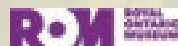




# TREES, SHRUBS & VINES OF TORONTO

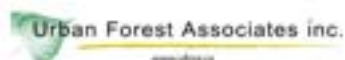
A GUIDE TO THEIR REMARKABLE WORLD

• City of Toronto Biodiversity Series •





Imagine a Toronto with flourishing natural habitats and an urban environment made safe for a great diversity of wildlife. Envision a city whose residents treasure their daily encounters with the remarkable and inspiring world of nature, and the variety of plants and animals who share this world. Take pride in a Toronto that aspires to be a world leader in the development of urban initiatives that will be critical to the preservation of our flora and fauna.



Cover photo: "Impact," sugar maple on Taylor Creek Trail  
by Yasmeen (Sew Ming) Tian



photo: Jenny Bull

Ohio buckeye, *Aesculus glabra*: in full flower on Toronto Island (above);  
the progression of Ohio buckeye flowers (counterclockwise on next page)  
from bud, to bud burst, to flower clusters elongating  
as leaves unfurl, to an open flower cluster

*"Indeed, in its need for variety and acceptance of randomness, a flourishing natural ecosystem is more like a city than like a plantation. Perhaps it will be the city that reawakens our understanding and appreciation of nature, in all its teeming, unpredictable complexity." – Jane Jacobs*



photos: Baye Hunter

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## Welcome!

To encourage the celebration of all life on earth, the United Nations declared 2010 to be the Year of Biodiversity. We congratulate the City of Toronto for honouring this special year with this Biodiversity Series celebrating the flora and fauna of our city. Each booklet within the series – written by dedicated volunteers, both amateurs and professionals – offers Torontonians a comprehensive look at a major group of flora and fauna within our city.

We hope that this Biodiversity Series will achieve its main goal: to cultivate a sense of stewardship in Toronto area residents. If each of us becomes aware of the rich variety of life forms, their beauty and their critical roles within the varied ecosystems of Toronto, we will surely be inspired to protect this natural heritage. After all, our own health and ultimately our very survival is linked to the species and natural spaces that share the planet with us. Without plants, there would be no oxygen; without the life of the soil, there would be no plants; without unpolluted fresh water, we would die.

While there are many organizations actively engaged in protecting our city's flora and fauna, the support of ordinary citizens is critical to the conservation of our natural habitats. We hope you'll take a walk in one of our parks and open spaces, lower your blood pressure, look around you, and enjoy the diversity of trees, animals, fishes, birds, flowers, and even fungi that flourish among us.

*Margaret Atwood*  
*Graeme Gibson*

With best wishes,  
Margaret Atwood and  
Graeme Gibson  
January 2011



## Introduction

In Toronto, trees and shrubs are ubiquitous. Resilient and resourceful, they are sentinels vibrantly heralding the march of the seasons and witnesses to the passage of time, ever while sequestering and recycling resources, and purifying our air. Seemingly they endure, from the staghorn sumac forcing up shoots through newly paved asphalt to the majestic white oak defying the environmental odds outside my window near the corner of Bloor Street and Queen's Park.

Immediate appearances, however, can be deceiving. Trees and shrubs are also silent canaries in the wooded coal mine: harbingers of environmental perturbation and first indicators of local and global impact of human activity. Elm, ash, beech, butternut and chestnut trees fall to the introduction of invasive insects and fungi, and the distributions of woody plants are significantly affected by broad-scale habitat alteration, direct human intervention and climate change.

And woody plants are not stand-alone wallflowers. Living or dead, the three-dimensional architecture of trees, shrubs and vines provides habitat for other organisms from woodpeckers and moths to flying squirrels and bracket fungi. In fact, one of the best indicators of a healthy forest community is the amount and complexity of standing and downed woody debris: a major factor supporting biodiversity in the city's green spaces (the shrews all cry, don't clear those fallen trees!).

*Trees, shrubs and vines of Toronto* is not a field guide in the typical sense. This delightful booklet is intended to reveal the surprising diversity of woody plants found within the city and highlight the vital role that the urban forest plays in the quality of our life in Toronto. I hope that this book will inspire you to go out and experience our botanical city-mates first-hand, and to admire their tenacity in an ever changing environment.

Yours in green,

*Mark D. Engstrom*

Dr. Mark D. Engstrom, Interim Director and CEO, Royal Ontario Museum

## City of Toronto Biodiversity Series

*Trees, Shrubs and Vines of Toronto* is part of the Biodiversity Series developed by the City of Toronto in honour of the Year of Biodiversity 2010. A number of the non-human residents of Toronto will be profiled in the Series. It is hoped that, despite the severe biodiversity loss due to massive urbanization, pollution, invasive species, habitat loss and climate change, the Biodiversity Series will help to re-connect people with the natural world, and raise awareness of the seriousness that biodiversity loss represents and how it affects them directly. The Series will inform residents and visitors of opportunities to appreciate the variety of species inhabiting Toronto and how to help reduce biodiversity loss by making informed individual decisions.



## For the Love of Trees

Trees are part of our lives and we delight in them. We relax while walking amongst them, we sit under them to rest, we seek their shade in summer, and we admire their colours, shapes and sounds throughout the year. By lifting our eyes to the sky, trees can connect us to whatever spiritual beliefs we hold dear. In fact, in many cultures, trees embody the spirits themselves.

In Toronto, a tree can be the longest living species we encounter. In laying a hand on a mature tree, we can touch our grandparents' youth at the same time as reaching out to our grandchildren's old age. Trees grow so slowly that their aging is imperceptible. It may seem like an old oak has always been an old oak. In fact, as living organisms like us, trees are constantly growing and changing. They have finite lifespans, some long and healthy, some cut unnaturally short. Both naturally occurring and planted trees are very dynamic, as individuals and as communities.

Toronto is recognized world-wide for its trees – on our streets, in our neighbourhoods, and in our ravines. Trees are all around us! They frame our environment; they define our sense of home; and they stand as key features in our mental map of our own communities, even defining some neighbourhoods as much or more than the buildings do. As members of the urban forest, trees are important contributors to our environment – providing many benefits to us and all living things.

Yet trees live difficult lives in an urban environment. They are removed for “development”, cut back to make room for utilities, and planted in inadequate spaces. Most of Toronto's residents feel a kinship to trees and are very vocal about protecting them, especially those close to home. Thousands are drawn to planting events throughout the city every year. But we must always be vigilant, recognizing that every tree counts and that the loss of a single tree diminishes the urban forest.

Let this booklet be your first step to learning more about trees. Then, plant a tree, nurture a tree, love a tree! Be kind to trees and we will all be rewarded!



*Trees, please!*

## The Story of The Great Tree of Peace

*As penned by: Amos Key Jr., Mohawk Nation, Turtle Clan,  
Director of First Nations Languages Department,  
SNP-Indigenous Knowledge Guardian, Faith Keeper,  
Woodland Cultural Centre, Brantford, Ontario.*

*This history is about the Indigenous North American Civilization and democratic society known as the Q:gweh̓:weh (tr. Original People) or Hodiŋhs̓:ni (tr. the People who build Longhouses). This Civilization covered territory across most of the north eastern part of the North American continent. This democratic civilization was established hundreds of years before Canada and United States were countries and at a time when the rest of the World was still being led by Kings and Queens. In this democratic civilization men and women hold an equal balance of power. This is the story of the origins of this first democratic civilization in the world and its symbols.*

The origins of this democratic civilization began at a time when the peaceful Q:gweh̓:weh communities of the Longhouse People were growing and increasing in their populations. Great numbers of individuals began to defy and not remember the virtues and rich teachings of the Creator and the tenets of His instructions. The Q:gweh̓:weh people at this time began fighting among themselves, bringing sorrow, destruction and even death to family and community. Upon seeing and hearing this chaos from His people, the Creator knew He had to help them regain civil order.

To this end, the Creator sent and instructed two wise men to help; one of whom the Longhouse People refer to as the 'Peacemaker', the other his Translator/Interpreter Hay̓hwahta' (tr. He Strings Wampum). Together they joined forces and their intellect and began to organize the communities into a democracy and confederacy of Five Nations. They first established family clan systems led by women who were, and still are, revered as Clan Mothers. Women were chosen to lead these Clans as they were the closest relative to the Creator in that they give life.





The Peacemaker with the guidance of the Creator crafted with the Five Nations, a Constitution. This Constitution contained a set of rules to govern and safeguard themselves internally, among their Nations, their Clans and their Families, as well as rules to engage with their neighbours externally. In time, 49 Chiefs were selected by each of the Clan Mothers to represent their Nations, Clans and Families. The 50th Chief was always chosen by the 'Chiefs in Assembly' and given the title: 'Tadodaho'.

This Constitution became known as Gayenahsra'go:wah or 'The Great Law' of the Mohawk, Cayuga, Onondaga, Seneca and Oneida Nations.

The Peacemaker relayed to the Five Nations, "The Creator has stated war against each other is foolish and is evil. The harm of war must cease and an everlasting Peace must be established to replace war among all peoples on Turtle Island."

At the conclusion of establishing the Great Law of the Five Nations, the Peacemaker bound five arrows together to symbolize the strength of this new democracy, with one arrow representing each of the Five Nations.

The Warriors of the new Five Nation Confederacy and the Great Law accepted the words of the Peacemaker as well. As recognition and acceptance of the new Gayenahsra'go:wah - Great Law of Peace, the Warriors and the people laid down their weapons of war.

### A WHITE PINE AS A SYMBOL OF PEACE

The Peacemaker upon seeing and hearing this acceptance, uprooted a great white pine tree and the Warriors and the people threw into the uprooted crevice, all their weapons of war. It is said, the Peacemaker chose this particular tree for its beautiful aroma, its

stature, and its ability to keep its colour and shade year in and year out. The Peacemaker perfectly matched the attributes of the Great White Pine to the strengths and principles of the Great Law of Peace to create another symbol.

To symbolize the burial of these weapons of war, the Peacemaker then replanted the tree and instructed the Chiefs, Clan Mothers and the People of the Five Nations to nurture and secure this new symbol as a 'Great Tree of Peace' so that it will never topple and it will grow stronger for all time.

The Peacemaker said, "Our Five Nation Constitution and Great Law is strong like this Great Tree of Peace. This Great Tree of Peace reaches high into the sky so that all peoples will see and know of its existence". The Creator then placed atop this Great Tree of Peace a regal Bald Eagle. With her keen eyesight, this regal Bald Eagle watches and surveys the bounty of Mother Earth. The regal Eagle was instructed to warn the Q:gwehQ:weh Longhouse People of any approaching harm and danger.

It is said, this Great Tree of Peace has four white roots that will grow towards the four directions. If any person or any Nation shall show a desire to trace these roots to their source and obey the Great Law of Peace, they shall be made welcome, to take shelter beneath this tree. Many Nations over the centuries have taken shelter and refuge beneath this Great Tree of Peace, becoming a part of this first 'United Nations'.

The Gayenahsra'go:wah or 'Great Law of Peace' of the Longhouse People and these symbols of the Q:gwehQ:weh Civilization are alive to this day.

## What is a Tree?

Everyone can recognize a tree, but it's a challenge to define "tree" in a way that applies to all examples. All trees belong to the dominant group of plants known as vascular plants, which have specialized cells that carry water and dissolved mineral nutrients from their roots to their leaves, and carry products of photosynthesis (sugars) from the leaves to other parts of the plant. But among vascular plants, trees are not a distinct group of closely related organisms in the way that fishes, butterflies, spiders or mosses are. For example, apple trees are more closely related to strawberry plants than they are to oak trees.

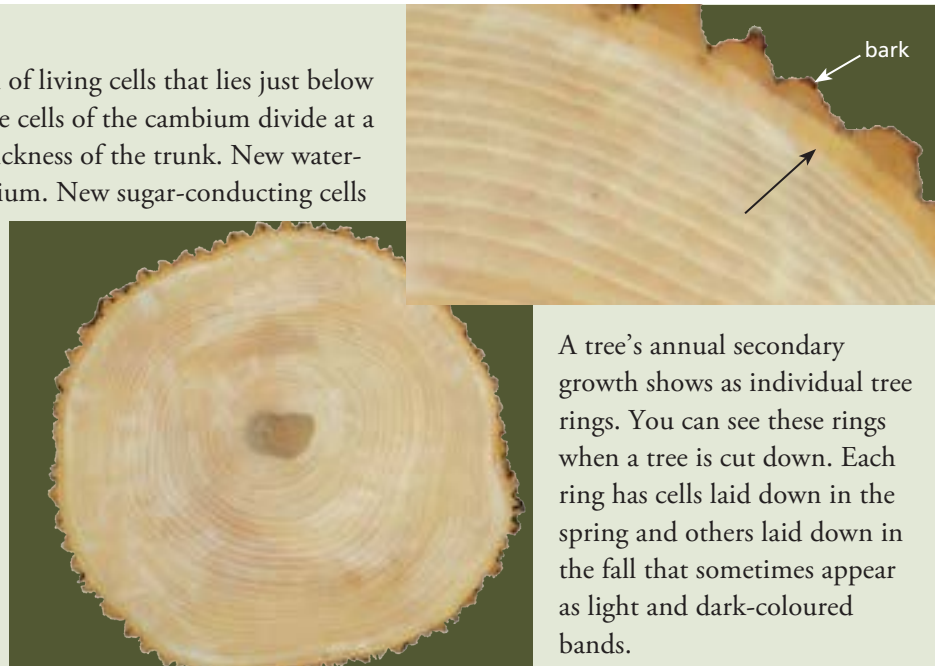
Trees command our attention because of their great size. Surprisingly this great size is achieved in part by the same growth process found in smaller vascular plants like strawberries or tulips. This lengthening process is called primary growth, that is, cell division that occurs at the tips of branches and roots.

The trees that grow in Toronto's temperate climate are able to grow to their great size because they not only grow *taller* by *primary growth*, but also *wider* by adding new vascular tissue by means of *secondary growth*.

### SECONDARY GROWTH

Woody plants have a vascular cambium, a cylinder or sheath of living cells that lies just below the surface of the bark on the trunk, branches and twigs. The cells of the cambium divide at a right angle to the surface, so that the new cells add to the thickness of the trunk. New water-conducting cells (xylem) form on the inner side of the cambium. New sugar-conducting cells (phloem) form on the outer side. An additional layer of cells outside the phloem (the cork cambium) produces bark.

The accumulation of xylem through the process of secondary growth forms wood. (Xylem comes from the Greek word *xylon* meaning wood.) Older wood cells in the inner part of the trunk that no longer function as conducting tissue are collectively termed heartwood. Heartwood contributes to the strength of a tree, but a tree can still live if its heartwood rots away as long as the cells in the outer part of the trunk, collectively the sapwood, are still functioning. Heartwood is often darker than sapwood.



A tree's annual secondary growth shows as individual tree rings. You can see these rings when a tree is cut down. Each ring has cells laid down in the spring and others laid down in the fall that sometimes appear as light and dark-coloured bands.



## "NON-WOODY" TREES

In the tropics and subtropics, the kinds of trees that are able to grow are much more varied than in Ontario. Tree ferns, cycads, palms and bamboos all include species that we would recognize as trees because their stems are wide and rigid like a tree trunk, but they all lack secondary growth and therefore do not form true wood.

Rather, these non-woody trees are formed by a double process of primary growth in which the thickness of the stem is established by the young plant before it increases in height. Thus, the diameter of the trunk in these species is the same from base to tip.



cycad



bamboo



## BANANAS DON'T GROW ON TREES!

Banana is an example of a tree-like herbaceous flowering plant. It has a narrow non-woody stem that appears as a tree trunk because it is sheathed by thick leaf stalks which provide support.

Examples of banana and non-woody trees can be seen in City of Toronto conservatories like Allan Gardens, Centennial Park and the Cloud Gardens.

## WOODY VINES



Some vines are woody and increase in diameter with secondary growth. These Virginia creepers (red autumn leaves) have grown very tall by climbing up tall trees (green leaves). Their woody stems can grow up to about 10 cm in diameter.

## IS IT A TREE? IS IT A SHRUB?

What is the difference between a tree and a shrub? Generally, trees have a single trunk, distinct from its branches, that persists throughout the life of the tree. Shrubs, on the other hand, have multiple stems branching low to the ground that are replaced over time, as one stem dies off and new ones sprout from the root.

However some species may be shrubby under some conditions but grow with a single stem under others. Other species that are clearly trees may have multiple rather than single trunks. Thus, we use terms like multi-stemmed tree, shrubby tree or tree-like shrub.

Trees are often separated from shrubs by minimum height. However, there is little agreement on what that height should be, and the height of a tree or shrub can vary depending on growing conditions.

It's not easy to precisely define a tree!



Large multi-stemmed willow tree



European hornbeam with a shrubby, multi-stemmed form (left) and with a single trunk (above)



## Classifying Trees

Most of Toronto's trees and shrubs belong to two main groups of plants:

**Conifers** lack a protective fruit, bearing their seeds on the scales of a cone (conifer means "cone bearing"). Conifer leaves are needles or scales. Most conifers are evergreen – their leaves remain on the tree over winter. Read more about conifers on pages 10-11.

**Flowering plants** bear seeds within a protective fruit. Trees in this group are often called broad-leaved trees because their leaves are wide and flat. Here in Toronto, where winters are cold, most broad-leaved trees and shrubs are deciduous – their leaves fall off at the end of the growing season and the tree becomes more or less dormant through the winter. Read more about broad-leaved trees on pages 12-15.

There are always exceptions to general definitions. Some conifers, like tamarack and larches, are deciduous (page 32) while some broad-leaved shrubs, like rhododendrons and some euonymus, are evergreen. Some conifers, like yew, don't have woody seed cones but rather a single seed surrounded by a red fleshy covering that looks more like a berry (page 11). Some flowering trees, like alders, have fruits that are woody and appear cone-like (page 35).

**Ginkgo** is neither a flowering plant nor a conifer, but is more closely related to conifers because its seeds do not develop within a fruit. The seeds are mistaken for fruit because they have a fleshy orange seed coat that attracts animals. In Toronto, ginkgo seed has been found in coyote scat.

Ginkgo is known as a living fossil because fossils of very similar trees have been found dating from more than 250 million years ago.

It is also called maidenhair tree because its fan-shaped leaves are somewhat like maidenhair fern fronds.



## Looking at Trees: Conifers . . .

CONIFER LEAVES are narrow needles or small scales that are evergreen in most species.

scales  
e.g. white cedar



single needles  
e.g. spruce, hemlock



bundles of two to five needles  
e.g. pines



bundles of many needles  
e.g. larches



A tree's shape is determined by the architecture of the branches. Most young conifer trees are conical with regular tiers of branches off a straight TRUNK. Each year a new whorl of branches is added at the top to start a new tier.

As conifers mature some, like white pine, become very irregular in their form while others, like white spruce, remain conical.

Trees growing in the open retain their lower branches. The lower branches of trees growing in a forest die if they aren't receiving enough light.

BARK of some conifers breaks into thin flakes when young. As bark ages, it becomes rougher and thicker. In some species it breaks up into squarish plates while in others it develops vertical ridges and furrows.



Young flaky bark



Mature ridged bark



Young white pine showing regular tiered growth



## ... and their Cones

Conifers bear pollen cones (male) and seed cones (female), which may be on different branches or even on separate trees.

**Pollen cones**, sometimes borne in clusters (1), emerge in the spring along with the new shoots. The cones fall off the tree after the pollen has been released.

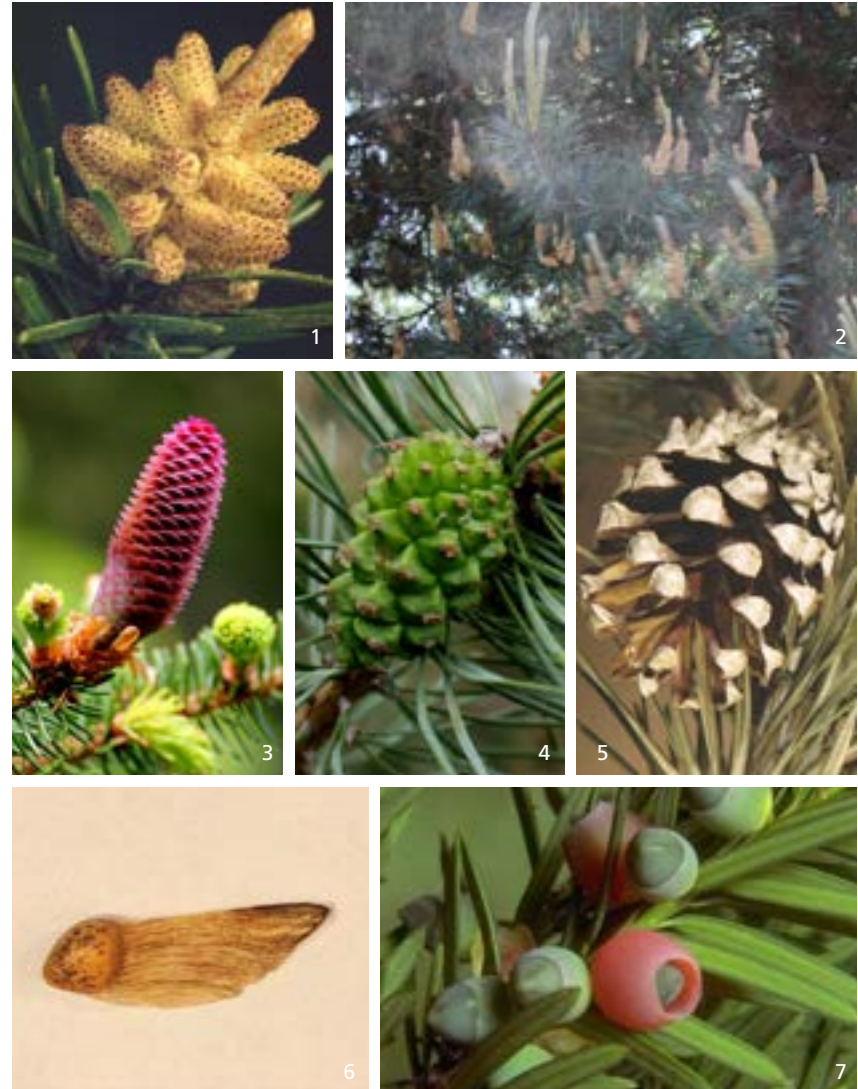
Many members of the pine family have distinctive pollen with air bladders that make the pollen grains very light so they can fly very high and travel great distances. On a windy spring day, great quantities of pollen can sometimes be seen blowing from pine trees like a cloud of smoke (2) or covering lakes, ponds, or puddles.

**Seed cones** have a series of scales and bracts along an axis. One or more seeds develop on each scale. Cones remain tightly closed until the seed is mature, when the scales and bracts spread open, releasing the seed. Some cones develop in one year, others in two or three. Still others, like jack pine, need the heat of a forest fire to open the scales.

Seed cones are often pink before pollination (3), changing to green (4) and then brown (5) as they mature. Most cones become quite woody and hard when old.

Most of our conifers have seeds with a thin papery wing (6) that helps the seed flutter away from the parent tree.

An exception is yew (*Taxus*) which does not have a recognizable seed cone or winged seeds. Rather there is a single seed, with a modified fleshy scale that surrounds it (7), attracting birds for its dispersal.



## Looking at Trees: Broad-leaved Trees

LEAVES are arranged along a twig in **OPPOSITE** pairs or are staggered singly on **ALTERNATE** sides.

Sometimes, leaves are clustered too closely to see the arrangement; however, the short (spur) shoots that bear these clusters will be either opposite or alternate.

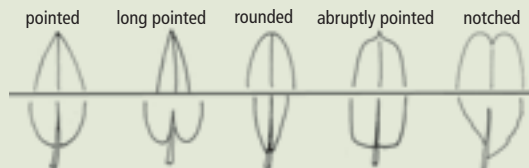
**SIMPLE** leaves have a single leaf blade attached to a leaf stalk, usually with a bud at the base.

**COMPOUND** leaves have several leaflets attached to a leaf stalk, usually with a bud at the base. There is never a bud at the base of a leaflet.

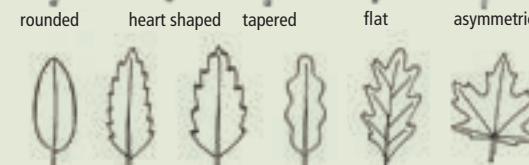
Leaf and leaflet **SHAPES** range from narrow to broad.

Leaf and leaflet

**TIPS** may be



**BASES** may be



**MARGINS** may be



opposite

alternate



simple



trifoliate



pinnate



palmate

The **CROWN** is made up of leafy branches and gets its shape from their architecture. A species may have a characteristic crown but remember that crowns tend to be wider when the tree is growing in the open and narrower when growing in a forest.

**BARK** protects a tree from physical damage and disease. Young bark is usually smooth with conspicuous pores (lenticels) that allow gas exchange. Older bark is usually thicker and rougher with ridges and furrows. Many of our trees can be identified by the pattern of their bark alone.

**ROOTS** anchor a tree to the ground, provide it with water, oxygen and minerals, and store food for winter dormancy. While trees start out with a tap root, only a few species are anchored by one when mature.



Some trees have SPINES or THORNS on their twigs, branches or trunks.



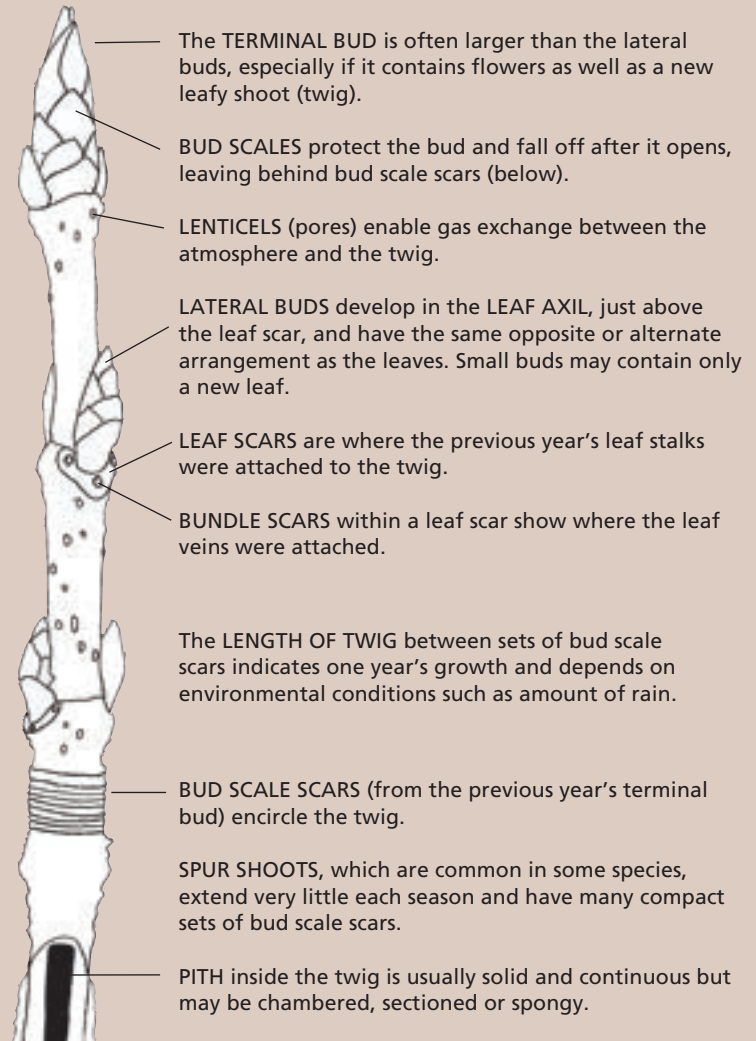
#### DID YOU KNOW?

A tree's below-ground biomass may be equal to or greater than the biomass above-ground.

The TRUNK is the main stem of a tree, supporting the branches and connecting to the roots underground.

Most of a tree's roots are found in the upper one metre of soil and may extend horizontally two to three times the radius of the crown. Specialized feeder roots are found close to the soil surface, where water and air are most available.

TWIGS are useful for identifying trees in winter.



## Broad-leaved Trees: from Flower . . .

Broad-leaved trees have flowers with petals, sepals, pistils and stamens. Tree flowers are usually pollinated either by the wind or by animals, especially insects.

### WIND-POLLINATED FLOWERS

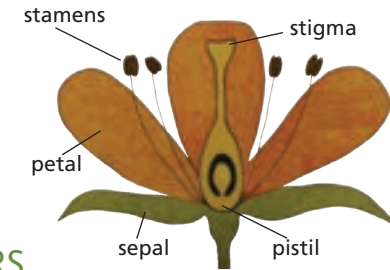
- are often inconspicuous because they have no petals
- open early in the season before the leaves are fully developed
- often have separate male and female flowers on the same branch, a different branch, or even on separate trees



The tiny male flowers of wind-pollinated trees are often clustered in catkins, like these of hop-hornbeam (left) and English oak (right). The stamens release copious amounts of pollen that is blown by the wind. Some of the pollen will land on female flowers.



The tiny female flowers of wind-pollinated trees may be single or in small clusters, like these of black walnut (left), or clustered in catkins, like these of trembling aspen (right). The stigmas on their pistils are sticky to catch the pollen that lands on them.



### ANIMAL-POLLINATED FLOWERS

- are usually large, colourful and fragrant to attract animals including insects, birds, and mammals
- usually open in summer when more insects are active
- have both male and female parts present in each flower

The large single flowers of tulip-tree have many pistils, each of which will produce a fruit if pollinated. Pollinators transfer pollen from the stamens of one flower to the stigmas of another.



The flowers of ninebark form round upright clusters. The brightness and sweet scent of the flowers attract insects that pollinate them. As with tulip-tree, pollinators are rewarded with sweet nectar.



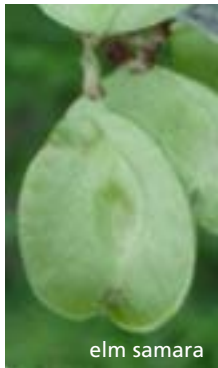


## ... to Fruit

After a flower has been pollinated, the pistil and the ovules inside it start to develop into fruit and seeds, and the petals, if present, fall off. Fruits and seeds are very varied in size, shape, colour and texture. Much of this variation has evolved for dispersal – the way plants get their seeds to new ground, away from the parent plant. Seeds may be dispersed by wind, water and/or animals, from ants to birds to squirrels to humans.

### ON THE WING - WIND DISPERSAL

Many trees have fruits or seeds with papery “wings,” called samaras, or tufts of cottony fibres to catch the wind.



elm samara



ash samaras



maple samaras (keys)



The light winged seeds of birch break away from the central axis of a seed catkin.



The tufted white seeds of cottonwood and other poplars and willows burst out of green capsules and are carried long distances on a windy day.

### FRUIT AND NUTS - ANIMAL DISPERSAL

Plants entice animals to disperse their seeds by providing an edible reward.

Fleshy fruits are often brightly coloured to attract mammals and birds to eat them. Seeds that survive digestion get “planted” far from the parent tree when the animal defecates.



Nuts from oak, beech, and walnut are high in fat and are an important food for wildlife. Many nuts can be stored for later use but the animals that bury nuts may forget to return for them, allowing a new tree to grow.



### DID YOU KNOW?

Every few years, trees like beech and oak produce huge crops of seed known as mast, with much smaller amounts in the years between. It is thought that in MAST YEARS, there are so many nuts that wildlife such as squirrels and even insects cannot eat them all, so that at least some seed will be guaranteed the chance to germinate and grow into new trees.



photo: Matt Forsythe





Don Valley Brick Works Park with Moore Park Ravine in the background taken from Governors' Bridge Lookout

## Toronto's Forests and Trees

### A NATURAL HISTORY

#### GLACIAL ORIGINS

About thirteen thousand years ago all of Ontario was still covered by glaciers more than one kilometre thick. As the climate warmed, the glaciers gradually melted and retreated northward, leaving behind a series of valleys and lake basins. Rock and debris that had collected beneath the ice, known as till, was deposited as hills and ridges.

Within the Toronto region, valleys were carved by the streams and rivers of runoff from the melting glaciers. This water flowed into Lake Iroquois, a glacial meltwater lake present for thousands of years before it drained to the size and position of modern-day Lake Ontario. Both the small cliff that runs through the city along Davenport Road and the Scarborough Bluffs are visible remnants of the Lake Iroquois shoreline. The flat or gently sloping area to the south of the Lake Iroquois shoreline is composed of various lake bottom sediments.

These glacial sediments interact with soil moisture and topography to create different soil types which range from acidic, well-drained sand to alkaline, poorly-drained clay. Because most plants have specific requirements for moisture and soil type, this range of soils supports a mosaic of different plant communities, the basis of Toronto's biodiversity.

The greening of the barren post-glacial landscape was a gradual process of colonization by plants over thousands of years. Succession from barren till to grasslands and forests was driven by variations in climate and by natural phenomena like fires, floods, and erosion, aided by an influx of seeds carried by wind, water and animals. Conifer forests eventually gave way to deciduous forests as the soils accumulated organic matter from the roots and leaf litter of pioneering species and high-nutrient silts deposited by flooding streams. Thus, the terrain, drainage patterns and vegetation of the modern Toronto landscape reflect its postglacial history.



Tom Henriksson



Bathurst St looking south from Davenport Rd, 1907



Scarborough Bluffs, 1915

City of Toronto Archives, Fonds 1548, Series 393 (left) and Fonds 1244, Item 700 (right)





White pine towering above deciduous trees in Moccasin Trail Park  
photo: Matt Forsythe

## FOREST REGIONS

The current vegetation of Toronto reflects its position at the junction of two forest regions, the Deciduous Forest Region, and the Great Lakes-St. Lawrence, also known as the Mixed Forest Region.

The Deciduous Forest Region extends from the Carolinas in the U.S. to its northern limit in southwestern Ontario, where it is referred to as the Carolinian Zone. It supports particularly high biodiversity, among the highest in Canada. It is composed of many kinds of broad-leaved deciduous trees, including maples, oaks, beech, tulip-tree, sassafras, and hickories, with an understory of tall shrubs. Historically, dense forest was interspersed with pockets of grasslands (oak savannah or tallgrass prairie) lush with wildflowers and grasses. The Carolinian Zone just reaches Toronto, especially along the western lakefront and lower portions of the Humber River and Etobicoke and Mimico Creeks. A remnant of original oak savannah occurs in High Park.

Much of Toronto and the regions to the east and north lie within the Mixed Forest Region. These forests are composed of both conifers and deciduous trees, especially maples, oaks, beech, white pine and eastern hemlock, and have an understory of low shrubs. They are transitional between the conifer-dominated forests of the Boreal Forest Region to the north and the deciduous forests to the south.

Toronto's position where these two forest regions intermix, along with its terrain, watersheds and shorelines, makes it one of the areas with the highest biodiversity in the country. Its diverse habitats, from the wetlands, dunes and floodplains of the lowlands, to the forests, meadows and prairies on the tablelands and slopes of the uplands, support a diverse flora of both woody and herbaceous plants that, in turn, attract and support a diversity of other organisms including animals and fungi.

Prior to European settlement, these natural habitats covered the landscape and teemed with wildlife. Over the course of the last two hundred years, forestry and agricultural practices, along with the growth of Canada's largest city, have significantly reduced their size. The remnants that still survive in the city's ravines and parkland form green corridors for today's wildlife. Protection and maintenance of these corridors and the diversity of native plant species within them is critical for the preservation of Toronto's biodiversity and is an important focus for all conservation, restoration and planting projects.

## FOREST TYPES

Natural forests are typically described by their physical position (upland or lowland) or the most common trees within them. On any given site, the combination of soil type, moisture content and temperature determines which trees dominate.

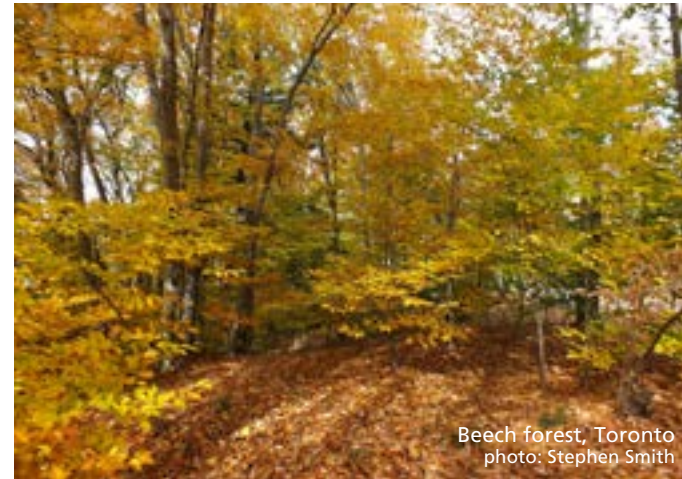
**Upland Forests:** Uplands are areas of flat or rolling terrain that are usually well above the water table throughout the year, and so have relatively well-drained to dry soils that vary in type from sand to loam to clay.

Historically, Toronto's flat dry sites and south- or west-facing slopes were covered by Oak-Pine or Oak-Hickory Forests in which the most common trees were red and white oaks, white pine, shagbark and bitternut hickories, with some black cherry. Witch-hazel and maple-leaved viburnum were common shrubs in the understory and white trilliums and wild sarsaparilla carpeted the forest floor in spring. There are still remnants of these forest communities in Toronto, for example in Crothers Woods.

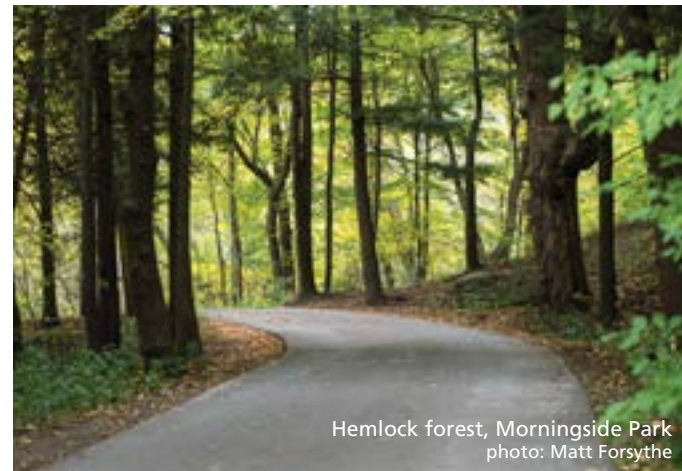
The east-facing slopes of Toronto's ravines tend to be cooler and more sheltered, with rich moist soils. Some of these sites support Maple-Beech Forests, nearly pure stands of sugar maple with a few American beech and scattered ironwood (hop-hornbeam), blue beech, basswood, and white ash. These trees shade the understory for shade-loving young sugar maples and a few shrubs including chokecherry, alternate-leaved dogwood and witch-hazel. On sites with less rich soils, white birch, red maple, eastern hemlock and white pine are added to the mix. There are remnants of these forests communities in Sunnybrook and Morningside Parks.

North-facing slopes which receive less direct sunlight are often covered by pure stands of eastern hemlock which thrive in these cool conditions. There are hemlock forests in Morningside and Rouge Parks.

Savannahs are open woodlands with widely spaced trees and an understory of native tall prairie grasses and wildflowers with few shrubs. They are found on dry sites with well-drained soils and are dependent on disturbance, namely fire, to retain their openness. Oaks, with their thick, fire-resistant bark, and the deeply-rooted grasses and wildflowers, dominate these habitats because they can survive and thrive following a fire. There are remnants of savannah in Lambton Park and High Park.



Beech forest, Toronto  
photo: Stephen Smith



Hemlock forest, Morningside Park  
photo: Matt Forsythe



**Lowland Forests:** Lowlands include valley bottoms, river terraces, and flood plains where the land surface is at or close to the water table. These sites are either seasonally flooded or poorly drained and so their soils are moist to wet for at least part of the year. Lowland forests are therefore composed of trees and shrubs adapted to growing in soils with fluctuating moisture content.

Swamps are wooded wetlands. They may be dominated by deciduous trees such as silver maple, or by coniferous trees such as white cedar. Thicket swamps are dominated by shrubs including willows and dogwoods. Swamps often have abundant mosses and herbaceous plants including grasses and sedges. There are remnants of natural swamps in Morningside and Centennial Parks.

Riparian forests occur along creeks, streams and rivers and often overhang their banks. These areas are often flooded in the spring. Common trees include elms, willows, poplars and Manitoba maple. There are remnants of riparian forests along the Humber River and Highland Creek.

**Lake Ontario Shoreline:** Most of the shoreline in Toronto has been developed, leaving only remnant and altered natural communities. The higher ground includes bluffs and dunes that are colonized primarily by poplars and willows. The low ground differs from riparian habitats in having well-drained mineral soils that are continually deposited as sediments and eroded away by wind and waves. These shoreline communities share species with the riparian forests, but are dominated by willows, poplars, red osier dogwood and riverbank grape. There are remnants of Great Lakes shoreline at East Point Park and Toronto Island.



Silver maple swamp, Bob Hunter Park  
photo: Stephen Smith



Lake Ontario shoreline, Scarborough Bluffs  
photo: Jeff Warren

## A HISTORY OF HUMAN IMPACTS

The composition of the forests in Toronto and throughout southern Ontario has changed in response to human settlement and lifestyle. Prior to European settlement native peoples moved in and out of the Toronto region seasonally and cleared only small areas of forest for agriculture. They may also have burned areas of tallgrass prairie and savannah but, overall, the forest remained intact. Trees with large edible seeds like black walnut, butternut, shagbark and other hickories, and bur oaks were likely brought to this area by native peoples as they migrated in and out of the region over the course of many centuries.

In the 18th century large numbers of newly-arriving Europeans started cutting the dense forests to clear land for farming and settlements. They also cut trees needed for local use and for export to their homelands. The tall pines of the virgin forests made excellent masts for ships, and the oak and other deciduous trees provided valuable lumber for construction, shipbuilding and wood-working.

While clearing forests, settlers were also planting their homesteads and communities with plants they imported from their home countries: shade trees such as horsechestnut, London plane-tree, linden, and English oak; ornamental shrubs and vines including lilac, honeysuckle and English ivy; as well as orchard trees such as apples, cherries, and pears.

Over a period of about 200 years, the tree cover was almost totally removed throughout southern Ontario causing the soils in some areas to be completely eroded away by the wind. To save the remaining agricultural potential of the land, tree replanting by farmers, early foresters and naturalists began on a massive scale, as windbreaks and plantations.

From the 19th century onward, Toronto has been further expanding to satisfy urban growth. Orchards and woodlots were cleared as agricultural land was converted to residential subdivisions. Often, these new developments featured addresses like Oak Avenue and Maple Street, perhaps a clue to the original forest type, but with not a tree in sight. Gradually, street trees and yard trees were planted and parks were created. For instance, 500 horsechestnuts, were planted on University Avenue and what is now College Street to mark the opening of Allan Gardens and Queen's Park by the Prince of Wales on September 11, 1860.





By the 20th century, modern urban conditions required species that were tolerant of air pollution, poor soils, road salt, and pruning around utility lines. A relatively few cultivated varieties of native and non-native species that would withstand these conditions were planted.

In the 1950s and 1960s, Toronto fell victim to this lack of diversity as the white elms that lined many streets became infected and died from Dutch elm disease as it rampaged across North America. Whole streets, once well-treed, became completely bare of tree cover as the disease spread easily from tree to tree. Hardy and fast-growing Norway and silver maples were planted as replacements. Unfortunately, because the trees were planted at the same time and are all of similar age, they will all die at the same time leaving the streets once again bare.

Today, based on lessons learned, new trees are constantly planted to ensure a diversity of ages. The planting of monocultures and non-native species, despite their urban tolerance, is discouraged. Rather, the accepted practice is to plant a diversity of species native to Ontario on public and private lands that will support and enhance local biodiversity and create wildlife corridors throughout the city. This new approach is also intended to lessen the impact of future waves of infestation and disease.

The composition of trees in different neighbourhoods throughout the city reflects the trends in popular species over time. Streets were traditionally planted with a single species or cultivar, in rows called avenues, such as these silver maples along Palmerston Avenue, shown when first planted as saplings in 1908, as young trees in the 1920s and when mature in 2002.



photo: City of Toronto Archives



photo: City of Toronto Archives



photo: City of Toronto

## TORONTO'S URBAN FOREST TODAY

Toronto's Urban Forest is made up of all of the trees found in both its natural and its developed areas on publicly and privately owned lands. Natural areas include the rich patchwork of Toronto's ravines, woodlots, forests and shorelines. Developed areas include city streets, manicured parks and parkettes, front and back yards, school yards, golf courses, cemeteries, and business properties.

### TORONTO'S URBAN FOREST

**60%** Private trees .....6.1 million trees

**34%** Park and natural area trees.....3.5 million trees

**6%** Street trees.....0.6 million trees

from *Every Tree Counts: A Portrait of Toronto's Urban Forest*

### TREES AND SHRUBS IN NATURAL AREAS

Toronto is known for its extensive ravine system and Lake Ontario shoreline, remnants of natural features that have been altered but not obliterated by the growth of the city around them. The ravines, many of which traverse the city from its northern limit south to the lake, form green corridors that support a high biodiversity of plants, fungi and animals. They also provide the most tree canopy within the City's park system. Most of the trees in these areas, both native and non-native, have not been planted but have grown by natural regeneration from seeds or root suckers as members of the forest types represented on the previous pages.



Toronto's Urban Forest  
photo: City of Toronto



photo: Martin Taylor



photo: Ontario Archives

Due to the catastrophic impact of Hurricane Hazel in 1954, Ontario implemented legislation to prevent development of valleys, under the Conservation Authorities Act. This left Toronto with the legacy of green spaces we enjoy today.





Maple-beech forest in Earl Bales Woodlot ESA  
Photo: Matt Forsythe

### Environmentally Significant Areas

The natural areas within a large city such as Toronto are used to serve the recreational needs of nearly 3 million people and therefore suffer from the pressures of overuse and abuse. Therefore, those areas that are exceptionally important within the City's Natural Heritage System have been identified as Environmentally Significant Areas (ESAs) requiring additional protection.

Criteria for designation as an ESA include: containing habitats of large size or unusually high diversity, providing habitat for rare species, containing rare landforms, or serving as stop-overs or concentration points for migratory wildlife.

## TREES AND SHRUBS IN DEVELOPED AREAS

We interact with trees in Toronto's urban landscape every day: along our streets, in our backyards, in manicured parks and parkettes, in parking lots and even on roof tops. We plant trees to soften the “concrete jungle” and beautify our neighbourhoods. However, these trees often struggle to survive and have shorter lifespans than those in natural forests and urban natural areas. Ongoing planting of new trees to replace the existing canopy is crucial to maintaining a sustainable urban forest in Toronto.

**Trees on streets:** Anyone who's walked along Toronto's streets on a hot summer day has likely enjoyed the shade of a street tree. These City-owned trees make up a small proportion of the urban forest but contribute greatly to the livability of the city.

Street trees have to withstand very tough growing conditions: lack of space above and below ground, drought, heat, salt, pollution, and physical damage from bicycle locks, dog urine, and vandalism. While there are 144 different species of tree growing along Toronto's streets, most are found in residential areas. Only a few species are hardy enough to survive the adverse conditions of major streets and even these still require a high level of maintenance.

To ensure the health of trees on major streets, the City continually improves its methods of planting and care after planting. For instance, trees are now planted in more and better quality soil and many are watered regularly for two years after planting to help them become established. Where there is space, trees are planted in beds with suitable mulch and low-growing plants around them to minimize the drying and compaction of soil. In narrower sidewalks, trees are planted in large soil filled trenches with sidewalk panels held above the soil surface, or in soil cells, which allow tree roots to grow under the sidewalk.

Trees on the road allowances in front of homes are owned and maintained by the City throughout their lifetime and removed and replaced when necessary. Neighbourhoods are periodically canvassed for tree planting opportunities.





**Trees on private property:** Most of Toronto's trees are not publicly-owned but rather grow on private land ranging from backyards to the grounds of commercial properties and institutional campuses. Many of these sites have large areas of lawn, or garden beds with soft uncompacted soil that provide excellent conditions for growing trees. With the necessary space, water and nutrients for roots to grow, trees on private property are usually larger than those in highly urbanized areas. Single family properties have the highest diversity of tree and shrub species in the city. These same areas have the potential to expand Toronto's tree canopy by 13%.



The Beach: a well-treed neighbourhood  
photo: TRCA

**Trees that “pop up”:** Many of Toronto's trees are not planted by people, but rather “pop up” on vacant land, between buildings, along fences and in cracks in sidewalks. Most of these trees are introduced species well suited to growing under hostile conditions. Once established they can be very difficult to remove and can eventually damage nearby structures. They include tree-of-heaven, Manitoba maple, Siberian elm, white mulberry, common buckthorn, and Norway maple. These are often considered weed trees, and yet they still provide welcome shade and a splash of green in the concrete jungle.



Tree-of-heaven seedling  
photo: Norman DeFraeye

**Trees in small unexpected spaces:** In highly urbanized areas of Toronto, trees and shrubs are often squeezed into small spaces like parking lot islands and rooftop gardens. These spaces have insufficient room above and below ground to support large, mature shade trees so small trees and shrubs are more likely to survive. Trees planted above parking garages often have to be taken down long before their natural life span when the garage roof needs to be repaired or replaced. Despite these challenges, these green spaces make an important contribution to the urban forest and the services it provides to humans and wildlife.



Trees and shrubs in rooftop garden  
photo: Jenny Bull

## Toronto's Trees, Shrubs and Vines

### TORONTO'S (UN)OFFICIAL TREE: NORTHERN RED OAK (*Quercus rubra*)

One of Toronto's oldest, largest and most majestic trees, the native northern red oak can be found throughout the city. They are plentiful in our ravines, preferring dry sunny sites on upper slopes or tablelands. A few of the oldest red oaks in the city may date back to the oak-pine forests that covered the region prior to European settlement. Others were planted in parks, along streets and in backyards more than a century ago when the city and its outlying areas were young.

Red oaks can grow to 25 m or more in height and have trunks up to 120 cm in diameter at maturity. When open grown, the branches are wide spreading and some may be horizontal. Red oak leaves and branches are arranged alternately. The leaves have pointed bristle-tipped lobes and turn bronze or red in the fall. They often remain on the tree into winter. The bark on young trees is smooth and grey, but as the tree ages it develops vertical flat-topped ridges separated by reddish furrows.

Red oak flowers early in spring as the leaves are unfurling, using the wind to transport its pollen from male to female flowers. Like other oaks, its fruit is an acorn with a scaly cup that looks like a hat atop the nut. Red oak acorns take two years to mature and are more likely to be stored over winter by squirrels than white oak acorns that squirrels tend to eat as they fall. Hollow cavities in the trunk and branches are used by wildlife for nesting and winter shelter.



photos: Mary Ferguson FPSA



Northern red oak in Marie Curtis Park  
photo: Matt Forsythe



## FEATURED CONIFERS

### CYPRESS FAMILY (Cupressaceae)

All native members of this family have overlapping scales or short, sharp, overlapping needles – junipers may have both. Eastern white cedar has small woody cones while junipers have blue waxy berry-like cones that are used to flavour gin. A recent study that documented over 114 shrub species in the city showed that the top species by canopy area was eastern white cedar at 29%, due to its popularity as a hedge.



Eastern white cedar, *Thuja occidentalis*



Creeping juniper,  
*Juniperus horizontalis*



Eastern red-cedar, *Juniperus virginiana*



### A LIVING FOSSIL: DAWN REDWOOD

*Metasequoia glyptostroboides*

When scientists first described dawn redwood from fossils in 1941, it was thought that all the species in the genus were extinct. A small group of living trees was later discovered in a remote region of China, and by 1948 seeds had been distributed to botanical gardens throughout the world. Today, dawn redwood is widely cultivated and can be found in many Toronto parks.

Dawn redwood is related to the giant sequoia of the U.S. west coast. It is a deciduous conifer and, unlike most conifers, its needles and branchlets are arranged opposite to each other.

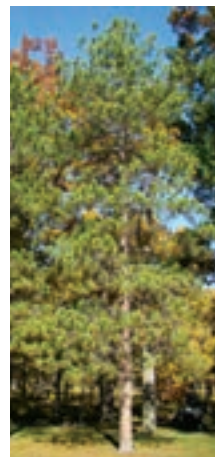


## PINE FAMILY (Pinaceae)

**Pine (*Pinus*)** All of our pines bear needles in bundles of 2 to 5. There are many 2-needled pines growing in Toronto that can be distinguished by needle length and twist. These species can also be distinguished by their growth form and profile. White pine is the official tree of the Province of Ontario.



Eastern white pine, *Pinus strobus*



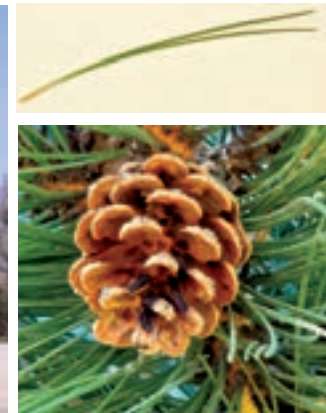
Red pine, *Pinus resinosa*



Jack pine, *Pinus banksiana*



Scots pine, *Pinus sylvestris*



Austrian pine, *Pinus nigra*



## PINE FAMILY continued

**Spruce (*Picea*)** Spruces are known for their pyramidal “Christmas tree” form. Their needles are borne singly and spiral around the twig. Spruce trees have high wildlife value, providing habitat and food for many animals. Norway spruce can be distinguished by its drooping branchlets and large cones. The scales of spruce cones are thinner and less rigid than pine cone scales.



White spruce, *Picea glauca*



Blue or Colorado spruce, *Picea pungens*



Norway spruce, *Picea abies*

**Fir (*Abies*)** Firs have flat blunt-tipped needles often curved up along the twig. The cones stand upright and fall apart when they are mature. Balsam fir is the only fir native to Toronto. This species is known for its blistered bark that contains sticky yellow resin – balsam.



Fir, *Abies* spp

## PINE FAMILY continued

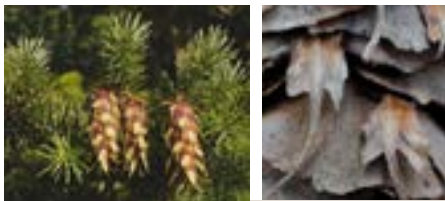
**Hemlock (*Tsuga*)** Hemlock is a large slow-growing tree with a tip that often droops to one side. It has short flat needles with two white stripes on the back, and small cones.



Eastern hemlock, *Tsuga canadensis*

## Douglas-fir (*Pseudotsuga*)

A native of western North America, Douglas-fir only occurs here as a landscape tree. The seed cones have bracts with three points, the central one longer than the side points.



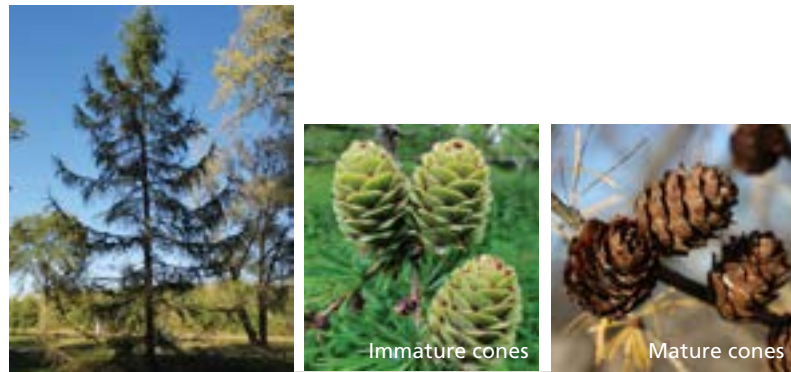
Douglas-fir, *Pseudotsuga menziesii*



**Larch, tamarack (*Larix*)** These trees are deciduous, turning yellow and dropping their soft needles before winter, a rare trait among the conifers. The native tamarack is widespread in the peatlands of the boreal forest but only found in cool swamps and bogs in southern Ontario. It is very rare in Toronto. European larch is a popular landscape tree. Its cones are much larger than those of tamarack.



Tamarack, *Larix laricina*



European larch, *Larix decidua*



## FEATURED BROAD-LEAVED TREES, SHRUBS AND VINES

### BEAN OR LEGUME FAMILY (Fabaceae or Leguminosae)

Though Toronto has no native legume trees or shrubs, planting and naturalization have made them abundant. All plants in this family, whether trees, shrubs or garden peas and beans, bear seeds (beans) in pods. Most species growing in Toronto have flowers that are borne in dense clusters, and in many cases the individual flowers resemble pea flowers. Some, like Kentucky coffee-tree and honey-locust, have separate male and female flowers. Leaves are usually singly or doubly compound. Many legume species have thorns or prickles on their twigs, branches and/or trunks and some are toxic when eaten or touched.



Kentucky coffee-tree, *Gymnocladus dioica*



Redbud, *Cercis canadensis*



Black locust, *Robinia pseudoacacia*



Yellow-wood, *Cladrastis kentukea*



Honey-locust, *Gleditsia triacanthos*



Siberian pea-shrub, *Caragana arborescens*

## BEECH FAMILY (Fagaceae)

**Beech (*Fagus*)** See page 45.

**Oak (*Quercus*)** The oaks found in Toronto include some of the largest and longest-lived trees in the city. They are important trees in our ravines and natural areas and valued landscape trees in our yards. Oaks are great trees for wildlife – their acorns provide food for many small mammals and birds, their crowns provide shelter, and cavities in their large trunks can serve as roosting and nesting sites.

Ontario's oaks divide into two groups: the red group with pointed, bristle-tipped lobes, shown below left and on page 28, and the white group with leaves with rounded lobes or large, regular teeth, shown at right.



Black oak, *Quercus velutina*



Pin oak, *Quercus palustris*



Swamp white oak, *Quercus bicolor*



Bur oak, *Quercus macrocarpa*



English oak, *Quercus robur*



White oak, *Quercus alba*



## BIRCH FAMILY (Betulaceae)

The birch family is strongly represented in the Mixed Forests of Toronto. All its members have simple leaves with toothed margins and separate male and female flowers in drooping clusters called catkins. Birches typically have peeling bark with many lenticels. Alders have woody cone-like fruits that persist through the winter. The two species called ironwood can be distinguished by their bark. *Carpinus* has sinewy muscle-like bark while *Ostrya* has flaky bark. The hazels have large heart-shaped leaves and hairy fruits.



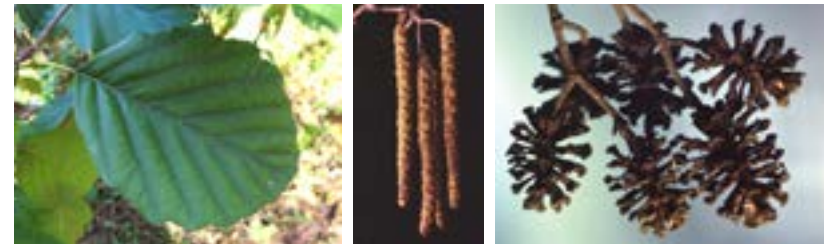
White or paper birch, *Betula papyrifera*



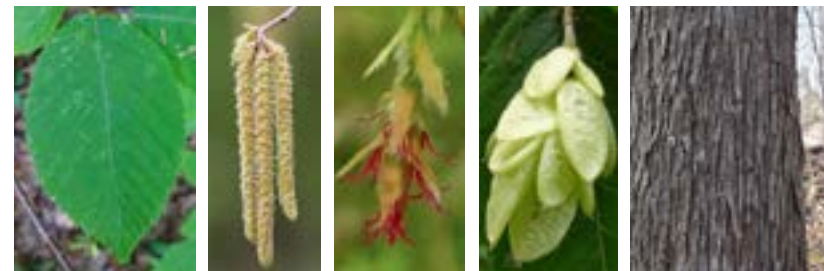
European white birch, *Betula pendula*



Yellow birch,  
*Betula allegheniensis*



Alder, *Alnus* spp



Ironwood or hop-hornbeam, *Ostrya virginiana*



Blue beech or ironwood, *Carpinus caroliniana*



Beaked hazel,  
*Corylus cornuta*

### BUTTERCUP FAMILY (Ranunculaceae)

Virgin's bower's spectacular displays of white flowers and feathery fruits provide a native alternative to related cultivated clematis species and other non-native vines.



Virgin's bower, *Clematis virginiana*

### CASHEW FAMILY (Anacardiaceae)

The sumachs and their cousin poison ivy are common throughout Toronto. Staghorn sumach gets its name from its brown, velvety twigs and branches that look like antlers, while fragrant sumach has a strong, distinctive odour when crushed. Some members of this family, including poison ivy, contain urushiol and other volatile oils that cause contact dermatitis in some people. The rhyme "Leaflets three, let it be; berries white, shun the sight" is a good way to remember what poison ivy looks like. Contrary to mistaken belief, poison ivy is a native species. It is commonly found in Toronto as a low shrub but it can also be seen as a robust climbing vine.



Staghorn sumach, *Rhus typhina*



Fragrant sumach, *Rhus aromatica*



Poison ivy, *Toxicodendron radicans*



### DOGWOOD FAMILY (Cornaceae)

This family is characterised by white flat-topped flower clusters, fruit that are berries, and leaves with veins that follow the leaf edge. All except alternate-leaved dogwood have opposite leaves. Native dogwoods are an important source of food and shelter for wildlife.



Alternate-leaved dogwood, *Cornus alternifolia*



Red osier dogwood, *Cornus stolonifera*



Flowering dogwood, *Cornus florida*



Korean dogwood, *Cornus kousa*

## ELDERBERRY FAMILY (Adoxaceae)

This large family (formerly Caprifoliaceae) includes opposite-leaved shrubs and vines, many of which are cultivated and planted in gardens.

While some species are used to make jelly and wine, others are poisonous so correct identification is important before eating any fruit.

Viburnums and elderberry produce flat-topped or erect clusters of cream-coloured flowers in the spring. Bush honeysuckle, as well as many non-native honeysuckles, have paired flowers and fruits. This family is an important source of food for birds and butterflies.



European highbush cranberry, *Viburnum opulus*



Red elderberry, *Sambucus racemosa* ssp *pubens*



Nannyberry, *Viburnum lentago*



Common elderberry, *Sambucus canadensis*



Wayfaring tree, *Viburnum lantana*



Bush honeysuckle, *Diervilla lonicera*



### ELM FAMILY (Ulmaceae) and HEMP FAMILY (Cannabaceae)

All members of the elm family have alternate simple leaves with asymmetric bases and toothed margins. Many of the elms (*Ulmus*) are easily recognized by their upright arching crowns, leaves with double-toothed margins, and inconspicuous flowers that are rarely noticed until the winged fruits develop and drop to the ground later in the spring. Dutch elm disease has killed most of the large old specimens of white, red and Scotch elm that once lined Toronto's streets. Members of the elm family are important hosts for the caterpillars of several butterfly species. Hackberry, in the closely related family Cannabaceae, is increasingly being planted and is becoming naturalized.



White elm, *Ulmus americana*



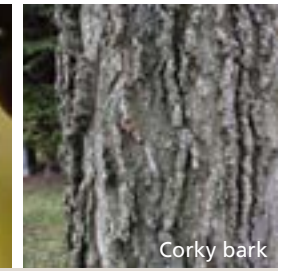
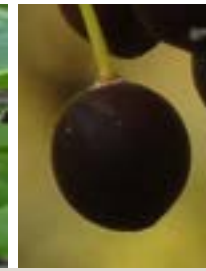
Siberian elm, *Ulmus pumila*



Japanese zelkova, *Zelkova serrata*



Scotch elm, *Ulmus glabra*

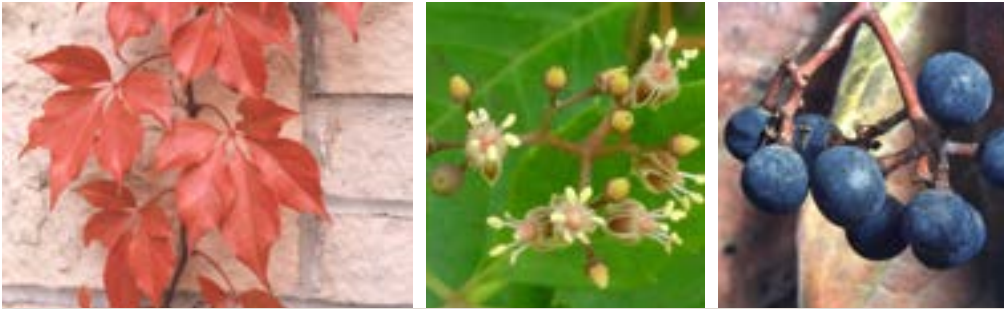


Hackberry, *Celtis occidentalis*

Corky bark

### GRAPE FAMILY (Vitaceae)

The grape family consists of woody vines that climb over other woody plants, walls, fences, and telephone poles or sprawl across the ground. Grapes wind their tendrils around their host structure. Some species of *Parthenocissus* have tendrils equipped with adhesive discs. Boston ivy is often grown on buildings. Like most vines, these are fast growing species that are capable of killing trees and shrubs by covering them, and either shading them from the sun, pulling them down by their weight or strangling them. Many have spectacular fall colour.



Virginia creeper, thicket creeper,  
*Parthenocissus quinquefolia* and *Parthenocissus vitacea*



Riverbank grape, *Vitis riparia*

Boston ivy,  
*Parthenocissus tricuspidata*

### LAUREL FAMILY (Lauraceae)

Sassafras is also called mitten tree because one of its three leaf shapes has a thumb like a mitten. The other leaves are either unlobed or with three lobes.



Sassafras, *Sassafras albidum*



### MAGNOLIA FAMILY (Magnoliaceae)

This is one of the oldest flowering plant families. The flowers have many pistils, each of which can become a fruit. In tulip-tree each flower produces a cluster of narrow, dry samara-like (winged) fruits. In magnolias, the pistils swell so that the cluster of fruitlets can resemble a gnarled fist. Tulip-tree and cucumber-tree are native to the Carolinian Zone. Saucer magnolia and star magnolia are planted as specimen trees in gardens and parks for their spectacular spring flowers.



Tulip-tree, *Liriodendron tulipifera*



Saucer magnolia, *Magnolia x soulangeana*

### OLIVE FAMILY (Oleaceae)

This family includes the ashes (page 55) as well as some of our most common introduced garden shrubs. Both forsythia and lilac can be seen in parks that had previously been gardens and farms.



Forsythia, *Forsythia viridissima*



Common lilac, *Syringa vulgaris*

## ROSE FAMILY (Rosaceae)

The rose family is a large family of flowering plants that includes many familiar fruits and flowers including apples, cherries, roses, and spiraeas. All members of the family have finely- to coarsely-toothed, alternate leaves that may be compound, lobed or simple. Species on this page all have fruits tipped with crown-like remnants of the flower's calyx (sepals). The tips of cherries (next page), peaches and plums only bear the scar of the flower's style. Many species have high wildlife value, with showy, nectar-rich flowers attractive to pollinators, and/or bearing brightly coloured fruit attractive to birds and other animals. Old domesticated apple and pear trees in Toronto are often found on former farmland.



Serviceberry, *Amelanchier* spp



Apple (domestic and crab), *Malus* spp



Hawthorn, *Crataegus* spp



Callery pear, *Pyrus calleryana*



Mountain-ash, *Sorbus* spp



Common pear, *Pyrus communis*



## ROSE FAMILY continued

**Cherry (*Prunus*)** Cherries and plums are favourite foods of birds and people, and many species have been cultivated for their fruit, blossoms or colourful leaves. The native species on the left may be found in upland forests of Toronto's parks and ravines. Black cherry is a tall canopy tree with dark flaky bark that people describe as looking like black cornflakes. Chokecherry is a very common shrub in the forest understory. The species on the right have been introduced to Toronto from Europe and Japan. Sweet cherry can become invasive when planted near natural areas.



Black cherry, *Prunus serotina*



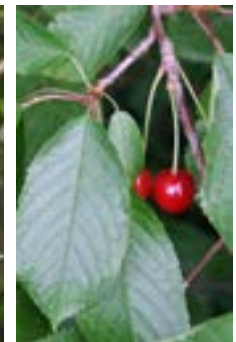
Flowering cherries,  
*Prunus* spp



Pin cherry, *Prunus pensylvanica*



Chokecherry, *Prunus virginiana*



Sweet or bird cherry, *Prunus avium*

## ROSE FAMILY continued

**Rose (*Rosa*) and other shrubs** In contrast to the sterile multi-petalled flowers of hybrid tea and other cultivated roses grown in gardens, wild roses have a single whorl of five petals and many stamens that produce pollen collected by insects. Smooth rose and swamp rose, once plentiful in Toronto, are now most commonly found in restoration sites. Unfortunately, the invasive multiflora rose has overtaken many of Toronto's natural areas. Native spiraeas can be found in sunny meadows, while cultivated spiraeas such as Bridal Wreath or Goldflame are common landscape shrubs. Ninebark, an increasingly popular native shrub, can be recognized by its peeling bark and triangular lobed leaves. The many species of raspberries and blackberries, recognizable for their fruits, can be difficult to tell apart and even harder to harvest before the squirrels do!



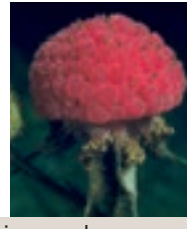
Smooth rose, *Rosa blanda*



Swamp rose, *Rosa palustris*



Purple flowering raspberry,  
*Rubus odoratus*



Wild red raspberry,  
*Rubus idaeus* ssp *strigosus*



Wrinkled rose, *Rosa rugosa*



Multiflora rose, *Rosa multiflora*



Meadowsweet, *Spiraea alba*



Spiraea cultivars, *Spiraea japonica*



Ninebark, *Physocarpus opulifolius*





## NATIVE AND NOT!

Several tree species native to Toronto have non-native lookalikes — or at least species they are easily confused with. Here are four examples, each from a different family.

### Beech Family (Fagaceae)

Both these *Fagus* species have smooth grey bark and long-pointed buds. Copper beech is a variety of European beech.

#### NATIVE



American beech, *Fagus grandifolia*



#### NOT NATIVE



Copper beech, *Fagus sylvatica* Purpurea group

### Mallow Family (Malvaceae)

*Tilia* species produce sweet-smelling flowers with abundant nectar that hang from a pale green strap-like bract.



Basswood, *Tilia americana*



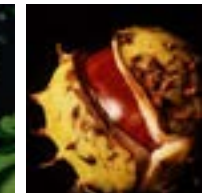
Linden, *Tilia* spp

### Soapberry Family (Sapindaceae)

Both these *Aesculus* species produce tall clusters of flowers and spiky-husked nuts that are toxic — unlike true chestnuts which are edible.



Ohio buckeye, *Aesculus glabra*



Horsechestnut, *Aesculus hippocastanum*

### Sycamore Family (Platanaceae)

Both of these *Platanus* species have smooth mottled multi-coloured bark that looks like camouflage, especially when young.



Eastern sycamore, *Platanus occidentalis*



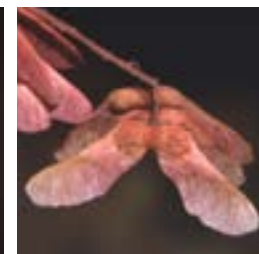
London plane-tree, *Platanus xhispanica*

## SOAPBERRY FAMILY (Sapindaceae)

This family includes maples (*Acer*) and horsechestnuts (*Aesculus*, page 45). There are more than 100 maple species found world-wide. All maples have opposite leaves and branches. Flowers, borne in clusters before or as the leaves are opening, develop into dry, winged fruits (samaras) borne in pairs. The pairs split in half and spiral to the ground like the blades of a helicopter when ripe. The five species and one hybrid that are native to Toronto, shown on this page, occur naturally in Toronto's ravines and forests and are often planted as street and landscape trees.



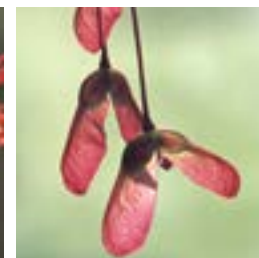
Sugar maple, *Acer saccharum* ssp. *saccharum*



Mountain maple, *Acer spicatum*



Black maple, *Acer saccharum* ssp. *nigrum*



Red maple, *Acer rubrum*



underside



Silver maple, *Acer saccharinum*



Freeman or hybrid swamp maple, *Acer xfreemanii*



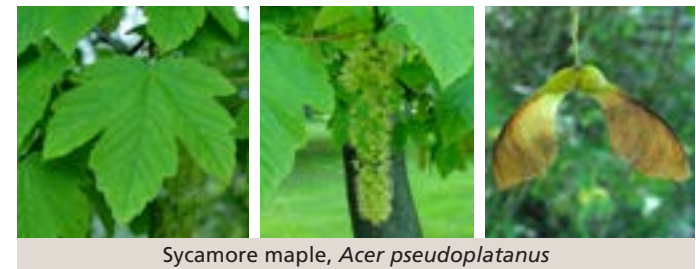
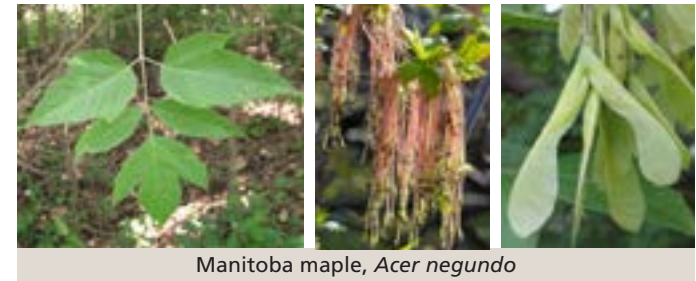
## SOAPBERRY FAMILY continued

There are six species and numerous cultivated varieties of non-native maples that are found throughout Toronto. Manitoba maple, native to western Canada, is the only North American maple with compound leaves. Norway maple is often confused with sugar maple but can be distinguished by its milky sap which is visible when the leaf stalk is broken (see below). Its red-leaved cultivars, including 'Crimson King' and 'Schwedler,' along with the many red-leaved cultivars of Japanese maple, are often mistakenly called red maples.



### DID YOU KNOW?

Norway maples should not be planted in or near Toronto's natural areas. These Norway maples (trees with yellow leaves) were planted close to Rosedale Ravine and are now invading the sugar maple forest (bare trees), threatening native understory species.



### TRUMPET CREEPER FAMILY (Bignoniaceae)

Catalpa has large spade-shaped leaves in whorls of three along the twigs and long narrow fruits that persist through the winter.



Northern catalpa, *Catalpa speciosa*

### WITCH-HAZEL FAMILY (Hamamelidaceae)

Witch-hazel is a large shrub with a spreading form. The native witch-hazel (below) is the last shrub species to flower in the fall, while an introduced species is one of the earliest to flower in the spring.



Witch-hazel, *Hamamelis virginiana*



## WALNUT FAMILY (Juglandaceae)

Members of the walnut family all have large compound leaves, inconspicuous flowers, and fruits in which a hard shell around the seed (nut) is further enclosed by a leathery outer wall. All of these species are more common in the deciduous forests of southwestern Ontario. Butternut is endangered throughout its range in Ontario. Several members of this family produce a chemical that accumulates in the soil and prevents other plants from germinating beneath them (allelopathy).



Black walnut, *Juglans nigra*



Butternut, *Juglans cinerea*



Bitternut hickory, *Carya cordiformis*



Shagbark hickory, *Carya ovata*

### DID YOU KNOW?

Squirrels fail to retrieve between 15% and 40% of the food they bury. That is good news for all of the nut trees that rely on squirrels to disperse their fruits and seed!

from *Wild City*,  
Tim Tiner & Doug Bennet



## WILLOW FAMILY (Salicaceae)

This family includes willows (*Salix*) and poplars and aspens (*Populus*). Their wind-pollinated flowers are borne in catkins on separate male and female (dioecious) trees in the spring. Members of this family are a favourite food and construction material of beavers. Cut stumps will often resprout vigorously. Some species of poplar, especially aspens, produce root shoots distant from the trunk that grow into large trees. These clones of the parent tree eventually form large colonies.



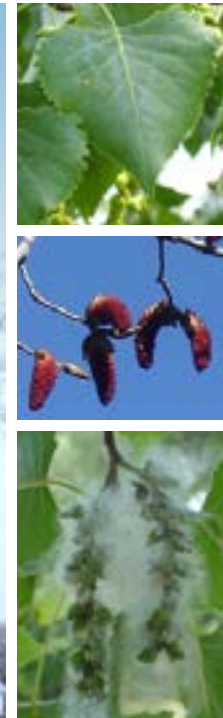
Trembling aspen, *Populus tremuloides*



White poplar, *Populus alba*



Eastern cottonwood, *Populus deltoides*





## WILLOW FAMILY continued

The most common tree willows (left column) in the Toronto area are the non-native species shown here. These species are often mistaken for black willow which is very rare in Toronto. Native shrub willows (right column) dominate Toronto's shorelines and riverbanks. They are most noticeable in spring when their catkins are visible or later in the fall when several species are covered with galls.



Crack willow, *Salix xfragilis*



Weeping willow, *Salix xsepulcralis*



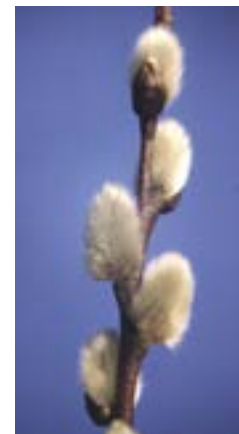
Corkscrew willow, *Salix matsudana* 'Tortuosa'



Woolly-headed willow,  
*Salix eriocephala*



Sandbar willow,  
*Salix interior*



Pussy willow,  
*Salix discolor*

### DID YOU KNOW?

That these are willow galls, not fruits. Galls, common on willows, are growths formed by the plant in response to the presence of a fungus, insect or other intruder.



Redgall on willow leaf



Pinecone gall on willow bud

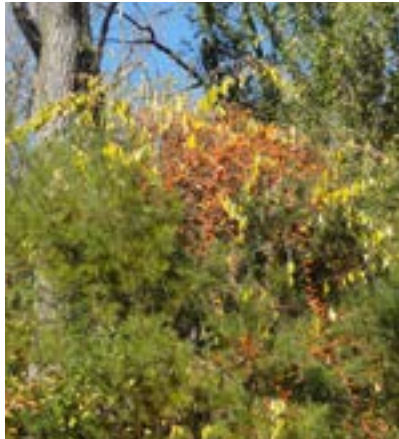
## INVASIVE TREES, SHRUBS AND VINES

These introduced (alien or exotic) species survive without human assistance and negatively impact native biodiversity by reproducing aggressively and out-competing other plants. Once established, they are difficult to remove.

The species on these two pages are all invasive trees, shrubs and vines that are problematic in Toronto.

Others, shown on the previous plant family pages, include Norway maple, Manitoba maple, crack willow, Siberian elm, European white birch, multiflora rose, sweet cherry, and black locust.

See the Checklist of Toronto's Trees, Shrubs and Vines for species identified as invasive.



Oriental bittersweet, *Celastrus orbiculatus*



Winged euonymus or burning bush, *Euonymus alatus*



Wintercreeper, *Euonymus fortunei*



## INVASIVE TREES, SHRUBS AND VINES continued



European buckthorn, *Rhamnus cathartica*



White mulberry, *Morus alba*



Tree-of-heaven, *Ailanthus altissima*



Russian olive and autumn olive, *Elaeagnus* spp



Honeysuckles, *Lonicera* spp

## PESTS OF TREES AND SHRUBS

Trees and shrubs host a diverse range of small organisms, including insects, fungi, bacteria and viruses. Many introduced pests have no natural predators here to keep their populations in check. A mix of tree species planted on the right sites and properly maintained are less likely to suffer from, and are more resistant to, pest problems than are monocultures of a single species.

**Low risk pests** cause cosmetic damage but do not seriously impact the health of the tree.



Powdery mildew



Tar spot

Powdery mildew and tar spot are both fungal diseases which attack leaves. The “powder” and the “spots” are patches of fungal spores. Tar spot is most commonly seen on the leaves of maples, most often Norway maple.

**Medium risk pests** do not permanently damage the tree. However, repeated infestations, especially those that cause leaves to drop, can weaken trees and predispose them to attack by other pests or environmental stresses.



Gypsy moth caterpillar

European gypsy moth caterpillars eat tree leaves, sometimes defoliating an entire tree. They prefer oaks but will attack other species.



Black knot

Black knot fungus infects *Prunus* species, causing swollen black growths on their twigs and branches. A severe infection may eventually kill the tree or shrub.

**High risk pests** result in wide-spread, often rapid, death of host trees.

Dutch elm disease is a deadly fungal infection first detected in Ontario in 1950. Toronto has since lost many of its largest elms. The City monitors trees for the disease and treats uninfected, significant elms with fungicide to protect them.



White elm killed by Dutch elm disease

Butternut canker is a fungal disease that arrived from Asia in the 1960s. It attacks healthy butternut trees of any size or age. While some infected trees can survive for many years, so many trees have been killed by the fungus that butternut is now listed as an endangered species in the U.S. and Canada.



Butternut canker



## FROM ASHES TO ASHES: A tribute to a once-dominant group of trees

The most recent catastrophic infestation in Toronto is an insect, the emerald ash borer (EAB). As its name implies, this bright green beetle completes its life cycle exclusively on ash trees (*Fraxinus* spp).

EAB was introduced into North America from Asia, and spread from Michigan into southwestern Ontario. It was confirmed in Toronto in 2007. Trees may die as early as one year after infestation, but it normally takes two to three years. EAB is expected to kill most of the ash trees in Toronto by 2017. Prior to EAB, there were more than 800,000 ash trees among the City's ten million trees. Ashes dominated many natural and urban landscapes in Toronto and the loss of these beautiful native trees is profound. There is even concern for the survival of all ash species in North America.



Doomed ash swamp in a Toronto ESA



Fall foliage of white ash (left) and red ash (right) on Centre Island. These trees are among those treated with pesticide in the hope of sustaining some individuals in Toronto



Adult emerald ash borer  
photo: USDA



Live larva one year after tree was cut



Galleries chewed out by the larva beneath the bark

## A Chronology of the Toronto Tree Year

Note: The exact timing of events depends on location and varies from year to year with the weather.

### FEBRUARY & MARCH

Although trees are dormant they can still be identified in winter by their woody features: twigs, leaf scars, buds, bark, and architecture.

As the days lengthen and temperatures rise the sap starts to run in some species. Look for a local maple syrup festival to taste the sweet treat made from the sap of sugar maple. With increasing temperatures, buds start to swell. The large shiny buds of **horsechestnut** and **buckeyes** are particularly noticeable.



Horsechestnut buds

By the end of March, native **silver maples** are flowering, soon followed by **red maples**. Squirrels often eat the buds and flowers leaving bits of them littered on the ground.

### APRIL & MAY

In Queen's Park and Mt Pleasant Cemetery, **Cornelian cherry's** yellow

flowers mark the beginning of spring. **Forsythia** won't be far behind.

Wind-pollinated flowers, many clustered in dangling catkins, flower at this time before or as the leaves unfurl. They include members of the **elm**, **birch**, **willow**, **walnut** and **beech** families, and some **maples**. Because the flowers lack petals they often go unnoticed.

More conspicuous are **pussy willow** and **eastern cottonwood** catkins, the latter staining sidewalks blue when they fall. Masses of lime green flowers



Norway maple in flower

cover the city's many **Norway maples** in parks and along streets, giving the impression that these trees are already in leaf.

By late May, the weather is warm enough for trees with insect-pollinated flowers to bloom: **magnolia**, **crabapple**, **pear**, **cherry**, **lilac**, **hawthorn** and **serviceberry**.

The bare grey branches of **redbud** burst forth, first with the dark red buds after which it is named, then with the open pink flowers.

The leaves of most trees emerge through April and May, with shrubs usually coming first. As the buds of **balsam poplar** open they release a musky scent, for which they are named. Before the end of May, the tall candle-like flower clusters of **horsechestnut** open, and the papery fruits of **elm** are blown around into drifts along the street.

On windy days, you may see pollen being blown from conifer trees like yellow smoke or accumulating on ponds or puddles.

### JUNE & JULY

The leaves of most trees have unfurled by early June and new twigs and roots are growing. Just when you are convinced that **Kentucky coffee-trees** have died over winter, the hidden buds swell and its large compound leaves start to unfurl.

The sweet fragrance of **black locust**, **basswood** and **linden** trees perfumes the air to lure pollinators to their showy flowers, while the putrid smell of **tree-of-heaven** causes passers-by to hold their breath. The flowers of other species, like **catalpa**, provide visual nectar guides for their insect visitors.

Fruits are maturing. **Cottonwoods** are dispersing their fuzzy seeds as if in a snow storm, using cotton-like fibres to help them fly. The seeds are eaten by waterfowl as they amass on water surfaces.



Eastern cottonwood fluff

**Silver** and **red maple** keys spin to the ground like the blades on a helicopter. The purple fruits of **serviceberry** and the red fruits of shrubs like **elderberry**, **currant**, and **raspberry** are being taken by squirrels and birds, some even before they are ripe. **White mulberry** fruit also attracts wildlife and fallen fruit stains the sidewalk.

By the end of July, many trees have set buds for the following year and stop growing during the hottest days of the summer.



## AUGUST & SEPTEMBER

Leaves deteriorate as insects feast on them and diseases take hold. Large black spots of tar spot fungus can be seen on **Norway maple** leaves.

**Horsechestnut** leaves may brown from several different organisms. Many kinds of insect galls form noticeable bumps on leaves of **maples, oaks, willows, poplars** and **hackberry**. The webs of fall webworm harmlessly surround clusters of leaves on some trees. Summer heat and lack of water cause stress that can result in early fall colours.

Fruits continue to ripen: beneath female **ginkgo** trees, seeds litter the ground – stinking as their orange flesh rots; bright red fruit clusters of **staghorn sumach** are prominent along forest edges.

Acorns and nuts of **oaks, hickories, butternut, walnut** and **horsechestnut** start to fall, occupying squirrels full-time collecting and burying fruit. Uneaten **white oak** acorns will start to grow immediately. **Pine** and **spruce** cones open to release seeds late in August. As the weather cools, trees will be growing roots again until frost.

By the end of September leaves of native trees are beginning to change colour and keys of **Norway, sugar** and **black maple** will be falling to the ground.

## OCTOBER & NOVEMBER

Native **witch-hazel** is the last shrub to flower in the year. Leaves of deciduous trees (including the coniferous larches) continue to change colour as green chlorophyll pigment fades. Fall colours include the yellows of **Norway maple, witch-hazel, poplars, red ash** and **larches**; the reds and oranges of **maples, dogwoods, chokeberry, serviceberry,**

**apple** and **sumachs**; the purple of **white ash**; and the bronze of **oaks**.

Leaves of most native deciduous species have fallen by the end of October while those of introduced species like **Norway maple, weeping willow** and



Maples and oaks in fall colour

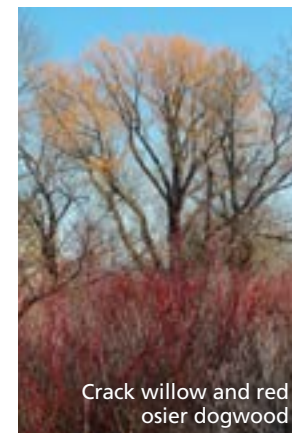
**black alder** may hang on well into November. The dark green leaves of **European buckthorn** and **Siberian elm** stand out against the bare forest until freezing temperatures kill the leaves.

Tree fruits still clinging to branches are obvious now that leaves are gone. **Kentucky coffee-tree, honey-locust, black locust** and **catalpa** have variously shaped pods. The round seed clusters of **London plane-tree** dangle, while the remains of **tulip-tree** fruit clusters stand upright at the tips of branches.

## DECEMBER & JANUARY

Even in the dead of winter trees and shrubs provide colour and interest against the blue skies and white snow.

Look for: golden twigs of **willows** and crimson twigs of **red osier dogwood**; silvery bark of **birch**; red fruit clusters of **sumach**;



Crack willow and red osier dogwood

brightly coloured red, orange or pink fruits of many shrubs and trees; dark brown of woody **alder** cones; the pale brown, dead leaves of **beech** and some **oaks** that hang on for most of the winter; clusters of pale brown **Manitoba maple** keys on their green or purple twigs; and of course the many shades of green and blue of the evergreen **conifers**.



Dried apples in winter

Twigs and bark are browsed by mammals both up high and below the snow – often causing damage that will become evident after snow melt. Fruits including dried, shrivelled fleshy fruits like **apples** nourish wildlife through the winter.

## Checklist of the Trees, Shrubs and Vines of the Toronto Area

This list of over 380 trees, shrubs and vines covers most of the woody plants that you are likely to encounter in Toronto. It is organized alphabetically by the common plant family name. Some species have several common names but usually only one is provided.

Note: *Many species have one or more cultivated varieties and/or hybrids which are not listed. Some of them look quite different from the true species.*

Most trees and shrubs in Toronto are not native. They have been – and continue to be – introduced here either intentionally as garden or agricultural plants or inadvertently, for example as seeds on the mud of shoes.

Many introduced plants have become naturalized – that is, they have spread to natural areas and now reproduce with no assistance from humans. If an introduced species becomes a serious threat to native biodiversity by reproducing aggressively and taking over natural habitats, it is considered to be invasive. **Invasive species** are marked ■

**Native species** are marked ●

A plant is considered native if it grew in Toronto prior to European settlement. Additional species not originally found in Toronto but that are **native to Ontario** are marked with ●

All are trees unless otherwise noted: S shrub; (S) shrubby tree or tree-like shrub; V vine

Abbreviations:  
spp species (plural)  
ssp subspecies  
var. variety

### Ginkgo family – Ginkgoaceae

maidenhair tree *Ginkgo biloba*

### CONIFERS

#### Cypress family – Cupressaceae

yellow-cypress, Nootka cypress *Callitropsis nootkatensis* (S)

Chinese juniper *Juniperus chinensis* (S)

● common juniper *Juniperus communis* S

● creeping juniper *Juniperus horizontalis* S

savin juniper *Juniperus sabina* S

● eastern red-cedar *Juniperus virginiana*

dawn redwood *Metasequoia glyptostroboides*

● eastern white cedar *Thuja occidentalis*

#### Pine family – Pinaceae

**fir, larch, spruce, hemlock**

● balsam fir *Abies balsamea*

white fir *Abies concolor*

European larch *Larix decidua*

● tamarack *Larix laricina*

Norway spruce *Picea abies*

● white spruce *Picea glauca*

Alberta spruce *Picea glauca* var. *densata* S

● black spruce *Picea mariana*

Serbian spruce *Picea omorika*

blue spruce, Colorado spruce *Picea pungens*

Douglas-fir *Pseudotsuga menziesii*

● eastern hemlock *Tsuga canadensis*

**pine**

● Jack pine *Pinus banksiana*

limber pine *Pinus flexilis* (S)

mugo pine *Pinus mugo* (S)

Austrian pine *Pinus nigra*

● red pine *Pinus resinosa*

● eastern white pine *Pinus strobus*

■ Scots pine *Pinus sylvestris*

Himalayan pine *Pinus wallichiana*

### Yew family – Taxaceae

European yew *Taxus baccata* S

● Canada yew *Taxus canadensis* S

Japanese yew *Taxus cuspidata* (S)

foundation yew *Taxus xmedia* S

### BROAD-LEAVED TREES, SHRUBS & VINES

#### Aralia family – Araliaceae

Japanese angelica-tree *Aralia elata* S

devil's walking-stick *Aralia spinosa* S

five-leaved aralia *Eleutherococcus pentaphyllus* S

■ English ivy *Hedera helix* V

#### Barberry family – Berberidaceae

Oregon grape *Berberis aquifolium* S

■ Japanese barberry *Berberis thunbergii* S

■ common barberry *Berberis vulgaris* S

#### Bean or legume family – Fabaceae or Leguminosae

shrubby false indigo *Amorpha fruticosa* S

Siberian pea-shrub *Caragana arborescens* S

● eastern redbud *Cercis canadensis* (S)

yellow-wood *Cladrastis kentukea*

Scotch broom *Cytisus scoparius* S

● honey-locust *Gleditsia triacanthos*

● Kentucky coffee-tree *Gymnocladus dioica*

golden-chain tree *Laburnum xwatereri* S

■ black locust *Robinia pseudoacacia*

clammy locust *Robinia viscosa* S

Japanese pagodatree, scholar-tree

*Styphnolobium japonicum*

Japanese wisteria *Wisteria floribunda* V

#### Beech family – Fagaceae

**chestnut, beech**

● American chestnut *Castanea dentata*

Chinese chestnut *Castanea mollissima*



- American beech *Fagus grandifolia*
- European beech *Fagus sylvatica*

#### oaks

- white oak *Quercus alba*
- swamp white oak *Quercus bicolor*
- bur oak *Quercus macrocarpa*
- chinquapin oak *Quercus muhlenbergii*
- pin oak *Quercus palustris*
- English oak *Quercus robur*
- northern red oak *Quercus rubra*
- black oak *Quercus velutina*
- red-black hybrid oak *Quercus xhawkinsiae*

#### Birch family – Betulaceae

##### alder, birch

- European black alder *Alnus glutinosa*
- gray alder *Alnus incana* ssp *incana* (S)
- speckled alder *Alnus incana* ssp *rugosa* S
- green alder *Alnus viridis* ssp *crispa* S
- yellow birch *Betula alleghaniensis*
- Himalayan white birch *Betula utilis* var. *jacquemontii*
- river birch *Betula nigra*
- paper birch, white birch *Betula papyrifera*
- European white birch *Betula pendula*

##### hornbeam, hazel

- European hornbeam *Carpinus betulus*
- blue-beech, ironwood *Carpinus caroliniana* (S)
- American hazel *Corylus americana* S
- European hazelnut *Corylus avellana* S
- Turkish hazel *Corylus colurna*
- beaked hazel *Corylus cornuta* S
- hop-hornbeam, ironwood *Ostrya virginiana*

#### Bittersweet family – Celastraceae

- oriental bittersweet *Celastrus orbiculatus* V
- American bittersweet *Celastrus scandens* V
- winged euonymus, burning bush *Euonymus alatus* S

- eastern burning bush *Euonymus atropurpureus* S
- European spindle-tree *Euonymus europaeus* S
- winter creeper *Euonymus fortunei* S
- running strawberry-bush *Euonymus obovatus* S

#### Bladdernut family – Staphyleaceae

- bladdernut *Staphylea trifolia* S

#### Box family – Buxaceae

- boxwood *Buxus sempervirens* S

#### Buttercup family – Ranunculaceae

- clematis *Clematis* spp V
- virgin's-bower *Clematis virginiana* V

#### Buckthorn family – Rhamnaceae

- New Jersey tea *Ceanothus americanus* S
- glossy buckthorn *Frangula alnus* S
- alder-leaved buckthorn *Rhamnus alnifolia* S
- European buckthorn, common buckthorn *Rhamnus cathartica* (S)

#### Cashew family – Anacardiaceae

- smoke-tree *Cotinus coggygia* (S)
- fragrant sumach *Rhus aromatica* S
- smooth sumach *Rhus glabra* S
- staghorn sumach *Rhus typhina* S
- poison ivy *Toxicodendron radicans* S V

#### Citrus family – Rutaceae

- Amur corktree *Phellodendron amurense*
- northern prickly-ash *Zanthoxylum americanum* S

#### Currant family – Grossulariaceae

- alpine currant *Ribes alpinum* S
- wild black currant *Ribes americanum* S
- buffalo currant *Ribes aureum* var. *villosum* S
- prickly gooseberry *Ribes cynosbati* S
- smooth gooseberry *Ribes hirtellum* S
- black currant *Ribes nigrum* S
- European red currant *Ribes rubrum* S

- swamp red currant *Ribes triste* S
- European gooseberry *Ribes uva-crispa* S

#### Custard-apple family – Annonaceae

- pawpaw *Asimina triloba* S

#### Daphne family – Thymelaeaceae

- daphne *Daphne mezereum* S
- rose daphne *Daphne cneorum* S
- leatherwood *Dicra palustris* S

#### Dogwood family – Cornaceae

- white dogwood, Siberian dogwood *Cornus alba* S
- alternate-leaved dogwood *Cornus alternifolia* (S)
- silky dogwood *Cornus amomum* ssp *obliqua* S
- bunchberry *Cornus canadensis* S
- flowering dogwood *Cornus florida* (S)
- grey dogwood *Cornus foemina* ssp *racemosa* S
- Korean dogwood *Cornus kousa* (S)
- Cornelian cherry *Cornus mas* (S)
- round-leaved dogwood *Cornus rugosa* S
- red osier dogwood *Cornus stolonifera* S
- black gum *Nyssa sylvatica*

#### Elderberry family – Adoxaceae

##### honeysuckle

- bush honeysuckle *Diervilla lonicera* S
- fly honeysuckle *Lonicera canadensis* S
- glaucous honeysuckle *Lonicera dioica* V
- hairy honeysuckle *Lonicera hirsuta* V
- Japanese honeysuckle *Lonicera japonica* V
- Amur honeysuckle *Lonicera maackii* S
- Morrow's honeysuckle *Lonicera morrowii* S
- Tartarian honeysuckle *Lonicera tatarica* S

##### elderberry

- common elderberry *Sambucus canadensis* S
- red elderberry *Sambucus racemosa* ssp *pubens* S

### snowberry, weigela

- eastern snowberry *Symphoricarpos albus* var. *albus* S
- western snowberry *Symphoricarpos albus* var. *laevigatus* S
- wolf-berry *Symphoricarpos orbiculatus* S
- weigela *Weigela* spp S

### viburnum

- maple-leaved viburnum *Viburnum acerifolium* S
- Korean spice viburnum *Viburnum carlesii* S
- wayfaring tree *Viburnum lantana* S
- hobblebush *Viburnum lantanoides* S
- nannyberry *Viburnum lentago* S
- wild raisin *Viburnum nudum* var. *cassinoides* S
- highbush cranberry *Viburnum opulus* ssp *trilobum* S
- European highbush cranberry, guelder-rose *Viburnum opulus* ssp *opulus*
- downy arrow-wood *Viburnum rafinesquianum* S
- southern arrow-wood *Viburnum recognitum* S
- ornamental viburnums *Viburnum* spp S

### Elm family – Ulmaceae

- white elm *Ulmus americana*
- Japanese elm *Ulmus davidiana*
- Scotch elm, wych elm *Ulmus glabra*
- field elm *Ulmus minor*
- English elm *Ulmus procera*
- Siberian elm, Chinese elm *Ulmus pumila*
- slippery elm *Ulmus rubra*
- rock elm *Ulmus thomasii*
- Japanese zelkova *Zelkova serrata*

### Figwort family – Scrophulariaceae

butterfly bush *Buddleia davidii* S

### Grape family – Vitaceae

- thicket creeper *Parthenocissus vitacea* V
- Virginia creeper *Parthenocissus quinquefolia* V
- Boston ivy *Parthenocissus tricuspidata* V

- summer grape *Vitis aestivalis* V
- fox grape *Vitis labrusca* V
- riverbank grape *Vitis riparia* V

### Greenbriar family – Smilacaceae

- bristly greenbrier *Smilax tamnoides* V

### Heath family – Ericaceae

- common bearberry *Arctostaphylos uva-ursi* S
- azalea *Azalea* spp S
- leatherleaf *Chamaedaphne calyculata* S
- creeping snowberry *Gaultheria hispidula* S
- eastern wintergreen *Gaultheria procumbens* S
- black huckleberry *Gaylussacia baccata* S
- sheep-laurel *Kalmia angustifolia* S
- bog-laurel *Kalmia polifolia* S
- pieris *Pieris japonica* S
- Labrador-tea *Rhododendron groenlandicum* S
- rhododendron *Rhododendron* spp S
- lowbush blueberry *Vaccinium angustifolium* S
- velvet-leaf blueberry *Vaccinium myrtilloides* S
- hillside blueberry *Vaccinium pallidum* S

### Hemp family – Cannabaceae

- hackberry *Celtis occidentalis*

## DID YOU KNOW?

There are 44 species of trees, 103 shrubs, and 10 vines that are indigenous to Toronto. A further 35 are indigenous to other parts of southern Ontario and grow well here. The rest are cultivated species that in many cases have been bred for particular attributes, such as leaf colour, flower size, or growth form.

### Holly family – Aquifoliaceae

- English holly *Ilex aquifolium* S
- common winterberry *Ilex verticillata* S

### Hydrangea family – Hydrangaceae

- slender deutzia *Deutzia gracilis* S
- hydrangea *Hydrangea paniculata* S, V
- European mock-orange *Philadelphus coronarius* S

### Katsura family – Cercidiphyllaceae

- katsura-tree *Cercidiphyllum japonicum*

### Laurel family – Lauraceae

- spicebush *Lindera benzoin* S
- sassafras *Sassafras albidum*

### Madder family – Rubiaceae

- buttonbush *Cephalanthus occidentalis* S
- partridgeberry *Mitchella repens* S

### Magnolia family – Magnoliaceae

- tulip-tree *Liriodendron tulipifera*
- cucumber-tree *Magnolia acuminata*
- magnolia *Magnolia* spp (S)
- star magnolia *Magnolia stellata* (S)
- saucer magnolia *Magnolia x soulangeana*

### Mallow family – Malvaceae

- rose of Sharon *Hibiscus syriacus* S
- basswood *Tilia americana*
- little-leaved linden *Tilia cordata*
- European linden *Tilia heterophylla*

### Moonseed family – Menispermaceae

- moonseed *Menispermum canadense* V

### Mulberry family – Moraceae

- osage-orange *Maclura pomifera* (S)
- white mulberry *Morus alba*



### Oleaster family – Elaeagnaceae

- Russian olive *Elaeagnus angustifolia* (S)
- silverberry *Elaeagnus commutata* S
- autumn olive *Elaeagnus umbellata* S
- sea-buckthorn *Hippophaë rhamnoides* S
- silver buffaloberry *Shepherdia argentea* S
- russett buffaloberry *Shepherdia canadensis* S

### Olive family – Oleaceae

#### ash

- white ash *Fraxinus americana*
- European ash *Fraxinus excelsior*
- black ash *Fraxinus nigra*
- red ash, green ash *Fraxinus pennsylvanica*
- blue ash *Fraxinus quadrangulata*

#### forsythia, privet, lilac

- weeping forsythia *Forsythia suspensa* S
- forsythia *Forsythia viridissima* S
- privet *Ligustrum vulgare* S
- Japanese tree lilac *Syringa reticulata* (S)
- common lilac *Syringa vulgaris* S
- Preston lilac *Syringa xprestoniae* S

### Plane-tree family – Platanaceae

- eastern sycamore *Platanus occidentalis*
- London plane-tree *Platanus xhispanica*

### Quassia family – Simaroubaceae

- tree-of-heaven *Ailanthus altissima*

### Rose family – Rosaceae

#### serviceberry, chokeberry

- Saskatoon *Amelanchier alnifolia* S
- downy serviceberry *Amelanchier arborea* (S)
- shadblow, Canada serviceberry *Amelanchier canadensis* (S)
- smooth serviceberry *Amelanchier laevis* (S)
- round-leaved serviceberry *Amelanchier sanguinea* S

- running serviceberry *Amelanchier spicata* S
- red chokeberry *Aronia arbutifolia* S
- black chokeberry *Aronia melanocarpa* S

#### cotoneaster, hawthorn, firethorn, jet-bead

- cotoneaster *Cotoneaster* spp S
- pear-shaped hawthorn *Crataegus fluviatilis* S
- fireberry hawthorn *Crataegus chrysocarpa* S
- scarlet hawthorn *Crataegus coccinea* var. *coccinea* (S)
- Fuller's hawthorn *C. coccinea* var. *fulleriana* S
- Pringle's hawthorn *C. coccinea* var. *pringlei* S
- cockspur hawthorn *Crataegus crus-galli* (S)
- Dodge's hawthorn *Crataegus dodgei* S
- fan-leaved hawthorn *Crataegus flabellata* S
- Holmes' hawthorn *Crataegus holmesiana* S
- Paul's scarlet hawthorn *Crataegus laevigata* 'Paul's Scarlet'
- long-spined hawthorn *Crataegus macracantha* S
- variable hawthorn *Crataegus macrosperma* S
- downy hawthorn *Crataegus mollis* S
- English hawthorn *Crataegus monogyna* (S)
- Washington thorn *Crataegus phaenopyrum* (S)
- dotted hawthorn *Crataegus punctata* (S)
- rough hawthorn *Crataegus scheutteii* S
- northern downy hawthorn *Crataegus submollis* S
- juicy hawthorn *Crataegus succulenta* S
- Toba hawthorn *Crataegus xordenensis* 'Toba' S
- scarlet firethorn *Pyracantha coccinea* S
- jet-bead *Rhodotypos scandens* S

#### apple, pear, quince

- flowering quince *Chaenomeles japonica* S
- common quince *Cydonia oblonga* (S)
- Siberian crabapple *Malus baccata* S
- wild crabapple *Malus coronaria* S
- Chinese crabapple *Malus prunifolia* S
- common apple *Malus pumila*
- flowering crabapple *Malus* spp
- Callery pear *Pyrus calleryana*
- common pear *Pyrus communis*

#### almond, apricot, cherry, peach, plum

- American plum *Prunus americana* S
- apricot *Prunus armeniaca* (S)
- sweet cherry, bird cherry *Prunus avium*
- sour cherry *Prunus cerasus* S
- common plum *Prunus domestica* S
- Mahaleb cherry *Prunus mahaleb* S
- Canada plum *Prunus nigra* S
- pin cherry *Prunus pensylvanica*
- peach *Prunus persica* (S)
- sand cherry *Prunus pumila* var. *susquehanae* S
- black cherry *Prunus serotina*
- Japanese cherry *Prunus serrulata*
- blackthorn *Prunus spinosa* S
- Manchu cherry, Nanking cherry *Prunus tomentosa* S
- flowering almond *Prunus triloba* S
- chokecherry *Prunus virginiana* (S)
- purpleleaf sand cherry *Prunus xstena* S
- Yoshino cherry *Prunus xyedoensis*

#### rose

- smooth rose *Rosa blanda* S
- dog rose *Rosa canina* S
- pasture rose *Rosa carolina* S
- cinnamon rose *Rosa davurica* S
- horticultural roses *Rosa* spp S
- multiflora rose *Rosa multiflora* S
- swamp rose *Rosa palustris* S
- sweetbrier rose *Rosa rubiginosa* S
- wrinkled rose *Rosa rugosa* S
- Virginia rose *Rosa virginiana* S

#### blackberry, raspberry

- common blackberry *Rubus allegheniensis* S
- northern dewberry *Rubus flagellaris* S
- swamp dewberry *Rubus hispidus* S
- wild red raspberry *Rubus idaeus* ssp *strigosus* S
- black raspberry *Rubus occidentalis* S
- purple flowering raspberry *Rubus odoratus* S

- Pennsylvania blackberry *Rubus pensilvanicus* S
- dwarf raspberry *Rubus pubescens* S

#### mountain-ash, whitebeam, rowan

- American mountain-ash *Sorbus americana* S
- whitebeam *Sorbus aria*
- European mountain-ash, rowan *Sorbus aucuparia*
- showy mountain-ash *Sorbus decora* (S)
- oakleaf mountain-ash *Sorbus xthuringiaca*

#### dry-fruited shrubs

- Japanese kerria *Kerria japonica* S
- shrubby cinquefoil *Potentilla fruticosa* S
- eastern ninebark *Physocarpus opulifolius* S
- false spiraea *Sorbaria sorbifolia* S
- narrow-leaved meadow-sweet *Spiraea alba* S
- bridal wreath spiraea *Spiraea* spp S

#### St Johns-wort family – Hypericaceae

- Kalm's St. John's-wort *Hypericum kalmianum* S
- shrubby St. John's-wort *Hypericum prolificum* S

#### Smartweed family – Polygonaceae

- silver-lace vine *Fallopia aubertii* V

#### Soapberry family – Sapindaceae

##### maple

- trident maple *Acer buergerianum* (S)
- hedge maple *Acer campestre*
- paperbark maple *Acer griseum* (S)
- Manitoba maple *Acer negundo*
- Japanese maple *Acer palmatum* (S)
- striped maple *Acer pensylvanicum* (S)
- Norway maple *Acer platanoides*
- sycamore maple *Acer pseudoplatanus*
- red maple *Acer rubrum*
- silver maple *Acer saccharinum*
- black maple *Acer saccharum* ssp *nigrum*
- sugar maple *Acer saccharum* ssp *saccharum*

- mountain maple *Acer spicatum* (S)
- Tartar maple *Acer tataricum* (S)
- Amur maple *Acer tataricum* ssp *ginnala* (S)
- Freeman maple, hybrid swamp maple *Acer xfreemanii*

#### buckeye, horsechestnut, rain-tree

- yellow buckeye *Aesculus flava*
- Ohio buckeye *Aesculus glabra*
- horsechestnut *Aesculus hippocastanum*
- red horsechestnut *Aesculus xcarnea*
- golden rain-tree *Koelreuteria paniculata* S

#### Tamarix family – Tamaricaceae

tamarisk *Tamarix ramosissima* S

#### Trumpet creeper family – Bignoniaceae

- trumpet creeper *Campsis radicans* V
- southern catalpa *Catalpa bignonioides*
- northern catalpa *Catalpa speciosa*

#### Walnut family – Juglandaceae

- bitternut hickory *Carya cordiformis*
- shagbark hickory *Carya ovata*
- Japanese walnut *Juglans ailantifolia*
- butternut *Juglans cinerea*
- black walnut *Juglans nigra*
- English walnut *Juglans regia*

#### Wax-myrtle family – Myricaceae

- sweet-fern *Comptonia peregrina* S
- sweet gale *Myrica gale* S
- northern bayberry *Myrica pensylvanica* S

#### White-alder family – Clethraceae

summersweet *Clethra alnifolia* S

#### Willow family – Salicaceae

##### poplar

- white poplar *Populus alba*
- balsam poplar *Populus balsamifera*

- eastern cottonwood *Populus deltoides*
- large-toothed aspen *Populus grandidentata*
- Lombardy poplar *Populus nigra* var. *italica*
- trembling aspen *Populus tremuloides*
- Carolina poplar *Populus xcanadensis*
- Jack's poplar *Populus xjackii*

##### willow

- white willow *Salix alba*
- peach-leaved willow *Salix amygdaloides*
- yellowish willow *Salix aurita* S
- Bebb's willow *Salix bebbiana* S
- goat willow, European pussy willow *Salix caprea* (S)
- grey willow *Salix cinerea* S
- heart-leaved willow *Salix cordata* S
- violet willow *Salix daphnoides* S
- pussy willow *Salix discolor* S
- narrow heart-leaved willow, woolly-headed willow *Salix eriocephala* S
- prairie willow *Salix humilis* S
- sandbar willow *Salix interior* S
- shining willow *Salix lucida* S
- corkscrew willow *Salix matsudana*
- black willow *Salix nigra*
- laurel willow *Salix pentandra* (S)
- slender willow *Salix petiolaris* S
- purple osier willow *Salix purpurea* S
- autumn willow *Salix serissima* S
- basket willow *Salix viminalis* S
- crack willow *Salix xfragilis*
- weeping willow *Salix xsepulcralis*

#### Witch-hazel family – Hamamelidaceae

- vernal witch-hazel *Hamamelis vernalis* S
- witch-hazel *Hamamelis virginiana* S
- sweet-gum *Liquidambar styraciflua*





Black walnut, *Juglans nigra*  
Watercolour by Celia Godkin

## Exceptional Viewing Locations

### 1 HUMBER ARBORETUM

The Arboretum, adjacent to the Humber River, has botanical gardens and over 6 km of walking trails through forests characteristic of the Carolinian zone. Its collection of labeled trees and shrubs provides examples of native species and horticultural varieties that are suited to this climate and can be used in home gardens in the Toronto region, including sweet-gum, American bladdernut and pawpaw. Exceptional among them is a giant bur oak that is over 30 m tall with a circumference of just under 4 m!

### 2 CENTENNIAL PARK

Shagbark hickory forests and a patch of sugar maple-beech forest cover different slopes of this part of the valley formed by Etobicoke Creek. Scattered swamps featuring red ash, and riparian forests featuring white elm and crack willow, occupy the valley bottom.

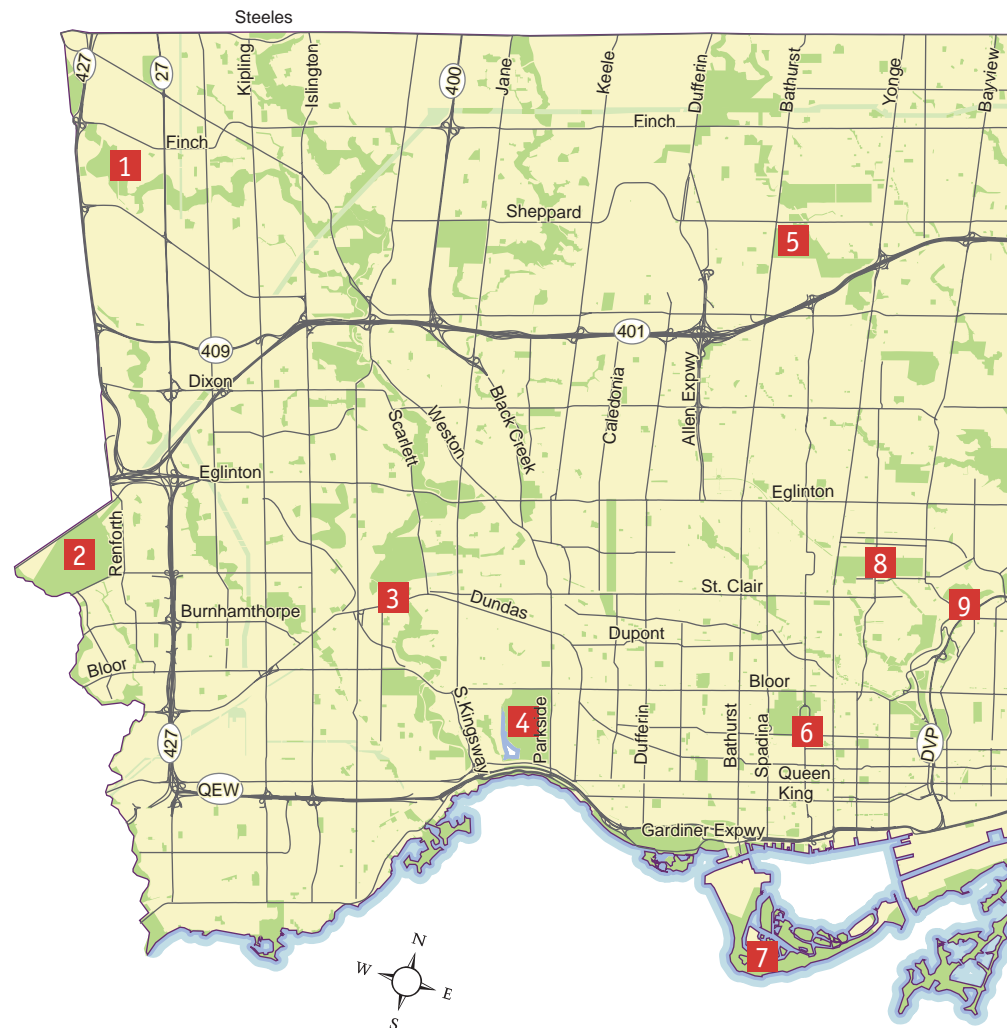
### 3 LAMBTON WOODS AND LAMBTON PARK

These parks, located on opposite sides of the Humber River, are biodiversity hot-spots within Toronto. The upland Mixed Forests of sugar maple, eastern hemlock and white birch on the steep slopes in Lambton Woods grade into lowland forests of balsam poplar, tamarack and yellow birch in the floodplains in the southern part of the park. Across the river, remnant tallgrass prairies and black-oak savannah with an understory of New Jersey tea persist from pre-settlement times. These habitats are subject to periodic managed burns that maintain the savannah characteristics.

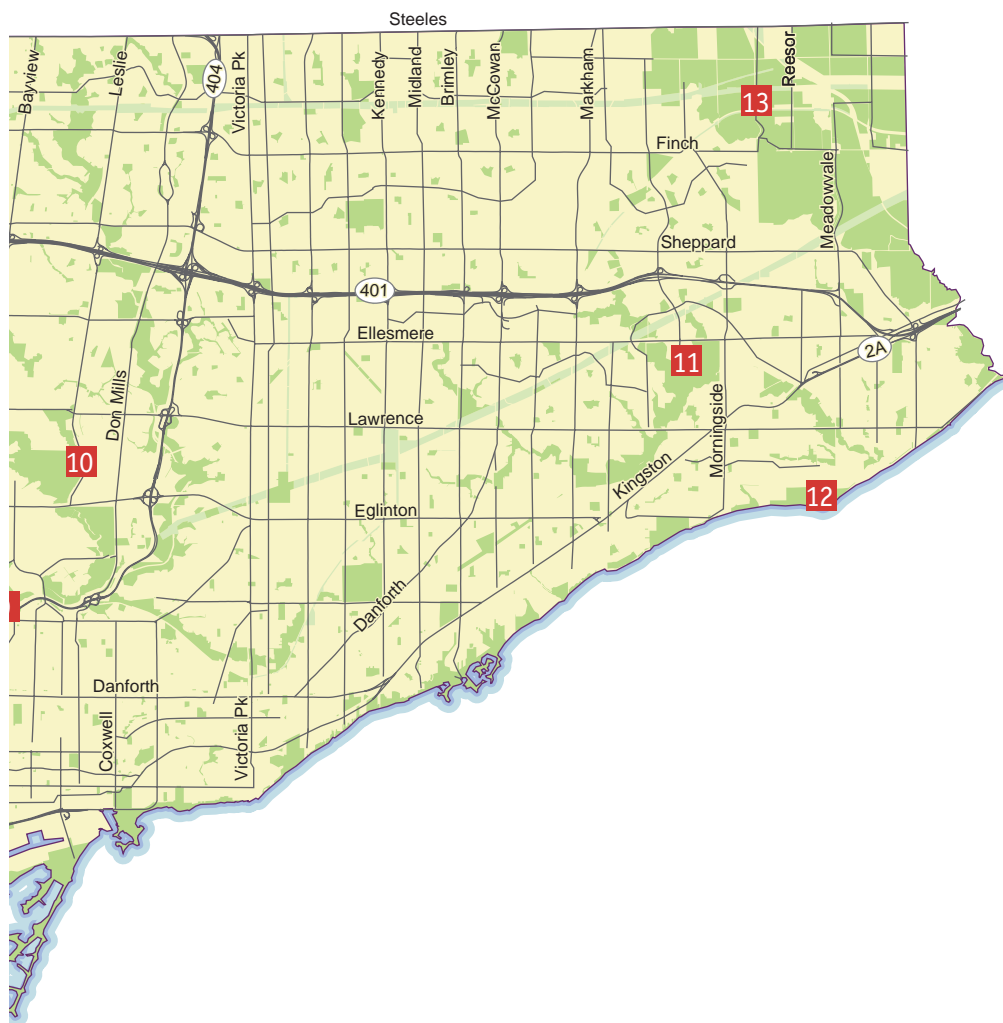
### 4 HIGH PARK – featured on page 66

### 5 EARL BALES PARK

The upper slopes of this section of the West Don River valley have good examples of Mixed Forests of sugar maple, eastern white pine, American beech, red oak and eastern hemlock. The lower slopes







and bottomlands provide examples of lowland forests dominated by Manitoba maple with some patches of black maple, yellow birch, and butternut. Large specimens of black walnut in the park are the remains of plantations that were established by the original farmers.

**6 QUEEN'S PARK** – featured on page 67

**7 TORONTO ISLAND** – featured on page 68

**8 MOUNT PLEASANT CEMETERY**

This private cemetery is an arboretum with one of the largest and most spectacular collections of native and horticultural tree and shrub specimens in Canada. Many of the trees are labelled, and a tree map with an index to species is available for a nominal charge through the office.

**9 CROTHERS WOODS** – featured on page 69

**10 SUNNYBROOK AND OTHER PARKS OF THE CENTRAL DON** – featured on page 70

**11 MORNINGSIDE PARK** – featured on page 71

**12 EAST POINT PARK**

This is one of the best places in the city to experience forest succession from open meadows lush with wildflowers, through shrubby thickets of colourful red osier dogwood and staghorn sumach, to open poplar woodlands. Its location on Lake Ontario also offers an opportunity to observe bluff habitats with species such as russet buffaloberry and shrub willows.

**13 ROUGE PARK** – featured on page 72

## HIGH PARK

Black oak savannah once flourished on the well-drained sandy soils of glacial Lake Iroquois throughout the park. This globally rare forest type, dominated by black oak, relies on periodic fires to keep it from succeeding to dense forest. Although a third of the park remains in this pre-settlement natural state, soil compaction from recreational uses, introduction of non-native and invasive species, and the suppression of fire over the last century threatened the savannah's continued existence. In the absence of fire, black oak seeds were not germinating, native grasses and wildflowers were being outcompeted and appeared to be lost to the ecosystem, and the grassland was filling in with invasive species.

Since 1997, the City of Toronto has carried out regular prescribed burns in order to restore the savannah. The burns help to control invasive species, increase regeneration of black oaks and encourage success of planted native species. Burns also stimulate germination of seeds hidden in the soil from the tall grasses and wildflowers that originally grew there. In addition to the burns, the City undertakes ongoing natural area management, such as invasive species control, planting of native species, and closing of unauthorized trails.

In the Mixed and Deciduous Forests found in other parts of the park, trees to be seen include sassafras, red oak, red maple, eastern hemlock and black cherry. Restoration efforts in these habitats have included removal of invasive species and planting of native trees, shrubs and other plants.

High Park is especially known for its groves of flowering cherries, first planted in 1959 as a thank you gift from the citizens of Tokyo Japan to the citizens of Toronto for welcoming Japanese-Canadians after WWII. These impressive sakura, or cherry blossom trees, bloom in late April or early May, depending on weather.



Black oak savannah  
photo: City of Toronto



Flowering cherry  
photo: John Barker





photo: ROM

Lightning-damaged white oak

## QUEEN'S PARK

At the time of European settlement, Queen's Park and the surrounding area was covered by groves of eastern white pine and red and white oaks. The first urban park in North America, Queen's Park was established in 1860 as a gathering place for social activities and relaxation on the outskirts of the City. Today Queen's Park is a focal point of the urban forest because of its large, mature trees and tranquil space nestled in the heart of downtown Toronto.

There are over 300 trees of more than 50 different species, nearly 20 of which are native to Ontario. The huge red and white oaks, some of which have lost their tops to lightning, are the progeny of trees from the original sand plain forest. These old trees are being under-planted with a variety of young oaks to replace the canopy when they inevitably die. Other mature native species include butternut, black walnut, Kentucky coffee-tree, sugar and silver maple, and white and red ash.

Norway maple is by far the most common species in Queen's Park, likely planted by Boy Scouts in the mid-20th century. The varieties 'Crimson King' and 'Schwedler' provide splashes of burgundy foliage. There are also impressive specimens of London plane-tree, horsechestnut, sycamore maple, English oak, European ash, northern catalpa, and several different lindens.

The trees in the park have been mapped and some have been labelled. "Trees for Toronto" interpretive panels trace the cultural and natural history of Queen's Park and provide a guide to recognizing trees through the seasons.



photo: John Barker

Cornelian cherry  
photo: D. A. Metsger

## TORONTO ISLAND

Toronto Island was originally a sandy peninsula forming Toronto Bay. Remaining natural areas include beach strands, dunes and wetlands where eastern cottonwood, shrub willows and the crimson-stemmed red osier dogwood thrive in spite of seasonal flooding and/or burying by blowing sand. Here too, riverbank grape climbs tall trees with its corkscrew-like tendrils or simply sprawls over the sandy ground.

Elsewhere, trees from around the world have been planted in parkland. As fitting for a shoreline habitat, willow family members abound: graceful weeping willows, crack willows with massive trunks, and Carolina poplars with leaves that flutter in the slightest breeze. A self-guided tour of over 50 labelled trees extends the length of the island. A map and information about each species can be found online (see Resources section).



Crack willow

From the boardwalk, look out to Tommy Thompson Park where eastern cottonwoods colonized this man-made spit following its construction. These fast-growing trees grew from seed carried on the wind from Toronto Island. Many are now dead from the effects of cormorant guano and only their silvery trunks and branches remain, dotted with the large nests of cormorants.



Riverbank grape in fall



Eastern cottonwood woodland with red osier dogwood in fall

photos: Jenny Bull



Dead cottonwoods on Leslie Street Spit  
photo: John Barker



## CROTHERS WOODS

Crothers Woods is one of the best examples of mature deciduous forest in Toronto. Many trees here are more than a century old, with parts of the forest remaining in much the same condition as it was before European settlement.



Buttress of mature beech tree  
photo: Lynnette Browne

The east-and south-facing slopes of this portion of the Central Don River valley are cloaked with maple-beech and oak-hickory forests, featuring American beech, sugar maple, red and white oak, shagbark hickory, bitternut hickory, beaked hazel, and eastern hemlock. There are also a few surviving butternut, an endangered species.

On the lowlands, at Sun Valley, Cottonwood Flats and along the Lower Don Trail, shrub thickets and successional forests lead down to the river.

Crothers Woods has a long history of industrial and recreational uses. Since 2002, the City of Toronto has been actively managing 8 km of sustainable narrow, natural surface trails with the assistance of community volunteers.



Aerial view of Crothers Woods  
photo: Aerographic



Mountain biker on natural surface trail  
photo: Matt Forsythe

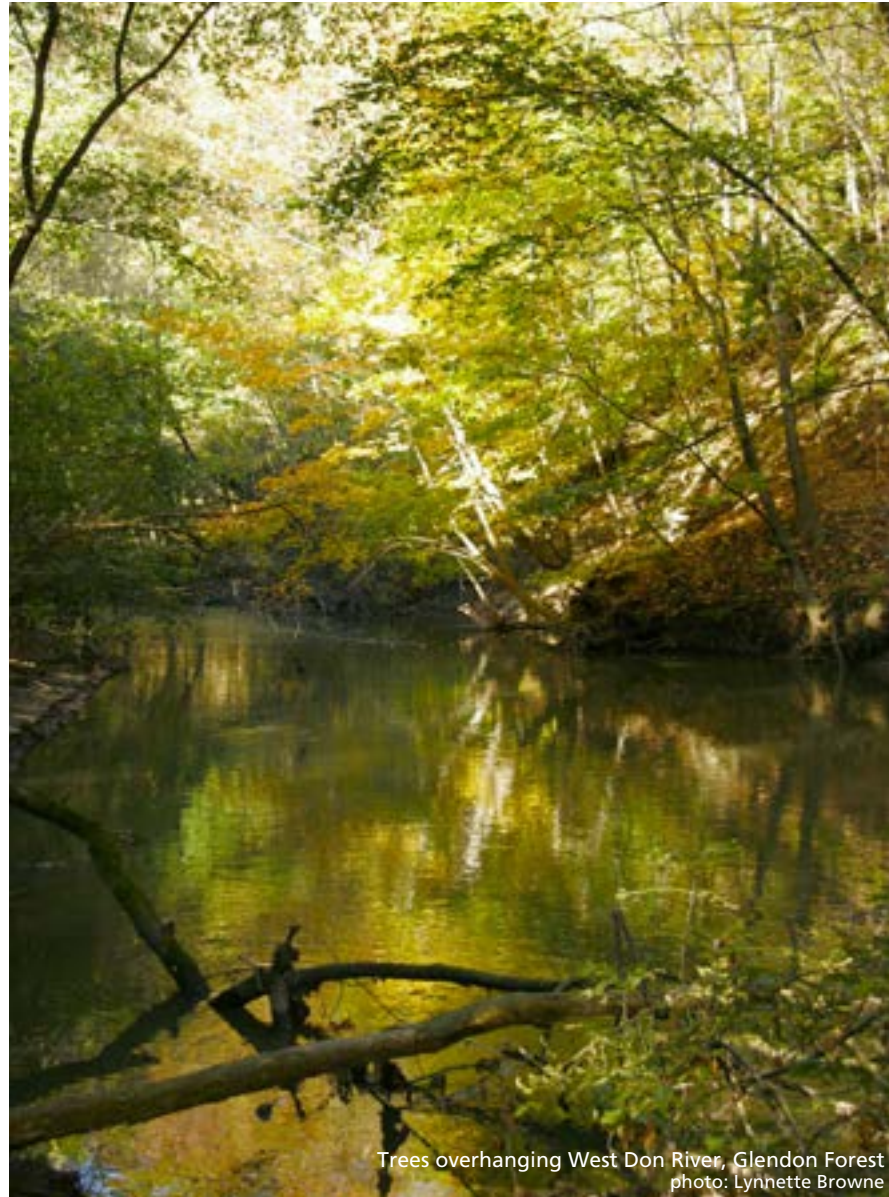


## SUNNYBROOK PARK COMPLEX

Sunnybrook Park is abutted by three other large forested areas that are designated as Environmentally Significant Areas – Glendon Forest to the northwest, Wilket Creek Park to the northeast and Burke Brook to the west. Together, this complex of parks makes up one of the largest greenspaces in central Toronto, at nearly 200 ha of parkland.

Like many of Toronto's ravines, much of the land in Sunnybrook and its neighbouring parks was farmland with just a few trees less than a century ago. In the late 1800s, Sunnybrook Park was Sunnybrook Farm, a country estate which was later donated to the City to be used as a park. The farm's barns are still present on the site and currently serve as a public riding school. Large areas of the park have regenerated or have been restored to natural forest, especially on the valley slopes and along the West Don River and its tributaries. Follow the trails through Sunnybrook or these adjacent ravines to find a diverse mixture of forest, bluff, swamp and marsh communities.

The slopes of these ravines are primarily covered by mature mixed maple-oak forest, while the bottomlands contain swamps and red osier dogwood thickets that provide great habitat for wetland wildlife including frogs and turtles. Large white pines are visible in Glendon Forest, rising out of the canopy on the ravine slopes. Soon after the spring snow melt, the forest floors are carpeted with spring wildflowers, such as trilliums and trout lilies, especially along Wilket Creek. The north facing slopes of Burke Brook still retain some stately old hemlock trees mixed in with the sugar maples and oaks.



Trees overhanging West Don River, Glendon Forest  
photo: Lynnette Browne



## MORNINGSIDE PARK

In addition to its broad expanse of picnic grounds, this park in the Highland Creek valley is one of the best places in the city to see the broadest range of forest habitats in a small area.

The hills in the middle of the park showcase how forest communities relate to specific conditions of soil and temperature. On the east and south sides of the hills a tall shrub layer of alternate-leaved dogwood leads into moist, cool sugar maple and American beech forests with some black cherry, white birch, white pine and hop-hornbeam. These bottomlands and hillsides are carpeted with ferns and in the early spring, native woodland wildflowers.

As you move toward the tops of the hills, the dry soils and warmer temperatures support open grown red oak and white cedar with some chokecherry. The cool, shady north-facing slopes are cloaked in pure stands of eastern hemlock. The west side of the hills are erosion slopes that border Highland Creek where Manitoba maple and several willow species grow well in the disturbed soils.

North of the main entrance, along Morningside Avenue there is an excellent example of a white cedar swamp with one of the few stands of tamarack in the city. East of Morningside, the cedar swamp grades into a stand of eastern hemlock and balsam fir with a shrub layer of Canada yew. This damp forest has acidic soils and cool conditions that mimic the Boreal forests of northern Ontario.



Riparian and mixed forests visible from Highland Creek as it runs through Morningside Park  
photo: Matt Forsythe

## ROUGE PARK

Rouge Park is Canada's first National Urban Park. Its rich mosaic of habitats supports over 100 nationally and regionally rare species of plants and animals. The Toronto portion of the park stretches from the shores of Lake Ontario to the city limit at Steeles Avenue.

The splendour of the lower Rouge Valley forests can be seen from Highway 401 as it crosses over the Rouge River east of Meadowvale Road. From here wind-blown white pines tower above the canopy of red and white oak in the mature upland forests that cloak the steep ravine slopes. Many of these trees are 100 to 200 years old.

The spectacular forests of Rouge Park can also be experienced close up from the network of trails. The Mast Trail, one of the best and longest, first passes along the river lined with willows, poplars and Manitoba maple, then travels through cool, shady hemlock woodland. Further north, past Twyn Rivers Drive, this forest type dominates the north side of the ridge providing a sharp contrast to the mature Mixed Forest on the south side where you will encounter sugar maple, beech, white ash, bitternut hickory, butternut, ironwood, basswood, and yellow birch. From the trail head, Cedar Trail passes through white cedar woodland.

Near the north end of the park, the Woodland Trail takes you through a stand of lowland forest dominated by black maple with ashes, basswood and a variety of other species along the river shoreline.



Little Rouge River  
photo: Stephen Smith



View of Rouge Park and Toronto from Beare Hill Park  
photo: Matt Forsythe



## Toronto's Big Old Trees

A few very large, very old trees, some dating to pre-settlement times, still stand throughout Toronto. These impressive trees are important symbols of the past and relics of aboriginal settlement patterns. Their seeds are sources of genetic material that are truly native to Toronto and therefore adapted to its conditions. Recognizing their value, several organizations champion their protection and propagation. As many of these trees are on private property, they cannot be visited, but photos and historical information are available for some at the Forests Ontario website (see Resources section).



White elm at Exhibition Place  
photo: ©Vincenzo Pietropaolo. Courtesy of the artist

## A Walk in the Forest

Close your eyes and imagine entering a forest in the middle of the city. At first it seems dark and quiet after the bright sun reflecting off concrete sidewalks and the roar of trucks and cars. But soon your eyes and ears attune to the sights and sounds of the many kinds of life that call the forest home.

In the dim light, you see spindly young maples. They are growing slowly as they wait in the shade of their elders. When an old one falls in a big wind, allowing sunlight to stream in, they'll race towards the light, eventually taking their place high in the canopy. These maples and the other trees and shrubs around them are not only part of the biodiversity of the forest but are also the home – or habitat – of many other plants, animals, fungi and micro-organisms.

As we walk through the forest, our footsteps crackle and crunch on the crisp leaves that fell from the trees and shrubs the previous fall. Over time, these leaves will be decomposed by thousands of tiny organisms until they become part of the soil. Slowly but steadily, this rotted organic matter increases the depth and richness of the soil.



Within the soil, the rootlets of the maples are entwined with a fungus that helps the trees gather in moisture and nutrients, while the fungus in turn receives sugars from the trees. This mycorrhizal “fungus-root” association actually joins the trees in the forest together in a huge network. Many of the mushrooms you may see on the forest floor come from these underground fungi. The mushrooms release spores from the underside of the cap to be wafted away above ground.

photos: Jenny Bull





Take a deep breath and appreciate the cool, moist air and earthy smells of the forest. The interior of the forest beneath the leafy canopy is sheltered from drying winds and shaded from full sun. A narrow shaft of sunlight may briefly light up a mat of bright green moss growing on a rock. Like the fungus with its mushrooms, the mosses raise their spore capsules up on slender stalks so the spores inside can be dispersed when the capsules open. Within the miniature forest formed by the moss stems, bugs and beetles are running around, busy with their daily life. There may even be a salamander that's come out from under a slab of fallen bark.



photo: Mary Ferguson FPSA

A bird alighting on the branch of a shrub in the understory searches for green caterpillars munching on the leaves. When the bird has a beakful, it will fly off to its nest where its young are eagerly waiting. The nest may be in a low shrub nearby but it's likely to be well camouflaged and hard to see.

Some of the trees in this forest are dead or dying but still play an important role, providing shelter, food, and even a place for courtship. The loud drumming of a woodpecker leads us to a still-standing dead tree, "a snag" chosen by the woodpecker because it resonates loudly. He is counting on this to attract a mate. Softer drumming may indicate that a woodpecker is digging out a dinner of insect larvae growing within the wood of a tree.



photo: Karen McDonald

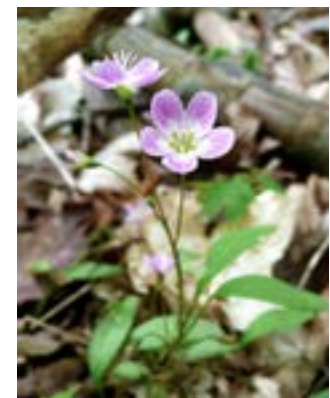


photo: Stephen Smith

As trees die, wood-rotting fungi spread through them. Their spores are brought out into the open for dispersal in "shelves" or "brackets," so they are called shelf or bracket fungi. Diseased and dying trees may drop branches so that cavities are formed where a raccoon can safely raise her kits.

Moving along, we encounter the half rotted remains of a tree that has fallen to the forest floor. Tipped up by a strong wind, the tree's roots have left behind a large hole in the ground. The log is now partially hidden by feather moss and ferns.

Over time, it will completely decay thanks to fungi, insects and micro-organisms. The rotted trunk and the hole beside it will eventually merge into the pattern of mounds and dips left by other fallen trees throughout the forest. The mound will become a nursery bed for plants, including new trees, to get a good start. Perhaps seeds of a wildflower will land there and grow. And perhaps you will be passing by when they are in flower.



## Preserving the Urban Forest: What Trees Do For Us ...

In 2010, the replacement value of Toronto's urban forest was estimated around \$7 billion. In addition, these trees provide many benefits, including:

**Aesthetic value:** Trees beautify our neighbourhoods, mark the changing seasons and are landmarks that give us a sense of place.

**Economic value:** Trees and shrubs increase the value of your property.

**Ecological services:** Trees provide about \$30 million in the following ecological services each year, which exceeds the annual cost of management.

- **Carbon storage:** store 1.1 million metric tonnes of carbon equivalent of annual carbon emissions from 733,000 cars
- **Energy reduction:** moderate temperature by shading buildings and providing evaporative cooling in summer, and blocking winter winds
- **Pollution removal:** intercept 1,905 metric tonnes of air pollutants annually
- **Storm water management:** intercept precipitation, reduce storm water runoff and erosion, and moderate the costs of maintaining infrastructure



photo: City of Toronto

**Wildlife value:** Trees promote biodiversity by providing habitat for many different species of plants, fungi and animals.

**Recreational and health value:** We enjoy recreational activities in treed areas that benefit our physical and mental health.

## ... and What We Can Do For Them

For the 10,000,000 trees that make up Toronto's urban forest to continue to benefit us in the future, we must:

**Protect and retain trees,** especially the large, old specimens of native species that provide the greatest ecological benefit and sow the seeds for the next generation of trees.

**Save growing space for trees** on both private and public lands. The future of the urban forest depends on having optimum habitat available.

**Diversify the canopy** by planting different kinds of trees, all matched to local conditions including those adaptable to potential climate change. Preference should be given to using native species whenever possible.

Learn what you can do on the next three pages.



## HELP PROTECT TREES IN NATURAL AREAS

Trees and shrubs in parks and natural areas are vulnerable to overuse and abuse by people and their dogs.

- **Stay on official trails.** Foot and bicycle traffic through the forest damages tree roots by compacting soils, and destroys ground cover and tree saplings by trampling.
- **Don't disturb wildlife.** Feeding and interacting with wildlife interferes with their natural habits, including pollination and dispersal of seeds.
- **Keep your dog on a leash.** Dogs running loose threaten wildlife and damage plants and soils in the understory.
- **Leave no trace.** Don't litter. Don't pick or dig up wildflowers or other plants. Don't remove dead wood, rocks, or soil.
- **Become a Parkland Naturalization Volunteer** and take part in community stewardship, invasive species management, or natural environment trails programs.
- **Take part in a planting event** like 'Trees Across Toronto,' the City's native tree and shrub planting program. See Resources section for link to dates and places.



Volunteers help Toronto achieve its canopy goal  
photo: City of Toronto



photo: City of Toronto



photo: Lynnette Browne

This area of Birkdale Ravine was planted in 2005. By 2013 a small woodland had grown up.

### DID YOU KNOW?

Concentrated dog urine damages the bark and the root crown at the base of trees.

Don't let dogs pee on trees!



photo: Jenny Bull

## HELP BY STEWARDING TREES IN YOUR NEIGHBOURHOOD

### DID YOU KNOW?

You can request a free street tree for your property. Call 311 or visit [www.toronto.ca/trees](http://www.toronto.ca/trees)



photo: City of Toronto

**Adopt the street tree in front of your home:** Watering and mulching are easy ways to help care for street trees. Encourage your neighbours to do so too, then every street tree in your community will have someone looking out for it. Visit the City's Forestry webpage for information on caring for trees. Contact 311 to report dead trees, fallen or broken branches, or other tree concerns.

**Become a Tree Advocate:** Share your knowledge of the benefits of trees and how to care for them. Encourage your neighbours to plant more trees on their property. Work with your neighbourhood school to help establish or maintain a schoolyard naturalization project. Join one of the many tree advocacy groups in the city. See Resources section.

**Join or start a Community Tree Group:** Take it one step further: get organized! Work with your local residents' association to create a sub-group, or start your own initiative. For example, the Leslieville-Riverdale Community Tree Project is one of several successful tree groups in the city. There are lots of activities a community tree group can do, such as:

- Connect community members with reliable information on how to protect and maintain existing trees and to the names of reputable arborists or tree care specialists.
- Arrange an annual tree-planting event for private properties in the neighbourhood.
- Inventory neighbourhood trees to assess potential planting locations. This is especially important if your community has rows of old, declining trees.

### DID YOU KNOW?

Bikes locked to trees damage the bark which could kill the tree. Contact 311 to request bike posts or a bike rack for your neighbourhood or City park.



## HELP BY STEWARDING TREES ON YOUR PROPERTY

Protecting both existing trees and space for planting new trees is critically important to the future. Unfortunately space for trees is too often lost to redevelopment, renovation, pools and driveway expansion. We can all help steward our trees by recognizing threats and poor practices and providing the best possible care.

**Trees don't live forever.** Plan ahead – plant replacement trees well before you remove old or declining trees.

**Bad pruning and poor maintenance are tree killers!** Assess the canopy for corrective pruning every 5 to 10 years. Call an arborist if you need help.

**Trees need water** especially during dry periods and when they are young. Make sure to water the entire root area, especially the feeder roots. **BUT NOT TOO MUCH!** Don't let water pool on the root zone of your tree, especially in clayish soil.

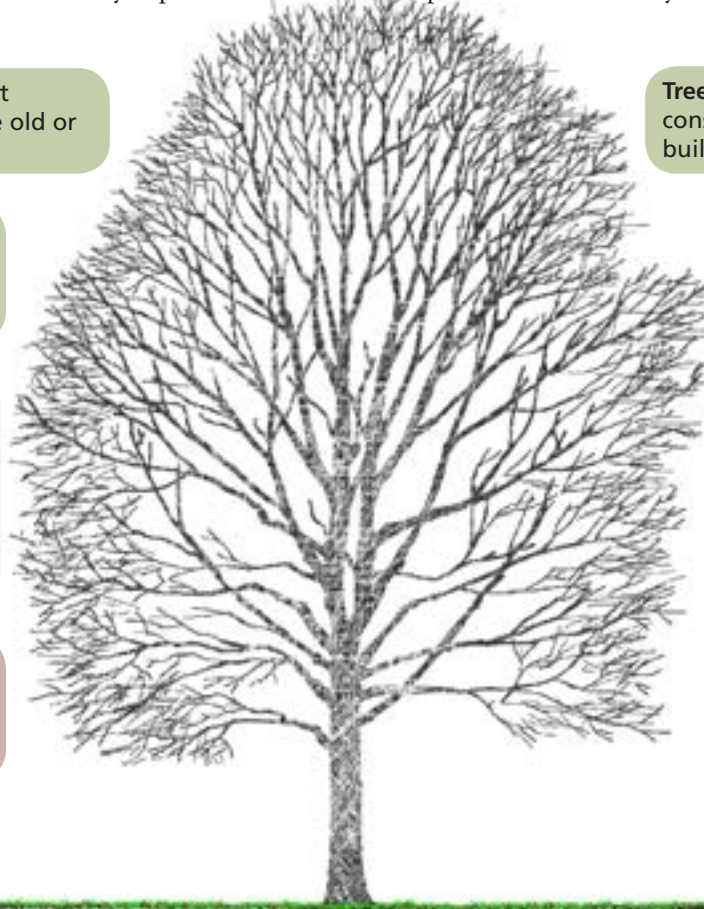
**Root zones are easily forgotten.** Remember to protect them when building, digging, drilling, trenching, or altering the grade.

**Trees need space.** Plan ahead and consult with the City if you intend to build as a permit may be required.

**Physical injury invites disease.** Protect your tree by not attaching anything to the bark, trunk or branches. Keep your weed trimmer away from all tree trunks.

**Chemicals damage trees.** Don't expose your trees and shrubs to heater exhausts, pool chemicals or de-icing products.

**Promote healthy roots.** Water and air can't infiltrate hard surfaces, such as compacted soils or pavement. Protect root zones. Don't dump soil, pile building materials, or drive or park your car on top of roots.



Feeder roots absorb water and nutrients and exchange gases.

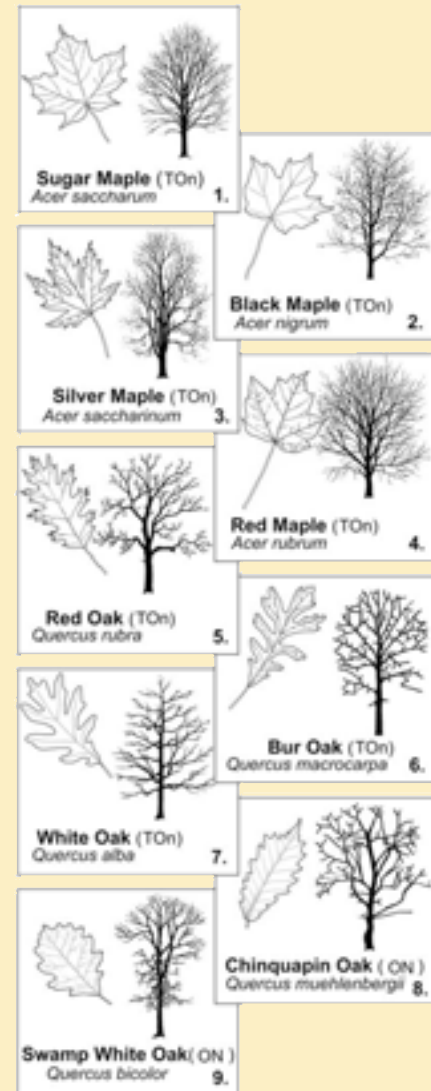
Main roots provide support and distribution of nutrient flow.

## Planting New Trees? Choose Native Species!

When buying trees and shrubs select native species that are best suited to the existing conditions, especially soil type, moisture content, available light and shelter.

The current trend to give preference to planting native trees and shrubs is in response to the loss of native species' habitat across North America. Planting native trees and shrubs in urban and suburban areas helps to address this loss by providing habitat and food for birds, butterflies and other native wildlife.

Non-native trees and shrubs may be more appropriate in some instances where conditions are poor and space is limited, e.g. a rooftop garden. If you choose an introduced species be sure it is not an invasive species that will spread to and overrun natural areas, eliminating native species and destroying habitat for wildlife. See Checklist and Resources section for more information on invasive species.



These are some of the native trees that may be available for planting by the City in front of your house



## Toronto's Future is in the Trees!

The urban forest is a big part of what makes Toronto a very livable city, a city within a park! However, if we are to sustain our urban forest, we must acknowledge and mitigate the pressures its trees face. We can never assume they can take care of themselves. Without good planning, development and intensification can lead to removal of the oldest and biggest trees and to the loss of space in which to replace them.

The increase in severe weather events due to climate change, including the December 2013 ice storm, have caused staggering losses to the city's tree canopy. Further, entire populations of tree species have been lost to insect invaders and disease: American chestnut to chestnut blight, elms to Dutch elm disease, and ashes to emerald ash borer, to name just a few.

The size of Toronto's urban canopy is the envy of many cities in Canada and throughout the world. Let's celebrate this great resource and at the same time protect it and grow it for the future!

The quality of life in Toronto of the future will be determined at the same time as the future of trees in Toronto. Today. By you.



White oak acorn sprout, *Quercus alba*  
Watercolour by Nellie Sue Potter

## Local Policy Initiatives

### CITY OF TORONTO

Protecting and enhancing the natural environment and biodiversity are high priorities for the City of Toronto. The Official Plan is the City's guiding land use planning document. It provides protection for important natural areas and functions, supports biodiversity and requires that the natural environment be taken into account as part of our city-building activities. Toronto's natural heritage features and functions have been mapped and are identified as the Natural Heritage System (NHS) in the Official Plan. The NHS includes the City's Environmentally Significant Areas (ESA's), Areas of Natural and Scientific Interest (ANSIs), Provincially Significant Wetlands, watercourses and forests, and connects these

significant features. Most of these areas are located within the extensive network of ravines that cross our city and along the Lake Ontario shoreline, and are protected by zoning and land use designations.

These areas provide habitat for a wide variety of native plants and animals, and sustain local biodiversity. When new development is proposed in or near the NHS, the proposed development's impact must be evaluated and measures must be identified to protect the system, mitigate negative impacts and improve the system.

The City undertakes a wide range of stewardship activities in parks and natural areas, often in partnerships with other agencies, institutions and community groups. Examples include ecological enhancement of existing habitats; control of invasive species; tree planting; creation of new habitats; and restoration of watercourses. Some of the city's forest communities require specialized care that can only be provided by professionals.

Policy initiatives aim to reduce the impact of the built environment on biodiversity and the natural environment. The Street Tree By-law and Parks By-law protect trees located on City property. The Private Tree By-law protects trees on privately-owned land. The Ravine and Natural Feature Protection By-law protects forests and valley slopes in designated areas on both public and private lands. The Toronto Green Standard will help preserve the urban forest, encourage tree survival and growth, and ensure native species are planted.

By protecting, maintaining and expanding the urban forest, the City is committing to the strategic goal adopted by Toronto City Council in 2007: to significantly expand the city's forest cover, up to 40% from the estimated 27% at that time. The successful implementation of this plan will require the efforts of the whole city: politicians, City staff, property owners and all other citizens.



A controlled burn in High Park, a component of the stewardship required to maintain the black oak savannah habitat, is undertaken by highly trained professionals  
photo: City of Toronto



## TORONTO AND REGION CONSERVATION

With decades of practical experience in protecting our environment, educating young people and engaging communities, Toronto and Region Conservation (TRCA) works with municipalities, businesses and individuals to build a greener, cleaner, healthier place to live – The Living City. TRCA's mission is to work with these partners to ensure that The Living City is built upon a natural foundation of healthy rivers and shorelines, greenspace and biodiversity, and sustainable communities.

TRCA plays a major role in forest management, tree and shrub planting, and reforestation throughout the Toronto Region, including the City of Toronto. The Terrestrial Natural Heritage Program and Integrated Restoration Prioritization are tools used to identify and inventory natural areas, habitats and opportunities to restore ecologically impaired lands to healthy functioning ecosystems.

Native tree and shrub planting is an integral part of TRCA's habitat restoration projects, land stewardship initiatives and forestry outreach programs. Thousands of trees and shrubs are planted annually by staff, and partners, volunteers and landowners.



photo: TRCA

*Maple syrup, please!*

Many of the trees and shrubs used in these projects and programs are grown at TRCA's native plant nursery.

TRCA also celebrates the Canadian tradition of "sugaring off", where sap is collected from sugar maples in the spring to make maple syrup. Maple syrup festivals are a great way to appreciate trees and welcome spring!

## PROVINCE OF ONTARIO

The Province has enacted legislation related to the Niagara Escarpment Plan, the Oak Ridges Moraine Conservation Plan, and the Greenbelt Plan. These large scale protection measures ensure the ongoing health and connectivity of major natural features in Southern Ontario, supported in part by Toronto's ravine, valley, and watercourse related open space system.

The Ontario Ministry of Natural Resources and Forestry (OMNRF) is responsible for the Endangered Species Act, 2007, the province's legislation that provides protection for extirpated, endangered or threatened species, including some trees and shrubs.

Under the Endangered Species Act, naturally occurring individuals of these species are protected from being harmed, harassed, captured, transported, or killed. Endangered and threatened species receive recovery strategies and habitat protection. Management plans are prepared for species of special concern. Of the tree species listed in the Endangered Species Act, only butternut occurs naturally in Toronto.

## Select Tree and Shrub Resources

### Organizations and Websites

City of Toronto Urban Forestry: [www.toronto.ca/trees](http://www.toronto.ca/trees)  
 Toronto and Region Conservation (TRCA): [www.trca.on.ca](http://www.trca.on.ca)  
 Toronto Parks and Trees Foundation: [torontoparksandtrees.org](http://torontoparksandtrees.org)  
 Toronto Field Naturalists: [www.torontofieldnaturalists.org](http://www.torontofieldnaturalists.org)  
 Trees for Toronto (Royal Ontario Museum): [www.rom.on.ca/trees](http://www.rom.on.ca/trees)  
 Canadian Tree Tours: [www.canadiantreetours.org](http://www.canadiantreetours.org), click on “maps” or “trees”  
 LEAF: [www.yourleaf.org](http://www.yourleaf.org)  
 Evergreen: [www.evergreen.ca](http://www.evergreen.ca)  
 Park People: [parkpeople.ca](http://parkpeople.ca)  
 Maple Leaves Forever: [www.mapleleavesforever.com](http://www.mapleleavesforever.com)  
 Not Far from the Tree: [notfarfromthetree.org](http://notfarfromthetree.org)  
 Forests Ontario: [www.forestsontario.ca](http://www.forestsontario.ca)  
 Ontario Urban Forest Council: [www.oufc.org](http://www.oufc.org)  
 Ontario Ministry of Natural Resources and Forestry:  
[www.ontario.ca/ministry-natural-resources-and-forestry](http://www.ontario.ca/ministry-natural-resources-and-forestry)  
 Ontario Invasive Plants Council: Grow Me Instead: A guide for Southern Ontario: [www.ontarioinvasiveplants.ca/files/GMI2012web.pdf](http://www.ontarioinvasiveplants.ca/files/GMI2012web.pdf)  
 Tree Canada Foundation: [treecanada.ca](http://treecanada.ca)  
 Trees for Life Canada: [treesforlifecanada.org](http://treesforlifecanada.org)  
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## Acknowledgements

### Contributing Authors



*Trees, Shrubs and Vines of Toronto* was developed by a working group that included (from left to right) Stephen Smith, Jenny Bull, Karen McDonald, Wendy Strickland, Deborah Metsger and Norman DeFraeye. The Project Manager is Kelly Snow, City of Toronto, City Planning Division.

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### Photographers

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Back Cover: Yellow Birch, *Betula alleghaniensis*. Watercolour by Nellie Sue Potter

### Contributing Artists

**Celia Godkin, BSc, AOCA, MSc** Celia has enjoyed complementary and overlapping careers that combine her love of art and nature: biologist, natural science illustrator, teacher, and author and illustrator of award-winning children's nature books. She has published hundreds of illustrations in books and journals, on zoo signs, museum exhibits and coins issued by the Royal Canadian Mint.



**Arnold Jacobs, is a Ho:yani or Condoled Chief carrying the title Skanawadi for the Onondaga Nation at Six Nations of Grand River Territory.** Raised in the traditional society of the Q̄gweh̄:weh Civilization and steeped in its languages, Arnold's art expresses his connection to his spirituality and its theology. His symbols of the earth and sky, water, wind, thunder, moon and sun, along with other related themes, depict the traditional ways of his people, their clans and their collective intellect.



**Nellie Sue Potter** Nellie Sue is a botanical artist, naturalist and botanical art teacher. Her love of nature, which she shares through her art and teaching, began early in life. She exhibits as a solo artist and with societies of botanical art and science illustration. In 2011, her painting of yellow birch (back cover) was chosen for an international exhibition at the New York Botanical Garden.



### Partners

City of Toronto

Royal Ontario Museum [www.rom.on.ca](http://www.rom.on.ca)

Toronto and Region Conservation [www.trca.on.ca](http://www.trca.on.ca)

Urban Forest Associates Inc [www.ufora.ca](http://www.ufora.ca)



*Betula alleghaniensis*

Yellow Birch

Heilie Sue Potter