# FOREST update HEALTH

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The following Forest Health Update describes conditions affecting Ontario's forests in the OMNR Districts of Aylmer and Guelph. This report has been prepared by Eric Cleland, Forest Health Technical Specialist with the Ontario Ministry of Natural Resources.

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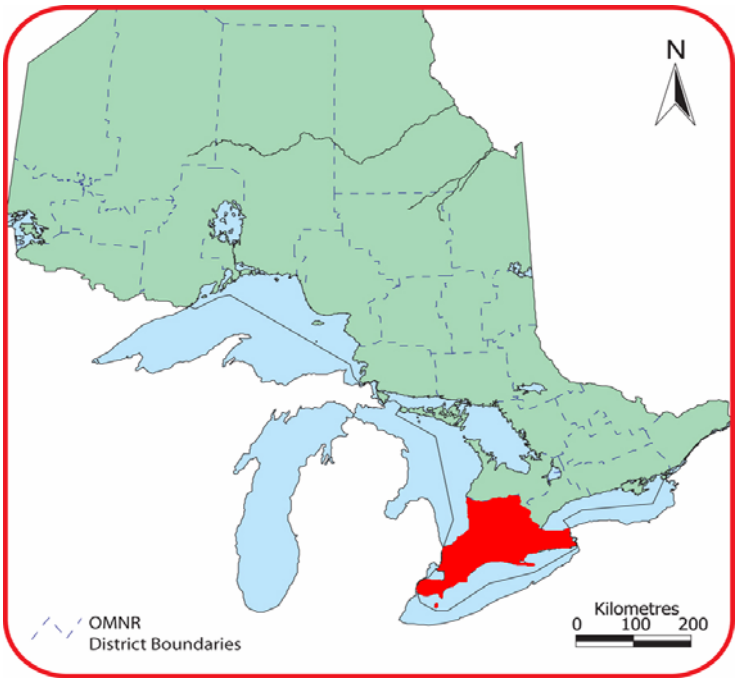


**Emerald Ash Borer,** *Agrilus planipennis* (Fairmaire)

The Emerald Ash Borer (EAB) was originally discovered in Windsor, Ontario in 2002. Since this initial find, the insect has travelled by natural spread and through the movement of Ash products to a number of jurisdictions within the province.

The Canadian Food Inspection Agency (CFIA) is the lead agency on the regulation and control of all exotic pests, such as the emerald ash borer, introduced into Canada. The CFIA currently has imposed six regulated areas (Figure 1.) in Ontario for the emerald ash borer, within which the removal of ash materials and all species of firewood is prohibited. The Ontario Ministry of Natural Resources (OMNR) partners with the CFIA and the Canadian Forest Service (CFS), through aerial reconnaissance, ground surveys, research and trapping programs to monitor the extent of damage caused by the emerald ash borer in Ontario.

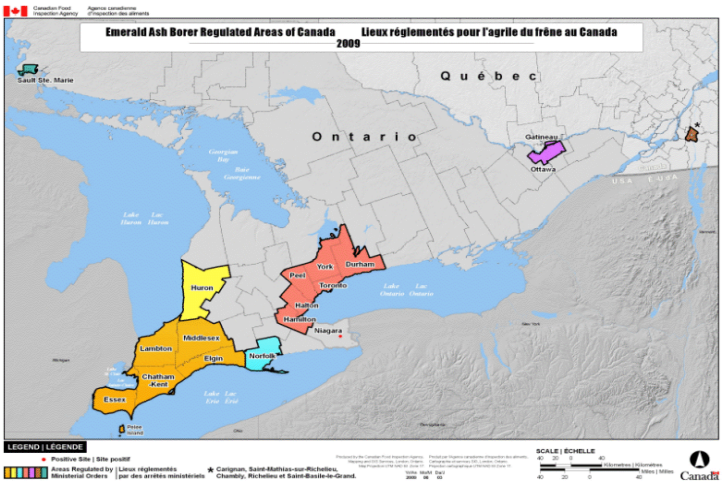


**Figure 1. Regulated Areas of Canada**

For 2009, the Forest Health Unit aerially surveyed southwestern Ontario to delineate the perceived natural spread of this elusive insect. This mapping produced 18,224 ha of new decline and mortality. This 2009 area is in addition to the 9,593 ha of damage mapped in 2007, bringing the overall total of destruction caused by emerald ash borer to 27, 817 ha in rural Ontario.

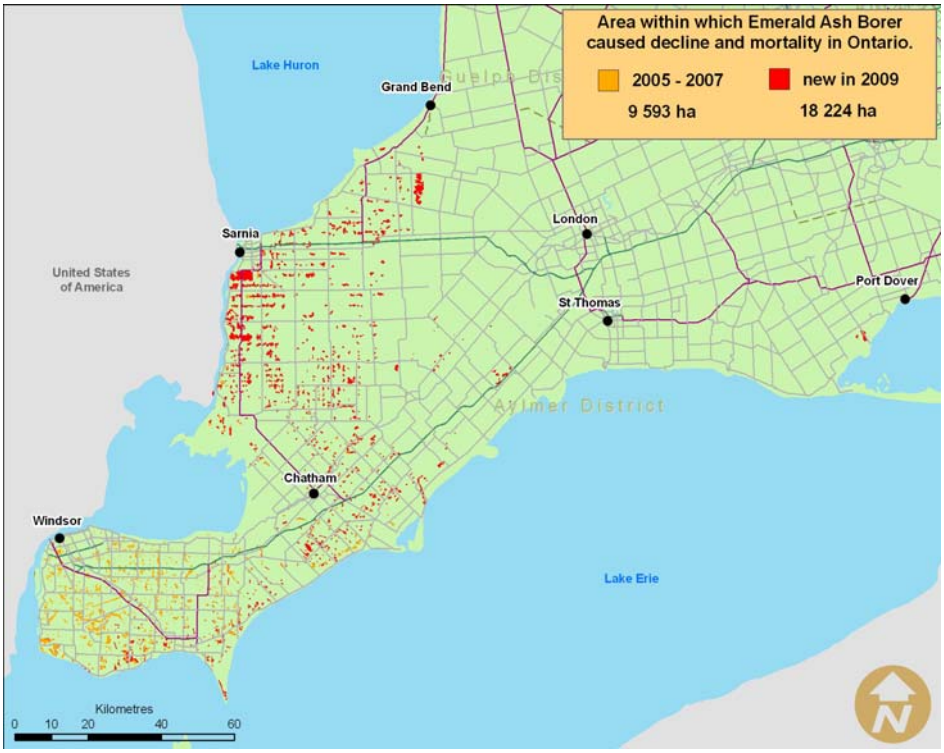


**Figure 2. 2009 Decline and mortality of Ash due to Emerald Ash Borer**

Several research projects led by the Canadian Forest Service in 2009 focussed on the development of early detection tools that may be utilized in other parts of the country. These preliminary trials involved the field testing of several types of lures and traps, bio-surveillance using native parasitoid wasps and the sampling of crown branches to detect emerald ash borer populations at low levels. Further research is required on these methods, but early results are promising.

## Ash Decline

Across Aylmer and Guelph Disticts a general decline in the health of Ash – *Fraxinus spp.* was noted. Trees exhibiting symptoms of stressors other than emerald ash borer were recorded in Perth, Oxford, Brant, Haldimand and Norfolk counties, however only the Ash in the Huron, Middlesex and Elgin counties declined to a level that was mapped aerially, for a total of 3,602 ha.

Ground checks in these woodlots revealed a number factors contributing to the overall decreased health

**Figure 3. Woodlot with Ash trees in decline**

of the ash trees. Many secondary pests including Armillaria root rot, Eastern ash bark beetle and Lilac borer and were recorded in these woodlots, suggesting that some other stressors were negatively affecting the overall tree health. Over the past decade, southwestern Ontario has experienced varying climatic conditions from severe droughts to seasons of above-average precipitation levels; these large fluctuations can greatly affect the overall health of shallow-rooted ash trees. Excessive drought conditions may desiccate the fine 'feeder' roots, killing them and further reducing the crown's foliage and overall vigour, predisposing the tree to the secondary pests mentioned above.

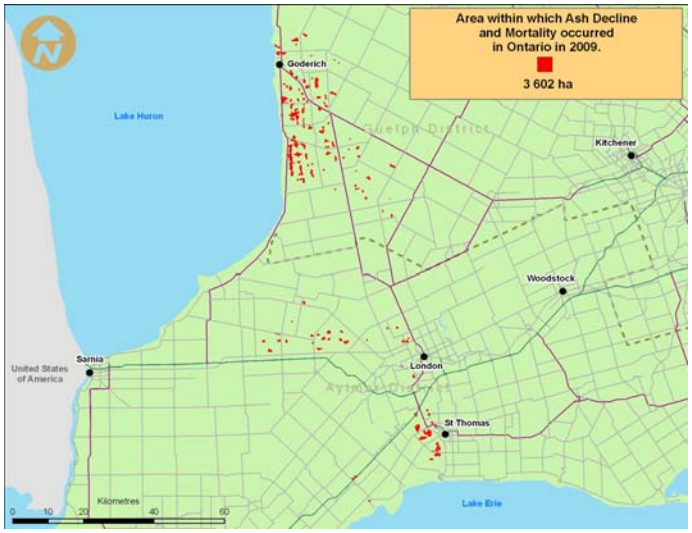


**Figure 4. Map of Ash decline in southwestern Ontario**

**Fall webworm,** *Hyphantria cunea* (Drury)

**Figure 5. *H. cunea* feeding webs on black walnut**

Populations of the Fall webworm remained constant this year in Ontario. For 2009 the only mapped damage occurred within the St. Williams Conservation Reserve, Norfolk County, Aylmer District; where moderate-to-severe defoliation totalled 510 ha of damage.

The favoured hosts here were Black Walnut, Black Cherry, Choke Cherry, Bitternut Hickory, Shagbark Hickory, American Elm and to a lesser degree Black Oak. Overall damage to the host is minimized due to the late-season timing of the larval feeding. Landowners may cut and burn infested branches when the webs are first noticed to reduce population levels, unsightly webs and defoliation in subsequent years.

**Figure 6. Larvae excreting silken web**

## Beech Bark Disease

Fall and early winter are excellent times to survey woodlots for signs of beech bark disease. The initial stage of this disease leaves the tree with a 'snowy' appearance on the outer bark (Figure 7). This 'snowy' residue is a waxy secretion that hides a tiny, scale insect, *Cryptococcus fagisuga* (Lind.), the beech scale. This European native inserts its long stylet through the bark of the host beech, and begins feeding, during which the scale secretes the waxy residue which offers protection for the winter months. In the spring, molting takes place and the nymph changes to an adult female scale insect (there are no males of this species; reproduction is parthenogenetic) and by mid-summer eggs are laid renewing the life cycle again.

**Figure 8. Typical lemon-shaped fruiting bodies**

**Figure 7. Beech covered with scale insect**

The second stage of this disease is infection by *Neonectria coccinea var. faginata,* a nectria fungus. This pathogen capitalizes on the microscopic feeding holes left behind by the beech scale insect. These wounds provide the ideal vector for this fungus to enter into the sapwood of the tree. This fungus produces characteristic lemon-shaped red fruiting bodies (Figure 8) which are quite distinctive during the fall and winter months. Underneath these fruiting bodies, patches of dead bark can be found restricting the tree's abilities to translocate water and sugars. Once these patches of dead material coalesce, trees may be girdled into mortality.

In Ontario, both stages of this disease are known to occur. A formal survey completed in 2004 is currently being updated and as such, landowners with possible populations of the scale insect or the nectria infection are asked to contact their local Forest Health Technical Specialist.

**Armillaria Root Rot**, *Armillaria spp. complex*

The cool, wet weather that has prevailed over southern Ontario the last two summers has provided favourable conditions for a number of fungal pathogens, including armillaria root rot. This genus of fungi has several native species which attack a wide variety of stressed trees, both coniferous and deciduous.

Considered to be the most serious root disease in Ontario, armillaria lurks in the soils of woodlands waiting for ideal weather conditions in order to overcome stressed individual trees. Once the disease has taken hold in an area, it spreads via sporulation and root grafts to nearby trees often creating a pocket of decline and mortality in the woodland.

The best defense against infection by armillaria is to maintain a healthy and vigorous woodlot. The removal of stressed and declining trees will help to slow the spread. Due to the soil-borne nature of this disease, the excavation and removal of infected stumps is necessary to completely sanitize the immediate site. While this method is labour-intensive and not always practical, it is the only known method of control as no fungicides are known to be effective in controlling the disease.

**Figure 9. Typical rhizomorphs of *armillaria spp*.**


**Fig. 10 'Honey' mushrooms & mycelial fans associated with armillaria root rot**

Signs and symptoms of Armillaria Root Rot:

- Crown dieback and yellowing foliage
- White mycelial fans underneath bark at root collar and on roots
- Black 'shoestring' rhizomorphs at base of trees and up to 2m up the trunk
- Honey-coloured mushrooms at the base of tree or within the root zone in autumn
- Considerable flow of resin is common symptom of coniferous infections