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RMD-13-** (Decision)

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Title: Pest Risk Management Document – Regulated Areas for Emerald Ash Borer (EAB) (*Agrilus planipennis*)

Preface

As described by the International Plant Protection Convention (IPPC), Pest Risk Analysis (PRA) includes three stages: initiation, pest risk assessment and pest risk management. Initiating the PRA process involves identifying pests and pathways of concern and defining the PRA area. Pest risk assessment provides the scientific basis for the overall management of risk. Pest risk management is the process of identifying and evaluating potential mitigation measures which may be applied to reduce the identified pest risk to acceptable levels and selecting appropriate measures.

This Risk Management Document (RMD) includes a summary of the findings of a pest risk assessment and records the pest risk management process for the identified issue. It is consistent with the principles, terminology and guidelines provided in the IPPC standards for pest risk analysis which may be found at https://www.ippc.int/.

Canada

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1.0 Executive Summary:

The emerald ash borer (EAB) was detected for the first time in North America in the summer of 2002 in Windsor, Ontario, and Detroit, Michigan. By the end of the 2012, its presence has been confirmed in 27 Ontario counties, and in seven areas in Quebec. Pest infestations such as that of EAB are dynamic and it is essential that the CFIA's regulatory approach is reviewed periodically, and adjusted as appropriate, in order to ensure that risk-mitigation and resource usage are effective and appropriate.

Due to the continuing spread of EAB in Ontario and Quebec, it is clear that the previous federal emergency response approach is ineffective and no longer feasible. As the pest continues its spread, despite initial aggressive eradication efforts and the later 'slow-the-spread' management approach, the regulatory approach requires amendment. The Canadian Food Inspection Agency (CFIA) therefore proposed two options for the continued management of EAB, both with the goal to continue slowing its spread in Canada, including to unregulated parts of Ontario and Quebec. Stakeholders subsequently proposed an additional option for consideration.

The CFIA has consulted with affected provinces and municipalities on the different options and has taken the decision to expand and consolidate the regulated areas to include high risk corridors that represent more accurately the expected distribution of the pest.

2.0 Purpose:

To record the final risk management decision with regard to the 2013 Emerald Ash Borer (EAB) regulated areas.

3.0 Scope:

This Risk Management Document (RMD) summarizes the CFIA's 2013 decision for the EAB regulated area(s).

Information pertaining to current import requirements for specific plants or plant products may be obtained from the CFIA Automated Import Reference System (http://airs-sari.inspection.gc.ca/AIRS/airs-sari.asp).

4.0 Definitions, abbreviations and acronyms:

Definitions for terms used in this document can be found in the Plant Health Glossary of Terms at www.inspection.gc.ca/english/okaveg/protect/dir/glosterme.shtml or the IPPC Glossary of Phytosanitary Terms at www.ippc.int

5.0 Background:

EAB, *Agrilus planipennis* Fairmaire, is an introduced wood-boring beetle native to Eastern Asia. It is believed that it was introduced to North America in the early 1990s on wood packaging

material, prior to the development and widespread international implementation of International Standard for Phytosanitary Measures (ISPM) 15, *Regulation of wood packaging material in international trade*, but was not initially detected until 10 years later, in the summer of 2002, in Windsor, Ontario, and Detroit, Michigan. All North American species of ash (*Fraxinus* spp.), and many exotic ash species, are susceptible to EAB attack and infestation. It should be noted that mountain ash (*Sorbus* spp), an unrelated genus, is not susceptible.

The initial response to the detection of EAB in Canada followed a typical emergency response as little was known about how the pest would behave in Canada at the time. It was initially decided to pursue an aggressive eradication effort, in order to minimize its potential impact. Therefore in 2004, in an attempt to contain the existing pest population, the CFIA removed approximately 150,000 ash trees, creating an ash free zone in south-western Ontario between Essex County and the municipality of Chatham-Kent, where EAB had not yet been detected. It was hoped that this would act as a barrier to the continued spread of EAB, but this proved to be unsuccessful as it was detected beyond this zone in January 2005. In accordance with the principles of the International Plant Protection Convention IPPC), eradication is appropriate only in specific situations in which eradication can be achieved with available resources and where the costs are not greater than the economic benefits. In the case of the EAB, it quickly became clear the pest had established locally, and the cost of response efforts in removing trees would outweigh the impact of the pest. As it was no longer practical to pursue eradication, an alternative pest response strategy was adopted based on slowing its spread, allowing science and urban forest managers time to research and develop effective risk-mitigation measures.

It is very apparent that early infestations of EAB are difficult to detect. Although detection and control tools have improved substantially since 2002, further refinement is still required. Even in recent years, tree-aging analysis at newly detected sites has confirmed that the pest has already been established in the area for three to four years prior to detection, also implying that EAB has already spread beyond that location at the time of detection. A map of the areas regulated for EAB in Canada up to March 2013 is provided in Appendix 1.

The situation in the U.S. is very similar to that in Canada, with EAB now infesting parts of over 15 states, all part of a continental ash-zone as viewed from a North American perspective (map provided in Appendix 2). EAB has spread rapidly through the U.S. ash forest and urban plantations, and the U.S. regulatory response has taken a similar path, based on withdrawing intensive resource usage from the infested areas, and focusing surveillance and management efforts at the perimeter of the pest population. It is expected that EAB will continue to spread naturally through all ash areas of North America.

Although EAB does not pose a risk to human health, it is a destructive forest-pest. It has killed millions of ash trees in Ontario, Quebec and the United States, and poses an economic and environmental threat to urban and forested areas of North America.

Invasive species have increasingly become recognized as a significant concern in recent years as worldwide trade and travel have increased the risk of spreading these species. Commercial trade is accompanied by an ongoing threat of pest importation from other countries and domestic spread within Canada. The list of regulated pests in Canada contains over 250 species, and

inspection, regulation and enforcement are the key phytosanitary measures employed to mitigate these risks, in conjunction with the adoption and implementation of ISPMs developed by the IPPC. However, many commodities cannot be easily inspected, nor in meaningful volumes, and effective regulation relies on the support of all stakeholders. Therefore, communication and public outreach are key components to raise awareness and garner involvement and support in managing the threat from these invasive pests. The CFIA invests significant efforts in outreach, and CFIA employees are regularly involved in myriad public events intended to increase awareness on the quarantine pests that represent invasive species.

Pathways of Spread

The rate of spread of EAB through natural flight is relatively low. However spread by human-assisted means via movement of wood commodities is an important pathway. Movement of ash products such as logs, lumber, bark and wood chips, as well as firewood, from areas of infestation can inadvertently move the pest if there are life-stages of the beetle in the wood. In order to mitigate this risk, the movement of commercial ash wood commodities, such as lumber and logs, has been regulated under an EAB Ministerial Order since 2002, to restrict their movement from areas recognized as being infested with the beetle.

CFIA Engagement

The CFIA has implemented numerous import control policies in order to restrict the entry and establishment of invasive plant pests. Since 1998, through its regulatory efforts on dunnage and other wood products, the CFIA has targetted high-risk import pathways through policies such as D-98-08 (*Entry requirements for wood packaging materials produced in all areas other than the continental United States*), stipulating requirements such as dunnage reclamation at marine ports, and a requirement for all off-continent wood products to be heat-treated or fumigated. This is in keeping with Canada's obligations as a member of IPPC. The CFIA import policy D-02-12 (*Import requirements of non-manufactured wood and other non-propagative wood products, except solid wood packaging material, from all areas other than the continental United States*) stipulates phytosanitary import requirements for non-manufactured wood products such as logs, wood chips, and decorative wood items from all counties except the Continental U.S. For EAB specifically, CFIA policy D-03-08 (*Phytosanitary Requirements to Prevent the Introduction Into and Spread Within Canada of the Emerald Ash Borer, Agrilus planipennis (Fairmaire)*) stipulates phytosanitary requirements to prevent the entry and spread within Canada of EAB. In addition, a variety of compliance programs, such as the Emerald Ash Borer Approved Facility Compliance Program are in place for specific commodities and pests to ensure phytosanitary risk mitigation for imported wood products.

Some of the risk-mitigation and management activities that the CFIA delivers include:

- Risk-assessments
- Restriction of the introduction and spread of quarantine pests through import policies, border controls and destination product-inspections
- Surveillance, to monitor pest-presence and distribution
- Enforcement of regulations and associated policies
- Public awareness of risk and regulations

In keeping with its regulatory mandate, given the current spread of EAB, the CFIA's responsibility in the management of EAB is to use its legal authority in developing and maintaining programs aimed at slowing the artificial (i.e., human-assisted) spread of EAB to areas in which there is a high degree of confidence that EAB is absent. This includes surveillance, regulation and enforcement, investment in research, and communications and outreach activities. To help prevent the spread of EAB, a Ministerial Order, 'The Emerald Ash Borer Infested Places Order', is updated annually at the end of each survey season to take into account all new detections. This order restricts the movement of firewood of all species, as well as trees, nursery stock, logs, lumber, wood packaging or dunnage, wood or bark, wood chips or bark chips of the genus *Fraxinus* from regulated areas, in order to limit the spread of EAB**.** A map of the areas previously regulated for EAB in Canada is provided in Appendix 1. Maps of the U.S. Federal EAB Quarantine Area are provided in Appendix 2.

Having recognized the risk associated with the movement of firewood, the CFIA launched a *Don't Move Firewood* campaign in 2008. Since then, thousands of brochures, posters and other communications products have been distributed annually through collaboration with partners. In addition, road signage highlighting the risks of moving firewood has been installed. The CFIA also participates in public shows and exhibits to educate the general public about the risk of moving firewood. For 2012, the CFIA has prioritized continued work on the firewood pathway (harmonising with the U.S.), drafting a proposal to revise Canada's firewood import policy in order to require heat-treatment of firewood, as well as exploring options to strengthen domestic movement risk-mitigation measures. For this to be effective, all partners must combine in efforts to under their mandates and/or roles and responsibilities, including governments, industry and private stakeholders.

Stakeholder Engagement

The CFIA continues to engage with stakeholders at the national and regional levels, including outreach and training sessions for provincial, municipal and city staff, as well as landscape and tree companies, to increase awareness of EAB. The CFIA participates in various committees, such as the Eastern Ontario Model Forest Committee, sharing relevant information, surveillance updates and policy-consultations, as well as the Ontario and Quebec regional Critical Pest Committees, in joint discussions with various provincial partners impacted by the pest. Recently, the CFIA has also partnered with the Ontario Invasive Species Centre, in increasing outreach to affected municipalities and working across provincial boundaries to share valuable information on best management efforts, and develop collaborative management approaches. The CFIA also assists sawmills and firewood vendors through local compliance programs to mitigate the risk of spread while maintaining current markets for industry. The CFIA also participates in an EAB Science Committee, chaired by the Canadian Forest Service. Recommendations from the EAB Science Committee are taken into consideration by the CFIA in policy decision making.

The CFIA is also engaged in consultations with federal and provincial partners to develop a national management approach for forest pests such as EAB through a Decision Support Framework initiative. The framework will provide guiding principles for the collaborative management of, and key management decisions on, invasive forest pests on an ongoing basis.

6.0 Pest Risk Assessment Summary

(note: new information not in the 2011 assessment is presented as footnotes in the text below)

The pest risk assessment for the emerald ash borer, *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae) was re-evaluated in 2011 by the CFIA and the pest is considered a high risk for Canada (Dobesberger 2011). This flat-headed wood borer (beetle: buprestid, or "jewel beetle", specific common name "emerald ash borer") causes physiological damage to its ash (*Fraxinus* spp.) hosts[1] by girdling the stem and branches, and several years of high-density larval feeding in the phloem and cambium causes tree mortality. Mortality can occur within one year of detection, depending on pest population level and local climate. Overwintering larvae, pupae and adults in trunks, stems or branches can be easily moved by humans in various wood products with living bark such as solid wood packaging materials, logs or lumber with bark, firewood with bark, nursery stock, wood chips and bark itself.

A risk assessment is divided into three parts. The first is a rating of the potential for "entry and establishment", or the potential for a pest to enter Canada or to move from a regulated part of the country to a pest-free area and establish a self-reproducing population. For this beetle, entry and establishment is rated high. Even with regulatory measures currently restricting the movement of various wood products, the emerald ash borer still continues to spread naturally and (undetected) by human-assisted means. Contamination of articles by EAB is also a possibility[2]. The potential for establishment is also high because suitable host material occurs across Canada within climate zones where the emerald ash borer can overwinter and survive low winter temperatures (i.e., -30 C) successfully. Sufficient heat units can be accumulated to allow the successful development of one generation/year in most southern Canadian ash forests, particularly in urban environments.

The second stage of a risk assessment is an assessment of the potential for movement. The potential for natural spread of EAB is considered to be 'medium'. On average, adults may disperse by natural flight about 1.5 to 3 km annually, but a small proportion of the population (less than 1%) are capable of flying much farther. A related beetle (the bronze birch borer), is native to North America and can naturally move 32 km/year; similar abilities are expected of the emerald ash borer. Human-assisted movement has been estimated in the United States to be between 25 and 100 km per year, with maximal movement of about 250 km, mostly recorded in firewood[3].

[1] New research shows that all Canadian ash tree species are vulnerable to attack, and that all but the blue ash (*Fraxinus quadrangulata*) is susceptible to being rapidly killed by the emerald ash borer (see for example: Tanis and McCullough 2012).

[2] Note that hitch-hiking has been confirmed by the conditions present in the Ottawa area in 2012: high volumes of cut ash logs at the Trail Road landfill have resulted in reports of emerald ash borer adults entering vehicles and likely being moved out of the landfill area (see: CBC, 2012).

[3] Movement in nursery stock is abating due to a lesser demand for ash nursery stock and due to regulations limiting movement out of the regulated area, but ash trees are still being moved from outside, but near to, the regulated areas, to non-regulated areas.

The third phase of a risk assessment considers potential harm caused by a pest: the economic and environmental impacts by the emerald ash borer can be severe[4] (Risk rating = high). A wide spectrum of age classes of ash from nursery stock to mature timber can be affected, reducing their urban landscape and timber values. Hardwood lumber exports are valued at about $109 million (in Canadian dollars, 2010 values and numbers). Export markets would be negatively affected because signs of live insect or disease damage are not allowed in any wood product destined for foreign markets and must be treated if signs are found. Various economic and amenity values of urban forests (real estate values, heating and cooling costs, tree removal and replacement costs), biodiversity and wildlife values and cultural values of native Canadians can be detrimentally affected as a result of pest activity by the emerald ash borer, but have not yet been fully tabulated and calculated for Canada.

The risk components in a risk assessment are combined to give an overall risk summary. This pest's risk summary combines to "high", which indicates that specific phytosanitary measures are recommended to slow or restrict the spread and introduction of the emerald ash borer to uninfested parts of Canada. Infestations of EAB are expected to be detected beyond the current (2011) regulated areas every year. Despite the threat of natural and human-assisted spread beyond these regulated areas, large populations of EAB seem still to be generally restricted to southern Ontario and parts of Quebec[5]. Detection and delimitation of emerald ash borer populations is still difficult because signs and symptoms of infestation are not evident until damaging populations have already built up. Early warning and detection at low population densities requires further research, but has been improved with newer tools: baited green prism traps, tree-top branch sampling, etc. Natural and human-assisted spread is expected to continue, but regulatory and control action, despite inefficiencies, will probably slow the spread of this pest for several years and possibly hinder its movement into western North America (Muirhead and others, 2006). Therefore, it should still be feasible to slow the spread of this pest to other parts of Canada by implementing phytosanitary measures and developing protocols for biological controls.

7.0 Risk Management Considerations

- The presence of EAB has now been confirmed in 27 Ontario counties, and in seven areas in the province of Quebec. The CFIA does not have resources available to maintain individual regulations on numerous, discrete regulated areas.

- As Canada's National Plant Protection Organization, the CFIA has a domestic mandate to protect Canada's forests in uninfested areas, as well as market access-related aspects in demonstrating that its pest-mitigation programs are effective at producing pest-free wood products. In order to do so, pest management programs must be based on science, and regulated areas must include adequate buffers to protect uninfested parts of Canada, as well as providing effective risk-mitigation options in support of a viable ash products industry.

[4] Research suggests that ash will virtually disappear from areas infested by this beetle (especially when compared to its historical stand densities), similar to what has happened to the American elm due to Dutch elm disease and the American chestnut, due to chestnut blight (Knight and others, 2013; Tanis and McCullough, 2012).
[5] The population in eastern Ontario could now (2012) also be considered "large".

- Given resource availability, and the spread of EAB, the CFIA must reduce its overall resource utilization for this pest by April 2014. Consequently, the CFIA is moving from an emergency response-based programme towards a pest management approach aimed at protecting uninfested areas of Canada (i.e., surveillance, regulation, enforcement, research and communication efforts).

- Activities for voluntary implementation by stakeholders must also be considered for the management of EAB.

The following activities may be implemented irrespective of which regulatory option is implemented; these activities can be delivered by any stakeholder partner or collaborative group (e.g., the CFIA may not be involved with the points listed below).

- Implement non-regulatory recommendations such as Best Management Practices
- Increase industry, stakeholder, and public awareness through communication materials and media campaigns, signs, pamphlets
- Manage stand-health through silviculture & tree-removal, etc.
- Maintain surveillance program to determine extent of spread
- Maintain trade negotiation efforts to ensure market access
- Support research and development of management tools

Reducing the risks presented by the firewood pathway will be an important component. The CFIA will update its firewood policy to include import requirements and domestic guidelines to reduce risks.

Given the current widespread distribution of EAB in parts of Ontario and Quebec, the use of biological control agents, in combination with the above measures, may offer the best method of managing the pest. This approach is being tested in parts of the U.S. and the CFIA will review petitions received for the release in Canada of these biological control agents.

8.0 Pest Risk Management Options:

Maintaining the previous emergency response approach on an ongoing basis has been determined not to be feasible, given continued pest-spread and limited resources and, therefore, is not presented as an option. The three options considered were as follows:

Option 1: Expansion of the regulated areas to include high risk corridors and represent more accurately the expected distribution of the pest (Appendix 3, map 1):
The existing regulated area will be expanded and consolidated to include highway corridors, which are the primary pathways of pest-spread. Highways 400, 401, 416 and 417 in Ontario and Highways 15, 20, 40 and 50 in Quebec are included, with additional counties not directly covered by these highways included to include expected distribution of EAB. This option reflects optimal resource usage for the CFIA and is based on the protection of areas in which there is a high degree of confidence that EAB is absent

Option 2: Expansion of regulated area to include all current regulated areas and buffers (Appendix 3, map 2):
This option includes merging all existing regulated areas and including a larger area than that proposed in Option 1, in order to take into account ash tree distribution and the likely long term extent of the spread of EAB.

Option 3: Creation of a Collaborative Management Zone based on partnership approach (Appendix 3, map 3):
Maintain the existing regulated zone, with continued regulation of new detections at the county level, but rely on significant activities led by partners (provinces and municipalities) within a new collaborative management zone.

With each of these three options, the CFIA will continue surveillance activities at the perimeter of the regulated area to monitor pest spread, taking into consideration the distribution of ash, risk factors, etc. The CFIA will also maintain regulatory oversight on product movement out of each regulated area, provide electronic communications materials, and, based on resource availability, support research on tools for management of this pest (biological and chemical controls, etc.)

These options will provide a greater level of protection for the rest of Canada as it will result in a lower risk associated with ash material moving from areas that are currently not regulated, but in which there is a high probability that EAB populations have established.

9.0 Pest Risk Management Decision:

The CFIA has consulted with affected provinces and municipalities, and has not received any support for Option 2. A commitment to providing resources required to support Option 3 has not been forthcoming.

Therefore, through the circulation of this RMD, the CFIA is informing stakeholders on its decision to modify the regulated areas for EAB as per Option 1.

By March 31, 2013, the CFIA plans to commence the one year transition approach that will lead towards implementation of the selected option by April 1, 2014. The CFIA will orient its available resources during the transition period to continue offering training and communications materials.

All pest situations are subject to periodic review based on pest distribution and resource availability. If provincial and/or municipal resources were to become available at some point in the future, the CFIA could consider revising its approach for the management of EAB.

10.0 Stakeholder Communications

The CFIA has held several meetings, teleconferences and communications to inform stakeholders of the need to revise the current management approach for EAB. The CFIA is also working with the Invasive Species Centre (ISC) of Ontario to facilitate interaction with municipalities. The ISC hosted EAB forums on January 22 and February 7, 2013, including the

provinces of Ontario, Quebec and Manitoba; as well as various affected municipalities. At these meetings, municipal stakeholders expressed a preference for a collaborative management approach (Option 3) that would include the same municipalities as Option 1, but would include two distinct zones, requiring a coordinated surveillance approach led by provincial and municipal partners. Under this approach, CFIA activities would focus on surveillance and compliance outside the proposed collaborative management zone. A follow-up meeting of an EAB Focus Group led by the CFIA, including representatives of the provincial governments of Ontario, Quebec and Manitoba, and a small group of municipalities, took place on February 13, 2013. Feasible alternatives to the proposed expansion of the regulated zone under Option 1 could not be identified and additional resource availability was not indicated, nor is it expected to become available.

11.0 References:

CBC. 2012. Ash borer clean-up poses new problem. Available at: http://www.cbc.ca/news/canada/ottawa/story/2012/06/28/ottawa-ash-borer-disposal-pile.html. Last accessed January 4, 2013.

Dobesberger, E.J. 2011. Plant health risk assessment PRA# 2011-10: *Agrilus planipennis* Fairmaire, Emerald ash borer (Update to PRA-2002-28). Canadian Food Inspection Agency, unpublished.

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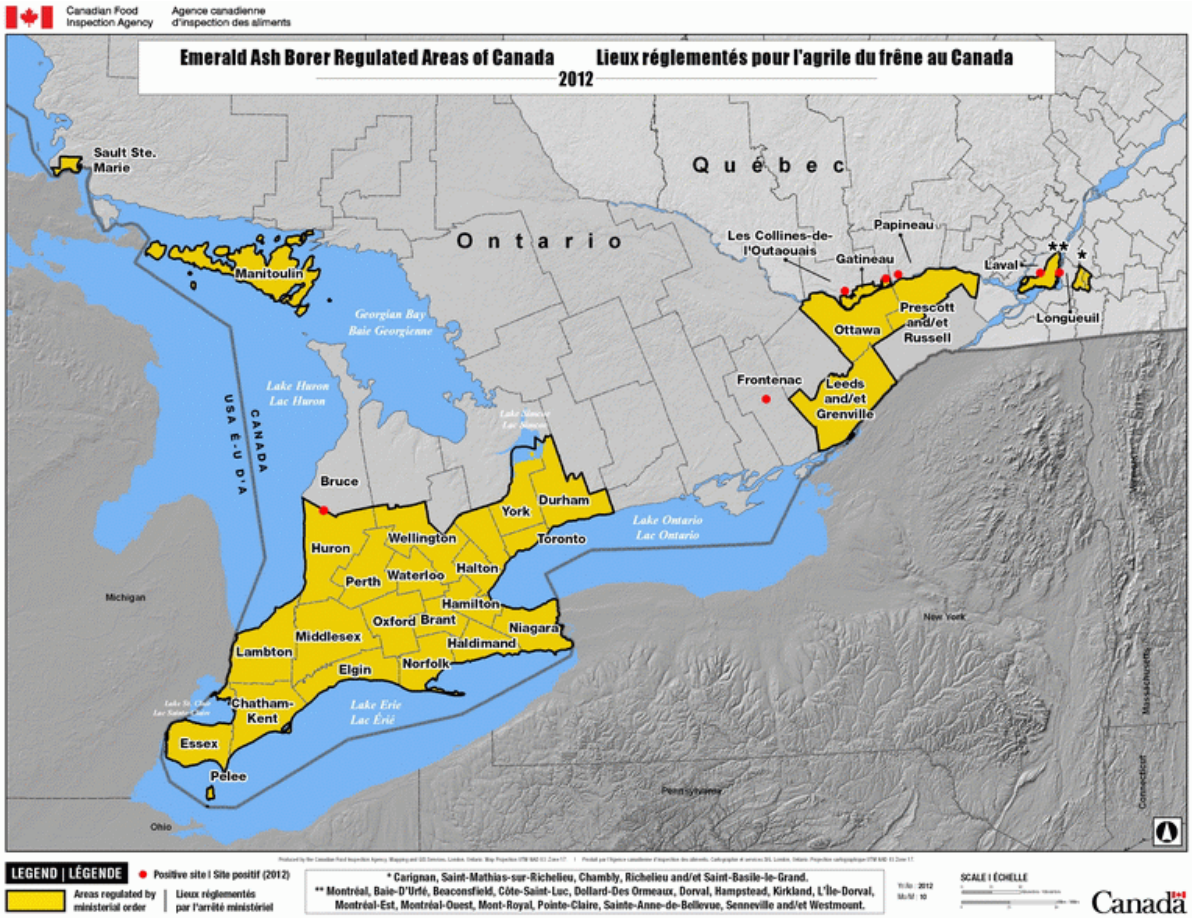
Muirhead, J.R., Leung, B., van Overdijk, C., Kelly, D.W., Nandakumar, K., Marchant, K.R. and MacIsaac, J. 2006. Modelling local and long-distance dispersal of invasive emerald ash borer *Agrilus planipennis* (Coleoptera) in North America. Diversity and Distributions 12: 71–79.

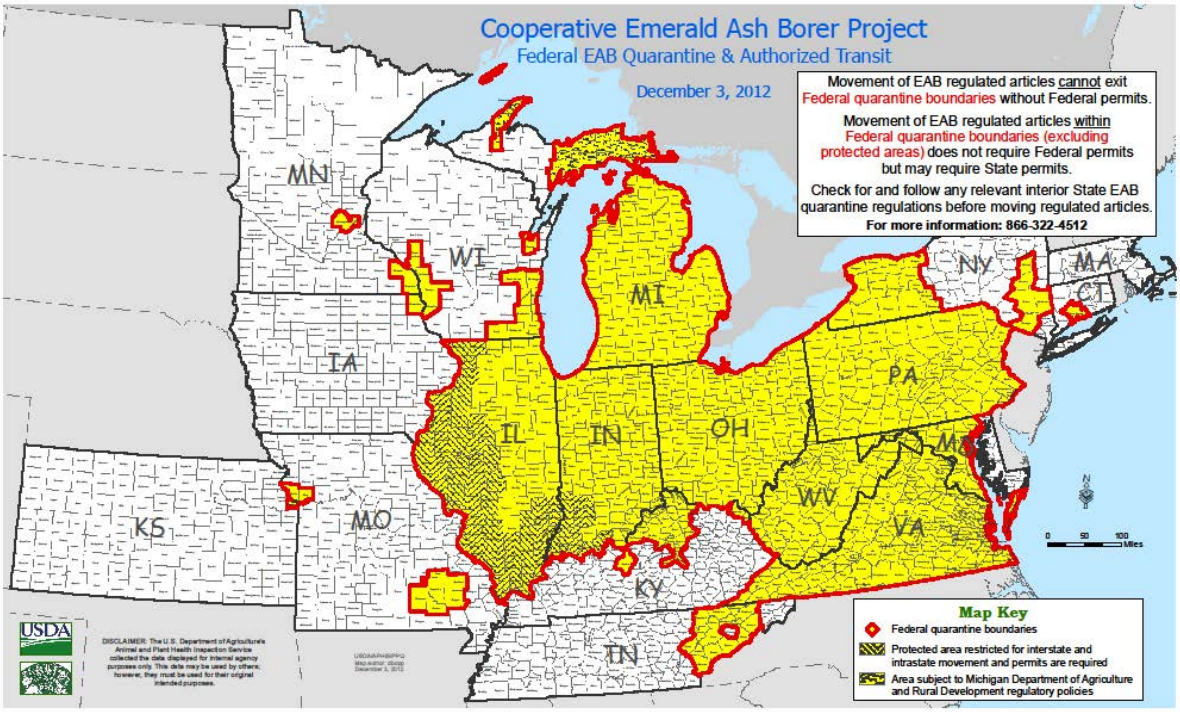
Tanis, S.R., McCullough, D.G. 2012. Differential persistence of blue ash and white ash following emerald ash borer invasion. Canadian Journal of Forest Research 42(8): 1542-1550.

APPENDIX 1 – EAB Regulated Areas in Canada

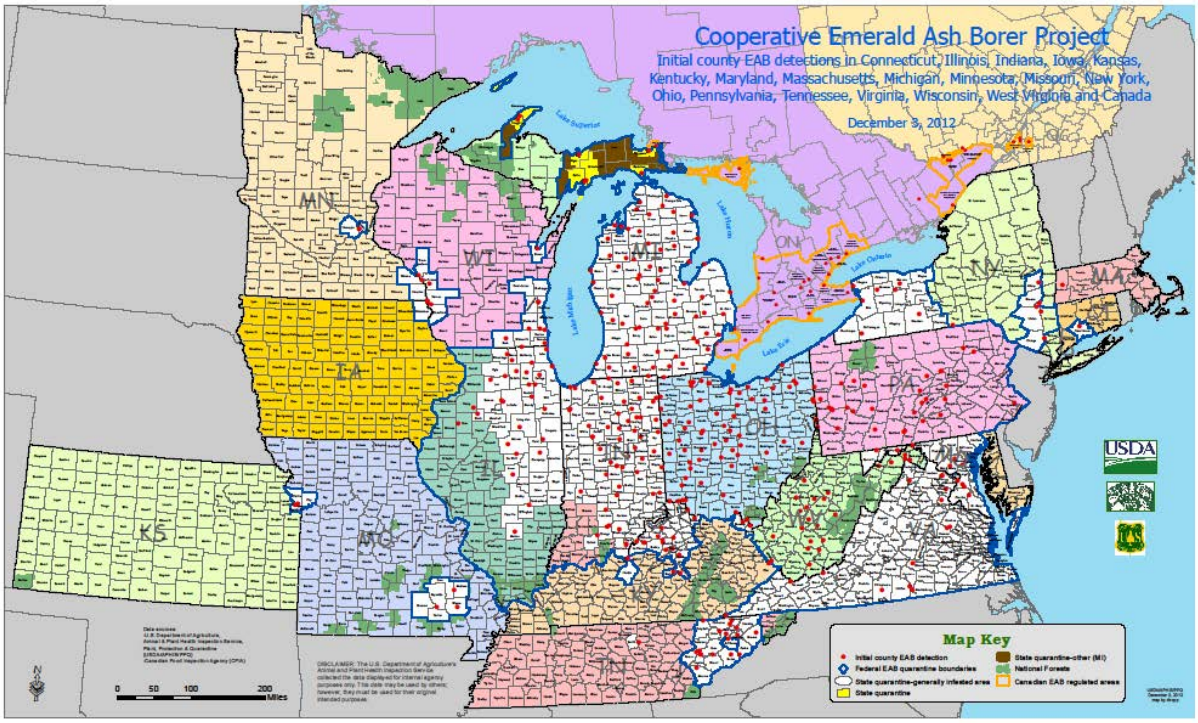


APPENDIX 2 – US Federal EAB Quarantine Area and Initial County EAB Detections

US Federal EAB Quarantine Area

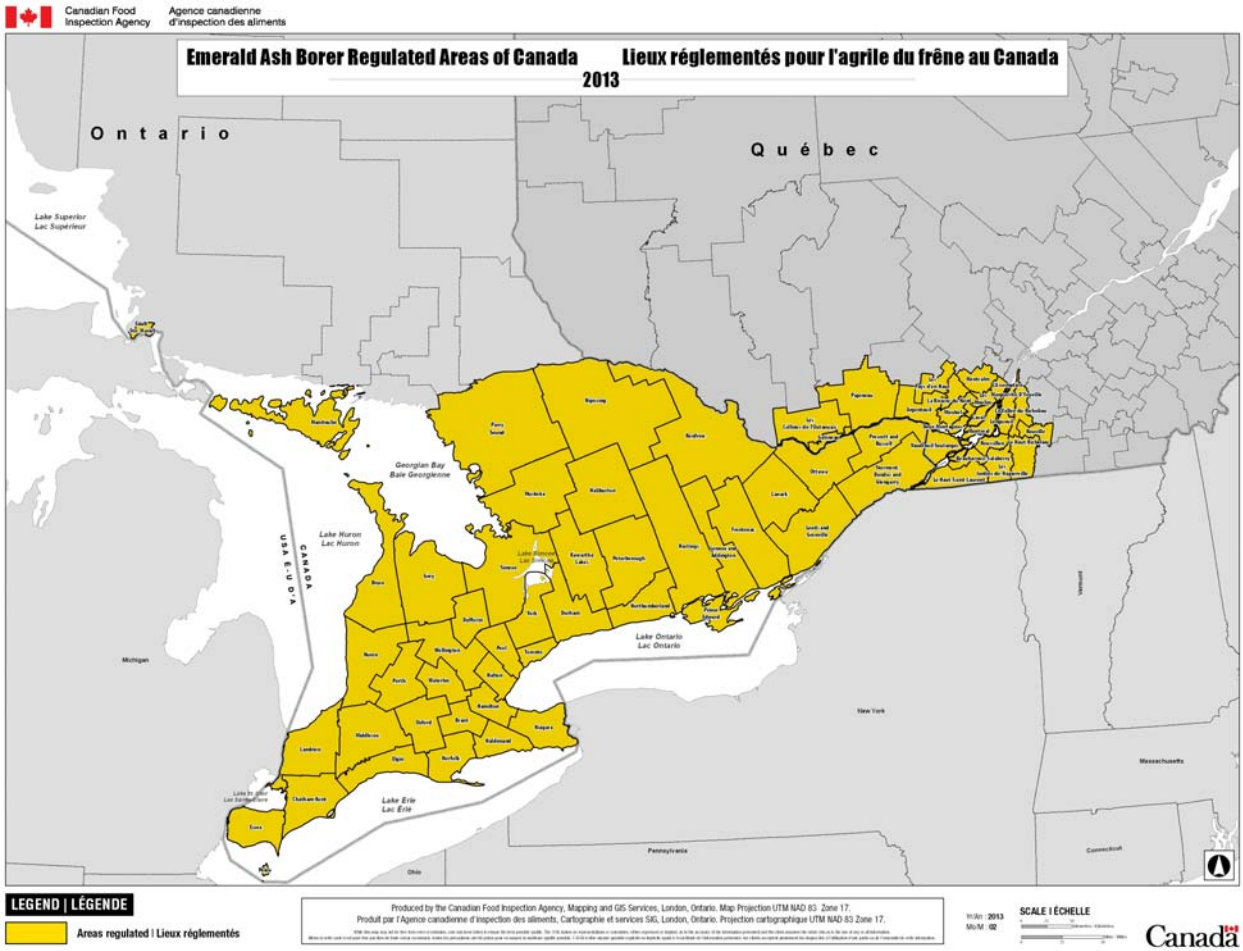


Initial County EAB Detections

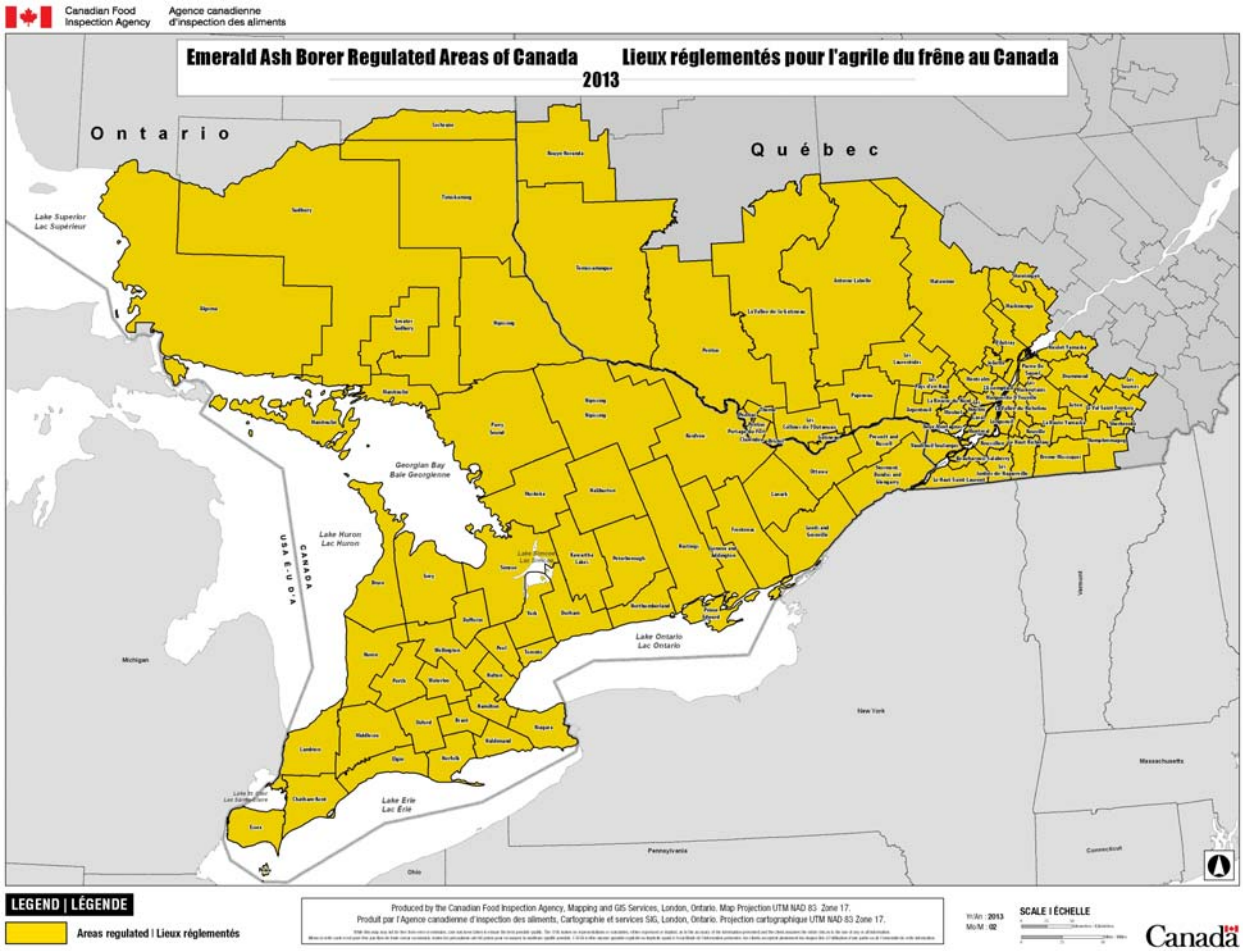


APPENDIX 3 – Maps of the options for the 2013 regulated area(s) for EAB

Map 1: Option 1: Expansion of the regulated areas to include high risk corridors and represent more accurately the expected distribution of the pest



Map 2 : Option 2: Expansion of regulated area to include all current regulated areas and buffers



Map 3: Option 3: Creation of a Collaborative Management Zone based on partnership approach