



STAFF REPORT ACTION REQUIRED

Strategy for the Management of the Emerald Ash Borer

Date:	March 16, 2011
To:	Parks and Environment Committee
From:	Brenda Patterson, General Manager, Parks, Forestry and Recreation Division
Wards:	All
Reference Number:	P:\2011\Cluster A\PFR\PE02-032811-AFS#12934

SUMMARY

Emerald Ash Borer (EAB) is an invasive, non-native insect that will have a significant impact on Toronto's urban forest. This report identifies what management strategies Urban Forestry has taken since 2007 and recommends a comprehensive plan to manage and mitigate the impact this invasive species in future years.

The report provides a general overview of a dedicated and comprehensive Emerald Ash Borer (EAB) Management Plan and the projected implementation cost for 2011.

This report addresses the motion by City Council to provide an update on plans for monitoring, education, treatment, removal, tree canopy mitigation, and inter-governmental strategy.

RECOMMENDATIONS

The General Manager of Parks, Forestry and Recreation recommends that:

1. The General Manager, Parks, Forestry and Recreation implement the EAB Management Plan commencing in 2011, including the proposed survey monitoring, and pesticide injections as recommended in this report, as well as the removal and replacement of city-owned dead ash trees and continued enhancement planting within areas heavily populated by ash species.
2. City Council request that the Federal and Provincial Governments provide financial support for Emerald Ash Borer mitigation efforts.

Financial Impact

The 2011 Operating budget for Urban Forestry does not include funding to implement an Emerald Ash Borer (EAB) Management Plan and, therefore, resources from the Area Street Tree Maintenance program will need to be reallocated to manage the infestation. The cost to implement the EAB Management Plan in 2011 is estimated to be \$1.139m with an additional \$.009m required for replacement of trees removed in 2010 as a result of EAB infestation. (Replacement of trees removed as a result of EAB infestation will be done in the next planting season to allow for adequate site preparation)

EAB Management Plan	2011 Cost Estimate
Surveys	85,000
Removal of city-owned ash trees	1,014,000
Pesticide Injection program for protection of high value trees	40,000
Total Financial Impact(Urban Forest Operating Budget)	1,139,000

**Given the uncertainty of the rate of spread and death of trees, the financials listed are cost estimates*

Urban Forestry is recommending the \$.009m required for tree replacement be funded by Toronto Water for tree planting.

Diminished investment in the Area Street Tree Maintenance program will result in failure to fully implement a proactive maintenance program with a 7 year average cycle. This exacerbates the objective to eliminate the existing complaint based tree service as outlined in the Council approved eight year Urban Forestry Service Plan. The overall impact is more trees are not properly maintained throughout their life span and could potentially lead to hazardous trees.

The financial impact for future years is unknown given the uncertainty of the rate of spread and death of trees; however, it is expected that the number of infested trees will increase by 2.5 times with an estimated cost of \$3.4m in 2012 further delaying the Area Street Tree Maintenance and further delays in reactive tree service. A subsequent staff report on Urban Forestry's Service Plan will identify additional budget pressures including the associated impacts of the EAB infestation on the current service standards and implementation of the council approved Urban Forestry Service Plan. The financial impact for 2012 will be reported through the 2012 Operating Budget process.

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

MM52.7 - Motion requesting Official Management Plan to Fight Emerald Ash Borer
<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2010.MM52.7>

Report to City Council on the changes to business processes being implemented to comply with the Ministerial Order to limit the spread of emerald ash borer (EAB) (2008):
<http://www.toronto.ca/legdocs/mmis/2008/pe/bgrd/backgroundfile-14288.pdf>

Report reviewing issues associated with three invasive exotic tree pests currently found in Toronto (2008):
<http://www.toronto.ca/legdocs/mmis/2008/pe/bgrd/backgroundfile-9640.pdf>

Report identifying City initiatives and initiatives by other organizations, both public and private, that are required to achieve the tree canopy target of between 30% and 40% (2007):
<http://www.toronto.ca/legdocs/mmis/2007/pe/bgrd/backgroundfile-4049.pdf>

Report to provide an update on the infestation of the Emerald Ash Borer in south western Ontario and the actions being taken by the Federal Government to control the invasive insect spread (2006):
<http://www.toronto.ca/legdocs/2006/agendas/committees/edp/edp060706/it017.pdf>

Report to provide information on Emerald Ash Borer (EAB), which has infested ash trees in Essex County, Ontario and in south eastern Michigan (2003):
<http://www.toronto.ca/legdocs/2003/agendas/committees/edp/edp030324/it005.pdf>

ISSUE BACKGROUND

The Emerald Ash Borer (EAB) is an introduced wood-boring beetle native to China, Japan, Korea, Russia and Taiwan that was first discovered in Canada in Windsor, Ontario in 2003. The beetle is a destructive insect that kills true ash, *Fraxinus*, species by interrupting the flow of water and nutrients to the upper branches and leaves. Eradication of this insect pest is not feasible.

Emerald Ash Borer was first detected in Toronto in 2007 in the Hwy 404 and Sheppard Avenue area of North York and resulted in the entire City being declared a “Regulated Area” for this pest by the Canadian Food Inspection Agency (CFIA). This designation resulted in a significant change in the Standard Operating Procedures for Solid Waste Management as all ash material and firewood of all species required treatment before leaving the City boundaries. Over the last three years, the subsequent confirmation of EAB infestations has resulted in an enlarged Regulated Area that allows for the movement of regulated material within the continuous generally infested area (see map in Attachment 1).

Surveys conducted in 2008, 2009 and 2010 have confirmed that EAB is firmly established in many areas of the City of Toronto. Presently, the highest levels of the infestation are seen in the north-central and eastern areas of the City in Wards 23, 24, 25, 33, 34, 37, 38, 39, 40, 41, 42, 43 and 44. Relatively low levels of EAB infestation have also been confirmed in the west end of the City in Wards 1, 2, 3, 5 and 12. See map as Attachment 2.

EAB has the potential to affect 8.4 % or 860,000 of Toronto’s trees worth an estimated \$570 million in structural value. The loss of the ash trees will be particularly devastating to

neighbourhoods that have predominantly ash tree canopy on the road allowance, in parks, and on private property.

COMMENTS

Emerald Ash Borer (EAB) Management Plan

Urban Forestry is recommending a dedicated and comprehensive plan (EAB Management Plan) to manage and mitigate the impact of the Emerald Ash Borer on the City of Toronto's forest in future years. The purpose of Toronto's EAB Management Plan is to provide a guide that describes how Urban Forestry will manage the EAB infestation. The Plan will evolve as new information about the scope and extent of the infestation, control methods and scientific knowledge become available. Unlike previous invasive species like the Asian Long-Horned Beetle, Urban Forestry will not be able to eradicate the beetle. Implementation is intended to achieve the following key objectives:

- 1) Integrate ash tree removals with the area maintenance program to build efficiencies.
- 2) Communicate information to citizens that will prepare them for the financial burden of removal of privately-owned trees and encourage replanting of trees on private lands to replace lost tree canopy.
- 3) Develop proactive tree planting programs that will aim to replace tree canopy, particularly where ash trees form a large part of the existing tree population.

It is anticipated that Urban Forestry will experience a significant increase in requests for tree removals required to maintain healthy public spaces. Municipal Licensing and Standards will similarly receive an increased number of calls for inspection of hazardous trees on private lands. The EAB Management Plan will include the revision of policies and practices to mitigate the impact on city services.

Highlights of Management Actions Since 2007

The infestation in Toronto was first detected in November 2007. Initially the Canadian Food Inspection Agency (CFIA) conducted a ground survey to map the infested trees on public and private lands in the vicinity of Sheppard Avenue East and Hwy 404. Survey methods used at the time were relatively ineffective.

In March 2008, Urban Forestry partnered with the CFIA and the Canadian Forestry Service to remove 165 infested ash trees. Entire trees were dissected with a goal to understand the spread of infestation within a tree at the time of early infestation. Urban Forestry also helped facilitate a study of parasites that kill EAB.

In September/October 2008, Urban Forestry completed an inventory of approximately 1,500 ash trees around the area of the initial infestation as well as at Morningside Avenue and Kingston Road where infested trees were found in 2008. Systemic insecticide was applied to 115 trees,

with a goal of protecting high value trees and slowing the spread of the infestation. The process of treatment and subsequent evaluation of tree condition demonstrated the effectiveness as well as limitations for pesticide treatment to control EAB.

In 2009, Urban Forestry removed 59 City-owned ash trees in the area of Hwy 404 and Sheppard Avenue East, with the goal of slowing the spread of the emerging beetles. Urban Forestry continued to work with the Canadian Forestry Service and the Ontario Ministry of Natural Resources to assess tools for early detection, using information learned in 2008. This study resulted in development of a protocol to effectively detect EAB during the early stages of infestation.

Urban Forestry surveyed 800 ash trees in the area of Morningside Avenue and Sheppard Avenue East. Systemic insecticide was applied to 50 high value trees in Wishing Well Park. Samples were analyzed from 41 of the trees injected with pesticide, confirming the effectiveness of the pesticide in killing EAB larvae.

In 2010, armed with new protocols for survey, Urban Forestry completed a comprehensive EAB detection survey across the city, sampling 550 trees (110 plots) and deploying 30 traps. The results of this survey are described in Attachment 2. Urban Forestry also continued the program of applying systemic insecticide to high value trees, treating 279 ash trees.

In 2010, approximately 37 dead and dying ash trees were removed from the known EAB infested areas. Replacements are planned for 2011 with funding through the Toronto Water funds.

The EAB Management Plan includes the following five key components:

1. Monitoring (Survey)

Urban Forestry will conduct an annual survey to (1) track the spread of EAB and (2) determine the size of the infestation and advancing mortality of trees.

Survey types include:

- Visual survey to look for signs of the beetle, ie. tree canopy dieback, woodpecker holes;
- Trapping adult beetles by using sticky traps and volatiles;
- Branch sampling to look for signs or presence of the beetle; and
- Site inspection of non-target areas in response to reports by staff and the general public.

In 2011, Urban Forestry plans to shift the focus of delimitation surveys to newly-detected areas in west Toronto and to continue detection surveys in the west, north and south areas of the City with an estimated cost of \$85k. Branch sampling is the more accurate method of mapping EAB infestation to better inform management activities.

2. Education (Communication) Plan

Communication with the public is a critical part of the EAB strategy. Regular and consistent communication will:

- improve public understanding of how to respond to the EAB threat;
- will educate private landowners of potential costs they will face to maintain trees affected by EAB; and
- encourage and promote replacement tree planning in the event of tree removal on private property.

Communication will be achieved through printed documents, the City website and 311 Toronto services as detailed in the following sections. In 2011, new information will be provided to explain the progress of the infestation and the City Council approved management plan that will be implemented. Other than staff time the cost to implement the communication plan is minimal.

3. Pesticide Treatments

Research has shown that TreeAzin™, injected in the main stem, will inhibit emerald ash borer larval development, prevent adult emergence, affect adult fertility and provide preventative and curative treatments in the control of EAB. The pesticide TreeAzin™ has been granted an Emergency Use permit by the Pest Management Regulatory Agency (PMRA) since 2007 and has received emergency use registration again for 2011.

The following criteria have been used by Urban Forestry to select trees for insecticide injection:

1. High value ash trees
2. Trees must have less than 30% dead branches
3. Trees must be in good general health.

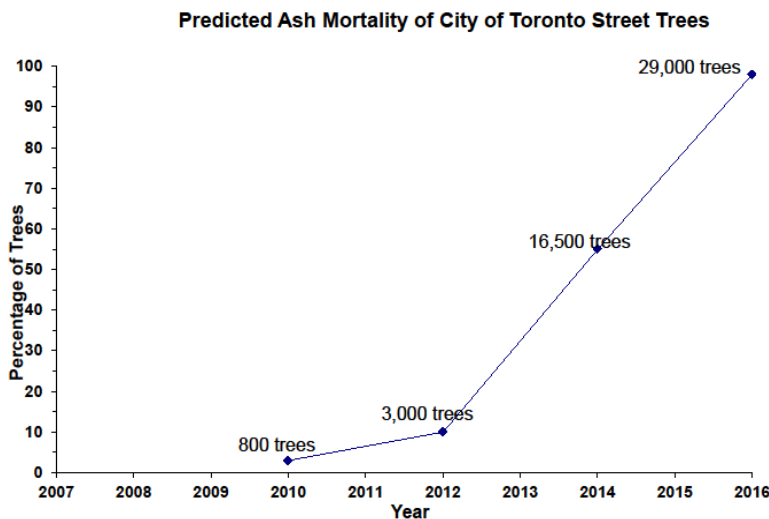
Due to the high cost, Urban Forestry does not propose to implement a wide-scale program of TreeAzin™ injections. Urban Forestry has injected approximately 450 trees over the past three years in an effort to assess the efficacy of the pesticide product and to protect high value trees on City property. Preliminary results from injections have indicated that larvae were killed in treated trees and that wounds caused by injection have healed well. Injections must be repeated every two years to provide continued protection against EAB. Estimated cost for 2011 is approximately \$40k.

4. Removal of Infested Trees

Emerald ash borer will kill ash trees of all sizes. Initial establishment of Toronto's infestation was slow; however, now that the beetle is well-established, it is estimated most ash trees will die within 6 or 7 years. Ash tree mortality surveys identified approximately 1,350 ash trees that will need to be removed in 2011. Ash mortality surveys were conducted in the known infested areas but were not comprehensive across the City.

From the tree inventory and information from the ash mortality surveys, it is estimated that there are 32,400 ash street trees in the City in addition to those in parks and on private lands. While only 4% of the city-owned ash street trees are dead and dying now, it is expected that the neighborhoods currently infested will lose most ash trees within 2 years, and across the City, most ash trees will be killed by 2017. The graph below shows the estimated decline of ash street trees, City-wide (based on the estimates from Michigan).

In 2011, Urban Forestry plans to remove and replace dead and dying City-owned ash trees in the areas with the highest ash mortality. It is proposed that all ash trees be removed from areas found to contain more than 60% dying ash. This approach will provide some cost efficiency, both in the removal operation as well as replanting. The threshold of 60% will be periodically reviewed and adjusted if required.



It is estimated that the cost to remove the trees that have died as a result of an infestation of EAB will be approximately \$1.014m in 2011. The total cost of tree removal is greater when selected trees in an area are pruned or removed individually in a random manner as in a reactive program than it is when many trees in one area are pruned or removed in sequence, as with the area street tree maintenance program. It is anticipated that there will be an increase in the number of tree removals in 2011-2016, as shown on the graph above.

In sections of the City where there is area street tree maintenance scheduled for 2011, the removal of EAB infested streets will be integrated with the area maintenance program to achieve cost efficiencies. Removals of trees resulting from EAB infestation in sections of the City where area street tree maintenance is not scheduled for 2011 will be done on a reactive basis. As a result, the implementation of the Area Maintenance Program will be further delayed as resources will be reallocated to the removals.

5. Tree Canopy Replacement

The loss of the ash trees will be particularly devastating in neighbourhoods where ash forms over 80% of the tree population. As such, tree planting will be a major component of the Urban Forestry's management plan to deal with EAB.

Urban Forestry will continue to identify planting opportunities with an emphasis on those areas that have an EAB infestation and/or an existing high ash component. Planting prior to the inevitable decline of the existing ash trees will lessen the impact of tree loss in these neighbourhoods. In 2011, Urban Forestry is recommending that a portion of the funding traditionally provided by Toronto Water for tree planting will be allocated to proactively replace the tree canopy, with an emphasis on areas where ash tree population is high and loss of tree canopy is expected to be high.

All City-owned trees including ash that are removed will be replaced during the next available planting season as part of current forestry tree planting programs. In 2011, 37 trees will be replaced at an estimated cost of \$.009m and paid through the funding provided by Toronto Water. If the number of tree removals increase as estimated in 2011 to 1350, the cost of replacements will increase to an estimated \$.312m in 2012. As the scale of tree removals increase, additional funds and associated staff resources will be required to sustain tree replacement after removal. Future costs of infestation will be reported through the operating budget process as a base budget pressure.

The Live Green Toronto grants program is a possible source of funding for private residents and businesses. The Toronto Environment Office has agreed to work with Urban Forestry to develop a program that will support tree replacement on private property.

By-law Administration

The confirmed presence of EAB in Toronto has implications for the administration of the Private Tree (Chapter 813) and Ravine and Natural Feature Protection (Chapter 658) By-laws including:

- financial costs to homeowners to remove infested trees on private property;
- increase in the volume of suspected tree by-law contravention calls from the public and
- potentially insufficient staff resources available to review permit applications and exemption requests, and the need to monitor and identify areas of new infestations.

It is necessary to strike a balance between protecting the existing forest canopy through administration of existing by-laws and facilitating timely and cost-effective removal and replacement of private trees. EAB infested trees are exempt from the requirement of a permit application and applicable fees. Urban Forestry staff will undertake a review of tree protection by-law procedures with a view to streamlining the exemption process for the public. Public education about EAB is extremely important as is the need to communicate the benefits of trees and to encourage the planting of new trees when removal of infested trees becomes necessary.

Interdivisional and Intergovernmental Strategy

The City of Toronto will continue to work with and seek financial support from higher levels of government to mitigate the impacts of EAB in Toronto.

In the past, Urban Forestry has worked with the Canadian Forest Service to develop early detection tools for EAB. The protocols developed jointly were used in the 2010 EAB survey program yielding more effective early detection of the beetle. The same tools were also used by other southern Ontario municipalities in their EAB surveys.

In the past, the City of Toronto has requested financial support from the federal government and will continue efforts to acquire financial assistance from both the federal and provincial governments. Through cooperation with other municipalities, engagement of the Federation of Canadian Municipalities and the Association of Municipalities of Ontario is proposed to seek funding to mitigate the impacts of EAB.

CONTACTS

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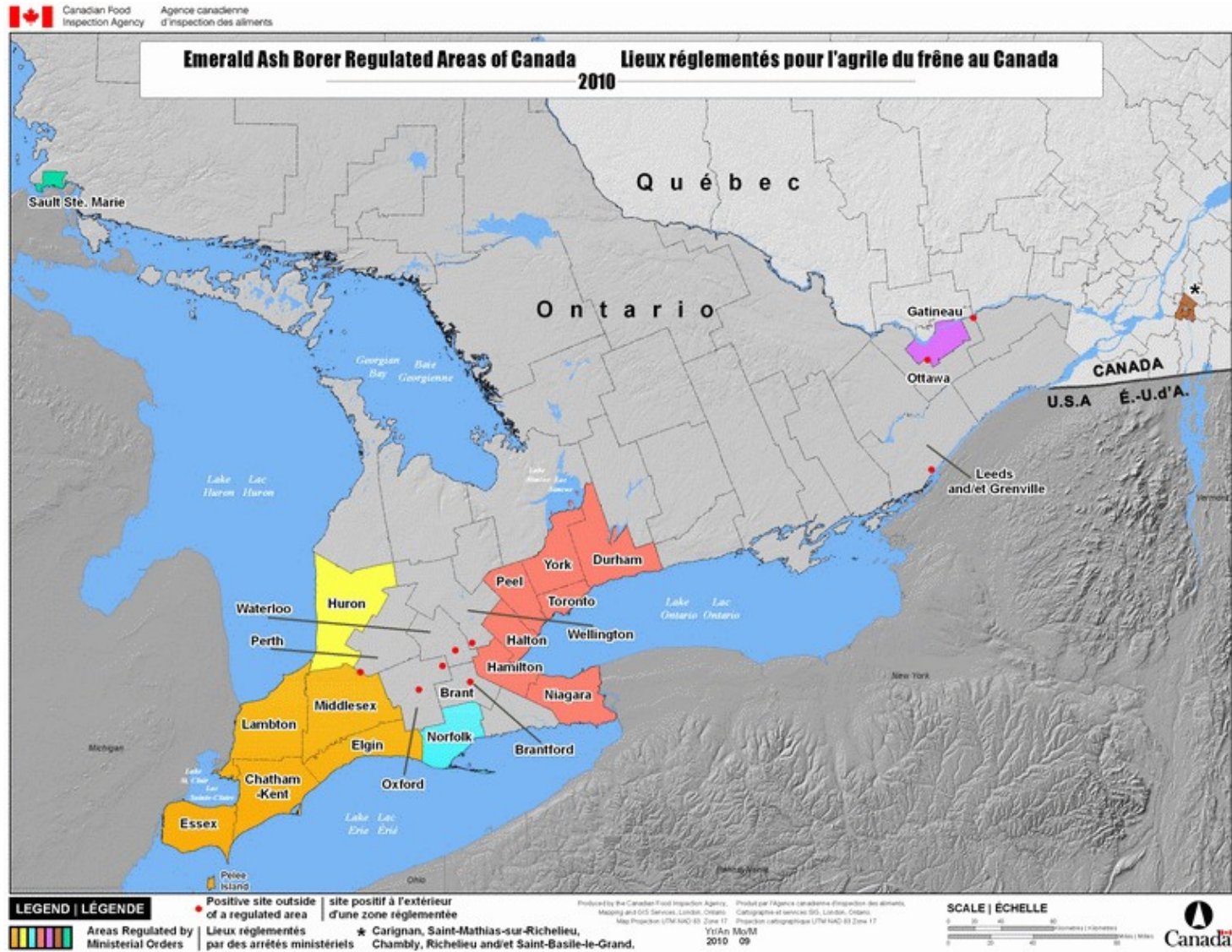
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Brenda Patterson
General Manager, Parks, Forestry and Recreation Division

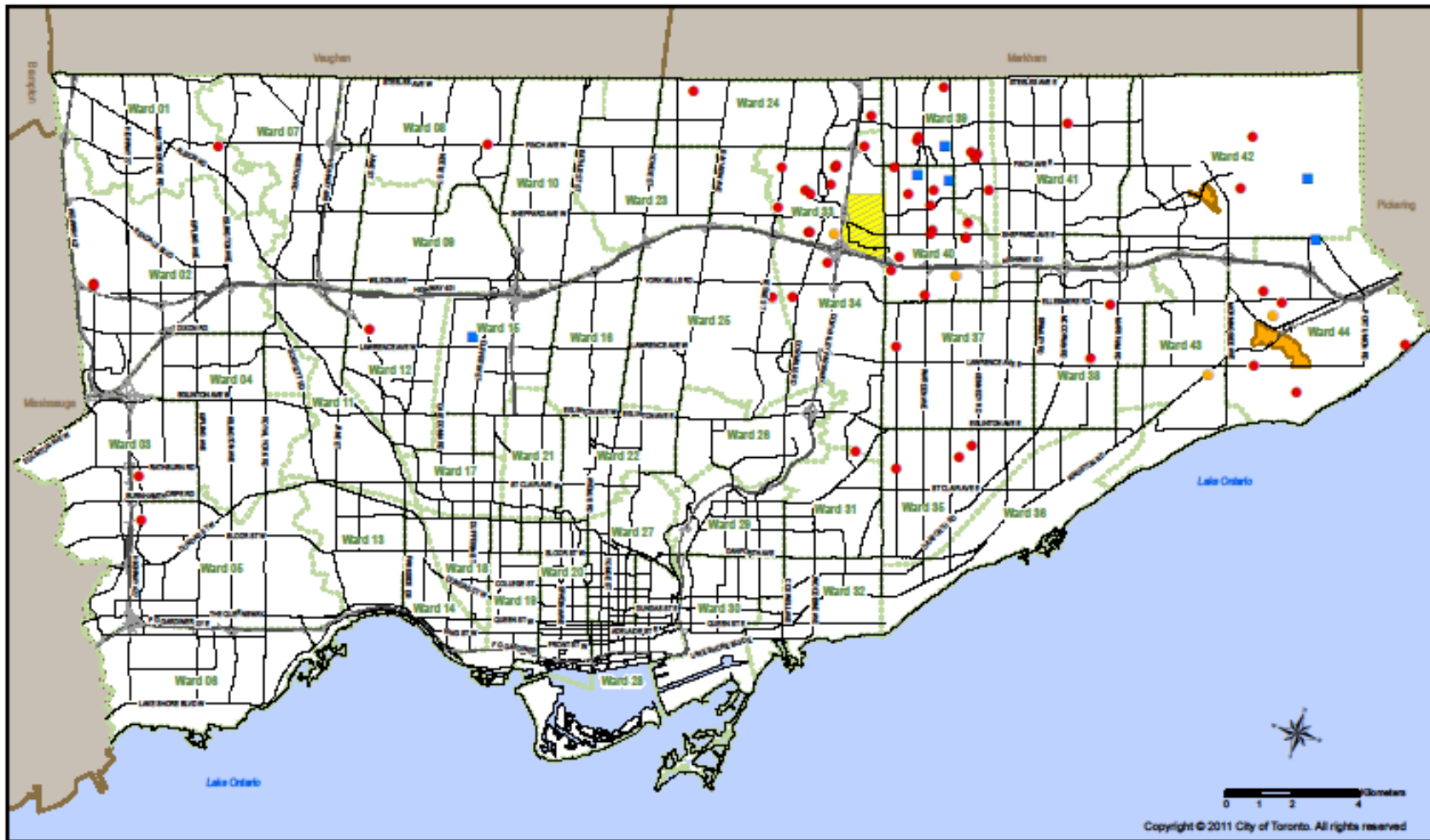
LIST OF ATTACHMENTS

Attachment 1 – Map of Emerald Ash Borer Regulated Areas of Canada
Attachment 2 - Map of Emerald Ash Borer Infestation, February 2011

Attachment 1: Map of Emerald Ash Borer Regulated Areas of Canada.



Attachment 2: Map of Emerald Ash Borer Infestation in February 2011



Map Created By:
Geospatial Competency Centre
City of Toronto

- 2010 EAB Detection
- 2008-2009 EAB Detection
- 2010 Trap Capture Site
- 2007 EAB Original Infestation Site
- 2008-2009 EAB Infestation Site
- Expressway or Arterial Road
- Ward Boundary

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