Natural Resources Canada
Ressources naturelles Canada

FRONTLINE
policy perspectives

# MANAGEMENT OF THE EMERALD ASH BORER

NOTE 1

GLFC SCIENCE INFLUENCING FOREST POLICY

*Emerald ash borer (EAB)*

## THE CHALLENGE

The emerald ash borer (EAB) is an invasive alien insect originating from eastern Asia which was first discovered in North America in 2002 near Detroit, Michigan and Windsor, Ontario. Since then, EAB has been found in six additional American states, and has been detected in Canada throughout much of southwestern Ontario, ranging from Windsor to Toronto, and north to Sarnia. Similar to many other invasive alien species in Canada, EAB is believed to have arrived in North America in wood-packing material in a shipping container.

EAB is a highly destructive insect pest capable of attacking all species of ash trees in North America. In addition to the many ash trees growing naturally in northeastern North America, ashes are commonly used as landscaping and urban trees, making the potential economic and social impacts of continued EAB spread in North America particularly concerning. Estimates current to 2007 suggest that EAB has already killed several hundred thousand trees in Ontario, in addition to 20 million trees in the United States.

Controlling the spread of EAB has proven to be challenging to resource managers in both countries. Detection methods for EAB are currently ineffective, with most confirmed occurrences of the pest resulting from visual identification of heavily infested trees. Once identified, EAB populations are extremely difficult to control due to the advanced state of infestations, and the lack of available chemical control products that target the insect.

**EAB IS A HIGHLY DESTRUCTIVE INSECT PEST CAPABLE OF ATTACKING ALL SPECIES OF ASH TREES IN NORTH AMERICA.**

Canada

## SCIENCE INFLUENCING POLICY

The biology of EAB was relatively unknown before its discovery in North America. Since then, Great Lakes Forestry Centre (GLFC) researchers, in conjunction with numerous collaborators, have produced scientific and technical literature detailing EAB biology and detection methodologies. GLFC research programs continue to focus on improving current EAB detection methods by studying the attractiveness of chemical cues emitted by either the insect itself or by ash trees. The discovery of a chemical cue could help in the development of lures for EAB traps, which would significantly alter the current approach to detection and management of EAB in North America

GLFC researchers are also helping to develop possible control mechanisms to help slow the spread of EAB as well as other invasive alien insects such as the Asian longhorned beetle and the brown spruce longhorn beetle. Since 2003, GLFC staff has been collecting scientific data to document the efficacy and environmental acceptability of systemic insecticide formulations and tree injection technologies. Two insecticide formulations developed by GLFC scientists, EcoPrid (imidacloprid) and TreeAzin4 (azadirachtin), the latter derived from Neem trees in India, have shown promise as potential EAB control products. On-going research continues to gather detailed data on insecticide uptake and translocation rates in ash trees, toxicity of the product to different life stages of EAB, and impacts to non-target invertebrates such as aquatic and terrestrial decomposer organisms.

During the summer of 2007, the systemic injection of the TreeAzin4 formulation into ash trees was one of the strategies used in an experimental project to manage EAB in London, Ontario. The research program was specifically designed to investigate the efficacy of potential control methods for the insect pest in urban/suburban environments. Based on this project and previous studies undertaken by GLFC scientists, the Ontario Ministry of Natural Resources (OMNR) has applied to Canada's Pest Regulatory Management Agency (PMRA) for emergency registration of the product to help combat the spread of the pest during the summer of 2008.

GLFC scientists are also studying the potential for slowing the spread of EAB using biological control strategies; approaches that focus on discovering, propagating, and supplementing natural enemies to regulate pest populations. Through the use of the insect quarantine facility at GLFC, scientists have recovered two native parasitoids that attack EAB populations in Ontario during its larval stage.

Parasitism rates by one of the parasitoids, in a population of EAB in Ontario were as high as 40%, suggesting the possibility for the parasitoid to serve as an effective biological control agent for the insect pest. GLFC research programs will continue to study the interactions and impacts that these parasitoids have on EAB populations, and will provide essential data for the consideration of future EAB biological control programs in North America.

*Emerald ash borer larva*

## BENEFITS TO CANADIANS

Introductions of alien forest insects and diseases continue to have serious and significant impacts on the health and sustainability of Canadian forests; a threat that is virtually guaranteed to continue in the future given the globalization of world economies and the ease of international trade and transport. The research conducted by GLFC scientists is contributing to the discovery of new knowledge and expertise regarding the biology of invasive species, in addition to the development of innovative control and management techniques. The research contributions made by GLFC scientists are helping to combat the spread and curb the destruction of exotic invasive species, and provides for the continued sustainability of Canadian forests, economies and biodiversity.

## KEY POLICY CONSIDERATIONS

As a signatory to the Convention on Biological Diversity, Canada is obliged to control invasive alien species. The Canadian Biodiversity Strategy, as well as its provincial equivalent, Ontario's Biodiversity Strategy, supports monitoring and controlling the importation of alien invasive species.

The Government of Canada's Invasive Alien Species Strategy for Canada provides for the establishment of a nationally coordinated policy and management framework that protects Canada's aquatic and terrestrial ecosystems, and native biological diversity, by preventing, detecting, responding to, and managing the risk associated with invasive alien species in Canada

Registration of pesticides for emergency use is governed by the PMRA, Regulatory Directive DIR2001-05. This regulatory directive governs the registration of pesticides for emergency control of pest infestations where no other efficacious, registered pest control product or alternative method of control exists.

The Memorandum of Understanding for Prevention, Eradication, Control and Management of Critical Plant Pests was developed to provide a more coordinated and effective approach in the control of invasive pests in Ontario amongst the responsible agencies, including, NRCan-CFS, OMNR, Canadian Food Inspection Agency, Agriculture and Agri-Food Canada, and Ontario Ministry of Agriculture.


*EAB research at the GLFC insect quarantine facility.*

## SUGGESTED READING


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## CONTACT


Barry Lyons, Research Scientist, Pest Ecology
Canadian Forest Service, Great Lakes Forestry Centre
1219 Queen St. E.
Sault Ste. Marie, ON P6A 2E5
705-949-9461
barry.lyons@nrcan.gc.ca

Jason Langis, Policy Liaison Officer
Canadian Forest Service, Great Lakes Forestry Centre
1219 Queen St. E.
Sault Ste. Marie, ON P6A 2E5
705-541-5667
jason.langis@nrcan.gc.ca


*GLFC researcher monitoring for EAB in the field.*


Canadian Forest Service, Great Lakes Forestry Centre
1219 Queen St. East,
Sault Ste. Marie, Ontario, P6A 2E5,
(705) 949-9461
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