In old-growth forests of Algonquin Park, like the one at Kenneth Lake pictured above, hemlock trees commonly reach over 300 years in age.

In the photo below, at Great Smokey Mountain National Park, many of the old-growth hemlock trees were killed by hemlock woolly adelgid in less than 10 years. Because we can draw on decades of management experience in the US, the situation in Ontario is more hopeful.

Eastern hemlock: an ecologically important species

Hemlock is a very long-lived tree that is common in many of Ontario's old-growth forests. It often grows on steep ravine slopes, on lakeshores and along creek-sides where it casts very deep shade, cooling streams so that cold-water fish such as brook trout can live there.

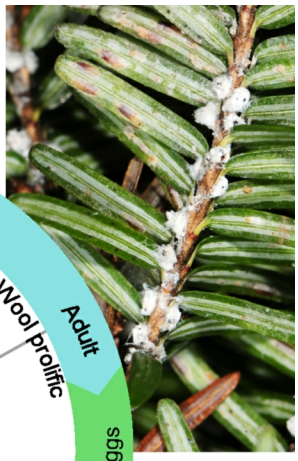
Louisiana waterthrush feeds on bottom-dwelling insects and crustaceans in cold-water streams of southern Ontario, and was recently reassessed from *Special Concern* to *Threatened* status because of the growing threat to eastern hemlock. Louisiana waterthrush is known to breed in hemlock ravines near Long Point and in the Dundas Valley.

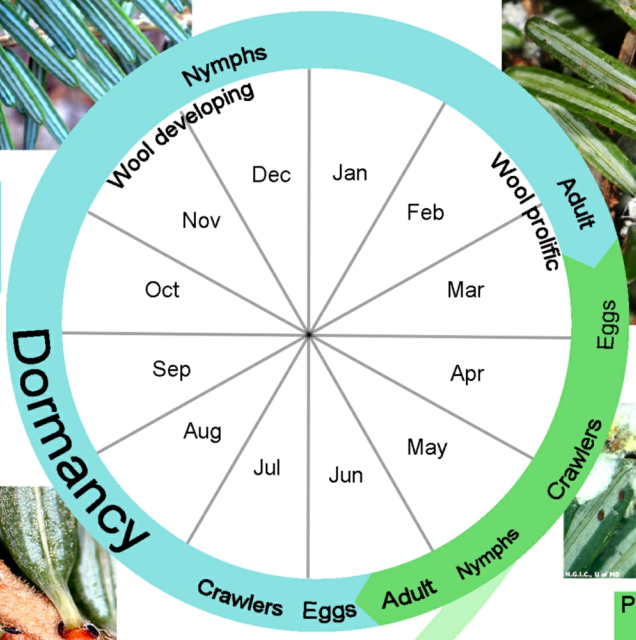
Hemlock Woolly Adelgid

Hemlock woolly adelgid (HWA) was introduced from Japan and has spread through more than half of the geographic range of hemlock, and through much of 20 US states. It was first detected in Ontario in 2012.

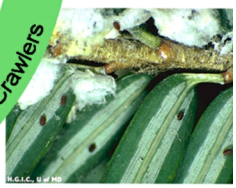
HWA is a serious threat to Ontario's hemlock forests, and is moved on nursery stock or by birds. So far it has been detected in Niagara Falls (where it was probably carried by birds), and in Etobicoke (where it was likely introduced on nursery stock).

It's not hopeless! HWA can be managed using a combination of systemic insecticides and biological control. A species of beetle (*Laricobius nigrinus*) and two kinds of silver fly (*Leucopis* spp.), all from western North America, are showing promise for control of HWA. In order to manage it, however, we need to know where it is. You can help by participating in citizen monitoring for hemlock woolly adelgid.





Sistens (winter) generation "to halt"



Progrediens (spring) generation "to proceed"

Winged adult lives on Japanese spruce trees: dead end in North America

Hemlock Woolly Adelgid Biology

HWA has two asexual generations per year, and adults lay 25-175 eggs in each generation. This tremendous fecundity means that even small populations of the insect can expand rapidly, and recover quickly from high rates of winter mortality.

After eggs hatch there is a brief crawler stage, then the insects embed themselves in the twig at the base of a needle, and suck juices from the tree. HWA undergoes a period of dormancy in the summer, and is very hard to see.

In winter HWA develops a woolly coating, which is easily observed as small balls on the underside of the branches - consequently winter and spring are the best times for surveys.

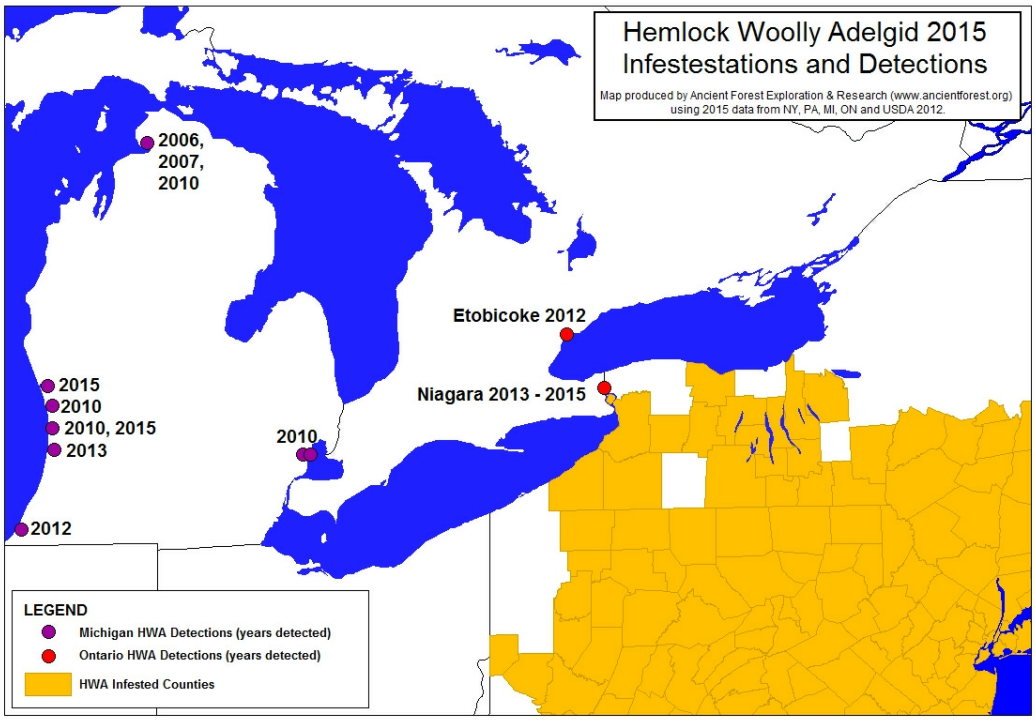
It can take several years for HWA populations to grow and be noticed at ground level. It may take 10 years or more for trees to die, although HWA in combination with drought may kill infested trees much more rapidly.

Marv Elliott

How HWA moves around

- Wind can move adelgid crawlers 300 m or more
- Birds commonly move crawlers several km or more
- HWA can be moved 100's of km on hemlock nursery stock
- Hikers may sometimes move HWA

The areas of Ontario at highest risk include the Niagara Peninsula and the Greater Toronto Area, however it could potentially be found almost anywhere in the province where hemlock grows.



Report HWA sightings to CFIA: 1-800-442-2342 or use the EDDMapS Ontario app: www.eddmaps.org/ontario

Learn more:

www.ancientforest.org/hemlock

http://www.inaturalist.org/projects/eastern-hemlock-project

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