

## Report to Planning and Environment Committee

**To:** Chair and Members  
Planning & Environment Committee  
**From:** Kelly Scherr, P. Eng., MBA, FEC  
Managing Director, Environmental & Engineering Services  
and City Engineer  
**Subject:** Urban Forest Health - Oak Wilt  
**Meeting on:** February 19, 2019

## Recommendation

That, on the recommendation of the Managing Director, Environmental and Engineering Services and City Engineer, that this report **BE RECEIVED** for information.

## Executive Summary

**2015-2019 Strategic Plan Alignment:** Building a Sustainable City: 3. Strong and Healthy Environment; C. Plant more trees and better protect them from deforestation, invasive species and other threats.

Council approved in its Urban Forest Strategy (2014) to plan for the effective management of invasive species of pests that will be harmful to trees, with the development of an Invasive Species Strategy.

The purpose of this report is to inform Council of the potential future forest health threat to London's urban forest from [Oak Wilt](#). Oak Wilt is a fungal disease that poses a threat to oak trees and certain other species and could result in their rapid decline, death and removal throughout the city of London. We know where Oak Wilt is, we know how it has moved through parts of the United States, and we can assume that it may appear in London.

There is currently no known "cure" for this disease and its management centres on early detection and reporting through community awareness and education. This report includes what the City is doing to anticipate its arrival and examines the possible costs of managing this disease among City-owned trees and woodland assets.

## Analysis

### 1.0 What Is Oak Wilt

Oak Wilt is a fungal organism called *Ceratocystis fagacearum* (syn. *Bretziella fagacearum*) and it is a regulated pest under the Plant Health Act and Plant Protection Regulations enforced by the Canadian Food Inspection Agency (CFIA). The fungal organism, once in the tree, creates blockages in the tree's vascular system, killing the tree as important water and nutrients cannot move throughout the tree.

The Oak Wilt fungal organism can be spread the following ways:

- through contact with the native sap beetles (known as picnic beetles or beer beetles) as they move from tree to tree,
- by human movement of firewood from infected (mostly red) oak trees,
- by root grafts below ground between adjacent infected and uninfected red oaks.

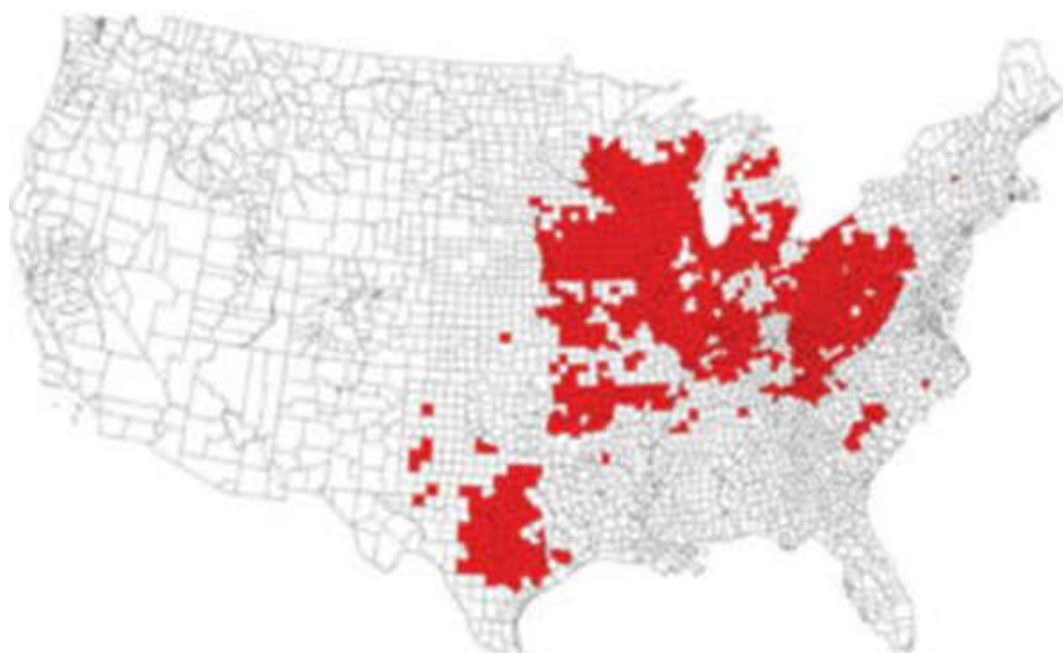
Oak trees are divided into two “family types” red oaks (includes red, pin, black) and white oaks (includes white, bur). Oak Wilt affects all species of oak, with the most rapid decline seen in the red oak family. In these types of oaks this can happen in just a few weeks, while white oaks may persist after infection for decades. Oaks typically resist decay and retain their strength. There is generally little immediate risk to human life property from an oak tree when it dies. A dead oak may stay standing for decades. However, the ongoing presence of an infected tree as a host is a serious concern.

Infection can happen at any time the fungus is producing spores, which is usually in the warmer, wetter months of spring. The most noticeable symptom will be a sudden wilting of the foliage, which may appear to be water-soaked. Green leaves as well as discoloured leaves may drop prematurely in the summer, or leaves may turn brown and remain on the tree. Fungal sporulation mats or patches develop on the infected red oak trees, very rarely on white oaks, appearing on the trunk or larger branches. These mats typically appear the spring following a summer infection by Oak Wilt and can be associated with vertical cracks that are created by the outwards pressure of the mats. The mats produce a peculiar and diagnostic sweet smell described as being identical to Juicy Fruit™ gum. Beetles are attracted to these fungal mats and may carry the fungal spores to the next host tree. The fungus can be found still viable in infected sawn lumber 24 weeks after sawing.

Oaks are native to the Americas, supporting a strong domestic and international market for quality lumber, dyes and tannins. Oaks are also an important component of our Carolinian forest and contribute to diverse and spectacular fall colour. Oaks are extremely valuable for wildlife, usually being very long-lived trees, with each oak species capable of supporting hundreds of other species over its lifetime, as well as providing useful shade, amenity and other ecosystem and cultural benefits. Our first official Heritage Tree, The Meeting Tree at Westminster Ponds, is a white oak.

#### **Where Is Oak Wilt Found?**

Oak Wilt has never been detected in Canada, but it has been identified within 600m of Canadian shores. Oak Wilt has been known in the United States since the 1940s and it is now a widespread serious economic pest in many mid-west to eastern States (Fig. 1). The closest known host infection site is Belle Isle, Michigan just under 600m from Windsor, Ontario (Fig. 2) which was detected in 2016.



**Fig. 1** Oak Wilt occurrence in the United States (Source: USDA Forest Service, 2010)



**Chemical Techniques**

At the time of writing, there are no approved methods for chemical (pesticide) prevention of the disease in Canada. Experience from inoculations of ash trees against Emerald Ash Borer here in the City, and reports from US companies treating oaks is challenging. Reports have shown that unless the tree is still really healthy, on good soils, and primed by recent rain, it can take many hours for the inoculated solution to be taken up. Preliminary estimates are between \$2,000-\$3,000 to treat a 25cm diameter oak tree for the costs of the injection kit, licensed labor and pesticide product.

**3.0 Impact to the Urban Forest**

When or if Oak Wilt arrives in the City, the impact to the urban forest in any one year may be modest, but cumulatively Oak Wilt will likely lead to the loss of our most valued large trees, and decimate oak-rich parts of the City. When the City conducted its Urban Forest Effects study in 2008, approximately 2% of all London’s trees were oaks. By stem count, this is about 140,000 trees. Roughly one-half, or 70,000 of those trees (1% of all trees) are highly susceptible species of oak that would die within a year after infection by Oak Wilt. The remaining 70,000 are more resistant, but would still become infected, dying slowly over a decade or so. It is estimated that the City owns about 30,000 oak trees across all its lands, and that 20,000 of those, including 6,000 on City streets, would be highly susceptible to Oak Wilt.

Proportionally, slightly more oak are present in the rural areas of the City, located in woodlands and woodlots. There are, however, certain parts of the City urban area where oaks are the predominant species of the urban forest e.g. Oakridge, Warbler Woods, and Kiwanis Park. Generally, oaks are very long-lived, large-stature trees so considerable canopy could be lost with each tree that dies. Property values would be likely to drop in neighbourhoods where oak trees are lost, a consequence of loss of shade, privacy and landscape degradation, as has been experienced through many cities in the US.

**4.0 Key Issues and Cost Considerations**

**Root Trenching**

Root trenching is the process of using a piece of equipment with rotating sharp blades to cleanly cut the root connections between trees. Current research is to cut to a recommended depth of 1.6m (5’) if possible and 10cm (4”) in width to create “suppression trenches” between healthy and impacted oak trees in natural settings. Proper placement and location of the trench is very important in the containment of Oak Wilt. While root trenching aims to minimize the number of oak trees removed while achieving control of infection, it is unlikely to be a viable option in the urban area of the City because of the presence of utilities and infrastructure in City streets and yards, and the lack of suitable access for machinery to enter, move through, and exit an urban woodland. Many of our woodlands in Parks have inadequate or no access suitable for machinery or vehicles. If access were available, most woodland soil is sensitive to compaction and erosion, so the use of geotextile mats, silt fencing and temporary roads could be an extra budget consideration.

Root trenching costs would likely vary between \$1,500 and \$4,500 per tree, depending on whether good access above and below ground is available for the machinery to work around the tree or if brush-mowing is necessary.

**Logistical Considerations Woodlands**

Should the Canadian Food Inspection Agency require complete destruction of infected oak trees to control Oak Wilt, the logistics of complying with such an order may be considerable. The challenges may be severe in park woodlands where equipment and the logs and tree debris may have to be taken to and from site by helicopter (This is what occurred on Belle Isle.), on foot, or by horse. In some woodlands it may be possible to remove other trees to create appropriate access routes for machinery, and staging areas for oak disposal operations (e.g. chipping or shredding, burning or burial) within the woodland.

Costs of control may be highest in Park woodlands if equipment and the logs and tree debris that result from work have to be taken to and from site by helicopter, on foot, or by horse. Lesser, but still significant, costs may occur with removal of other trees to create appropriate access routes for machinery, and staging areas for oak disposal operations within the woodland. To remove the infected tree entirely, disposing of all the waste to a landfill, or chipped, burned or buried on site, is estimated to cost around \$1,500 to \$5,000 per tree depending on tree volume, assuming the tree is easily accessible by machinery. If not readily accessible, costs of control on site (with additional trees removed as necessary for accessibility) would likely be in the region of \$5,000 - \$10,000 per infected tree, depending on tree volume and method chosen to remove or dispose of waste.

On City streets there are about 6,000 oaks that are susceptible to Oak Wilt, and around 3,000 oak trees that are resilient. Theoretically, if preventative treatment by chemical means were permitted in Canada, it might cost around \$2 million per year (treating 50% of the trees each year) to inoculate all these street oak trees, and would require a large team of Licensed Exterminators. But even if this method was available to us, it is doubtful the City could hire sufficient Licensed Exterminators to complete the work inside the June – August period.

Other costs that could be seen as a potential result of Oak Wilt are costs to City services such as disposing of debris, impact to landfills and associated operational costs. Chipping and shredding of the wood appears to be typical practice in the hot, southern United States such as Texas, so it dries quickly, causing the fungus to desiccate and die. It is not clear whether this would be an option here in Ontario.

It remains to be seen whether the Canadian Food Inspection Agency will provide financial support to any municipality that may be ordered to control Oak Wilt by root trenching or tree destruction. The Canadian Food Inspection Agency does provide some financial compensation to municipalities ordered to destroy trees to control another invasive pest in Ontario, the Asian Long-horned Beetle. However, the level of financial support to a municipality may not be enough to cover the full costs for removal and replacement by new trees.

**Cost Implications – Private Lands**

It can be expected that private citizens will have the same challenges if Oak Wilt impacts their private lands. This includes not only residential land owners, but also golf courses, commercial areas and conservation lands.

It is unknown whether the Canadian Food Inspection Agency will provide financial support to any landowner that is ordered to control Oak Wilt on their property. The Canadian Food Inspection Agency did provide some financial compensation to landowners in Ontario that were ordered to destroy trees to control Asian Long-horned Beetle.

**5.0 What is The City of London Doing**

**Communicate and Educate**

The City of London Urban Forestry Division continues to be in close contact with the Canadian Food Inspection Agency and other regional stakeholders such as The Invasive Species Centre on emerging research and information on Oak Wilt. Staff are participating in the regional Oak Wilt Technical Advisory Committee (TAC).

The City of London's Urban Forestry Division is planning a regional Oak Wilt workshop with these groups for industry leaders, such as other municipalities, conservation authorities and/or golf courses in early March. An evening public meeting with experts in the field is planned to be held for interested residents to drop in and learn about Oak Wilt.

With support from Communications staff, an Oak Wilt Awareness campaign will be implemented this spring to coincide with camping/cottage season informing residents



about Oak Wilt and the risks with moving fire wood. Videos have been created for social media – “Don’t Move Firewood” and “The Meeting Tree” and plan to be launched via Twitter and Facebook. In addition, Urban Forestry has updated its web content to include a page for Oak Wilt. <http://www.london.ca/residents/Environment/Trees-Forests/Pages/Oak-Wilt.aspx>

**Staff Training and Practice**

City staff from Parks Planning, Forestry Operations and Urban Forestry attended a presentation of the symptoms, signs and control of Oak Wilt at an internal staff meeting. Also, several City staff have attended educational workshops about Oak Wilt with a recent new hire holding one of the first Oak Wilt Qualification designation in Ontario. The Upper Thames River Conservation Authority staff who manage seven of the City’s Environmentally Significant Areas (ESAs) have been educated about Oak Wilt. Field staff have been trained and are aware of the signs and symptoms and will be implementing best practises in managing the disease.

Pruning of City oak trees in the months of April to July has been halted by Forestry Operations, except for public safety emergencies. Where pruning of oak trees is unavoidable in the April-July period, wounds will be painted. Similar to other municipalities, The City is reducing the number of red oak trees planted under the current tree planting contract, subject to the minimum that has been contractually obliged to date and will plant no red oaks moving forward. Substitution by white oak species may be permitted.

**Woodland Acquisition and Management Reserve Fund**

On March 21, 2017 Council approved a proactive revision to the Woodland Acquisition and Management Reserve Fund that identified invasive pests as a potential issue for the long-term health of the City’s woodlands. With this revision, it would be possible to utilize the reserve fund to assist with the costs of addressing the impacts of Oak Wilt within woodlands. This fund is also used to acquire woodlands and manage other invasive species.

**6.0 Financial Impact**

For illustrative purposes, the City has budgeted \$400,000 per year in the capital budget since 2012 to deal with the Emerald Ash Borer. This annual funding anticipated to continue until approximately 2032. In the event that Oak Wilt arrives in the City of London. A future budget request may be required to provide the necessary resources to address the infection. As described in this report, the costs of managing Oak Wilt can be anticipated to be significant for both the City and for landowners in our community. It is expected that the City of London would be responsible for a portion of the costs should an infection occur on its lands, although the magnitude of those costs would be dependent on the extent of the disease, the method of control, and the funding contributed by other partners such as the Canadian Food Inspection Agency.

**7.0 Conclusion**

Oak Wilt is and will continue to be a threat to London’s oak trees and is likely to arrive here within their lifetime. Public education and awareness, early detection and reporting are important components in limiting the spread of Oak Wilt. Staff training should continue to be supported so that personnel involved in tree care are able to assess oak trees for early signs of infection. The cost to control this new disease is unknown, but likely to be considerable for both the City and for landowners in our community. If Oak Wilt is discovered in the City, control and cost recovery will be managed through agreement with, and regulations enforced by, the Canadian Food Inspection Agency.

**Acknowledgments**

This report was prepared with the assistance of Sara Rowland, Urban Forestry Planner.

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