along the urban portion. The estimated road side hazard tree removal and replacement (as necessary) is \$7,500,000.

Recent ecological studies in the US indicate that EAB is likely to have a significant and long-lasting impact on ash regeneration as ash seed banks have become depleted in infested areas. This will result in the loss of genetic diversity within the genus *Fraxinus* and could heavily impact the ability of ash to ever regain its niche in Ontario forests.

In recent years there have been significant scientific advancements in the areas of detection and pest control. This presents an opportunity to review the cost/benefits and consider tree protection of selective ash trees for extended periods of time.

¹ Draft Report: Emerald Ash Borer Threat Assessment in York Region, Silv-Econ, April, 2011

While not a panacea, registered pesticides such as TreeAzin will have an impact on managing the pest in some areas.

Over the long term (10's -100's years), it is hoped that biological control will play a key role in bring EAB into equilibrium before genetic diversity is lost forever. To this end, considerable research has been conducted in the US and Canada on the role that biological control organisms play. Three exotic species of parasitoids have been released in recent years that specifically prey on EAB. Native species have also been observed to attack EAB in increasing numbers which is seen as very encouraging.

In developing management options for consideration by York Region, the author engaged other municipalities in Ontario with similar pest, land use, forest and infrastructure profiles in order to provide a comparison. The results of this survey are contained in Section 16 of this report.

Management Options

Four possible management options were developed in consultation with York Region. The intention is that the Regions approach will not present conflicts with the development of local municipal EAB strategies and management plans. Local municipal plans will be complimentary and allow for efficiencies in terms of delivery and implementation. These options reflect the latest science around EAB as well as analyses of the various regimens employed by US and Canadian cities to manage EAB.

The Options are:

1. Do Nothing/Minimal Management
 2. Active Management
 3. Pre-Emptive Management
 4. Aggressive Management
-
1. **Do Nothing/Minimal Management:** With this option, ash trees would be treated the same as any other tree genus. As such they would receive no special consideration for conservation or protection and would be removed where they are deemed to be hazardous or an obstruction. No surveys would be conducted by the Region to detect and/or monitor the spread of EAB, and no control actions would be undertaken. Tree replacement would be minimal and confined to high impact areas. Notwithstanding, there would still be a

considerable financial impact with this option as hazard trees along roadways and woodland trails would have to be removed as they die. The estimated cost for this option is \$3-4 million over a ten year period;

2. **Active Management:** The objective of this option is to manage and potentially off-set the impact of EAB. The Region, in cooperation with its municipalities would conduct detection surveys to locate new infested sites and possibly conduct delimitation surveys around these and currently known infested sites. Infested trees on Regionally owned roadways and those adjacent to woodland trails would be removed at the onset of mortality as cost-effectively as possible. Replacement would be prioritized towards trees growing along regionally owned urban roads, with minimal replacement in rural areas. Protection of high value or selective trees with pesticides would not be a major component of this option. Communication and public education initiatives would be focussed on utilizing existing resource materials and delivery mechanisms. Assistance to private land owners would be minimal and focussed on private land tree-planting programmes. However, there could be recognition of adaptive management and flexibility to consider increased funding to off-set the observed impact on private trees and woodlots. The expected cost of this option over a ten year period is \$10-11 million;
3. **Pre-emptive Management:** This option is similar to Active Management but there would be greater emphasis placed on surveys, public education and communications, tree protection (i.e. maintaining tree canopy) and higher incentives for private land owners to plant trees. As with other options, the Region could elect, at its discretion, to treat specific high value, publicly owned trees with pesticides. The estimated cost for this option is \$14-18 million over a ten year period;
4. **Aggressive Management:** The objective of this option is to save a greater proportion of ash trees and protect the ash component of the tree canopy. Survey activity of both woodland and roadside trees would be intensified as compared to the other options in order to detect new outliers and delimit spread around these. This option would also see enhanced assistance to private landowners through existing programs such as the York Natural Planting Partnership, and the Backyard Tree Planting program. While pesticides would be used to protect some high value trees there would be an acknowledgement that not all trees, especially those in woodlands could be saved. There is no expectation that EAB can be eradicated or that this strategy will suppress population build-up, but this option is likely to prolong

the lives of some high value trees, retain canopy and could possibly off-set some long-term management costs. The estimated cost for this option is \$21-24 million over a ten year period.

Summary of management options and associated costs (10 Year Forecast Period)

Option/Activity	Tree Removal	Tree Replacement	Public Ed. and Outreach	Survey and Monitoring	Tree Protection	Private Landowner Incentives	Est. cost over 10 yrs (\$millions)
Minimal	M	N/A	L	N/A	N/A	N/A	3-4
Active	M	L	L	L	L	L	10-11
Pre-emptive	M	M	M	M	M	M	14-18
Aggressive	H	H	H	H	H	H	21-24

Note: H – high resources/funds required, M – medium resources/funds required. L – low resources/funds required.

In consultation with the York Region staff, Active Management is recommended as the preferred option.

The benefits of this option are:

- Accepts the reality that most ash trees in York Region will perish over the next 10 years
- A more pro-active, responsible approach to managing costs and resources than option 1
- Annual surveys will permit early detection to monitor the spread and identify outliers. This information will help inform and prioritize mitigation and operational decisions.
- Prompt detection and removal of infested trees will minimize hazards, improve aesthetics and possibly result in some efficiency of scale with respect to removal activities
- Tree replacement in priority areas (e.g. urban areas) will help to maintain urban canopy and improve aesthetics
- Actions (e.g. surveys, tree replacement) will raise public awareness
- Providing private landowner incentives through the Greening Strategy will assist with tree loss/replacement and lessen the overall environmental impact

The negative aspects of this option are:

- Minor mitigation of environmental impacts resulting from EAB outbreak

- Some woodland areas with high percentages of ash trees will be heavily impacted
- Loss of biodiversity in woodlands
- Permanent loss of genetic diversity for genus *Fraxinus*

Discussion:

The objective of this option is to actively manage and potentially off-set or mitigate the impact of EAB, rather than try to manage the pest *per se*. It is recognized that the management of the EAB in York Region will need to be flexible and adaptive. An adaptive management approach will allow adjustments to respond to the rate of EAB spread and infestation, and also respond to the increase in landowner awareness, engagement and expectations. Active Management is cost-effective, science-based, environmentally responsible and compatible with current best management practices employed by the Region and its partners.
