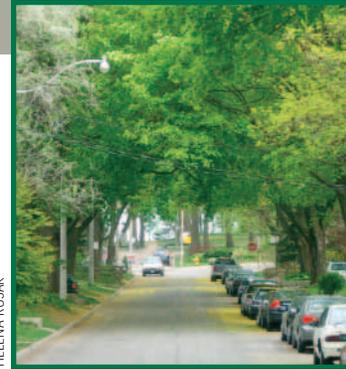




HELENA RUSAK

# Urban Forests: An Important Part of Our Natural Heritage



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## WHAT IS THE URBAN FOREST?

The urban forest is an integral part of our woodland heritage in southern Ontario. This resource is typically located in areas under intense pressures from human activity. At the same time, these forests have a direct influence on the urban population and provide us with a host of essential environmental, economic and psychological “goods and services.” Often it is the most common connection that urbanites have with their natural environment.

The urban forest can be described as a system of plant and animal communities, or as the woody and associated vegetation in and around human settlement areas. It includes street trees, residential trees, park trees and greenbelt and ravine plant and animal communities, and provides habitat for a diversity of urban wildlife.

### Is the urban forest different from forests in the surrounding countryside?

The urban forest can be viewed as a continuum passing through degrees of “urban-ness,” ranging from trees in planters in the downtown core to backyard trees to the interspersed woodlots of a more rural landscape. Urban forests exist in big cities, in small towns and in the spaces in between. What is common throughout is that planning decisions, human action and movement, and human alteration of landscape features influence these trees. Despite different immediate environments, collectively these trees are part of a continuous ecosystem and need to be planned for.

### What benefits do we get from our urban forests?

*Improved air quality:* Toronto’s urban forest, for example, alone removes almost 1,500 tonnes of air-borne pollutants yearly. Leaf surfaces are able to trap and absorb noxious gases and particulates. This can go a long way towards alleviating our increasing problems with smog.

*Extremes of temperature:* Urban trees and wooded areas are able to buffer extremes of temperature in highly urbanized areas. Not only does shade prevent the ground and built structures from absorbing and re-radiating solar energy, but trees also transpire vast quantities of water on a daily basis, cooling the ambient air.

*Property values and aesthetics:* Trees have been shown to enhance the market value of residential properties by as much as 25 percent in some cities. People simply prefer to live in treed neighbourhoods.

*Storm-water reduction:* Urban forests allow infiltration and the immediate absorption or retention of rainwater by tree root systems, keeping polluted storm water from directly entering sewer systems. This reduces flood risks and improves the quality of the water.

*Energy conservation:* Appropriately selected and placed trees can provide energy conservation benefits by way of wind breaks in the winter, cutting heating costs, and shade in the summer, cutting air-conditioning consumption.

*Reduced noise pollution:* Trees have the ability to buffer noise. Substantial tree buffers (greater than 30 metres wide) along highways and industrial sites can reduce the harmful effects of noise pollution

*Wildlife habitat:* Trees provide essential food and shelter for all kinds of wildlife from microorganisms to birds and small to larger mammals, such as fox and deer.

*Physical and psychological well being:* Trees and natural areas have been shown to promote psychological well-being. Studies have shown that hospital patients with a window view of a green canopy recover more quickly. Treed neighbourhoods are less stressful environments, with lower crime rates and an enhanced sense of community.



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## *Our attachment to trees in our neighbourhoods*

A recent survey of attitudes of urban residents towards urban forests tells us that the vast majority (84 percent) thinks the presence of trees in their local community is very important. This includes trees on private property and those on public property such as streets and parks. Almost no one thinks trees are unimportant, and most believe strongly that trees play a very important role in urban areas, while having a major impact on their own personal health and well being. As well, most urban residents (84 percent) view the woodlots and forests found generally throughout southern Ontario as important.

## *The urban forest in our backyards*

The management of urban trees in most municipalities involves only trees located on municipally owned property. This typically includes “street trees” – trees within the road allowance on residential front lawns, boulevards, municipal parks, ravines and other municipally owned properties. The planning and maintenance of these trees include species selection, site selection, pruning schedules, planting and removals, watering, and tree inventories. All of this is done in an effort to maintain and enhance our urban forests – yet up to 90 percent of the trees that make up the urban forest are on private property and in people’s backyards! These trees are not maintained by the municipality but are looked after by the residential population. Hence, most of the important decisions about what species of trees to plant, where to plant them and how to take care of them are left up to the homeowner.

## *The urban forest in our public spaces*

Urban woodlands are a critically important part of the urban forest landscape. These are the greenbelts and more naturalized areas that represent the remnant forests and relics from pre-urbanization. Often they are represented in our cities and towns by areas such as natural river valleys and ravine systems that have not been developed, largely because of the instability of the slopes and the potential for flooding. These urban woodlands can be excellent representatives of the original forest ecosystem types that once existed there. Despite heavy urban stresses upon them, they can contain a diversity of native tree and understory species, including wildflowers.

Toronto has many fine examples of urban woodlands in the major river systems that flow from the Oak Ridges Moraine into Lake Ontario, including the Humber, Don, and Rouge Rivers. These valley systems are often the only mechanisms that allow natural movement of plant and animal life. They serve as stopover and

migratory paths for birds and as natural corridors for fish and mammals.

Urban woodlands serve a wide variety of functions. They provide stable cover and erosion protection in sensitive areas, habitat and migratory paths for wildlife species, and connected and accessible systems of natural areas for human recreation. They protect water quality and quantity. They are places of diversity. These “anchors of the urban forest” are thus highly valued landscapes in urban settings, and this value rests heavily on maintaining them as an intact, connected system.

## **A vision for the urban forest**

### *Genetically appropriate selection*

The importance of biodiversity to healthy ecosystems is not limited to natural areas. A more diverse urban forest will provide a greater variety of habitats for wildlife and a more interesting environment for humans. Even more importantly, genetic diversity will help protect the urban forest from catastrophic losses due to insects, disease, drought, and climate change. For example, the impact of Dutch Elm Disease on urban forest ecosystems with a disproportionately large number of trees in one genus is well known. Throughout North America, many saw their streetscapes devastated by the fungus.

Unfortunately, we didn’t learn from this painful lesson. We continue to rely too heavily on species such as Norway maple, green ash, and honey locust in our urban forests. Since most of these trees are produced vegetatively (by grafting), the genetic diversity within species is very low. It has been suggested that an urban street tree population should be made up of no more than 30 percent of one genus, 20 percent of one family, and 10 percent of one species.

### *Age distribution*

As with a diversity of species, there should also be a diversity of ages in the urban tree population. Many parts of our cities are facing declining tree populations, as the trees age and die off, without a new generation of trees coming up to replace them. In a more naturalized forest, this happens through natural regeneration. In the urban forest, trees need to be planted and cared for throughout its lifespan to ensure that it is healthy and reaches maturity.

### *Bigger is better*

Bigger trees provide exponentially more benefits than smaller ones. Most of the benefits we derive from the urban forest can be

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directly or indirectly related to the total leaf area of the urban forest. It is the leaves that take in carbon dioxide and eventually, through photosynthesis, lock up carbon in the wood. Similarly, leaves absorb gaseous pollutants and trap dust particles. Since big trees have a much greater leaf area than small trees (and also store much more carbon), it is important to retain these big trees as long as possible. Therefore, protecting and caring for existing large trees while also establishing species that have the potential to become large is important.

#### *Conservation*

A tree-planting program alone is not a comprehensive urban forest management strategy because it does not consider the care and maintenance of established trees that will allow them

to survive a long period of time in a stressful environment. It is important to conserve and maintain the ageing tree population into a mature canopy.

To integrate larger older trees into the urban fabric, appropriate growing space must be protected and expanded to accommodate them. This includes space for a mature tree's root system, adequate height and breadth for the canopy, and freedom from obstructions such as fences, buildings, and overhead wires.

#### **Using Toronto as an example, urban forests do a lot to provide environmental benefits in urban areas.**

*Canopy cover:* Toronto's urban forest cover has recently been calculated at 20 percent. This includes canopy in residential areas and on private property. These figures compare well to those of cities like Boston, Philadelphia and Baltimore. The percentage of forest cover in Toronto is a lot higher than in some Ontario counties. In Essex County, for example, forest cover is only at about 3-5 percent.

*Carbon sequestration:* Toronto's 7.5 million trees and shrubs store about 900,000 tonnes of carbon and sequester a net 28,000 tonnes of carbon each year.

*Pollution:* Our urban forests trap or absorb a number of other pollutants in great quantities. Estimates for Toronto include:

- ozone: 614 tonnes/ year
- sulphur dioxide: 117 tonnes/ year
- nitrogen oxide: 306 tonnes/ year
- particulate matter of less than 10 microns: 452 tonnes/ year

*Valuation:* The nearly three million trees in Toronto's residential areas are valued at \$2 billion. This is a conservative estimate as it represents only the replacement cost of those trees. If all the services that the urban forest provides were accounted for, including pollution abatement, energy savings and social value, this figure would be much, much higher.

Further references and reading:

Urban Greening  
[www.ecoiq.com/onlineresources/anthologies/urbangreening](http://www.ecoiq.com/onlineresources/anthologies/urbangreening)  
Articles, essays, and longer documents on urban forestry.

Evergreen [www.evergreen.ca/en/index.html](http://www.evergreen.ca/en/index.html)

Dedicated to preserving and restoring natural areas in the urban environment through education and community action projects in order to make Canadian schools and communities healthier places to live, learn, work and play.

American Forests [www.americanforests.org](http://www.americanforests.org)  
American Forests, the United States' oldest citizen-based conser-



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vation organization, and is a leader in the burgeoning urban forestry movement. The organization mixes education, action, and research into programs that improve trees and forests in our communities. Though the programs are unique in their specific goals and activities, they each centre on the idea that urban trees produce far-reaching ecological and social benefits.

Urban Forest Ecosystems Institute [www.ufe.calpoly.edu](http://www.ufe.calpoly.edu)  
The Urban Forest Ecosystems Institute (UFEI) is a new program being developed by the Natural Resources Management Department faculty to address the increasing need for improved management of the urban forests in California.

The Garden Spider's Web [www.hcs.ohio-state.edu/talks/Phipps/InternetResources.html](http://www.hcs.ohio-state.edu/talks/Phipps/InternetResources.html)  
This site provides plenty of links to gardening and urban forestry related sites.

Private Land Resource Stewardship Program (Ontario) [www.ontariostewardship.org](http://www.ontariostewardship.org) A program of the Ontario Ministry of Natural Resources linking landowners, land interest groups and agencies to encourage responsible land care on private land.

LEAF [www.leafontario.org](http://www.leafontario.org)  
LEAF is a non-profit group dedicated to the protection and improvement of Toronto's urban forest. Present activities focus on a residential tree planting program within the new city of Toronto (Scarborough, North York, York, Etobicoke, East York and Toronto).

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The Federation of Ontario Naturalists (FON) protects Ontario's nature through research, education, and conservation action. FON champions woodlands, wetlands and wildlife, and preserves essential habitat through its own system of nature reserves. FON is a charitable organization representing 25,000 members and supporters and 125 member groups across Ontario.

Fact sheets in this series include:

Cores and Corridors: The Importance of a Green System in Southern Ontario  
Forest Fragmentation  
Introducing Old Growth – The Ultimate Forest  
10 Ways to Save Your Local Woods (and Water!)  
Urban Forests: An Important Part of Our Natural Heritage  
Making the Connection Between Woodlands and Water

*Woodlands At Risk* is a 32-page full colour booklet about the threats to southern Ontario's woodlands, available from FON.

If you wish to support FON or learn more about current conservation issues in Ontario visit: [www.ontarionature.org](http://www.ontarionature.org)



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