

Trees Under Threat

Information Sources for the Asian Long-horned Beetle

Canadian Food Inspection Agency
<http://www.inspection.gc.ca>

Natural Resources Canada,
Canadian Forest Service
http://www.pfc.forestry.ca/news/asian_longhorn_e.html

Ontario Ministry of Natural Resources
<http://ontariosforests.mnr.gov.on.ca/foresthealthoverview.cfm>

Toronto and Region Conservation
www.trca.on.ca

City of Toronto, Urban Forestry Services
<http://www.toronto.ca/trees>

Regional Municipality of York, Forestry Division
http://www.region.york.on.ca/Services/Forestry/Forest_Asian.htm

City of Vaughan, Parks and Forestry Department
www.vaughan.ca

U.S. Department of Agriculture, Animal and
Plant Health Inspection Service
<http://www.aphis.usda.gov/lpa/issues/alb/alb.html>
<http://www.aphis.usda.gov/ppq/ep/alb/>

U.S. Department of Agriculture,
Beneficial Insects Introduction Research
<http://ag.udel.edu/biir/anoplophora/default.htm>

U.S. Forest Service, Northeastern Area,
St. Paul Field Office
<http://www.na.fs.fed.us/spfo/alb>

University of Vermont, Entomology Research Laboratory
<http://www.uvm.edu/albeetle/>



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Partners on the Asian Long-horned Beetle Emergency Response Team in the Greater Toronto Area:



Canadian Food
Inspection Agency

Agence canadienne
d'inspection des aliments



Natural Resources
Canada

Ressources naturelles
Canada

Canadian Forest
Service

Service canadien
des forêts



Ontario

Ministry of Natural Resources
Ministère des Richesses naturelles



For additional copies of this booklet, call Toronto
Urban Forestry Services at 416-338-TREE.
For an online version, visit www.toronto.ca/trees.

Unwelcome Guest, Unwanted Pest



The Asian long-horned beetle (*Anoplophora glabripennis*), a serious forest pest in its native Asia, has been found in Canada. In September 2003, beetle-infested trees were found for the first time in an industrial area on the Toronto-Vaughan boundary.

The beetle is not a threat to human or animal health. It does however, pose a great risk to Canada's hardwood forests and shade trees as a killer of multiple hosts. Our hardwood forests have already lost tree species – elm, chestnut, butternut, beech and now ash – due to successive attacks of introduced pests. The additional impact caused by Asian long-horned beetle would be devastating, if allowed to establish, especially to maples.

Stopping the invasion requires action on many fronts. Led by the Canadian Food Inspection Agency (CFIA), all levels of government are working to contain and eradicate the beetle before our trees and forests are decimated. An informed and active community is a critical element in this battle against the beetle. This brochure introduces the Asian long-horned beetle and addresses:

- how the beetle got to Canada, and what's at risk in this country
- which trees are attacked by the beetle, and how it kills
- how you can identify the beetle and infested trees
- what you can do to halt the spread of the beetle

- what government agencies are doing in Canada to combat the beetle.

For updates on the Asian long-horned beetle in Greater Toronto, visit www.inspection.gc.ca, www.mnr.gov.on.ca, www.toronto.ca/trees, www.vaughan.ca, www.region.york.on.ca/Services/Forestry/ and www.trca.on.ca. If you think you've found an adult beetle or an infested tree, call the **CFIA toll-free at 1-800-442-2342**.



Alien Invader

Global trade is responsible for bringing the Asian long-horned beetle to North America. For decades, the beetle has attacked poplar and willows growing in plantations and windrows in agroforest landscapes in China. Infested wood from these plantations was turned into crates, pallets, spools and dunnage – cheap packing material for cargo carried by ships to overseas markets. Thus, infested cargo is the pathway by which this beetle came to North America.

The Asian long-horned beetle was first detected in the U.S. and Canada at ports and inland warehouses in the early 1990s. To date, at least 15 U.S. states and two Canadian provinces (British Columbia and Ontario) have reported interceptions at these locations.

Steps have been taken to prevent the re-entry of the beetle. Canadian officials imposed stringent entry requirements in 1999 for wood packing materials originating from China and Hong Kong, but the current infestation likely began before these measures were implemented. All non-manufactured wood must undergo kiln drying, fumigation or treatment with preservatives prior to export. In 2004, these

conditions will apply to all countries except the U.S., which has similar rules in place.

The beetle is not new to North America - it has long been on the move. Infested trees were found in New York City and on Long Island, NY, in 1996, followed by Chicago, IL, in 1998 and Jersey City, NJ, in 2002. By October 2003, over 7,700 infested trees had been cut down in these areas.

Like many alien forest pests, the Asian long-horned beetle has no known natural predators in North America that can control its spread. Insecticides do not protect infested trees and only kill some beetles when applied to uninfested trees before attack.

What's at Risk?

Community quality of life: 50% of Toronto's street trees are maples – one of the beetle's preferred host species. These and other threatened hardwoods provide shade and beauty, shelter birds and animals, help filter air pollutants, produce oxygen, and increase property values.

The forest-based economy: Canada's commercial hardwood forests produce \$11 billion in wood products annually. The maple syrup industry is worth another \$100 million each year. Healthy forests also support tourism and recreation.

Ecological dynamics: Broad-leaved deciduous trees are a vital component of healthy woodlands in southern Canada. Many of Canada's endangered and threatened species are found in Ontario hardwood forests. Forest health and biodiversity are at stake.

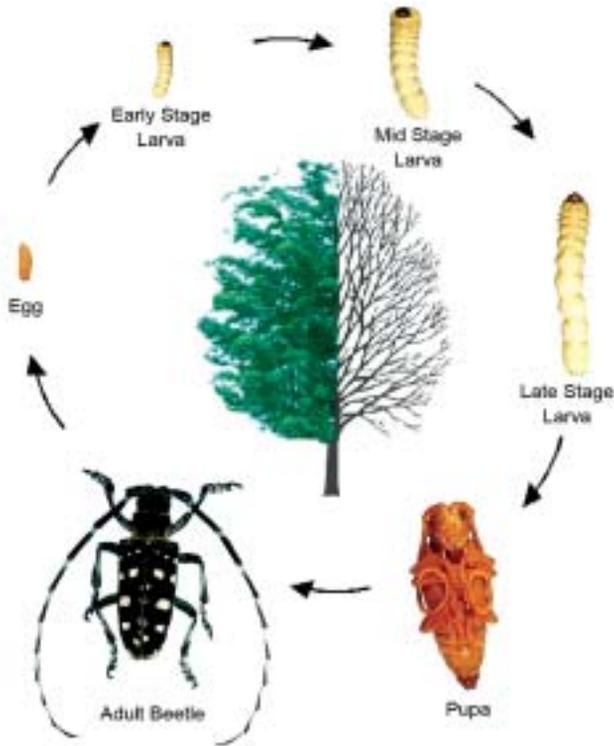
If the Asian long-horned beetle goes unchecked, much of the fall colour in Toronto's parks and southern Canada's forests could be erased.



A Bug's Life – A Tree's Death

Unlike most other Canadian long-horned beetles that feed on dying or dead trees or cut timber, the Asian long-horned beetle attacks and kills apparently healthy trees. A look at its life cycle reveals how the beetle larvae kill trees and how the adult beetle and infested trees can be identified.

In its native range in East Asia, the beetle has either a one- or two-year life cycle. Southern Canada's climate is well-suited to the beetle; our harsh winters do not pose a problem. Insulated by wood, the beetle overwinters either as an egg, larva or pupa.



Life cycle of the Asian long-horned beetle.

Egg

- each egg is deposited on the inner bark with one egg per pit
- eggs develop in 1-2 weeks (if laid in summer), or several months (if laid in late fall)

Larva

- young larvae generally feed for about 20 days in the sappy, green inner bark (cambium-phloem interface), thereby reducing nutrient and water transport within the tree
- older larvae (up to 5 cm in length) bore into the sapwood and heartwood, chewing tunnels through the trunk and branches, thereby structurally compromising the tree

Pupa

- mature larvae pupate in the wood in early spring – the stage between larva and adult

Adult

- adult beetles chew and emerge through exit holes in the bark, likely beginning in late June in Toronto
- female beetles undergo a sexual maturation period of 10-15 days, during which they disperse and feed; mating may occur during this period, but few eggs are laid
- female beetles chew egg pits (oviposition sites) through the bark of the host trees, deposit or inject a single egg within the cambium and plug the egg deposition channel
- adults cause external damage by feeding on young shoots, petioles, leaves and bark
- populations peak in July-August

Larval tunnels within an infested tree.



Being a Good Host is Deadly

Beetles affect hardwood trees serving as hosts in various ways: (1) foliage may drop prematurely because adult beetles feed on leaf petioles and the leaves themselves; (2) eggs may be laid but fail to hatch; or eggs may be laid and hatch, but larval development fails to occur, thereby limiting damage to oviposition pits on trunks, branches or exposed roots; or (3) all stages of the beetle's life cycle are completed, and adults bore their way out of infested trees. Repeated attacks of this latter type can cause tree death in as little as two to five years depending upon beetle density and tree health before the attack.

Knowing which tree species are attacked and killed by the beetle is essential to any program of survey and treatment. Hardwood species in the Greater Toronto urban forest that are suitable for the full development of the Asian long-horned beetle are listed on page 7. This list is based on field studies and laboratory research in China and the United States. Work is underway to determine the suitability of other hardwood species that are found in Greater Toronto, but not in China or in the infested areas of the United States.



Maples (Acer spp.) are among the preferred host species for the Asian long-horned beetle. Some of the infested trees found in Greater Toronto have been under attack for several years, as indicated by the presence of branch dieback and dead trees.

Greater Toronto hardwoods suitable for full development of the Asian long-horned beetle

Common Name	Scientific Name (Genus)
Maple (sugar, silver, red, Manitoba, Norway, Schwedler, Japanese, etc.)	<i>Acer</i>
Horsechestnut (common and red horsechestnut; Ohio buckeye, etc.)	<i>Aesculus</i>
Elm (white, Siberian, etc.)	<i>Ulmus</i>
Birch (white, yellow, etc.)	<i>Betula</i>
Willow (golden weeping, crack, pussy, etc.)	<i>Salix</i>
Poplar (balsam, Lombardy, Carolina and European white poplar; trembling and largetooth aspen; eastern cottonwood, etc.)	<i>Populus</i>
Sycamore/London plane-tree	<i>Platanus</i>
Hackberry	<i>Celtis</i>
Mountain-ash	<i>Sorbus</i>

It is strongly recommended that no trees belonging to the above genera be planted within 400 metres of any treatment zone (see pages 20 and 21) until the beetle has been eradicated.

Coniferous (i.e., evergreen) trees are not attacked by the Asian long-horned beetle and are never hosts. The beetle is not a structural pest – unlike termites, it does not attack construction wood in residences. The beetle will bite people only if threatened (such as when held in the hand and squeezed).

Recognizing Adult Beetles and Infested Trees

Being observant is the first line of neighbourhood defence against the Asian long-horned beetle. Because larvae and pupae are hidden inside infested trees for more than 10 months, focus your search on adult beetles.

Adult Beetles: Identification

1) Body

- glossy black with from 0 to 20 irregular white spots on the back (giving rise to the beetle's Chinese name, translated as "starry sky beetle")
- bullet-shaped
- length – 1.7 to 3.5 centimetres, with females generally larger than males

2) Antennae (there are two antennae)

- long (1 to 1.3 times the body length in females, 2.5 times the body length in males)
- alternating black and bluish-white bands on each antennae segment (generally evident only for a short time immediately after emergence)

3) Legs (there are six legs)

- blue or bluish-black colour (generally evident only for a short time immediately after emergence)



Female (top) and male (bottom) adult Asian long-horned beetles, shown at actual size. Both can be confused with other species like the white-spotted sawyer, which is common in Ontario. For information about look-alikes, see www.inspection.gc.ca and www.uvm.edu/albeetle/identification/index.html.

How to Look:

A good pair of “bird-watching” binoculars with a wide field of view and good light-capturing ability is best. Such binoculars enable you to see deeper into a dark canopy than you can with the naked eye, even at close range. Looking with the sun at your back is best.

Where to Look:

In the Landscape: (1) street and backyard trees; (2) isolated or open grown trees in parks and cemeteries; (3) hedgerows; (4) edges of woodlots or ravines.

In Trees: (1) male beetles either rest or wander throughout the tree in search of female beetles and thus can be seen anywhere on the tree; (2) female beetles rest, chew egg pits and lay eggs on branches and the trunk (more than 5 cm in diameter), or feed on shoots, petioles or leaves. The location of females in trees attacked for the first time will depend on tree size: in large trees, female beetles can be seen laying eggs on higher branches, whereas in small trees (less than 16 cm diameter at breast height), females can be found lower on the trunk. When a tree has been attacked for several years, female beetles are found laying eggs lower on the trunk of even large trees because preferred oviposition sites have been used-up.

When To Look:

Based on U.S. experience, and on a mathematical model predicting adult emergence that uses our temperature records, adults are likely active in Greater Toronto between late June and early November. Their peak months for flying and mating are probably July and August.

Infested Trees

Hardwoods of any age or size are attacked – check young saplings with stems over 5 cm as well as mature trees, focusing on the tree species listed on page 7. Do not check evergreens like pine, hemlock, spruce or cedar, as they are not host species for the Asian long-horned beetle.

Signs of beetle damage on host trees include:

1) Egg-pits (created by adult females laying eggs)

- oval or round pits, 10-15 mm in diameter
- found on the trunk, branches or exposed roots (more than 5 cm in diameter)



Adult beetles and egg-laying sites.

2) Leaking sap

- dark spots on trunk and branches around egg pits created by adults, or near cracks or holes created by larvae
- wasps, ants, flies, scarab beetles, butterflies and other insects are attracted by the sap and may be seen around these spots



Egg-laying sites leaking sap.

3) Frass (mixture of wood and dung created by larvae boring in wood)

- short slivers or strands of wood fibres (1-1.5 cm long)
- found either at bark crevices, at tree joints (where branches meet the main trunk), or around the base of infested trees



(left) Frass in a tree joint.



4) Exit holes (created by adult beetles emerging from inside tree)

- large round holes, 10-15 mm in diameter
- typically found near egg-laying sites
- irregularly distributed – holes in a horizontal line are likely the work of woodpeckers



A pen or pencil will fit easily into an exit hole.

5) Yellow or drooping leaves and premature leaf drop

- premature leaf drop, specifically where the base of the leaf petiole has been chewed on or scarred, where the outer tissue of the petiole has been chewed off, or where portions of main leaf veins or tissue has been removed by feeding adults

6) Branch dieback

- an advanced sign of attack
- typically begins at the top of the tree

When To Look

The search for evidence of infested trees can take place year-round.

Battling the Beetle

Eradicating the Asian long-horned beetle will be a long, difficult and expensive process requiring significant resources and commitment. The American experience is instructive. Federal, state and city officials adopted a US\$365 million plan in 2000 to eradicate the beetle by 2009 in New York City and Chicago. The target date has now been pushed back to 2018 due to federal budget cuts. More beetles and infested trees have since been found in these cities.

Work is underway to find more effective detection, control and eradication methods. Success also requires co-operation and co-ordination among many partners. Moreover, battling the beetle is not the work of government alone – support from residents, tenants, property owners, employees, arborists, landscapers and naturalists is essential.

What You Can Do

Alert and observant citizens – not pest specialists – first discovered the Asian long-horned beetle in New York City, Chicago, Jersey City and Greater Toronto. All community members, including tree-care and landscape professionals, can help beat the beetle through an 8-step program:

- 1) Learn to recognize what adult beetles and infested trees look like. Know the beetle's host tree species.
- 2) Alert your family, friends and co-workers to the threat posed by the beetle.
- 3) Watch for signs of infestation on public and private property. Check trees along streets, in backyards, and in parks, ravines and valleys. Binoculars will help.
- 4) Report any suspected sightings of adult beetles or infested trees to the **Canadian Food Inspection Agency (CFIA) at 1-800-442-2342**. If you catch a beetle, let the CFIA know immediately. Be careful that you do not risk letting the beetle escape to a new location. Report the exact location where the beetle was found. For infested trees, report the exact location, type of damage, and site of damage on the tree.

- 5) Know if your property lies within the regulated area (see page 15). This area is bounded by Highways 401/409, Highway 27/York Regional Road 27, Rutherford Road/York Regional Road 73 and Dufferin Street/York Regional Road 53/William R. Allen Road. For a current map, visit www.inspection.gc.ca.
- 6) Don't remove any restricted woody material from the regulated area. This includes firewood of all tree species along with nursery stock, trees, logs, lumber and wood with bark attached, wood chips or bark chips from trees identified as hosts for the Asian long-horned beetle. This material can accidentally spread the beetle to uninfested areas. Leaf and yard waste in the regulated area of Toronto (south of Steeles Avenue) is picked up by Works and Emergency Services and transferred to a designated facility. Call customer service at 416-338-2010 for information, or see the collection calendars for residential single family homes at <http://www.toronto.ca/garbage/>.

For information on approved disposal sites for the tree-care industry, call the **CFIA (416 665-5055)**, the **City of Toronto (416 338-TREE)** or the **City of Vaughan (905 832-8562)**.
- 7) If you own property in an infested area, expect several visits from CFIA inspectors. They will survey all known and potential host trees, likely on several occasions. They will remove infested and potentially infested trees. Don't cut down infested trees – let CFIA-approved professionals do the work. There is no charge to you for this service and you may be eligible for compensation through the tree replacement program.
- 8) Plant either conifer trees or hardwood trees suggested in the following chart. Use the chart as a guide for appropriate species and planting locations. For more advice, call your municipal forestry office. Once the beetle has been eradicated from Greater Toronto, you will be able to plant other hardwood species.

Trees Suggested for Planting in Greater Toronto Infestation Areas

Common Name	Scientific Name	Planting Location*		
		street	backyard	ravine or within 100 m of a natural area
Serviceberry	<i>Amelanchier</i> spp.	yes	yes	yes
Blue-beech	<i>Carpinus caroliniana</i>	yes	yes	yes
Hickory	<i>Carya</i> spp.	yes	yes	yes, if native
Catalpa	<i>Catalpa</i> spp.	yes	yes	no
Katsura-tree	<i>Cercidiphyllum japonicum</i>	yes	yes	no
Redbud	<i>Cercis canadensis</i>	yes	yes	yes
Turkish hazel	<i>Corylus colurna</i>	no	yes	no
Beech	<i>Fagus</i> spp.	no	yes	yes, if native
Ash	<i>Fraxinus</i> spp.	no**	yes**	yes, if native**
Ginkgo	<i>Ginkgo biloba</i>	yes	yes	no
Honey-locust	<i>Gleditsia triacanthos</i>	yes	yes	no
Kentucky coffeetree	<i>Gymnocladus dioica</i>	yes	yes	yes
Hibiscus	<i>Hibiscus</i> spp.	no	yes	no
Black walnut/butternut	<i>Juglans</i> spp.	yes	yes	yes, if native
Tulip-tree	<i>Liriodendron tulipifera</i>	yes	yes	yes
Apple	<i>Malus</i> spp.	no	yes	no
Dawn redwood	<i>Metasequoia glyptostroboides</i>	no	yes	no
Ironwood	<i>Ostrya virginiana</i>	yes	yes	yes
Amur corktree	<i>Phellodendron amurense</i>	yes	yes	no
Cherry/plum	<i>Prunus</i> spp.	yes	yes	yes, if native
Pear	<i>Pyrus</i> spp.	yes	yes	no
Black locust	<i>Robinia pseudoacacia</i>	no	yes	no
Japanese lilac tree	<i>Syringa reticulata</i>	yes	yes	no
Basswood	<i>Tilia americana</i>	yes	yes	yes
Little-leaf linden	<i>Tilia cordata</i>	yes	yes	no
Crimean linden	<i>Tilia x euchlora</i>	yes	yes	no
Oak	<i>Quercus</i> spp.	yes	yes	yes, if native

chart continues on page 15

Trees Suggested for Planting in Greater Toronto Infestation Areas continues...

Common Name	Scientific Name	Planting Location*		
		street	backyard	ravine or within 100 m of a natural area
Conifers (e.g., pine, hemlock, cedar, fir, spruce)	<i>Pinus</i> spp., <i>Tsuga</i> spp., <i>Thuja</i> spp., <i>Abies</i> spp., <i>Picea</i> spp. and others	no***	yes	yes, if native

* Suitability of a species to a site is also determined by environmental factors such as soil drainage, texture (sand or clay content) and shade. For planting tips, including a list of species native to Toronto, visit www.toronto.ca/trees

** Not recommended due to the threat posed by the emerald ash borer, an alien forest pest that has recently infested southwestern Ontario. The City of Toronto has adopted a policy of not planting ash trees along streets or in parks until further notice. For more information, visit www.toronto.ca/trees and www.inspection.gc.ca.

*** Unless the tree is more than 5 metres from curb.



The Greater Toronto regulated area, February 2004. The movement of woody material out of or through this area is regulated and requires a Movement Certificate issued by the CFIA. For a current map, visit www.inspection.gc.ca.

Some residential trees suggested for planting in Greater Toronto infestation areas:

- 1 Canada red chokecherry in late spring (*Prunus virginiana cultivar*)
- 2 Shagbark hickory (*Carya ovata*)
- 3 Ironwood (*Ostrya virginiana*)
- 4 Turkish hazel (*Corylus colurna*)
- 5 Kentucky coffeetree (*Gymnocladus dioicus*)
- 6 Redbud with spring flowers (*Cercis canadensis*)



What Government Agencies Are Doing

The Canadian Food Inspection Agency (CFIA) is the lead government agency. The CFIA is working with the City of Toronto, the Canadian Forest Service, several branches of the U.S. Department of Agriculture (ie. Animal and Plant Health Inspection Service (APHIS), the Agricultural Research Service (ARS) and the Forest Service (FS), the Ontario Ministry of Natural Resources, Toronto and Region Conservation, the Regional Municipality of York, and the City of Vaughan on an aggressive campaign to control and eradicate the Asian long-horned beetle in Greater Toronto.

The Canadian Food Inspection Agency

Under the *Plant Protection Act*, the CFIA is responsible for preventing the entry and spread of pests of quarantine significance into Canada. The CFIA has the authority to conduct eradication projects and has regulatory authority in the control of pest situations.

Inspectors designated by the CFIA have wide powers to control and eradicate pests like the Asian long-horned beetle. For example, inspectors can:

- enter and inspect public and private property to detect pests or ensure compliance with the *Plant Protection Act* and its regulations
- seize, treat or destroy infested or potentially infested trees and wood
- require owners of infested or potentially infested trees and wood to treat or destroy it.

An Action Plan for Greater Toronto

Eliminating the Asian long-horned beetle requires action on three fronts: breaking the pathway of pest introduction; eradicating all known infestations; and finding any undetected infestations. The CFIA has already addressed the pathway issue nation-wide through its import requirements for solid wood packing material. Work on the other two fronts is now underway in Greater Toronto. A science group and a communications group support this effort. The

science group makes research- and experience-based recommendations that shape operational policy. The communications group is responsible for public education and awareness and the ongoing involvement of stakeholders in the project.

On the ground, the eradication project consists of four activities – survey, containment, treatment and replanting.

1) Survey

Surveys determine the limits of beetle infestation. Intensive surveys of public and private trees within 800 metres of all infestation sites are being carried out by ground, bucket truck and tree-climbing crews. This involves visually checking all parts of host or potential host trees that have woody stems greater than 5 cm in diameter. Climbers use binoculars to check parts of the tree canopy that cannot be reached while climbing. All surveyed trees are individually tagged and photographed for future reference. If not removed immediately, each tree may be surveyed several times within the next few years. The duration of this survey will be determined by the CFIA.

A more extensive survey, covering 169 square kilometres, has also been completed. Visual inspections by crews focused on public street trees. A modified approach to surveillance was used in ravines, where prominent host trees were climbed and checked in detail.

Surveys will continue to be carried out in Greater Toronto for the next several years. As the beetle's presence is not readily apparent in the early stages of infestation, it is important to use experienced staff for surveillance work. Constant vigilance by residents, especially during the summer and fall months when adult beetles are active, is also critical.

2) Containment

Containment prevents the spread of the beetle beyond the current infestation area. In February 2004, the federal Minister of Agriculture and Agri-food issued a Ministerial Order under the *Plant Protection Act and Regulations*. The movement of



A forestry crew inspects an infested tree in northwestern Toronto.

firewood of all tree species along with nursery stock, trees, leaves, logs, lumber, wood chips and bark chips from trees belonging to the genera on page 7 is now prohibited or restricted within the regulated area. Movement of this material out of or through the regulated area requires a Movement Certificate issued by the CFIA. The disposal site for wood waste in Toronto is the Emery Yard, 27 Toryork Road. The hours of operation are Monday - Friday 7 am-3 pm (closed on weekends). If you live in Vaughan, please call **City of Vaughan, Public Works, 905-832-8562** for disposal information.

3) Treatment

Treatment of infested trees is currently limited to removal and disposal by cutting, chipping and tub grinding. To ensure all life stages of the beetle have been eliminated, chips must not exceed 15 mm in diameter. Stump grinding is required if an egg pit or exit hole is found within the lower 60 cm of the tree bole. Infested material, once treated and approved by the CFIA, can be used for compost and mulch outside of the regulated area.

The CFIA is also pursuing emergency registration for the insecticide imidacloprid to help prevent the beetle's spread. About 185,000 healthy host trees in the U.S. have been treated with imidacloprid, which is chemically related to the tobacco toxin nicotine. Evidence to date suggests there is no satisfactory insecticide treatment for infested trees, but research is ongoing.

The treatment program takes a zonal approach (See page 21). Clusters of infested trees constitute a **primary zone**. Concentric rings with radii of 400 and 800 metres have been drawn around each primary zone to create **secondary** and **tertiary zones**.

In the first eight months of the eradication program, four infested areas were identified in Greater Toronto – a core area centred on Steeles Avenue West, and three satellite areas (Ansley Grove, Beechwood Cemetery and Thistletown). All infested and host trees were removed from the primary zone of the core area. All infested trees were removed from the satellite areas.

In the core area, most host trees in the inner 400-metre (secondary) zone have also been removed. In satellite areas, trees in the secondary zone with egg pits have been removed; tree climbers will monitor all other suitable host trees. If exit holes are discovered, the locale will be identified as a primary zone and more trees will be removed (e.g. Ansley Grove).

In the outer 400-metre (tertiary) zone, all suitable host trees will be surveyed. A locale will be identified as either a primary zone, if exit holes are found, or a secondary zone, if egg pits are discovered. Both cases will trigger tree removals and more intensive surveys.

This eradication plan is based on previous research on Asian long-horned beetle dispersal patterns. About 99% of the beetle population is found within 400 metres of the last known infested tree. Nearly 100% of the population is found within 800 metres.

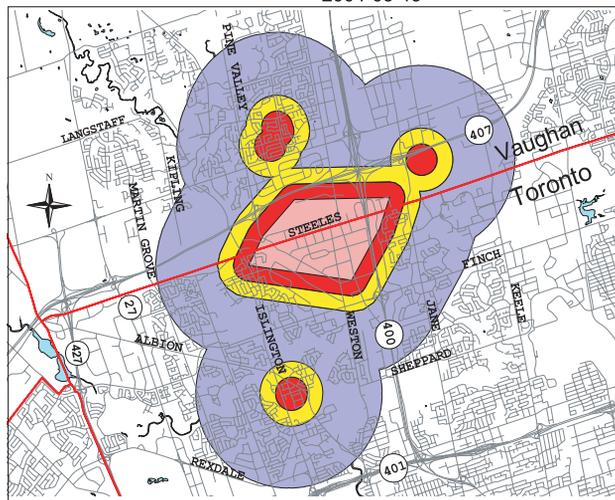
Signs of infestation can be very difficult to detect. In Chicago, data has shown that inspectors finding all infested trees has been no more than 70% effective. Eradication of the beetle requires the treatment of both infested and host trees.

More than 15,000 trees were removed in Greater Toronto between November 2003 and March 2004. Another 40,000 host trees in the secondary and tertiary zones are currently being inspected and will require ongoing monitoring. Treatment of these trees, if necessary, has yet to be determined.

Research is addressing questions about dispersal, host preference, egg-laying behaviour and other matters related to the beetle's biology and ecology in Greater Toronto. Some answers will come from removed trees, which are then sent to a designated CFIA lab where they are examined in detail. The scientific data collected will help guide the eradication project.

We now know that trees growing in open conditions are at more risk than trees growing in forests. Consequently, special treatment protocols for woodlots and ravines outside the core area have been developed.

Asian Long-horned Beetle / Longicorne Asiatique
Toronto - Vaughan, Ontario
2004-05-19



Canadian Forest Inspection Agency / Agence canadienne d'inspection des forêts

Legend / Légende

- Containment Zone / Région circonscrite
- Primary Zone / Région primaire
- Secondary Zone / Région secondaire
- Tertiary Zone / Région tertiaire
- Water / Eau
- Roads / Rues



The information is subject to change pending survey results

L'information est sujette à changement selon les résultats des enquêtes de dépistage

Infestation zones in Greater Toronto, March 2004. These zones lie within a larger regulated area (see pages 13 and 15), where the movement of woody material is prohibited or restricted. For current maps of the infestation zones and the regulated area, visit www.inspection.gc.ca.

4) Replanting

Replanting establishes new trees in the infestation area as soon as possible after tree removal. Until the Asian long-horned beetle is eradicated, municipal foresters will plant only species with a low risk of being infested.

Municipal staff are working with the CFIA, Ministry of Natural Resources, Trees Canada, York Region and Toronto and Region Conservation on a long-term reforestation strategy for Toronto and Vaughan. This includes looking for sources of funding beyond the property tax base. In February 2004, the government of Ontario announced that up to \$1 million would be allocated to plant new trees in areas affected by the Asian long-horned beetle (in Toronto and Vaughan) and the emerald ash borer (in southwestern Ontario). In May 2004, the CFIA announced a tree replacement program to compensate for trees ordered destroyed to prevent the spread of the Asian long-horned beetle in parts of Toronto and Vaughan, Ontario. This program is intended to compensate those who lost trees due to the Agency's control and eradication measures for this invasive pest between November 2003 and December 31, 2004. To obtain detailed information on the CFIA's **Compensation Plan** visit www.inspection.gc.ca or call **1-800-442-2342**. There are other sources of funding as well. Tree Canada Foundation is helping raise awareness and money by pooling donations from individuals and companies to replace trees lost to this beetle. York Region has currently allocated \$50,000 toward replacement of trees in Vaughan.

Renewing the Urban Forest

Even if the Asian long-horned beetle's attack can be limited to those areas currently infested in Greater Toronto, the removal of thousands of trees will dramatically change the urban forest and the appearance of many neighbourhoods. Will anything positive emerge from this devastation?

As a clear and present danger to the urban forest, the beetle has underscored the need to improve tree care in cities. Renewing the urban forest means many things. It means planting more trees, and a greater number of tree species, to expand and diversify the forest canopy. It means ensuring that trees have an adequate growing environment, including soil, space and water. It means controlling invasive, non-native species that undermine the local ecology.

Renewing the urban forest means that we all must think seriously about the needs and the benefits of city trees, and then develop and implement a plan of action. This is not a job for government alone – as the beetle battle has demonstrated, success requires the support and participation of an active and aware community.

Community stewardship is essential to renewing the urban forest and responding to threats like the Asian long-horned beetle.



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