National Capital Commission
Commission de la capitale nationale

A LIVING LEGACY:

Remarkable Trees of Canada's Capital

Canada

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SUZANNE HARDY

National Capital Commission
Commission de la capitale nationale

Library and Archives Canada

An original idea of Suzanne Hardy's,
this book is an initiative of the National Capital Commission.

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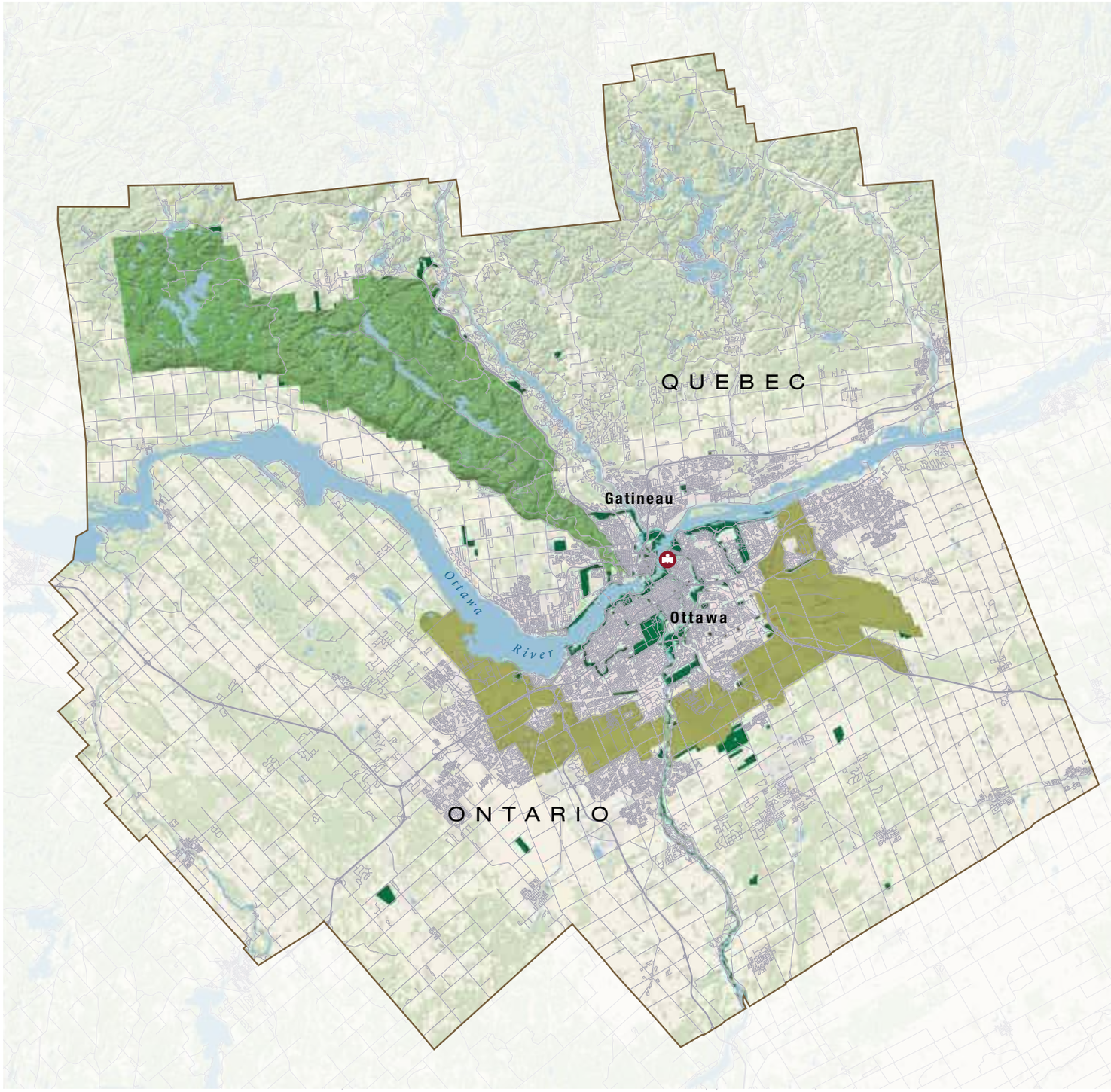
The NCC has offset the use of paper in the printing of this book through the planting of 20 additional trees in the National Capital Region.

1899-2019 **120** *Years of Capital Building*
ans à bâtir la capitale

A LIVING LEGACY:

Remarkable Trees of Canada's Capital



National Capital Region

Gatineau Park
Greenbelt
Other federal lands

Forest
Urban

National Capital Region
Parliament

N

0 10 km

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Messages From the Partners

From our capital's earliest days as a ragged logging town on the banks of the Ottawa River, in the traditional territory of the Algonquin Nation, its relationship with the majestic wilderness from which it emerged has been essential to its character and identity. This rich natural heritage is expressed dramatically by the Capital's extraordinary forests and the tremendous diversity of tree species that thrive within them.

This book is the result of a two-year project undertaken to document this diversity, in the interests of preserving it in the face of the environmental challenges of the 21st century, so that it can be enjoyed by future generations of Canadians.

It also celebrates a pair of milestones in the history of the Capital. It has been 120 years since the National Capital Commission's (NCC) predecessor organizations began the work of planning and stewardship of the Capital, and 60 years since the founding of the NCC itself.

We hope that this book fosters a genuine appreciation for the remarkable trees of Canada's Capital and encourages everyone to get out, explore our breathtaking green spaces and experience their beauty in person.

Tobi Nussbaum,
Chief Executive Officer
National Capital Commission

Commission de la capitale nationale
National Capital Commission

It is a positive step forward that the Kitigan Zibi Anishinabeg and the Algonquins of Pikwakanagan have been invited by the National Capital Commission to participate in the development of this book about the remarkable trees of Canada's Capital Region. *Enhenh* (yes), the region has had beautiful, remarkable trees since time immemorial.

And the Anishinabe-Algonquin Nation has survived in large part due to the hearty, healthy, strong trees that provided bark or wood for canoes, baskets, snowshoes, sleds, teas, medicines and delicious syrups for millenniums.

While there have been many differing views, disputes or legal issues with regard to development on the traditional territory of the Anishinabe-Algonquin Nation, the remarkable trees have stood throughout, as witnesses to all of this human activity.

Remarkable trees within Canada's Capital Region are all around us. Let's open our eyes and acknowledge their grandeur.

Anita Tenasco,
Director of Education
Kitigan Zibi Anishinabeg

Trees are an integral part of what it means to be a Canadian and are important to our communities. Trees clean our air, quiet our streets, cool our cities and calm our minds. They can help commemorate moments in time or honour special individuals.

As the national leader in urban forestry, Tree Canada promotes the positive value of green spaces where we work, live and play. The pride that Canadians have for their national capital is, to a large extent, due to its well-managed network of green spaces. We are pleased to collaborate with the National Capital Commission, the Crown corporation that manages these green spaces, as we celebrate the remarkable trees of this region.

Because we are dedicated to improving the lives of Canadians by planting and nurturing trees, Tree Canada sees this book as a celebration of the richness of the trees of Canada. It is our hope that this example of urban forest stewardship will be replicated across this great country.

Michael Rosen,
President
Tree Canada

TreeCanada ArbresCanada

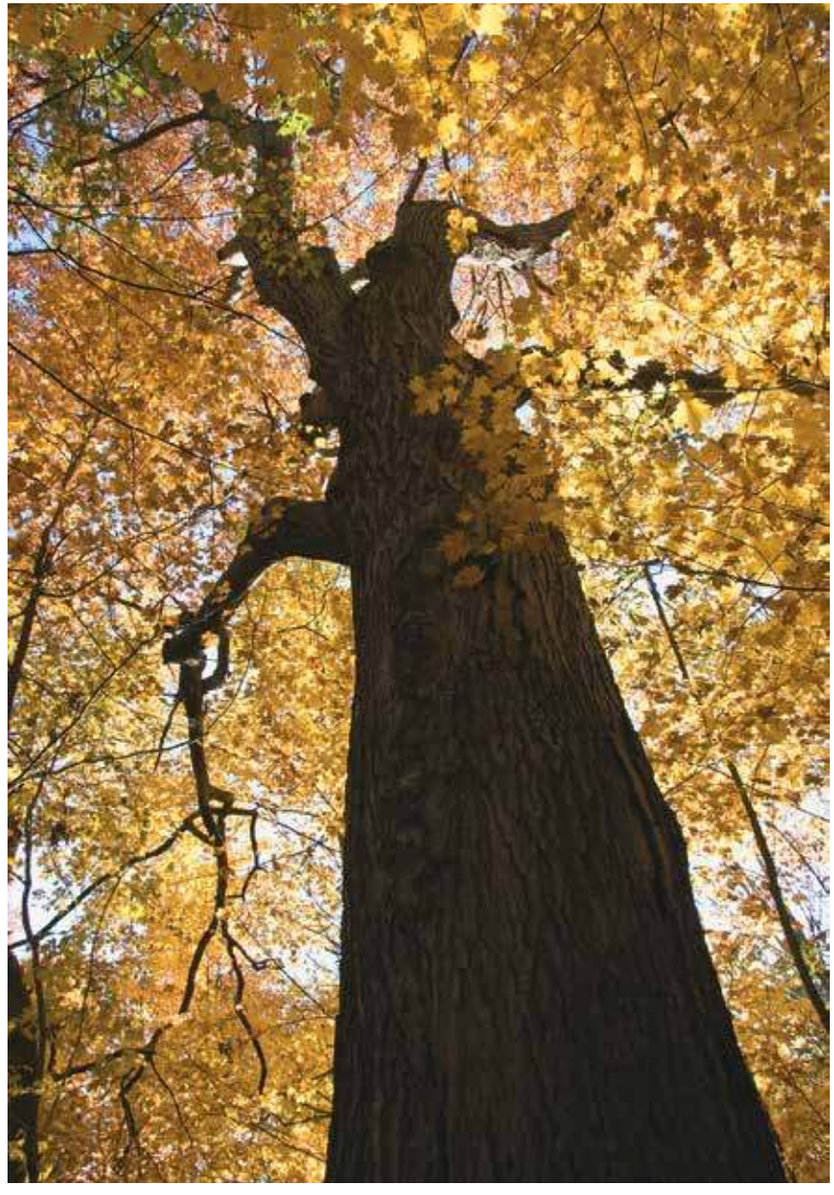
About the Author

Suzanne Hardy is passionate about botany. It is her life's work, and remarkable trees are the focus of her all-consuming passion. Given a copy of *Flore laurentienne* by Brother Marie-Victorin at the tender age of 14, she could be found roaming the Anticosti Island flats two years later. Her keen sense of observation and thorough knowledge of botany, complemented by her studies in plant science, paved the way for collaborations with distinguished scientists — agronomists, botanists and geneticists — for whom she unearthed rare specimens.

Recognized early on for the quality of her work cataloguing native vascular or horticultural plants and identifying specimens of rare or exceptional trees, she would also garner praise for her talents as an illustrator and photographer. Her drawings made the cover of *Provancheria* editions devoted to Nordic flora and accompanied an article in the *Naturaliste Canadien*. Her work for various public organizations, private outfits and associations, including Hydro-Québec, saw her criss-cross North America, from St. Pierre and Miquelon to Alaska, armed with identification keys, sketchbooks and photographic equipment.

In 1996, she founded Enracinart, a non-profit organization dedicated to relating the history of native or horticultural vegetation. There she developed a rich written and visual record of the botanical, historical, cultural and esthetic aspects of remarkable trees — in a nutshell, everything that describes their existence alongside us. She has passed along this knowledge during lectures, events, exhibits and guided tours at hundreds of horticultural and environmental societies, beautification committees, historical societies and heritage organizations. Her preferred topics include the evolution of the urban forest, the magnificent blooms of the sugar bushes dotting the banks of the St. Lawrence, the successive flowerings of the Quebec forest mosaic and the rediscovery of native plants in landscaping.

A prolific author whose delightful prose marries art, culture, history and botany, Suzanne Hardy is on her third book devoted to remarkable trees: her first work (2009) focused on the Québec City capital region, her second on the city of Laval (2016), and this, the third, on the National Capital Region of Canada (2020). With her enthusiasm for living heritage, her influence on rural and urban communities and her easy-to-use remarkability criteria, she has often been profiled in the print, radio and television media. In 2016, she was honoured by the Quebec chapter of the International Society of Arboriculture (ISA) for her immense contribution to furthering our knowledge of the most spectacular tree specimens.



Foreword

The National Capital Commission (NCC) is proud to offer this compilation and hopes that it will instill in residents and visitors a deep appreciation of the remarkable trees across Canada's Capital Region. This precious forest heritage recalls a fascinating past. Permanent features at nationally important sites and locations, these majestic trees are impressive and inspiring.

To undertake this project, the NCC called on Suzanne Hardy, a specialist in identifying trees of interest, to catalogue the most noteworthy specimens on federal lands in the National Capital Region. This book is the product of countless visits and two years of in-depth research. In a very accessible way, this work describes the distinctive features of these trees and includes anecdotes drawn from, as well as passing references to, regional history. The collection describes close to 170 remarkable trees that stand as witnesses to the growth of Canada's Capital.

The trees catalogued in this book are found on federal public lands, representing over 10 percent of the lands in the National Capital Region. Most of them are in Gatineau Park, the Greenbelt and urban parks, including the Dominion Arboretum at the Central Experimental Farm. And there are certainly other remarkable trees to discover in other cities and on private lands in the region.

The trees selected are outstanding because of their age, size or other characteristics. Some are remnants of ancient forests, while others date back to the very first projects aimed at beautifying the Capital. Living symbols of various eras, these trees are today more important than ever to our quality of life.

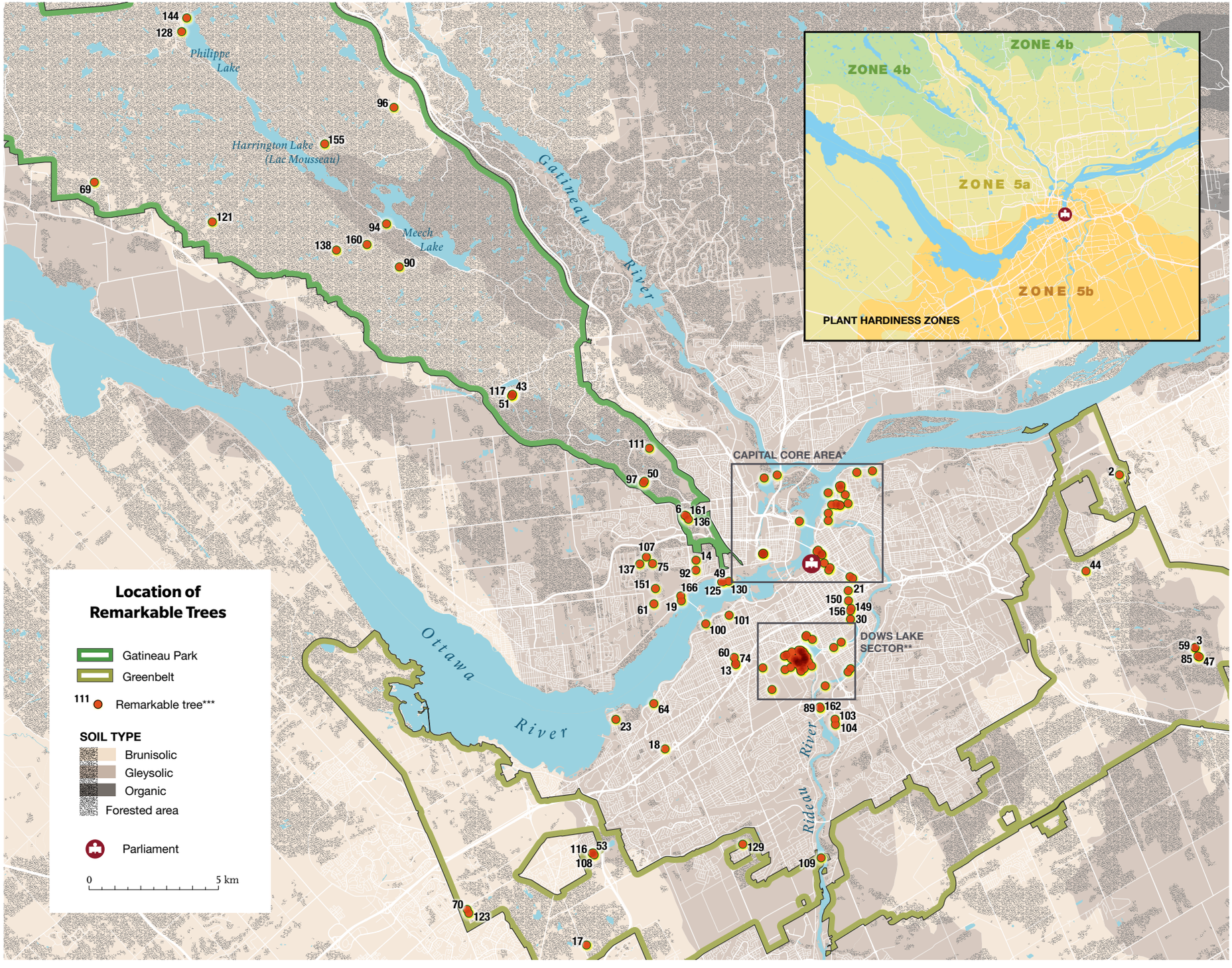
The Capital Region's trees and forests often endure threats such as disease and extreme climate events. To support biodiversity and contribute to significant environmental benefits, the NCC sustainably manages these lands and forests. Each year, the NCC plants thousands of trees of various species to help make our natural environments more resilient. The trees, urban woods and regional forest form a green infrastructure essential to the health and well-being of all. In fulfilling its stewardship mandate, the NCC ensures that this natural and cultural heritage is protected.

Truly a treasure to uncover, this compilation groups the featured trees according to their commonalities, which can include their physical relationship with the land or the fact that they were a source of food for Indigenous peoples or that they contributed to the growth of the forest industry. Some trees are grouped together simply for the sheer delight they offer passersby. Also, the book's various themes include a fascinating look at the region's history, from its geological formation to the challenges facing a 21st century capital.

The compilation includes many beautiful photographs and provides the exact location of each tree. An interactive map is also available on the NCC's website. The trees described in the book are easy to access, as they are all located on public lands. Just map out your own route, and discover these marvels at your own pace, season by season — on foot, by bike or any other way you choose.

I hope you enjoy reading this book and admiring these remarkable trees. May it serve as the impetus for some magnificent hikes or prove useful in developing innovative wooded areas.

Mario Fournier,
Project Manager



* Heart of the Capital, page 202 | ** Dows Lake Sector, page 211 | *** See details in the Index on page 203

Understanding the Notion of Remarkability

There's no point looking up "remarkability" in the dictionary: it has yet to be recognized, despite being used when describing trees. The first remarkable trees were identified in France in 1899 by the minister of waters and forests. He had noticed how attached people had become to these trees "either through history or legend, or by the admiration they had for their majestic bearing, exceptional dimensions or venerable age."

Some 120 years later, both major categories of remarkability continue to apply: biological criteria and socio-cultural criteria. A tree's age, size and shape fall under the biological category, while its connections with a place, community, person or historical event constitute socio-cultural criteria. But remarkability boils down to the reality on the ground. Is a particular specimen of a particular species in a particular location truly remarkable? In Toronto, for example, a 300-year-old oak is approaching the record for longevity, but in France, 600-year-old oak trees are at the peak of their lifespan.

In determining the remarkability of a tree, specialists rely on their in-depth knowledge of the biology of native and introduced species of a given region and on data on comparable ecosystems gleaned from field observations. For example, the White Mountains in California are home to 4,500-year-old pines, while Greece and Sicily boast 2,500-year-old olive trees. When can a tree's longevity be deemed exceptional in Nordic climes? A tree that manages to grow outside its usual hardiness zone and that stands apart for its dimensions is definitely remarkable.

While age and size are often related, a specimen that holds the record for either is not automatically deserving of the qualifier "remarkable": it may have grown in conditions harmful to its development or have been disfigured by excessive size. In some cases, a single criterion suffices — the 1,316-year-old cedar on the Niagara Escarpment, for instance. Similarly, rarity may seem to be an undeniable criterion, but this is not always so. Any tree belonging to an at-risk native species needs to be identified and protected, but a recently introduced exotic species can be rare without being remarkable. On the other hand, trees originating in ecosystems that have since disappeared are particularly precious, since their disappearance will mark the irrecoverable loss of their genetic material.

Objective measurements can be supplemented with other criteria of an aesthetic or historical nature. Some specimens are remarkable because they represent the ideal form of the species in optimal growing conditions, while others may adopt an eccentric shape. Still others may bear an uncanny resemblance to living beings or things. Although the feeling we get when we admire a tree is important, personal or family attachments are not enough in and of themselves to establish a specimen's remarkability. That is why trees are reported to experts who make their remarkability decisions based on all of the criteria.

There is no limit to potential socio-cultural associations; the key is to document them using reliable sources. Even a horticultural style typical of an era can confer remarkability. A case in point: this postcard showing a section of Ottawa's first scenic parkway, the Driveway, in 1905. The two lanes are separated by green spaces dotted with winding paths, plant beds, artificial mounds with red oaks, yellow birch, sugar maples, black maples and small rustic buildings. In the background, numerous eastern white pine are growing on the opposite side of the Rideau Canal. This landscaping, in the purest "gardenesque" style in vogue in the Victorian era, retains to this day the natural appearance of Canada's forests, with their native specimens dating back more than 100 years.

▼ This postcard, one of six depicting Ottawa city scenes, was sold in September 1905 by Raphael Tuck & Sons (London, England). It belongs to the Oilette collection of cards boasting the works of renowned painters and was produced using a printing process patented in 1903.

Source: City of Ottawa Archives (MG344, Peter D. K. Hessel fund, No. CA021523)

Concept of Remarkability

A concept developed specifically and exclusively for trees.*

Remarkability icons
These icons represent the various remarkability criteria for all the exceptional aspects of the specimens in question. The criteria relating to age, size and rarity are determinative; the other biological and socio-cultural criteria refine and complement the specimen's value.

Age and dimensions
Any tree of exceptional age and dimension, measured according to recognized international rules, based on comparisons or increment coring, and diameter at breast height (1.30 m). Champions can be national, regional or local.

Rarity and vulnerability
Any tree of a species at risk legally designated under the *Species at Risk Act* (Canada), *Endangered Species Act* (Ontario) and *Act Respecting Threatened or Vulnerable Species* (Quebec). Old trees are often associated with species at risk when it comes to conservation of biodiversity.

Vestige of old ecosystem
Any tree produced by an old ecosystem that has since disappeared. The conditions that gave rise to its existence will not recur, and its death will mark the end of its genetic material.

Noble hardwoods
Any deciduous tree whose durable and versatile wood has major commercial value, hence its rarity.

Rare taxon
Any tree from a botanical family, genus or species (either native or introduced) rarely catalogued within a given territory.

Northern eccentric
Any tree growing at the boreal limit of its species' native range.

Rare in cities
Any tree that has become rare in urban settings, often belonging to a native species normally incapable of withstanding urban stress.

Small-sized
Any tree rarely reaching a great height or width, often recommended for urban and peri-urban environments where space is limited.

Landscape heritage
Any tree constituting a structuring element contributing to a landscape's value, either alone, in a pair or in a group (canopy, row), often related to an area with a significant horticultural tradition.

Horticultural heritage
Any tree evoking the horticultural practices of a bygone era, often from a species belonging to old botanical varieties cultivated during a certain period.

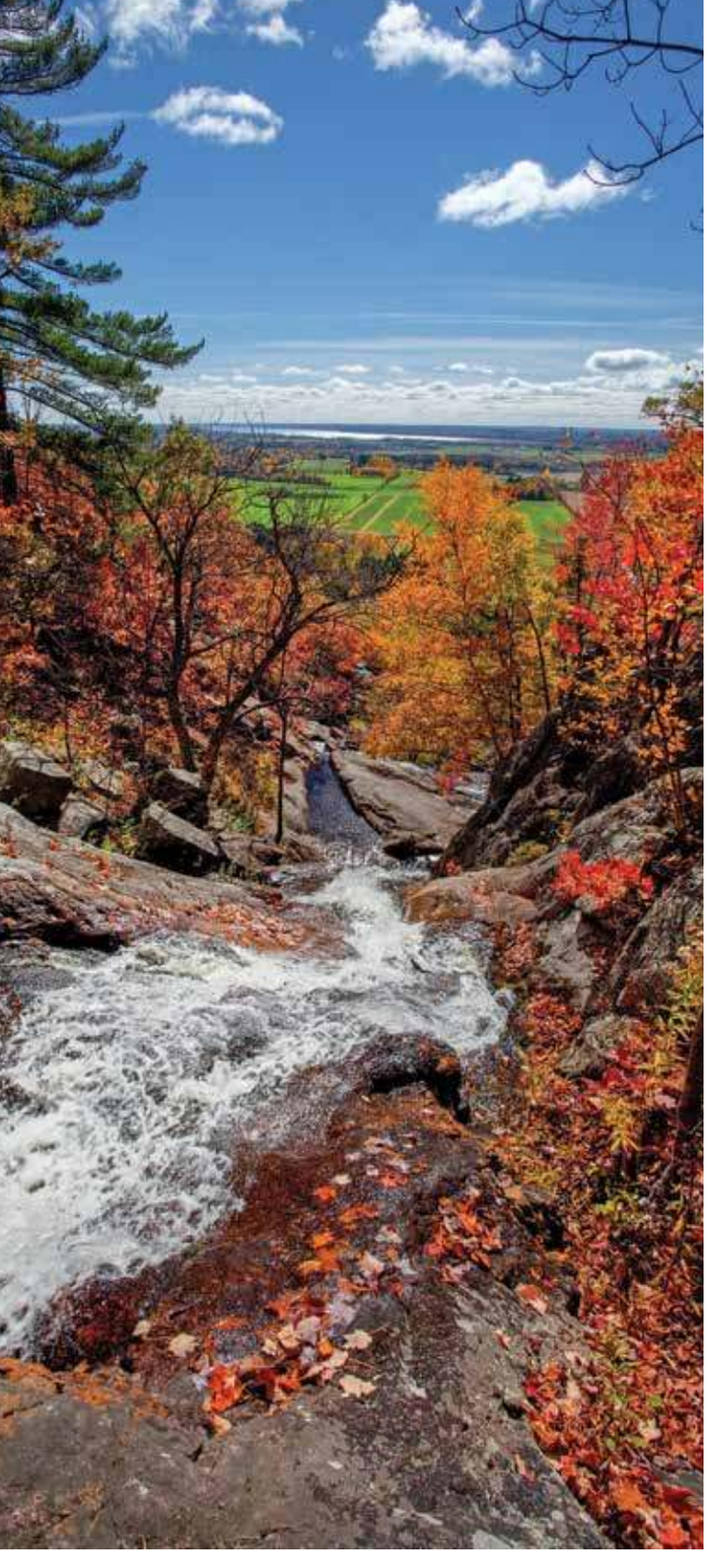
Picturesque
Any tree with an unusual silhouette compared with other specimens of its own species; often well known by the people living nearby.

Local colour
An indigenous or introduced tree or group of trees planted in a unique arrangement and preserved in a region where the species is typically found.

Historical heritage
Any tree that takes on significant value because of its strong relation with the settlement or history of the local community, whether reminiscent of the traditional customs of a cultural group, of an outdated horticultural practice or of a historical figure or event that marked the region or country.

Historic district
Any tree, naturally implanted or planted, that grows in a historic site or area where it adds to its patrimonial or aesthetic value.

* The explanations, criteria, definitions, icons on remarkability and red oak photo on page 7 reproduced in this book are from pages 11 to 14 of Suzanne Hardy's book, *Nos champions : les arbres remarquables de la capitale*, Austin, 2009, and are reproduced with the permission of the co-publishers, the Commission de la capitale nationale du Québec and Éditions BERGER.



Regional Geological and Paleobotanical History

Canada's National Capital Region features a tremendous variety of landscapes. Some are fractured, others flat. Some are wet, others dry. Some are rich, others barren. Together, these landscapes have given rise to an extremely diverse tree cover. Lying between the St. Lawrence River (*Kichi-gami Sibi*), the Canadian Shield, the Ottawa River (*Kitchissippi*) and the Great Lakes, this region has felt the wrath of the Earth's shifting crust over its 4.56 billion years of existence, leaving remnants everywhere to be discovered by the curious eye. It's a living geological atlas.

◂ View of Luskville Falls from atop the Eardley Escarpment, Gatineau Park.
Source: NCC

Exposed to the naked eye are igneous rocks solidified from molten magma during the first three billion years of Earth's existence. These Precambrian outcrops were formed from some of the world's oldest and hardest crystalline rocks. Over the billion years that followed, continental plates collided and created gigantic mountains, which then eroded and formed the Laurentian mountain range. Rising temperature and pressure deep in the Earth helped create metamorphic rocks, gneiss, quartzite and marble, as well as the industrial minerals that would later be extracted by the region's miners.

The most dramatic elements of the National Capital Region relief were shaped just before the Cambrian age. Faults appeared in the Canadian Shield, causing the Earth's crust to sink and giving rise to the Ottawa–Bonnechère graben, a fracture that marks the demarcation line between the Canadian Shield and the St. Lawrence lowlands. In addition to offering the region's most striking panoramic views, the graben had a pivotal impact on the region's soil, opening the way to an ocean that covered the continent with sediment and hosted the first forms of life. These rich sedimentary strata formed the plateaus of sandstone, limestone, dolomite and shale that would constitute the foundation for the Ottawa lowlands. These soils, consisting primarily of limestone and easily visible on the Parliament Hill cliff (*Pasabikahigan*) in Ottawa, are unique ecological niches.

The soils supporting the forest systems now covering the area are the stuff of recent geological history. After the last glaciation, the melting glaciers formed the Champlain Sea, which flooded the St. Lawrence lowlands all the way to the United States for 2,500 years. Once freed of the weight of the ice, the Canadian Shield rose and the Champlain Sea and its tributaries receded, leaving behind a mosaic of deposits that led to the diverse assortment of today's soils: fine sand transformed into the Pinhey Forest dunes in the Greenbelt, the marine clays found in the Ottawa Valley (*Anishinabe Aki*) and the organic matter that gave rise to the Mer Bleue Bog.

The postglacial climate paved the way for herbaceous vegetation that stabilized and nourished these thin layers of soil. This was soon followed by scrubland, and then the area was quickly colonized by black spruce, willow, pine and other pioneer species like aspen, tamarack and birch. Maple groves, fir stands and spruce stands eventually took root from south to north. From a bioclimatic standpoint, the region's forest ecosystem is characterized today by its stands of pine, sugar maples, yellow birch, oak, hickory and species at the northern boundary of their range.

The Eardley Escarpment highlights the contrast between the graben and plateau, as well as their role in this ecosystem. Exposed to the south, its cliff boasts a hot, dry microclimate where species like the eastern red cedar and jack pine have managed to thrive like nowhere else.

▲ View of Mer Bleue Bog, Canada's Capital Greenbelt.

Source: NCC

▼ Champlain Lookout, atop the Eardley Escarpment, offers the most popular view of Gatineau Park.

Source: NCC

Eastern Red Cedar

JUNIPERUS VIRGINIANA LINNAEUS
AKAWANJ (ANISHINAABEMOWIN NAME)

The eastern red cedar is among the vegetation given life by the precious ecological niche that is the Eardley Escarpment. This small tree is often found in the driest areas of the cliff, on the limestone bedrock, where it grows alongside stunted red and white oaks. About 80 percent of the Quebec population of this species grows on the Eardley Escarpment. Its presence at the foot of the escarpment can likely be attributed to the bird population, since many avian species are fond of its false berries. In fact, its vernacular name "red cedar" is the source of the name cedar waxwing.

The *Juniperus* are sometimes nicknamed the "camels of the tree world" because they grow in widely diverse ecological conditions, ranging from the extremely dry desert steppes to the extremely harsh climate of the Arctic tundra. The species *virginiana*, characteristic of the Ottawa Valley, owes its unique florule to biological migrations dating back to the dawn of the postglacial age, to the time of Lake Algonquin. The lake emptied some of its waters into the Champlain Sea through a depression that to this day joins the Ottawa River to Georgian Bay via Lake Nipissing and the Mattawa and French rivers. The eastern red cedar's distribution range overlaps this precise region of eastern Ontario, along the rivers of Lake Huron and Lake Erie and as far north as the French River.

◀ This giant eastern red cedar, which can be accessed from Pilon Road and the equestrian trail, is flanked by fellow members of its species at the foot of the Eardley Escarpment. They grow in this former pasture rather than clinging to the cliff like most of the Gatineau Park junipers.

▶ The eastern red cedar is a dioecious species, meaning that its populations include distinct individuals bearing unisexual cones, i.e., only male or only female.

Eastern Red Cedar

JUNIPERUS VIRGINIANA LINNAEUS
AKAWANJ (ANISHINAABEMOWIN NAME)

The eastern red cedar, one of 52 species of *Juniperus* from the Cupressaceae family, first appeared in the Late Jurassic period. As is often the case with species having lived through numerous geological periods, their adaptation strategies are especially effective. Although small, this tree is found in great numbers alongside roads and in abandoned fields and can live to a ripe old age — the oldest identified in Gatineau Park is over 300 years old. No doubt it owes its success to its small, round, wax-covered cones, which produce an odoriferous resin and look like blue berries. Thanks to these exceptionally fleshy false fruits abounding among its scaly leaves, the eastern red cedar enjoys the cooperation of birds in its reproduction process.

A few specimens can be accessed from Old Quarry Trail, in particular among Stony Swamp's limestone clearings. The bedrock found in this area of the Greenbelt dates to Precambrian time, and Old Quarry Trail is an ideal place from which to document the region's geological history. The swamp is criss-crossed by kilometres of trails that make it possible to discover a rich diversity of ecosystems and natural habitats, ranging from the sugar maple forests to the network of beaver ponds and a variety of wetlands. With its thousand-odd plant and animal species, many of them rare or endangered, the swamp is the most diverse protected area in the Ottawa Valley.

▸ Stony Swamp, which is crossed by Old Quarry Trail, features numerous natural habitats of interest, including small limestone clearings, or alvars. Their soil composition is especially conducive to the growth of eastern red cedar stands, including this marvelous and accessible specimen.

Jack Pine

Pinus banksiana Lambert
OKIKENS (Anishinaabemowin name)

One of Quebec's southernmost populations of jack pine grows on the Eardley Escarpment. Some of the specimens are the remnants of a small stand that appeared in the wake of numerous fires that ravaged the Gatineau Hills in years past. This stand is not far from the fire tower, built sometime around 1930 or 1940 to monitor forest fires, and not far from the summit of the Luskville Falls Trail. The falls are named after the Eardley township hamlet where, in 1832, pioneer John Lusk settled. Luskville remains there to this day, in the northern part of the Municipality of Pontiac, itself located 24 kilometres west of Old Hull in Gatineau. Those who venture to the top of the Luskville Falls Trail can see for themselves how rich and fragile the Eardley Escarpment ecosystem truly is.

The jack pine was able to take root and thrive in this area thanks to its special relationship with fire. Indeed, its survival depends on flames melting the resin sealing the fruit-bearing cones and bursting them open, enabling the seeds to escape. Fire also creates conditions favourable to the tree's germination by eliminating competition from other plants. It is possible to see, among young jack pines, striking-looking old pines whose bare, stocky and gnarly trunks have become fireproof since their deaths long ago.

◂ With the jack pine, pairs of divergent, rigid and slightly twisted needles are often found alongside different generations of reproductive organs. Crooked and asymmetrical young cones appear next to faded grey cones that last for 10–20 years and alongside male conelets clustered around the base of new growth.

Black Spruce

PICEA MARIANA (MILLER) BRITTON, STERNS & POGGENBURG
SESEGANDAG / MAKADE-MINAHIG (ANISHINAABEMOWIN NAME)

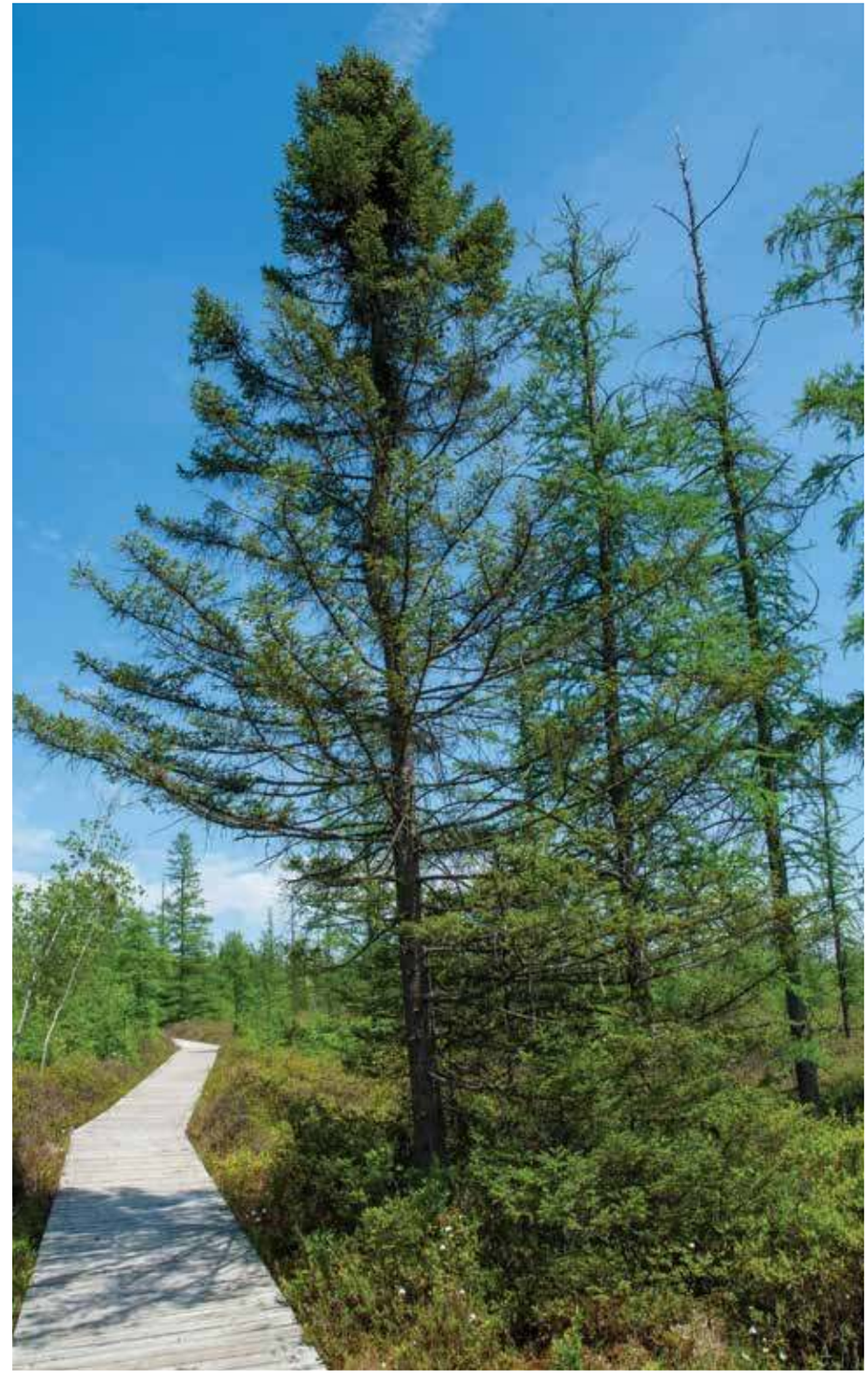
A tundra-like black spruce forest is certainly not what one would expect to see in Canada's Capital Greenbelt! The fact that a northern forest is in a southern environment can be chalked up to the nature of the peat substratum in which the trees are rooted. The presence of this unique forest is thanks to the Mer Bleue Bog.

All of Canada's large bogs began to form after the most recent glaciation, some 10,000 years ago, after the Pleistocene, an era that alternated between glacial and interglacial episodes. During the last glaciation (Wisconsin), the Ottawa region was covered with a two-kilometre-thick continental glacier extending all the way to the New York region. Under the weight of this ice, the continent sunk by several metres, and then a warming climate melted the glacier and raised ocean levels. The Atlantic Ocean flooded the St. Lawrence and Ottawa River valleys and created the semi-open Champlain Sea, which covered the region to a height of 200 metres.

At the time, the Ottawa River was a huge, muddy river whose waters carried away tonnes of debris of all sorts. It gradually retreated, with one of its channels becoming a shallow lake with a clay floor, trapping the water there. The gradual transformation of this lake gave rise to the Mer Bleue Bog, which today features the slender silhouettes of the black spruce.

▸ The black spruce is a wetland tree with a lifespan of at least 200 years. This specimen belongs to the black spruce forest of the Mer Bleue Bog, which is also home to tamarack, trembling aspen, and grey and white birch.

◂ The female cones of the black spruce ripen every year in September, but they can remain on the tree for 20 to 30 years, all the while retaining their treasure trove of viable seeds and releasing them gradually, unless a forest fire bursts them open.



Eastern White Cedar

THUJA OCCIDENTALIS LINNAEUS
WABINO-KIJIK / KIJIK (ANISHINAABEMOWIN NAME)

The receding of the Iapetus Ocean some 420 million years ago left sediment containing debris that accumulated and clustered into superimposed layers, forming sedimentary rocks throughout today's National Capital Region. These limestone rocks are visible on the ledges and sides of the cliff overlooking the Ottawa River, from Major's Hill Park to the eastern edge of Rockcliffe Park. It was here, circa 1735, that the first trees of a Canadian old-growth cedar forest first appeared.

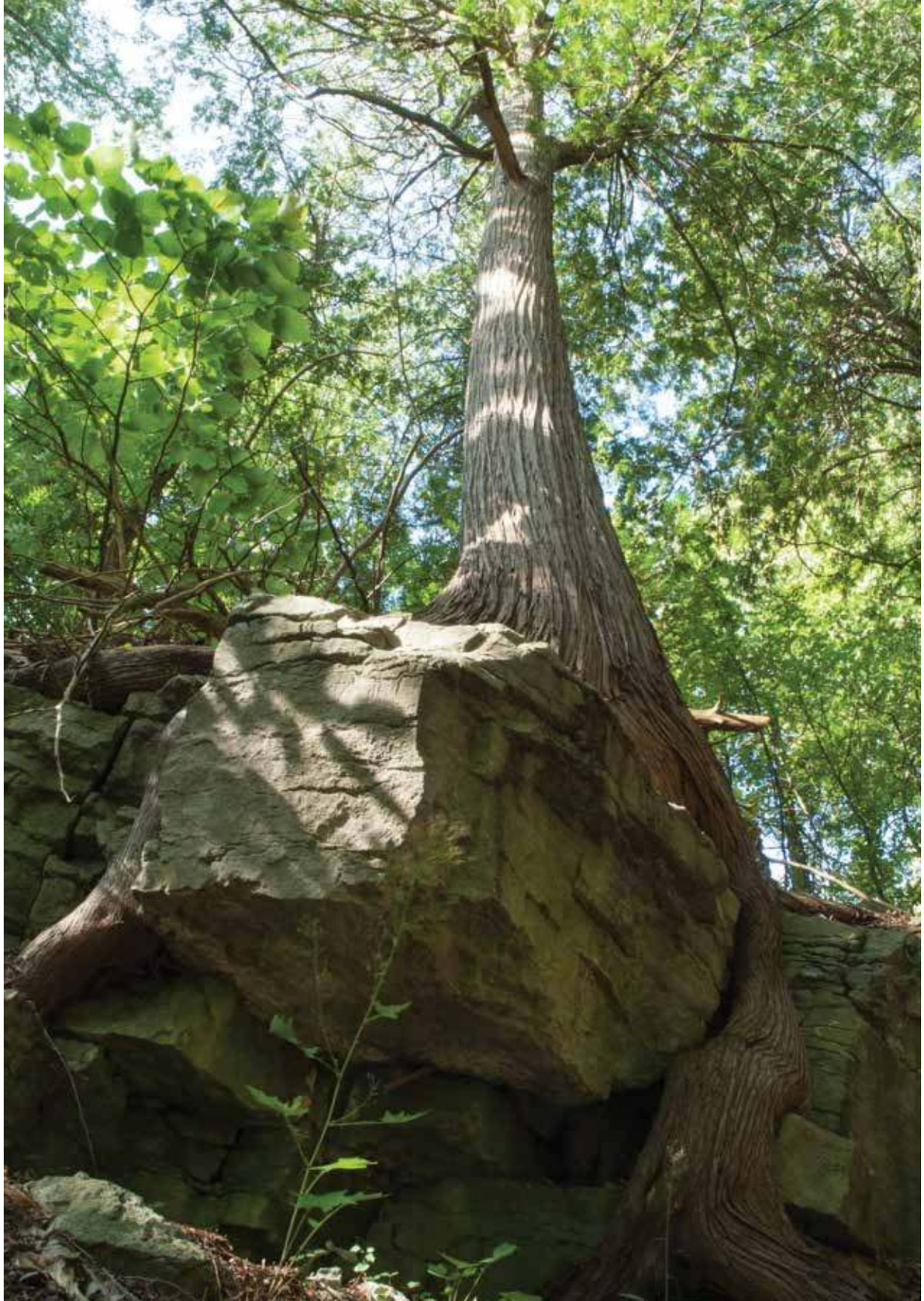
This cedar grove developed and densified for 100 years before the 1826 founding of Bytown, which would become the city of Ottawa in 1855. And so it was that Canada's Capital became one of the few in the world to harbour and preserve the vestiges of an old-growth forest. The population of the Rockcliffe Park cedar grove, comprising trees of various ages and their companion plants, presents certain similarities with the population of the small, scraggy cedars that are up to 1,300 years old and dot the limestone cliffs of southern Ontario's Niagara Escarpment.

Although the terms cedar grove and cedar forest are commonly used, a more accurate term is "thuja" because the trees belonging to the botanical genus *Cedrus* are large, with needle-like leaves of Himalayan and Mediterranean origin. Since the first European settlers had never seen a Canadian cedar, the *Thuja occidentalis*, they named it after an odoriferous conifer they were familiar with, and this inappropriate nickname has stuck. However, the name thuja is actually appropriate for this fragrant wood, especially when one considers some of its uses in homes, because its ancient Greek root (θυία) is a reference to its scented wood.

Thujas form a small botanical genus that, like the junipers and metasequoias, first appeared in the Jurassic era. They include no more than six species well adapted to cold climates and spread across the forests of China, Taiwan, Korea, Japan and California (*Thuja plicata*) and Canada (*Thuja occidentalis*). Although the species native to Canadian forests came from the eastern part of the North American continent, it was nevertheless termed occidental upon discovery, to differentiate it from Asian species.

Canada's thuja is an aromatic conifer whose wood, bark, branches, twigs and roots boast a lovely dark-red colouring. Small and slow growing, it tends to grow in its natural state in places where there is no competition from large or fast-growing trees. That is why it often proliferates in wetlands, where it digs in thanks to its rot-resistant roots, and along limestone rock faces, where it can live for a very long time by clinging to the rock, supported by its buttress roots beneath its massive trunk. Strangely, its rot-resistant and very durable wood contrasts with the frailness of its individuals, which are brittle and vulnerable to strong winds. No surprise, then, that twisted specimens with discontinuous growth rings can be found even among living stands.

Although the flammable oils contained in its fibrous bark make in vulnerable to wildfires, the eastern white cedar is capable of great longevity due to its high resistance to fungus and the fact that few insects attack it. Even the fearsome Japanese beetle is no threat, since the thuja is not one of its preferred hosts.



▲ The thuja's fragrant foliage consists of scaly leaves in four tightly interlinked rows, closely layered one on top of the other. They provide such a perfect cover for the fan-shaped flat twigs that they look like braids.

◀ This venerable Rockcliffe Park cedar, a marvelous specimen of the *Thuja occidentalis*, belongs to a grove that is nearly 300 years old, predating the birth of the Capital. It is a rare capital that can lay claim to such vestiges of an old-growth forest on its territory!

Tamarack

Larix laricina (du Roi) K. Koch
mashkigwatig (Anishinaabemowin name)

The shores of the shallow lake that gave birth to Mer Bleue were dotted with marshes and peninsulas formed by sand deposits from the Ottawa River. Bit by bit, the lake was colonized by algae and other aquatic plants, followed by sphagnum moss from its periphery to its centre. With no supply of free-flowing water, the anoxic conditions and acidity grew worse as the layers of peat accumulated with no possibility of decomposition. These conditions persist to this day: the sphagnum continues to accumulate, and the bog, fed solely by rainwater, has a bulging look to it.

Because of the layers of acidic, mineral-deprived sphagnum caused by the anaerobic conditions responsible for the bog and the cold temperatures that continue long after the snow has melted, only plants specially adapted to the rigours of a northern climate manage to grow in this ecological niche. So it is hardly surprising that the Mer Bleue Bog is home to a boreal forest featuring black spruce and tamarack, two species that are very rare for this latitude. With its sand spits and surrounding swamps, this bog alone accounts for 50 percent of the Mer Bleue Bog Conservation Area landmass, a 3,500-hectare habitat protected since 1995 under the Ramsar Convention on Wetlands.

◀ Just like the black spruce, this tamarack is marked by a witch's broom, a long-misunderstood syndrome now attributed to a parasite, dwarf mistletoe (*Arceuthobium pusillum* Peck), that proliferates near bodies of water. The abnormal, accelerated development of short shoots lends a bushy, broom-like air to the affected branches.

▶ The annual process whereby the tamarack branches spring back to life is enough to melt even the coldest heart. Clusters of soft and supple needles attached to dwarf shoots begin to take shape and become intertwined with the beautiful violet-red female conelets that emerge in the lead-up to fertilization.

Maidenhair Tree

GINKGO BILOBA LINNAEUS

Paleobotany, which carefully examines the imprint of fossilized plant matter in substrates of various origins, such as peat moss, can establish the genesis of today's species. In this respect, bogs serve as marvelous playgrounds for this science.

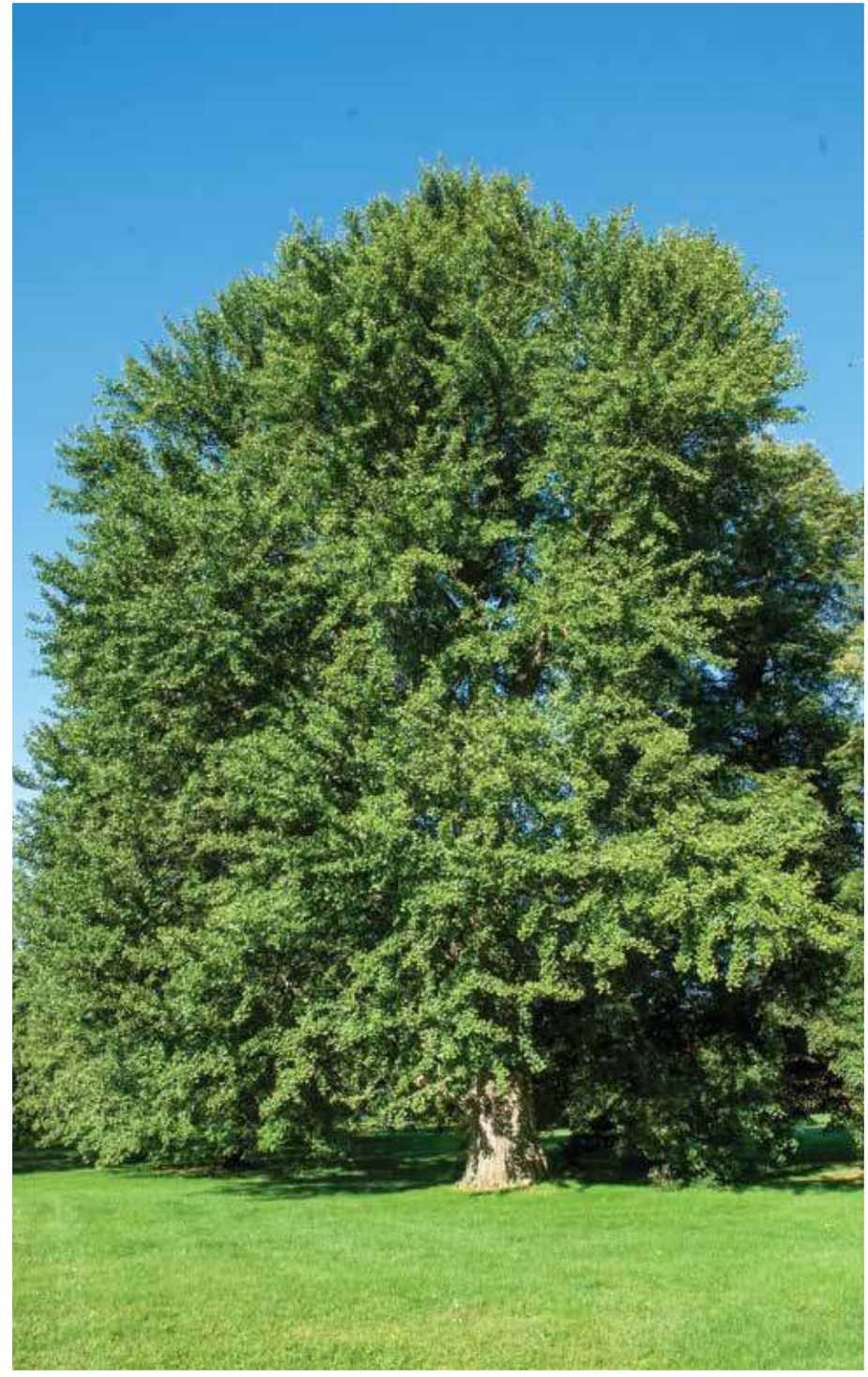
One of the best-known fossilized plants is the genus Ginkgo, the last of the Ginkgoaceae family, which first appeared as the *primigenia* in the era of the supercontinent called Pangea, 250 million years ago. The species *biloba* dates back to 150 million years ago, the age of the dinosaurs. It grew not only in Asia but in Europe and the Americas as well. The maidenhair tree is the only species of its botanical genus to have survived successive glaciations. Brought from Eastern Asia to Europe in the 18th century, its presence was first reported in the 19th century at Ottawa's Central Experimental Farm, where it was one of the first trees studied.

Planted in 1896, the maidenhair quickly proved to be a hardy specimen. Less than 30 years later, in 1924, Dominion Horticulturalist William Terrill Macoun highly recommended this "curious, magnificent species." It has proven more than a match for any predator over the millennia, and it remains to this day impervious to native insect attacks and disease. It also owes its tremendous resistance to another defensive characteristic: its leaves are enveloped by a cuticle containing repellent alcohol that turns away potential predators.

▸ This is the oldest and most spectacular of the maidenhair trees in the Capital region. This living fossil owes its presence to the visionary work of the Experimental Farm, which, beginning in the 19th century, revealed the hardy nature of this tree and promoted its planting.

◂ This specimen of maidenhair was planted at Rideau Hall, the official residence of the governor general of Canada, on July 15, 1985, by Li Xiannian, President of the People's Republic of China, making it a historically significant tree.

◂ The maidenhair's leathery leaves are polymorphous. Atop the new shoots, the fan-shaped leaves — slightly indented in the middle — are arranged in a spiral. They differ greatly from typical biloba leaves, which are attached in clusters to the top of dwarf shoots, called spurs, on older branches.



Dawn Redwood

METASEQUOIA GLYPTOSTROBOIDES HU & CHENG

The rediscovery of the Chinese metasequoia in eastern China's Sichuan province in the 1940s, at a time when it was thought to have gone extinct, was one of the most exciting developments in 20th-century botany. This distinctive living fossil tree, whose trunk is covered with red fraying bark, belongs to a select club of conifers that lose their foliage in autumn (other examples include the bald cypress and the tamarack). Strangely, its needles fall to the ground either one by one from evergreen branches or in a bunch from deciduous branches to which they remain attached. And so each spring, the dawn redwood needs to acquire new foliage. Its evergreen branches become covered with long, flat needles, while its twigs develop short, flat needles that are slightly curved at the ends.

In 1947, Elmer Drew Merrill of Harvard University's Arnold Arboretum funded an expedition to China to enhance knowledge of the metasequoia. The expedition bore fruit when the first deliveries of metasequoia seeds arrived on January 5, 1948. The arboretum immediately distributed them to other parks and botanical gardens, including the one in Montréal. In 1954, Ottawa's Dominion Arboretum took delivery of the plants produced from these seeds, donated by the Montréal Botanical Garden. Since then, the species has been introduced in 50 other countries in Asia, Africa, Europe and North America, where it is adapting to a wide range of climate conditions.

◀ This specimen of fossil tree, a Chinese metasequoia, is one of the rare conifers to lose its needles in the fall. This large tree, which can grow to a height of 35 metres with a diameter of 300 centimetres where conditions are favourable, is on display at the Dominion Arboretum in Ottawa.

▶ The flat, long needles on the branches and the short, flattened needles on the twigs are found along two rows. Sporting a tender, apple-green colour upon their emergence, in the fall they adopt a rich palette of colours, ranging from yellow and apricot to bronze and red.

Katsura Tree

CERCIDIPHYLLUM JAPONICUM SIEBOLD & ZUCC.

For nearly 125 years, researchers have observed the behaviour of the *Cercidiphyllum japonicum*, or katsura, an Asian species of a small tree nicknamed "caramel tree" for the mild fragrance released when its leaves are crushed. As is often the case with plants from far away, this living fossil tree belongs to a monogeneric botanical family containing the lone *Cercidiphyllum* genus. In turn, this botanical genus is monospecific, as it contains only one species, *japonicum*. The other species of *Cercidiphyllum* that presumably existed throughout the planet's northern hemisphere, including Europe and the Americas, became extinct during an evolutionary period that began some 15 million years ago, leaving only the Asian species.

As far back as 1896, William Terrell Macoun, then assistant director of Canada's experimental farm system, was a fan of the katsura's beautiful pyramid-shaped silhouette and delicate foliage, woven from a multitude of heart-shaped leaves. In 1980, Dominion Arboretum superintendent Arthur R. Buckley published his observations on the katsura, calling it among the loveliest and hardiest trees to grow in the city's gardens. Not only is it resistant to parasites, but — speaking of resistance — who can resist its delicate red springtime flowers, giving way to pink heart-shaped leaves that turn yellow in autumn, before at last floating to the ground and releasing their heavenly scents.

◀ Red flowers without petals (apetalous) appear early in the spring during bud burst, cohabiting with the small, claw-like fruit-bearing pods produced the previous year. Each dwarf shoot supports a single heart-shaped leaf.

▶ The katsura tree is a favourite among Asian peoples for its embodiment of the principles of yin and yang complementing one another in nature. In their natural state, these trees bear only male or female flowers.

First Peoples and the Bounty of Nature

It was not until the Champlain Sea receded that the nomads of the ancient Paleo-Indian archeological period began to migrate gradually toward the current-day Ottawa Valley, and it was during these thousands of years that the St. Lawrence and Ottawa rivers emerged. The shores of the Champlain Sea that they occupied now form a territory dotted with hills and terraces left by the glaciers. These Paleo-Indians were well adapted to the environments alongside the glaciers, and their material culture was centred on hunting large land mammals and gathering plants. They produced their arrow heads and other tools, including hide scrapers, from the hard crystalline rocks found in the Ottawa region.

◂ First Nations encampment on the shore of Allumette Lake along the Ottawa River, in Ontario, 1870, watercolour by Alfred Worsley Holdstock (1820–1901).

Source: Library and Archives Canada, W.H. Coverdale Collection of Canadiana [online] MIKAN 2836424

Some 8,000 years ago, when the topography came to resemble more or less the current-day configuration, the Laurentian lowlands stretching along the Ottawa River for 280 kilometres were freshly exposed. And since these lowlands had barely popped their head out of the water, so to speak, they were not yet ready to inhabit. The First Peoples tended to occupy instead the sandy or well-drained flats and highlands. Soils had to dry, vegetation take root, and forests develop before a rich habitat could take shape and be inhabited by the ancestors of today's Indigenous peoples. As they settled in Western Quebec and Eastern Ontario over 7,000 years ago, these Indigenous groups adapted to and harvested (including fishing) the resources of the lake, rivers and surrounding land. They belonged to the extended Algonquin family: nomadic hunter-gatherers with related languages and cultures, distinguished from the Iroquois to the east and south, who were semi-sedentary peoples from the Iroquoian languages who practised subsistence farming.

Around 1500, the members of the nation living on both shores of the Ottawa River called themselves the *Anishinabeg*, meaning "human beings from this land." When Samuel de Champlain first encountered them in 1603 in Tadoussac, he gave them the name Algonquins, or "Algoumekins" as he wrote in his travel journals. Inhabiting the land on the Ottawa River watershed for at least six millennia, the Anishinabe developed an intuitive knowledge of medicinal plants and trees, as well as unique know-how about how to use them. This knowledge was documented by the ethno-botanical observations compiled by the first European explorers.

In the 17th century, what is now the National Capital Region was an ocean of trees. Stands of immense eastern white pine, red pine and jack pine grew on the deep, well-drained sands of the Ottawa River shorelines and on the dry ridges and slopes. Elsewhere within this territory, mature pines could be seen mixed in with the deciduous forests. The Algonquins travelled these dense forests, winding their way along well-trodden paths. They practised a semi-sedentary brand of nomadism wherein their movements were dictated by where the game, fish and wild fruit making up their diet were most plentiful. By turns, they lived off two territories: their own and the one they shared with other communities during certain seasons. According to Champlain and Sagard, three groups of Algonquins would leave the area to winter in Huronia: the Kinouchipirinis, the Mataoueskarinis and the Onontchataronons.

▲ Indigenous family, likely Algonquin, travelling the Ottawa River by canoe, watercolour, brown ink over pencil by Sir William Henry Wentworth Acland, August 31–September 3, 1860.

Source: Library and Archives Canada / Acc. No. 1986-7-258 [Online] MIKAN 2859736

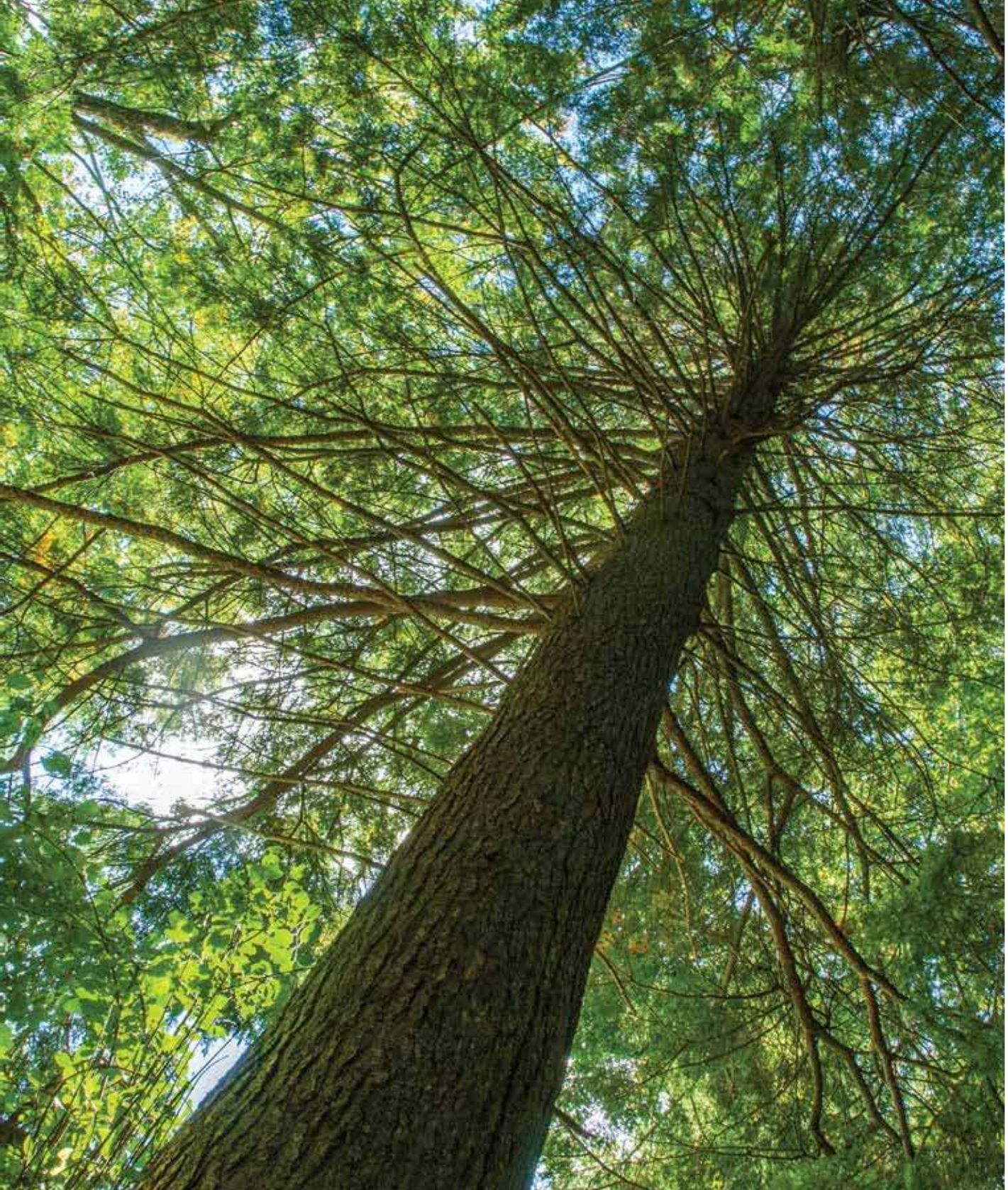
Eastern Hemlock

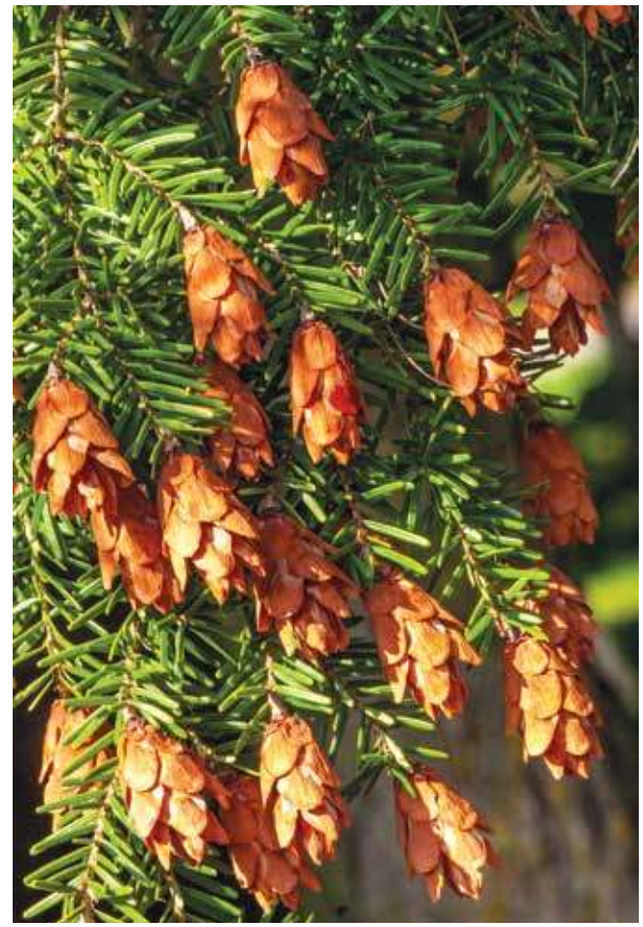
TSUGA CANADENSIS (LINNAEUS) CARRIÈRE
KAGAGIMIJ (ANISHINAABEMOWIN NAME)

Throughout the thousands of years predating the Europeans' arrival in the Ottawa Valley, the First Peoples took full advantage of the bounty this wild and diverse territory had to offer. The forests were not just ancient, undisturbed trees. The Algonquins moved within a mosaic of habitats at varying stages of growth: meadows and prairies alternated with forests, clearings and savannahs, with young stands alongside mature forests and wetlands. The species of trees and shrubs, the habitats and the many species of animals were found in larger, denser and more diverse populations than what exists today, including myriad species that are now rare or in danger of extinction. A number of the trees found in today's National Capital Region, including oak, ash, linden, pine, birch and cedar, were abundant then. The trees that dominated mature forests, provided smaller species with shade, and sheltered birds and small mammals were the sugar maples, beech and eastern hemlock.

In the early days of New France, the eastern hemlock was among the species of evergreen and deciduous trees that flourished in the colony's mixed forests, at a time when Indigenous peoples had long been harvesting and venerating this giant conifer for its tremendous medicinal properties. The hemlock's significant vitamin C content made it a key element in the therapeutic arsenal used to prevent scurvy and survive the harsh winters. The Algonquins would also boil shoots to produce a thick syrup or paste for use in a poultice to treat rheumatism. So confident were they in the antiseptic qualities of the hemlock that they even used topical applications of this syrup or paste to gently bandage their babies' infected navels. In treating wounds, they also discovered that its internal bark helped in the natural healing process. Possessing a high concentration of polyphenolic tannins, this reddish bark was used to lower inflammation and promote tissue repair. The bark was collected mainly in late spring during heavy periods of sap flow.

Compared with its medicinal properties, the eastern hemlock's botanical characteristics are more mundane, with certain surprising exceptions. As with all conifers, its leaves are acicular, that is, needle-shaped — linear, rigid and pointed. In the case of the eastern hemlock, the leaves are flat, delicate and bluntly tipped needles with a finely serrated upper half. These acicular leaves seem to alternate around the branch, but in reality, they are arranged in a spiral surrounding the branch, and as their filigree petioles — or small tails — withdraw into themselves, the needles all bend and seem arranged along the same horizontal plane. That also explains why some of them lie upside-down on the branches, exposing the strip of white dots on both sides of their midrib. When the needles eventually fall — after clinging to their branches for anywhere from three to ten years — the newly barren branches seem to have goose bumps! They are covered with small pads arranged in a spiral where the leaf petioles had been attached. The eastern hemlock can certainly wow anyone who happens by one on a spring walk: the turquoise of its newly fertilized female cones, which turn a purplish hue in the fall, is irresistible.





▲ The eastern hemlock is a typical species found in the forests of the Great Lakes and St. Lawrence region, an area that includes the National Capital Region. We are fortunate to see here one of the loveliest specimens in southeastern Ontario.

◀ This remarkable eastern hemlock, seen here in the Champlain Corridor, shares an old farm woodlot with sugar maples and a few scattered American beech, its preferred companion tree.

Eastern Hemlock

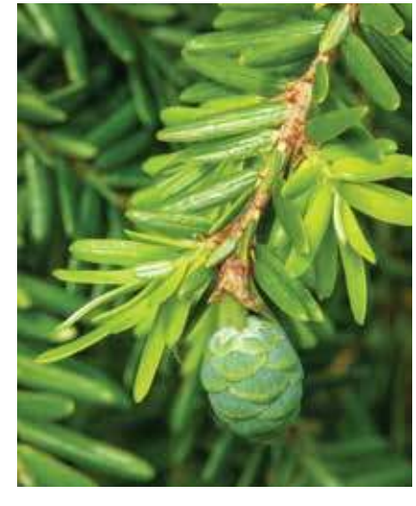
TSUGA CANADENSIS (LINNAEUS) CARRIÈRE
KAGAGIMIJ (ANISHINAABEMOWIN NAME)

Gatineau Park's oldest eastern hemlocks can be found in the Meech Lake and Skyline trail areas. Imagine that one of them, now over 270 years old, sprouted around 1744 — and could easily be still living and even reproducing hundreds of years from now. After all, the mixed forests of northeastern North America are known to include 800-year-old specimens, some of which bore cones until the ripe old age of 450.

From an ecological standpoint, the hemlock is the polar opposite of a pioneer species. It is incapable of colonizing sites exposed to the sun, because its seedlings are very sensitive to light and drought. To germinate, its seeds need a moist bed of decomposing leaves from an already well-established forest of white pine or yellow birch, for example. Young hemlocks grow very slowly in the shade of these large trees, supported by their favourite companion tree, the American beech. This can be seen in certain wooded areas of Gatineau Park.

One day, after 50, 100 or even 200 years of slow growth, these patient hemlocks will spring to life thanks to the rays of light allowed in by the death of large pioneer trees. In no time at all they will pierce through the canopy and, in certain places, the tree tops will form magnificent cathedrals of nature. They pass along their genetic material and tremendous longevity through the seeds contained in tiny, thimble-sized cones.

◀ This magnificent specimen of eastern hemlock greets hikers along the Wolf and Ridge trails area of Gatineau Park. Apart from its size and diameter, the remarkable elephant foot is by far its most distinctive feature.



▶ The eastern hemlock has an average life expectancy of 600 years. This seems astounding, but hemlocks this old have indeed been found in ancient forests considered to be exceptional forest ecosystems.

Yellow Birch

BETULA ALLEGHANIENSIS BRITTON
WINISIK (ANISHINAABEMOWIN NAME)

Yellow birches often grow alongside sugar maples to form a distinctive forest ecosystem. But it is not uncommon to encounter them in the Mer Bleue Bog, a protected wetland crucially important to the Greenbelt. The bog environment was as valuable to the successive generations of Anishinabe who occupied it for thousands of years. The Anishinabe/Algonquin peoples set up camps on this vast site, where they fed off the wide diversity of bog berries and tapped various species to produce sweeteners.

The Algonquins knew how to take advantage of the dynamic duo formed by the yellow birch and red maple. When maples were scarce nearby, they would extract the sap from both species, and then either freeze it to isolate the syrupy sugar from the ice water or plunge hot stones into it to convert it to syrup. Birch syrup, whose distinctive taste is reminiscent of honey, caramel and molasses, is used today in gourmet cuisine. A refined taste passed down from the Indigenous diet!

The yellow birch served a less-known purpose as well. Very old specimens sometimes remain standing, as though sleepwalking, while their wood decomposes. The corky, rigid bark holding them up during this process is as flammable as tinder, and Indigenous peoples would use it to start their fires.

◂▸ The trunks of both of these behemoths, a yellow birch in the foreground and a red maple behind it, are a perfect illustration of some of the native species that, along with the sugar maple, circle the Mer Bleue conservation area.

Bitternut Hickory

CARYA CORDIFORMIS (WANGENHEIM) K. KOCH
MITIGWABAK (ANISHINAABEMOWIN NAME)

Before the most recent ice age began, numerous species of hickory covered the Earth. Several of these have since gone extinct, leaving only about 15 still in existence, including 12 native to the eastern United States. Of this dozen, four are also native to Canada. The bitternut hickory, which extends to southern Ontario and Quebec, is the hickory with the largest and northernmost natural distribution, as opposed to the shagbark hickory, which is more sensitive to the cold and thus does not extend as far north. Other species include the pignut hickory, often mixed in with oak, and the shellbark hickory, whose nuts are edible.

The bitternut hickory is nurtured by soil from the sedimentary materials left when the Champlain Sea receded from the low-altitude, southernmost portion of current-day Gatineau Park. The sedimentary limestone layers transformed into young and fertile brown forest soils, including a form of humus called mull. Over time, these soils paved the way for stands of maple and hickory. The bitternut hickory never forms pure stands like its companion trees, the sugar maple and beech. That is why it is most often found associated with maples whose ecosystem also includes basswood, white ash, red oak and, less commonly, black maple, butternut and eastern hop-hornbeam.

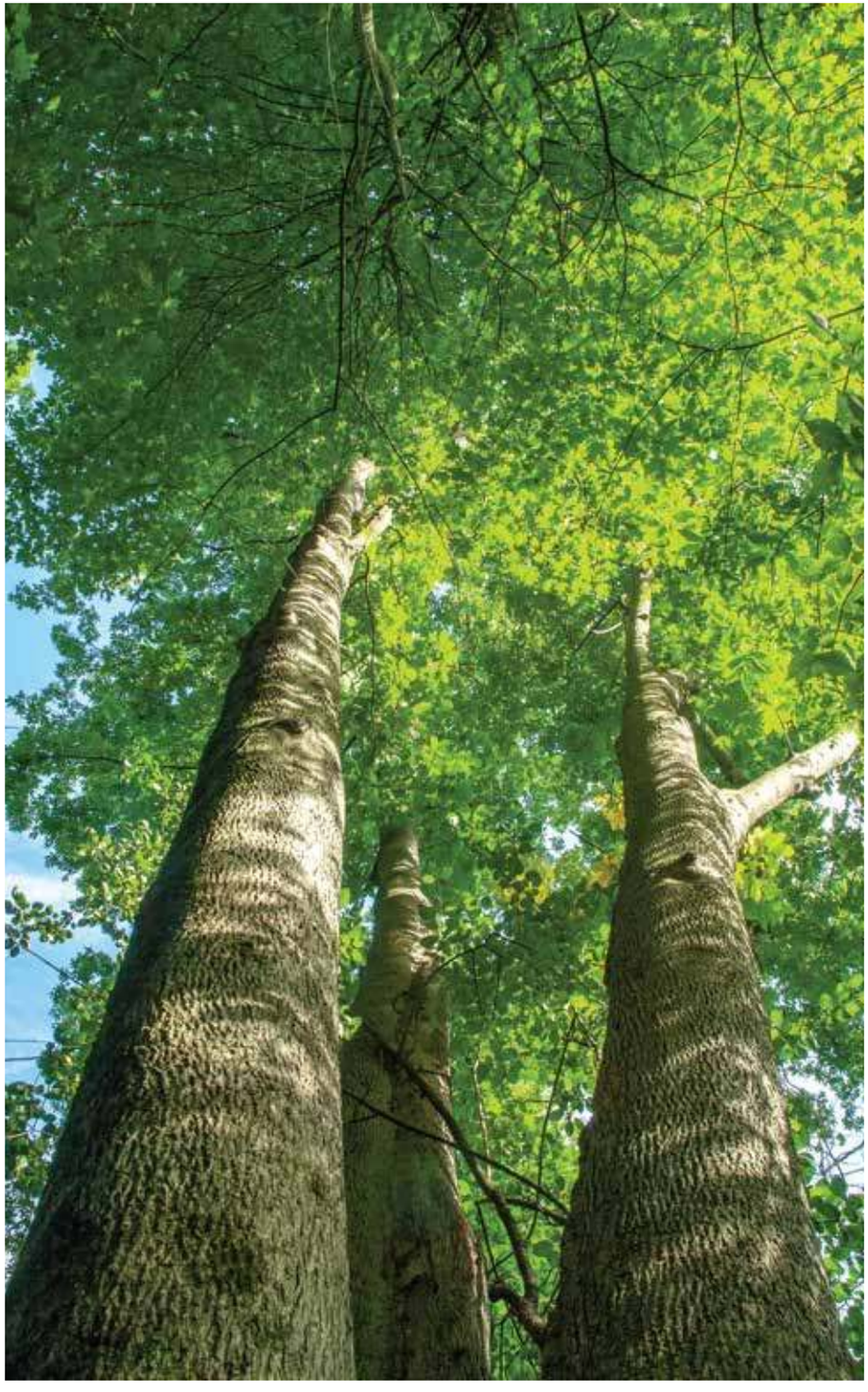
The bitternut hickory belongs to the Juglandaceae family, making it a close relative of the walnut. Unsurprisingly, Indigenous peoples learned to take advantage of its unpleasantly bitter-tasting nuts, which is how it got the nickname bitternut in the first place. In terms of passing down this knowledge, history provides us with two strokes of fortune. The first was the extended stay in New France of Louis Nicolas, a Jesuit missionary who wrote an Algonquin grammar book and compiled observations on the use of hundreds of plants in a manuscript entitled *Histoire naturelle des Indes occidentales*. The second is the discovery of this manuscript, out of print for 300 years, by Daniel Fortin, a Quebec ethnobotanist who published it in 2014. The manuscript is a treasure trove of ethnological and biological information about the First Nations peoples, European explorers and their experiences with plants.

The manuscript describes the process for extracting fruit oil from the bitternut hickory, for use in lighting. Indigenous women would crush the unshelled nuts, comparable in size to nutmeg, in a wooden mortar or between two stones, producing a paste they would then immerse in pots of water to skim off the oil that would float to the surface. This oil was so valuable that they would guard it carefully. Thinking it would evaporate if unexpected visitors entered their cabin, they would always take care to cover their pots of emulsifying oil.

In the colony, the bitternut hickory was also highly prized for its bark, which was used to cover cabin roofs. Since it would eventually become harder than finely tanned leather, it was also used in the manufacture of sailboats and rowboats. Its fibres were also used to make rope solid enough to tie up cattle and thread to sew shoes with.

▲ The fertilized female flowers of the bitternut hickory are transformed into these characteristic nuts. Encased in a woody shell with a hard greenish coating, these nuts have four ridges where their valves open, distinguishing the bitternut from the so-called true hickory species.

◀ This bitternut hickory, a gentle giant of a deciduous tree, is native to this wooded area of the Dominion Arboretum. Cared for since it was planted sometime between 1886 and 1890, it is found here near its preferred companion species, the sugar maple and American beech.



Bitternut Hickory

CARYA CORDIFORMIS (WANGENHEIM) K. KOCH
MITIGWABAK (ANISHINAABEMOWIN NAME)

The bitternut hickory is perfectly suited to the National Capital Region. The area's forest soils are fertile, and the mildish climate conditions are conducive to southern flora, although the tree does best when shielded from the northern winds. Its lifespan of more than 200 years, tolerance to shade and growth in competition with intermediary species are all assets, but its slow growth is a liability. Thus, the bitternut hickory is not a naturally dominant species.

In the years prior to Gatineau Park's creation in 1938, the stands of maple and bitternut hickory trees usually found below the hills were accessible thanks to their topographic position and often harvested selectively. For much of the 19th century, they were logged to clear the way for agriculture, while the ashes from the maple trees were processed into potash and pearl ash, two industrial alkalis that were indispensable at the time to bleach cotton and wool, to tan leather goods and to produce soap, detergent, glass and fertilizer. These activities enabled typically subdominant species like the bitternut hickory and basswood to take over more space. The bitternut hickory also shares interesting traits with walnut trees: its aromatic leaves, its solid bearing thanks to a primary root surrounded by dense superficial roots, and its completely male and completely female individuals.

◂ This specimen of bitternut hickory is spectacular. Located on Gatineau Park's Pionniers Trail, it benefits from ideal conditions for its development. Note not only its three trunks but also the branches intertwined between the main trunks.

▸ Hickory trees belong to the Juglandaceae family, otherwise known as the walnut family. They are called noble because their valuable wood is used to make fine cabinets, musical instruments and inlay objects. Growing these trees requires refined silvicultural practices.

Shagbark Hickory

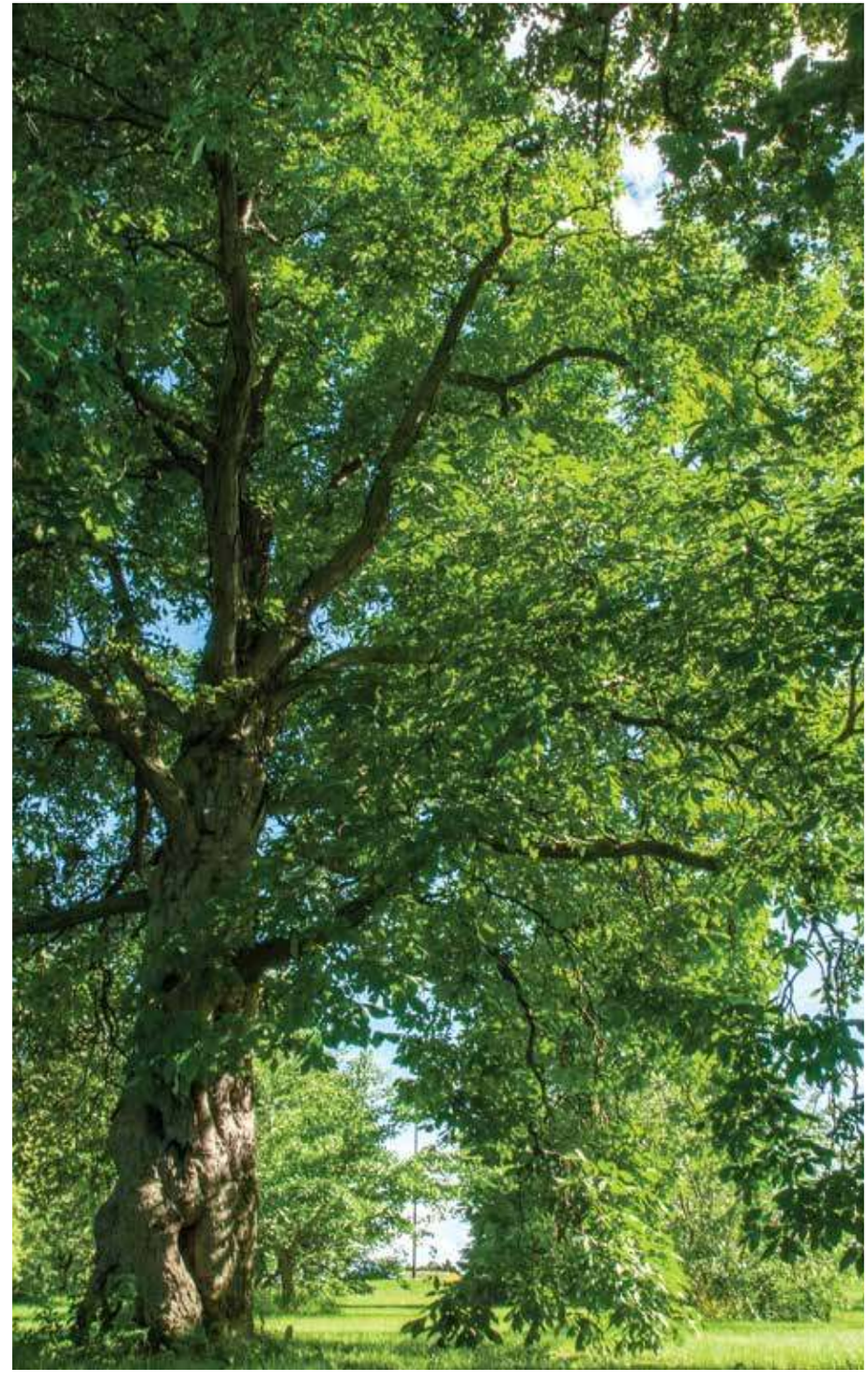
CARYA OVATA (MILLER) K. KOCH VAR. *OVATA*
MITIGWABAK (ANISHINAABEMOWIN NAME)

The shagbark hickory was more common in the mixed forests of New France than it is in today's forests. The natural distribution of this noble hardwood is concentrated along the St. Lawrence and its tributaries. Although it used to flourish in the rich, damp soil of the forests along the banks of the Ottawa and Rideau rivers, it is rarely seen there today. This fertile land was cleared by the first settlers for agriculture and then gradually urbanized, so much so that in its natural state, the species is at risk in Quebec.

The shagbark hickory figured prominently in the Algonquins' diet and way of life. They even planted small colonies of the tree for subsistence purposes around the camps they would visit periodically. Its sweet, edible nuts, which were prized by the first explorers, can be eaten as is or added to various dishes. The Algonquins would also make a type of fermented milky drink from ground hickory nuts for use in preparing cornbread and corn flour porridge. The tree's extremely hard wood was used to make tools and bows and arrows, and its detachable bark was used to make thick rope. A little known fact: the shagbark hickory can be tapped, much like the walnuts and sugar maple, to extract a sweet sap.

This elegant shagbark hickory was planted some 80 years ago in the Dominium Arboretum. With its branches and twigs that seem to hang down despondently toward the soil, its graceful silhouette differs from the natural form of the species — making for a distinctive specimen.

The name of this tree has become practically synonymous with quality smoked meat (hickory smoked). Although it is not known whether the Algonquins smoked their game with hickory wood, the word "hickory" comes from *pocohicora*, the fermented milk the Algonquins made from ground hickory nut.



Bur Oak

QUERCUS MACROCARPA MICHAUX
MISHIMINJ (ANISHINAABEMOWIN NAME)

With its high tolerance to freezes and droughts, its potential to grow tall and its preference for clay soil, the bur oak used to flourish in the Ottawa Valley. Unfortunately, the timber extraction necessitated by the 19th-century railway construction boom eliminated the bur oak from forests along urban creeks. These natural habitats recuperated to some extent, however, thanks to the creation of parkways for automotive transportation and the preservation of the Greenbelt. Recommended in 1950 by the French urban designer Jacques Gréber, these ribbons of urban greenery were intended to shield the Capital from an invasion of built environment and its network of roads.

Like the white oak, the *macrocarpa* species has tannins throughout its tissues. The medicinal virtues of these tannins were put to good use by the Algonquins, who treated their wounds with the help of boiled oak leaves, bark and roots. The acorns from both these oak species were also a good source of food. The yearly shoots of both species produce an abundance of acorns that mature in just a few months. In the fall, the nuts do not separate from the scaly cupules surrounding their base, but rather fall as one to the ground. The Algonquins would dry and then grind them to produce a flour to be used as a thickening agent in soups or to make pancakes with. They would also eat the sweet-tasting kernels as candy, either plain or roasted over coals.

◀ Well camouflaged in the Pinecrest Creek forest, this majestic bur oak survived the upheavals that affected wooded areas in and around the city of Ottawa. In the 1980s, it could well have been dynamited to make way for the city's rapid bus transit system.

▶ The bur oak produces its best acorns from age 35 to 150. The most voluminous of all the species of Canadian oak, these acorns contain a lone seed, encased inside a hard, tough and sharply tipped shell.

Basswood

TILIA AMERICANA LINNAEUS

WIGOBIMIJ (ANISHINAABEMOWIN NAME)

The basswood is an attention-seeker, both in the countryside and in the city. This is one good-looking tree! Its regular bearing and the way its branches fan out make it look like an ace of spades, thus very much mimicking the shape of its own leaves — a rarity in the tree world. Some say its habit (shape) and leaf are cordate (heart-shaped). It is the ideal companion tree of the Laurentian maple, where the soil is rich, deep and well drained. Its pointed crown does not encumber the forest cover. Once it gets big, its cavities are enjoyed by the pileated woodpecker and the wood duck. Its fragrant flowers attract a wide variety of pollinators, and its delicate yet intense honey is sought after for its culinary and medicinal qualities.

One of the National Capital Region's largest hardwoods, the basswood was just as generous to the Anishinabe/Algonquin peoples, who knew it was edible. The Algonquins would feast on the tasty, nutritious buds of its springtime shoots and on its large leaves throughout the summer. Prepared in a variety of ways, these leaves also possess myriad medicinal virtues, particularly in the treatment of dermatological problems. The Algonquins would also soak the bark from young basswood in water and then weave it into rope, clothing and fishing lines and nets.

▸ Defying the laws of gravity, this basswood is surrounded in the spring with a forest cover full of pretty flowering plants native to the area. As though having guessed that their time is short, they hasten to take advantage of the few weeks of glorious sunshine before their large companion tree begins to leaf.

◂ The creamy yellow, fragrant and melliferous flowers of the basswood are said to be perfect, because their five exterior sepals and five interior petals contain the male and female reproductive organs. They cluster together in a multitude of bouquets of five to 10 flowers, called cymes.

◂ During the springtime bud burst, the bright new leaves of the basswood emerge from the mass of reddish buds, revealing their elongated tip. Their main veins fan out, and their rectilinear lateral veins extend out to the delicately serrated edges.

White Oak

QUERCUS ALBA LINNAEUS
MISHIMINJ (ANISHINAABEMOWIN NAME)

The white oak is not as robust as the bur oak. Although it is resistant to the cold, the white oak's great need for nutritional elements and fertile, deep and well-drained soil, together with its spaced-out, irregular seed production and its poor resistance to floods, significantly limits its distribution area. Its northern limit, southwest Quebec, might have more to do with recurrent fires than major cold spells. This uncompetitive tree tends to gain a foothold in elevated areas and on sunny, dry sites. It is seen more often near other noble hardwoods, and when its stands are nearly pure, they are small. The white oak has been extensively harvested commercially, a victim of its quality wood. In short, the *Quercus alba* has become uncommon on Canadian soil, with an only limited distribution.

The specimens that have managed to survive should therefore be treasured, such as the white oaks in one of the greatest natural habitats in the urbanized part of the National Capital Region, Mud Lake in Ottawa. Naturalists have flocked to this area for more than 150 years. Resort activity reached its zenith in the area at the turn of the 20th century, mainly with the advent of the streetcar and the arrival of cottagers, but it was not until the influx of permanent residents that the pressure exerted on the natural environment by human activity became acute.

And so it was that the Mud Lake–Britannia conservation area came into existence, designed to protect not only Mud Lake but also the surrounding wetlands and wooded areas, the Ottawa River shoreline and swamps, and the Deschênes Rapids. This mosaic of interconnected biotopes covers 60 hectares of the city of Ottawa and is home to a vast biodiversity of flora and fauna. The results are impressive: the western portion of the conservation area, where conditions are drier, is home to a mature woodlot predominated by white pine, sugar maples and three species of native oak, namely the northern red oak, the bur oak and the white oak. In Quebec, the white oak is seen only sporadically, limited to the Montérégie and Outaouais areas, where stunted individuals take refuge on the arid land atop the Eardley Escarpment, among other places.

The Mud Lake–Britannia conservation area's small forest tract is a treasure — especially considering that in 1879, it belonged to logging magnate John Rudolphus Booth, who was awarded the lucrative contract to supply wood for the construction of the Parliament buildings. The National Capital Commission's efforts to conserve this area were aided by its designation by the Ontario government as an area of natural and scientific interest. The NCC also manages the area as a Category IV protected area as defined by the International Union for Conservation of Nature.

Camps used regularly by the Algonquins were discovered on the edges of Deschênes Lake. As with the shagbark hickory, the Algonquins grew the white oak around these sites so they could eat its fruit. They would soak the acorns in water for several hours before cracking them open with stones to extract the kernel. They would eat the kernels raw, boiled or roasted over coals. Sometimes they would process them into flour and prepare pancakes with it. They would even eat them as candy after dipping them in maple syrup. Last but not least, the Algonquins would shred, roast and grind the husks to make a coffee-like drink. Nothing was wasted!

▲ The white oak puts on a colourful display. Its leaves, which feature a slightly velvety underside, are pink in the spring, light green in the summer and burgundy red in the fall, with shades of pink, light red and purple.

◀ Although stands of white oak were once observed on the southern hills of the Ottawa Valley, and oak stands grew on the Eardley Escarpment, the species today is rare and scattered in the region. Shielded from the wind, this large white oak is representative of the specimens found around Mud Lake.

Yellow Birch

BETULA ALLEGHANIENSIS BRITTON
WINISIK (ANISHINAABEMOWIN NAME)

It is easy to understand why the yellow birch was given the name "cherrywood" by the first American settlers: its reddish brown wood — heavy, hard and strong — looks like cherrywood. It was just as valuable to cabinet makers in New France. The largest of the birch trees in Eastern Canada, it is well suited to the long, cold winters in this part of the country. In southern forests, as in the National Capital Region, it grows in rich, damp and even swampy soil, hence its nickname "swamp birch." This dominant species is widely found in several bioclimatic zones of Ontario and Quebec. Its primary limiting factor, apart from certain extreme conditions of drought or late frost, is the fact that white-tailed deer and moose overgraze on its seedlings and saplings, and hares overgraze on its seedlings.

The yellow birch belongs to a group of aromatic species whose internal bark, branches, shoots and leaves possess a wintergreen scent and taste. In New France, the yellow birch was known to yield more sap than the maple for the production of sugar. Where the sugar maple was absent, the First Peoples extracted syrup from another species of this group, the white birch, which also supplied them with light, water-resistant bark that was used to make utensils, containers and water craft. Today, birch syrup made exclusively from the sap of yellow birch is called *sirop de merisier* in French, capitalizing on the historical name for cherrywood in French — *merisier*.

◀ This yellow birch is flourishing in the heart of a small woodlot of mature trees, accompanied by large eastern white pines and old hemlocks, in Orleans' Chapel Hill North neighbourhood, in Ottawa's east end. It is part of a stunning rural landscape just steps from the Greenbelt.

▶ Once fertilized, the yellow birch's female flowers turn into a mass of tiny, light, bi-winged fruit called nutlets. This thin fruit is attached to the white-haired scales making up the plump catkins that lie on the branches, looking like mini pine cones.

Sugar Maple

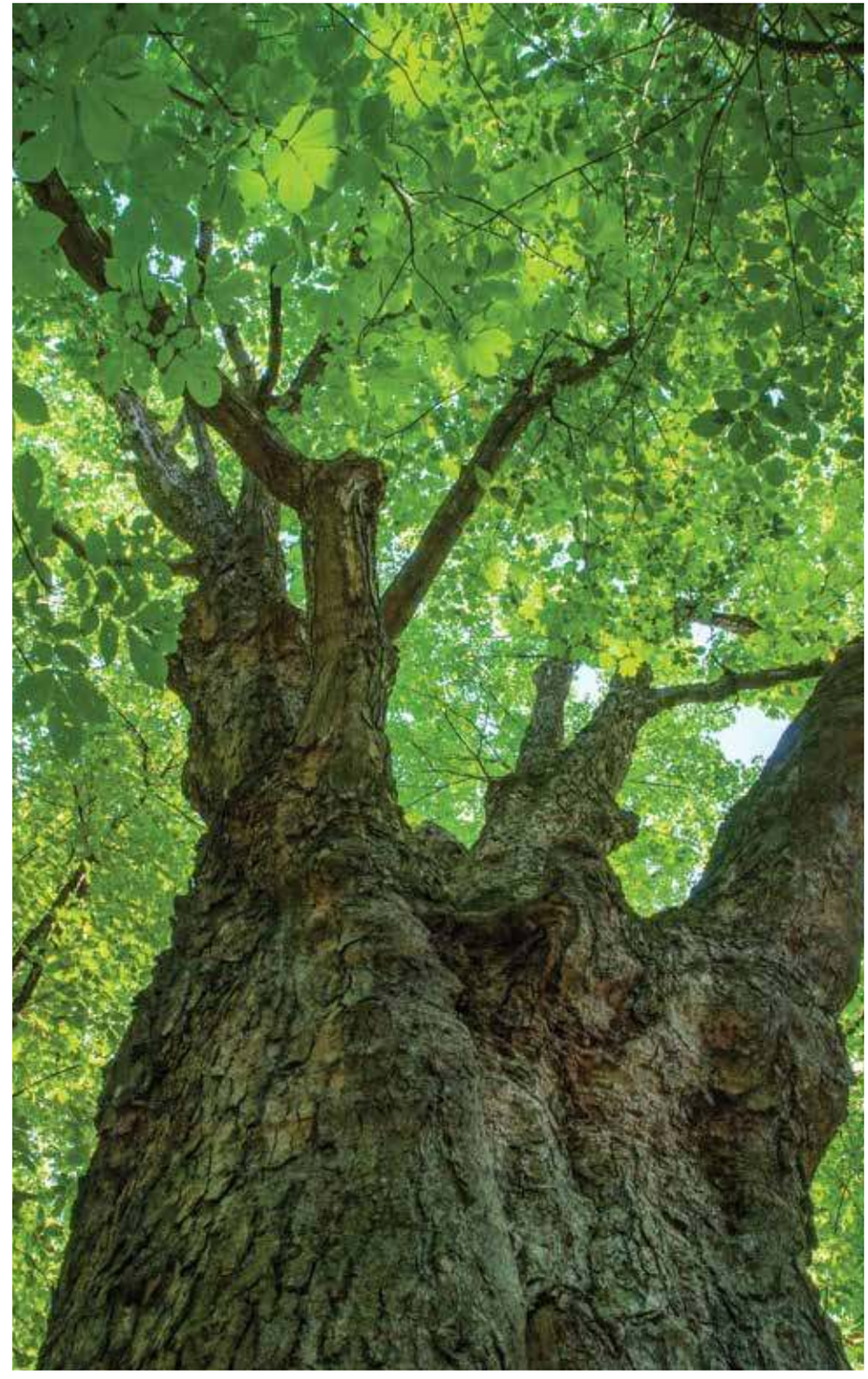
ACER SACCHARUM MARSHALL
SIZIBAKWADO-ININATIG (ANISHINAABEMOWIN NAME)

Sugar maples bring a host of pleasures to daily life. They are the source of the fine wood and bird's-eye wood that adorn our floors and furniture, the innumerable treats that delight our taste buds, and the wood that supplies our fireplaces. They are such an integral part of our way of life that it seems as though they have been — and will remain — here forever. One thing is for certain, though: the development of this dominant species is being closely monitored, because its social, cultural and economic value is so vast that it has become part and parcel of our national identity.

Knowledge and uses of the sugar maple have been handed down by the First Nations. It is said that the Algonquins were skilled at identifying the best "sugar factories" on their land — the sugar maple groves that were potentially the most productive, given their optimal elevation and orientation in relation to the sun. This enabled them to produce the largest possible quantity of maple syrup. This liquid gold was their main natural sweetener.

The first settlers, Francophones and Anglophones alike, all learned the basics of how to produce sugar and maple syrup from the First Nations peoples. In a book published in 1810, John Lambert noted that large quantities of quality maple sugar were being produced in both Upper and Lower Canada, and that Canadians — big believers in its medicinal properties — were gobbling it up.

◀ Everyone is familiar with samaras, those whirlybird dry fruit keys that never open and whose lone seed is encased in a membranous wing. Maple samaras are formed in pairs and have two wings, hence the name "double samara." The broad wings of the sugar maple samara are u-shaped



▶ A survivor of an ancient ecosystem, this magnificent sugar maple thrives on just the right amount of water in its Gatineau Park soil. It benefits from a canopy that opens up just enough to let in light.

Red Maple

ACER RUBRUM LINNAEUS

MISKO-ININATIG (ANISHINAABEMOWIN NAME)

With its strength and resilience, the red maple enjoys a dominant place in the area's forest ecosystems. Among other features, the red maple is the least picky of all the hardwoods when it comes to soil fertility, and its root system adapts easily to various types of drainage. This helps it grow better than its usual companion trees in harsh conditions, in dry soil and in peaty soil, as found in Mer Bleue. The red maple is known as an eager opportunist, as it easily takes over from sugar maples lost to logging, fire or windstorms. Fortunately, it contributes just as much as the sugar maples to the beauty of the landscape, with its bright yellow autumnal foliage that eventually turns scarlet red.

The Algonquins knew that the sugar content of the red maple was below that of the sugar maple. They would tap it to extract the sap and produce a sweet syrup, but only when the sugar maple population was insufficient. During a plant-gathering expedition to Canada (at the request of Carl Von Linné, who established the two-part naming system used to classify all lifeforms), François Gaultier, physician to the king, and botanist Pehr Kalm could easily tell the two maples apart, but they called the sap produced by the red maple *sève de plaine*. The word *plaine* is a bastardization of the word used to identify the Norway maple (*érable plane*), a species that is well known in Europe and grown in North America, and whose foliage resembles that of the red maple.

◂ Be inspired by the respect and veneration that the Algonquins have always shown toward food-bearing trees and plants as you admire this well-sized red maple and yellow birch standing side by side, just off the Mer Bleue Bog interpretation trail.

Basswood

TILIA AMERICANA LINNAEUS
WIGOBIMIJ (ANISHINAABEMOWIN NAME)

From the early settler days, mixed forests of basswood and sugar maple — markers of the most fertile land — were decimated to make way for farming. Basswood trees are still found from time to time around old farmland from which their ancestors, along with their companion trees, had been removed. But before the settlers arrived, the basswood held a special place for Indigenous people, who worshiped them. They sculpted ritual masks from the sapwood of living specimens, then detached the masks from the tree. If the tree survived, the masks were reputed to possess supernatural properties.

In his book *Histoire naturelle des Indes occidentales*, missionary Louis Nicolas described the many uses of what he called the "white wood" of the basswood. Indigenous people used it to make attractive bags by boiling the basswood bark and that of various other species, and then turning it into hemp from which they made thread, ropes, clamps and ammunition bags. Once dried, the bark looks like leather. They would also weave huge nets for fishing or to capture turtles. The white wood of the trunk was also used to make snowshoes, chests, long boats, canoes and cenotaphs indicating the location of burial grounds.

▸ Found along the Pionniers Trail, this tree is a fine specimen of the basswood, whose cultivation is being encouraged on abandoned farmland. On occasion, a rare good-sized specimen belonging to this unique native species of linden can be still found in Canada.

◂ When the basswood blooms, certain pollinating insects feed exclusively on its flowers, in good weather and bad. This is because its enormous heart-shaped leaves arranged horizontally along two rows serve as an ideal shelter for bees while they feed during inclement weather.

A Crossing Point and Meeting Place

Kitchissippi! That is what the Algonquin people have called the Ottawa River for a millennium now. After travelling 1,130 kilometres from its source, east of the Dozois Reservoir, the Ottawa River empties into Lac des Deux Montagnes (*Ka-nijobikwadinawang Sagahigan*). The bulk of its watershed, 65 percent to be precise, is in Quebec, and the rest in Ontario.

◂ Voyageurs Pathway boardwalk along the Ottawa River

Source: NCC

Samuel de Champlain, the father of New France, called it the River of the Algonquins or the Great River, and indeed, it is the longest river of all the tributaries of the St. Lawrence River. In 1613, Champlain travelled this waterway in search of what was then called the North Sea (now Hudson Bay). However, he had to interrupt his exploratory voyage at Île aux Allumettes (*Ishkode Minitig*). Undeterred by this setback, he took up a new challenge in 1615, travelling to Huronia along the Great River by way of the vast Georgian Bay of Lake Huron.

It was during this voyage that he ventured along the River of the Algonquins, the main waterway going west — and lived to tell the tale. As an explorer and mapmaker, he indicated on his maps the location of the waterfalls the Algonquins called Asticou (*Akiko*). Extremely important from a navigational standpoint, this site is now known as Chaudières Falls (*Kishkabikedjiwan*), comprising one large waterfall and several smaller ones. These falls have always caused problems for those travelling the Ottawa River from east to west. They must circumvent the falls via a land route by portaging. In so doing, they pass through three short sections of what is now the Voyageurs Pathway spread over 30 kilometres of shoreline before reaching the calm waters of Deschênes Lake. Over the millennia, this historic pathway was determined by the Anishinabe/Algonquin peoples and followed by explorers, coureurs des bois, fur traders, missionaries and soldiers.

Brébeuf Park, located on the route of today's Voyageurs Pathway at the second Chaudières portage, is the site of a monument commemorating the death by torture of Jesuit priest Jean de Brébeuf at the Saint Ignace Mission (Simcoe County, Ontario) at the hands of the Iroquois in 1649. Some of the trees planted on this site also travelled from afar, including two European species of pine: the Scots pine and the Austrian pine. Not unlike the country's builders, both these hardy, tough-as-nails specimens can grow to a ripe old age in a natural environment. These frugal conifers were mass-grown in Europe to reforest cleared lands, and it was for that same purpose that they were introduced in North America in the mid-18th century. Despite this initiative having yielded only mixed results, these two hardy pines wasted little time seducing specialists in urban forestry and ornamental horticulture with their resilience and good looks. They became so popular that today, the Scots pine and Austrian pine are two of the top choices for Americans shopping for Christmas trees.

The common hackberry is another tree that has done its share of travelling. From the dawn of the postglacial period, this tree — a native of the United States and southernmost Canada — managed to invade new lands. It travelled north, accompanying migratory birds on their annual spring journey along major waterways. Today, the common hackberry is found on the occasionally flooded lands around the Ottawa and St. Lawrence rivers, as far as Lac Saint-Pierre.

▲ Chaudières Falls on the Ottawa River, Upper Canada, 1826. Lithograph from a sketch by an officer of the Royal Infantry Corps, done in 1827 before the construction of bridges over the falls by Lieutenant Colonel John By, Rideau Canal, Upper Canada.

Source: Library and Archives Canada, Colonel John By Collection / 0330-A221-02 / e999923116-u. [Online] MIKAN 2928483

▲ Like certain European and North American species such as the pitch pine, red pine and jack pine, the Scots pine belongs to the hard pines group. These pines stand apart for their highly resinous nature and a tough sheath at the base of their needle fascicles.

Scots Pine

PINUS SYLVESTRIS LINNAEUS

The Scots pine has come a long way in both time and space. Millennia ago, its natural distribution was circumboreal. Well before the most recent glacial periods, its species was linked with the fir and spruce to form a unique, never-ending stand of trees winding around the entire Earth in the boreal area of the Northern hemisphere. In North America, the Scots pine was the most widely distributed native tree in this area. After the glaciations, its populations survived only on the Eurasian supercontinent. It is most often found in mountainous regions to an altitude of 2,000 metres, from Scandinavia and the Sierra Nevada mountains of Spain to Eastern Siberia and the Amour River region in Northern China. In Norway, it is the only native pine.

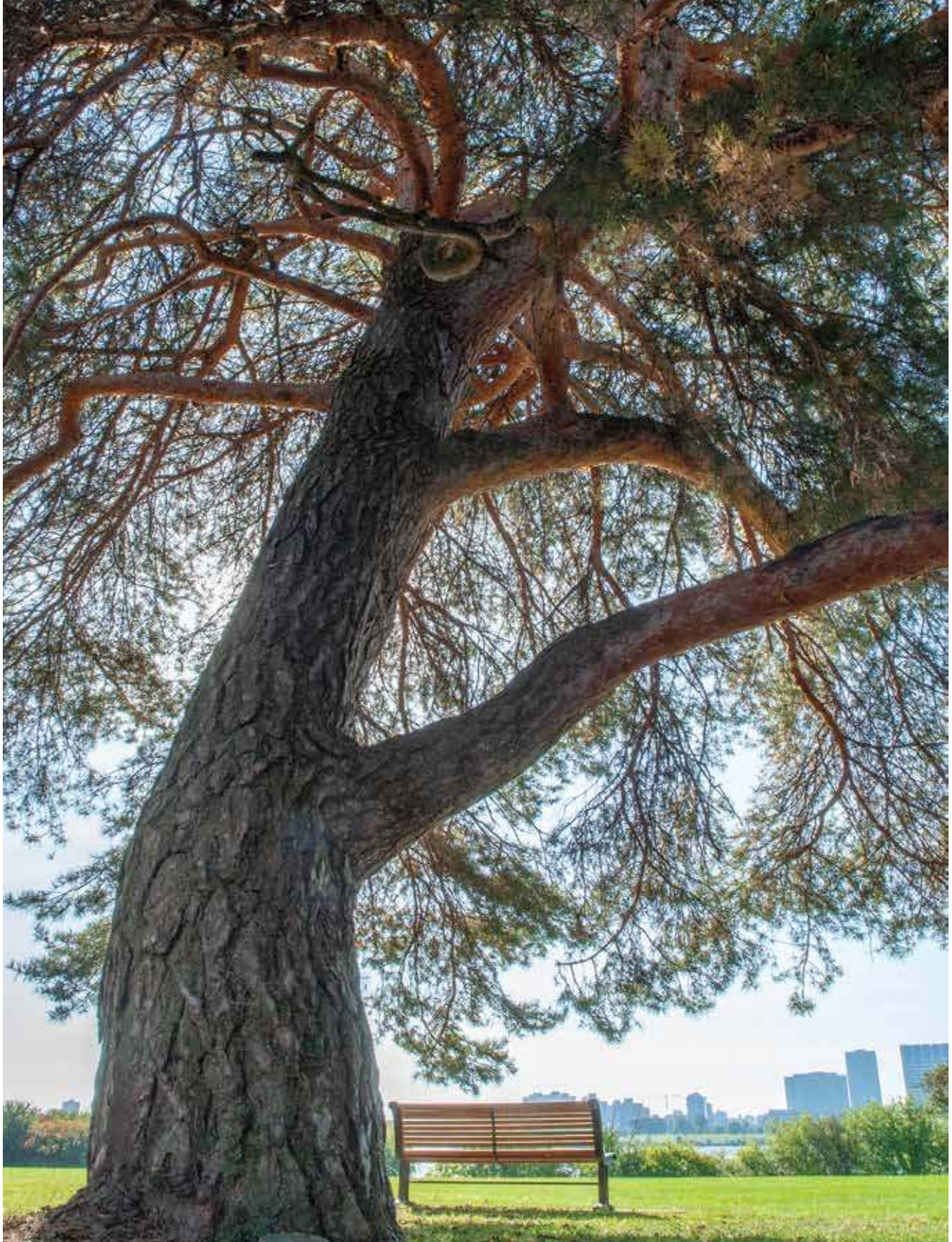
This speaks to its tremendous adaptability to extremely varied soil and climate conditions and explains its many alternative names, including Caledonian pine and Scotch pine, which date back to its reintroduction in Northern Europe, when it once grew in the Scottish Highlands.

The Scots pine is known as the most cosmopolitan of all the pines, for its ability to brave both scorching heat waves and Siberian cold snaps, coupled with its remarkable capacity to feed off the most impoverished soil systems, is impressive. As a fast grower, it became an ideal species for restoring soils depleted from decades of intensive farming. As early as 1752, or perhaps even earlier, it was introduced into North America, where it was planted in landscaped areas and protective hedges to reforest the land and combat erosion. And so although the Scots pine finally made it home, its trip around the world stripped it of its native species status.

The polymorphism of the Scots pine is intriguing: it is as though its adaptability is also reflected in its the shape it takes. In Europe, it is a large tree that reaches 50 metres high, with a rectilinear trunk and high-quality wood. In North America, it reaches no higher than 30 metres, its trunk is rarely rectilinear, and it has poor-quality wood — all this due to the genetic material of the seeds imported by the first settlers. In short, asymmetry comes naturally to it. In nature, it has a wide assortment of shapes: tortured, lanky, stocky and even unworldly at times. The shorter and twistier it is, the more it tends to have large branches. Sometimes the branches at the crown are short, delicate and oblique, while at other times they are large and spread out. Old specimens have flattened crowns with long, sparsely needled branches. The Scots pine also forms hybrids with two related species: the mugo pine (*Pinus mugo*) and black pine (*Pinus nigra*).

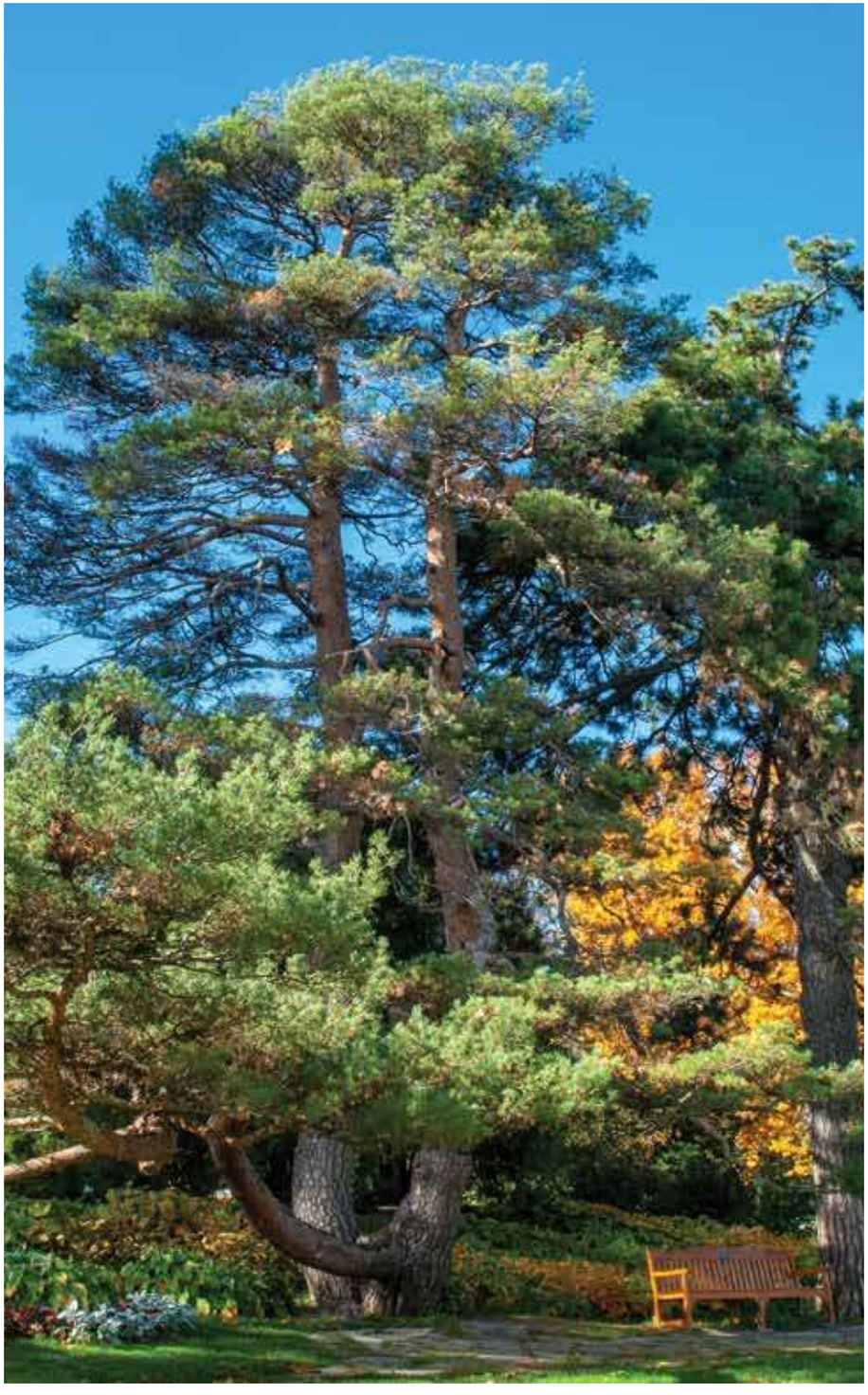
This tremendous plasticity has inspired a number of geneticists and tree growers. Different-coloured varieties have been developed, as have disease-resistant cultivars. The Scots pine's witch's broom-type spontaneous mutations have even been used to create over a hundred dwarf varieties with endless shapes, to the delight of landscapers.

Its only weakness is its taste for light. The resilience that saw it survive the millennia and travel the world over comes up short when dealing with shade, and some of its specimens die young.



▲ Admired for its bluish foliage set against its beautiful red bark, the Scots pine is one of three pines used to make turpentine.

◀ A curious conifer, this Scots pine never fails to wow people hiking along the Voyageurs Pathway to Brébeuf Park. Its roots, branches and upper trunk boast a brilliant orangey bark.



Scots Pine

Pinus sylvestris Linnaeus

The Scots pine was among the wide band of trees that William Saunders, a British-born Canadian scientist, had planted in 1889 around the western and northern boundaries of Ottawa's Central Experimental Farm. Not only did these trees beautify the area surrounding the farm, but they also served a research purpose. Saunders was hoping to gather as much information as possible about the growth speed, in local climatic conditions, of certain species that could potentially be used to supply lumber and build a wind-breaking shelterbelt. In fact, a shelterbelt was planted in 1895 east of the Dominion Arboretum. Some of these trees are still alive more than a century later.

William Terrill Macoun began his career at the Central Experimental Farm in 1887 at age 18. Although lacking specialized training, he was hired by Saunders as a labourer thanks to the influence of his father, celebrated botanist John Macoun. One year later, after recognizing William's abilities, Saunders made him his main assistant. In 1893, he put him in charge of plantings and promoted him to the position of forestry work foreman. He would never regret placing his full trust in him. Macoun became head of the Horticultural Division of the Central Experimental Farm in 1898 and later the Dominion Horticulturalist, a post he held from 1910 until his death.

◂ This Scots pine entwined with an old Austrian pine is hard to miss. Its dazzling, flaky orange bark covers its upper trunk and its branches. As it ages, the branches become contorted, loop around one another and let the sunlight in.

▸ Located at the Central Experimental Farm, this remarkable Scots pine stands amid the Macoun Memorial Garden, designed between 1934 and 1936 by R. Warren Oliver and dedicated to William Terrill Macoun, who devoted his 46-year career to the farm.

Austrian Pine

PINUS NIGRA F. J. ARNOLD

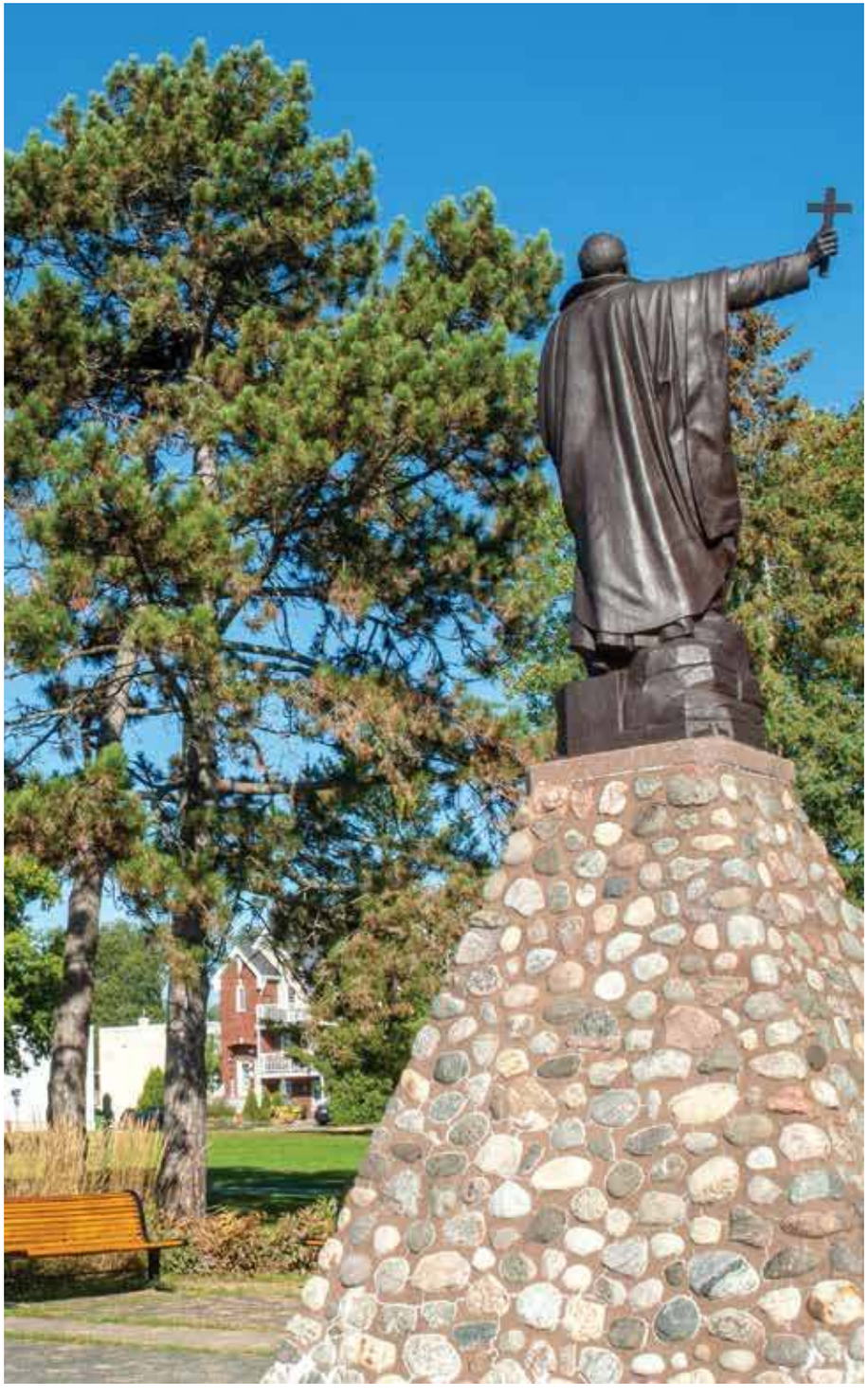
Like the Scots pine, the Austrian pine is a sunlight species. It has survived over millions of years, reproducing along the northern coast of the Mediterranean, from Spain to Asia Minor. This tree grows to a maximum height of 55 metres and lives as long as 500 years. It is well suited to a common habitat with several other softwood species. The trunk of the Austrian pine stands apart for its large scales (ranging in colour from yellowy-brown to reddish), separated by deep cracks that widen with age. This is in stark contrast with the sombre appearance of the rest of the tree, with its thick branches supporting dark shoots where its thick and curved feathery dark green needles intercept the light.

Because of its resistance to damage caused by snow and ice, the Austrian pine adapted easily to the New England and southern Ontario climate when first introduced. It was one of the first trees grown at Ottawa's Central Experimental Farm. When the windbreak was created east of the Dominion Arboretum in 1895, it was wisely planted in combination with ponderosa and Scots pines, along with Norway spruce.

In contrast with other pines, much of the Austrian pine is dark: branches, shoots and needles, not to mention the fact that its dense foliage and broad canopy produce thick shade that only amplifies its sombre, murky appearance.

▸ The different generations of this pine rub shoulders with the current year's shoots, nicknamed "candles." Near the top sit the fleshy purple female cones. Below sit the previous year's fruit-bearing cones. And in between are the needle pairs that will eventually take on a rubbery look.

◂ This old specimen of Austrian pine, entwined with a magnificent Scots pine, had long been growing before the decision was made to turn the site into the Macoun Memorial Garden. Its bark features a mosaic of thick violet-red chunks with black cracks running through.



Austrian Pine

PINUS NIGRA F. J. ARNOLD

In its way, like the Scots pine, the Austrian pine has also travelled long and far. A native of eastern Austria, northeastern Italy, the former Yugoslavia, Western Romania, Albania, Bulgaria and northern Greece, this pine was given its official name in 1785. It was first grown in the Netherlands, between 1750 and 1780, before spreading to France in 1834, the British Isles in 1835 (courtesy of the Lawson nursery of Edinburgh) and then North America. It is not surprising, therefore, that it can adapt to nearly every soil type, although it prefers deep, well-drained soils or dry, sandy ones.

Today's Austrian pine owes its popularity to other highly prized features. Far and away the pine most resistant to pollution and most tolerant of drought and calcium, it has become the most oft-grown conifer in urban settings, where it can survive just about anything: contaminated soil, drying winds, de-icing salts in winter, extreme drought, heat islands and no doubt worse still. To take fuller advantage of this "magic" conifer, the Netherlands had developed numerous horticultural varieties before exporting it throughout the West. This is why there is today such a wide range of Austrian pine types, from ground cover specimens and dwarf varieties designed for rock gardens, to pencil-shaped trees specially designed for tight spaces.

◀ Like the Scots pine, this Austrian pine in Brébeuf Park is one of the rare species of European conifers to have survived the successive waves of glaciation outside the Mediterranean Basin. They are miraculous trees.

▶ The Austrian pine's fruit-bearing cones, called strobilus, are attached to the shoot individually or in groups of up to six cones. These particularly stubborn cones remain attached to their shoot and closed in on themselves, only to finally open in three years.

Common Hackberry

CELTIS OCCIDENTALIS LINNAEUS

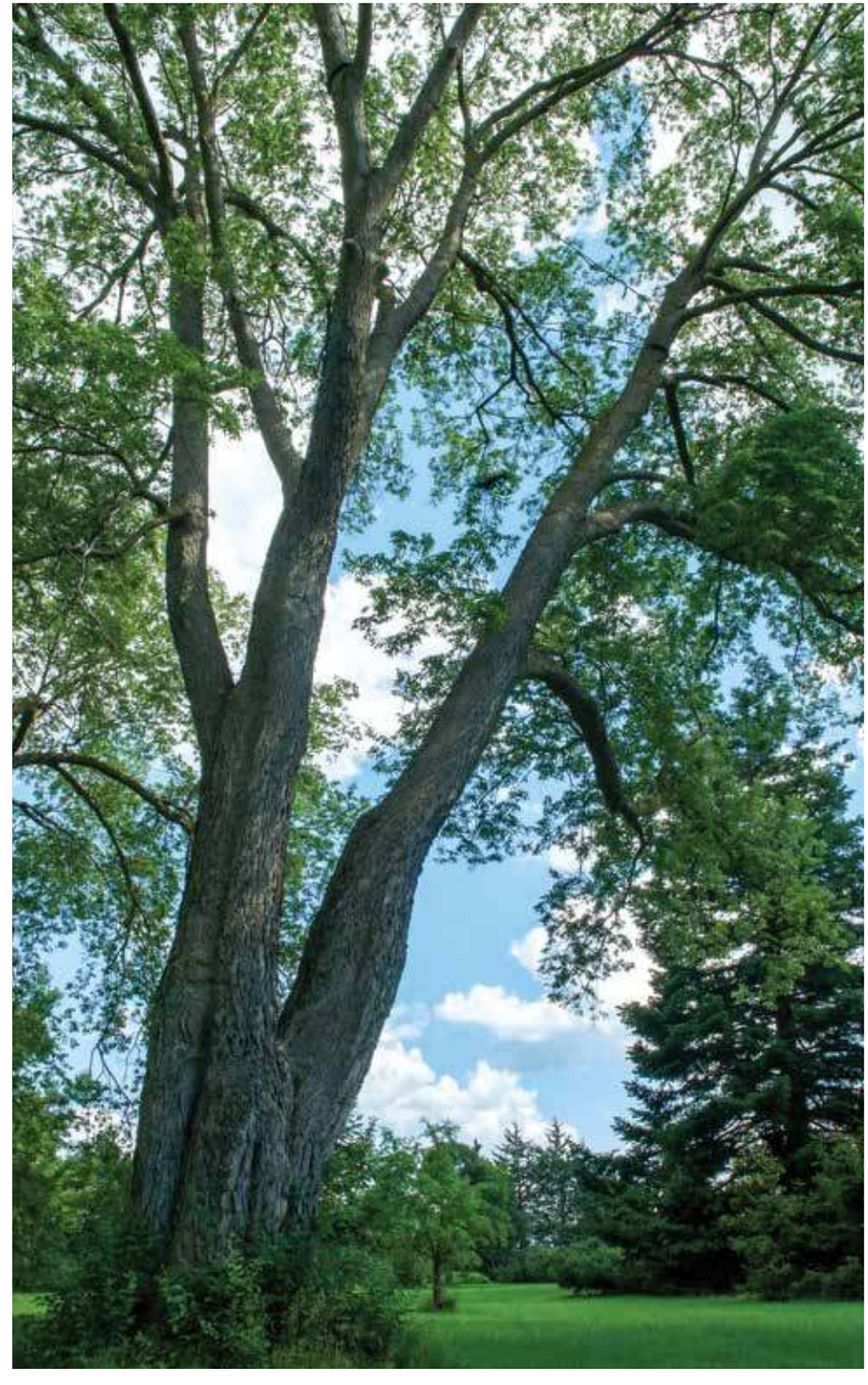
Renowned for its wide travels, the common hackberry used to have only a sporadic presence in Canada, and even at that, only in its original distribution area, which was confined to the southern part of the country, particularly the tiny Canadian enclave of the Carolinian forest of North America. It was after the most recent postglacial period that the hackberry made its way north to the boreal boundary of its natural distribution. Today it is found along the Ottawa and St. Lawrence rivers, in the heart of the National Capital and ranging as far as Lac Saint-Pierre. It would be worthwhile to study this migration to deepen our understanding of the mechanisms for making southern species hardier.

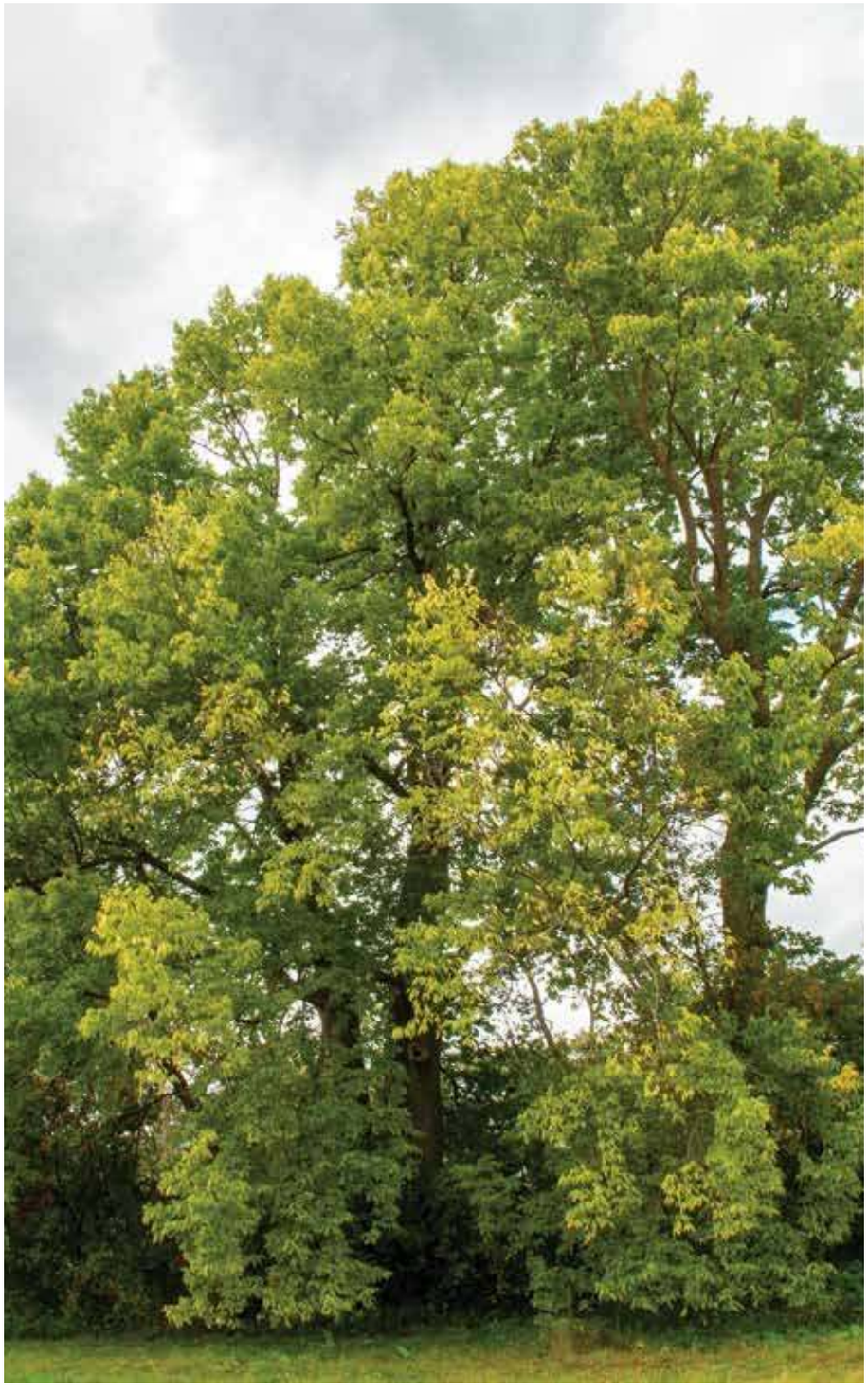
In the remarkably lush Carolinian forest, the hackberry blends in with the 70 species of hardwood found there to this day. It grows most often alongside the Kentucky coffee-tree or the black walnut, with which it shares physiological characteristics, including a high degree of allelopathy — the ability to impede the development of nearby plant life. Like other cold-sensitive trees, it clusters mainly around Point Pelee, where it enjoys the moderating effects of Lake Erie.

In North American cities, it is grown for its adaptability to the pressures caused by human activity: increasingly frequent and lengthy heatwaves, air pollution, soil compaction and de-icing salt, among others. Reminiscent of the American elm (albeit not as graceful), it has also been grown for decades along avenues to replace the great elms that have succumbed to Dutch elm disease.

▸ This common hackberry, discreetly supported with the aid of cables, was planted in 1900 at the Dominion Arboretum as part of research that began in1889 into the hardiness of native and exotic species of trees and shrubs at Ottawa's Central Experimental Farm.

◂ At the turn of the 20th century, the common hackberry was an excellent research subject for eastern Ontario and western Quebec climate adaptability — and remains so today. Like the eastern red cedar, white oak and rock elm, this species is characteristic of the Ottawa Valley.





Common Hackberry

CELTIS OCCIDENTALIS LINNAEUS

Nordic Circle Park, which boasts some beautiful specimens of common hackberry, is also known for its springtime flooding at the hands of the Rideau River. From the start of the 19th century, the area saw successive waves of settlers and immigrants stubbornly make it their home despite the damage and heartache that ensued. Beginning in 1943, scores of families, led by a veteran of the Second World War, moved into the village, which was called Billings Bridge at the time. Unfortunately, the ice jams that formed in April 1947 near the Billings and Cummings bridges caused devastating flooding. The fledgling community of Nordic Circle suffered tremendous losses, and many of the veterans who had invested their pensions to make a life for themselves there were ruined.

Determined to complete its network of pathways, the Federal District Commission, forerunner to today's National Capital Commission, decided to expropriate the families who remained in the area. By the time the City of Ottawa had begun its annual dynamiting program to dislodge ice jams in 1956, almost no one lived there anymore. The NCC, founded in 1958, set about building what is now called Riverside Drive and Nordic Circle Park.

That impressive specimens of common hackberry grow along the Rideau River should come as no surprise. Much like the silver maple and the American elm, the hackberry is a native species naturally adapted to land that is periodically flooded.

◀ This pair of hackberries, all dressed in yellow, are among the several individuals of this species growing, either individually or in small groups, in Nordic Circle Park along the shores of the Rideau River.

▶ No matter the season, the intriguing bark covering the hackberry's trunk, branches, shoots and roots draws in passers-by. This highly flammable, corky bark is woven with narrow, irregularly distributed edges and covered with distinct wart-like protuberances.

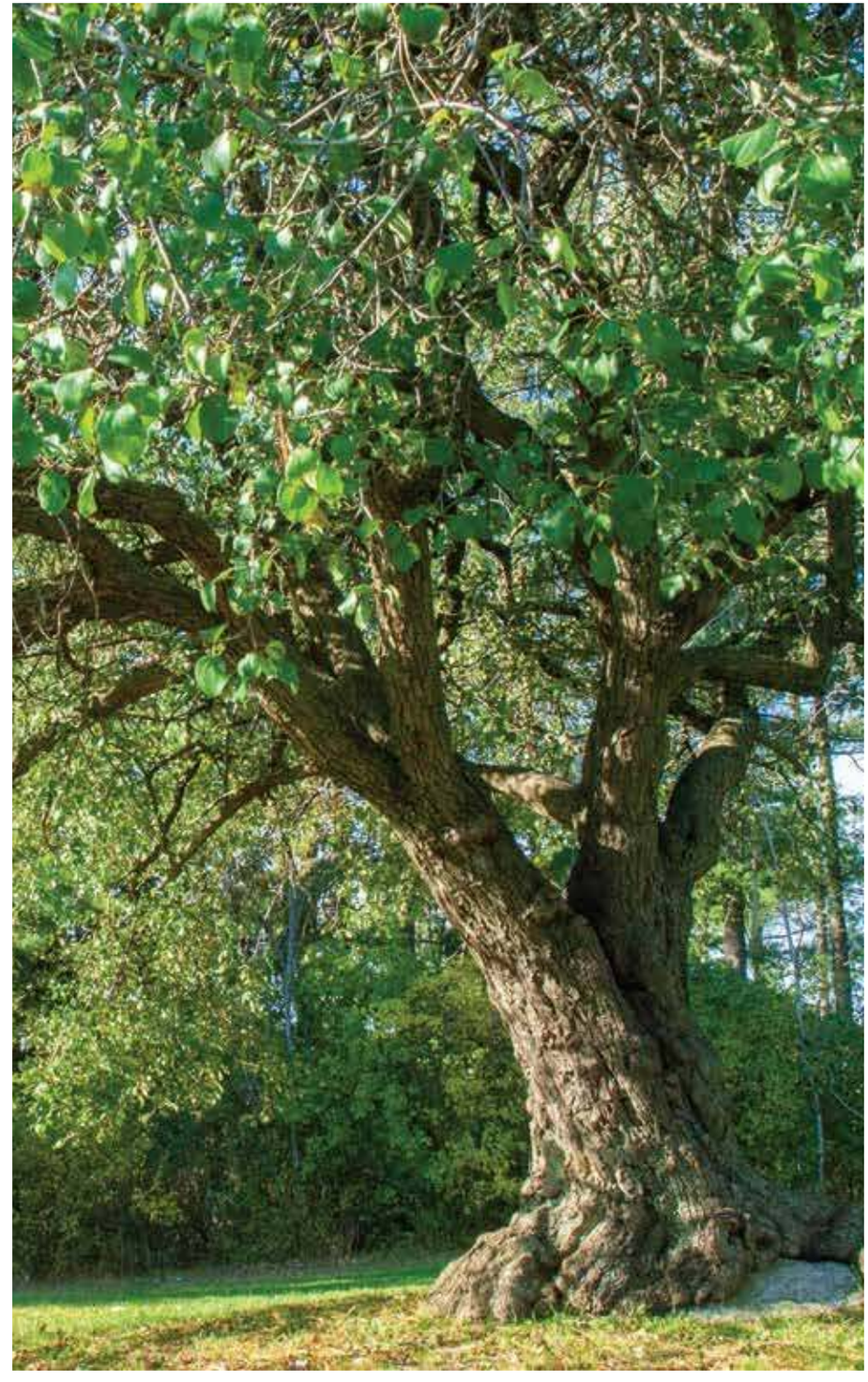
European Buckthorn

RHAMNUS CATHARTICUS LINNAEUS

The dimensions of the giant-trunked European buckthorn in Hog's Back Park (*Makwa Obikwan*) are surprising, because the species typically takes the shape of a shrub or small tree. In fact, it is not uncommon to confuse it with native fruit-bearing shrubs, and its pretty black berries are a laxative.

Like the majority of invasive alien species, this aggressive plant came from Europe and western Asia. Circa 1850, it was introduced in North America to build impenetrable hedgerows and windbreaks. It was chosen for this task because it is a hardy species that is resistant to insects and disease, and it adapts well to a range of soil and climate conditions.

Beginning in 1915, however, more and more "garden-escaped" European buckthorns had to be harvested in urban areas in southeastern Canada, and especially in the National Capital Region, as the buckthorn was spreading at an alarming pace. The desirable features that had led it to be planted in the first place had suddenly become abominable weapons: the European buckthorn had developed the capacity to take hold in natural environments and effectively compete with native species, causing them serious harm and even destroying them in some cases. Making matters worse, the buckthorn's propensity to invade natural habitats is abetted by native birds and a fellow alien species: the European starling. By feeding on buckthorn's berries, European starlings help to disseminate the species.



▸ Boasting a giant trunk, this European buckthorn is a perfect illustration of a "successful" alien invasive plant. With its close relative, the glossy buckthorn, it is among the most aggressive and widespread species throughout the area under management by the National Capital Commission.

◂ The greyish brown bark of the European buckthorn is punctuated with rows of lenticels, while its free ends wind around themselves, as is the case with birch bark. Its purple or dark reddish-grey shoots sometimes support specialized dwarf shoots with a terminal spine at the tip. Like its fruit, the bark contains glycosides that have a purgative effect.

Manitoba Maple

ACER NEGUNDO LINNAEUS

It is generally said that the Manitoba maple is a native of the North American prairies, where it grows mainly around streams and rivers, but it may also have existed in the southwestern-most portion of Ontario. Valued for its fast-growing qualities, it was planted to form hedgerows and as specimen trees in the Central Experimental Farm beginning in 1890. Masses of seeds and young seedlings were distributed to Canadian Prairie farmers to shelter crops and grazing livestock.

A distinctive feature of this maple is its ability to reproduce spontaneously through the winged seeds of its female trees. Indeed, there is evidence that the species began spreading beyond its natural distribution area in the early 1880s. Today it grows pretty much everywhere in urban centres and wooded areas around the entire northeastern United States and southeastern Canada, hence its reputation as an invasive alien species.

A huge Manitoba maple grove, consisting of male and female individuals, is found at the heart of Moussette Park in Gatineau, south of the Moore Farm Estate. Christened Luna Park at its official inauguration in 1925, this park was meant to be a miniature version of the famous amusement park of the same name created in 1903 at Coney Island, New York. Its promoter, H. F. Blackwell, entrusted Vineland nursery, Ontario, with landscaping flower beds, groves and walks. In addition to dance floors, roller skating rinks, a pavilion and rides, he also built a pool lined with sand and a giant roller coaster.

◂ The small Manitoba maple colony found in Moussette Park is a remnant either of the plantings done during the park's creation in the 1920s or of redevelopment work carried out in 1938, when the municipal association returned it to the population in the Val-Tétreau area.

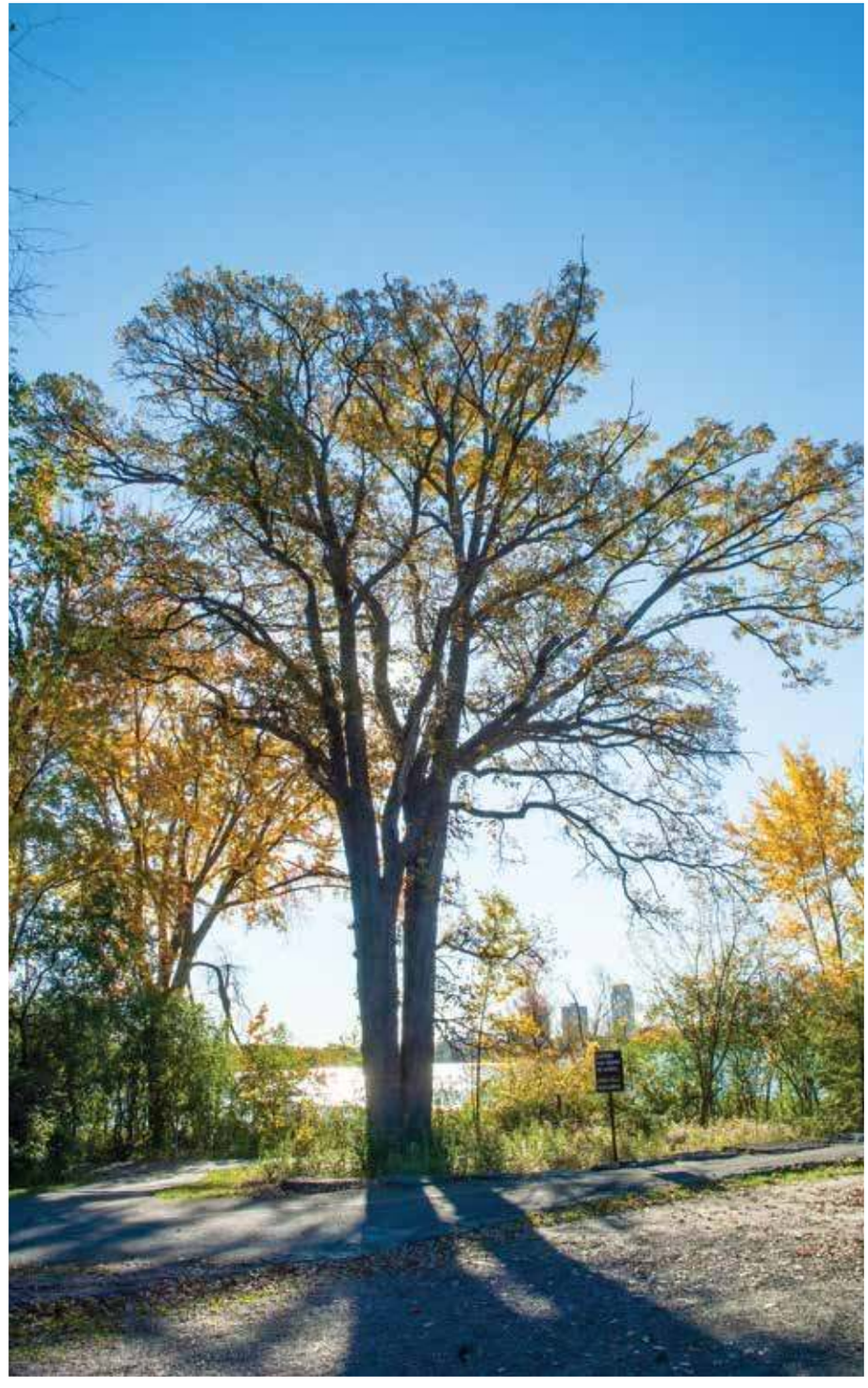
▸ Most maples native to North America produce three types of flowers. The Manitoba maple is an exception, as it is dioecious: some specimens bear flowers that are all female, whereas others bear flowers that are all male.

Bur Oak

QUERCUS MACROCARPA MICHAUX
MISHIMINJ (ANISHINAABEMOWIN NAME)

Bur oak abound along the banks of the Ottawa River, especially in the Deschênes area of Gatineau, where they enjoy the rich, damp limestone soil. Throughout this area, and particularly along the Ottawa River, it is possible to see rocks formed by the consolidation of ancient sedimentary layers that geologists call the Rockcliffe formation. The few bur oaks visible in the eastern portion of this district, around the Deschênes Rapids (*Ka-babikwakwadjiwang*) developed instead on tills — glacial sediment deposits. These noble oaks have a central taproot and several tentacular lateral roots by which it clings to its native soil for 200 to 400 years.

The tumultuous waters of the Deschênes Rapids attracted industrialists who sought to exploit their energy potential. In the mid-19th century, Aylmer timber merchant Robert Conroy chose the site to build a flour mill and a sawmill, which would later burn to the ground (the ruins are still visible). After the fire, in 1896, sons Robert and William Conroy built the area's first hydropower plant there, powering the city of Aylmer and the streetcars operated by the Hull Electric Railway. In today's dense urban fabric, it is fortunate that the bur oak's bark makes it fire-resistant. Indeed, its rough bark has deep grooves interwoven with scales and is the thickest among deciduous trees.



▸ This bur oak, boasting an impressive array of trunks, sits on the Voyageurs Pathway close to the Champlain bridge. Not having to fear seasonal flooding makes life all the more comfortable for this specimen.

Logging and the Development of the Capital

The founding of Hull township in 1806 — and later the cities of Bytown in 1826 and Hull in 1875 — was largely made possible by the potential and development of the forest industry, which, it must be said, benefited greatly from the Township Plan instituted by Britain in 1796. This system of privatizing public lands, in effect in Quebec until 1809, saw 37,000 acres of Ottawa-area forest earmarked for farming and the development of village cores, to the great benefit a handful of individuals.

◂ Timber slide to circumvent Chaudières Falls, 1880–1900, silver halide photograph by William James Topley (1845–1930).

Source: Bronson family / Library and Archives Canada / PA-147886, [Online] MIKAN 3211182

Philemon Wright (1760–1839), a farmer born in Woburn, Massachusetts, was one of the first Americans to take advantage of the situation. Heading up a group of associates in 1797, he asked the British Crown to cede them all unsurveyed lands belonging to what would become Hull township. From having explored the area previously, he knew how rich it was in forestry resources.

Wright arrived in the winter of 1800 with his wife, their six children, his associates and their families, and was assigned a quarter of the township's most fertile land. As the group's leader, he received from his associates 1,000 of the 1,200 acres the British Crown had allocated to each of them. Wright took ownership of 9,000 acres of land across the township, and settled near the Chaudières Falls where, with the community of his associates, he founded the village of Wright's Town.

A firm believer in the future of agriculture, Wright nevertheless jumped right into logging. It was too good an opportunity to pass up! At war with France since 1802, England was in desperate need of wood to repair its warships and had turned to its colonies to supply the raw materials. The forests of red and eastern white pine in the Ottawa River lowlands and around its tributaries were a goldmine for Wright. The eastern white pine, whose long cylindrical trunks are composed of nonresinous wood, was particularly prized for shipbuilding. Wright started his logging operations in Lower Canada, northeast of the Ottawa River where the waters were calmer than in Upper Canada, and then expanded them along the Rideau River and in the township of Montague. This logging was intended to complement the land-clearing operations and finance the establishment of new settlers. It required him to export to the Port of Québec and thus circumvent the dangerous rapids along the way. Taking a page from the techniques used along the Richelieu and St. Lawrence rivers, he created a prototype of a huge articulated raft or cage that would be dismantled before crossing the rapids and then reassembled. Colombo, his first raft, was piloted by four intrepid *cageux* (raftsmen). It left the mouth of the Gatineau River (*Tenagadino Sibi*) on June 11, 1806, bearing a cargo of 700 pieces of squared timber consisting of eastern white pine and oak, 900 planks and logs, and other forestry products. In August 12, the raft was brought safely to harbour, not before being partially sold along the way.

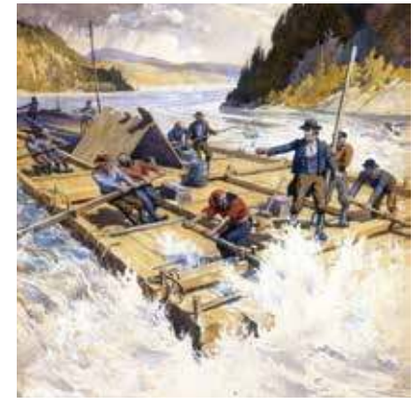
This difficult yet rewarding export experience would serve as a model. Entrepreneurs went on to use these *cages* to ship to Québec City not only wood but also potash and pearl ash — produced from wood ash and very much in demand on the British market — along with various foodstuffs.

▲ A lumber baron, J.R. Booth, of the Canada Atlantic Railway, 1920–1925. Unknown photographer.

Source: Library and Archives Canada / C-046480. [Online] MIKAN 3193653.

▼ First raft on the Ottawa River in 1806, watercolour over pencil with opaque white on commercial board, 1930, Charles William Jeffreys (1896–1951).

Source: Library and Archives Canada, Imperial Oil Collection series (R4956-0-7-E) / Acc. No. 1972-26-792 [Online] MIKAN 2897203.



Eastern White Pine

PINUS STROBUS LINNAEUS
SHINGWAK (ANISHINAABEMOWIN NAME)

The first explorers in New France described forests of white pines as tall as 45 metres, pressed up one against the other, their large trunks often branchless halfway up the tree due to the lack of light. In Quebec, some eastern white pines even reached the breathtaking height of 72 metres. The eastern white pine is Eastern Canada's largest conifer, the region's version of California's giant redwoods. To honour this noble conifer, which played a mighty economic role in Canada's history, Ontario made it its official tree in 1984.

This champion eastern white pine is the star of a small woodlot in Bell Corners, which is home to a nice diversity of native trees. Undoubtedly, it owes its size to the fact that this corner of the city long remained rural before its development in about 1950. A hundred years earlier, it was the site of a small town named Bells Corners, halfway between Bytown and the Richmond military settlement. Beginning in 1834, Hugh Bell operated a tavern at a major intersection of the town. A few years later, lumber merchant and farmer William Byers was living there when the town was incorporated into the township of Nepean. Unfortunately, in 1870, when Robert Moodie ran a hotel and John Robertson a general store, a fire destroyed much of this urban core, but the town would slowly rise from the ashes in the years to follow.

◀ At parking lot P13 in Canada's Capital Greenbelt, this eastern white pine may not be as big as its ancestors, but it impresses nonetheless. Its 35-metre height makes it one of the tallest specimens in the entire area managed by the National Capital Commission.

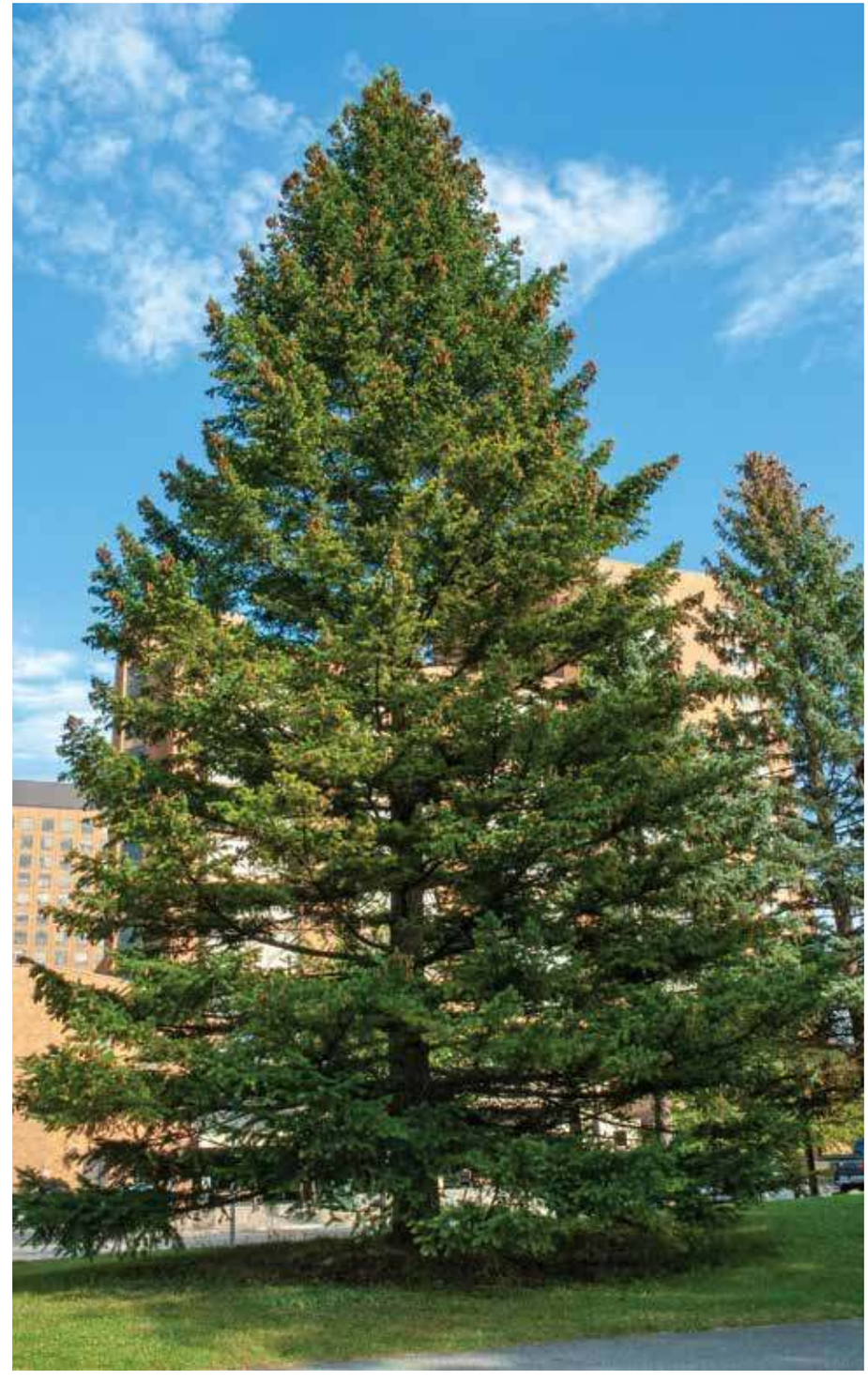
▶ One look at these pollen-engorged cones clustered together gives an idea of the effect produced by the blossoming of the eastern white pine's male flowers that once covered miles and miles of forest: storms of pollen swept across the forests, showering them with gold dust.

Douglas-fir

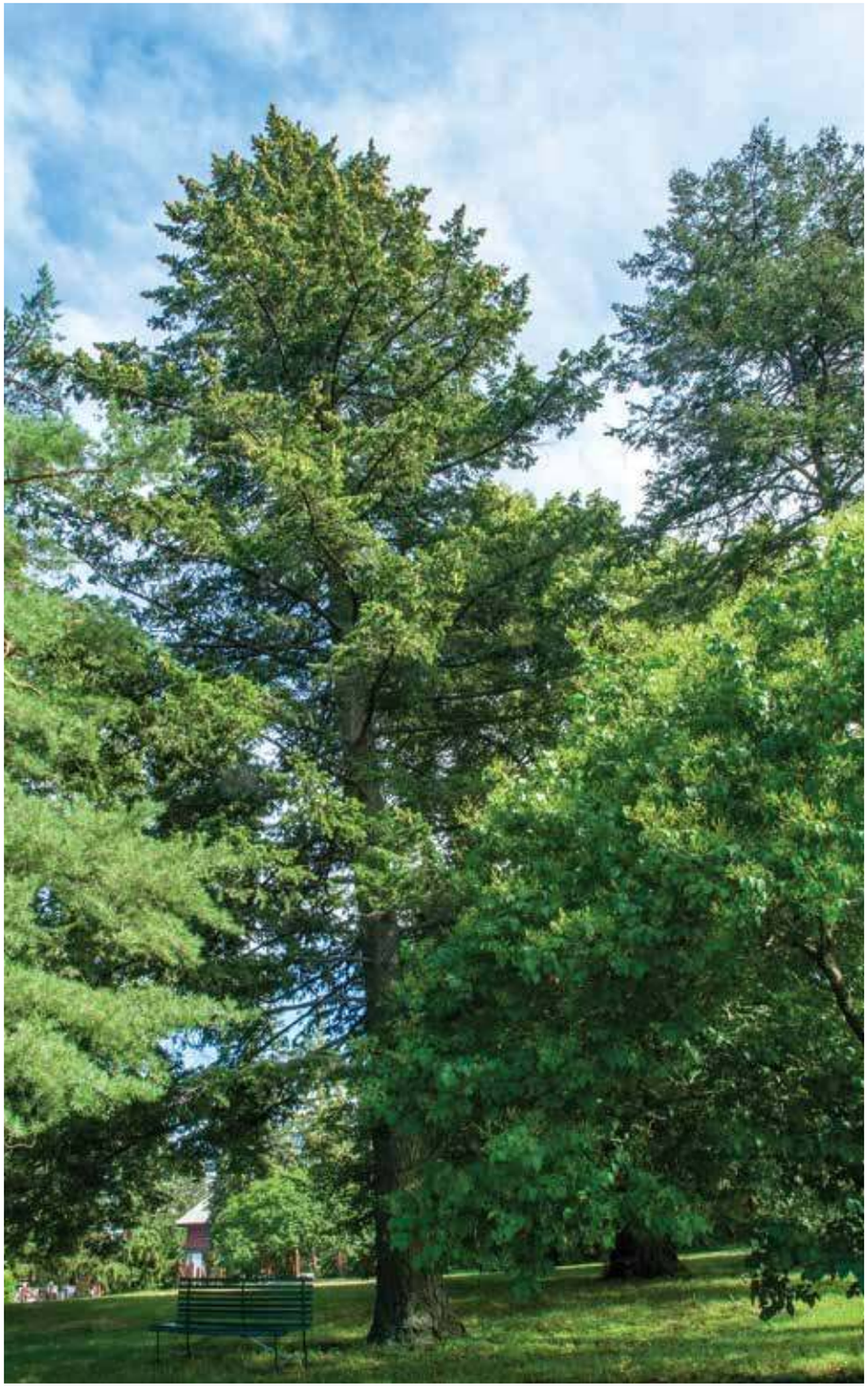
PSEUDOTSUGA MENZIESII (MIRBEL) FRANCO VAR. *MENZIESII*

The Douglas-fir is native to Canada, where, in North America, its size is surpassed only by the redwood of the U.S. Pacific Coast. In Europe, it was first grown in London around the year 1827, thanks to celebrated Scottish botanist David Douglas (1799–1834), who at age 23 was tasked by the Horticultural Society of London to collect North American plant species and introduce them in England. With its supremely versatile lumber, the Douglas-fir today constitutes the leading American commercial species and the second leading one in France, where it has been grown for over 150 years, accounting for nearly a quarter of reforestation efforts. Clearly, it is thriving there, as it is becoming naturalized.

The presence of a remarkable Douglas-fir near Brewery Creek is a nod to the British origins of Ottawa's 19th-century pioneers and entrepreneurs, like Philemon Wright, Ezra Butler Eddy and George Edward Hanson, who established their forestry industries at the intersection of the creek and Chaudières Falls. At that point, unprocessed wood that mainly being exported to England, but beginning in 1850, lumber was the main export to the United States. Wright, constantly diversifying his operations, built a brewery on the banks of the creek that now bears its name, as well as a whiskey distillery, brickyard, cement plant and tannery.



▸ Steps from downtown Gatineau, this Douglas-fir was planted in the heart of the Brewery Creek (Ruisseau de la Brasserie) walking path, an Ottawa River channel that surrounds the island of Hull. It belongs to the Hanson-Taylor-Wright heritage site, whose main arteries are lined with century-old trees.



Douglas-fir

Pseudotsuga menziesii (Mirbel) Franco var. *menziesii*

In its native state, the Douglas-fir grows in far milder environments than does its mountain variant, the Rocky Mountain Douglas-fir. Found along the Pacific Coast, from British Columbia to California at below 1,000 metres in altitude, it enjoys a humid temperate climate. Douglas-firs reach their full potential when there is ample annual rainfall. In the early 20th century, 100-metre-tall specimens were harvested. Douglas-firs remain the largest trees native to Canada, where they live for an average of 500 to 600 years, versus 300 years for their mountain counterpart.

It was at Nootka Sound on Vancouver Island that the Douglas-fir was discovered in 1792 by Scottish surgeon and naturalist Archibald Menzies (1754–1842), from whom the species derives its scientific name. Its English name commemorates another Scot, David Douglas, who brought back seeds from Oregon to London in 1826. It did not take long to recognize the tree's economic value: though a lover of sunlight, this tree with long, imperfectly layered branches grows quickly even in mild shade and takes well to pruning and thinning.

Our specimens are illustrative of some of the species' distinctive features. The young grey-green bark dotted with resinous pustules gives way to a thick and cracked reddish-brown bark over time. Fruit-bearing cones, hanging upside down from the treetop, cover their trident-shaped bract scales, lending them a bearded or spiky appearance.

◀ The Douglas-fir and the Rocky Mountain Douglas-fir are two distinct varieties of the same native Canadian species of their botanical genus: *Pseudotsuga*. Both varieties are among the first species to have grown since 1889 at Ottawa's Central Experimental Farm.

▶ Nicknamed "mousetraps" because of the way their bracts resemble a mouse's hind legs and tail, the Douglas-fir's resinous cones are a turquoise-hued light green to start, before lignifying, dispersing their seeds and falling whole to the ground.

Douglas-fir

Pseudotsuga menziesii (Mirbel) Franco var. *menziesii*

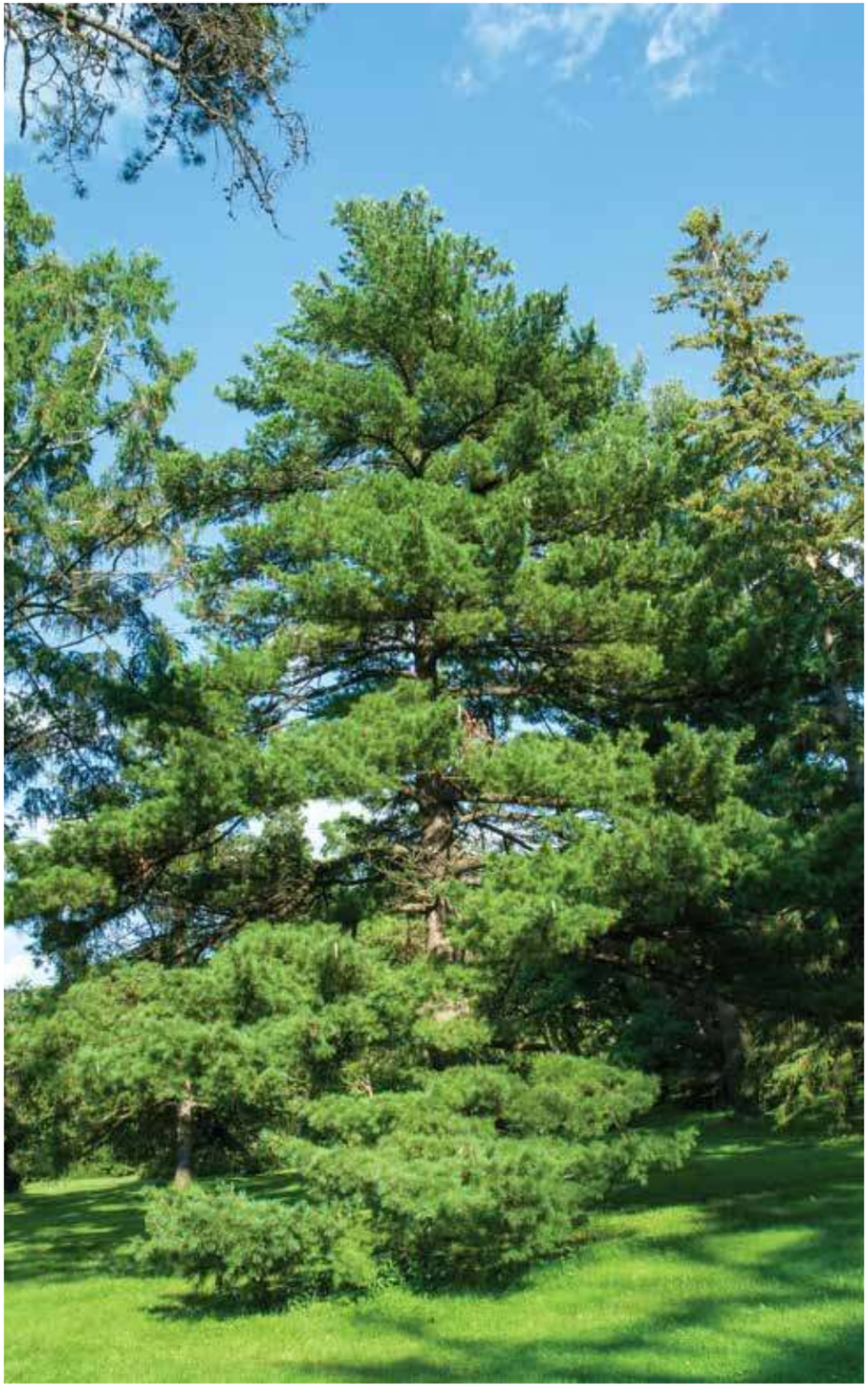
John Rudolphus Booth (1827–1925) is closely associated with the Ottawa forest industry and the Douglas-fir. Originally from the Waterloo area of Lower Canada, Booth helped build a paper mill in Sherbrooke before coming to Hull to build a sawmill for an Irish immigrant named Andrew Leamy, husband of Erexina Wright, the granddaughter of Hull's founder. Shortly after his marriage to Rosalinda Cooke in 1853, he moved to Bytown on the south shore of the Ottawa River. Bytown gained city status in 1854, was renamed Ottawa in 1855, and was named the capital by Queen Victoria two years later in 1857.

Booth leased Philip Thompson's Chaudières Island sawmill to learn more about hydraulic power and its use in commercial logging. In 1859, he landed a lucrative contract to supply the wood to build the Parliament buildings. He then acquired vast tracts of land for logging — and for grazing, because he also raised horses to haul logs. By about 1892, he owned about 640,000 acres in counties on both sides of the Ottawa River. At the time, his forestry business was the largest of its kind in the world.

The property that would house the Central Experimental Farm was purchased from this legendary logging magnate in or around 1886. The Federal District Commission also established Commissioners Park on another of its properties — the site of an old lumberyard — between 1920 and 1950.

This magnificent Douglas-fir in Commissioners Park serves as an introduction to the Ottawa lumber tycoon John Rudolphus Booth, who took advantage of the depression of 1874–1876 to buy forest concessions at a discount and expand his logging operations many times over.

The Douglas-fir was first thought to be a hemlock (Tsuga), owing to its large size and pyramid shape. Once taxonomists discovered that it was neither hemlock nor fir, they created a separate genus for it within the extended Pinaceae family: Pseudotsuga, or "fake hemlock."



Western White Pine

PINUS MONTICOLA DOUGLAS EX. D. DON

It was on the slopes of Mount St. Helens that David Douglas first identified the western white pine, naming it after the creamy white colour of its wood. Although its Latin name, *monticola*, signifies that it grows on mountainous land, it is found in a wide range of environments, from bogs to rocky soil, and does best in damp valleys and on gentle slopes.

Native to western North America, the western white pine is the western version of the native eastern white pine. Both belong to the soft pine family. Nonresinous, their needle-like leaves are grouped into five-needle bundles. Both pines hunger for the sun and reach great heights, generally between 30 and 50 metres but in exceptional cases as high as 70 metres. Both can also live for hundreds of years.

However, the western white pine's denser, narrower and more symmetrical shape sets it apart from the eastern white pine, known for its wobbly appearance. The western white pine's long, thin cones are a bit wider, and its foliage lasts longer, sometimes up to three years.

The western white pine and eastern white pine share some sad statistics: their populations were long ago devastated by logging. One of the end products of this logging was particularly ephemeral: wooden matches.

◀ The western white pine, also known as the mountain pine, is by definition a species found in the western regions of North America and is rarely cultivated. Nevertheless, it has grown since 1899 in the Dominion Arboretum, where it is doing very well.

▶ The western white pine rarely grows in a pure stand. Its branches grow in regular whorls, at a rate of one row a year, to a length that varies according to the available space. In spring, the male flowers bunched along the lower shoots produce enormous amounts of pollen ready to fly away with the slightest breeze.

English Oak

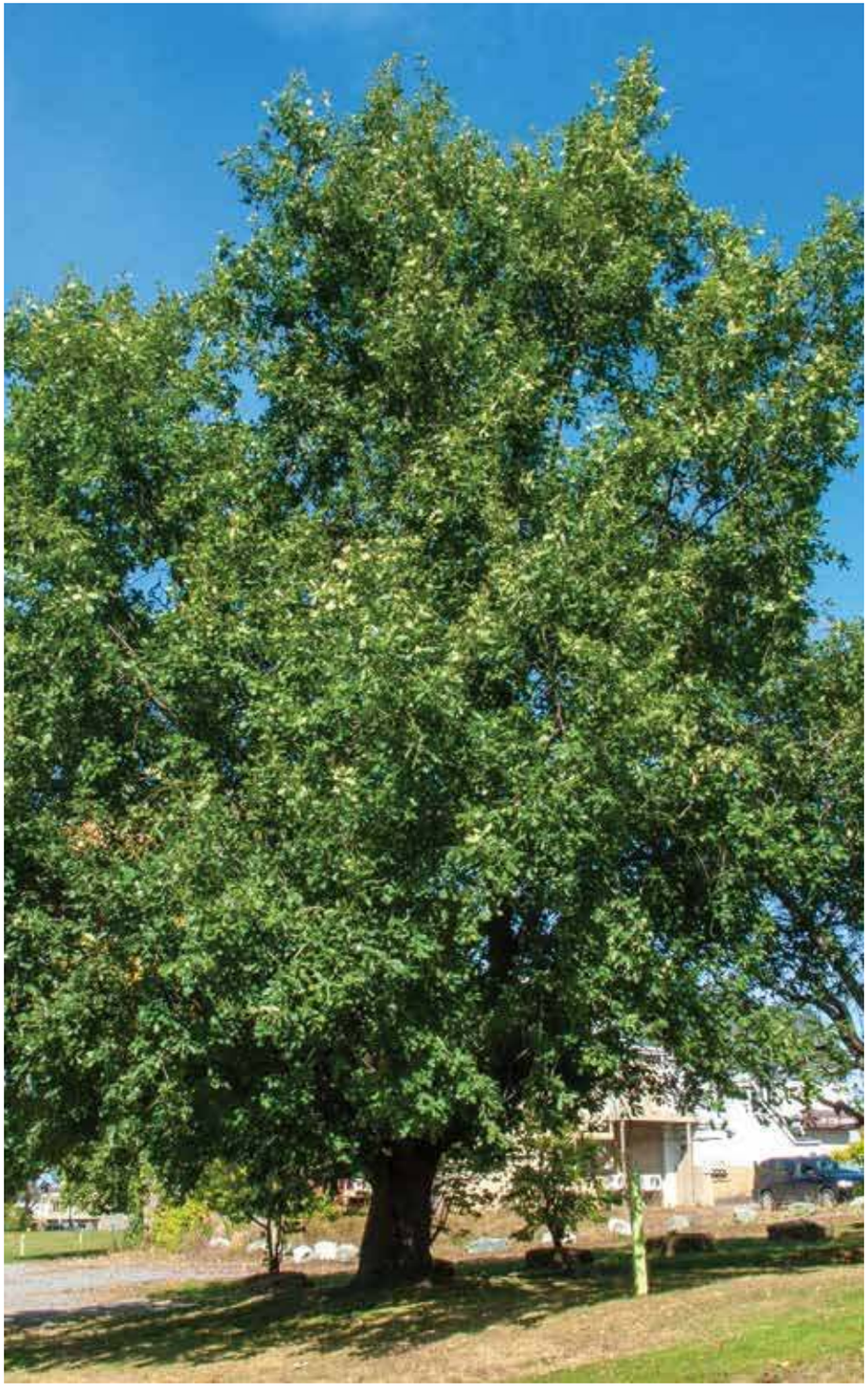
QUERCUS ROBUR LINNAEUS

The scientific name of the English oak, *Quercus robur* (meaning strong, hard oak) speaks to its economic value. Indeed, fine-grained hardwoods have always been prized by the world's shipyards. The species goes by several names, including common oak and European oak. While its distribution extends across most of temperate Europe, western Asia and into the Ural and Volga River regions of Russia, the English did not hesitate to make it their official tree, referring to it as the English oak and Royal oak.

When New England's first settlers noticed white oak trees along the shores of Massachusetts Bay, they were pleased to see a close relative of their English oak, whose wood is renowned for its tight seal and had been used for centuries to build vessels for exploration, the merchant marine and military fleets. English oak trees, which originally covered much of England, had been felled for so long and in such great numbers that a shortage had emerged by the time Elizabeth I had ascended to the throne in the 16th century.

The abundance of English oak in the National Capital Region testifies to Britain's cultural influence on Canadian soil. Wherever the English settled in North America, they planted their national oak. These English oak trees soon spread into the wild and now grow in many regions of Canada.

▸ Specimens of English oak are in good supply at the Central Experimental Farm in Ottawa. This species was first introduced here in 1897. One of the original oaks came from a seedling harvested in Russia, where the tree can grow to the age of 400.



English Oak

QUERCUS ROBUR LINNAEUS

The presence of settlers from England helped introduce the English oak to the Ottawa region, but this species also marked the development of the forestry industry, which took off in the early 1800s. This in turn led to serious difficulties supplying wood to the British. It was around this time that Philemon Wright and his associates set up shop at the Chaudières Falls. A visionary, Wright built a dam to supply his factories with water in 1820 and then a timber slide in 1829. He also invented a system of rafts to haul the squared timbers being exported for the production of planks and boards.

In 1854, a free-trade agreement on raw materials with the United States revitalized this industry. A number of entrepreneurs moved to the region, investing in large sawmills to serve the U.S. market. They also supplied the local housing market, which was overheated by the arrival of workers and their families attracted by the new wood processing plants (to make barrels, doors, windows and furniture) and tool-making factories, as well as food production for logging camps. And that is where Ezra Butler Eddy came onto the scene: after purchasing the Wright businesses, he began production — as he had done in his native Vermont — of matches, washboards and clothespins. His innovative initiatives in pulp (1889) and paper (1890) manufacturing helped build up Hull, which he would later lead as mayor, a city that was one of the mainstays of the paper industry.

◂ There is no confusing the English oak, like this specimen along the Ruisseau-de-la-Brasserie Pathway, with Canada's native northern red oak. The English oak has a crooked, perforated treetop supported by primary branches bent several times over, while the red oak is topped by a globular crown.

▸ It is hard to believe that the tiny female flowers of the English oak (one millimetre) go on to produce strings of hard, heavy acorns. Whether alone or in bunches, these cylindrical acorns always grow on the tip of a long stalk or peduncle — hence the name given to the species in French: *chêne pédonculé*.

Swedish Whitebeam

SORBUS INTERMEDIA (EHRHART) PERSOON

The Swedish whitebeam originated in the forests and pastures of southern Sweden, although small populations are also found in Finland, Estonia and Latvia, where it grows to a height of 20 metres.

It is fitting that this whitebeam is referred to as an intermediate — *intermedia*. It is the product of a presumably natural hybrid between two European species that are distinguished primarily by their foliage: the common whitebeam (*Sorbus aria*) and the rowan (*Sorbus aucuparia*). Swedish whitebeam leaves are uncut on their upper half and covered with pale white hairs on the underside, resembling the leaves of the common whitebeam. But Swedish whitebeam leaves are more and more deeply lobed the closer they get to their base, more like the rowan.

The Swedish whitebeam belongs to the Rosaceae family. Its white flowers are reminiscent of those of the hawthorn, a fellow member of this noble botanical family. Its luminous corymbs of late-May flowers gradually give way, over the course of the summer, to large orange-red berries called pomes. These large, bright clusters of berries, measuring a dozen centimetres in diameter, stand out against the dark green of the foliage. Since the Swedish whitebeam tolerates urban conditions well, it is planted as an ornamental tree in parks and gardens.

◀ The morphological compromise evident in the leaves of the Swedish whitebeam is a good way to identify and distinguish it from its relatives. Be careful: its bright red berries are edible only when mature. That said, they contain vitamin C and citric acid.

▶ This Swedish whitebeam adds a decorative touch to the Brewery Creek walking trail. Its name reveals its Northern European origins and speaks to its great adaptability to Nordic climes.

▲ While the black cherry produces abundant fruit, not all individuals do so consistently. Some trees always have a large yield, while others never produce more than a few. Small bitter cherries go from green to pinkish orange, before turning a dark reddish black, remaining on the tree as late as mid-October.

Black Cherry and Yellow Birch

PRUNUS SEROTINA EHRHART AND *BETULA ALLEGHANIENSIS* BRITTON

A special alchemy seems to have developed in the unique relationship formed here by a black cherry and a yellow birch. Both species, native to northeastern North America, prefer rich, damp soil, such that their distribution areas overlap mainly in the mixed stands of the Great Lakes and St. Lawrence forests. Both monoecious, they produce their male and female flowers in different positions on the same tree. That is where the similarities end.

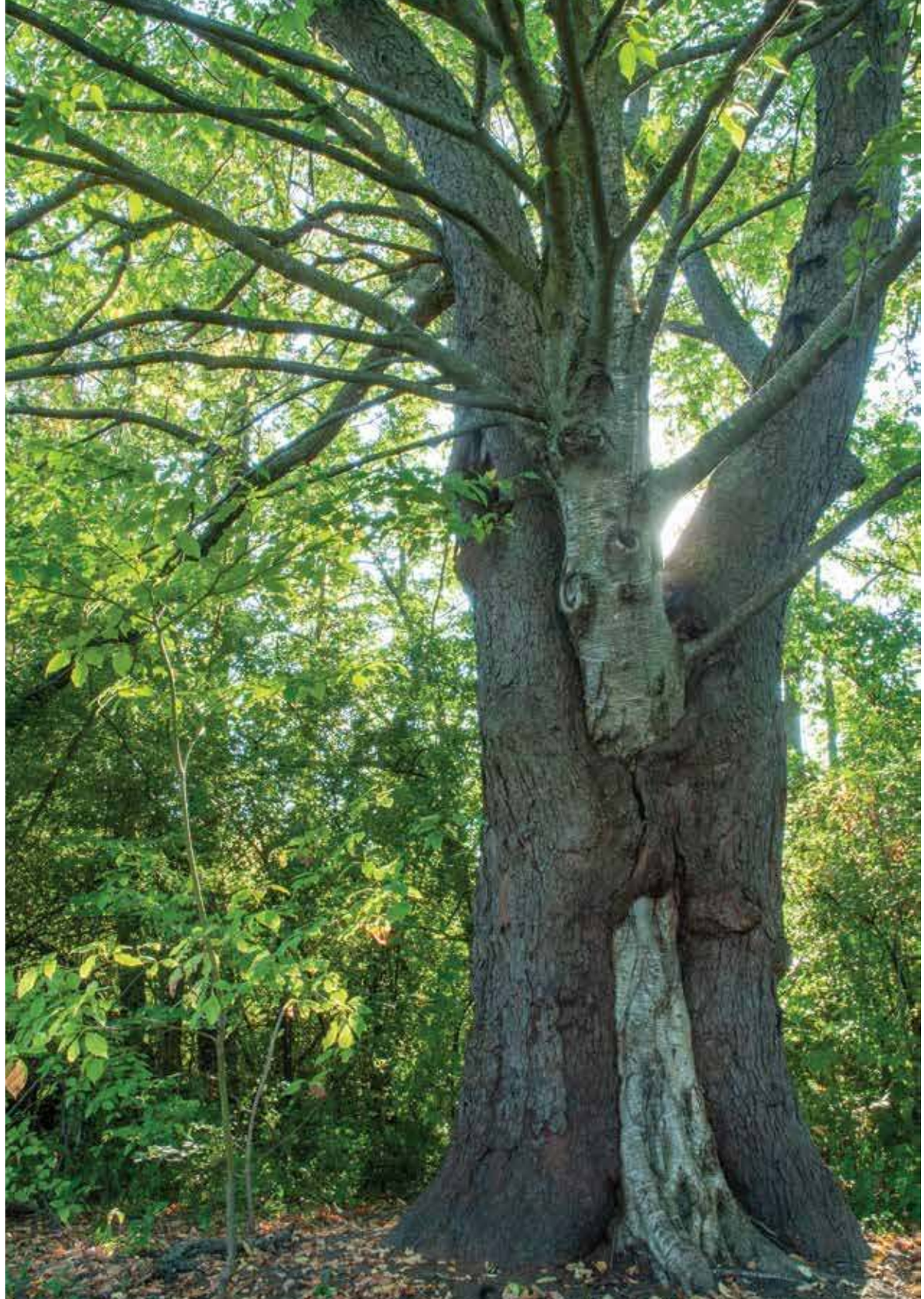
The black cherry is a distinguished tree belonging to the rose family. The Rosaceae botanical family comprises numerous species of trees, shrubs and other well-known perennial fruit plants such as apple, plum and pear trees, as well as raspberry and strawberry bushes. They all produce petalled flowers and fleshy fruits. A native species, the black cherry used to be integrated fairly often into certain orchards for its fruit clusters, whose dark purple flesh is so juicy that it surpasses that of all the other wild or horticultural species of cherry trees combined. In silviculture, it is generally considered to be a valuable companion species.

The yellow birch is a dominant species of the Betulaceae family. Its many qualities contributed to it being named Quebec's official tree in 1993. In addition to its aromatic properties, it manages to grow in some of the most seemingly impossible conditions: extreme temperature variations, wide variety of soil depths and moisture levels, fairly closed canopies and various degrees of incline.

The two trees are distinguished by their fruit. The black cherry produces drupes, while the yellow birch, beginning at age 15, produces countless tiny, light bi-winged fruits that are called nuculae. Carried by the winds, these nuculae nest in any crevices they land in and germinate on the spot. And so it was that 30 years ago, a birch nucula circling in the wind landed within the intertwined cracks of the raised scaly cherry tree bark, and there, it found the dampness it needed to germinate.

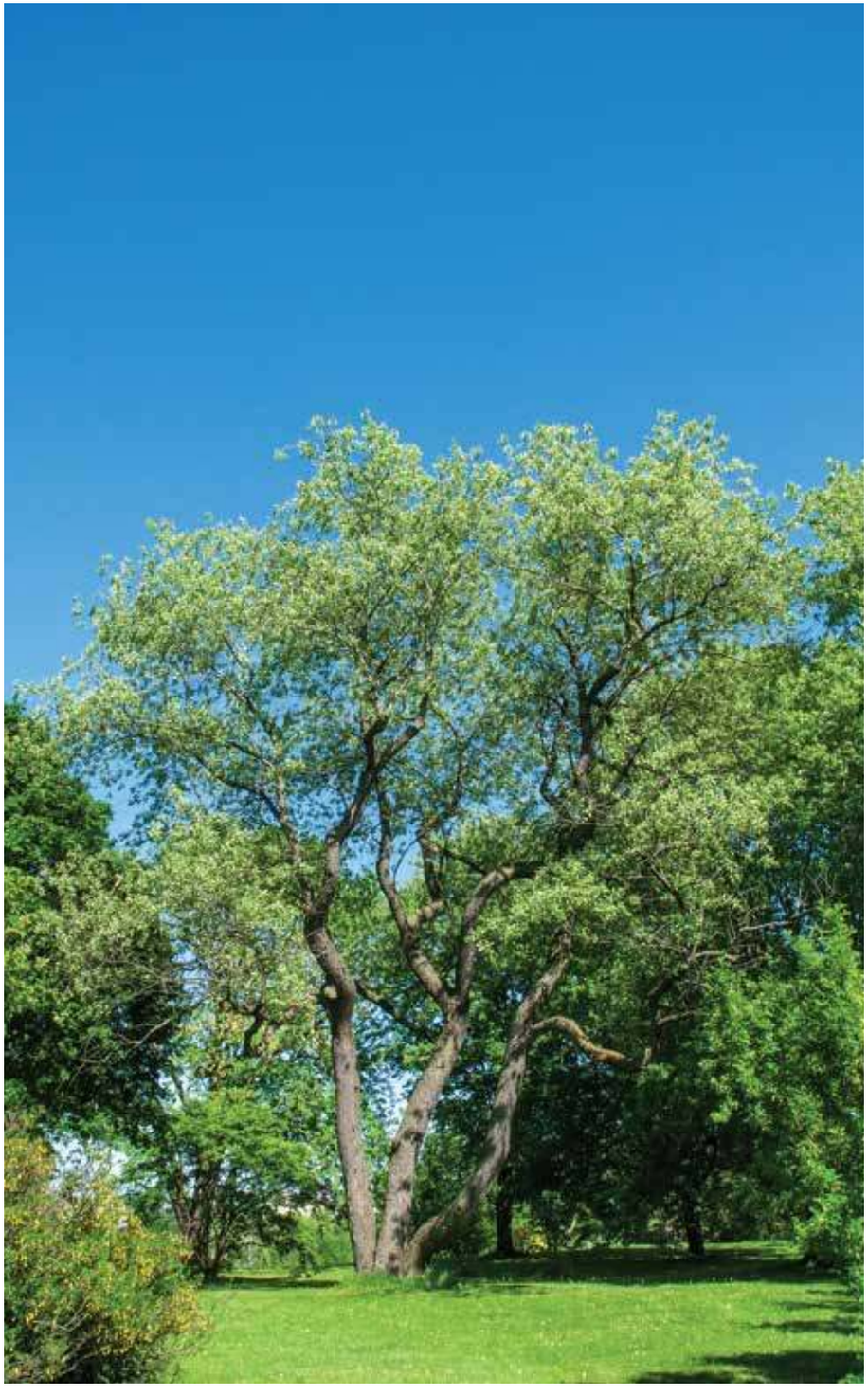
After 30 years of living together, these two symbiotic trees have not only melded into one another but are sometimes mistaken for one other. Within the old aromatic bark of the black cherry, in the midst of its dark reddish brown and fairly broken scales, is a lighter-coloured plate with matte golden yellow curved edges marked by sharp horizontal lines, like dashes. These are the lenticels responsible for the gaseous exchanges between the black cherry's internal tissues (beneath the bark) and the ambient air. This plate looks like parts of the bronze-yellow aromatic bark of the yellow birch, which bring out the transversal lines of the lenticels before breaking off and curling into themselves.

Today, this tree duo, in which the cherry tree seems to be embracing the birch, is not only strange but is also part of the history of the Moore Farm Estate, on the site of Britannia Farm, which was developed by Philemon Wright on land he had acquired in 1824, over 20 years after founding the village of Wright's Town. His son Ruggles lived there from 1825 to 1863, and then Ruggles Jr. from 1863 to 1872. Like the Wright family, who were Protestants, the other settler families cherished the black cherry and grew it on their farms, around their chapels and at their places of worship.



▲ The bark on the trunk of the black cherry, which contains prussic acid, was one of the therapeutic tools used by First Nations peoples when Europeans first arrived. In the case of the yellow birch, it was the root bark they used to heal certain diseases.

◀ This black cherry and yellow birch have been cohabitating for upwards of 30 years on the Moore Farm estate, ever since a birch seedling started growing inside the black cherry tree. While both species can reach a height of 30 metres, they differ greatly in terms of longevity.



Black Cherry

PRUNUS SEROTINA EHRHART

A real chameleon, the black cherry can grow in forests bunched together with other slender individuals, where it can reach its maximum height of 30 metres, with a third of its trunk branchless. The black cherry can also grow in open areas, along field edges, in which case it adopts a more stunted appearance, with a short, gnarled trunk. The imposing "trident" specimen on display at the Dominion Arboretum seems to belong to an intermediate form of black cherry.

Scent is another of the black cherry's characteristic traits: when its drooping branchlets with its long clusters of flowers break, they emit a strong odour. Its crumbly-looking bark, divided into angular scales with a reddish-brown underside, is also aromatic. Every part of the black cherry tree, including its leaves, contains hydrogen cyanide, which has sharp odour similar to that of bitter almonds — whose species also belongs to the genus *Prunus*. The black cherry's thick, leathery lance-shaped leaves have curved, finely toothed margins, and their sharply curved edges look like a bird's beak. The petiole is adorned with red glands at the base of the blade, as is often seen with both cultivated cherry trees and wild species of *Prunus*. Black cherry leaves have a glossy dark-green surface. Their paler, smoother underside is criss-crossed with a prominent midrib whose lower third is lined on both sides with a strip of white or light orange hairs.

◂ This picturesque, fork-shaped black cherry is a reminder of how long this species has been grown in Ottawa's Dominion Arboretum. Of all the species of this botanical genus found in Canada, the black cherry is the most impressive and the only one that grows to become a tree.

▸ When the black cherry's leaves are fully developed, the dense, long clusters of bisexual flowers point to the tip of the new shoots.

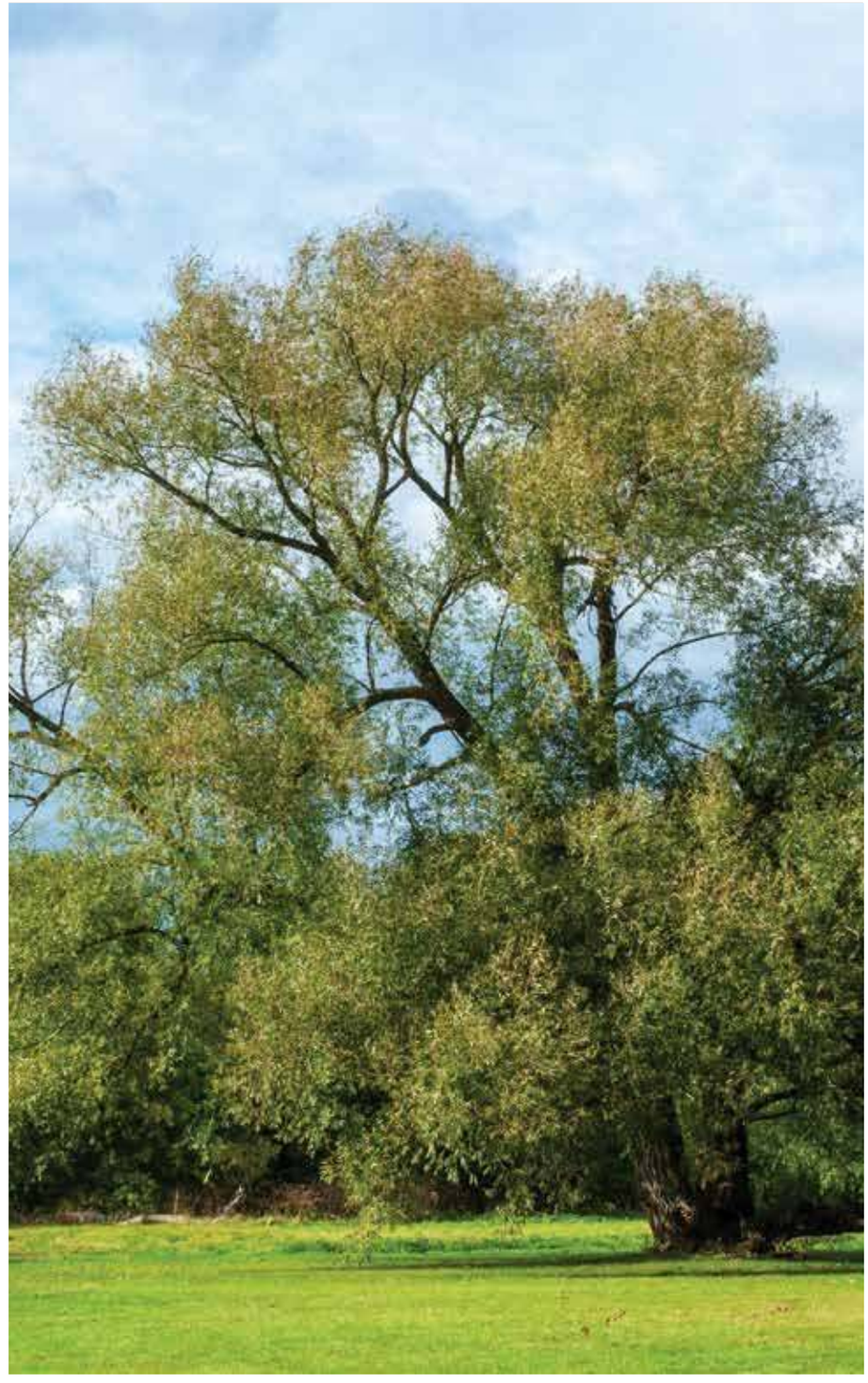
Hybrid White Willow

SALIX X *FRAGILIS* LINNAEUS

Nordic Circle Park, where this fragile willow hybrid was planted over a century ago, has known many ups and downs over the course of its history. Originally, it was part of a farm founded in 1812 by Braddish Billings. The first name given to the bridge built in 1830 along Bank Street, Farmers Bridge, speaks to the farming activities in this part of Gloucester township. Eventually it became known as Billings Bridge.

As settlers gradually moved onto the land around the bridge, a small community sprung up, including friends and members of the Billings family. In 1823, a sawmill was powered by the creek, which to this day is still named Sawmill Creek. The village grew in step with the development of the city of Bytown and the Rideau Canal beginning in 1826. Unfortunately, the village was soon known for the nearby ice jams on the Rideau River and the floods that left Bowesville Road impassable. Billings Bridge was washed out and rebuilt twice, in 1847 and 1862, before being rebuilt in its current form in 1915. Just before the First World War, merchants, industrialists and their families moved into the village, even though the risk of springtime flooding was still high. It was around then that this fragile willow hybrid, unafraid of water, chose to make its appearance!

This fragile willow hybrid, which bends but doesn't break, is one of the rare non-native species that can take on spring floods. Its relative, the white willow, whose "weeping" variety is grown to this day, prefers damp and even wet soil.



If only it could talk, oh, the many tragic tales it could tell! Half standing, half crouching, this tree grows in the centre of a small plot of land jutting out, like a peninsula, in the Rideau River. Before becoming the park that it is today, this land had a rich history.

Eastern White Pine

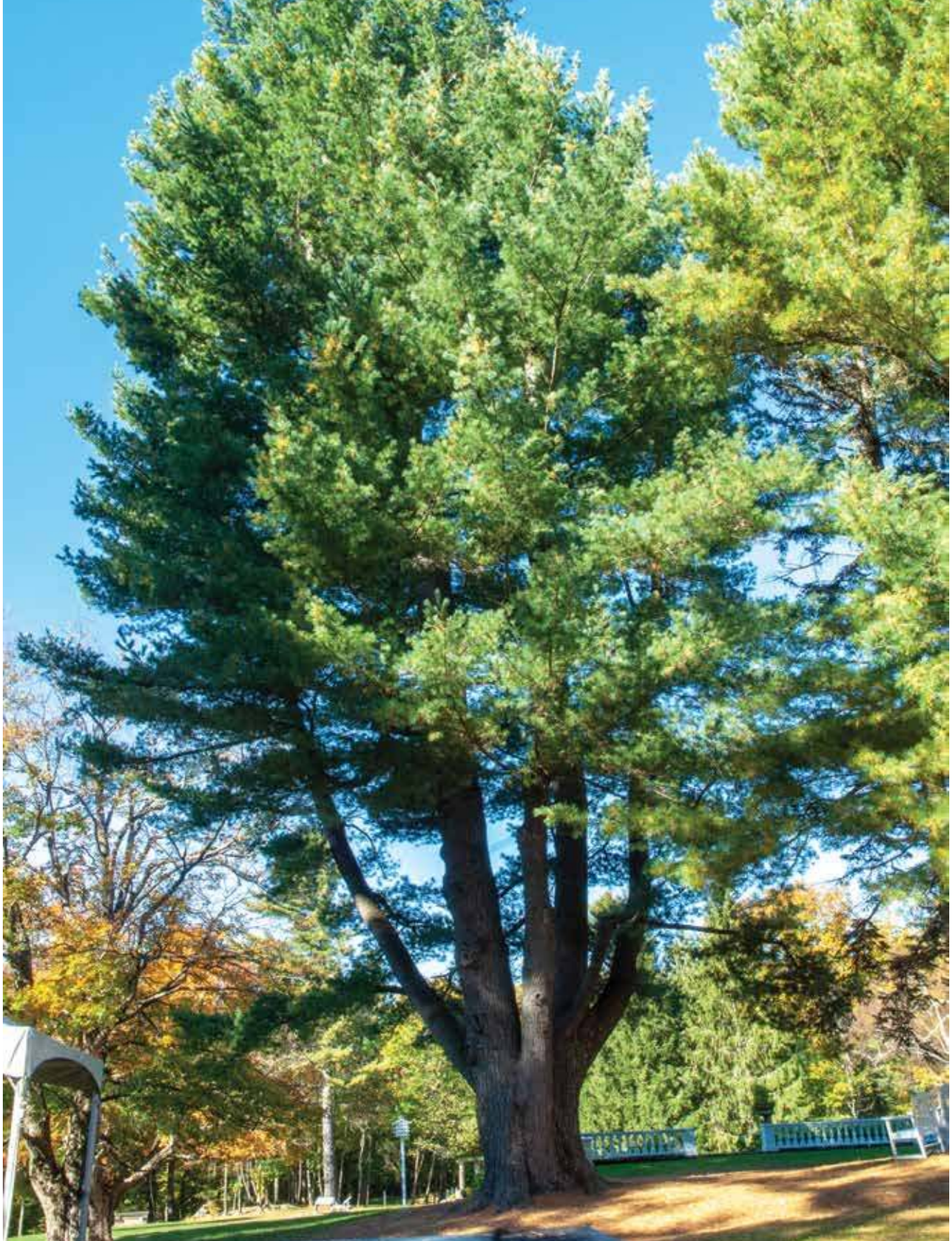
PINUS STROBUS LINNAEUS
SHINGWAK (ANISHINAABEMOWIN NAME)

The forests of the Gatineau Hills were logged intensively from 1824 to 1904, the peak activity occurring between 1857 and 1868 and then again between 1880 and 1889. In 1901, near the end of this golden age of the wood trade, William Lyon Mackenzie King, future prime minister of Canada, began work on his Kingsmere estate in these hills. He would spend time there until his death in 1950, surrounded by the tall eastern white pines that he loved.

On December 29, 1921, when first elected prime minister, Mackenzie King was already well aware of his country's forest history. Discussions had been ongoing since the early part of the century about the need to save Ontario forests and to bring a halt to irresponsible logging and land-clearing practices for settlements. Although entire forests had been wasted and sand deserts created, there had been little action to protect this fragile natural resource, apart from the introduction between 1908 and 1930 of unpopular woodland management programs aimed at farmers. This question troubled King for decades. That is why, just before returning to power for his third and final term (1935–1948), King became honorary president of the Federal Woodlands Preservation League, which had been created to combat the irresponsible logging practices on private woodlands that had spiked during the Depression. Private woodland owners were selling their lumber for a pittance, leaving large swaths of the Gatineau Hills entirely barren. Fiercely determined to halt this massacre, King fought for a Gatineau conservation park, justifying the spending required to create the park, promote its development and support its reforestation.

In 1929, King had taken the initial steps to acquire stonework to place among the large eastern white pines on his Kingsmere estate, as was the style in North American gardens at the turn of the 20th century. By the time work had begun on developing Gatineau Park in 1934, he had already collected stone structures from recovered material, which he placed to look like ruins in the white pine stand on his estate. Over the years, these cleverly "recycled" materials came from diverse places: pieces from the first Canadian Parliament building, which was destroyed by fire in 1916; portions of a decorative wall erected along Bank Street, which had a gate to allow access to the Lovers' Walk behind the Parliament building but was demolished at the start of the Second World War; and stones taken from the debris of London's Westminster Palace, which had been damaged by German bombs in 1941.

In 1934, King had the chief forester for Quebec assess the health of his eastern white pines, which he suspected were vulnerable to the blister rust fungal disease affecting white pines. He took advantage of the forester's visit to learn about a reforestation program set up by the Quebec government, and in 1935 he had 1,000 trees planted on his Kingsmere estate.



▲ Throughout his life, Prime Minister Mackenzie King never stopped fighting for tree conservation. In 1950, he bequeathed his entire 240-hectare (nearly 600-acre) estate to the people of Canada. Today, this estate is a popular destination in Gatineau Park.

◀ The creation of Gatineau Park put an end to 80 long years of intensive logging of the eastern white pine. Today the oldest remaining eastern white pine in the park dates back over 200 years. This motley shaped tree has a pentagonal fern growing out of its hollow.

Sugar Maple

ACER SACCHARUM MARSHALL
SIZIBAKWADO-ININATIG (ANISHINAABEMOWIN NAME)

Beaver Rock depicts an animal that holds symbolic value for First Nations peoples and that is represented on Canada's nickel as designed in 1937 by G.E. Kruger Gray. The elegant sugar maple strategically planted alongside it was probably one of the thousand trees received by William Lyon Mackenzie King in May 1935 from the Berthierville provincial forest as part of a reforestation program put in place by the Quebec government. At the time, King had pledged to have at least 1,000 trees planted per acre per year. To achieve this, he ordered 200 hard maples (that is, sugar maples), 400 white spruce, 100 red pine, 50 eastern white cedar (*Thuya occidentalis*), 25 European larch, 25 Engelmann spruce, 25 mountain pine, 100 American elm, 100 white oak — thought, in fact, to be bur oak — and 25 mountain ash.

King's love of trees was boundless. He often likened them to dear friends, and it pleased him to no end to enrich his estate forest with these donations from Quebec. He oversaw their planting, receiving advice from Alexander "Sandy" Stewart, superintendent of the Federal District Commission. He also saw to it that flag poles were erected on his property. His passion for the preservation of natural biological heritage makes him one the pioneers of environmentalism in the National Capital Region.

◂ This sugar maple, resting on a rock, can be found at the Mackenzie King Estate, near the beaver rock belonging to the collection of "ruins" fashioned from stonework recovered by the former prime minister for his Gatineau Hills estate.

White Spruce

PICEA GLAUCA (MOENCH) VOSS
MINAHIG (ANISHINAABEMOWIN NAME)

It is hard to talk about the white spruce without comparing it to the black spruce. Commonly found in Canadian soil, both are large conifers with drooping branches. Their general appearances, however, are distinctive. While the black spruce has a narrow bearing topped with a denser crown, the white spruce is cone-shaped with a terminal leader that lends it a graceful bearing. The northern boundary of their range is more or less the same, except that, at that latitude, the white spruce grows upright, while the black spruce is stunted.

In some cases, the white spruce forms pure stands, particularly on abandoned farmland, but it is generally found mixed in with other species of hardwoods and conifers. Since it does not fare well with de-icing salt, it is more of a rural species than an urban one. This makes it ideal for Gatineau Park, which was logged extensively over 150 years ago before being gradually transformed into a protected natural habitat.

The species was named after its white wood, which consists of cream-coloured sapwood with a yellowy core. It is a fine-grained light wood, resistant and elastic, that shipbuilders used to make masts and long beams. The resin from this spruce, which exudes from knots and wounds, was used by Indigenous peoples to seal birchbark canoes, after they heated it to purify it.

This elegant white spruce, planted in a strategic location on the Mackenzie King Estate, is one of the 1,000 trees received from the Berthierville provincial forest over 80 years ago and carefully preserved in Gatineau Park.

Conifers are considered to have evergreen foliage, although species like the larch and others lose all their needles each year or have needles of varying longevity. Spruce needles last for seven to 10 years. When they do fall off, it is almost imperceptible, because they do not all fall at the same time.

White Spruce

Picea glauca (Moench) Voss
MINAHIG (Anishinaabemowin name)

There is no better way to illustrate the importance of logging to the development of the Capital than to discuss its influence internationally and the global demand for the wood from native trees. Let us go back in time to the Paris of 1855. Between two world's fairs, the City of Light was organizing an exhibition of agricultural and industrial products, including Canadian items. To select the specimens to be exhibited, the organizers first reviewed the list of those sent to the 1851 World's Fair in London. Among the native tree products selected for exhibition, there were of course the noble hardwoods like the black walnut and sugar maple, whose commercial value was indisputable, but there was also a range of species providing wood for a wide variety of uses. Visitors were invited to compare planks from 64 varieties of species.

This information comes from the *Catalogue raisonné des produits canadiens exposés à Paris en 1855* by Joseph-Charles Taché and Thomas Sterry Hunt. The authors compiled a comprehensive inventory of the Canadian products at the fair, along with their uses and prices. As for white spruce, the catalogue says its wood is cheaper than pine wood, the main export of the day, and that it has the same uses, but only if pine is unavailable. It goes on to say that pine, fir and spruce gums, along with spruce oils, are valuable exports used to make varnish and herbal preparations.

◀ This white spruce is found among the rows of conifers planted on both sides of a road that used to lead to a house that has since disappeared. The rows include mature specimens of diverse species that were likely planted for reforestation purposes, like the white spruce, the Norway spruce and the eastern white pine.

▶ Shortly after being fertilized, the female cones of the white spruce gradually lose the bright purple colouring of the flower conelets. In natural forests, most of the cones fall in the same year, after the seeds have dispersed, but sometimes some of the cones last longer than a year.

Jack Pine

PINUS BANKSIANA LAMBERT
OKIKENS (ANISHINAABEMOWIN NAME)

The jack pine, a conifer from the Canadian boreal forest, grows between the Atlantic Ocean and the Rocky Mountains, with its natural distribution extending right up to the northern tree line in both Quebec and Ontario. Its genus, *banksiana*, was named after Joseph Banks (1743–1820), an English naturalist who took part in James Cook's first scientific expedition around the world and travelled to Canada a number of times.

It is remarkable that a jack pine can live to be 100 when its species, the most northern of the eastern North American pines, normally barely reaches 70 years of age in the wild. Presenting a haughty appearance, the remarkable jack pine of the Dominion Arboretum is clearly well cared for. It cuts a different figure from that of the wild jack pines that grow pretty much anywhere (except in water), even in places where there is practically no soil. Indeed, jack pines growing in nature are usually gnarled, sickly looking or stunted, seemingly suffering from malnutrition — characteristics that become more pronounced the harsher the conditions.

The same phenomenon applies to the Swiss stone pine, native to Europe. In the wild, it grows in harsh mountainous conditions, which lend it a wobbly, tormented appearance. But when it is grown with even the slightest bit of care, it develops an elegant silhouette. The jack pine and Swiss stone pine were likely planted at the Dominion Arboretum to assess their potential as ornamental trees or for use in reforestation.

▸ This jack pine specimen was planted in 1921 at Ottawa's Dominion Arboretum. But a century is nothing compared with how old some European pines can get, such as the Scots pine, which can live to the ripe old age of 600, or even 1,000.

◂ British explorer Joseph Banks lent his name to a wide variety of plants, thanks to a network of associates who provided him with information and plant specimens. This is how he was able to produce and publish a compilation of the names and uses of North American plants.

Jack Pine

Pinus banksiana Lambert
OKIKENS (Anishinaabemowin name)

Stony Swamp was protected to help create the Greenbelt. Proposed to the Federal District Commission in 1950 by French urban designer Jacques Gréber, the creation of this "emerald necklace" (as Gréber liked to call it) was aimed at preserving the Capital's natural environment by structuring urban growth while protecting spaces for farming or parkland. Lying southwest of the city, the Stony Swamp area is criss-crossed with some 40 km of trails that allow visitors to discover the most ecologically diverse protected area in the entire Ottawa Valley.

Old Quarry Trail is a living testament to the jack pine and white spruce trees planted along it in the 1960s and 1970s with a view to accelerating the natural regeneration of the original forest on dried-out land impoverished by farming. Thanks to the densification of the tree population, in particular the jack pine (planted here as a pioneer species), the forest cover gradually became thicker, the soil gradually became better at retaining rainwater, and the mass of organic matter became increasingly more abundant. Little by little, the area has come back to life. Species that used to flourish in this part of the country, such as the American beech, will eventually regain a foothold here.

◂ The current natural distribution area of jack pines like this one corresponds to the location of the immense ice cap that once covered the North American continent. The species had taken refuge both east and west of the northern portion of the Appalachians and, quite possibly, along an ice-free coastal stretch of the Atlantic.

Red Pine

PINUS RESINOSA AITON
PAKWANAGEMAG (ANISHINAABEMOWIN NAME)

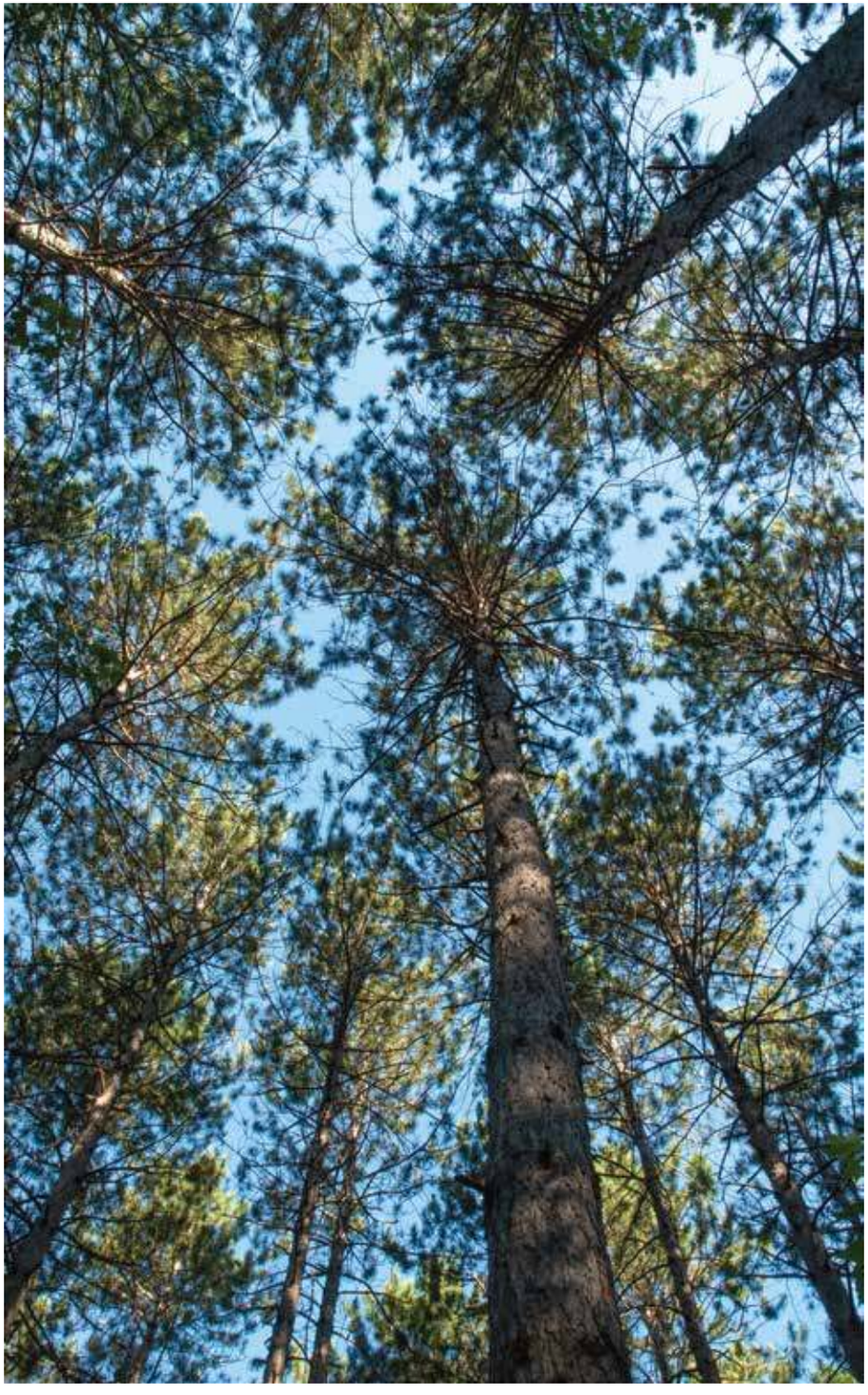
One of the species of choice of the National Capital Commission and its predecessors, the red pine was used for planting and reforestation purposes in Gatineau Park. And with good reason: this conifer does well in dry, sandy soil, in infertile soil on abandoned farmland, and in soil depleted by forest fires or human activity such as logging. When many plots of land were annexed to the park starting in 1938, they possessed these characteristics.

The red pine was tailor-made for the task at hand. It needs full sunlight and is commonly chosen for its ability to grow in exposed areas and to withstand the strongest of winds thanks to the strength of its root system, which can extend a dozen metres around its trunk and up to four metres beneath the ground.

Queen of the northern shore of the Great Lakes, the red pine was the species of choice for reforestation in Ottawa area, which belongs to the Great Lakes and St. Lawrence forest system. This vast forest transitions from conifers to hardwoods and includes characteristic species such as the eastern white pine (the red pine's companion species since time immemorial), eastern hemlock, yellow birch, sugar maple, red maple and basswood.

▸ The red pine has been grown for experimental purposes in Canada's Capital region for over a century, with the first specimens planted in the arboretum of Ottawa's Central Experimental Farm in 1889. The oldest living specimen dates back to 1895.

◂ By late May, the red pine is in full bloom: immature cones of male flowers clump together at the base of the new shoots formed by its young, still-sheathed needles. Atop these annual shoots, two or three glittering conelets of female flowers reach out to the sun.



Red Pine

PINUS RESINOSA AITON
PAKWANAGEMAG (ANISHINAABEMOWIN NAME)

It is no wonder that the red pine was enlisted to help restore Pinhey Forest, since it is the region's fastest-growing pine. Some red pines grow in pure stands, while others latch onto other sun-thirsty species like the large-toothed aspen, trembling aspen and jack pine. These trees offer shade, cool the soil and produce litter that decomposes, retains dampness and returns nutrients to the soil. This has the effect of restoring the soil, the first step in restoring the forest as a whole.

Pinhey Forest's red pine specimens speak to the wisdom of planting this species. This forest was planned and carried out in the 1950s and 1960s to reforest an area that had been left a sandy, windswept desert. Planted to kick off the restoration process, this stand of red pine was among the many demonstration forests of the Eastern Ontario Model Forest network, which the National Capital Commission joined in 1992.

On this site donated by the Pinhey family, the shallow, bowl-shaped depressions left by years of farming the sandy land are still visible. Depleted of organic materials, subjected to extreme drought and bereft of any stabilizing vegetation, the windswept soil had turned into dunes.

◂ The ruffled tops and tall straight trunks of a dense stand of these Pinhey Forest red pines — which, over time, have been stripped of their dead branches three-quarters of the way up — are best appreciated from a low angle.

Barges to transport wood, Ottawa, Ontario, 1872, photograph, gelatin dry plate, William Notman & Son, pre-1935.

Source: © McCord Museum, 1-78911.01

Creation of the Central Experimental Farm and Scientific Research

One of the most ambitious projects ushered in by the birth of Confederation consisted of planning and creating the Dominion network of experimental farms in March 1867. The driving force behind the project, Sir John Carling (1828–1911), was a businessperson and politician from London Township in Upper Canada. Born and raised on the family farm, Carling moved at age 11 to London, Ontario. Shortly thereafter, in 1843, his father founded a brewery that made beer according to a recipe from his native Yorkshire. Carling's father passed along the thriving company to him and his brother William in 1849. The W & J Carling Co. was John's first major commercial undertaking and would become the lynchpin of his financial and political success.

◂ Dominion Arboretum of Ottawa. Aerial photograph taken circa 1938, from 1950 Gréber Plan.

Source: NCC, Gréber Collection

John Carling promoted agriculture throughout his career. As commissioner of Agriculture and Public Works in the government of John Sandfield Macdonald, Ontario's first premier (1867–1871), Carling obtained funding to create an agricultural college and an experimental farm in Guelph. He also supported the Fruit Growers' Association, headquartered in the Niagara region. William Saunders was an esteemed member of this association. A pharmacist with a passion for farming and a science author, Saunders also lived in London (after moving there at age 19) and would become Carling's close associate.

Having been named federal agriculture minister in John A. Macdonald's cabinet (1885–1892), Carling was convinced that science could drive the growth of Canadian farming and accelerate the development of the Northwest. So, he created a national network of experimental farms whose flagship operation was in Ottawa. To put this network in place, John Carling enlisted the aid of William Saunders, a chemist and pharmacist by trade, but a botanist and fruit farmer at heart.

Saunders had been a member of the Ontario Agricultural Commission from 1880 to 1881. He was interested in plant disease and had studied entomology to learn more about insect pests. He was thus the ideal choice to head up the national network of experimental farms dedicated to research. Primary uses of the farms included field trials of various crops and various forms of insect and disease control, experimentation with various types of breeding and modes of dairy production, and the design of cutting-edge agricultural machinery. The farms also had a mission to disseminate their results and recommendations.

▲ Driveway through the Central Experimental Farm, Ottawa, Ontario, photograph from Gréber Plan, 1950.

Source: NCC, Gréber Collection

As the network was being set up, Saunders moved to Ottawa in 1887 with his wife, Sarah Agnes Robinson, who shared her husband's passion for botany. Accompanying them on their move were two of their six children, Annie Louisa and Frederick Albert. The two eldest sons, William Edwin and Henry Scholey, stayed on in London to run the family pharmaceutical business, while Charles Edward and Arthur Percy attended the University of Toronto.

In addition to the Central Experimental Farm in Ottawa, four other regional farms were created in the network's first years: in Nappan, Nova Scotia, in Brandon, Manitoba, in Indian Head, Saskatchewan, and in Agassiz, British Columbia. Under the direction of Sydney Arthur Fisher, Minister of Agriculture from 1896 to 1911, seven other experimental farms were founded in locations ranging from northern Alberta to Prince Edward Island.

By the early 1900s, the staff of the Canadian network of experimental farms were answering 70,000 letters a year from the country's farmers in search of practical tips.

Rocky Mountain Douglas-fir

Pseudotsuga menziesii var. *glauca* (Beissner) Franco

Like their fellow gymnosperms, conifers trace their origins back to the Carboniferous period 350 million years ago, preceding deciduous trees in the planet's evolutionary history. Despite the decline in their number of species since that geological period, coniferous trees and shrubs are considered one of the success stories of the plant world, because apart from some benign adaptations, they survived not only geological disruptions and extreme climates but also relentless competition from angiosperms (flowering plants). These survivors, numbering just over 600 species worldwide, have persevered on every continent, from low to high altitudes.

In 1856, the Rocky Mountain Douglas-fir was discovered in the Las Cruces Mountain drylands of New Mexico by Benedikt Roezl, an explorer, botanist and horticulturalist born in Bohemia. Roezl's claim to fame had been his collections of orchids, among the most remarkable of his day. Over the period spanning the tree's discovery, its rediscovery in Colorado in 1862, its introduction in Europe in 1876 and its widespread planting in North America, the hardy Rocky Mountain Douglas-fir quickly won the hearts of horticulturalists the world over.

The Rocky Mountain Douglas-fir was among the first species to be grown on the Central Experimental Farm, where it was studied for its hardiness. Beginning in 1889, it was planted individually, and five years later in hedges.

◀ Accompanied by a yellow-leaf dogwood, this Rocky Mountain Douglas-fir in the Dominion Arboretum is a historically significant specimen: it was studied for its hardiness in the Central Experimental Farm's infancy, when it was not yet known that Ottawa was the world's second coldest capital.

▶ The cones of the Rocky Mountain Douglas-fir are made of broad rounded scales with distinctive trident-like recurved bracts. While the long pollen cones may vary from yellow to orange-red, the smaller seed cones are yellowish to purplish brown, and shed their seeds from fall through to the next summer.

Rocky Mountain Douglas-fir

Pseudotsuga menziesii var. *glauca* (Beissner) Franco

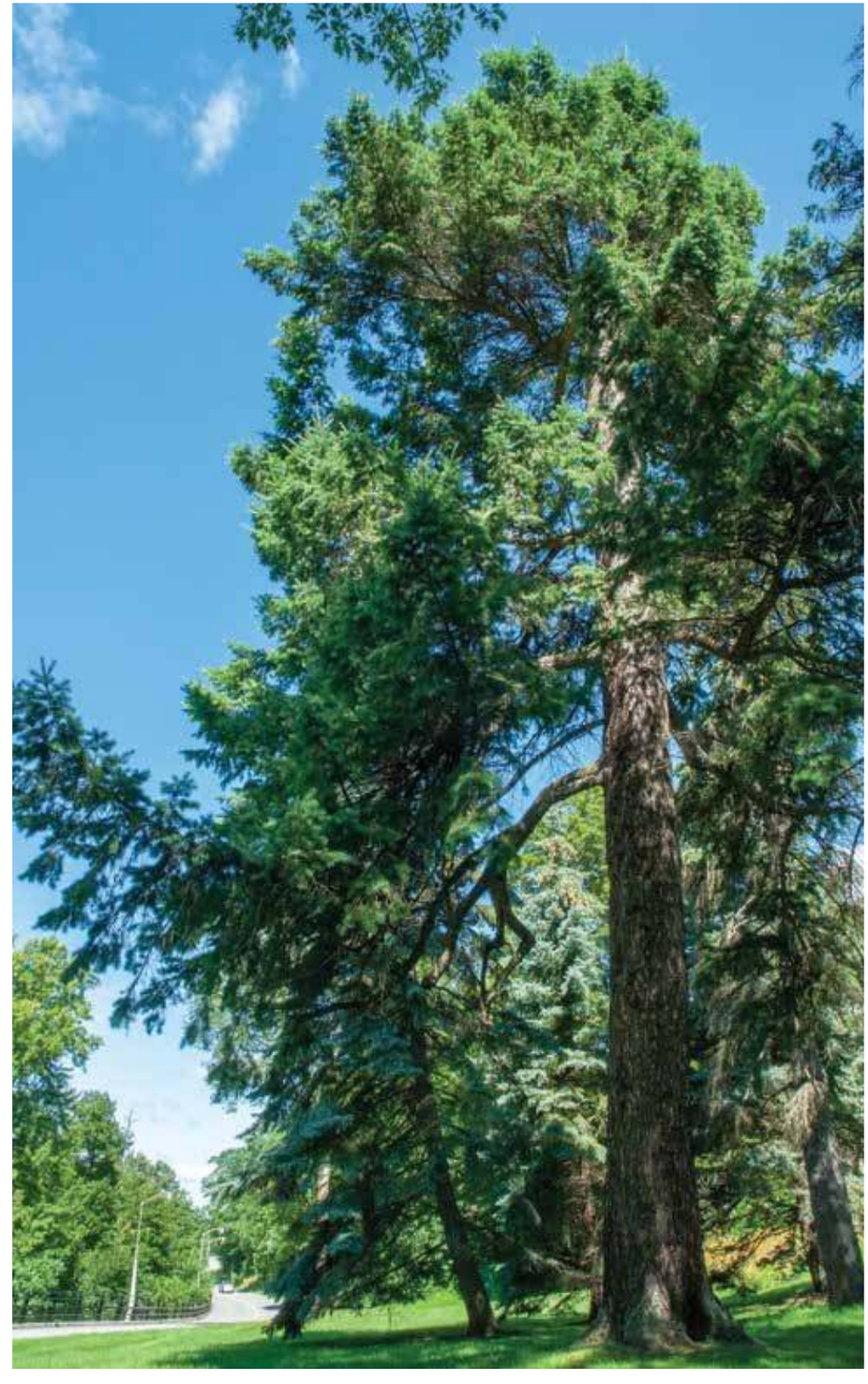
The Rocky Mountain Douglas-fir's arrival at Ottawa's Central Experimental Farm was no random event. The farm's first director, William Saunders, along with William Terrill Macoun, then head of the Horticulture Division, adored this majestic tree. As original members of the Ottawa Improvement Commission, founded in 1899 by Sir Wilfrid Laurier, they encouraged the planting of the Rocky Mountain Douglas-fir in the Rockcliffe park sector, as well as along Ottawa's first scenic drive, the Driveway, now known as the Queen Elizabeth Driveway.

According to the development plan designed by Saunders, who combined erudition with a love of the arts, all the trees that were to be planted — be it in the Arboretum, east of Prescott Highway (now Prince of Wales Drive) or on the grounds of the Experimental Farm itself, to the west — were intended for trials to study not only their hardiness but also their ornamental value. His concern was that the trees, shrubs and other herbaceous plants should not only perform well amid the growth of the Ottawa region but also beautify the region. That is why he conducted extensive research into the species, varieties and cultivars most likely to meet his objectives.

With the Rocky Mountain Douglas-fir, he could count on its excellent adaptability, on the fact that it grows as high as 40 metres and for as long as 300 years, and on the ornamental beauty of its greenish-blue needles.

While admiring this Rocky Mountain Douglas-fir along the Sir George-Étienne Cartier Parkway for its graceful and distinctive bearing, recall that 19th-century connoisseurs found this rare species to be a delight for the senses.

Although Rocky Mountain Douglas-firs manage to squeeze every last bit of nutrition from impoverished soil and as much energy as possible from the light of Canada's frigid winters, it takes know-how to grow and maintain them.



Norway Spruce

PICEA ABIES (LINNAEUS) KARSTEN

Known in Europe as the common spruce, this tree was christened Norway spruce in the New World. This fast-growing introduced species can adapt to all manner of environments. That is why numerous varieties of this spruce, differing widely in both appearance and uses, have been documented for the past five centuries. In the Dominion Arboretum, it has been grown since the late 19th century in the form of dwarf or ornamental weeping cultivars, as well as for use as shelterbelts that are now over a century old. The eye-pleasing, two-trunk specimen in the north end of the Central Experimental Farm is the remnant of a long-since abandoned experimental hedge. Left to grow on its own, this individual has been able to gradually regain its natural form, with its orange-brown boughs drooping down and brushing lightly against the trunk.

◂ The Norway spruce has a lifespan of 400 to 700 years, but thanks to its extraordinary ability to clone itself naturally, i.e., to produce new shoots from the roots of the mother plant, it can potentially regenerate itself for millennia.

Norway Spruce *reginæ Amelia*

PICEA ABIES (LINNAEUS) KARSTEN

In 1909, when Albert Henry George Grey was governor general, a Norway spruce was planted in the Arboretum and dedicated to Princess Amélie of Orléans, the last Queen consort of Portugal. Her name was given to this specimen, *reginæ Amelia*, which has never officially obtained the status of cultivar. No doubt the aim had been to mark the tragic events surrounding the Lisbon regicide, in which her husband, King Carlos I, and her son, Luís Filipe, perished on February 1, 1908.

◂ Norway spruce cones are a feast for the eyes. Male conelets go from purplish to yellowish during pollination. Female conelets start out as fleshy crimson red, turn green after fertilization and then turn shiny brown as they lignify.

European Larch

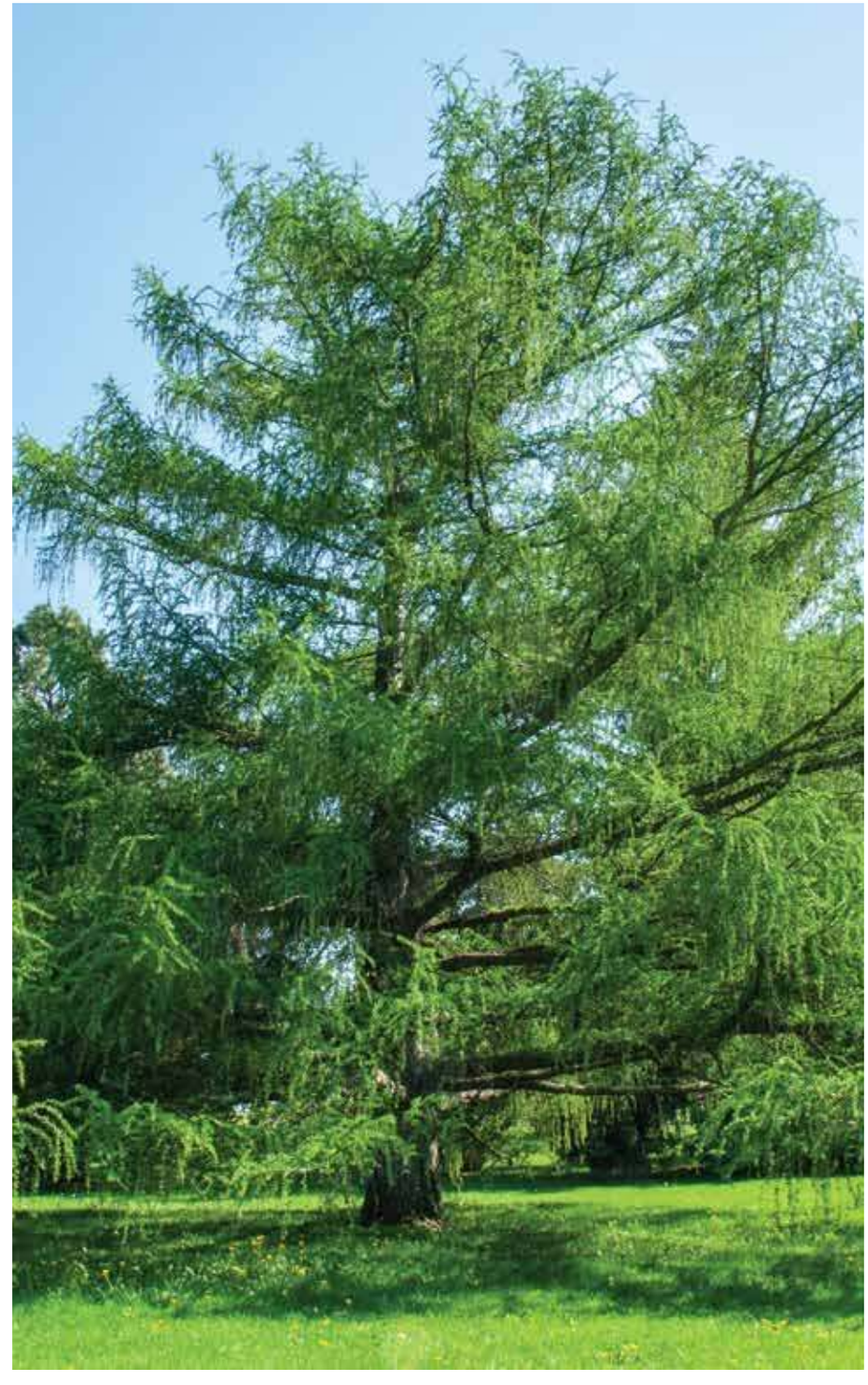
LARIX DECIDUA MILLER

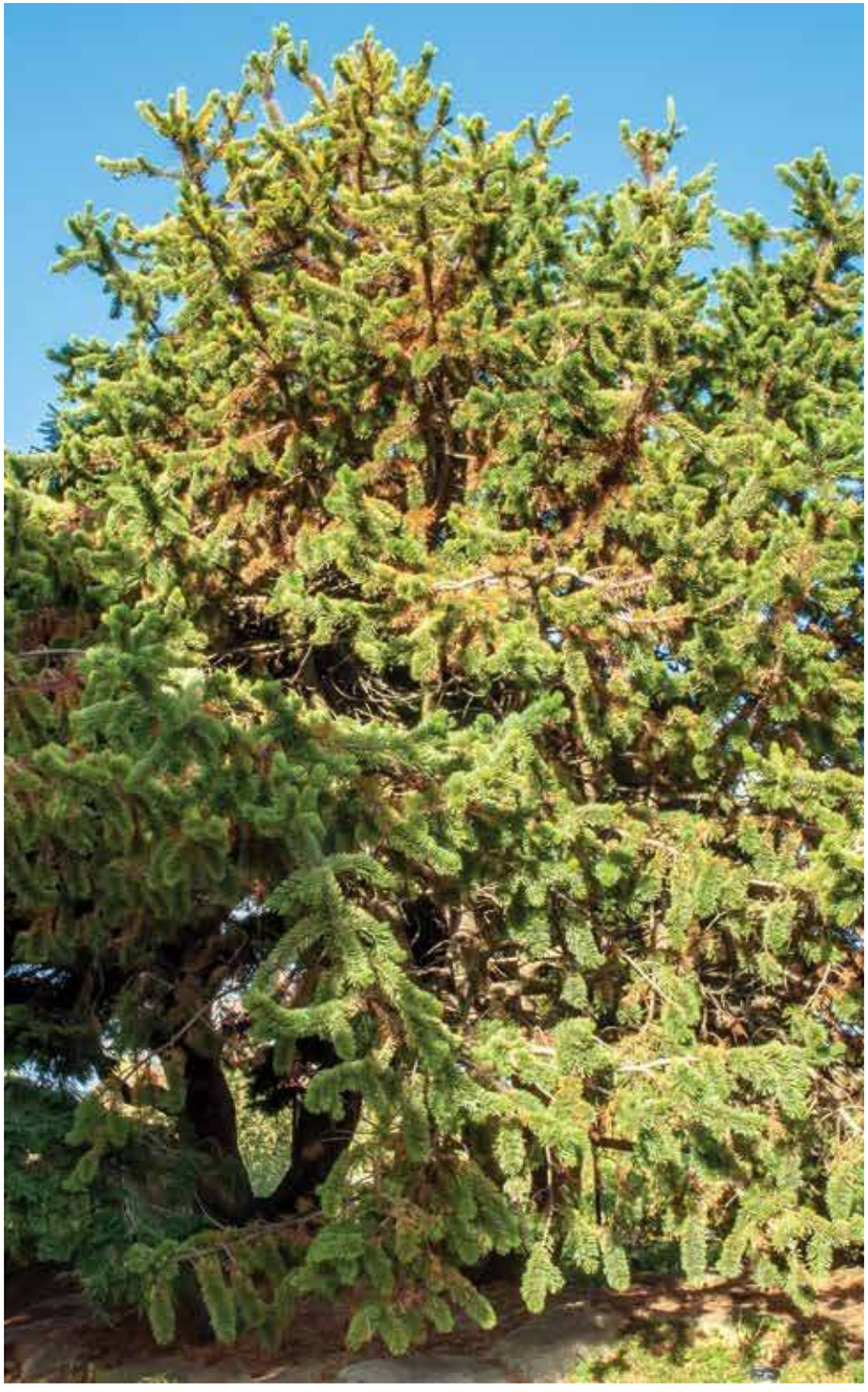
This European larch is amazingly resilient. Of all the European conifers to have survived the successive glacial periods outside the Mediterranean Basin, it is the only one to lose its needles in winter. Some of these survivors are among the most cherished species at Ottawa's Central Experimental Farm: Norway spruce, Swiss stone pine, Austrian pine and Scots pine. This European larch is one of the trademarks of the farm and its arboretum, where it was planted soon after their founding in 1889.

This European larch stands apart from the other larches for its distinctive look: near the base of its straight, skyward-pointing trunk emerge layer upon layer of horizontally arranged branches curving slightly upward. The branches are delightfully droopy and dotted with spurs that look like large buttons but are in fact small shoots bearing clusters of pale green needles, flexible and soft to the touch. A larch's growth history can be revealed by observing its spurs, because they have ringed scars indicating the attachment sites of previous years' needles. Cone gender can also be easily identified, since female conelets are large, brightly coloured and erect and are found in far greater number in the upper portion of the tree, whereas male conelets are small, pale yellow and found along the lower branches.

Some remarkable specimens of European larch, like the one pictured here, were planted at the end of the 19th century on land belonging to Ottawa's Central Experimental Farm, where they continue to thrive today. They are found not in the Dominion Arboretum, but on the campus.

Larches, more specifically their female cones, are said to blossom, and these so-called "larch flowers" are harvested to produce a variety of food products. The hues of these cones, ranging from raspberry red to ruby red, make for quite the spectacle — akin to the blossoming of flowering plants.





Bristlecone Pine

PINUS ARISTATA ENGELMANN VAR. *ARISTATA*

Despite having grown at Ottawa's Central Experimental Farm for 50-odd years, this bristlecone pine is dwarfed by the trees of the Pinaceae family. This is because its species, which originated on the arid, inhospitable peaks of western Colorado, northern New Mexico and northern Arizona, grows extremely slowly. Then again, specimens can grow to be an astounding 5,000 years old, which seems inconceivable given their twisted, stunted and suffering appearance — hardly the picture of health! This tremendous longevity has something to do with its slow metabolism, which is perfectly suited to depleted soil. These unique physiological characteristics also explain the interest it holds for Experimental Farm researchers.

After its discovery in Colorado in 1861, the bristlecone pine, belonging to the soft pine group, was immediately cultivated by Charles Parry of Boston's Arnold Arboretum. Since then, this cute little pine tree has been much sought after by landscapers to create a desert-like scene.

The bristlecone pine has also made an important contribution to science. Its exceptional longevity makes it an excellent subject for dendrochronologists. By analyzing the growth rings in the trunks of bristlecone pines that died in different eras, they can reconstitute geomorphological and climatological phenomena — certain periods of drought, for example — over a long time.

◀ A bristlecone pine, even an impressively sized and aged specimen, will never awe with its looks. Unlike other fast-growing conifers that regularly outgrow their hardwood counterparts, the bristlecone pine is best appreciated by discovering the things that make it distinct.

▶ The light-green needles of the bristlecone pine, often coated with resin, are attached either individually or in clusters to the tree's pale orange branches. Set close together, they make the branches look like brushes and remain there for some 15 years — a record for a conifer!

Swiss Stone Pine

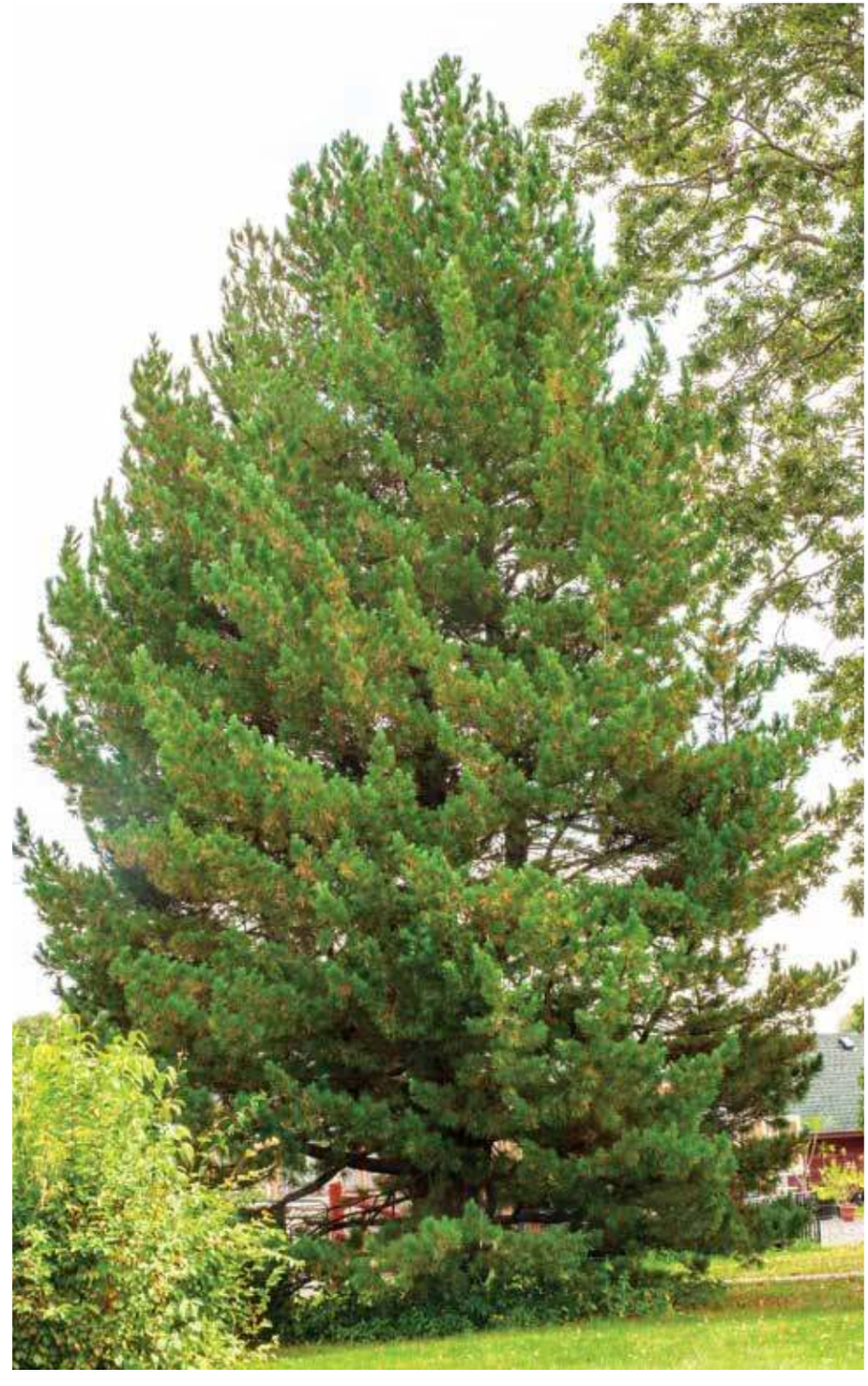
PINUS CEMBRA LINNAEUS

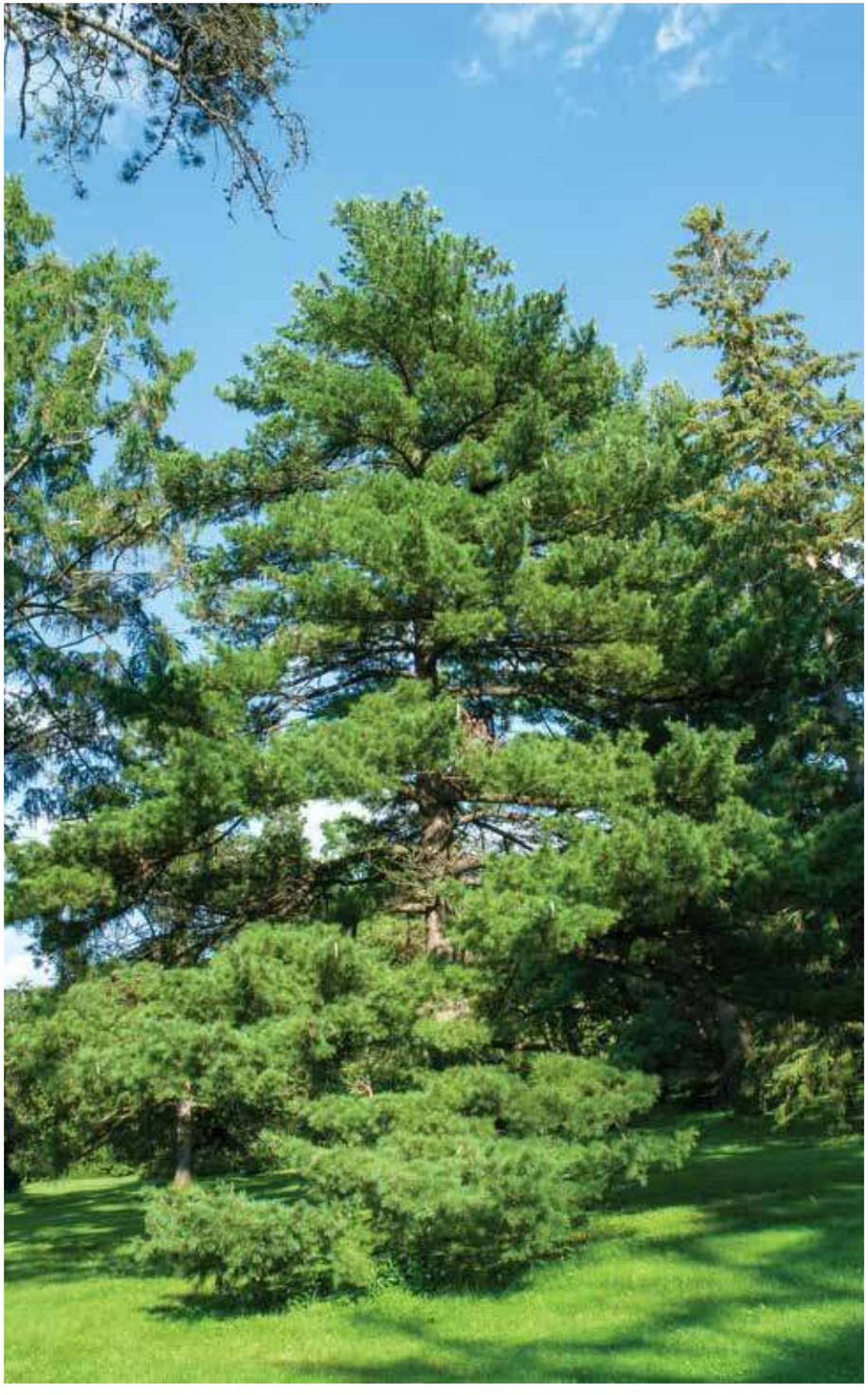
While the interglacial periods proved deadly to many conifer species in Europe, the Swiss stone pine took refuge in mountainous regions (the Alps and the Carpathian Mountains in Central Europe and as far away as Siberia and Asia). A tree at home on tall mountains, this pine continues to this day to inhabit vast forests, where its appearance, height and longevity vary by region. It is found in pure or mixed stands, often in association with spruce, firs and other pines, but most often European larch. Along with this fellow mountain-peak champion, the Swiss stone pine is found at an altitude of nearly 3,000 metres, forming the final treeline beyond which no trees can grow. That's why these trees are chosen for intensive pine reforestation planting on high-altitude mountains and plateaus.

What with the exceptional robustness and frugality of the Swiss stone pine, it is no wonder that successive curators of the Experimental Farm's Dominion Arboretum have wanted to study hedges of these trees. While its slow growth rate makes this species easy to maintain, its aesthetic value and effectiveness as a shelterbelt are enhanced by the fact that its branches fan out almost to the ground. Little known fact: the Swiss stone pine is among the 20-odd species of pine that produce large enough pine nuts to be harvested for culinary purposes.

▸ This specimen of Swiss stone pine is left over from a collection of experimental hedges planted at Ottawa's Central Experimental Farm in 1894. No doubt this species was chosen for its extremely robust, frugal nature.

◂ The resin-filled cones of the Swiss stone pine remain closed for the three years in which they hide behind their mother-pine's skirt, so to speak. They eventually fall whole to the ground, where little by little they unravel, revealing their large, angular seeds called pine nuts.





Macedonian Pine

PINUS PEUCE GRISEBACH

Originating in the mountain ranges of the Balkans, the former Yugoslavia, Albania, Bulgaria and Greece, the Macedonian pine was discovered in 1839 by German botanist H.R.A. Grisebach (1814–1879) on Mount Peristeri in Macedonia and then cultivated in Germany. No sooner had the species made its North American debut (around 1894) than it was introduced at Ottawa's Dominion Arboretum, in 1895. This proved to be another excellent choice, because the Macedonian pine has stood the test of time, withstanding everything thrown its way and adapting well to various growth conditions in the eastern Ontario and western Quebec climate. No surprise, then, that this cold-loving pine has also become popular in Scandinavia.

The Macedonian pine can be seen as the mountain cousin of North America's native white pine — that is how similar the two species are. Both belong to the family of soft pines, which contain much less resin than native hard pine species (the jack pine and red pine) and numerous European pines. What is more, the needle-like leaves of both species have finely indented margins and are arranged in bundles of five, enveloped in a deciduous sheath. These major similarities explain why the curator emeritus of the Dominion Arboretum, Arthur R. Buckley, discovered in 1972 that the two species were becoming a hybrid: the abundant pollen of the Macedonian pine was fertilizing the female conelets of its Arboretum neighbour, the eastern white pine.

◀ The Macedonian pine on display at the Dominion Arboretum is a rare species that was planted in year one of Ottawa's Central Experimental Farm.

▶ After being fertilized, the reddish female conelets of the Macedonian pine, most of which are found in the upper part of the tree, proliferate and turn green before releasing a large quantity of whitish resin. They lignify in their second year of growth and then release their seeds.

Ponderosa Pine

Pinus ponderosa Douglas ex P. & C. Laws

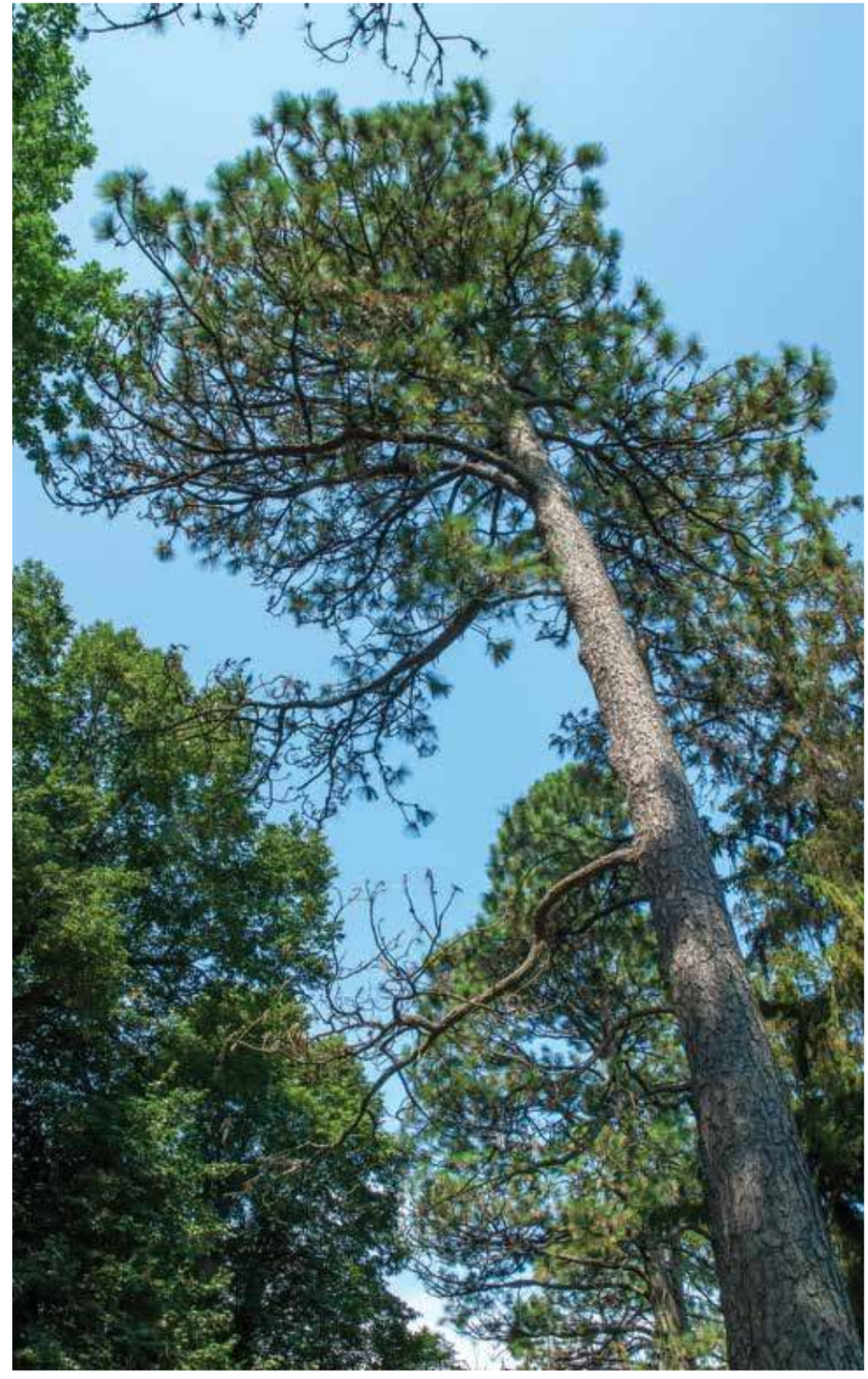
The ponderosa pine is the most famous of the western North American pines. It was introduced in England in 1826 by David Douglas, a Scot who had harvested some seeds in Oregon. The ponderosa pine has grown in the Dominion Arboretum since 1890, mainly as part of shelterbelts where other species of pine and spruce were judiciously mixed in. The ponderosa pine was an appropriate choice for this windbreak: its vigorous taproot and wide-spreading lateral roots make it able to withstand strong winds and draw water from deep underground during periods of drought. This species also likes full light and is frost-resistant.

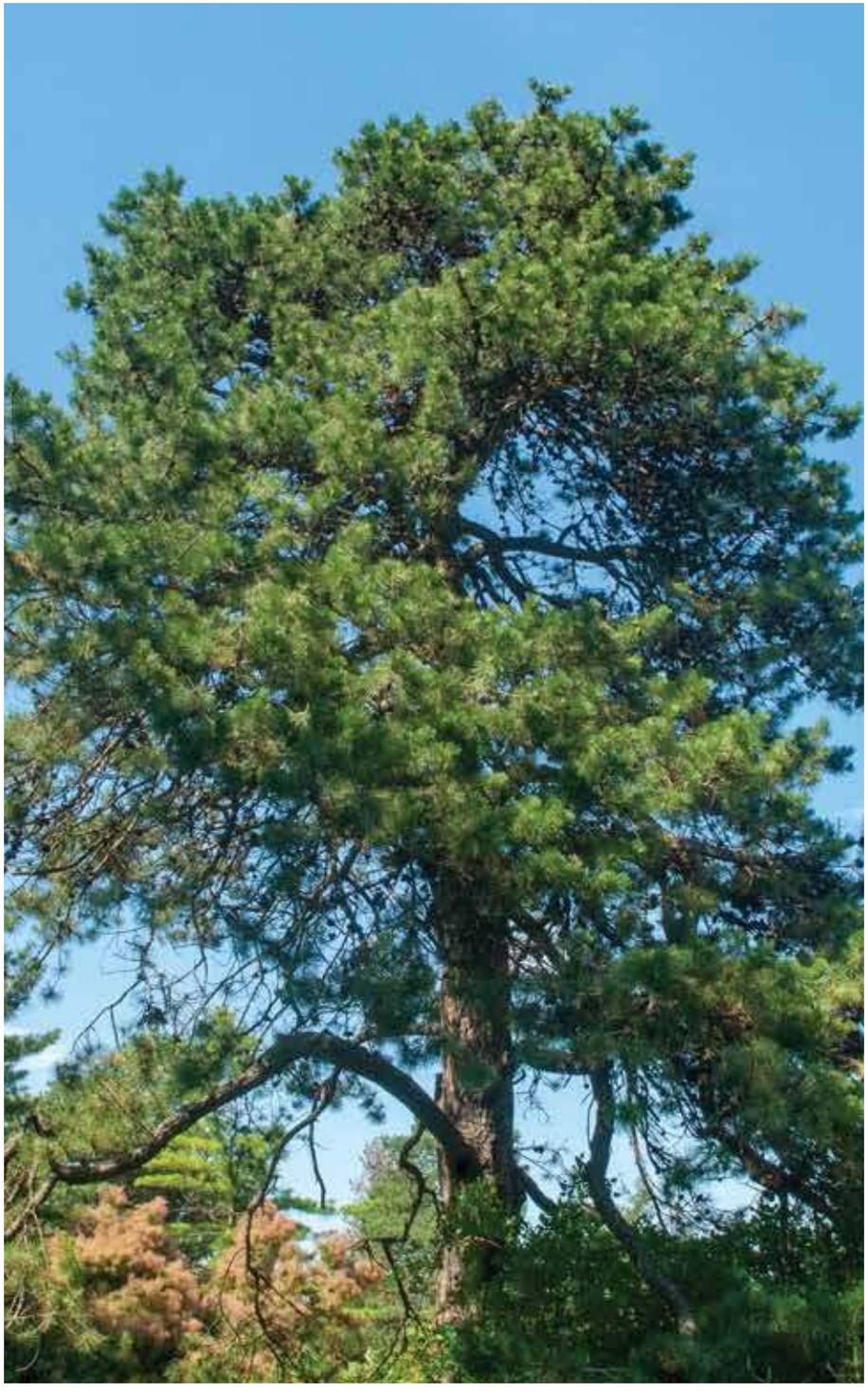
This quiet strength has been put to good use at the Arboretum to shelter trees and flowering shrubs, such as ornamental crab apple trees and magnolias, all of which feature buds that are sensitive to late spring and early fall frosts.

No other species of pine in western North America boasts as pretty a bark, lending the trunks of middle-aged trees a classy, well-dressed look. This brightly hued bark is made of large scaly plates, orange-brown in colour, interspersed with black grooves and measuring from 1.2 to 1.5 metres long and up to 45 centimetres wide. Its thick scales make it fire-resistant.

In 1890, James Fletcher planted shelterbelt hedges of conifers in strategic locations so as to envelop the Arboretum. This ponderosa pine belongs to one such shelterbelt, which is remarkable for its overall architecture.

The long, dark green, straight and rigid (though flexible) needles of the ponderosa pine are usually arranged in three-needle bundles. They are sheathed at the base by a weathered, evergreen membrane, typical of hard pines. When a branch is broken, it emits an orange peel scent.





Pitch Pine

PINUS RIGIDA MILLER

The Dominion Arboretum, Canada's oldest arboretum, illustrates the importance of national arboretums in conserving species at risk. Two century-old pitch pine specimens in the Dominion Arboretum, planted in 1908, proudly represent their species, which is at risk in Quebec. Known for its picturesque bearing, this pine, with its irregular shape and crown, features a mass of twisted, drooping branches.

The vast Pine Barrens region in the United states was named after the pitch pine. This region encompasses large swaths of Cape Cod, Long Island and New Jersey. In Canada, this species' natural distribution is confined to the eastern part of the country, along the northeast shore of Lake Ontario and around the St. Lawrence, particularly the Thousand Islands area. In Quebec, apart from some specimens in Montérégie, some 3,000 to 4,000 individuals are protected in the Pin-Rigide Ecological Reserve in southern Quebec's Saint-Antoine-Abbé region.

This tough pine, one of the rare conifers capable of resprouting after a natural disaster, stands apart for its resinous wood (hence the name pitch pine) and its needle-sprouting trunk. Unlike many other pines, this is a three-needled tree, with symmetrical evergreen fruit-bearing cones composed of prickly scales that are curved at the tip.

◀ Small in stature and with a short lifespan, the pitch pine is a native pioneer species that grows well in areas where other species have difficulty taking root (in acidic, sandy soil and in dry, poor soil, for example). Its knotty wood has restricted its harvesting but also, in all likelihood, its conservation.

▶ The pitch pine's cones tend to persist on the tree well after releasing their seeds. Over the years, they turn black, making the trees appear to have hundreds of black birds perched on their branches

Greek Fir

ABIES CEPHALONICA LOUDON

An immense species, this elegant Greek fir is perfectly pyramidal and features layered branches, each attached to one another from the base of its trunk to its crown. When it was first grown at the Dominion Arboretum in 1899, the person responsible for its planting, William Terrill Macoun, had doubts about the hardiness of this fir from the mountains of Greece, southern Albania and the Aegean islands, including the island of Kefalonia. These doubts stemmed from his observation that half the length of its annual shoot could die the following winter, if the winter proved even slightly harsh. And yet, all these years later, this pudgy specimen seems to be doing just fine.

Macoun had not counted on this fir's special resilience. It is extremely resistant to shade, for example. Individuals overshadowed for 20 to 30 years have rebounded strongly and produced a dense crown. Its needles persist for an average of seven years on the branch, where they reach towards the sky by twisting a great deal, looking like a brush.

Curiously, the very vigour of this fir, which boasts numerous large-diameter branches, is the source of the problems it poses for growers: it can become so immense that few private landowners can give it enough room to grow properly.

▸ A mountainous Mediterranean species, the Greek fir is resistant to drought, early and late frost and heavy snowfalls, even when the snow remains on the ground for a long time. It can grow to 25 metres, an exceptional feat for a fir tree.

◂ In its native Greece, the Greek fir grows in soil produced by a diverse range of bedrock: gneiss, schist, clay and crystalline or dolomitic limestone, among others — not unlike that of the National Capital Region.

Siberian Fir

ABIES SIBIRICA LEDEB.

The Siberian fir is among the hardiest species on the planet. Its natural distribution area includes the temperate southern zones of Asia, northern Russia and northeastern China, including Siberia, Mongolia and Kazakhstan. A typical species of the taiga, it tolerates extreme cold (down to minus 50 C), grows in mixed forests at altitudes ranging from 1,900 to 2,400 metres and, even in these difficult conditions, can grow as high as 30 to 35 metres. It is reported to grow even on permanently frozen land.

So it should come as no surprise that the Siberian fir was chosen for the Dominion Arboretum, where it is ideally suited to the primary mandate assigned to the Canadian experimental farm system upon its founding in 1886: to study the hardiness of tree species. It was necessary not only to validate its widely reputed ability to tolerate icy winters but also to examine its behaviour and adaptability to the bioclimatic conditions of eastern Ontario and western Quebec, particularly during heatwaves. In his book *Trees and Shrubs of the Dominion Arboretum*, published in 1980, retired curator Arthur R. Buckley declared himself satisfied with the performance of the Siberian fir, in particular with its impressive rate of growth. What is more, he indicated he had seen no evidence of it suffering during heatwaves.

◂ There is only one specimen of Siberian fir at Ottawa's Central Experimental Farm. It was planted in 1952 across from Heritage House, one of the farm's oldest buildings, whose construction dates back to 1889.

▸ The Siberian fir is not without aesthetic interest. With its cylindrical trunk measuring nearly a metre in diameter at maturity, lower horizontal branches touching the ground and a conical crown, this only slightly resinous fir has a mildly pyramidal bearing from bottom to top.

Sawara Cypress

CHAMAECYPARIS PISIFERA (SIEBOLD & ZUCC.) ENDLICHER 'FILIFERA'

The Sawara cypress is a slow-growing conifer native to Japan, where its fragrant, rot-resistant wood is used in the construction industry. Although it was originally a large evergreen tree, species of the *Chamaecyparis* genus, such as the Sawara cypress, are now being used in horticulture as dwarf cultivars or in small sizes created for their ornamental value. In its natural state, it can grow to a height of 35 to 50 metres, while its trunk can reach two metres in diameter. Known as "false cypress," the five or six known species of *Chamaecyparis* belong to the Cupressaceae family, like the true cypresses. The especially graceful Sawara cypress cultivar, grown since 1890 at the Dominion Arboretum, is a preferred choice for hedges.

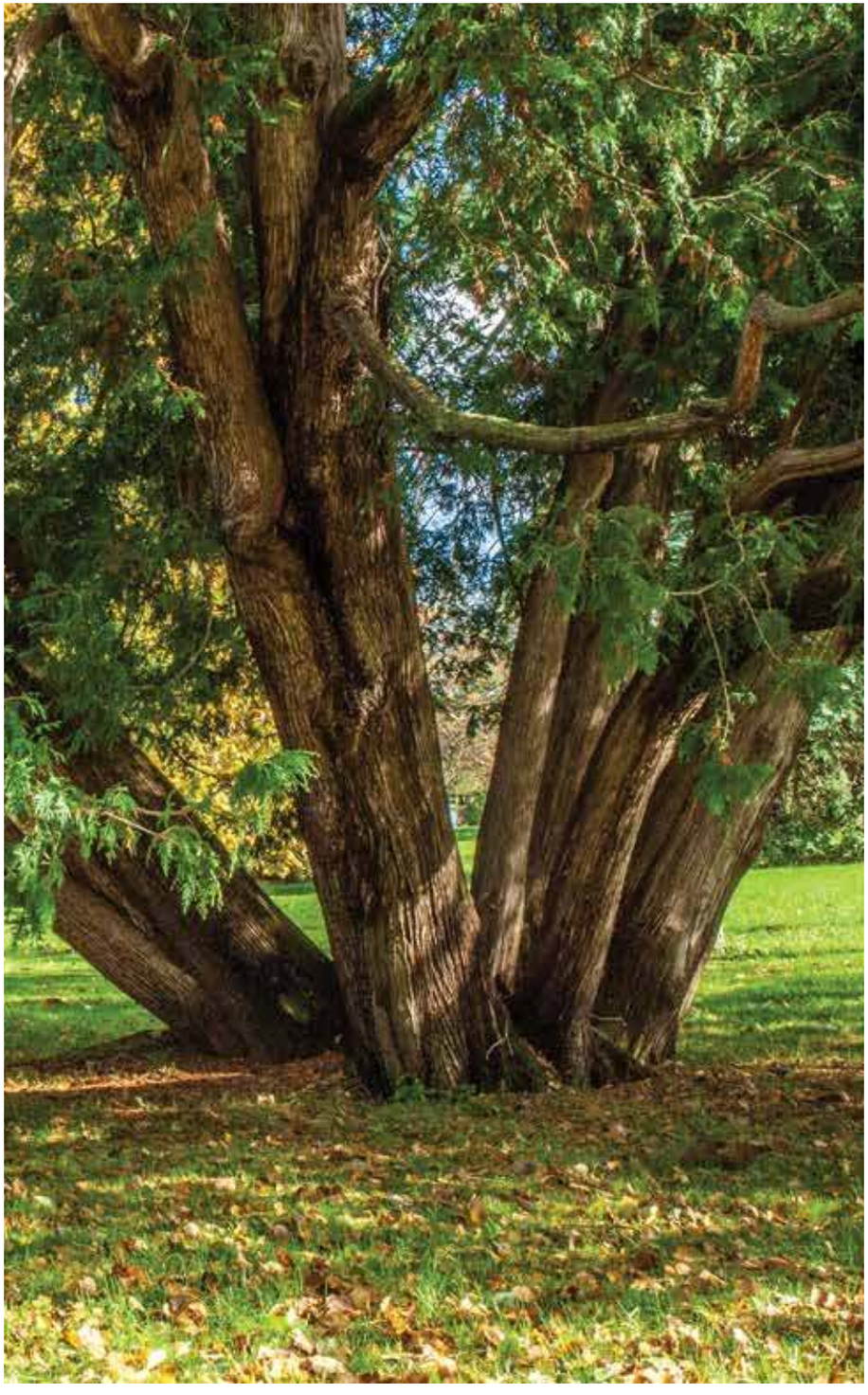
▸ The interwoven scaly foliage of the Sawara cypress could be mistaken for that of the cedar. On the other hand, the fruit is different. This false cypress bears spherical or oval-shaped cones, while the cedar has tulip-shaped cones.

Hinoki Cypress

CHAMAECYPARIS OBTUSA (SIEBOLD & ZUCC.) ENDLICHER

The Hinoki cypress often experiences spontaneous mutations that alter certain morphological features, like foliage colour, bearing and, in particular, rate of growth. The art of Japanese landscaping requires specimens with clearly defined traits, and so cultivars of every imaginable size, shape and colour have been created for centuries. The species became so popular after its discovery by Scottish botanist Robert Fortune in 1860 and its introduction in England in 1861 that every nursery worth its salt was working on developing its own "house cultivar." One such cultivar, the Gold Hinoki cypress, made its Dominion Arboretum debut in 1903. Undoubtedly the oldest Canadian specimen, this cone-shaped cypress stands apart for its new shoots changing colours from gold to green later in the season.

▸ Planted in 1909 at the Dominion Arboretum, this magnificent Hinoki cypress was described by the Arboretum's former curator, Arthur R. Buckley, as having soft, slightly drooping branches with frond-like leaves. It is also called "false Hinoki cypress."



Eastern White Cedar

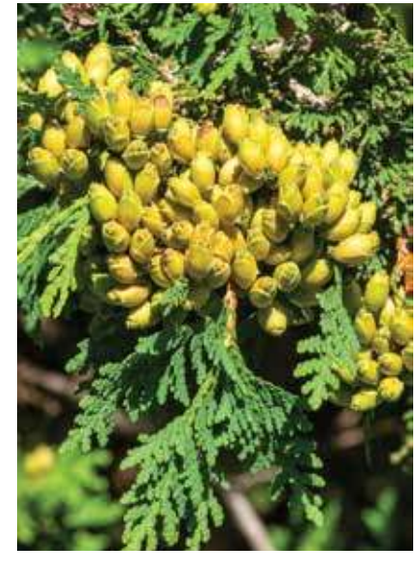
THUJA OCCIDENTALIS LINNAEUS

WABINO-KIJIK / KIJIK (ANISHINAABEMOWIN NAME)

In 1712, French engineer Gédéon de Catalogne (1662–1729) wrote a survey report on the colonial seigneurial system that included a detailed description of the plant life. On the topic of the cedar, he wrote that its light, rot-resistant wood was used to "fence the cities of Montréal and Trois-Rivières, terraces in Québec [City], all the country's forts and most fields and gardens." So, it should come as no surprise that, in 2016, during extensive controlled digs in Old Québec City, pieces of wood were discovered that were vestiges from the construction of ramparts in 1693. Similar vestiges have also been found at the Intendant's Palace and near the Ursuline Monastery. Made from massive axe-hewn cedar logs, the palisade was built according to plans devised by military engineer Josué Dubois Berthelot de Beaucours.

Grown in France since 1560 or earlier, the *Thuja* genus has long been considered by nurseries as one and the same species, such that the more than 200-year-old history of the cultivars created from "our very own cedar" is extremely difficult to trace.

The eastern white cedar has always been a favourite of researchers at Ottawa's Central Experimental Farm. They sought to retrace and create the most appropriate varieties to plant either alone in landscaped areas or grouped together in hedges. Horticulturalists indicated that as early as 1894, cedar hedges already extended over more than a kilometre around the farm's borders. They were also grown around certain buildings and the collection of experimental hedges.



◂ The myriad qualities and properties of the eastern white cedar proved beneficial to the earliest settlers of New France and have been studied in depth at the Dominion Arboretum since the 19th century. As of 2005, the Arboretum still had some 45 different varieties of eastern white cedar.

▸ Although palisades fell into disuse as the centuries wore on, use of the eastern white cedar in pole fencing around pastures and in hedges around properties have stood the test of time.

Umbrella Tree

MAGNOLIA TRIPETALA LINNAEUS

Originally, the idea of growing an umbrella tree in the Ottawa region seemed little more than a pipe dream. Native to the southeastern United States, from Pennsylvania to Alabama, the species prefers warmer temperate climates. Over the first 50 years after a specimen was planted in the Dominion Arboretum in 1907, the five leafy stems that it had worked so hard to develop were destroyed one by one in the wake of particularly harsh winters. One day, a sixth stem appeared. It survived, and from it there came a small flowering tree that would go on to produce each and every year a curious fruit that looks like pinkish pickles. This umbrella tree, which has over time become a hardy specimen, is an extraordinary example of resilience.

A truly lovely species, the umbrella tree made its debut in European gardens in the 18th century, just when North American magnolias were all the rage, thanks mainly to their exotic appearance borne of their opulent, bright green foliage. In the time that followed, the umbrella tree was grown less and less frequently because of the stench of its flowers. It would eventually give way to sweet-smelling, flowery species from Asia. This small tree is usually supported by a multiple trunk crowned by an open top. The umbrella look is accentuated by the spectacular effect of its enormous whorled leaves (arranged in a circle radiating from a single point).

▸ Like all magnolias native to North America, the umbrella tree produces large flowers that appear well after leafing. Among certain specimens, these large blooms can measure up to 25 centimetres in diameter.

◂ The ornamental value of the umbrella tree's foliage and flowers is readily apparent. At maturity, its fruit, shaped like a long, fleshy cone, are reminiscent of small ears of pink or red corn, enhancing the tree's the decorative effect at the end of the summer.

Sycamore

Platanus occidentalis Linnaeus
Chikimeminij (Anishinaabemowin name)

The most commonly occurring hardwood in North America, the sycamore was first grown around 1636 in South Lambeth, now part of London, in the Tradescant botanical garden housing curiosities from around the world. The garden was founded by John Tradescant and son, both gardeners, horticulturalists and explorers. Curiously, it was the Kew Royal Botanical Gardens near London, and not a North American source, that in 1896 supplied Ottawa's Central Experimental Farm with the seeds for this "native son" sycamore, which originated in extreme southern Ontario, the central and eastern part of the United States, and Mexico. It is the most massive tree found east of the Rocky Mountains.

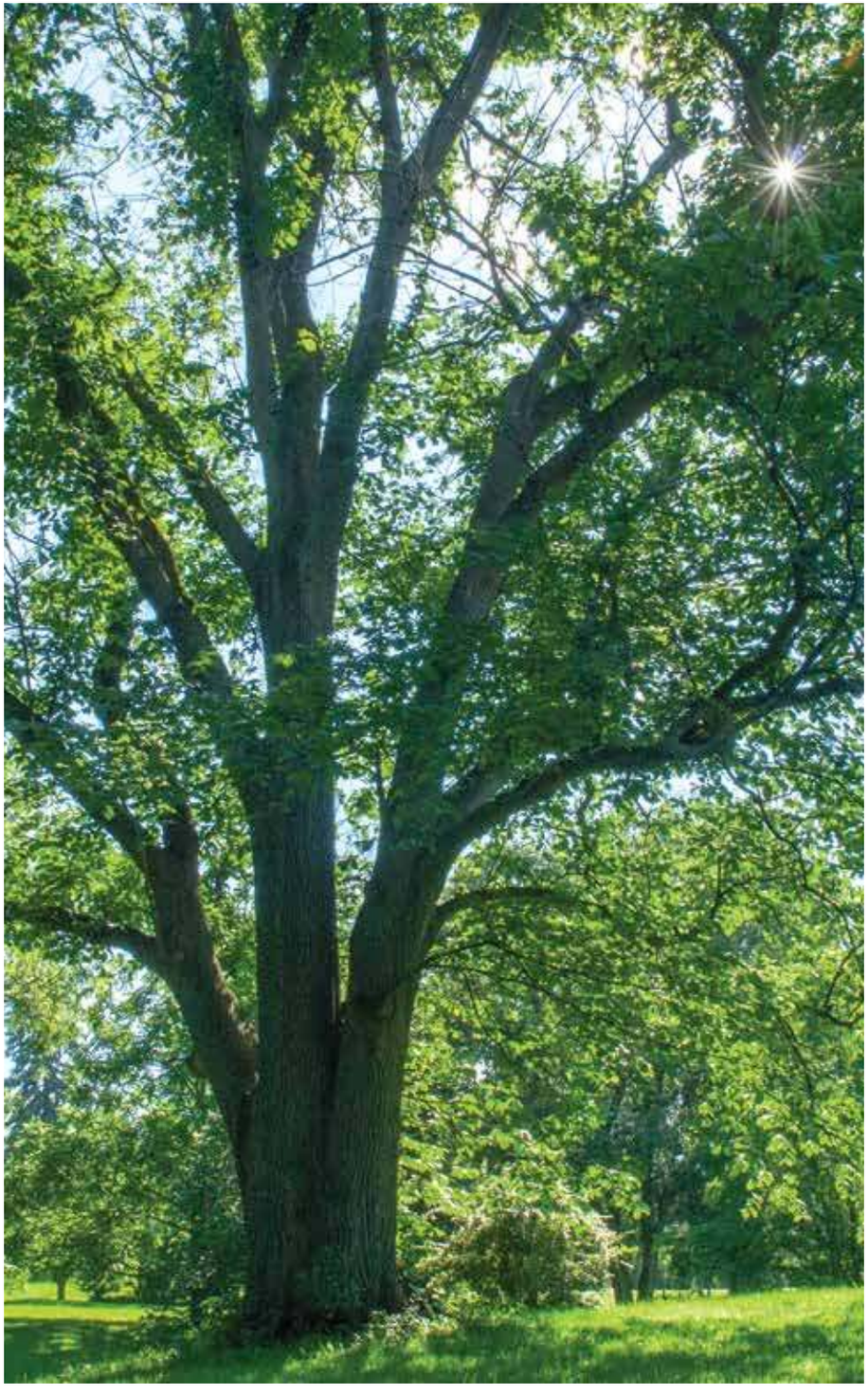
The sycamore in the Macoun Garden, designed by Warren Oliver in 1934, is likely the most eccentric of its species to grow in North America. It lies well beyond the natural distribution area for its species, but according to silvicultural experts, the sycamore is among the rare tree species to develop to their full potential when grown slightly north of their natural area. These "eccentrics" generally become hardier and more resistant to disease. The enemy for the sycamore is the seriously debilitating disease springtime anthracnose. The fungus-like plant pathogen responsible for the disease returns year after year, destroying new leaves and attacking even the boughs of the most vulnerable individuals. The star sycamore in the Macoun memorial garden is not exempt: every year, its new leaves turn brown, as if burnt by a surprising late spring frost. In response to this dressing down, it acquires a new set of leaves by developing secondary shoots, enabling it to conduct the photosynthesis necessary to save its life.

The sycamore is one tough cookie. Dating back around a hundred million years, it is the lone botanical genus of its family to have survived the Upper Cretaceous period. Amid the vast universe of trees, it is a true patriarch. Ten or so species of sycamore exist to this day in India, southeastern Europe and North America. Of these, the three species native to North America are considered the most evolved of their botanical genus. And this sycamore is one of them. It also has another worldly claim to fame. Some specimens are strategically located in the United States and share the same fantastic provenance: seeds brought to the moon in 1971 by Apollo 11 astronaut Stuart Roosa, an ex-firefighter with the U.S. Forest Service. After their lunar stay, the seeds returned to Earth for planting by the Forest Service. The most famous of these sycamores is the one outside Philadelphia's Independence Hall, where the American Declaration of Independence was signed in 1776 and the U.S. Constitution was adopted in 1786.

Settlers in North America were always delighted when they spotted a field of sycamores, and even more so if the trees were nicely sized. The presence of these green giants reassured them that the earth was rich and fertile, and that they could safely build a farm and raise their family there. These trees were even more impressive given their exotic appearance and their three-toned mottled bark with specs of green and light yellow.

▲ The leaves of the sycamore and the maple are similar in that they are indented by diverging lobes radiating from a point at the base of the blade. However, maple leaves are arranged in opposite pairs at each lobe, whereas sycamore leaves are arranged alternately.

◀ Although native to North America, this giant sycamore in the Experimental Farm's central flower bed was planted in 1897 from seeds originating from England and placed in the garden dedicated to William Terrill Macoun — who became William Saunders' assistant in 1888, head of the Horticultural Division of the Central Experimental Farm from 1898 to 1910, and later Dominion Horticulturalist from 1910 until his death in 1933.



Horned Scotch Elm

ULMUS GLABRA HUDSON 'CORNUTA'

In French, the horned scotch elm is aptly named — *orme de montagne*, or mountain elm. It is found in sparse forests on low mountains, to a maximum altitude of 1,600 metres in northern and central Europe and in western Asia. Its Nordic boundary extends as far as Scotland, Finland, southern Scandinavia and Russia. This horned Scotch elm has adorned parks and cemeteries since ancient times.

The Dominion Arboretum's 'Cornuta' variety perfectly illustrates the richness of the many cultivars that were selected: shoots were chosen first for their esthetic and singular traits and were then grafted onto the tree trunks of compatible rootstocks. Taking a closer look at this remarkable specimen shows that the foliage is what truly sets it apart. Its leaves are asymmetrical at the base and attached to hairy boughs covered with short stalks that are camouflaged by a flap. The surface is sandpapery, but the underside is fluffy. The leaves are said to be shoulder-like, because they reach their maximum width in the upper third. Furthermore, they are topped with three to five uneven tips.

The main species of Canadian elm flower early in spring, well before leafing. Right after that come the samaras, the flat, dry fruit typical of the elm. The samaras of the horned Scotch elm are mostly oval (nearly circular), hairless and large.

◂ The first noticeable thing about the Dominion Arboretum's magnificent horned Scotch elm is its flared shape, thanks in part to a trunk that forks out in two or three directions from its base. The 'Cornuta' is one of the myriad varieties specifically designed and developed to beautify gardens and parks.

▸ While the spring flowering of the horned Scotch elm is of little interest, the samaras produced by the tree are noteworthy: numerous, large and with a small yet distinctive notch at the top, the samaras are grouped in dense bundles and eventually separate before being dispersed by the wind and rain.

Swamp White Oak

QUERCUS BICOLOR WILLDENOW

The following bears eloquent witness to the Dominion Arboretum's contribution to the conservation and reproduction of the genetic heritage of vulnerable plant species. Since 1939, the Arboretum in Ottawa has grown a pair of swamp white oak — a rare species not only in Canada but throughout its distribution area. In nature, the swamp white oak lives mainly in the dwindling forested swamps of southern Ontario and southwestern Quebec. In May 1987, the Marcel-Raymond Ecological Reserve was created in Henryville, along the banks of the Richelieu River, to protect a blue oak grove, the rare ecosystem that is home to the swamp white oak.

The esthetic value alone of the swamp white oak is reason enough for the conservation efforts that have been made. From the base of the trunk to the top, its branches extend dissimilarly, lending the crown a roundish, even chubby air. The lower branches droop, the middle branches extend horizontally, and the ascending upper branches reach straight for the sky. And then there is the matter of its wood, whose beauty and durability earn its inclusion in the precious wood category. Fine-grained and heavy, this wood is tough and resistant. The sapwood is so pale that it verges on white, while the heartwood ranges from deep warm brown to chocolate. It is waterproof and resistant to rot.

The swamp white oak resembles the bur oak in terms of the diverse conditions it can grow in but also the quality of its wood. Since its population is only a tiny fraction of that of the bur oak, indiscriminate logging of both species has led to its dwindling numbers.

The swamp white oak may be rare, but if protected it will thrive. Its high tolerance to frigid winters and flooding, its ability to rebound from breakage, its resistance to pollution, its abundant fruit production and its extreme longevity are all reasons to plant it.

Bebb's Oak

QUERCUS X *BEBBIANA* C.K. SCHNEIDER

The Dominion Arboretum's oak collection has always been its largest, right from its creation in 1889. In 1904 it was said to contain one or more specimens of 98 different species and varieties of oak. But the Bebb's oak is one of a kind, and the king of the collection. According to Arthur R. Buckley, the Arboretum's curator for 35 years before stepping down in 1973, this noble and majestic oak first saw the light of day in the swampy forest just outside the Experimental Farm and was then transplanted to the Arboretum in 1898. Native to Canada, the Bebb's oak is a natural hybrid of the white oak (*Quercus alba*) and the bur oak (*Quercus macrocarpa*). The presence of this spectacular specimen in the Dominion Arboretum is a bit of a miracle in itself, because the white oak is rare in the Ottawa Valley.

A strong hybrid, this lone Bebb's oak has become the collection's largest oak over the years, in terms of both the diameter of its trunk and the width of its crown. And because it was transplanted to the Arboretum instead of having to compete upwards in search of light as would have been the case had it remained in the forest, this Bebb's oak stretches out its co-dominant stems as wide as can be, its breathtaking canopy dominating all the other oaks in the collection.

◀ This magnificent, hundred-year-old Bebb's oak was damaged by high winds that ravaged 22 trees in the Dominion Arboretum. Although it survived, the wind left it disfigured. Arborists are gradually restoring it over the years, as this is a process that cannot be rushed.

▶ The sociological value of this Bebb's oak cannot be minimized. It is well known that humans experience a feeling of well-being in the presence of large trees and that this sensation increases exponentially the larger the tree. The countless photos of people hugging this Bebb's oak bear witness to this phenomenon.

Shingle Oak

QUERCUS IMBRICARIA MICHAUX

The shingle oak has grown in the Ottawa region and in the fields of the Central Experimental Farm for just over 75 years. In a book published in 1980, Dominion Arboretum curator Arthur R. Buckley writes that the shingle oak hedge found among the farm's collection of experimental hedges was world renowned and photographed for numerous horticultural and dendrology reference works published in different languages and countries. He goes on to write that a buffer or hedge of this oak produced a stunning effect, especially in winter when the trees were loaded with lovely copper-coloured leaves attached to the branch ends, contrasting beautifully with the white snow.

Today, only small, isolated specimens of the shingle oak remain. Among its unique characteristics are its entirely un-oak-like leaves. Entire and with an untoothed margin, these look more like laurel leaves and have a leathery feel. When they flutter the slightest bit in the sun, their shiny dark-green surfaces intermingle and contrast with their hairy white undersides. As with red oak species, the shingle oak's acorns have yet to reach full maturity by the start of the second growing season.

▸ The shingle oak originated in the central and eastern United States, from Carolina to New England, where it grows as tall as 25 metres high. This hardy tree can adapt to all soil types and has few enemies, but the quality of its wood is poor.

◂ The shingle oak is a serotinous species, meaning that instead of falling after the growing season, its leaves wait until new leaves spring up to do so. Another characteristic trait: the single oak acorn cup envelops nearly all the nut.

Large-leaved Linden 'Laciniata'

Tilia platyphyllos Scopoli 'Laciniata'

The large-leaved linden 'Laciniata' horticultural variety is the product of a spontaneous form of large-leaved linden, a naturally variable species grown for centuries in Europe. This variety is thought to have existed since 1835 or even earlier, because the sons of Joseph-Bernard Baumann, descendants of a famous family of Alsatian growers and horticulturalists, offered it in their Bollwiller nursery catalogue in 1838. It has been grown in North America for at least 160 years.

The large-leaved linden is a large tree with oblique cordate leaves. Its deciduous, alternate and translucid leaves, usually heart-shaped with a sharply tapered top, feature an asymmetrical base that makes them look crooked or even lopsided. Their main veins fan out from the base of the blade, and their rectilinear lateral veins extend all the way to the edge of the leaf. These leaves are stiff. The leaves of the large-leaved linden 'Laciniata', on the other hand, stand apart for their delicate and flexible nature, their narrow cone shape and, most of all, their deeply and diversely toothed indentations and serrations.

The large-leaved linden 'Laciniata' blooms during the summer solstice. Like its mother species, it is among the first lindens to bloom, producing a profusion of cream-coloured flowers on its pretty red boughs. These edible and fragrant flowers are known for their medicinal properties. The loose, drooping flower heads contain three to six flowers suspended from delicate stalks.

◀ This Dominion Arboretum split-trunk specimen of large-leaved linden 'Laciniata' belongs to a rare variety of large-leaved lindens. Like all lindens, it can thrive in urban settings because it tolerates pruning well and is resistant to pollution.

▶ The honey-scented flowers of the large-leaved linden 'Laciniata' attract a multitude of insect pollinators. Their strong scent comes from the presence of a single nectar-producing gland at the base of each petal.

Downy Hawthorn

Crataegus mollis (Torrey & A. Gray) Scheele var. *mollis*

The downy hawthorn is native to eastern North America, where its primary habitats consist of abandoned farm plots, clearings and areas around creeks. It was first grown in the arboretum of Ottawa's Central Experimental Farm at the turn of the 20th century

This hawthorn, which is found in the wild in southernmost Eastern Canada as far as Nova Scotia, also grows among Canada's neighbours to the south. As with numerous species of this genus, it is spiny, and its light-grey bark exfoliates, producing long strips arranged close together. Its thick, firm leaves are a dull grassy green on the front, with the underside covered with fine silky hairs in the axils of the veins. Nearly as broad as they are long, these leaves reach their maximum width above their middle and then taper sharply at the base. Their margin is roughly double-toothed.

The downy hawthorn blooms profusely, which is what makes it so charming. The blooms take the form of numerous flattened flower heads, or corymbs, attached to dwarf branches as is the case with fruit trees. This is not surprising, since — like many fruit trees — hawthorns belong to the rose family. Their showy white flowers recall apple blossoms (the hawthorn blooms a few weeks later than the apple tree). Hawthorns produce an almost spherical edible fruit, scarlet or crimson red in colour.

In *Trees and Shrubs of the Dominion Arboretum*, Arthur R. Buckley, curator of the Arboretum's treasured collection of tree species between 1938 and 1973, reveals that this wide-spreading hawthorn is the loveliest of its botanical genus, *Crataegus*.

This specimen of hawthorn seems to belong to an unusual form of the *mollis* species because the flowers have 10 (and not 20) stamens with cream-coloured anthers.

Weeping Siberian Crab Apple

MALUS BACCATA BORKHAUSEN 'GRACILIS'

Some 250 ornamental crab apple trees representing a hundred or so cultivars have been planted on the grounds of Ottawa's Central Experimental Farm. A number of these varieties were developed there as early as the 1920s, mainly by breeder Isabella Preston under the direction of Dominion Horticulturalist William Terrill Macoun. The flowering Siberian crab apple tree pictured here is emblematic of the era when hardy crab apple trees were planted and developed at the farm. It was a gift from Boston's Arnold Arboretum, which had been growing this clone since 1913 after receiving specimens from the James Veitch & Sons nursery in Chelsea, England. This famous British nursery had tasked plant collector William Purdom with seeking out hardy Chinese plant species. And so it was that he collected seeds for this crab apple in Shaanxi Province in Northwestern China.

In adding this weeping Siberian crab apple to its collection, the farm enhanced its development and creation of hardy varieties of apple and crab apple trees. This program sought to develop cultivars whose flower and fruit buds would tolerate the harsh climate of the Canadian prairies without compromising their flowering and performance. The program started with the farm's creation in 1887, when founding director William Saunders, an experienced orchardist, obtained Siberian crab apple seeds from the Royal Botanical Gardens in St. Petersburg, Russia, for use in hybridization.

◀ Characteristic of this weeping Siberian crab apple are leaves that lack the leathery consistency typical of the Siberian crab apple. Its historical provenance and special genetic material make it one of the treasures of the Dominion Arboretum's flowering tree collection.

Hamilton's Spindle-tree

EUONYMUS HAMILTONIANUS WALL

Spindle-trees comprise a large family of nearly 180 species, all considered toxic. The Hamilton's spindle-tree, which originated in Japan, has been grown in North America since the 1930s for its autumn foliage and ornamental fruit. The specimen in the Dominion Arboretum, in all likelihood 75 years old, has developed into a solid little single-trunk tree. At the beginning of summer, its small greenish flowers, split into four equal parts, quietly appear. Once fall arrives, its dry capsule-shaped fruit reveals four separate deep pink lobes that open via four valves, each unveiling a large seed covered with a fleshy, bright orange-red sac called an aril.

In addition to being fragrant, the Hamilton's spindle-tree is a real eye-catcher. Like the Yeddo spindle-tree, its large seeds are as strikingly colourful as its fruit, if not more so. All this makes for a flamboyant visual display when its capsules burst open upon maturity.

Yeddo Spindle-tree

EUONYMUS HAMILTONIANUS WALL SSP. *SIEBOLDIANUS* (BLUME) H.HARA

Spindle-trees are grown for the superbly coloured leaves and fruit that their deciduous varieties produce in the fall, or for the vibrant variegated foliage of their evergreen varieties in winter. The Yeddo spindle-tree, which originated in the Far East, is a deciduous variety that offers an unexpected ornamental touch outside the growing season. It was introduced in the West in 1865 and received a distinction from the Royal Horticultural Society of London in 1924. Around 75 years old, the specimen in the Dominion Arboretum is a large shrub. Like the Hamilton's spindle-tree, its mundane flowers go unnoticed. However, it produces a large quantity of colourful seed capsules that will reveal orange-hued arils, some of which will hang for a long time from the year's shoots even after the leaves have fallen. The effect is spectacular.

The Yeddo spindle-tree is usually grown for its abundance of pale pink fruit. It grows best in sunny or partly shaded areas and adapts well to all soil types. Although a slow grower, it can eventually grow three metres tall and wide.

Shandong Maple

ACER TRUNCATUM BUNGE

The Shandong maple originated in Korea and northern China. It was discovered in Shandong province in 1830 by Latvian physician Emil Bretschneider, who was part of a Russian delegation to Beijing. An amateur botanist, Bretschneider sent some seeds from this tree to the Kew Royal Botanical Gardens in London and to Boston's Arnold Arboretum in 1881. Thanks no doubt to the exchanges that the Central Experimental Farm maintained from day one with the famous American arboretum, the farm began growing it in 1897 as part of an impressive collection of maples that, by 1904, would comprise 122 different species and varieties. The original specimen no longer exists, but a remarkable individual planted in the Arboretum over 80 years ago continues to enchant visitors.

Upon bud burst, the Shandong maple leaves, arranged in opposite-facing pairs on both sides of the branch, are a coppery or purple colour. Throughout their life, they communicate through their petioles, which contain a milky sap. They share this characteristic trait with the leaves of the Norway maple, a species widely grown the world over. Maples produces dry, two-winged fruit called a double samara. The samaras' angle of divergence varies according to the species and is therefore a valuable identifier. In the case of the Shandong maple, the nearly plane angle of the pairs also recalls its cousin species, the Norway maple.

◂ The Shandong maple is an average-sized maple with a rounded crown. It displays stunning hues and shapes that readily catch the eye. Its name in French, *érable à feuilles tronquées,* comes from the morphology of its leaves, which seem to come to an abrupt halt — as though bisected at their base.

▸ Characteristic of the *Acer,* the leaves of the Shandong maple are palmately lobed; in other words, they are divided into five or seven lobes that are entire and covered with the same number of main veins radiating from the intersection of the leaf stem with their petiole.

Silver Maple

ACER SACCHARINUM LINNAEUS
WABISHONIYA-ININATIG (ANISHINAABEMOWIN NAME)

Native to the eastern Unites States, the silver maple tends to dominate shoreline habitats in pure stands. In nature, it forms swampy forests in areas exposed to spring floods, along the banks of large waterways and their tributaries, including the Ottawa River. Its pure stands are becoming increasingly rare, however, as they are under pressure from agricultural development, urban sprawl and resort development. This maple has long been appreciated in urban forests and as an ornamental tree for its rapid growth, hardy nature and tremendous adaptability to the various stressors associated with big cities. The silver maple, like other species it encounters in nature (e.g., American elm and red ash), is especially suited to growing in the asphyxiating conditions and compacted soil of the paved and concrete urban environment. Its fairly shallow roots spread out wide to capture as much oxygen as possible to breathe.

But the silver maple is much more than a strong and hardy tree. It is the most graceful-looking of the *Acer* botanical genus. Its solid ascending scaffold branches support branches and boughs that droop before curling up at the ends for an elegant look. Its dainty leaves complete the graceful look. Deeply notched between the three to five square or rectangular lobes, they are light green on the top and whitish on the underside.

This Central Experimental Farm silver maple, with its characteristically majestic round habit, stretches gracefully to the sky. The species is associated with other wetland hardwoods like the elm and willow, but also the red maple, with which it is hybridized to produce the *Acer x fremanii*.

The silver maple is a tree of contrasts. Its urban population is expected to dwindle gradually as a result of global warming, since the tree is vulnerable to breakage caused by freezing rain, for example. And yet it is capable of revitalizing sites contaminated with mining residue.

Cut-leaf Silver Maple

ACER SACCHARINUM LINNAEUS 'LACINIATUM WIERI'

The cut-leaf silver maple, whose finely cut leaves are attached to deeply drooping boughs, is the epitome of grace. Long recognized for their vitality and rapid growth, many silver maple cultivars were among the first trees planted on the grounds of the Central Experimental Farm, where they quickly became dominant, if not gigantic, specimens. This 'Laciniatum Wieri' was one such cultivar. Discovered by D.B. Wier of Lacon, Illinois, it was marketed soon after, in 1873, by the famous Ellwanger & Barry nursery in Rochester, New York. A highly ornamental tree, it quickly became popular throughout the eastern part of the continent.

The silver maple is more than just an ornamental tree, though. It is also known for being used to make blue and black dyes and for its sap and the various food products derived from it — not as sweet as sugar maple sap, but comparable to the sap from the red maple.

Today, the ornamental 'Laciniatum Wieri' cultivar is increasingly rare among collections in arboretums and botanical gardens. It has become harder and harder to replace deceased specimens, which is why tree reproduction experts at Ottawa's Dominion Arboretum often receive requests from around the world for cut-leaf silver maple cuttings.

◂ This specimen of maple, known for its charming dainty leaves, is a silver maple cultivar planted in the earliest days of the Dominion Arboretum. Silver maple cultivars all take after their mother species in that they are able to grow quickly.

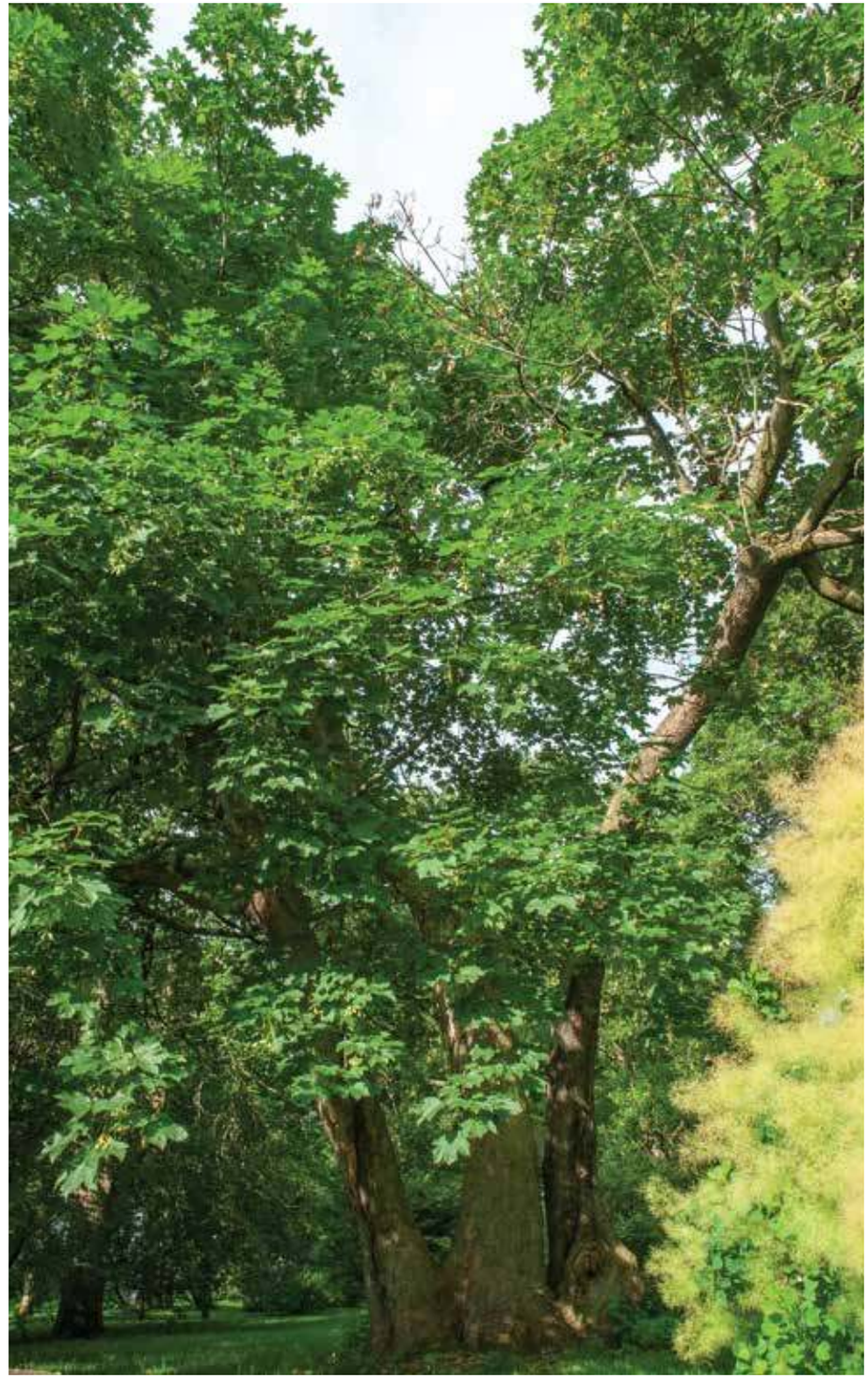
Sycamore Maple

ACER PSEUDOPLATANUS LINNAEUS

The sycamore maple has long been considered a semi-hardy Ottawa region species, because with one exception, specimens all froze to death (the freeze having penetrated down to soil level) during various harsh winters. The last remaining Arboretum specimen cuts a curious figure, different from what is seen in this European maple's natural state. It stands apart for its imposing, bumpy base, caused by scarring of wounds attributable to the death of numerous stems throughout its life. The large, solid stems projecting from this bulge seem huddled together, as though to stay warm, and will remain that way for the rest of the tree's life.

Fairly late in spring, after native maples have begun to bloom, the sycamore maple awakes from its winter slumber and begins leafing. Next, its plump green buds release long hanging bunches containing hundreds of tiny yellow flowers, which soon turn into winged seeds that will remain attached to the branches until the end of summer. One thing is certain: the sycamore maple is not grown for its fall colours, as they are far more subdued than those of many other maples, like the sugar maple. Still, its foliage is a marvelous example of graphic nature. Its thick, folded and wrinkled leaves are about as long as they are wide. They are heart-shaped at the base, while the underside is purplish green.

◀ The leaves of the sycamore maple naturally produce a purple-red pigment. Breeders have taken advantage of this quality by creating cultivars whose foliage is purplish red. Some of these specimens were planted recently on the campus of Ottawa's Central Experimental Farm.



▶ This sycamore maple is the lone survivor of all the specimens of this European maple species planted in the Arboretum at various times dating as far back as 1890. While the others all succumbed to harsh winters, this one refuses to die.

Yellow Buckeye

AESCULUS FLAVA AITON

The yellow buckeye is native to North America. To recount the history of its name, we need to take a short botanical tour. All buckeye species produce clusters of fruit that look like they are made of leather. Called husks, they produce large seeds, called chestnuts, whose number varies with the species. In the yellow buckeye, these thornless brown-flecked green husks produce two seeds; both of these shiny brown chestnuts are marked with a large, pale scar, called a hilum, making them look like the eyes of a deer. Another buckeye of North American descent, the Ohio buckeye, has also grown for a long time in the Ottawa region. Both species grow on the Central Experimental Farm campus and the Dominion Arboretum, as part of the collection of Sapindaceae family of trees. In cladistic nomenclature, this family includes maples and buckeyes. Irrespective of growing site, the Farm's buckeye specimens have all reached a healthy size. They also share other anatomic characteristics: their trunk bark becomes scaly with age, and the bark on their robust branches emits a stench when injured. Their massive buds produce enormous opposite leaves on both sides of their boughs.

◂ This yellow buckeye has grown since 1908 in Ottawa's Dominion Arboretum. Another was planted in Québec City at the same time to mark its tricentennial. As with all the Central Experimental Farm's Aesculus specimens, this one has grown to a wonderful size.

▸ As with the other buckeyes, cone-shaped flowers sprouting from large apical buds appear at the tip of this yellow buckeye's boughs near the end of spring, when the leaves are half developed. Their flowers, sporting brightly coloured petals, are known to attract hummingbirds.

▸ Year after year, the branches lengthen and the scars stretch out — scars left by the leaf fall and etched forever in the branches' flesh. The same is true of all hardwoods, but the marks left by the passage of time are more evident among the buckeyes, given the breadth of their petioles.

Bottlebrush Buckeye

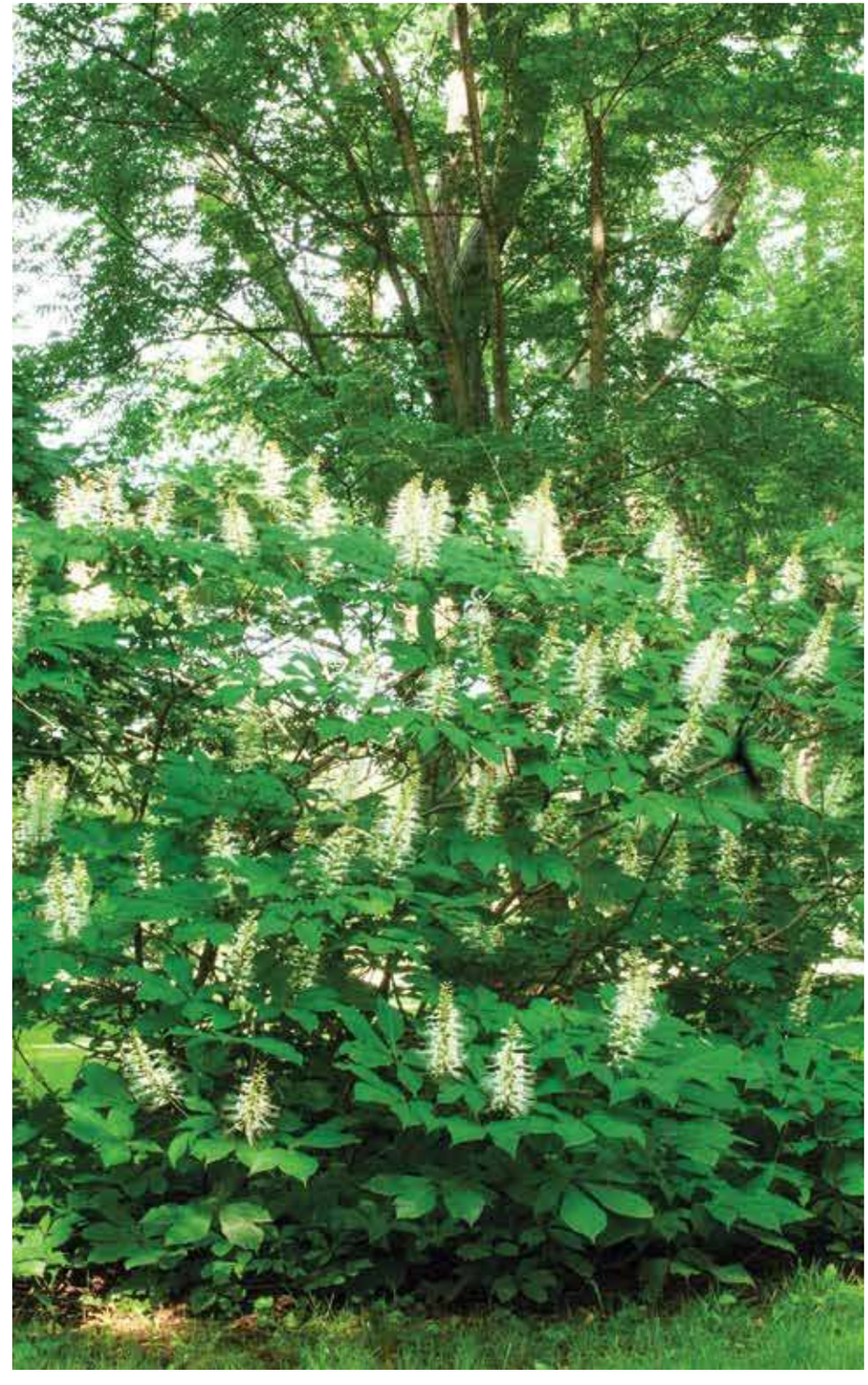
AESCULUS PARVIFLORA WALTER

The bottlebrush buckeye originated in the southeast United States. While native to the open woods of Alabama, Georgia and northern Florida, it is still resistant to the cold, especially in loamy, rich and well-drained soils.

This buckeye stands apart for its habit, which is broader than it is tall. This species boasts a relatively fast growth rate, but it rarely surpasses four metres in height, whereas its width is often double that. It grows this way thanks to the many suckers that proliferate around its base, enabling it to spread wide.

Like the other buckeye species, the bottlebrush buckeye produces compound leaves, called palmates. Its jagged-toothed leaflets radiate like the fingers of a hand around their petiole attachment point. Long and plump, they measure between eight and 20 centimetres long, tapering to a pointed tip. New leaves are bronze-coloured during bud break but turn a hairy grey on the underside at maturity. In the fall, they turn a rich pale yellow.

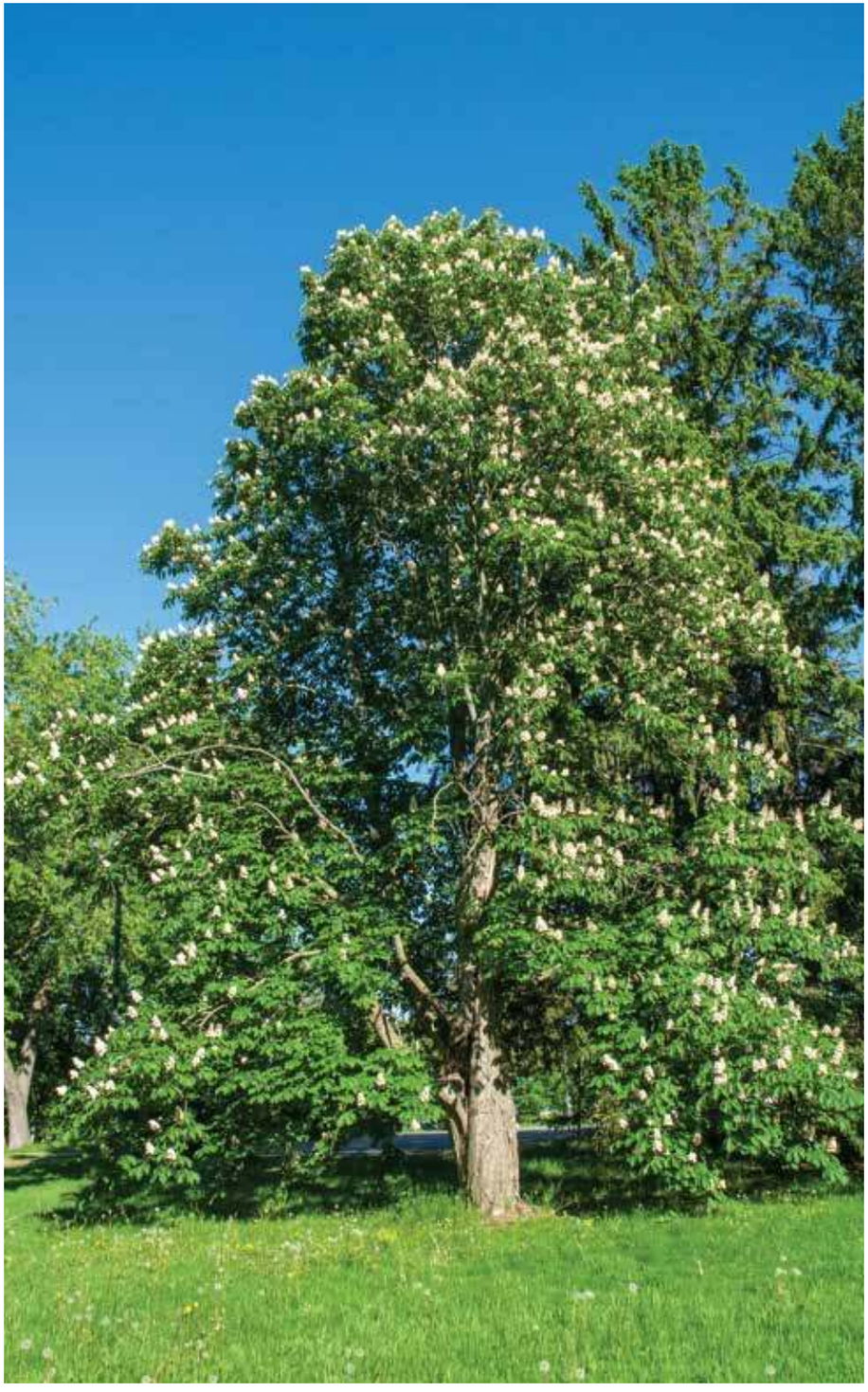
Every summer, just when the other trees seem to be dozing off, this buckeye turns into an immense candelabra. Compactly shaped with dark green foliage, it is adorned with lengthy, cylindrical and erect panicles measuring 20 to 30 cm, giving it a distinctive look. The pleasant scent emanating from the shrub attracts butterflies.



Planted in 1908 in the middle of the Dominion Arboretum's collection of maples and buckeyes, this huge bottlebrush buckeye forms a bush around 10 metres in diameter. It is considered a small tree that grows horizontally.

The bottlebrush buckeye is sometimes called a dwarf buckeye, in comparison with the other much larger buckeyes. Nevertheless, it does form large, highly ornamental groves.

Seen in isolation, the delicate pink-speckled white flowers of the bottlebrush buckeye do not attract attention, but for the fact that they form large feathery spikes, mottled with their long and graceful red or pink stamens. A few rare fertilized female flowers produce pear-shaped seeds.



Common Horse Chestnut 'Baumannii'

Aesculus hippocastanum Linnaeus 'Baumannii'

The common horse chestnut is a native of the Balkans Peninsula in southeastern Europe, where it grows in the wild, especially in northern Greece, in Albania and in Bulgaria. It was catalogued and described a long time ago for its magnificent flowers. It has been grown in Europe since the last quarter of the 15th century, particularly along large boulevards and in wide open spaces such as parks, campuses and cemeteries.

In 1819, Constantin Auguste Napoléon Baumann (1804–1884) discovered this type of common horse chestnut in the garden of a man named Duval, near Geneva, Switzerland. It was a spontaneous mutation on a common horse chestnut that, had it not been for its curious double flowers, would have looked completely normal. So, he took a graft of this tree and sent it to his father, who owned the Bollwiller nursery in Alsace. Only three short years later, in 1822, the nursery began marketing specimens of that cultivar under the name Baumann chestnut.

The common horse chestnut 'Baumannii' began to be marketed in North America around the 1850s. It was on regular offer in nursery catalogues in the early 20th century. In addition to its characteristic double flowers, it is distinguished from the standard common horse chestnut by its late flowering and its taller, narrower habit, or shape.

▸ The common horse chestnut 'Baumannii' found on the Central Experimental Farm has the sticky buds typical of the common horse chestnut from which it emanated. Later on, it is distinguishable during bloom, when it sports its characteristic double flowers — flowers that produce little if any fruit.

◂ The common horse chestnut 'Baumannii' is a fast-growth cultivar. Its white flowers are touched with yellow or red and last longer than those of the mother species. At maturity, this chestnut adopts an oval habit and can grow as high as 25 metres.

Ohio Buckeye

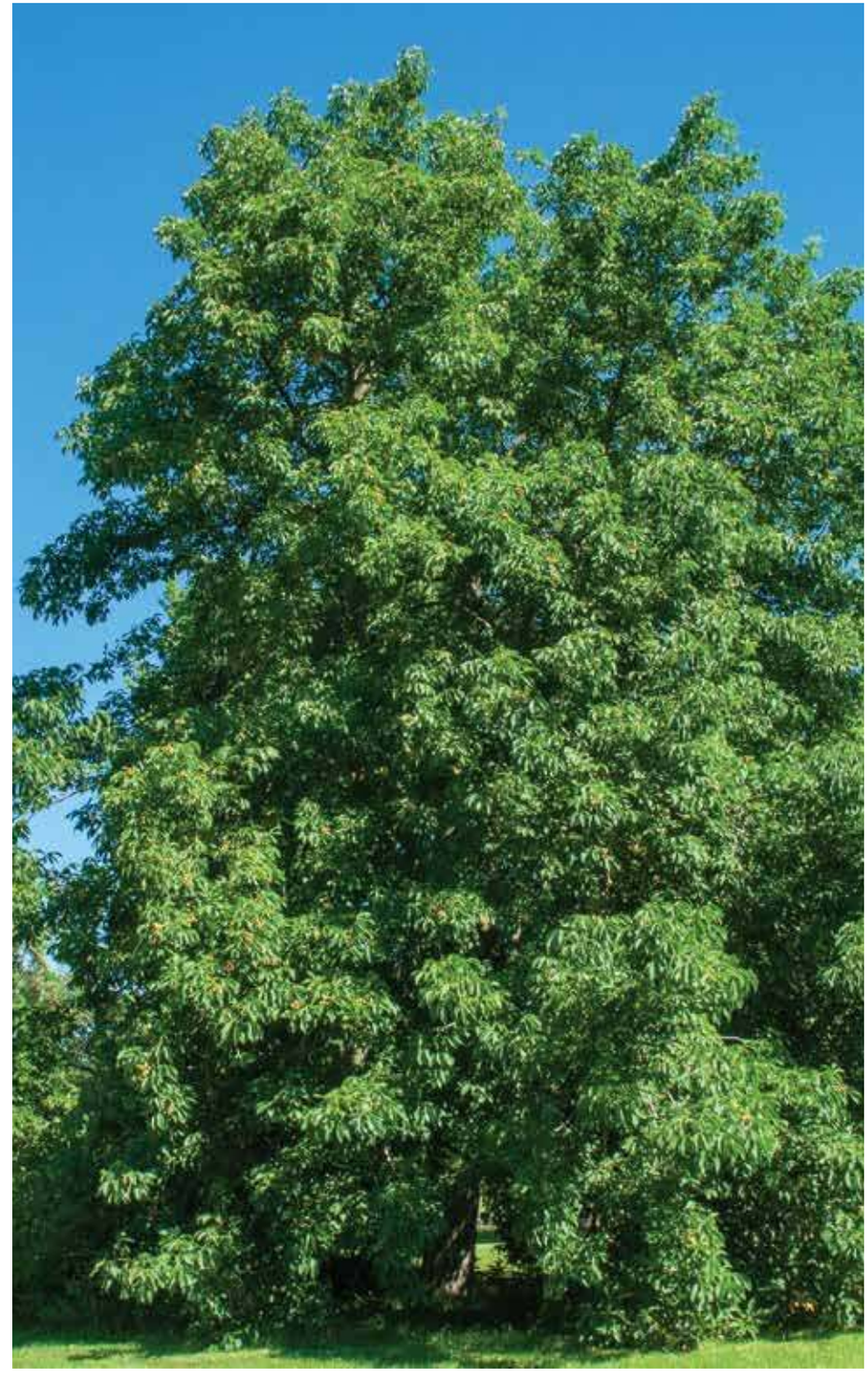
AESCULUS GLABRA WILLDENOW

The Ohio buckeye belongs to the group of buckeyes native to North America that are so-named because their shiny brown chestnuts resemble the eyes of a deer. It was long thought that this buckeye had originated exclusively in the southeastern Unites States, but to the delight of plant collectors, a colony of this species of buckeye was discovered in 1982 in a natural forest on Walpole Island in southwestern Ontario. Later, this buckeye was also found in the Canadian Prairies.

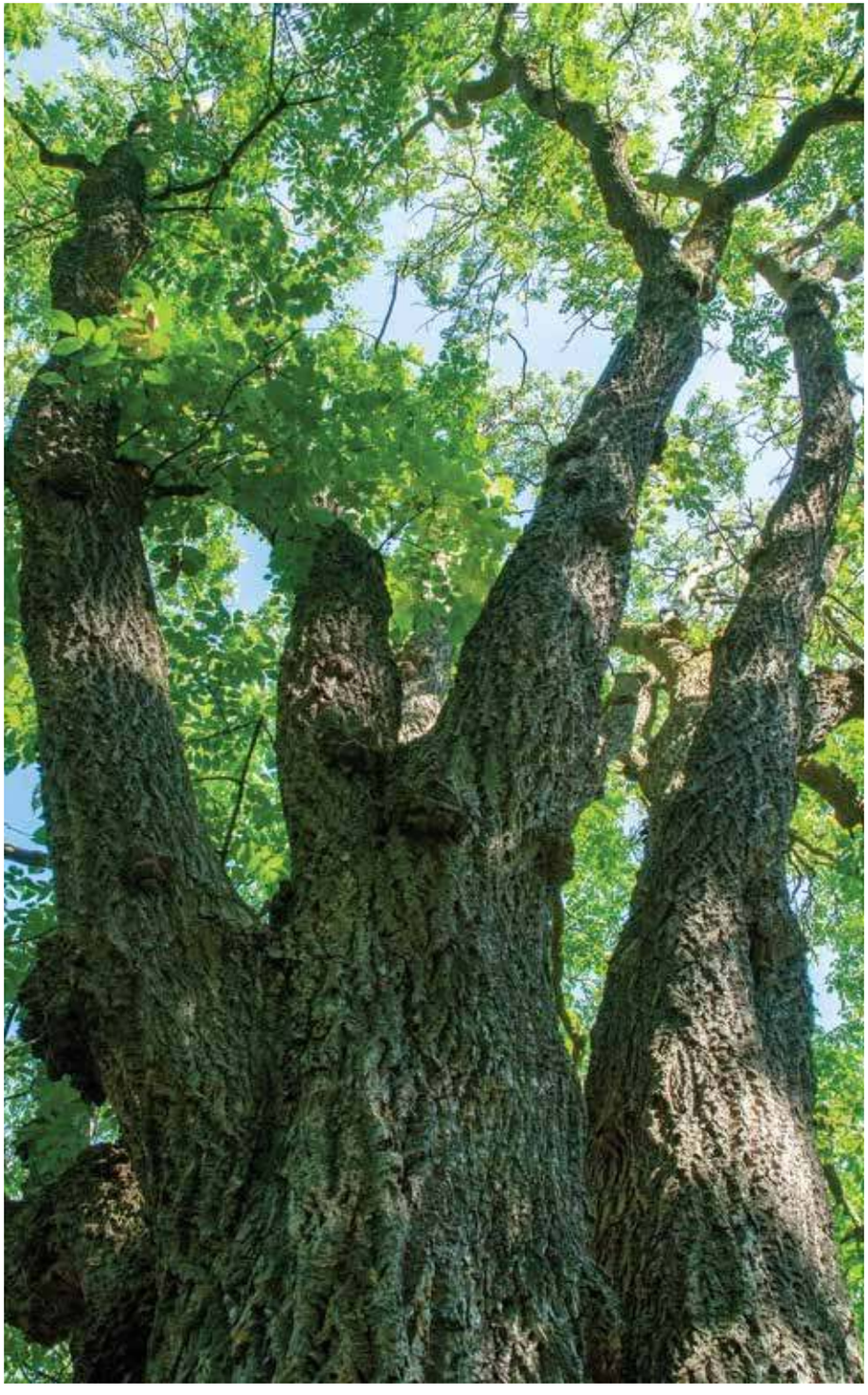
The Ohio buckeye blooms earlier and is hardier than the common horse chestnut. Frederick Gage Todd (1876–1948), an American-born landscape architect who moved to Montréal in 1900, was certainly aware of these characteristics. In 1903, the Ottawa Improvement Commission, founded by Prime Minister Wilfrid Laurier, hired him to put in place an urban master plan for the city. In 1908 he was hired by the National Battlefields Commission to create Battlefields Park, a gift from the federal government to the people of Québec City to mark its tricentennial. Todd oversaw the planting of six Ohio buckeyes around Avenue George VI, at the entrance to what is still called the Plains of Abraham. Two of these trees are still there.

By no means the "fairest of them all," this buckeye has wild-looking panicles due to its long stamens but is known mainly for its huge hemp-shaped leaves.

◀ Most of the flowers produced by the Ohio buckeye are exclusively male. Others in the basilar portion are bisexual and fertile. These produce two or three dark-chocolate-brown chestnuts in each of the husks.



▶ The Ohio buckeye cuts a dashing figure, thanks to its downward arching branches that skim the ground before suddenly curling back up at the tips. Its stocky branches end with a large pointy bud that, unlike that of the common horse chestnut, is not sticky.



Amur Corktree

PHELLODENDRON AMURENSE RUPRECHT

Also called the Chinese corktree, the Amur corktree originated in East Asia and proliferates in the harsh climatic conditions of the Amur River valley (the river separates Siberia and Manchuria along most of its path). Its trunk, its primary ascending branches and all of its boughs are covered with an ornamental bark woven from thick corky ridges, alternating with deep grooves. This insulating cork bark prepares it well for the worst winter storms and scorching summer heatwaves.

Corktrees belong to a small botanical genus within the prominent citrus family Rutaceae. They reach a height of 12 metres and usually live to a ripe old age. Perfectly healthy 100-year-old individuals are routinely catalogued in natural communities, since they are mostly unaffected by insects and disease. With their globular bearing and dense foliage of compound leaves, they are handsome trees. Their greenish flowers produce small black berries much appreciated by neighbouring wildlife.

These corktrees were among the thousands of plant species that the Central Experimental Farm assessed for hardiness, its primary mission at the end of the 19th century. In 1921, during a speech to the American Society for Horticultural Science, William Terrill Macoun reiterated his credo: “Hardiness has been aptly called the ‘Jewel of the North’ … It’s the most valuable characteristic that any plant can have in the colder parts of America.”

◀ The Amur corktree is a hardy sun-loving species at Canadian latitudes. It is also resistant to disease and tolerant of urban stressors. These qualities as a whole make it particularly suited to the function of street tree or to other public spaces.

▶ The melliferous Amur corktree is a source of food for birds. Its leaflets, with their long, curved tips, emit a citrus smell through their translucent spots.

▶ The berry-like fruit of the Amur corktree is aromatic. These berries proliferate inside panicles on female trees and gradually change colour, from green to blue to black. They remain on the tree for much of the winter.

Japanese Tree Lilac

SYRINGA RETICULATA (BLUME) H.HARA

The Japanese tree lilac, whose pale yellow flowers emit a honey scent in late June, was first grown at the arboretum of the Central Experimental Farm in 1905. Other plantings followed in 1921. The lilacs probably came from the Arnold Arboretum in Boston, established in 1872. The Dominion Arboretum has always maintained ties and carried out plant exchanges with its Boston counterpart. It was from this world-renowned arboretum that the Japanese tree lilac set out to conquer North American gardens. In 1876, American botanist William Smith Clark — who, at the Japanese government's request, became the assistant director of the Sapporo Agricultural College — sent some seeds from this lilac to Charles Sprague Sargent, then the Arnold Arboretum's director. The first seedlings flowered for the first time nearly 10 years later, in 1885.

The Japanese tree lilac has an exotic appearance characterized by staggered branches. It also stands apart for the shiny reddish-brown bark covering its trunk and branches with lenticels (small pores allowing gas exchange with the atmosphere). This bark, reminiscent of cherry tree bark, lends the lilac a lovely appearance, especially in winter when the effect is heightened by its golden dried seed heads glinting in the sun. These large flower heads arranged in pairs attract pollinators. A highly ornamental and hardy tree, this lilac is among the species worshiped by landscape architects the world over.

This magnificent Japanese tree lilac, boasting two enormous trunks, is around 100 years old. It was planted in the Central Experimental Farm in 1921, in cooperation with Boston's Arnold Arboretum.

In 1973, J.J. Pokluda, a botanist with a renowned Canadian nursery, used the Japanese tree lilac to create a single-trunk cultivar that he christened 'Ivory Silk'. This cultivar remains popular to this day in many large Canadian cities.

Princess Tree

PAULOWNIA TOMENTOSA (THUNBERG) STEUDEL

It was Philipp Franz Balthasar von Siebold (1796–1865), a Bavarian physician and naturalist, who discovered the princess tree. At the time, Von Siebold was part of a Dutch East India Company scientific delegation to Japan between 1823 and 1829. In 1835 and living in Leyden, the Netherlands, Siebold offered the botanical genus *Paulownia* to the Crown Prince's wife, née Anna Pavlovna of Russia, for her 40th birthday. The princess tree then travelled Europe, from France to England, before being exported to the United States around 1840. It was marketed in 1844 or 1845 by the Prince nursery in Flushing, New York. By 1856, it was already very popular in California.

A vigorous species, the princess tree produces huge woolly leaves resembling those of the sunflower. Its giant scented flowers, whose morphology recalls that of the catalpa flower, go from sky blue to pale violet. It therefore stands to reason that taxonomists have long danced around the question of which family it belongs to: the catalpas or digitalis. Thanks to recent advances in cladistic nomenclature, though, they finally settled on a family — its own family, *Paulownia*.

For some years now, Dominion Arboretum curators have sought to develop a completely hardy variety of the princess tree, the features of which would be comparable to its native Chinese variety. This Canadian clone would have large dimensions, a ridiculously fast growth rate and sublime blooms.

◀ Its spectacular foliage is one of the reasons that the princess tree has conquered western ornamental horticulture. Although its stems never become completely woody, the species' heart-shaped leaves always grow larger upon regeneration, and the silky texture of their underside is reflected in the Latin name of the species.

Chinese Catalpa

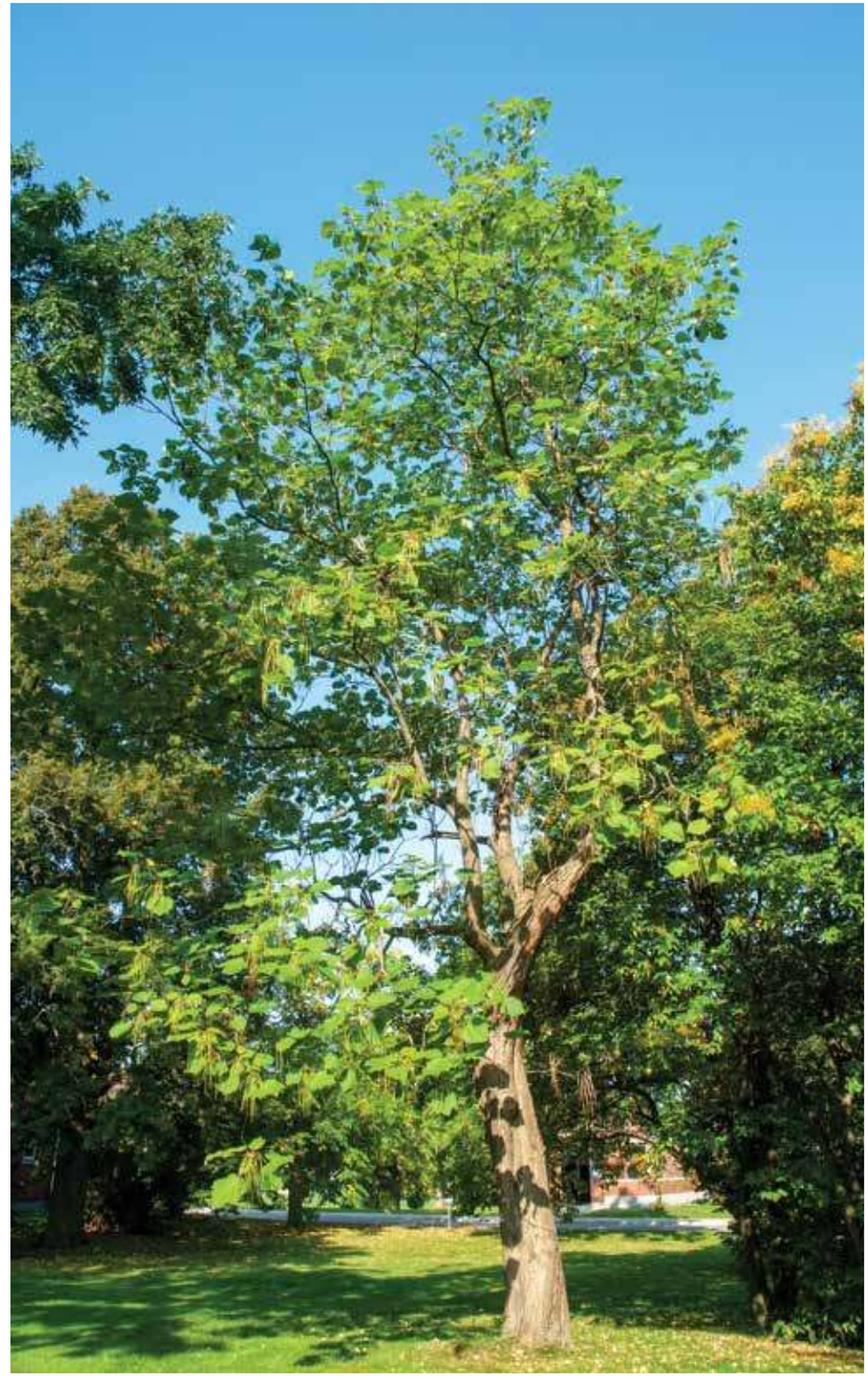
CATALPA OVATA G. DON

Of the several species, varieties and cultivars of catalpa studied at the Dominion Arboretum since its founding, the Chinese catalpa is the only one that has proved entirely hardy, irrespective of its growing site. This was the observation that Arthur R. Buckley made late in his career, after 35 years with the Central Experimental Farm as Arboretum curator. The specimens that remain in the Arboretum are thought to have been planted in the late 1950s.

As is the case with a great many trees of exotic origin, the road to North American gardens was a long one for this Chinese catalpa. Although it originated in China, it was grown for centuries in Japan. And so it was that German physician and naturalist Engelbert Kaempfer (1651–1716) discovered it in Japan at the end of the 17th century, at the same time as the ginkgo biloba. But it was another German doctor, Philipp Franz Balthasar von Siebold (1796–1865), who brought the Chinese catalpa to the attention of the West after by growing it in the Netherlands in 1849. It was marketed in North America beginning in or around 1874. It grows to this day in Canadian soil, mainly in large urban parks where its hardiness and resistance to air pollution stand it in good stead. Its abundant flowers bunched together in creamy white panicles, speckled with orange and violet, are a treat for the eyes and irresistible to insect pollinators.

▸ The catalpas make up a genus encompassing nearly 20 species. The species ovata, the Chinese catalpa, is a flowering tree with a spreading habit capable of reaching 10 metres high. It has large heart-shaped leaves with a greenish blue underside, as well as a robust root system.

◂ At every step of its annual phenology, or seasonal evolution, this catalpa has a definite exotic cachet: its dull-purple foliage during leafing, its enormous purple and orange-yellow flowers and its pod-like drooping fruit.



The Evolution of the Nation's Capital

Originally, in its natural state, the region that would become Canada's Capital was covered in trees. It had enticed Indigenous peoples, the first explorers and the European merchants who settled there over the years. The colonization of Hull township, beginning in 1806, and the creation of the cities of Bytown (later Ottawa) in 1826 and Hull in 1875, were thanks in large part to forest potential and the development of the forestry industry. But to profit from this invaluable resource, the settlers first had to tame those vast forests.

◂ Greenhouses and nurseries, Springfield Road, Rockcliffe, 1939, photograph from Gréber Plan, 1950.

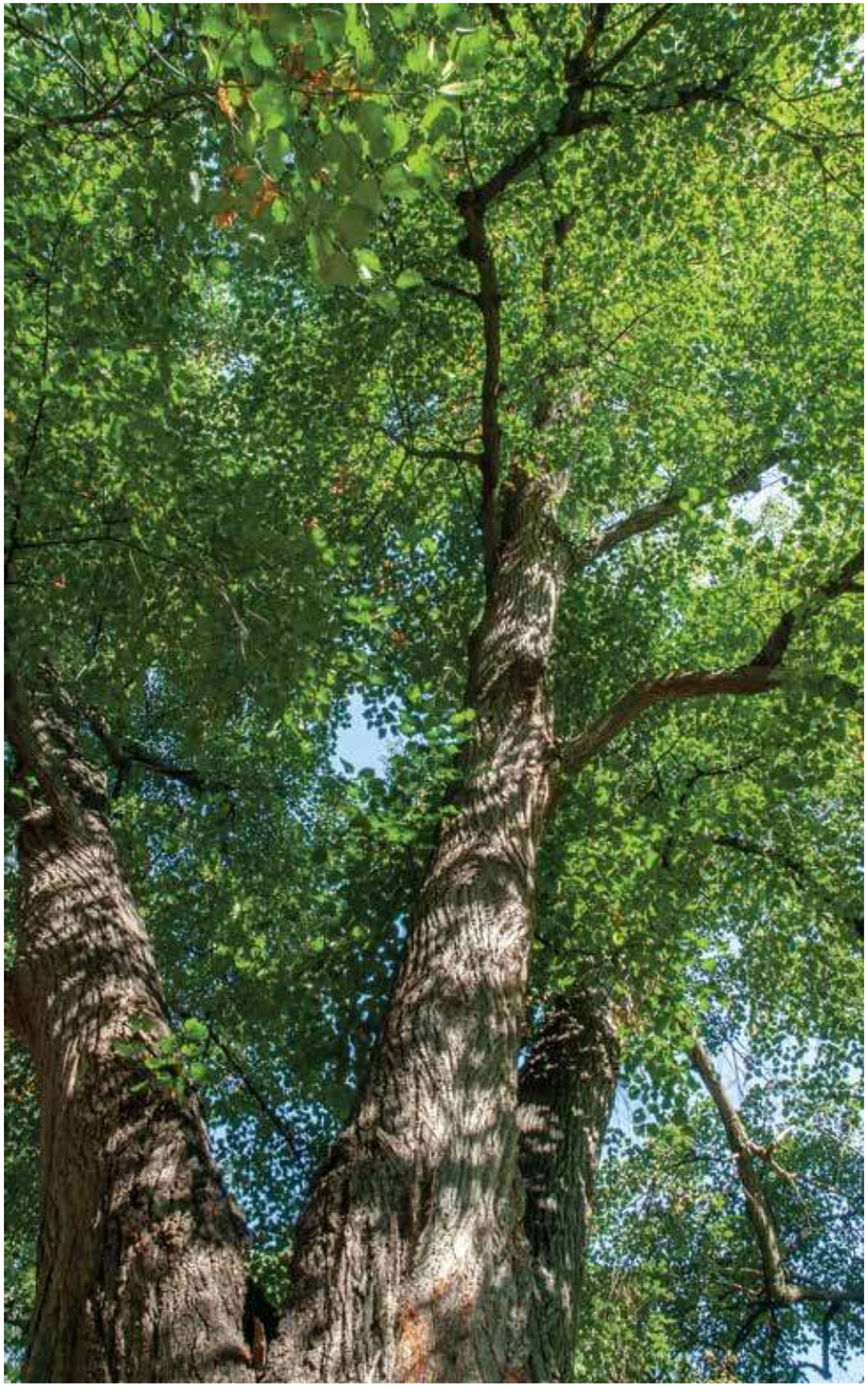
Source: NCC, Gréber Collection

The creation of the Rideau Canal, which took place between 1826 and 1832, was a prime example of this "taming." As described by Herb Stovel, an internationally renowned authority in heritage conservation, the work was exhausting for the labourers, who had to contend with virgin forest. The eastern white pine, with immense specimens measuring as tall as 30 metres, had colonized the most acidic soils. Oak, hickory, basswood, red maple, sugar maple and beech had taken over the richest soils. And cedars were found throughout the wetlands. Elm, birch and aspen, as well as the inscrutable alder, were also common. The workers had to thread their way through dense forests of giant conifers, whose immense low branches forced them to crawl on the ground. These builders were led by Lieutenant Colonel John By, who was responsible for much of Bytown's colonization and had hired stonemason and contractor Thomas McKay to oversee the construction work on the Rideau Canal and its locks. Between 1820 and 1830, McKay acquired large swathes of land at the confluence of the Rideau and Ottawa rivers. In 1834, he began laying out the grid for a village that he would christen New Edinburgh, in honour of his native Scotland. Around the same time, McKay began building his Regency-style villa called Rideau Hall (also known at the time as MacKay's Castle) on a 65-acre lot. In 1864, his son-in-law Thomas Coltrin Keefer, executor of McKay's estate, sold the property to the federal government, which would convert it to the governor general's residence. Keefer also liquidated most of his father-in-law's other land holdings but insisted on a clause barring residential development in the Pine Hill district, just north of the current Rideau Hall location. His aim was to protect this area and eventually turn it into an unofficial nature park.

Ottawa, a lumber town of 14,000 souls, would soon feel an unprecedented wind of change that would forever alter its development and landscape. At the end of 1857, Queen Victoria elevated Ottawa to the rank of capital of Upper and Lower Canada, choosing it over Montréal, Québec City and Toronto. Shortly after the Canadian government had acquired Rideau Hall, in 1864, Governor General Charles Stanley Monck packed his bags and moved in, bringing with him his Scottish-born gardener, Alpine Grant, already known throughout the region for his horticultural achievements. Under Grant's supervision, 195 trees were planted between 1867 and 1868, including about 10 European linden purchased from local supplier Alex Pontey. Among other interesting ventures, the governor general and his chief gardener introduced a brand-new horticultural variety, which would soon be featured in the royal gardens of England: the Camperdown elm.

▲▼ Tree planting during construction of Confederation Square: a large tree attached to a hitch platform is delivered to the construction site, March 24, 1939.

Source: Library and Archives Canada / National Capital Commission collection / e999909134, e999909135. [Online] MIKAN 5065168, 5065169.



European Linden

TILIA X EUROPAEA LINNAEUS

Lindens from collections the world over were planted in the Dominion Arboretum from day one, in 1889. The European linden is not a species per se, but rather the product of spontaneous hybridization between the little-leaved linden (*Tilia cordata* Mill.) and the large-leaved linden (*Tilia platyphyllos* Scop.)

It has long been known to exist in Europe, where the native ranges of the two parent species overlap. In the nursery, it is often confused with one of its parents, making it all the more difficult to identify. It was first observed in the 17th century and began to be grown soon after. Some 400 years ago, at a time when the European linden was being used along pathways leading to sumptuous homes and to line avenues, there was no technology to create similar individuals from uniform genetic material. That is why lindens that have long grown side by side are often from different races, with widely varying dimensions and appearances. The result: these pathways are not all masterpieces of landscaping.

In North America, European lindens have been grown since 1724, which is relatively early in the continent's horticultural history. Taking their cue from the Europeans, North American growers planted them on vast estates, like Spencer Wood (today known as Bois de Coulonge, in Québec City), which was the governor general's residence before it burned to the ground in 1860. It would later be rebuilt in 1863.

◂ This European linden in the Dominion Arboretum is a monster-sized specimen boasting a remarkable feature: it has two trunks, one of which a double trunk in its own right.

▸ The history of the European linden in Ottawa's Central Experimental Farm is shrouded in mystery, since the records on its origins were lost in a fire. It is also suspected that the identification labels got mixed up when various similar-looking lindens were shipped or received.

▸ Every year around St. Jean Baptiste Day, a bit before Canada Day, masses of tiny bouquets of flowers on the Dominion Arboretum's magnificent collection of linden trees fill the air with their sweet perfume.

Red Oak

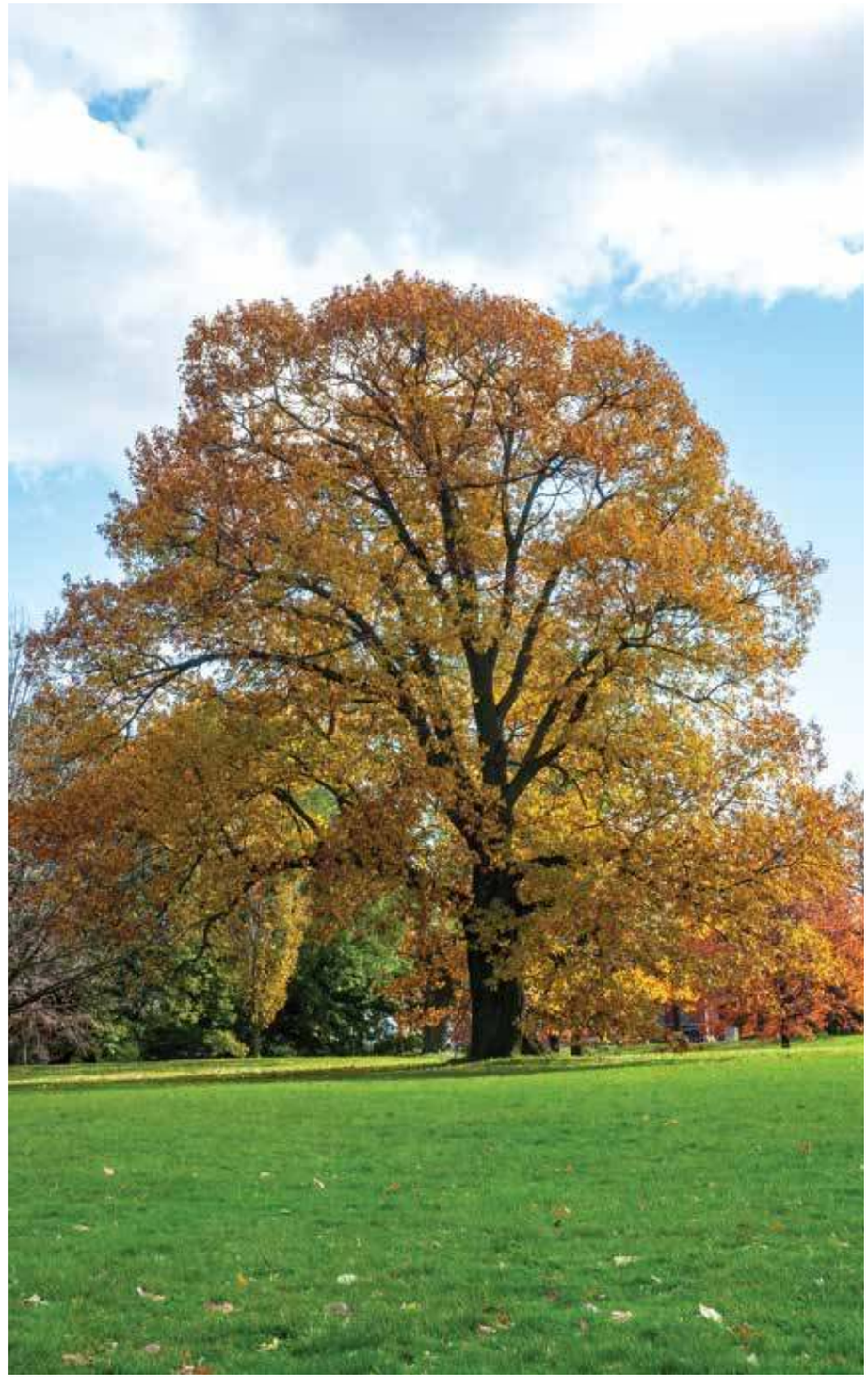
QUERCUS RUBRA LINNAEUS
MITIGOMINJ (ANISHINAABEMOWIN NAME)

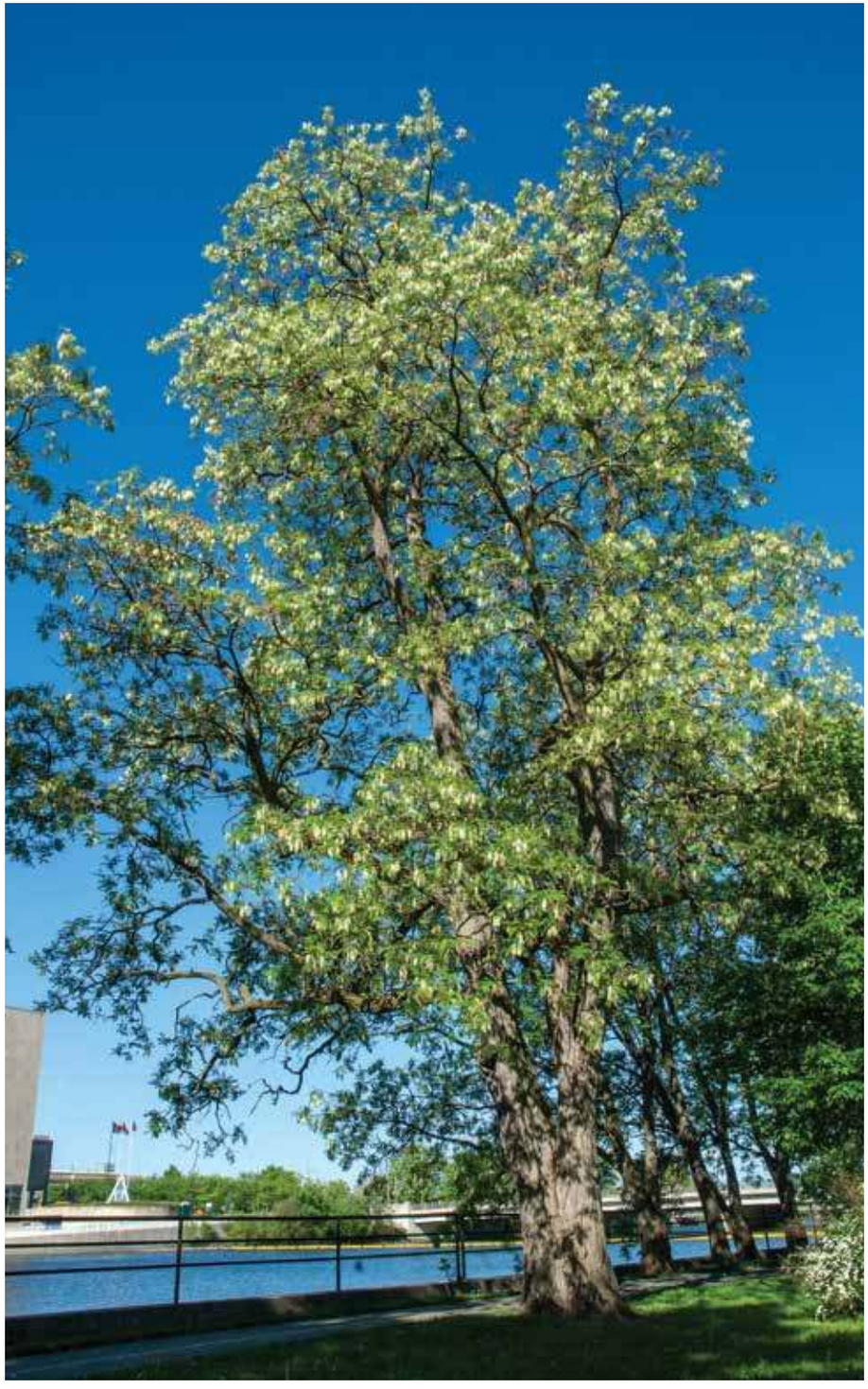
The noble red oak has a magnificent bearing. This living sculpture features a short trunk (in some cases divided) and an almost perfectly globular crown projecting up from an understructure of large and powerful (albeit twisted) branches that fan out horizontally. These characteristics make the branches of the red oak resistant to the vagaries of climate. Each twig, tipped not with a terminal bud but with a group of buds from which new shoots burst out in all directions, contributes to the strength and symmetry of the red oak.

The most spectacular specimens of this tree are found at Rideau Hall. A large number of species were planted between 1911 and 1916 by Prince Arthur, Duke of Connaught and Strathearn, while governor general of Canada. The third son of Queen Victoria, he was the first to cross the country on the brand-new Canadian Pacific Railway. It was during his term that Rideau Hall went from being "a gymnasium flanked by a riding school" to a residence worthy of a national capital, surrounded by a greenhouse and a developed park. Two waves of tree purchases and plantings followed, in 1913 and 1915, for a total of 1,200 specimens of oak, maple, elm, ash and spruce. The number of trees purchased from Ottawa tree grower John Graham was so high that a nursery had to be specially equipped to house the hundreds of trees destined for later planting.

This magnificent, hundred-year-old red oak was planted in 1911 by the Honourable Duke of Connaught, who was governor general of Canada at the time and living at Rideau Hall. That same year he had also planted a twin red oak on the property.

The *Quercus* genus comprises two subgroups: the red oaks and the white oaks. The white oak's leaves have round, smooth-edged lobes with no bristle, while the red oak's leaves have ribs that extend beyond the edge, ending in a bristle tip.





Black Locust

ROBINIA PSEUDOACACIA LINNAEUS

The black locust has been grown in the Dominion Arboretum of Ottawa's Central Experimental Farm since 1890. It is a large, narrow tree, often supported by two or three merged stems. The bark is filled with interconnected, intermingling grooves. The tree has an open, irregular-shaped crown with attractive, zigzag branches displaying twin spines. Its light, exotic-looking foliage consists of light-green compound leaves.

Some nice-sized specimens can be found in Ottawa's Stanley Park, in the neighbourhood of New Edinburgh (named after the hometown of its founder, Thomas McKay). In the 1820s and '30s, McKay, a stonemason, was actively involved in building the Rideau Canal. Around the same time, he acquired large tracts of land at the junction of the Rideau and Ottawa rivers. In 1834, he began laying out the grid for a village he would name New Edinburgh, which had originally formed part of Gloucester Township. In 1866, it received official designation under a special law, before being integrated into Ottawa in 1887. The neighbourhood streets were named after members of his family, beginning with McKay Street. Crichton Street bears his wife's maiden name, Thomas, John and Charles streets were named after his sons, and Keefer Street was named after his son-in-law Thomas Coltrin Keefer, who, after McKay's death, parted with a number of the properties in the district, including Rideau Hall.

◀ A hardy species native to the eastern United States, the black locust has been planted extensively in North America, where it has been able to reproduce in the wild throughout its native range, but also in the western U.S. and southern Canada.

▶ The black locust was one of the first ornamental trees to be introduced in Europe. First planted there in the early 17th century, it became naturalized without much difficulty. Its sweet-smelling flowers attract many insect pollinators and are used to make donuts in certain parts of Europe.

▶ The foliage of the black locust, whose texture recalls fern leaves, receives a June boost in the form of profusely blossoming flowers, whose honeywell consists of five uneven, butterfly-shaped petals. Producing loads of nectar, the flowers are showy and fragrant and form loose, drooping clusters.

Eastern White Pine

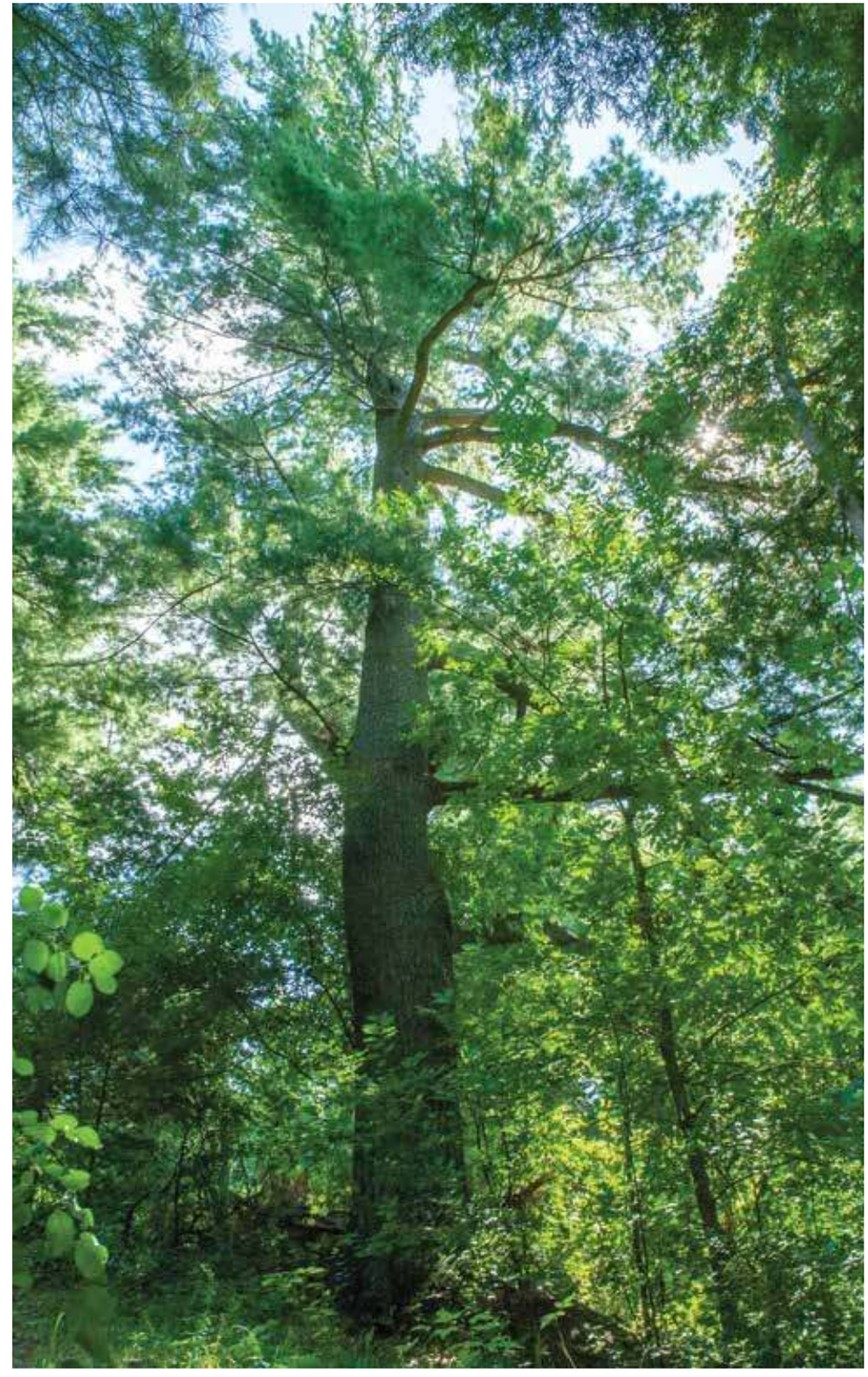
PINUS STROBUS LINNAEUS
SHINGWAK (ANISHINAABEMOWIN NAME)

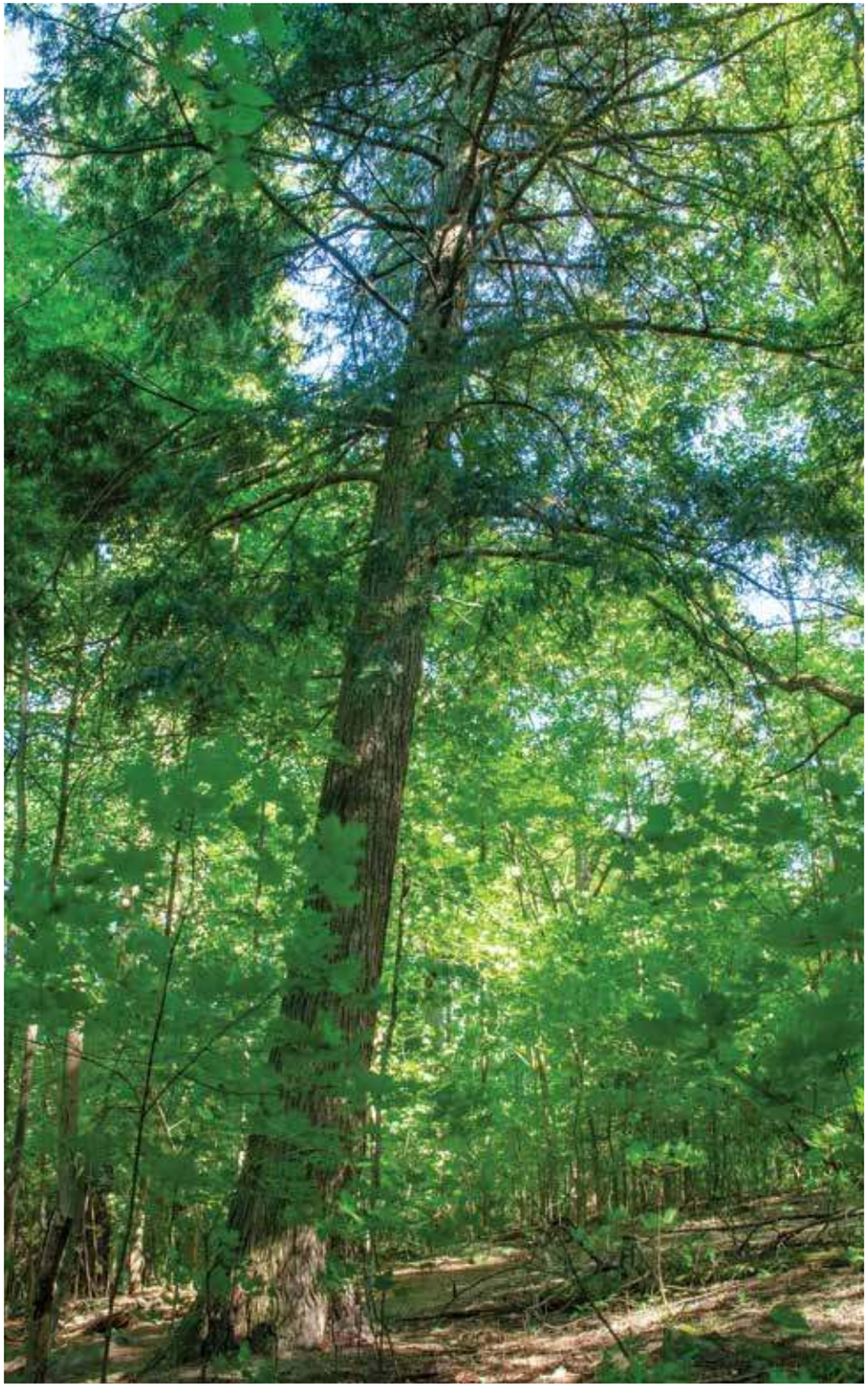
The development of scenic Major's Hill Park in 1874, the first of its kind in the area, and the creation of Lovers' Walk in 1880 marked the beginning of Ottawa's transformation into a national capital. First the city had to lease land from the federal government while promising to protect the existing trees and shrubs, to plant new trees and to develop trails, benches and fences. These had once been densely wooded areas but were now mostly barren. The city proceeded to plant sycamore maple, ash, elm, maple, basswood and tamarack.

Ottawa continued its beautification efforts by creating seven other parks within a quarter-century period. It began developing Rockcliffe Park in 1893, and in 1897 acquired most of the land and the Pine Hill portion of the park that had belonged to Thomas McKay. Much credit is due Keefer, McKay's visionary son-in-law and the executor of his estate, without whom the park would never have been created. When selling his father-in-law's land to the city of Ottawa, he included in the deed a clause prohibiting residential development in the Pine Hill sector, just north of the current site of Rideau Hall, to protect and convert it into an unofficial nature park. For nearly half a century and until the start of the Second World War, countless visitors would take the streetcar there on weekends.

▸ Nice specimens of eastern white pine, like this one, are found in the Pine Hill section of Rockcliffe Park. Fortunately, when the Dominion of Canada took over the area in 1885, it preserved it as a park. Since then it has been managed by various entities, most recently the National Capital Commission.

◂ Among the Iroquois, the eastern white pine is the tree with the largest documented number of therapeutic uses. They used it to treat coughs, colds, rheumatism, childhood illnesses, certain venereal diseases, as a breathing aid for the obese and as a stomach cleanse.





Eastern Hemlock

TSUGA CANADENSIS (LINNAEUS) CARRIÈRE

KAGAGIMIJ (ANISHINAABEMOWIN NAME)

How pleasant it feels to escape the scorching summer heat in Rockcliffe Park's charming little Pine Hill forest! The cool temperatures in the forest are no strangers to the eastern hemlock. Totally intolerant of light and drought, the young hemlock needs the shade cast by neighbouring trees to make its way in the forest. Once it reaches maturity, its crown — consisting of myriad branches with twigs covered with a massive amount of needles — becomes dense and great at intercepting the light. Its offshoots can then develop at the foot of their mother tree, under a shade that comforts them and passers-by alike.

The trees of the genus Tsuga toured the world before some 10 species found their way to the forest habitats of North America and Asia. Vestiges of European species are found in the form of petrified hemlocks and pollen in bogs in France and Poland. Three of the four species native to North America grow in Canadian soil, but only one in Eastern Canada: the eastern hemlock. Typically, like its Tsuga siblings, its slanted top shoot bends in the direction of the dominant winds. In Canada's latitudes, therefore, the hemlock generally bends eastward, and thus plays the role of forest compass.

Interesting fact: half the time, the dominant winds of the Ottawa region blow in a range of directions between north-northwest and southeast, which explains why the National Capital Region is home to hemlocks whose top shoot (or leader) seems disoriented.

◀ In the Pine Hill woods, magnificent hemlocks like this one rub up against large eastern white pines, brothers not only in nature but in Indigenous pharmacology — both have powerful healing properties and were used to combat scurvy and other serious illnesses.

▶ In the early days of the New World, tanners continued using the tannins from the oak bark with which they were already familiar on the Old Continent, but Indigenous peoples soon helped them discover the virtues of the eastern hemlock, whose bark consists of 8 to 10 percent tannins.

Sugar Maple

ACER SACCHARUM MARSHALL
SIZIBAKWADO-ININATIG (ANISHINAABEMOWIN NAME)

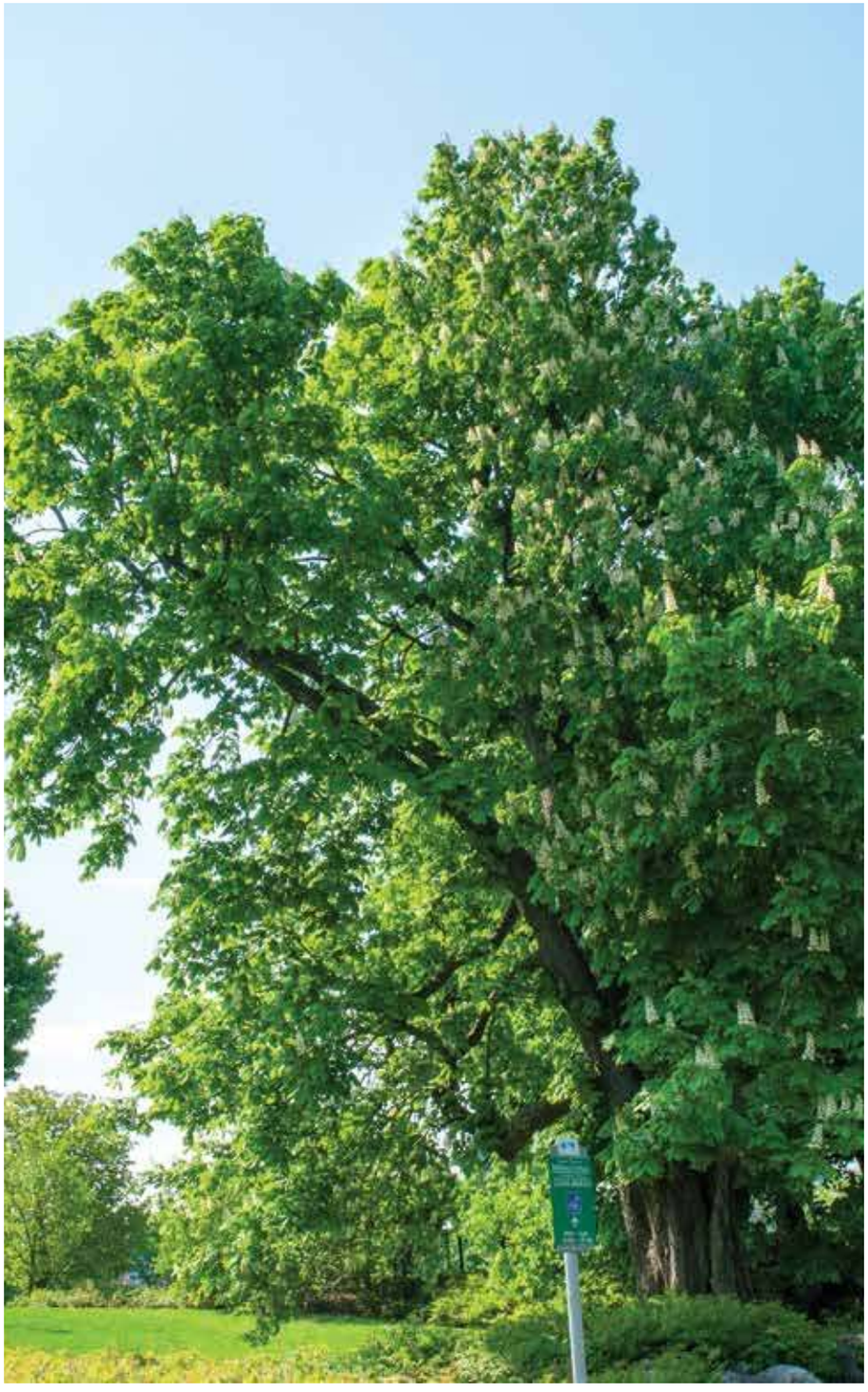
This Sir George-Étienne Cartier Parkway specimen perfectly illustrates the ornamental nature of the sugar maple. In his 1925 annual report, Dominion Horticulturalist William Terrill Macoun sang the sugar maple's praises. He described it as the best of all hardy ornamental trees in the Ottawa region, thanks mainly to its ideal globular habit. At the time, this native species was prized in urban arboriculture, primarily for its sumptuous fall colours but also for its magnificent, perfectly symmetrical bearing, surpassed only by that of the American elm.

The remarkable National Capital Region specimens are all the more impressive for the fact that over the past several decades, the sugar maple has tended to grow more slowly in these latitudes. Knowing that it does not tolerate acid rain or air pollution well, and that its sensitivity to flood and drought leaves it vulnerable to the effects of climate change, no effort should be spared when it comes to conservation. Nevertheless, the fact remains that the sugar maple is a dominant or co-dominant hardwood in local forests. Its many strengths include abundant seed production, high resistance to wind and blowdowns, and tremendous economic value, which guarantee it renewal and consistent care, not to mention continued monitoring by experts. There is also its strategy of cross-reproduction with the black maple, which generates a widely diverse progeny.

▸ The sugar maple grows throughout the northeastern United States, where it is the official tree of four states. In Canada, it is limited to the hardwood forests of the Maritimes, southern Quebec and Ontario, as is the case for most of the nine other *Acer* species native to Canada.

◂ An intriguing sugar maple is found near Trail 27, accessible from P13 in the Capital Greenbelt's Stony Swamp. In this specimen, the two neighbouring main stems merged at a certain height, creating a successful autograft.

◂ Because both the black and sugar maple feature hermaphrodite flowers, they reproduce by necessity through cross-fertilization. And since the two species are closely related, they hybridize easily.



Common Horse Chestnut

Aesculus hippocastanum Linnaeus

Steeped in history, Major's Hill Park offers magnificent views of Parliament Hill and the Rideau Canal. It has been a popular site since Ottawa became a city, in 1826. Lieutenant Colonel John By had his residence there while overseeing the Rideau Canal construction project. The ruins of his home, where he lived until 1832 before returning to England and which burned to the ground in 1848, are still visible. In 1874, the site became the city's first landscaped park and was expanded to include Lovers' Walk, under the direction of architect Thomas Seaton Scott. Scott took inspiration from Calvert Vaux's and Frederick Law Olmsted's work designing New York's Central Park, inaugurated the previous year.

Apart from the 100-year-old trees still standing in Major's Hill Park, another witness to its horticultural past is worth noting: Header House. This section of the park's greenhouse complex, mostly dismantled in 1937–1938, is found at the park's northern edge.

Over the centuries, the common horse chestnut has been featured in large cities the world over, well before they became contaminated by air pollution and periodically assaulted by heatwaves. Today's urban ecosystem has not been kind to this tree: its foliage turns brown prematurely, if, that is, some or all of it — flowers included — has not already been destroyed by a late spring frost.

◂ This old-timer was likely planted during the early days of the Ottawa Improvement Commission, circa 1900. One of the commissioners, William Saunders, also headed up the Ottawa Experimental Farm, whose nursery and staff supplied the improvement commission's plantings. The common horse chestnut has grown at the farm since 1890.

▸ The common horse chestnut is at its most splendid when it is blooming. Its bell-shaped crown, supported by a clockwise-twisting trunk, is laden with masses of blooms, each consisting of 100 to 200 cream-coloured asymmetrical flowers.

Yellow-wood

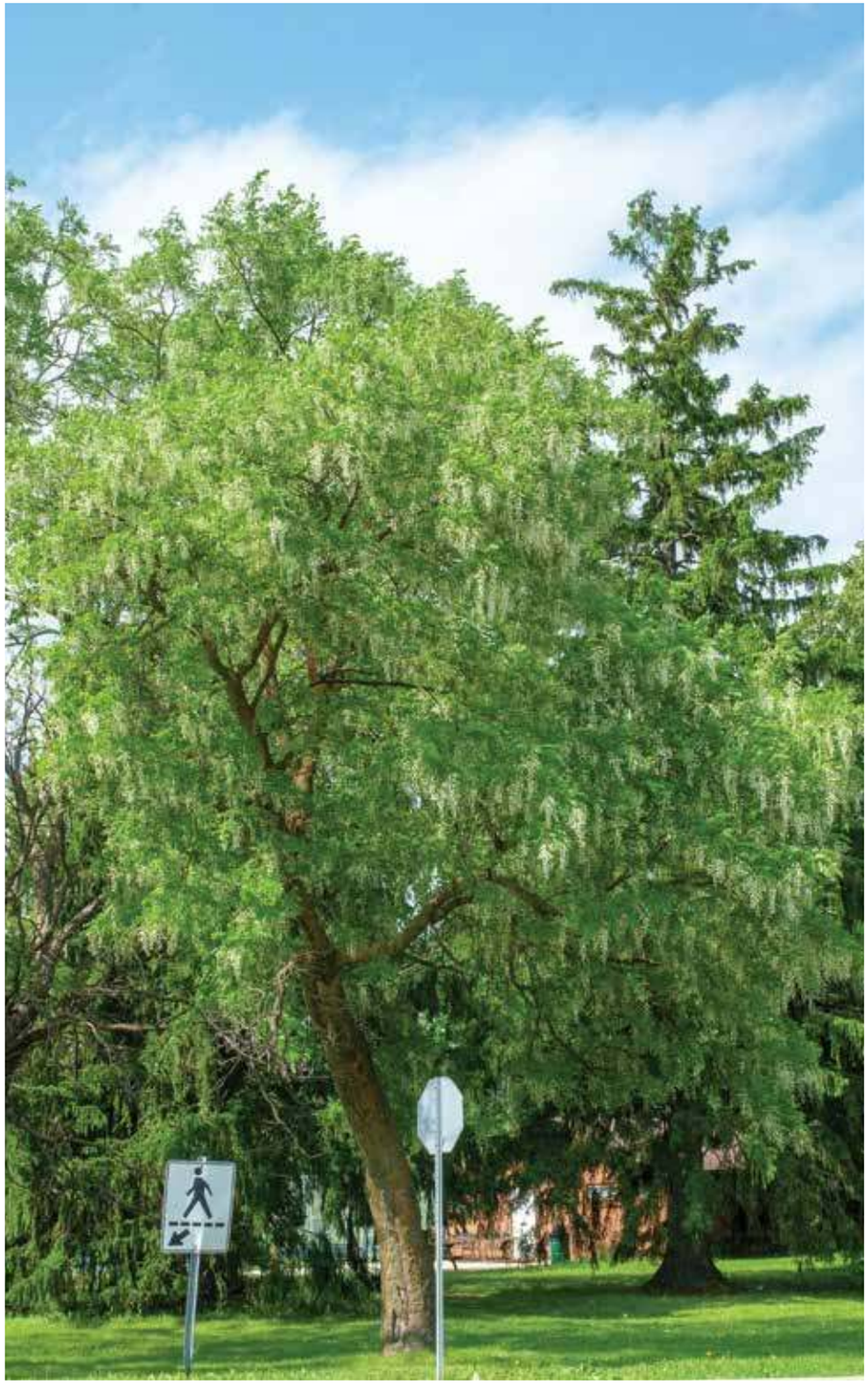
Cladastris lutea (Michaux) K. Koch

The yellow-wood is prized by landscape designers for its refined and uncommon nature. Its ornamental qualities and fragrance are undeniable: its irregular habit, clusters of fragrant white flowers, pod-shaped fruit and light green summer foliage that turns orange-yellow in the fall. All these features stimulate the senses, making the yellow-wood fit right in to scenic Major's Hill Park.

When this park was created, a great wind of change was sweeping Ottawa while it was preparing to put its best foot forward as the capital of Canada, as decided by Queen Victoria. The park's creation marked the beginning of the city's beautification movement, which would later see the city methodically add numerous parks, pathways and trails. As early as 1908, the city already boasted seven different parks. The Ottawa Improvement Commission, founded by Prime Minister Wilfrid Laurier in 1899 with a view to transforming Ottawa into a world capital, was then handed the baton from municipal authorities. From day one, the improvement commission could count on the assistance of experienced, volunteer commissioners who threw themselves into the task of developing and renovating pathways and parks: William Saunders, the founding director of the network of Canadian experimental farms, and William Terrill Macoun, then head of the Horticultural Division of the Central Experimental Farm.

The yellow-wood is a small North American tree with an attractive, mottled bark. It is rare in its native range, which is limited to start with (confined to North Carolina, Kentucky and Tennessee).

The yellow-wood belongs to the black locust and honey locust botanical family. Its fragrant large white flowers recall those of the sweat pea and are bunched together in long, elegantly drooping blooms attached to the tips of the year's new shoots.



Yellow-wood

CLADASTRIS LUTEA (MICHAUX) K. KOCH

In 1897, James Ross, who made his fortune heading up the Canadian Pacific Railway, had his Golden Square Mile home and property in Montréal expanded and redeveloped by brothers Edward and William Sutherland Maxwell, who, in turn, called on half-brothers John Charles and Frederick Law Olmsted Jr. for the landscaping. It was they who oversaw the planting of a yellow-wood in Ross's garden. They were the sons of Frederick Law Olmsted, who had created Central Park in New York City between 1860 and 1873 and, in 1874, received an invitation from Montréal officials to create Mount Royal Park.

In 1903, landscape architect Frederick Gage Todd, who had launched his career in Montréal in 1900, was serving as special adviser to the Ottawa Improvement Commission, which had him design an inaugural urban plan for the capital. He had interned for four years at the firm owned by the Olmsted brothers, who themselves had been trained at the Brookline School of Architecture in suburban Boston. At the time, landscape architects all had a way of putting their own distinctive mark on their design creations: they included specimens of unusual and exotic-looking species, like the maidenhair tree, Amur cork tree or yellow-wood. Their clients were honoured to be growing these rare trees in their gardens.

◂ The Dominion Arboretum first planted the yellow-wood in 1897. Curiously, it was around the same time that the species was first planted in Montréal — perhaps the latest fad among ornamental tree growers.

▸ The purpose of the Ottawa park network was to maintain the health and well-being of capital residents. Frederick Gage Todd was tasked with suggesting parcels of land to acquire for these parks and, later, with designing Québec City's Battlefields Park for the federal government.

Black Walnut

JUGLANS NIGRA LINNAEUS

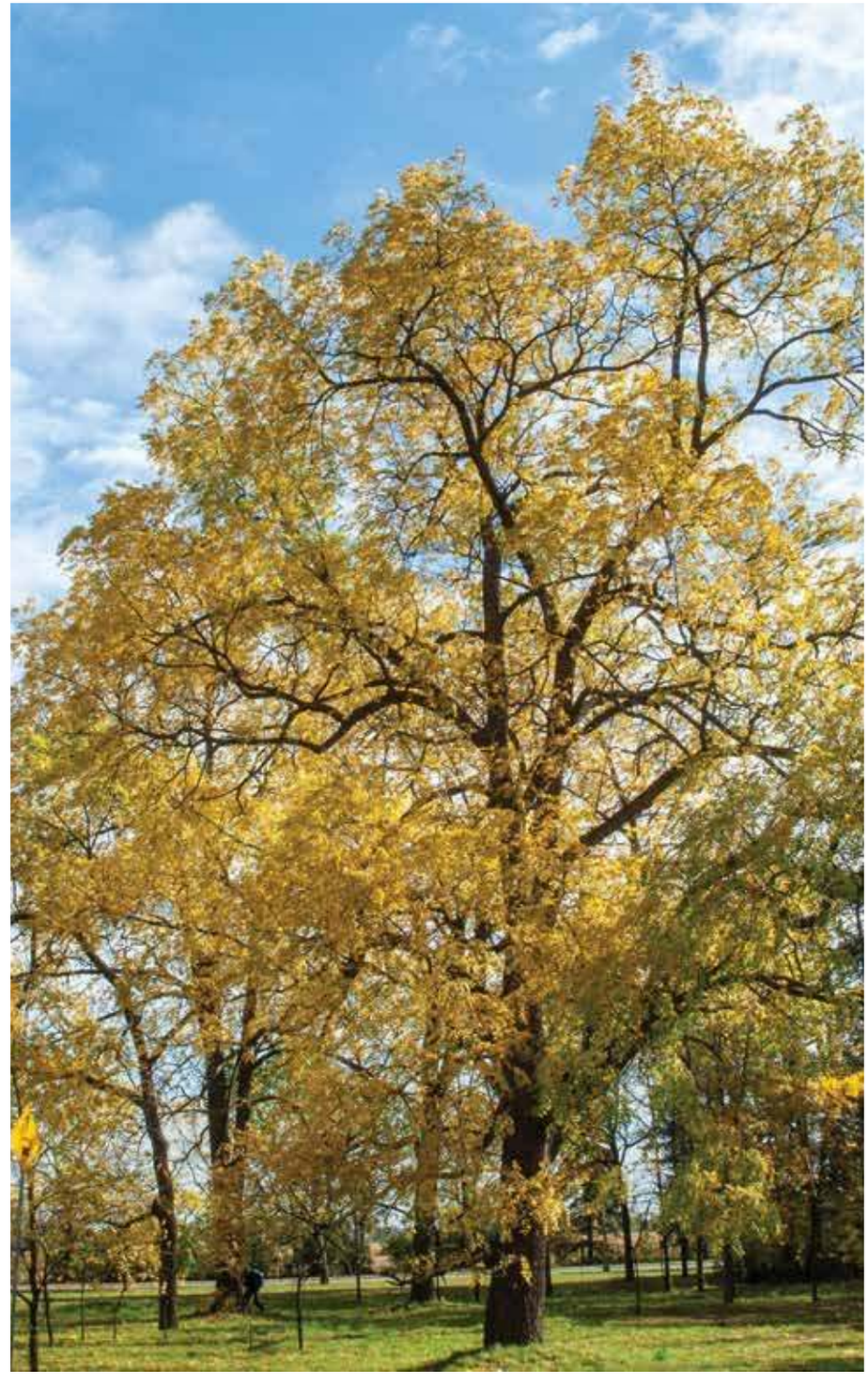
The black walnut is a native southern species whose origins can be traced to southernmost Ontario and the United States, with its hot temperate climates. It is not found in its natural state in the National Capital Region, on either the Ontario or Quebec sides of the Ottawa River. That said, it was planted early on for its myriad qualities, not least of which was the value of its wood. The oldest plantation of black walnut on the continent is in Quebec, along the St. Lawrence River. There, 100,000 walnuts were planted in Joly de Lotbinière Estate in 1882.

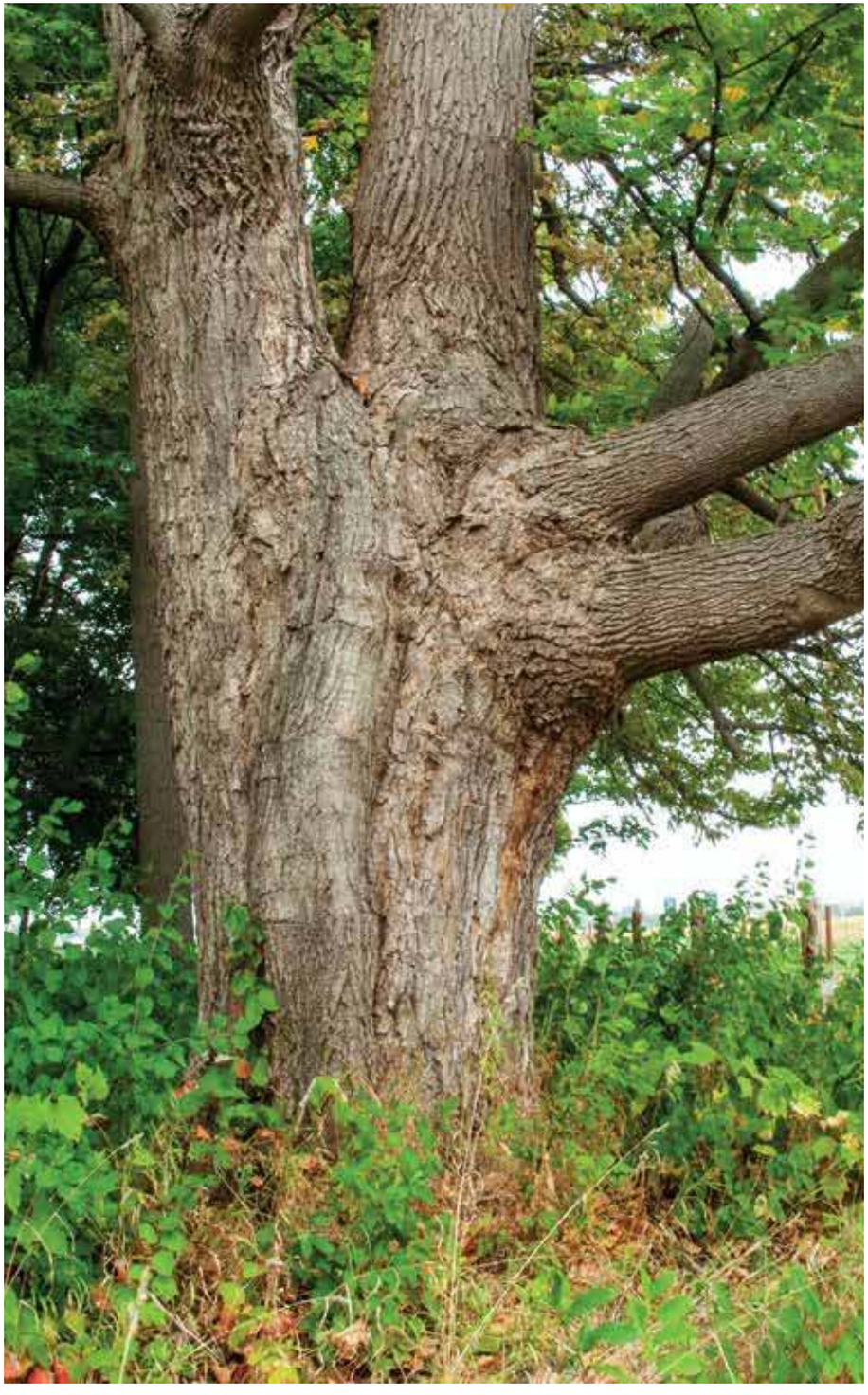
The black walnut was also one of the species selected by William Saunders for studies launched in 1899 by the Central Experimental Farm to identify the most commercially viable species, particularly for lumber. James Fletcher, Dominion Entomologist and Botanist from 1888 to 1909, described the black walnut as "one of the most valuable of our native woods." Tough, heavy and streaked with satiny brown, this valuable wood — resistant to both denting and humidity — is highly prized in cabinet-making, particularly for the manufacture of high-end furniture and musical instruments, as well as for shipbuilding. The black walnut is a landscaper's dream, with its serrated leaves and its large, round, apple-green fruit.

This magnificent black walnut, standing in the large plant bed near Fisher Park and Holland Avenue, is a remnant of the wide forest belt planted at the western and northern borders of the Central Experimental Farm by director William Saunders in the spring of 1889.

Every part of the black walnut, be it the leaves, husks, roots or bark, produce juglone, a substance that inhibits the growth of other surrounding species. This points to the importance of carefully choosing where to plant it — particularly, not too close to the garden.

Those planting the black walnut for its nuts, be forewarned: its fruit is encased in a citrus-smelling husk used to make a black dye that leaves a nearly indelible stain. As this husk must be removed before breaking the shell to obtain the nut, caution is advised!





Black Maple

ACER NIGRUM MICHAUX

There are over a hundred species of maples in the world, ten of which are native to Canada. The black maple is one of them. The other native maple species are the sugar, silver, big-leaf, red, mountain, Pennsylvania, Douglas, vine (with rounded leaves) and Manitoba (with compound leaves).

The black maple is found mainly in wet, fertile flood plains, where it can reach a height of 25 metres and live to be 200. It is the Canadian maple species with the southernmost native range, as it grows only in temperate climes. Its range extends as far north as the Laurentians and as far south as the American Midwest and includes southeastern Ontario. It is found only sporadically in pure stands, some of which comprise only a few medium-quality individuals. Fortunately, the Ottawa Valley, including the National Capital Region, has the moist and chalky soils it craves. It is found in maple stands with bitternut hickory and is also mixed in with other hardwoods, such as the eastern white pine and the eastern hemlock.

The black maple owes its name to the dark green of its foliage and the blackish grey of its bark. It can tolerate shade for many years before shooting upwards when there is an opening in the canopy. However, its dwindling numbers and the ease with which it hybridizes with sugar maple (and thus alters its genetic integrity) make it a species at risk, both in Canada and the United States.

◀ Around the perimeter of the Experimental Farm, at the corner of Fisher Avenue and Trent Street, is this magnificent specimen of black maple, with its egg-shaped habit and rounded peak. It is a remnant of the broad forest belts planted by William Saunders in the spring of 1889.

▶ Of the 70 Quebec populations of black maple, most grow in the Montréal region, where the species is threatened by urban sprawl. The species is considered at risk in Quebec, since even in protected areas it is intolerant of infrastructure development and human activity.

Balsam Fir

ABIES BALSAMEA (LINNAEUS) MILLER
SHINGOB (ANISHINAABEMOWIN NAME)

The native range of the balsam fir covers large swathes of northeastern North America, making this fir the most widespread of the nine native North American species. The only fir native to Eastern Canada, it reaches its northernmost latitude in Quebec.

Of all the *Abies* species, the balsam fir has the most symmetrical habit. The well-designed shape of its dense, dark bluish-green and narrowly pyramid-like crown leads its spiralled top straight to the sky. Nevertheless, it is not especially prized by landscapers because as it grows older, it tends to shed its lower branches. Then again, it makes a better Christmas tree than the spruce, if for no other reason than it takes longer to lose its needles. It is also used in shelterbelts, where it excels at creating micro-habitats for small animals.

Unlike spruce needles, balsam fir needles are short, flat and blunt. Since they do not prick, Indigenous peoples would use its smallest twigs to make beds, among other things. In traditional pharmacology, the needles are infused to produce an antiseptic and antiscorbutic tonic. The balsam fir also provides oleoresin, or fir gum, used by First Nations peoples to bandage wounds for faster healing and to seal their birch bark boats and containers.

In the sunny conditions of the Dominion Arboretum where it enjoys ample space and light in which to develop, this specimen of balsam fir, almost 90 years young, has grown at a rapid pace while maintaining a svelte and symmetrical bearing.

From the era of New France to the 20th century, fir gum was used to manufacture turpentine, which was exported to Europe under the name Canadian balsam. When scientists discovered that its refractive index was identical to that of glass, it was used as an optical adhesive.

Northern Catalpa

CATALPA SPECIOSA SCOPOLI

At the turn of the 20th century, William Saunders, Director of the Central Experimental Farm, would often discuss with Rideau Hall occupants Lord and Lady Minto ideas on how to spruce up the property and which trees and shrubs to plant there. As a volunteer member of the Ottawa Improvement Commission, he was also responsible for plantings along the scenic parkway bordering the Rideau Canal. In 1901, aware that the five-mile parkway would require a massive amount of vegetation, he imported 23,000 specimens from France. He planned on storing them in the farm's nursery until they could be planted.

It seems highly unlikely that catalpas, particularly from the genus *speciosa*, were not included in these beautification efforts, seeing as how the species was all the rage then. Circa 1895, the celebrated Auguste Dupuis from the Aulnaies nursery and Quebec politician Henri-Gustave Joly de Lotbinière were already growing it for its tremendous ornamental value. A concerted campaign was also led by the secretary of the International Society of Arboriculture to popularize the tree in the United States around the turn of the century. The campaign vaunted the tree's rapid growth, the rot-free nature of its wood and its industrial potential. Catalpa plantings began to proliferate. But little was known about the species' growth conditions, and the wood proved fragile and insufficiently dense, precisely because of its phenomenally fast growth rate. Soon, many agricultural businesses and farmers stopped growing it. Ever since, the catalpa has been used almost exclusively in ornamental horticulture.

Of the dozen species of catalpa, only two are American: the southern catalpa, also known as cigar tree (*Catalpa bignonioides*), and the northern catalpa (*Catalpa speciosa*). Of the two, the northern catalpa is the hardiest. It originated in a tiny region known for its alluvial soil, at the junction of the Wabash, Ohio and Mississippi rivers. Its native range extends only from the greater Memphis area to Lawrence County, Illinois. When it was introduced in Canada, no one could have foreseen its success. Usually when the risk is taken to grow a species with a limited native range, it does not adapt well to the conditions in the new region, especially in a colder hardiness zone. But the catalpa is the exception that proves the rule. Surprisingly adaptable, it has proven capable of withstanding the most extreme conditions: rich soil or poor, soil that is acidic or alkaline, and flooding followed by drought.

Catalpas in the National Capital Region are well-acclimatized trees with undeniable aesthetic value. Elastic and exotic, the catalpa grows quickly. Its massive trunk, measuring up to two metres in diameter, supports an asymmetric crown structured with large, upward curving branches. A multitude of enormous apple-green leaves, shaped like an upside-down ace of spades, cascade out from its twigs. Later on, these leaves turn a surprising purple. When the tree is in bloom, the effect is spectacular. Late June sees the appearance of long terminal racemes bearing large crumpled white flowers reminiscent of certain orchids. The gold- and lavender-flecked throat of these trumpet-shaped flowers is streaked with similar colours. In autumn, the catalpa is laden with a multitude of hanging fruit resembling giant bean pods. Solidly attached to the tree, these long cylindrical capsules flutter in the wind for much of the winter.

▲ The city-loving catalpa can withstand most urban challenges: heat islands, infertile or compacted soil, air pollution and even factory smokestacks. As if to honour the Capital, the Ottawa specimens time their spectacular blooms to coincide with Canada Day celebrations.

◀ This wonderful catalpa grows on Green Island, near a federal building that used to serve as city hall between 1958 and 2001. The site can be accessed via Minto Bridge, built in 1900 and named after the 4th Earl of Minto, then governor general of Canada.

American Elm

ULMUS AMERICANA LINNAEUS
ANIB (ANISHINAABEMOWIN NAME)

After the city of Ottawa developed Rockcliffe Park, one of the city's first recreational parks, from 1893 to 1897, the Ottawa Improvement Commission, created in 1899 by Prime Minister Wilfrid Laurier, quickly came to its aid and took over from the municipal authorities. Laurier created this organizational instrument to transform the city of Ottawa into a world-class national capital. From its very inception, the organization benefited from the contributions of expert volunteer commissioners who threw themselves into developing and renovating parkways and parks. These commissioners included William Saunders, founder of the network of experimental farms, one of the largest projects of the fledgling Canadian Confederation, and William Terrill Macoun, his right-hand man. They contributed not only their expertise but also labour and plant material from the Central Experimental Farm nursery. That is why certain specific species still in existence on the farm's campus and in its arboretum were also part of the ambitious projects completed by the Ottawa Improvement Commission, like Ottawa's first scenic route, Queen Elizabeth Driveway, originally the Rideau Canal Driveway.

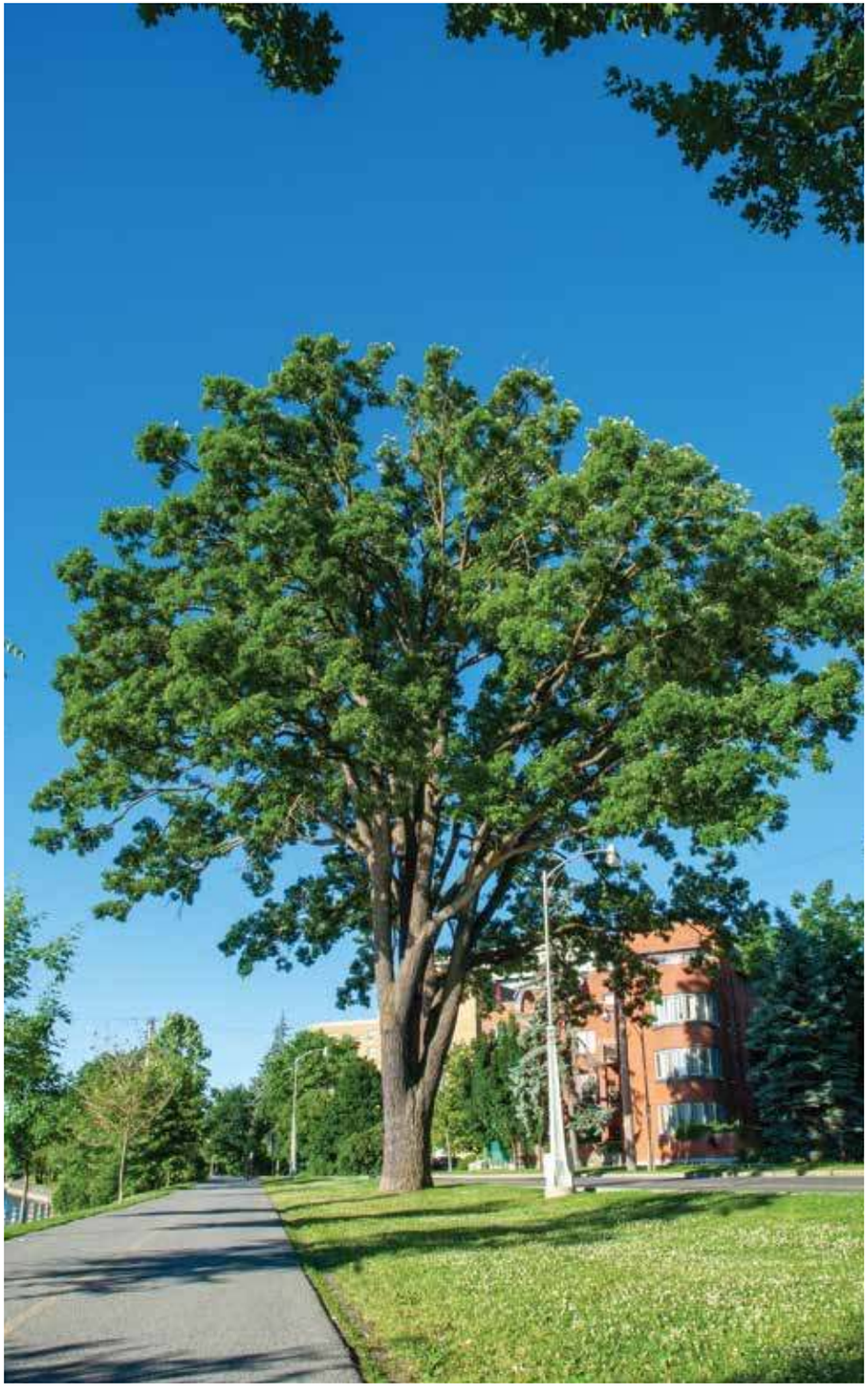
Typically, the work done by the improvement commission was modelled after the Victorian landscape design that was in vogue in the early 20th century. This landscaping incorporated the British tradition of earth sculpture, which consisted of fashioning mounds to create landscaping effects. The development of parks and parkways was also in keeping with the spirit of the Victorian "gardenesque" style and its planting traditions. They were generally designed in an axially symmetrical manner, where large swathes of greenery alternated with well-manicured lawns, gently curving gravel pathways, architectural features and other ornamental structures, such as stone benches. The gardenesque style also promoted a wide range of trees, shrubs, flowers, ferns and mosses, both native and exotic plants arranged in contrasting fashion in terms of shape, size, colour and density, and the presence of small animals, often birds.

Major's Hill Park and the spaces between the Parliament buildings and cliff are choice examples of this British landscaping tradition, largely reflective of the socioeconomic context of the Victorian age. It was an era of the growing industrial bourgeoisie and of the stately country manors its members were building, complete with garden salons where they would "receive" guests. The landscaping also reflected a desire to plant trees recently discovered in India on other British soil in the Empire.

The American elm is no stranger to this horticultural history, bringing its own undeniable exoticism. It is the aristocrat of North America's native trees, one of its most majestic and graceful species, which made it popular in North America and Europe. The first specimens were planted at the turn of the 18th century in Schwabach, in current-day Bavaria. One of them is said to have been growing there for some 150 years. In 1752, James Gordon introduced the American elm in England. He carried the tree in his popular nursery in Mile End, a hamlet in today's East End of London. In 1807, it was planted in France, in Versailles's Trianon Park, with seeds sent from America by botanist François André Michaux (1770–1855), who was carrying on the mission that France had assigned to his father in 1785: to introduce American plants in Europe.

▲ What is surprising about the American elm is that such a colossal tree with such a large trunk produces such tiny flowers attached to such frail stalks. Luckily, blooming occurs early in spring, before the leaves have had a chance to grow in.

◀ Perched on its mound, this magnificent elm is a remnant of the first projects carried out by the Ottawa Improvement Commission to create the Capital's first scenic parkway, now called Queen Elizabeth Driveway, at the turn of the 20th century.



Bur Oak

QUERCUS MACROCARPA MICHAUX
MISHIMINJ (ANISHINAABEMOWIN NAME)

A noble native hardwood, the bur oak belongs to a select group of deciduous species whose durable wood and great versatility have given them great commercial value ever since the first settlements. So-called noble hardwoods often became rare in the forests to which they were native. That is why forestry experts from various levels of government encourage their integration using sustainable forestry practices aimed at timber production and the reforestation of abandoned farmland and cleared forests.

The bur oak occupies an immense native range extending from Canada all the way to the Gulf of Mexico. In Canada, this member of the native white oak family stretches from New Brunswick to southern Saskatchewan. It is at once the most widespread and prolific of the 11 species of Canadian oak. It develops to its full potential in the deep soil found in rich, fertile lowlands, but it does just fine on dry land as well. Better still (and defying all expectations), the bur oak seems tailor-made for modern urban life and climate change: clinging to its host terrain thanks to its deeply anchored tap root and tentacular lateral roots, it valiantly withstands wind gusts and freezing rain. With its glossy foliage, it tolerates drought, pollution and city dust.

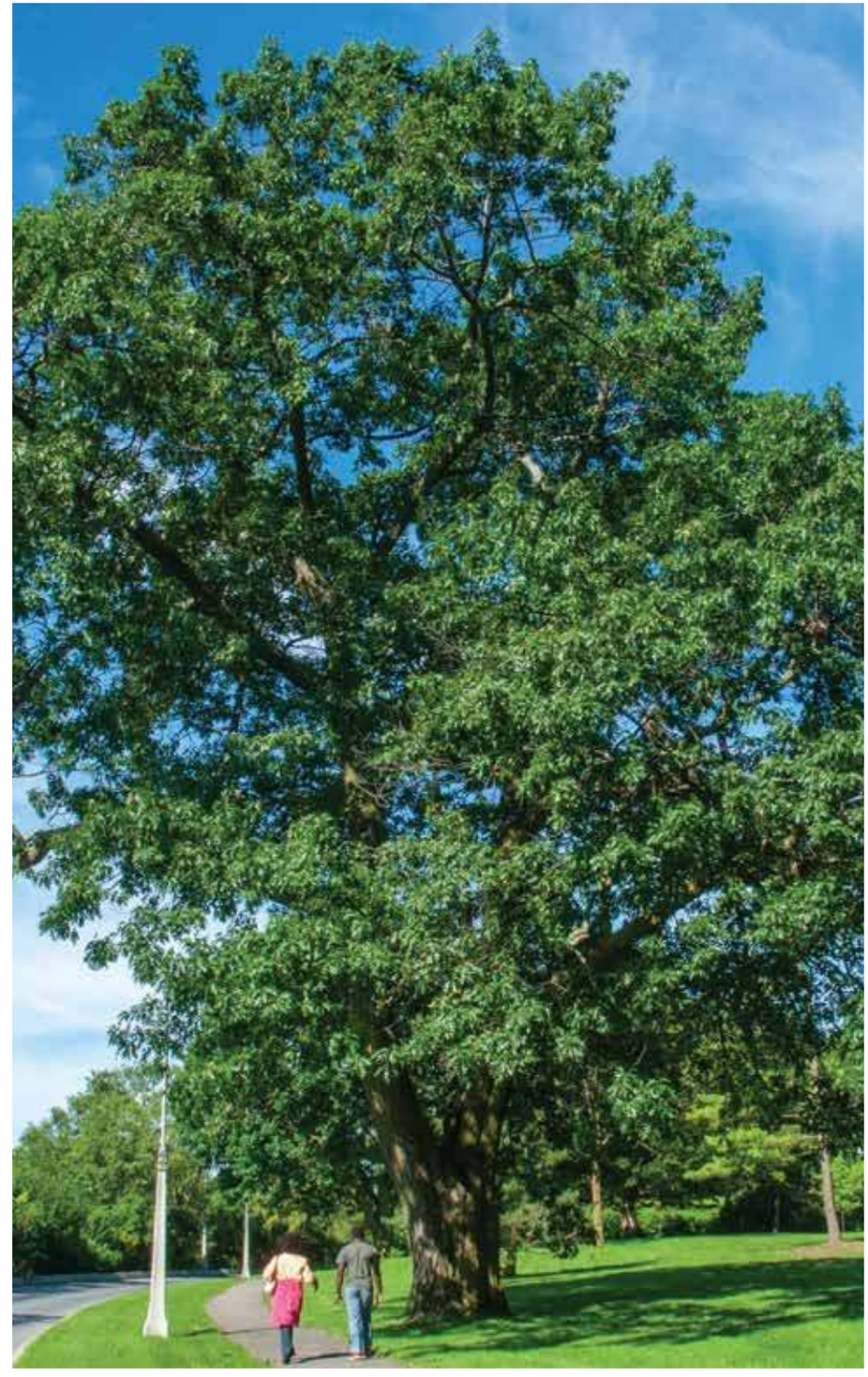
This bur oak is a magnificent representative of its species and is one of the most admired trees along the Queen Elizabeth Driveway. The bur oak's resistance to challenging urban conditions has contributed to this specimen's impressive growth.

Red Oak

QUERCUS RUBRA LINNAEUS
MITIGOMINJ (ANISHINAABEMOWIN NAME)

A major species native to eastern North America, the red oak has lent its name to an entire group of oak species sharing the same characteristics: the so-called red oaks. This colour has everything to do with one of this oak's distinctive and important traits: its tannins. Most are composed of polyphenols and anthocyanes — pigments that range from bright red to purplish. The entire anatomy of the red oak contains tannins, in greater quantity than those found in all other plant species combined. They appear in its spring foliage, in its pinkish petioles of summer and in its dark red fall foliage, which persists through much of the winter.

The large 100-year-old specimens of the National Capital Region make a convincing case that not only does the red oak fare well in urban settings, but it also has everything it needs there to become remarkable. These trees grow for as many as three centuries, despite receiving little if any help from their urban environment. The red oak's tap root extends deep into the soil, while its lateral roots are wide-spreading, shallow and fibrous. This is what enables it to tolerate pedestrian traffic and drought and to draw the maximum from the paucity of nutrients available in the urban soil. The waxy foliage of the red oak immunizes it against air pollution and helps it withstand heatwaves, thanks to moderate evapotranspiration.



This huge red oak grows along a section of Queen Elizabeth Driveway where the lanes were divided by green spaces consisting of winding trails, artificial mounds, plant beds and small rustic buildings. Thanks to the native species, the overall appearance was natural.

It did not take long for the new settlers to recognize the red oak for its ornamental value and the quality of its wood, which they used to make barrels for transporting dry goods, such as sugar. They exported large quantities of the wood to such places as the Bahamas and the Caribbean.

Cypress Oak

QUERCUS ROBUR LINNAEUS F. *FASTIGIATA* (LAM.) O. SCHWARZ

The elegant Cypress oak was first discovered in 1783 in a German forest. It is a spontaneous variety of the English oak, a species whose native range encompasses Europe, northern Africa, western Asia and Russia. The mother species has been grown for a long time, especially in the British Isles.

This is a fastigiate oak, meaning that its branches point up toward its peak, making for a compact tree with an open crown. Boasting a magnificent tapered bearing, cypress oaks are particularly well suited to an urban setting where there is only limited space between buildings and roads or pathways. In gardens, they make excellent companions for shade-intolerant species.

To date, efforts at reproducing this clone have succeeded using acorn seedlings and by grafting selected subjects according to their stability. The Dominion Arboretum started growing its first seedlings in the 1950s. Like all oak species, this fastigiated variety has marcescent leaves that die in the fall, dry on the spot and remain on the tree until the spring, when they give way to new foliage. These pointy oaks are intriguingly beautiful in winter, all dressed up in their coppery foliage.

◂ This Queen Elizabeth Driveway Cyprus oak and the surrounding and accompanying trees in this area were planted in all likelihood in the mid-1950s, around the time when the Dominion Arboretum began growing this variety.

Large-leaved Linden

TILIA PLATYPHYLLOS SCOPOLI

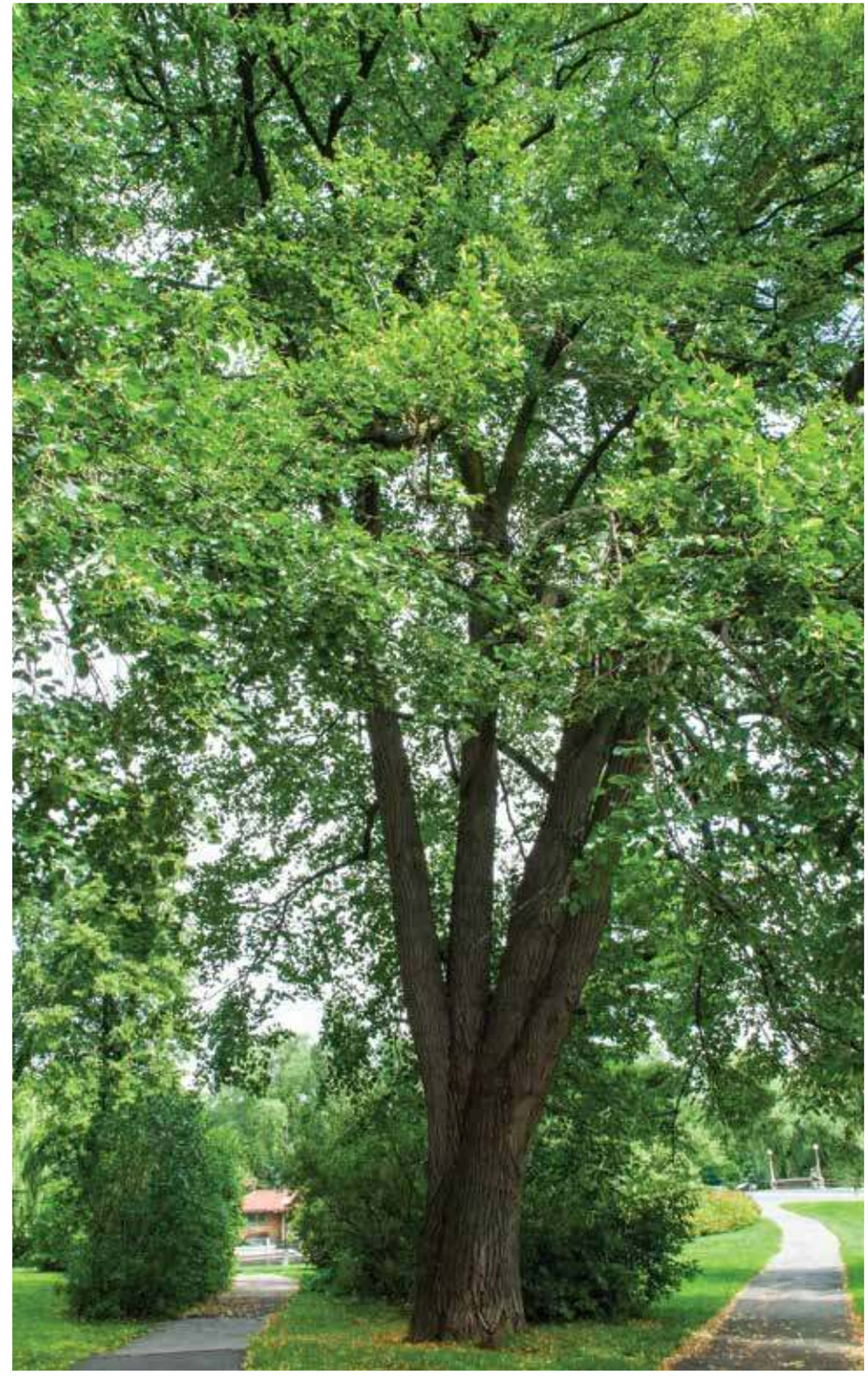
Any specimen of large-leaved linden is a living treasure, because this species — which had long grown in North America — is almost never grown anymore, other than in parks and gardens where a few individuals have survived to this day. It has given way to the European linden or the little-leaved linden.

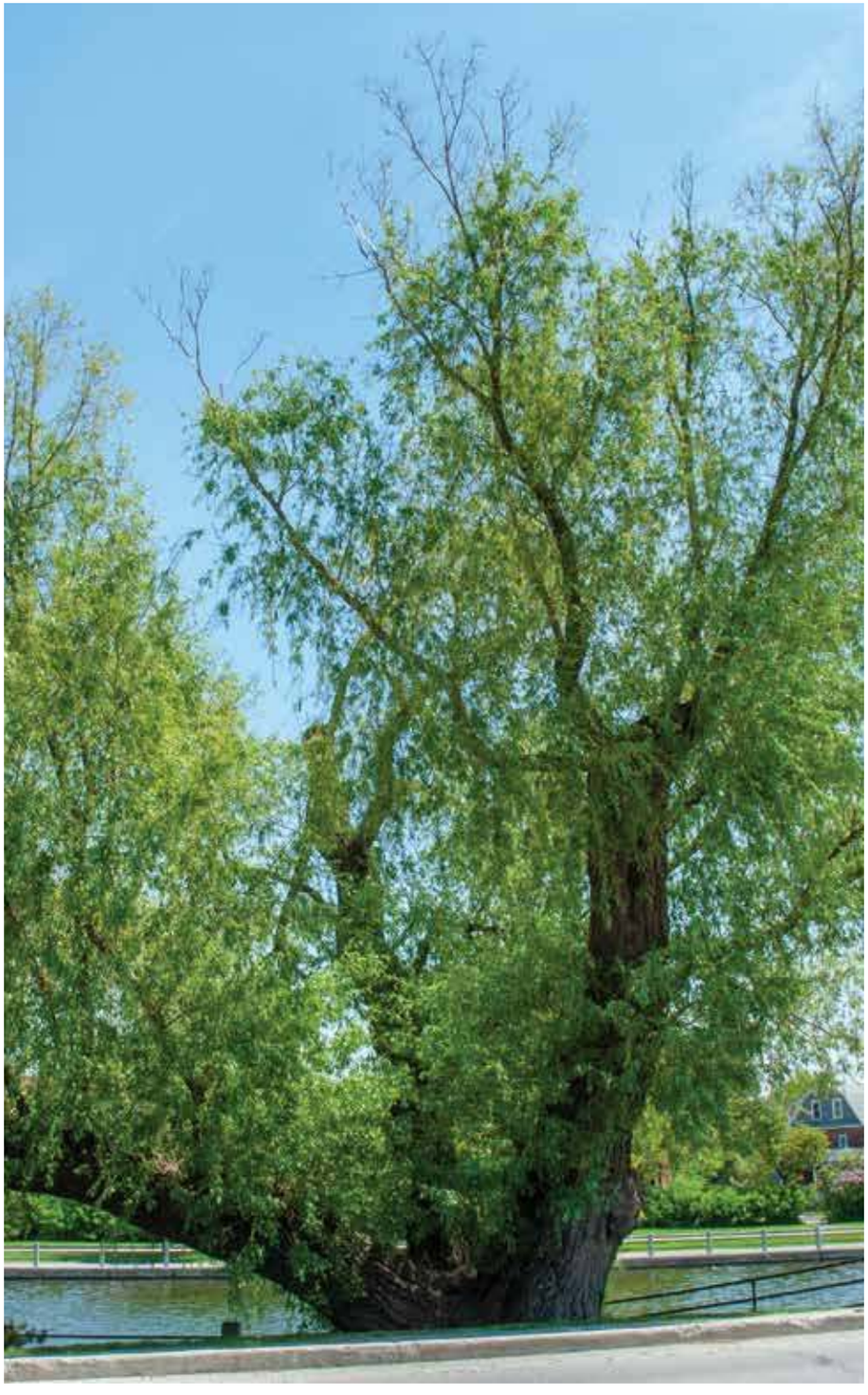
That said, the large-leaved linden enjoys a vast native range in Europe, encompassing its boreal region, southwestern Sweden, northwestern Ukraine, the southern portion of the British Iles, northern Turkey and the Caspian Sea. Seeking out pure air, this species often grows on mountains at an altitude of 1,500 metres, accompanied by beech and fir trees, and on highlands. A slow grower, this tree can live to be a thousand years old or more — an incredible feat for a hardwood. Thanks to this tremendous longevity, some of Germany's large-leaved lindens — for example, one in Upstedt (near Hanover) — are world renowned.

It has other distinctive features as well. Its leaves are hairy on both surfaces from an early age and remain slightly hairy their entire life. They also tend to become shrivelled in hot weather, forming a distinctive cap caused by the slight drooping of the sides. Of all the lindens, the large-leaved keeps its green foliage longest come the fall.

▸ This large-leaved linden, planted along Queen Elizabeth Driveway at the turn of the 20th century, is among the lindens whose flowers and sapwood are used in Western pharmacology, homeopathy, herbal medicine and the manufacture of mother tinctures.

◂ A precocious tree, the large-leaved linden is the first species of its botanical genus to bloom. Its honey-scented flowers, three to six to a cluster, hang from a whitish green bract and emit a deliciously fragrant scent. They can be picked, dried and infused.





Golden Weeping Willow

SALIX X *SEPULCRALIS* SIMONKAI

Who is not familiar with the weeping willow? Its pale yellow catkins and flowers and its irregular shaped crown might not be attention-grabbing, but its wide, flared bearing, weeping shape and elegant yellow-green branches that droop right to the ground make it instantly recognizable. The weeping willow has become so naturalized along Canada's vast nation of lakes and rivers that one could be forgiven for thinking it is native to the country. And yet, the variety called weeping willow is a cross between the weeping cultivar 'Pendula' of the genus *Salix babylonica*, which is native to China, and the white willow (*Salix alba*), a species native to cold European and Asian climates. A hardy species, the weeping willow has become naturalized wherever it has been introduced, be it Japan, North America or Europe.

Several hybrids bear the name weeping willow, which is why the word "golden" was added to distinguish the *Salix* x *sepulcralis* hybrid planted in the National Capital Region. In keeping with the growing requirements for this species, it was planted in the soggy earth where Patterson Creek used to cross a swamp, on land owned by George Patterson, before emptying into the Rideau Canal. The canal's construction, beginning in 1826, dammed the creek, which swelled and flooded the neighbouring lands, making it necessary to carry out various landscaping projects.

◀ This huge golden weeping willow, like so many other 100-year-old specimens lining Queen Elizabeth Driveway, dates back to the earliest days of the Ottawa Improvement Commission, which planted it in the early 20th century.

▶ Elegant no matter the season, the golden weeping willow is an ideal ornamental species for areas near ponds, lakes and other bodies of water, as well as in parks and other wide-open spaces, where it can soak up the sun and develop to its full potential.

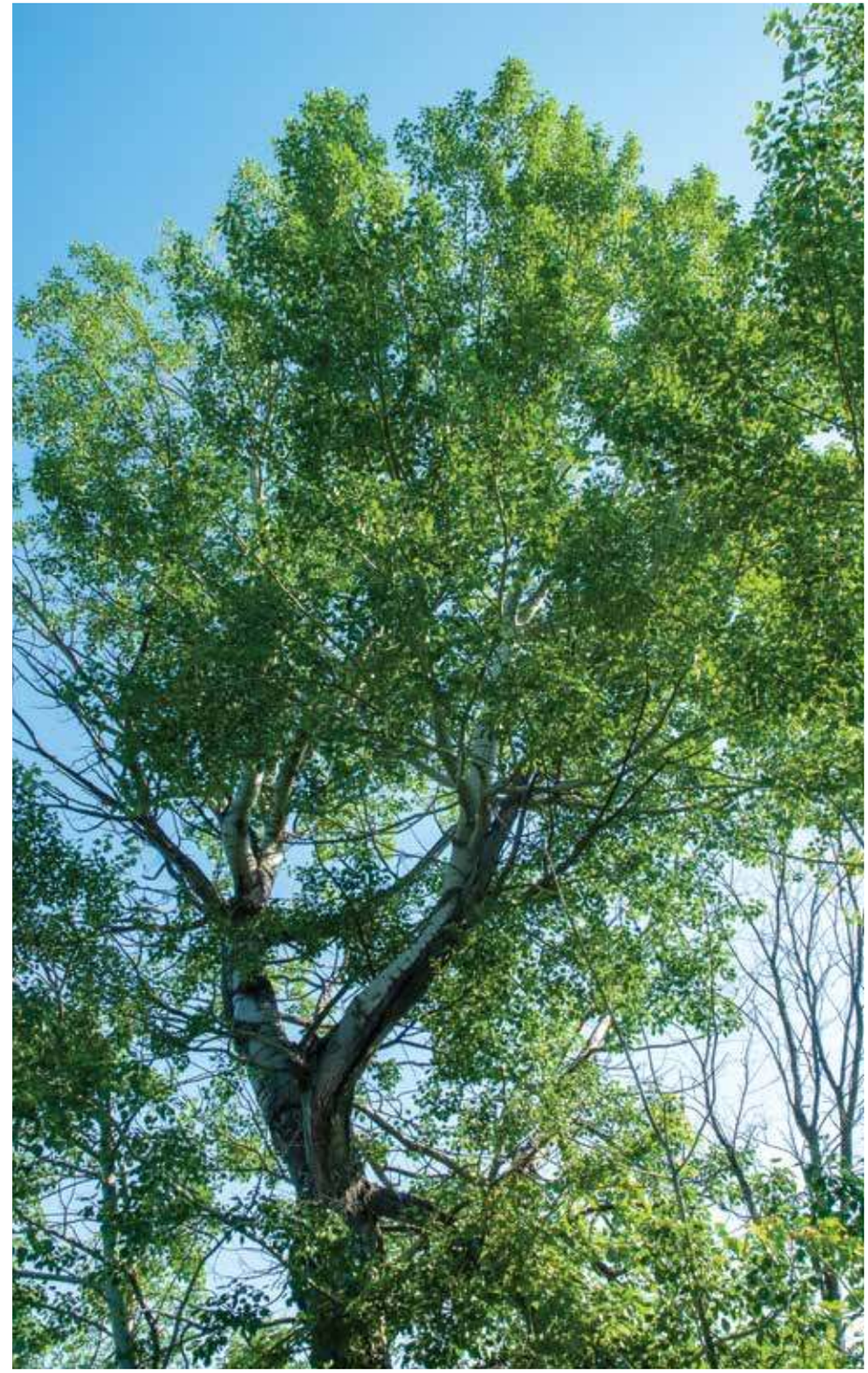
White Poplar

POPULUS ALBA LINNAEUS

Of Eurasian descent, the white poplar is an invasive species that has been grown since 1890 at the Dominion Arboretum in Ottawa, but it likely debuted on land belonging to present-day Ottawa after the Black Rapids Lock Station specimens were planted. It has been grown ornamentally in Canada for nearly 150 years, spreading from Newfoundland to British Columbia. This tall hardwood is suited to a variety of conditions. Its trilobed leaves resemble maple leaves.

The white poplar, known in Europe to have a 400-year lifespan, is a rapid-growth pioneer ideally suited to unstable land, since its fasciculated — or clustered — roots can help keep sands from shifting. This is a good way to take advantage of its well-known propensity for producing root suckers. Its trunk, very thick at the base, is covered with black bark, while its upper portion is covered with an attractive greyish-white bark. Its young twigs and buds are covered with dense white downy hairs. Its leaves, a brilliant dark green on the tops, are covered on the underside with a thick coating of silver- or snow-white down. With their flattened petiole perpendicular to the surface of their blade, the leaves flutter in the slightest breeze, revealing the contrasting colours of their surfaces. The three-lobed leaves that grow on the white poplar's root suckers and long shoots explain why it is sometimes confused with the silver maple.

◀ Clearly, the white poplar derives its name from its greyish-white trunk, but other parts of its anatomy are also white: the underside of its leaves, the hairs covering its twigs and the down surrounding its seeds.



▶ Here at the Black Rapids Lock Station, built in 1832, this white poplar was likely planted during redevelopment work around 1915 or in 1925. The dam was particularly vulnerable to damage from ice and driftwood.

White Fir

ABIES CONCOLOR (GORDON & GLENDINNING) HILDEBRAND

An admirer of the work of Sir Wilfrid Laurier, Prime Minister William Lyon Mackenzie King replaced the Ottawa Improvement Commission in 1927 with the Federal District Commission and proceeded to take the reins. This body is credited with, among other things, the long-term development (from 1920 to 1950) of Commissioners Park, where every spring since 1953, passers-by have admired the largest tulip flowerbeds in Ottawa during the Canadian Tulip Festival. Commissioners Park is also home to several attractive specimens of white fir.

The white fir is an American species native to mountainous regions in which it was discovered in 1847 by August Fendler near Santa Fe, New Mexico, and introduced in England in 1851. As early as 1867, the year of Canadian Confederation, it was growing and quickly becoming popular throughout North America. In addition to its great beauty, it was admired for its tremendous adaptability and rapid rate of growth. A few specimens were introduced to the Ottawa Experimental Farm to mark the 100th anniversary of Canadian Confederation.

White firs enhance the aesthetic value of any landscaped area. Their superb pyramid-shaped bearing, featuring branches right from the base of the tree, and their seductive bluish green hue are a feast for the eyes, in summer and winter alike. Their slanted upper branches and their differently angled lower branches make for a dense look. They retain this distinctive shape their entire lives.

◀ This white fir duo in the middle of Commissioners Park is easy to spot thanks to their lovely blue hue and their cone-like, dense and even bearing. This species is frequently planted in Canada because of its tolerance to drought and its robust nature.

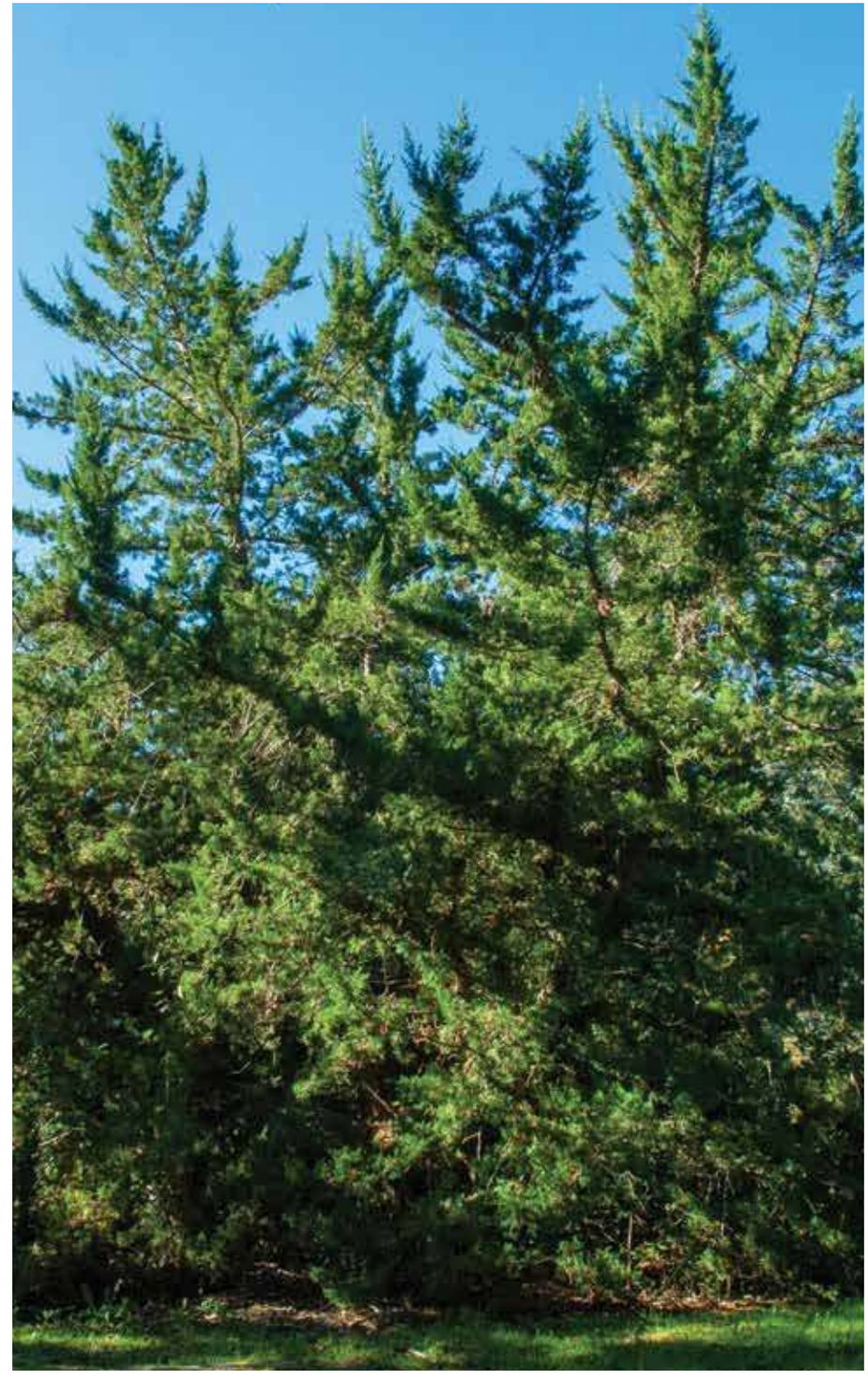
▶ The white fir's native range extends from Arizona to Utah and includes the Colorado Plateau, from which it derives its other name: Colorado fir. But it derives its Latin name, concolor ("one colour"), from the uniform colour of its needles, both top and bottom.

Eastern Red Cedar

JUNIPERUS VIRGINIANA LINNAEUS
AKAWANJ (ANISHINAABEMOWIN NAME)

In the late 1930s, Federal District Commission workers contributed much to the beautification of Ottawa and to its status as Canada's Capital. The decade saw extensive reforestation activity, particularly in the rockeries section of Rockcliffe Park to replace the many eastern white pines destroyed in the late 1920s by an outbreak of white pine blister rust. The commission took the opportunity afforded by the conifer reforestation work to systematically eliminate plants from the genus *Ribes*, namely currants and gooseberries serving as alternative hosts for the fungus responsible for the disease, *Cronartium ribicola*. During the second wave of mass planting in 1937, the workers planted cedars and junipers to replace those that had succumbed to the harsh conditions of previous winters. Lastly, the streetcar tracks, which had ferried masses of weekend visitors to the park since 1891, were removed, in favour of riding and pedestrian paths and a rock garden, all developed between 1937 and 1939.

The eastern red cedar is one of the four native Canadian species of the genus *Juniperus*, comprising small trees and shrubs with needle- or scale-like leaves. In 1862, William Sheppard wrote that he discovered the species in the Ottawa region. This cedar is one of the "tamed" species that gave rise to numerous diversely shaped cultivars created for ornamental horticulture.



▸ This gigantic, ship-like eastern red cedar was likely planted in the rockeries section of Rockcliffe Park in the late 1930s, when the beautification work carried out by the Federal District Commission was in full swing.

Serbian Spruce

Picea omorika (Pancic) Purk.

The Serbian spruce is native to the Drina Valley, whose river is a tributary of the Danube in western Serbia. This elegant spruce is at once rare and at risk. Like the other conifers of the genus Picea, the Serbian spruce dates back to the late Jurassic period. It belongs to a type of flat-needled spruce, making it a relic of an extinct species whose native range was far more vast millions of years ago. Today, this spruce is found naturally in only one place, accompanied by some 15 species of state-protected plant life, on the Tara mountain massif bordered by Bosnia-Herzegovina. In fact, it was on the Tara mountains near Zaovine Lake that Serbian botanist Josif Pancic discovered it in 1876. Since then, no individual in its species has been identified anywhere else in the world.

Growing Serbian spruce and protecting the remarkable specimens planted in the nation's Capital 50 years ago are part of our responsibility to conserve the world's plant heritage, but also a way to beautify landscapes. The Serbian spruce's narrow, cone-shaped habit makes for a svelte and graceful tree. Its curved, drooping branches curl back up at the tip, making it seem as though it were dressed in a wedding gown. It has shiny green needles (silvery blue on the underside) and pretty purple-blue cones that turn brown later in the year.

◀ Three Serbian spruce stand not far from the South African War Memorial in Confederation Park. The park opened in 1967 to mark Canada's centennial. This trio of spruce, boasting a svelte, elegant bearing, are representative of the species.

▶ A veritable living fossil, the Serbian spruce is not only the most graceful of the spruce family but also the most adaptable to extreme conditions, although it prefers rich, deep, damp and well-drained soil. It looks stunning on its own in wide-open spaces.

Ussurian Pear

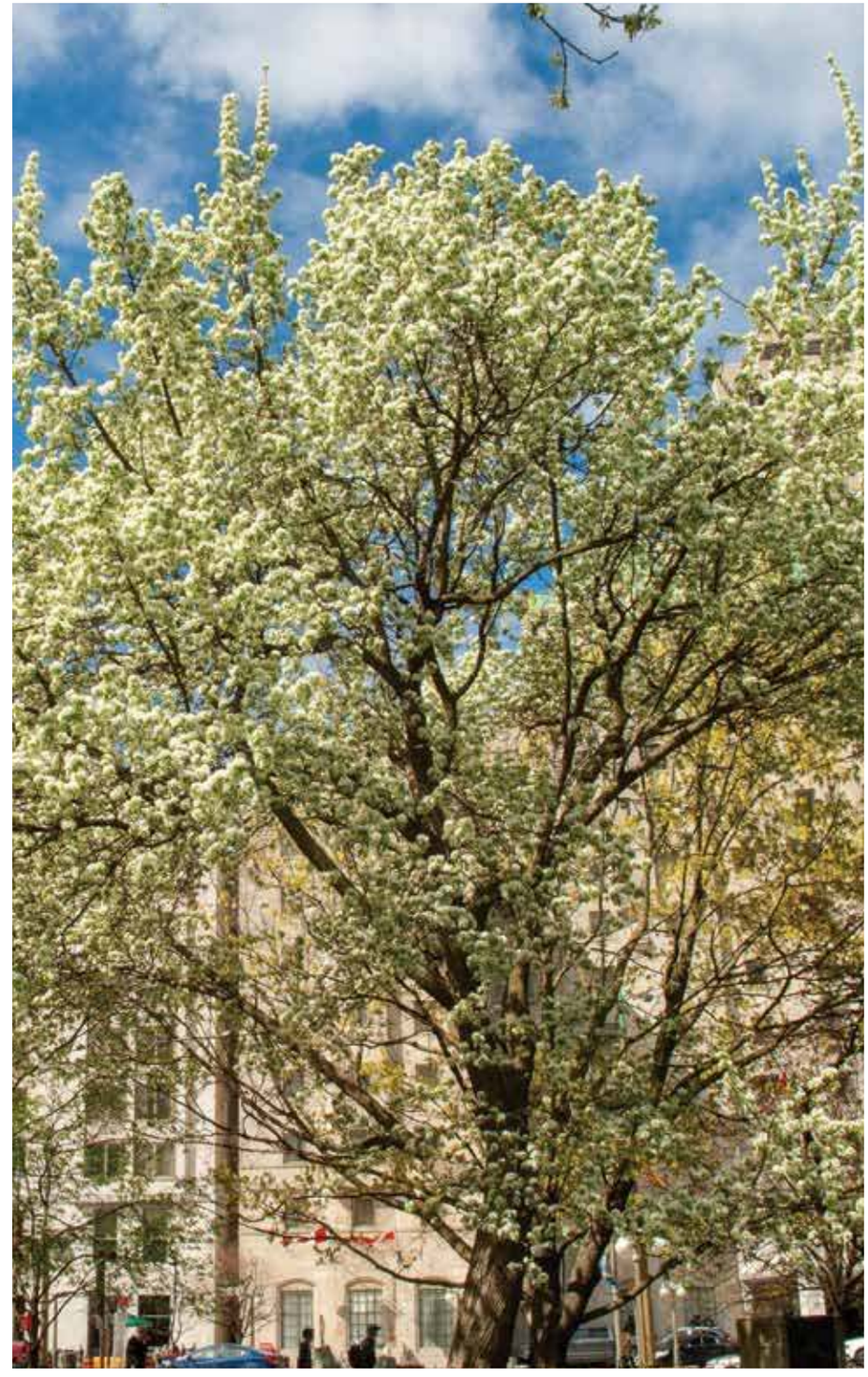
PYRUS USSURIENSIS MAXIM.

The Ussurian pear is native to the Manchurian region of northeastern China but is also found in Korea, the Ussuri River area of far eastern Russia, and Japan. It was discovered in 1855 by Russian botanist Carl Johann Maximowicz, who had it planted that same year in the St. Petersburg Botanical Garden. This flowering tree was then brought to Canada around 1897 before being introduced in the United States in 1908 by Danish scientist Niels Ebbesen Hansen, who worked for the South Dakota Experiment Station, an agricultural facility tasked with developing promising fruit tree varieties that could withstand the effects of late spring frost on flower and fruit buds. The approach consisted of using the Ussurian pear, a species extremely resistant to cold weather, as a rootstock upon which to graft varieties known for their fruit-bearing characteristics.

In 1927, Scottish-born grower Frank Leith Skinner, who had immigrated to Manitoba in 1895, began to produce and sell this pear tree strictly for its ornamental qualities. Of all the pear species and varieties grown in Canadian gardens or orchards, it is the first to bloom. Its dense umbels of white flowers intermingle with the shiny young apple-green leaves with rolled edges. The sharply indented leaves of the Ussurian pear hang on purple twigs. In the fall, they take on different hues ranging from light or reddish orange to crimson red or even bronze.

This specimen of Ussurian pear, a prolific bloomer, grows in Confederation Park near where Prime Minister William Lyon Mackenzie King used to have an apartment. Stand-alone individuals do not produce fruit, since the Ussurian pear relies on cross-pollination.

The green or greenish-yellow fruit, shaped like small apples, vary in size from one year to the next according to their quantity and the weather conditions.



Little-leaved Linden

TILIA CORDATA MILLER

One of the nation's Capital's most spectacular specimens of little-leaved linden stands guard over Canada's National War Memorial in Confederation Square in downtown Ottawa, in the triangle formed by Elgin Street, the Rideau Canal and Wellington Street. The square was once home to the Russell Hotel and city hall, but both went up in flames (on April 14, 1928, and March 31, 1931, respectively). The square was built at the request of Prime Minister William Lyon Mackenzie King, who also founded the Federal District Commission. Admired for its legendary longevity, the little-leaved linden is an excellent choice to accompany any memorial.

The little-leaved linden is named for its delicate and satiny leaves with a bluish underside, a heart-shaped base and a tapered tip measure no more than five to eight centimetres. In the wild, it can live for 500 to 800 years. It occupies a vast northern range in Europe, encompassing England, Finland and Russia, where it extends almost as far as the Urals. But it is nowhere to be found in the Mediterranean regions — it is very widespread in France, except along the Mediterranean coast. Unlike the large-leaved linden, a mountain species, the little-leaved linden proliferates on plains and hills, where it generates forests and thickets by virtue of its vigorous root suckers.

It reproduces easily in nurseries as well, which is one of the reasons for its long horticultural tradition and its popularity in North America. At Ottawa's Central Experimental Farm and the Dominion Arboretum, it has grown for over a century. North American landscapers have long held a soft spot for the little-leaved linden, especially in cities, where as in European countries, they line wide avenues and recreational pathways, and enjoy pride of place in public squares, parks and gardens.

The little-leaved linden is definitely worthy of a capital city. Indeed, the finest example of this species of the genus *Tilia* is found in Berlin, the capital of Germany. The historic Brandenburg Gate is the starting point for *Unter den Linden* ("under the linden"), the renowned boulevard that is lined on its west side by four rows of small-leaved lindens. The boulevard was built after the Thirty Years' War had devastated Europe between 1618 and 1648. As part of rebuilding efforts after the war, German authorities created boulevards and gardens. And so it was that Johan Maurits, Prince of Nassau-Siegen, borrowing from the Dutch style, converted an old dirt road from a royal hunting reserve into a boulevard. A thousand walnut and a thousand linden were planted along what would become *Unter den Linden*. Unfortunately, these linden were felled in 1658 and it was not until 162 years later that four new rows of little-leaved linden were planted.

This linden and the many cultivars developed for urban arboriculture enhance any area they are planted in. Graceful and proportioned, the linden maintains its symmetrical, cap-shaped bearing its whole life and does not compete with urban structures. Synchronized and producing a spectacular scent, its flowers, which are more noticeable in the evening, perfume the city and attract pollinators.

In the 17th century, a royal decree was issued to plant linden trees along French roads to harvest the flowers for hospitals. The infused flowers of the little-leaved linden were prized for their medicinal qualities and used to treat pain, spasms and circulatory disorders.

In Confederation Square, this peerless little-leaved linden stands watch over the National War Memorial. Named *The Response*, it was unveiled in 1939 by King George VI before a crowd 100,000 strong. Next to it lies the Tomb of the Unknown Soldier, added to the National War Memorial by the Canadian government in May 2000.

Basswood

TILIA AMERICANA LINNAEUS
WIGOBIMIJ (ANISHINAABEMOWIN NAME)

The spectacular basswood at Hog's Back Falls is living proof of the species' affinity for chalky soil. This location, the site of other tree species suited to calcareous soil like the eastern white cedar, was shaped by two important geological events. The first was the collapse of the limestone bedrock and the uplifting of huge limestone boulders. The second, 400 million years later, saw the formation of the Rideau River watershed some 10,000 years ago.

At the end of the Second World War, French urban planner Jacques Gréber delivered a beautification plan for the city of Ottawa, the fourth in its history, commissioned in 1937 by Prime Minister William Lyon Mackenzie King. This plan called for an expansion of Gatineau Park and the creation of a protected region surrounding western, southern and eastern Ottawa. The purpose of this Greenbelt was to help structure urban growth while at the same time setting aside land for farming, parks and research centres, among other things. And so the city set about annexing land from Carleton County and neighbouring townships. In 1949, land was annexed from Gloucester Township, which is where Hog's Back and Vincent Massey parks were created in 1954. The Federal District Commission also expropriated mostly undeveloped land on the eastern shore of the Rideau River to Mooneys Bay to protect it from development and to create a public park. The Greenbelt was born.

◀ This multi-trunked basswood is a true work of art. According to the authors of *Native Trees for North American Landscapes,* the trunk (or trunks) of this tree are often surrounded at the base with shoots and suckers.

American Elm

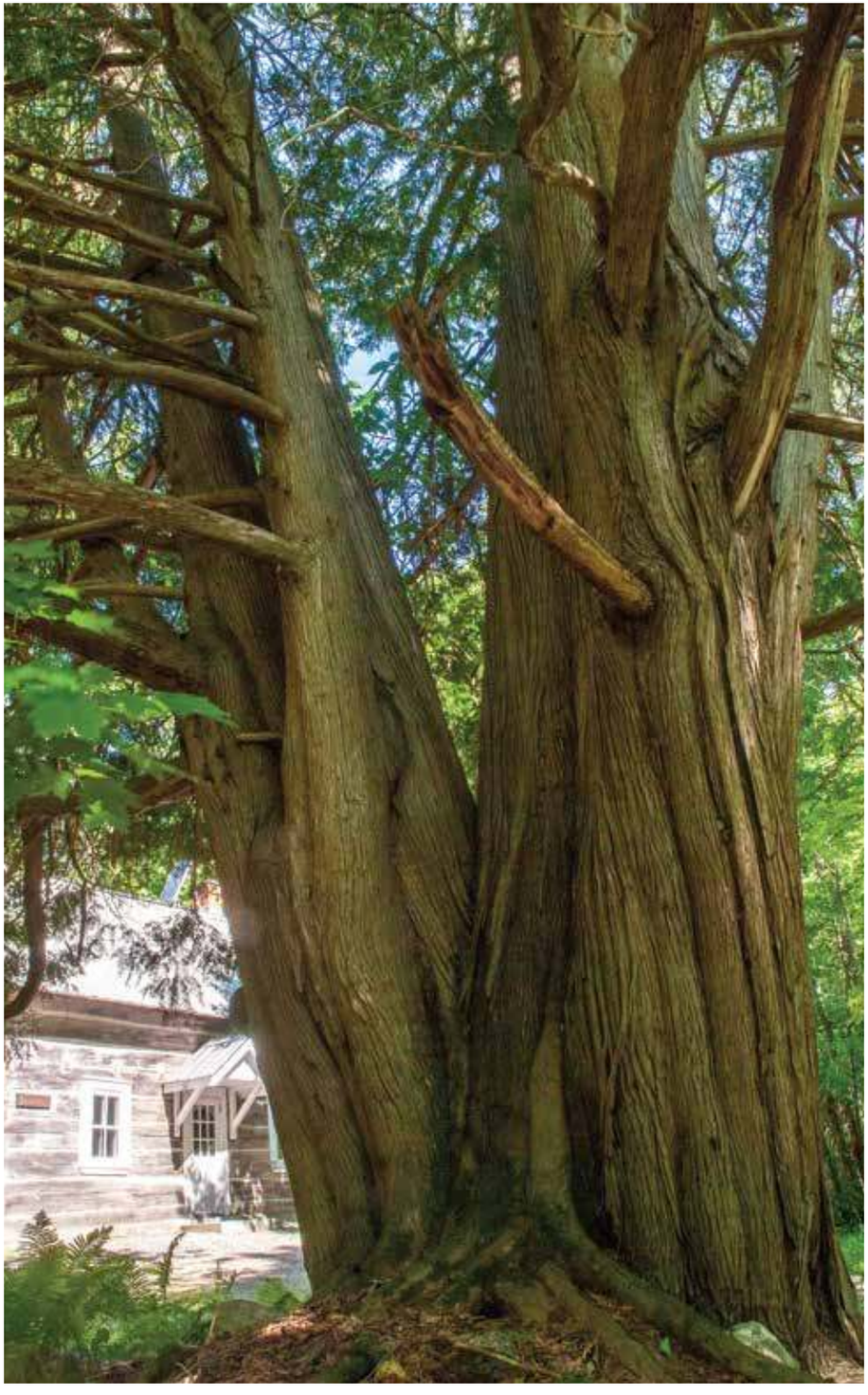
ULMUS AMERICANA LINNAEUS
ANIB (ANISHINAABEMOWIN NAME)

This American elm seems determined to stick around for good. Planted along the pathway leading to the Herridge and Healey shelters, it is firmly rooted in the history of Gatineau Park's creation. Both chalets were acquired by the Federal District Commission in 1951 and added to the park. The first had belonged to the Herridge family, friends of Prime Minister William Lyon Mackenzie King, while the second, built in 1863, had been owned by Irish immigrants Edward and Bridget Healey. The last Healey descendant continued to live there until 1955 and became the first government caretaker of Harrington Lake.

By the dawn of the Second World War, the Federal District Commission had already acquired the first 16,000 acres of Gatineau parkland. By purchasing plots of land surrounding Ottawa, it continued to expand its acquisitions: there were the 600 acres left by King in 1950 and the Healey and Herridge properties, but there were also those of local dignitaries in the centre of the Gatineau Hills, near Meech Lake and Harrington Lake (Lac Mousseau). By 1956, the Commission had acquired "about 50,000 acres of the planned park area of 75,000 acres." In 1958, the National Capital Commission, founded for the express purpose of implementing Jacques Gréber's urban plan, developed the park's parkways and purchased the Wilson (1963) and O'Brien (1964) estates, adding 700 acres.

As is typical of elms, the American elm blooms early in the spring. Its flowers begin to appear just after the silver maple and red maple start flowering, near the second week of April. This is so early in spring that these three species have yet to fully leaf.

This impressive American elm, whose structure is supported primarily by a group of nine stems, seems to be flourishing on a site that looks like it was recently bombed: scattered all around are the emaciated stumps of small elm trees that succumbed to Dutch elm disease.



Eastern White Cedar

THUJA OCCIDENTALIS LINNAEUS
WABINO-KIJIK / KIJIK (ANISHINAABEMOWIN NAME)

The Herridge Shelter, site of a majestic, awe-inspiring cedar, was built in 1880. This two-storey square-cut log cabin with dovetailed joints is a heritage building. It was owned by William Duncan Herridge, who used it as his secondary residence from 1926 to 1951, when it was sold to the Canadian government.

Son of Reverend William Thomas Herridge, who from 1883 to 1919 presided over Ottawa's oldest Presbyterian church, St. Andrew's, William Duncan discovered the joys of country life from an early age. In the early 1900s, he and his family would spend summers at an inn run by a Mrs. McMinn of Kingsmere, in the Gatineau Hills. It was then that William Lyon Mackenzie King, who would become prime minister in 1921, met the Herridges: 26 years old, he had just arrived in Ottawa and was editor-in-chief of the *Labour Gazette*, a recently launched Department of Labour publication. Accompanied by his friend, Bert Harper, whom he hired as an assistant, he became immersed in Ottawa society and attended services at St. Andrew's Church, where he made the acquaintance of the Herridge family. They became fast friends, and he would accompany them on their trips to the Gatineau Hills. He ended up purchasing an estate there and adding to it over the years. Upon his death in 1950, King left his 600 acres to become part of Gatineau Park.

◂ This enormous cedar stands next to the Herridge Shelter, designated a recognized federal heritage building for its historical importance and architectural values. Its name commemorates a politically influential family from Ottawa and the Gatineau Hills.

Amur Maple

Acer tataricum subsp. *ginnala* (Maximowicz) Wesmael

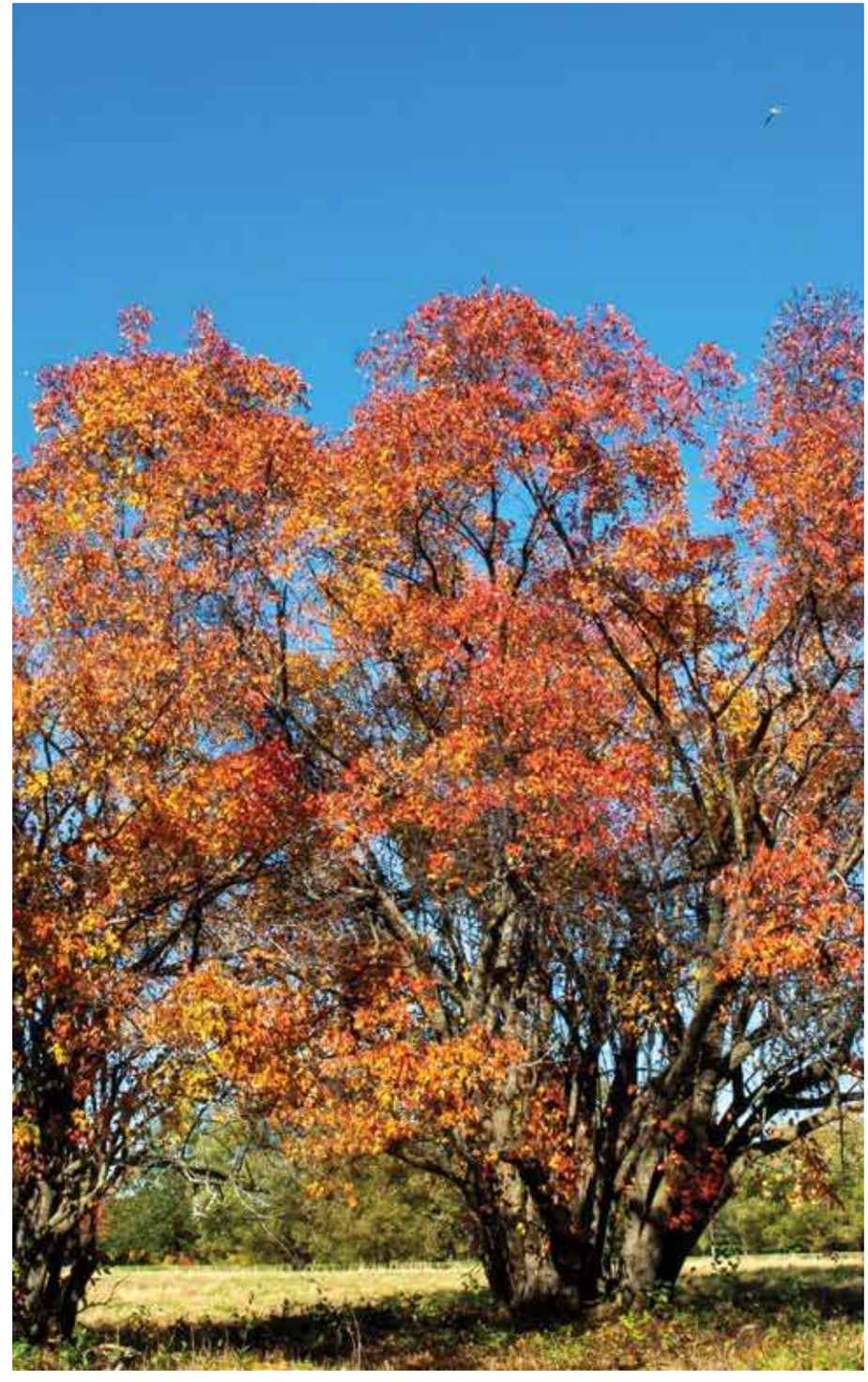
The Amur maple originated mainly in a region of Central Asia that was formerly part of Turkestan. It also grows in the wild along the 4,000-kilometre Amur River in Manchuria and eastern Siberia, as well as in Korea and Japan. The populations of the Amur River valley, where the climate is extremely harsh, call it *Ginnala*. This name was retained by Westerners and Latinized to lend a scientific name to this small maple, which is considered today to be a subspecies of the Tatar maple, with which the Amur maple shares a family resemblance: the small size, of course, but also the bearing and the famously fragrant blooms, which are rare for a maple.

Russian botanist Carl Johann Maximowicz discovered the Amur maple in 1860 and brought it to the St. Petersburg Botanical Garden. In 1874, thanks no doubt to exchanges between arboretums, seeds from this latest addition to the hardy maples family were shipped from St. Petersburg to the Arnold Arboretum at Boston's Harvard University, with which the Dominion Arboretum of Ottawa's Experimental Farm maintains close ties.

Either single- or multi-trunked, this small ornamental tree lends gardens an exotic touch through its delicate foliage, which turns a spectacular crimson red in early autumn. Each of its lustrous leaves boasts three deep lobes bordered by a single row of large teeth.

This Amur maple graces the Sir George-Étienne Cartier Parkway with its charming presence. A giant specimen from an otherwise small species, it impresses with not only its size but also its bouquet-like shape, making it even more remarkable.

The creamy white flowers of the Amur maple appear in clusters of 50 well after the tree's foliage, in late spring. As is often the case with maples, the blooms consist of unisexual flowers.



Developing Sites of Interest

The idea of helping the nation's Capital to grow, in particular by developing sites of interest, was neither spur-of-the-moment nor solely a local initiative. Rather, it was part of a wider back-to-nature movement that began in the mid-19th century throughout North America. A number of factors helped spread this romantic notion of the benefits of nature and country living. In particular, the quality of city life had gone downhill as a result of the fallout from industrialization. Cities had become unhealthy places to live in. In response to this, philosophers, philanthropists and even politicians called for remedial measures to be urgently implemented. It was in the same vein that the concept of a national park came into being, as an instrument for protecting natural sites of great beauty. Canada's first national park was Banff in 1885. This coincided with an urban architectural movement called City Beautiful (1890–1910), which made the beautification and monumental grandeur of cities an ideal indispensable to civic well-being.

◂ Vantage point from the Queen Elizabeth Driveway, 1950.
Source: NCC

The great fire of 1900 razed part of the cities of Hull and Ottawa in the National Capital Region. This major disaster devastated the area and worsened what was already in poor condition, prompting Prime Minister Wilfrid Laurier to call Ottawa "the ugliest capital in the world."

And so it was that at the end of the 19th century, the Gatineau Hills began exerting a strong pull on those in search of open spaces, sunlight, clean air and beauty. As always, it was the well-off who were able to acquire vast estates, build large homes and create impressive gardens. The year before the great fire, the federal government had founded its first commission dedicated to the development of a national capital: the Ottawa Improvement Commission. Two others would follow: the Federal District Commission in 1927 and the current National Capital Commission in 1958. The three successive organizations kept acquiring land in the city and its immediate surroundings, but they also acquired estates that had belonged to public service mandarins, leading entrepreneurs and prominent families who had popularized country living on the Gatineau Hills, including the McKay, Kingsmere, King, Herridge and Healey families. These estates were converted to public recreational parks for the greater well-being of area residents.

Rideau Hall, where successive governors general have continued a tree-growing tradition, was acquired in 1864, Major's Hill Park was acquired 10 years later, and new parks would join the seven that already existed in 1908. Jacques-Cartier Park opened in 1927, Hampton Park in 1930, and sprawling Gatineau Park in 1938, owned by the federal government and managed by the Federal District Commission. Hog's Back Park was developed in the 1950s and expanded through Vincent Massey Park in 1956. Continuing in the tradition of acquiring and developing green spaces, the National Capital Commission acquired Leamy Lake Park in 1959.

To develop the wealth of resources found in the 5,320 square kilometres of capital region land, the National Capital Commission and its forerunner organizations strove to expand, structure and refine the region's landscapes. In the first 60 years of activity, the shrubs and trees planted came mainly from the nursery at Ottawa's Central Experimental Farm, but the National Capital Commission would later source its plant material from its own nursery in the heart of the Greenbelt, in the Blackburn Hamlet area. Many specimens of ornamental crab apple trees, lilacs and Amur maples were cultivated there.

▲ View of Parliament Hill from the Quebec shore.
Source: NCC

Black Maple

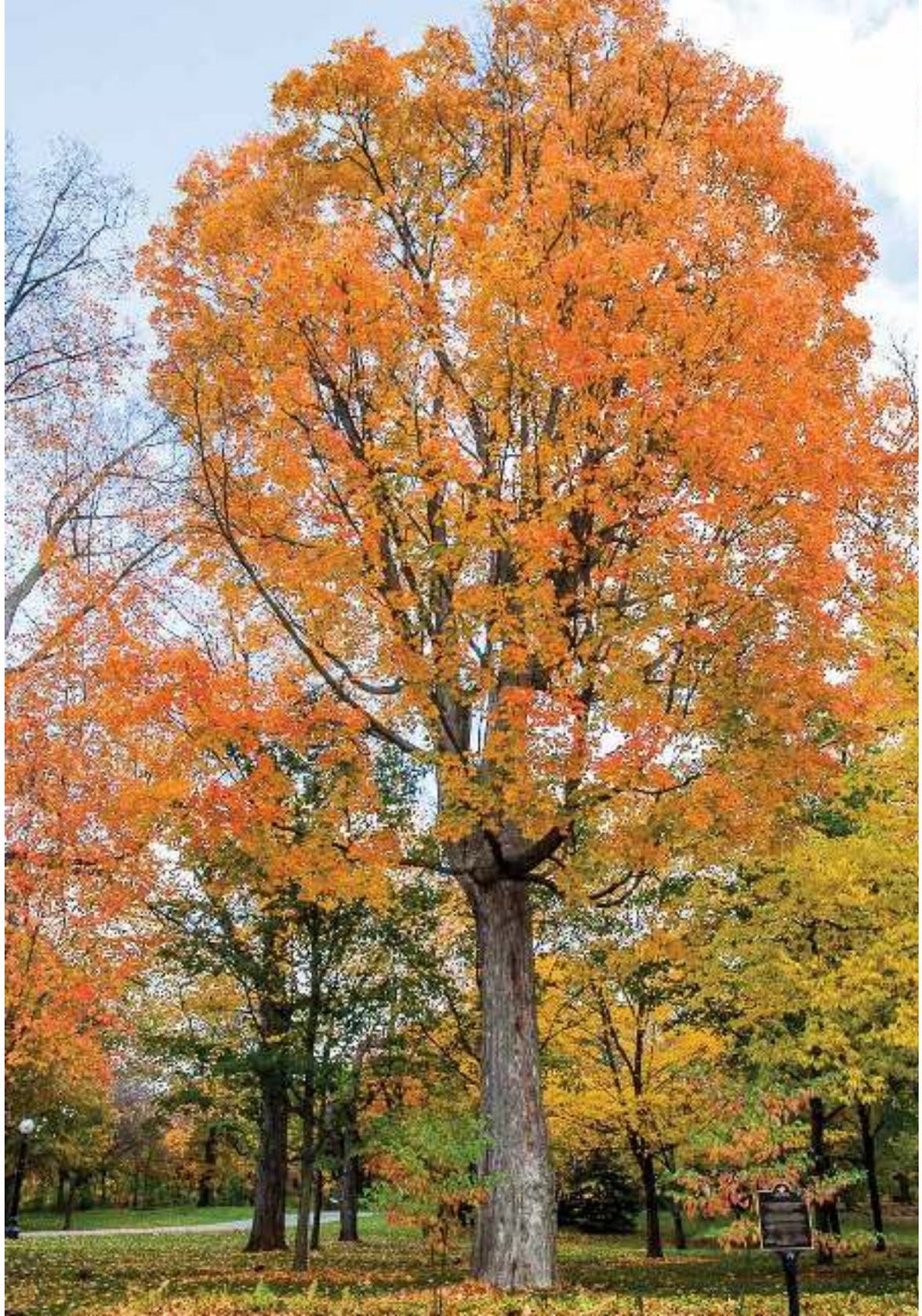
ACER NIGRUM MICHAUX

The black maple is a rare, vestigial species. Many moons ago, when the climate was far hotter and drier than today, the black maple slowly migrated northward from New England to Southern Ontario and Quebec. Little by little it crept north, taking advantage of the generous microclimate and soil factors, such as the calcareous conditions at certain sites where the soil was richest. Throughout its native range, be it in southern Canada or in the midwestern, central-eastern or northeastern Unites States, the black maple is always accompanied, albeit in small quantities, by the sugar maple.

Hybridization of the black maple with the sugar maple is facilitated not only by the proximity of the species in the same forest, but also by the fact that both are dichogamous, as though Mother Nature had always intended for them to mate. Each bears both male and female flowers, while their stamens and pistils do not mature at the same time. In certain individuals, it is the male flowers that mature first (protandry), whereas in other individuals, it is the female flowers that mature first (protogyny). This subtle difference is what enables the species to survive, because it obliges the specimens to cross-pollinate. This ensures a diverse gene pool for the seeds it produces and for the trees that grow from these seeds over the ensuing 200 years.

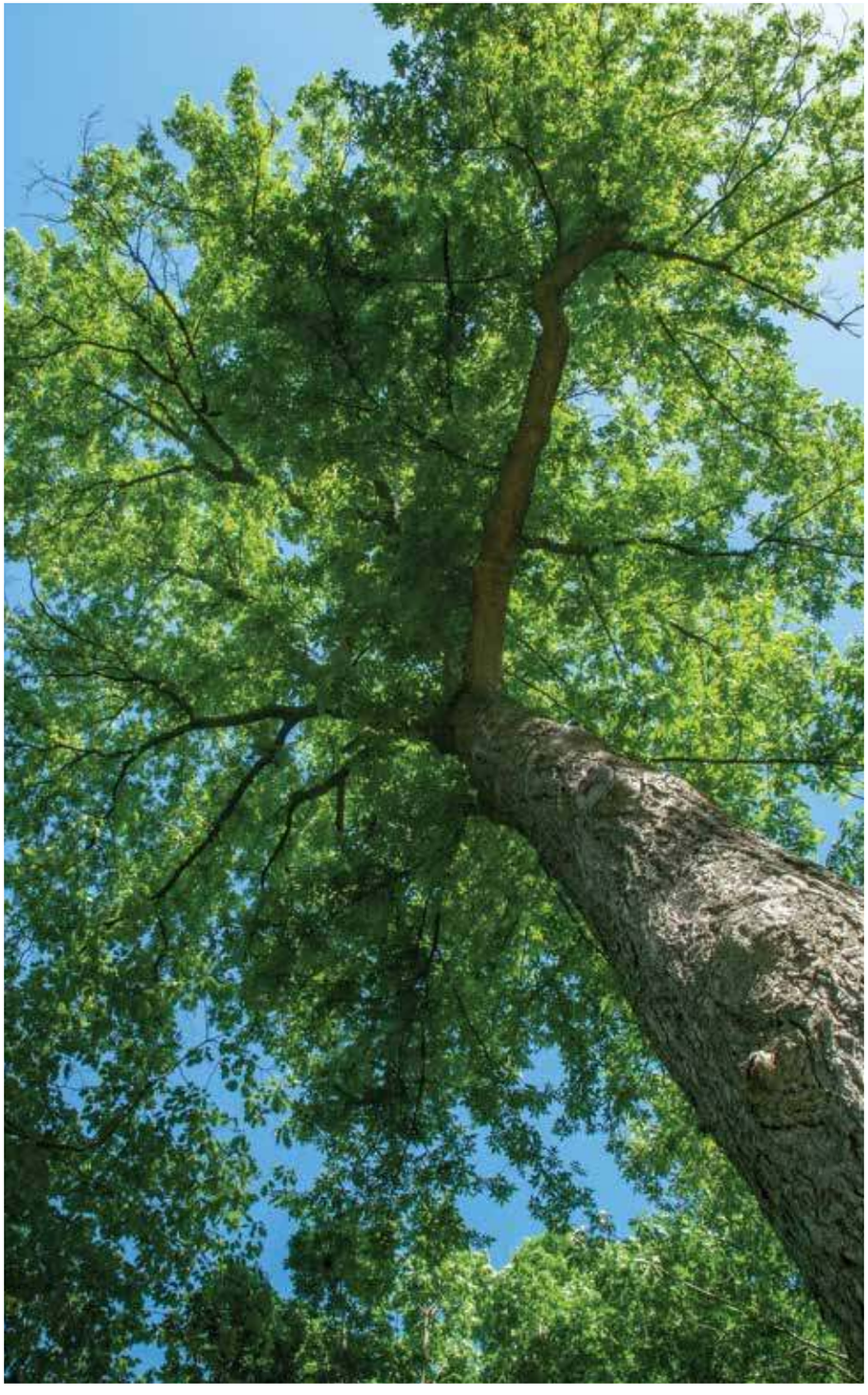
Given that the black maple and the sugar maple reproduce via cross-fertilization, and since they exchange genetic material, the species remain closely related and hybridize easily. Their offspring, consisting of individuals that vary significantly from one subject to the other, have features that borrow from each species, enabling them to intermix with sugar maple stands.

Some farmers in the U.S. Midwest claim the black maple produces better-quality sap and maple syrup than does the sugar maple, but the vulnerability of the Canadian populations precludes industrial production. Still, planting it singly or in groups, be it in urban areas or urban outskirts, enables growers to take advantage of the enviable features it shares with the sugar maple: respectable lifespan, majestic bearing, symmetrical and globular crown, and immunity to nearly any disease — not to mention its striking fall colours.



▲ Unlike sugar maple leaves, the leaves of the black maple are almost always three-lobed and turn from yellow to a copper colour in the fall, and do not change to red or orange in-between.

◀ Located near the Rideau Hall visitors centre, this black maple was likely planted in or around 1915, during the second wave of tree purchases and plantations. The Honourable Duke of Connaught was governor general at the time and occupied the property.



Bitternut Hickory

CARYA CORDIFORMIS (WANGENHEIM) K. KOCH
MITIGWABAK (ANISHINAABEMOWIN NAME)

The bitternut hickory is at once extremely strong and surprisingly delicate. It branches upwards, a pattern that contrasts with the delicateness of its slightly drooping boughs. This all makes for a beautiful, finely textured bearing. Its wood, like that of all the trees in the genus *Carya*, is considered to be, kilogram for kilogram, stronger than steel. It also derives its strength from its root system, organized around a solid taproot sunk into the soil, with a dense network of roots that extend so far laterally that, from a young age, they cover a diameter double the size of the tree's crown. That is why the bitternut hickory is one of the ornamental trees best able to withstand windstorms and freezing rain.

In forestry operations, the bitternut hickory requires careful management. But in the garden, it is the most interesting species of hickory to grow. Its lightly leaved crown lets the sun through, allowing the grass and surrounding ornamental plants to get the light they need. Generous like the basswood, this species enhances the soil humus when its mineral-rich leaves fall to the ground and decompose. It belongs to the family of noble deciduous trees, because its valuable wood is used to create fine cabinets, string instruments and inlay furniture.

◂ Some claim that the bitternut hickory, a cousin of the walnut tree, produces a sweet sap, sweeter than the sugar maple's, but in very small quantities. Its nut, no bigger than a nutmeg nut, also has a kernel, but it is bitter — hence the name bitternut.

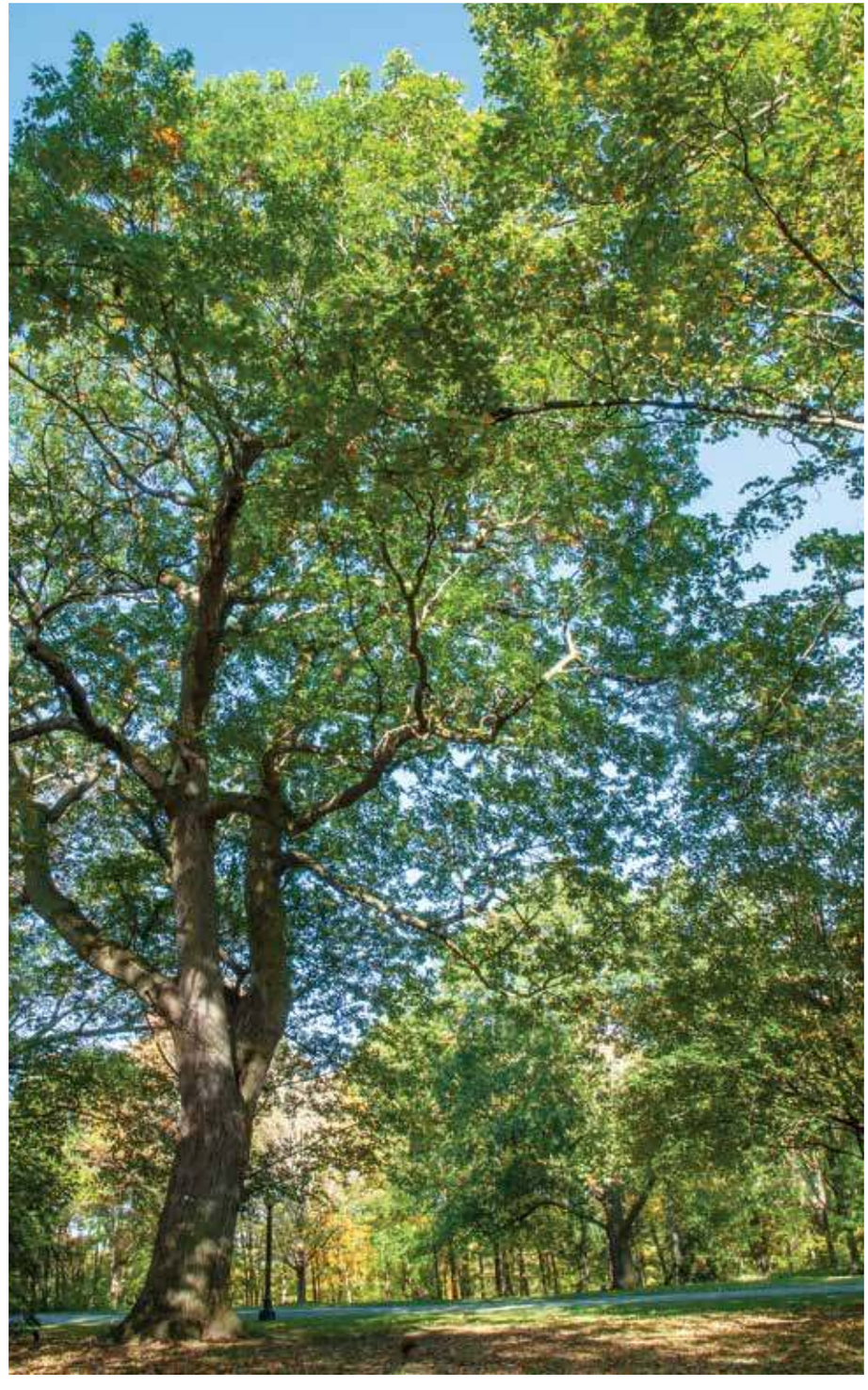
Red Oak

QUERCUS RUBRA LINNAEUS
MITIGOMINJ (ANISHINAABEMOWIN NAME)

The genus *Quercus*, with 600 species worldwide, is well represented in the forests of North America, Europe and Asia. In North America, it boasts an estimated 208 native species, including about 60 in the United States and 11 in Canada. Since over 150 grow in the Mexican wild, that country is considered the origin point in terms of differentiating among North American species. *Quercus* is subdivided into two main groups: red oaks and white oaks. It is the red oak, the queen species of all oaks that grow in the eastern North American wild, that gave its name to the group of red oaks that includes the pin oak and the shingle oak, both of which are represented in the National Capital Region.

Clearly a sturdy tree, with its massive trunk occupying half the total height of its rounded crown and its huge, strong primary branches spread out horizontally, the red oak is the strong silent type. It is not only the hardiest species of its botanical genus, capable of withstanding the harshest of Nordic climes, but it is also the most widespread in the country. It is also the official tree of Prince Edward Island.

Although oak trees are described as a deciduous species, Canada's boreal species imitate those of the Fagaceum family, such as the chestnut, with dead leaves that cling stubbornly to their twigs until the following spring.



▸ Oaks have been among the favourite species traditionally planted on the grounds of the prestigious Rideau Hall estate. The property's magnificent picturesque-style gardens beautify the surroundings of the governor general of Canada's official residence.

Large-leaved Linden 'Vitifolia'

TILIA PLATYPHYLLOS SCOPOLI 'VITIFOLIA'

Major's Hill Park and Lovers' Walk, developed in 1874 and 1880, respectively, were Ottawa's response to its new role as the capital of Upper and Lower Canada. Their creation marked the beginning of a movement to beautify the city to befit its status as a national and world-class capital, consistent with the dictates of urban planning at the time. Overseen by the Ottawa Improvement Commission in 1899, this transformation sought to structure these spaces and their uses for maximum efficiency and to place public health considerations front and centre. It was a time when British ideals of garden cities prevailed, with art and science teaming up to preserve the natural health of the land and to promote healthy and attractive communities.

It was with that in mind that experts with Ottawa's Central Experimental Farm worked to enhance the landscaping of Major's Hill Park, through such means as planting special trees. Some of these trees, still alive today, belong to varieties that are now rare in the region, including the common horse chestnut and both large-leaved linden 'Vitifolia'. Both species came from the farm's nursery, where they had been cultivated since 1890 and 1897, respectively.

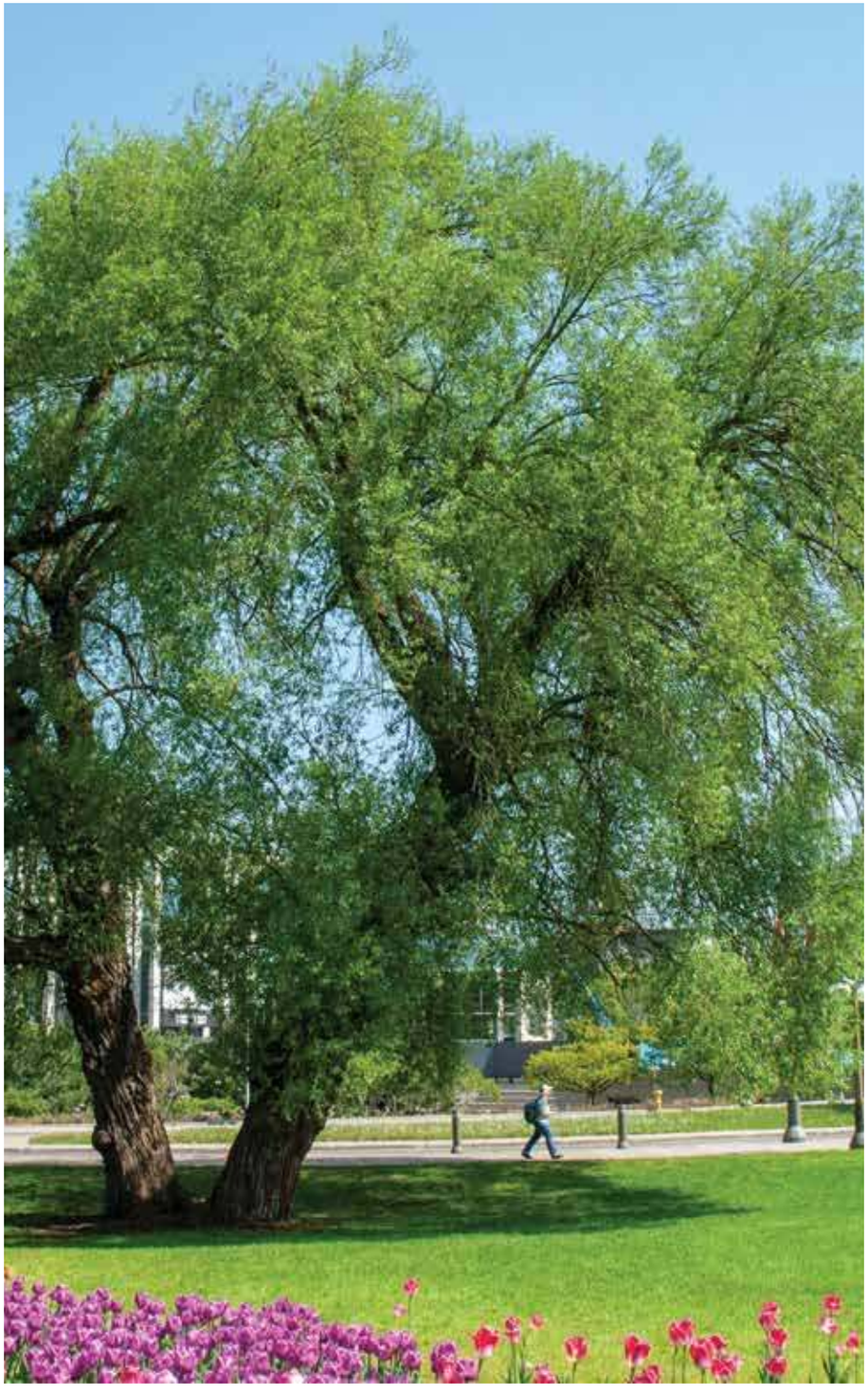
This vine-leaf variety of linden, whose date of origin is unknown, was first described at the end of the 19th century by celebrated Hungarian botanist Lajos Simonkai (1851–1910), who taught natural history for 33 years in a Budapest university. Cultivated only rarely today, it stands apart from the pure European species from which it stems — large-leaved linden (*Tilia platyphyllos* Scop.) — primarily for its leaves, whose indented margin is accentuated by three large teeth — hence the vine leaf effect. The mother species comes from Europe and southwest Asia. It was long grown in North America, but today it is almost never cultivated, other than in certain parks or gardens where a few scattered individuals have survived. It has been overtaken in popularity by the European and little-leaved lindens.

The large-leaved linden, the pure if inconsistent species, is native to much of Europe, covering its boreal portion, southwestern Sweden, northwestern Ukraine, the southern British Isles, northern Turkey and the Caspian Sea. In search of pure air, it often grows on mountains at an altitude of 1,500 metres, alongside beech and fir trees, or in highlands. Exceptionally for a deciduous tree, it grows slowly to a ripe old age. Certain millennial specimens, like the one in Upstedt, Germany, are known the world over.

With such a vast range, it is natural that this species has split off into a number of subspecies that differ from one another from a botanical standpoint, in particular by how hairy their leaves are. Both the pure species and this vine-leaf cultivar have leaves that are heart-shaped at the base, remain slightly hairy their entire life and, in very hot climates, tend to curl into a distinctive cap due to their slightly droopy sides. Come the fall, the gallant large-leaved linden 'Vitifolia' is the linden whose foliage remains green longest.

▲ Rich in nectar, the flowers of the 'Vitifolia' emit a delicious, sweet perfume. The fruit takes the form of hard and hairy pear-shaped capsules whose thick wall is embossed with five protruding ribs, with a small flap that opens to disperse their two reddish seeds.

◀ Before being planted in Major's Hill Park, both of these specimens of the strange vine-leaf linden cultivar were likely stored in the Central Experimental Farm nursery, circa 1897. Its director, William Saunders, a member of the Ottawa Improvement Commission, oversaw their planting here, in or around 1900.



Crack Willow

SALIX FRAGILIS LINNAEUS

The crack willow originated in Central Europe and southwestern Asia. By the end of the 18th century, it was being widely cultivated in North America, but today it has almost entirely disappeared from nurseries — so it should be considered a collectable. A forgotten tree, this species likely fell out of favour with growers because its twigs break off easily with an audible crack — hence its name. These twigs, which break off and fall to the ground in heavy winds, are designed to detach easily from the tree. Indeed, the species' reproduction strategy and thus its very survival depend on it. If the twigs fall onto a substrate that is the least bit damp, they take root easily and grow quickly into a tall tree — 30 metres high and one metre in diameter. This is how the crack willow escapes into the wild and becomes naturalized on semi-natural sites, where it seems so at ease that it is sometimes mistaken for a native species. As with many species of the genus *Salix*, the light pollen from the flowers of male crack willows is easily spread by the wind and distributed by pollinating insects to the flowers of female individuals of various willow species, which explains the species' propensity to hybridize. The crack willow's many offspring include ornamental hybrid willows, such as the hybrid crack willow.

◂ Around May, when the city is awash in tulips, it is a treat to gaze upon this crack willow planted below Major's Hill Park, with the National Art Gallery and Notre Dame Cathedral serving as the backdrop.

White Oak

QUERCUS ALBA LINNAEUS
MISHIMINJ (ANISHINAABEMOWIN NAME)

This magnificent white oak stands on a historical site that bears the name of one of Canada's first explorers: Jacques-Cartier Park. The park was created by the Federal District Commission in the 1930s on land that had been briefly owned by the International Pulp and Paper Company. Until 1870, white oak timbers were floated down the Ottawa and St. Lawrence rivers to Québec City, where they would then be exported to England, Ireland and the East Indies. Between 1873 to 1930, the Gilmour & Hughson company operated a sawmill on this site at a time when the region's economy was based primarily on logging.

Jacques-Cartier Park is therefore part of the region's forest history. The headquarters of the Gilmour & Hughson logging company, founded in 1892, still stands today at the park's northern edge. It is now home to the Maison du vélo. Also still standing is Charron House, built between 1826 and 1841 by Philemon Wright, the area's first logger and the founder of the city of Hull. Today it serves as the headquarters of the Maison des auteurs, where cultural activities are presented each summer.

Recent archeological digs have revealed numerous artifacts showing that Jacques-Cartier Park was used by Indigenous peoples as far back as 2,000 years ago. These Indigenous groups knew the value of the white oak's leaves in treating wounds. They would chew the leaves and use them to prepare poultices to promote nail growth and for other uses.

This solitary white oak in Jacques-Cartier Park is particularly colourful in the fall. Like all the species in the white oak group, it covers its branches with its most recent progeny, year after year, because its acorns ripen the same year as they appear, and they fall to the ground before winter.

White oak wood was popular for making barrels thanks to its water- and rot-resistant properties, but it was also popular in cabinet making and construction. For the same reasons, it was once used for shipbuilding and to make railroad ties, fences and farm tools.

American Beech

FAGUS GRANDIFOLIA EHRHART
AJAWEMINJ (ANISHINAABEMOWIN NAME)

This Hampton Park American beech stands alongside fellow senior citizens (aged between 150 and 165, give or take) from other species, including the eastern hop-hornbeam, black cherry, sugar maple, red maple and eastern white pine. The park is in Ottawa's Kitchissippi city ward (it gets its name from the Algonquin name for the Ottawa River), sitting on land developed in 1910 by J.C. Brennan and purchased in 1927 by the Federal District Commission, the year it was founded by Prime Minister William Lyon Mackenzie King. The park's woodlot is a remnant of the forest that used to lie west of the current-day Civic Hospital. It had remained intact until the 1920s, when residential development began taking over the area. One of Ottawa's oldest natural woodlots, it is home to a number of species represented by specimens that are more than a hundred years old. This charming urban park winds its way through a rare forest ecosystem: a dry clearing populated by some of the oldest American beech, sugar maples and eastern white pines found in Ottawa.

The American beech, the lone native species of the genus *Fagus* in Canada, enjoys optimal growth conditions in mesic habitats (with a moderate amount of moisture), such as those found in temperate mixed and hardwood forests. It prefers cool, damp environments with loam soils rich in organic matter, as well as areas atop hillsides and on medium slopes. In its first few years, it develops a taproot along with a multitude of long lateral roots, most of which are surface roots but some of which can be buried more than 1.5 metres deep in good soil. This is the species with the broadest crown in the forest, and it is wind-resistant in most locations.

The species' Latin name, *Fagus*, means to eat, a reference to its edible nuts. It is the only tree whose acorn has its own name: beechnut. These triangular-shaped beechnuts are borne two or three in a hairy husk. The first major frosts of the season trigger their birth: the involucres open up their four valves and free their seeds. When yields are abundant, beechnuts range in size from average to large. The nuts are dispersed by birds, particularly the blue jay, which transports up to six at a time. Within its native range, namely the entire North American East, First Nations used to eat beechnuts, raw or cooked, and crush them into flour. They would raid the hiding places of deer mice, which tended to store far more beechnuts than they could possibly consume. Indigenous peoples would also boil the leaves to produce a concoction to treat eye pain.

For centuries, the beech stands in southern Ontario and Quebec were the scene of an amazing bird show: immense flocks of migrating passenger pigeons would descend on the beech every fall to devour the oily beechnuts to fuel up for the rest of the trip. It did not take long for the first settlers to associate these hordes of birds with beech stands and the fertile soil for which these trees had developed such an appetite. Since this soil was an excellent place to grow food crops, many beech stands were lost to farming. Currently beech trees are succumbing to beech bark disease, caused by synergy between the beech scale and two fungal pathogens of the *Neonectria* genus. Identified in Quebec in 1965 and present in Ontario since the late 1980s, this disease is doing significant harm American beech stands.

▲ The leaves of the American beech, whose margins are notched with sharply curved indentations, take on a shiny surface and, over the summer, an increasingly coriaceous, almost leathery consistency. In the fall they transform once again, turning orange-yellow.

◀ Because it is sensitive to the area where it grows, the American beech is an important indicator of environmental quality — the plant equivalent of a canary in a coal mine. This proud old specimen dominates the scenery in this Hampton Park woodlot.

Black Cherry

PRUNUS SEROTINA EHRHART

Although the species name of the black cherry, *serotina* (for "coming late"), denotes the belated nature of its flower and fruit production, the tree's enthusiasts persist in calling it autumn cherry. In fact, it blooms a little after cherry trees cultivated in gardens and orchards, generally in mid-June, and at lightning speed when the weather is hot. Its edible fruit, which ripens in late August and September but remains on the tree until mid-October, is used to make jam and wine, but also to flavour such alcoholic drinks as kirsch.

For nearly a quarter century, forestry researchers have maintained that the black cherry figures among the select group of deciduous trees referred to as noble. Its lustrous and finely grained reddish-brown heartwood is heavy, hard, impact-resistant and rot-resistant. These qualities, as well as the fact that it does not warp after drying, explain why it produces top-notch lumber.

The native species accompanying the black cherry in the Hampton Park woods used to grow abundantly in the wild in the National Capital Region but have since become rare. The history of the black cherry is particularly sad: like the American beech, these trees used to grow in the most fertile soil around but were cut down to make way for agriculture.

◀ What is left of Hampton Park's natural forest cover is home to some magnificent, 100-year-old specimens of a noble hardwood: the black cherry.

▶ The black cherry blooms over a brief period, once its thick, shiny dark-green leaves have fully developed. Its flowers open gradually from the base to the top of the head-to-tail clusters, such that the last flowers are opening while the first have already been pollinated and fallen apart.

Red Maple

ACER RUBRUM LINNAEUS
MISKO-ININATIG (ANISHINAABEMOWIN NAME)

The hundred-year-old specimens of red maple in Hampton Park have withstood a number of changes to their surroundings, such as draining that proved necessary after the park was formed. Species capable of surviving disruptions such as these are called plastic. This means they have the genetic capacity to express different characteristics according to the environmental conditions, which generally lets them occupy various habitats. This is the case of the red maple, because the species is just as capable of occupying boggy sites as it is dry or rocky soil.

William Sheppard (1784–1867), a lumber merchant from Sillery, Quebec, who had worked for a time with Philemon Wright on various projects, had a passion for botany and the natural history of trees. He saw great value in the red maple. He wrote about the omnipresent red colouring that permeated these trees and about how its internal bark was used to produce dyes.

The red maple blooms before leafing and just after the silver maple blooms, once enough heat has built up day after day in the spring air. Each year, researchers record the date on which the red maple blooms, and this information is compiled along with other phenological data used to study the links among biological phenomena, climate and climate warming. This tree seems to bloom 15 days earlier than it did 125 years ago.

▸ Given its dimensions, it is likely that this lush red maple in Hampton Park already belonged to the mixed stand of noble hardwoods occupying the site when the Federal District Commission acquired this land in 1927.

Red Oak

Quercus rubra Linnaeus
MITIGOMINJ (Anishinaabemowin name)

Leamy Lake Park, created in the 1960s by the National Capital Commission, encompasses fertile land around Leamy Lake (or Columbia Pond, as it used to be called) in downtown Hull. The lake was named after Andrew Leamy, an Irish immigrant who had come to work in the logging industry before launching his own business and becoming a leading figure in Wright's Town, which would later be named Hull. In 1853, he built the region's first steam-driven sawmill on the lake's southern shore before digging a canal linking the lake with the Gatineau River to help transport logs to his mill. He married Erexina Wright, the granddaughter of Hull's founder, Philemon Wright.

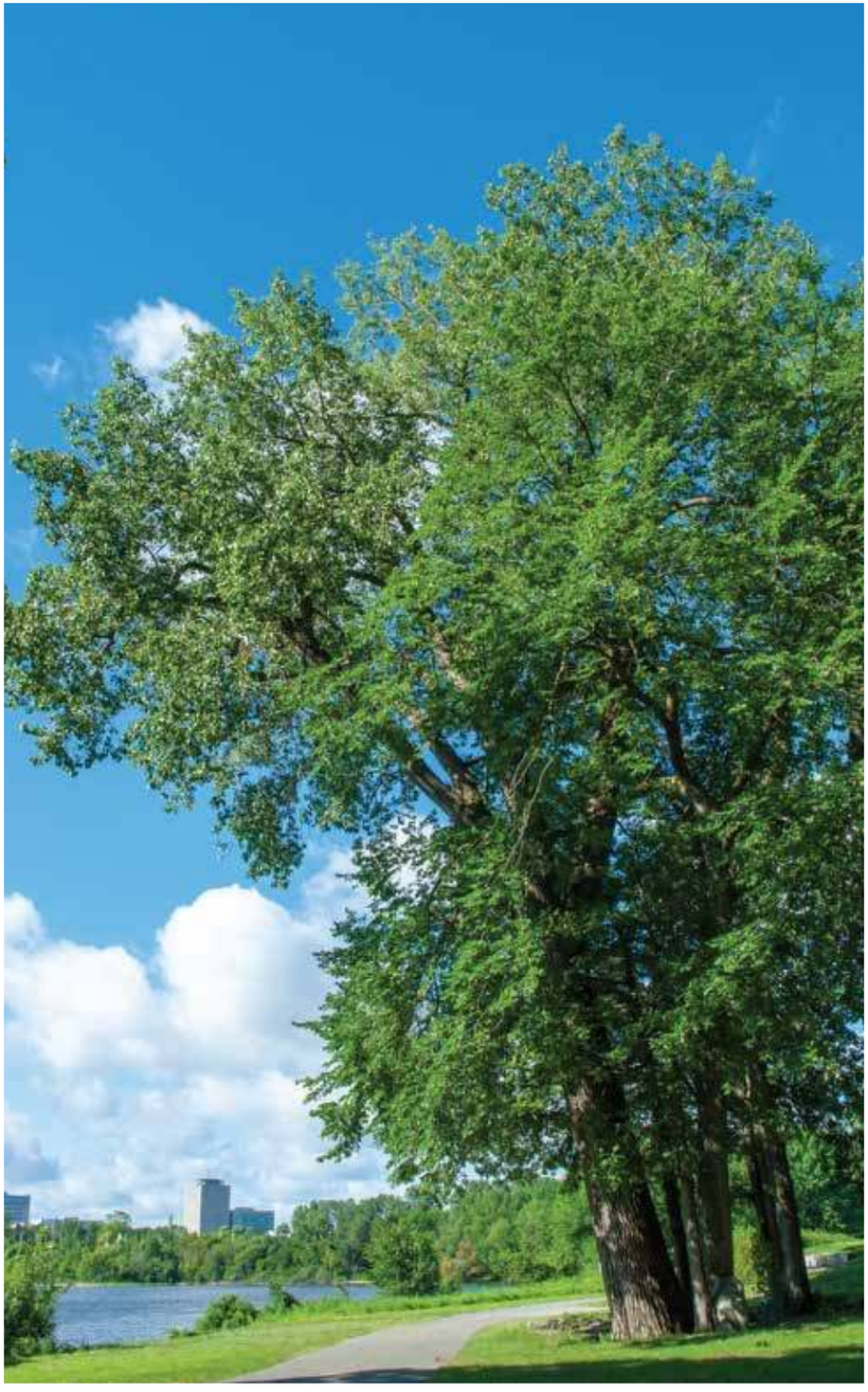
Leamy Lake is south of the Gatineau River and west of the Ottawa River. It is linked to both, with water flowing in from the Gatineau and exiting to the Ottawa. The flowing water from both rivers leads to an accumulation, at their confluence, of fertile silt and organic matter on a bed of fine sand. This is the delta origin of the fertile soils of the Leamy Lake Park forest. Although it is small, this forest is diverse, having counted numerous tree species over the years. An inventory drawn up from 1994 to 1997 identified 29 native species and six naturalized ones. Propelled by the richness of the soil, these trees reached phenomenal heights, with some even setting records. Their exceptional dimensions are also attributable to the park's advantageous location, forming an integral part of the humid, semi-temperate ecoclimate region extending from Montréal to Kingston.

In the case of the Leamy Lake Park oaks, as for all species of the family of red oaks, acorns take two years to mature. They produce small single flowers or small groups of flowers in the leaf axils of the new shoots. With their stigmas, they resemble beetles with protruding antennae. The red oak takes an average of 25 to 50 years to produce its first acorns. Once acorn production is in full swing, oaks measuring about 40 centimetres in diameter yield an average of 800 acorns and those measuring 50 centimetres in diameter can produce up to 1,600 acorns in a good year. Flattened, chipped, cracked or pierced acorns are sterile.

Acorn shape and size are quality indicators and vary by the latitude of the tree site: the farther north, the more delicate the acorns. Upon maturing, the nuts are 2 to 2.5 centimetres, with their lower quarter to a third enclosed in a hairy-scaled acorn cup. Unfortunately, they are not edible, as their high tannin content makes them bitter, even toxic. To make the kernels less bitter, First Nations peoples would draw out the tannins by burying the acorns all winter long, letting them soak in a stream or river, or boiling them with wood ash soap.

Oaks old enough to produce acorns are easily distinguishable from one another in winter: any tree with acorns when its leaves have fallen or partially fallen is a red oak. Since this species' acorns ripen at the end of the growing season in year two of the tree and it retains the acorns for a year after they mature, the branches simultaneously bear both small and large acorns formed in one or the other year.

◂ Of the oversized trees found in Leamy Lake Park, this magnificent red oak merits special attention. Like a few others of its species, this double-trunk tree occupies the driest parts of the forest.



Eastern Cottonwood

POPULUS DELTOIDES SSP. *DELTOIDES* BARTRAM EX MARSHALL

Of the oversized trees found around Leamy Lake, there are a few notable eastern cottonwoods, likely the survivors of a fairly large population that used to exist in these parts. This specimen, which grows in a cluster, seems to have been afforded special protection during the earthwork carried out during the landscaping of the bicycle path leading into the ecological park. To lessen the pressure exerted by the weight of the compacted matter that otherwise might have suffocated its root system, a well was created to clear away a perimeter at the base of its multiple trunks.

Curiously, the Greek letter delta (△), represented by a triangle, and the word delta, which denotes the triangular zone formed by the sections of a stream or river at its mouth, are central to the life of this *Populus deltoides*. The suffix *oids*, meaning "resemblance," associated with the root *del*, perfectly translates both the equilateral triangle of its leaves and the triangle formed by the rich alluvial soils at the confluence of the Gatineau and Ottawa rivers that satisfy the ravenous appetite of this gigantic cottonwood.

Usually growing to an imposing size, this species boasts an amusing if paradoxical feature: it trembles with every fibre of its being. Its multitude of triangular leaves flutter in all directions at the slightest breeze, attached as they are to their twigs by petioles flattened perpendicularly to the blade, hence their total instability.

◂ In rich, damp lowlands such as those found here in the Leamy Lake delta, the eastern cottonwood can truly shine. In optimal conditions, it is the fastest-growing species in North America.

▸ The eastern cottonwood is tolerant of compaction, flooding and intense cold, making it a good landscaping choice. Its wood, however, is not the best: it is light, soft, weak and fine-grained, and its heartwood tends to rot easily.

Red Maple

ACER RUBRUM LINNAEUS
MISKO-ININATIG (ANISHINAABEMOWIN NAME)

In New France and through to the 19th century, the red maple was sometimes called the red-flowered maple. It also goes by the names swamp maple, scarlet maple and soft maple. In French, it was routinely called the *plaine rouge*, either for its syrup or on manifests listing various types of wood for export. Its wood, colours, syrup and therapeutic properties have given the species a key place in North American culture. Perpetuating the tradition, the Champlain Golf Course greets visitors with a magnificent red maple that dazzles every fall.

The Champlain Golf Course took over a site that had originally belonged to the Highlea Tennis and Country Club. This social club, founded in or around 1920 by the secretary-treasurer of the municipality of South Hull, William H. Stewart, had been built on the site of a farm owned by George Routliffe, on the north side of Aylmer Road opposite the Chaudière Golf Club. In 1929, its board of directors decided to purchase additional land and turn it into an 18-hole golf course, which it named the Champlain Golf Course. During the 1970s, the National Capital Commission, which had taken over its ownership, expanded it again with land that had belonged to Lilian Ruggles and Charles Montgomery Wright, the great-grandchildren of Philemon Wright, the pioneering logging industrialist. The golf course is lined with a number of remarkable mature trees.

◀ René Louiche Desfontaines (1751–1833), botanist at the Jardin du roi de France, stated that the red maple originated in Pennsylvania and Canada and touted its great popularity among landscapers for its lovely foliage and considerable shade.

▶ The red maple flourishes even in harsh conditions, especially here at the Champlain Golf Course, where the specimen right near the entrance receives all the attention it so richly deserves.

Eastern Hop-hornbeam

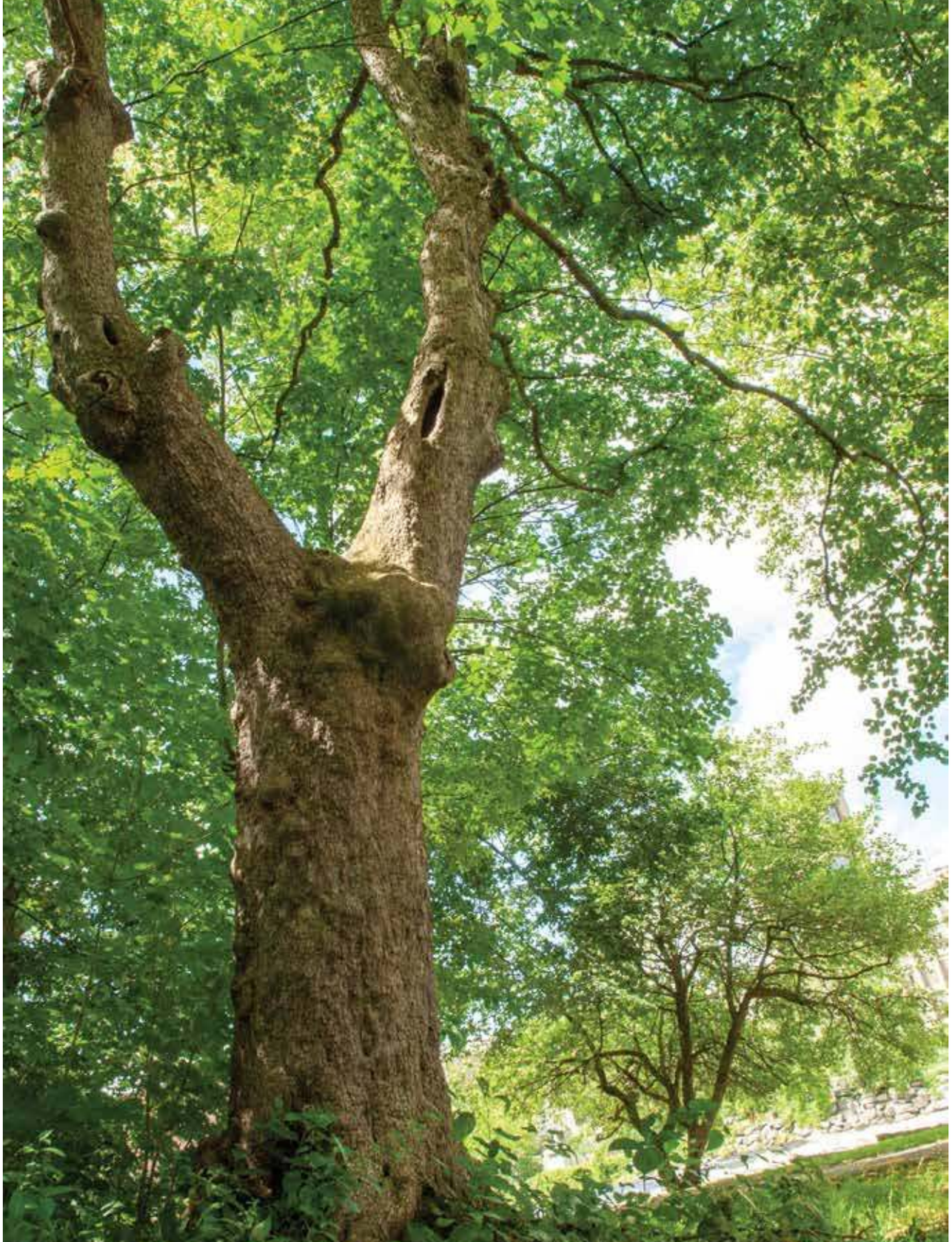
OSTRYA VIRGINIANA (MILLER) K. KOCH
MANAN (ANISHINAABEMOWIN NAME)

Consistent with the public well-being objectives of the Capital's urban planners, the project to create Vincent Massey Park was launched in 1956 by the Federal District Commission with a view to expanding Hog's Back Park. It was named after lawyer and diplomat Charles Vincent Massey (1887–1967), governor general of Canada at the time. In 1958, the National Capital Commission took over management of this space, which went on to become separated from Hog's Back Park as of 1969, when Heron Road was built. A wooded fringe along the Rideau River was kept when the park was created, and to this day there are still native trees there, including a nicely sized eastern hop-hornbeam.

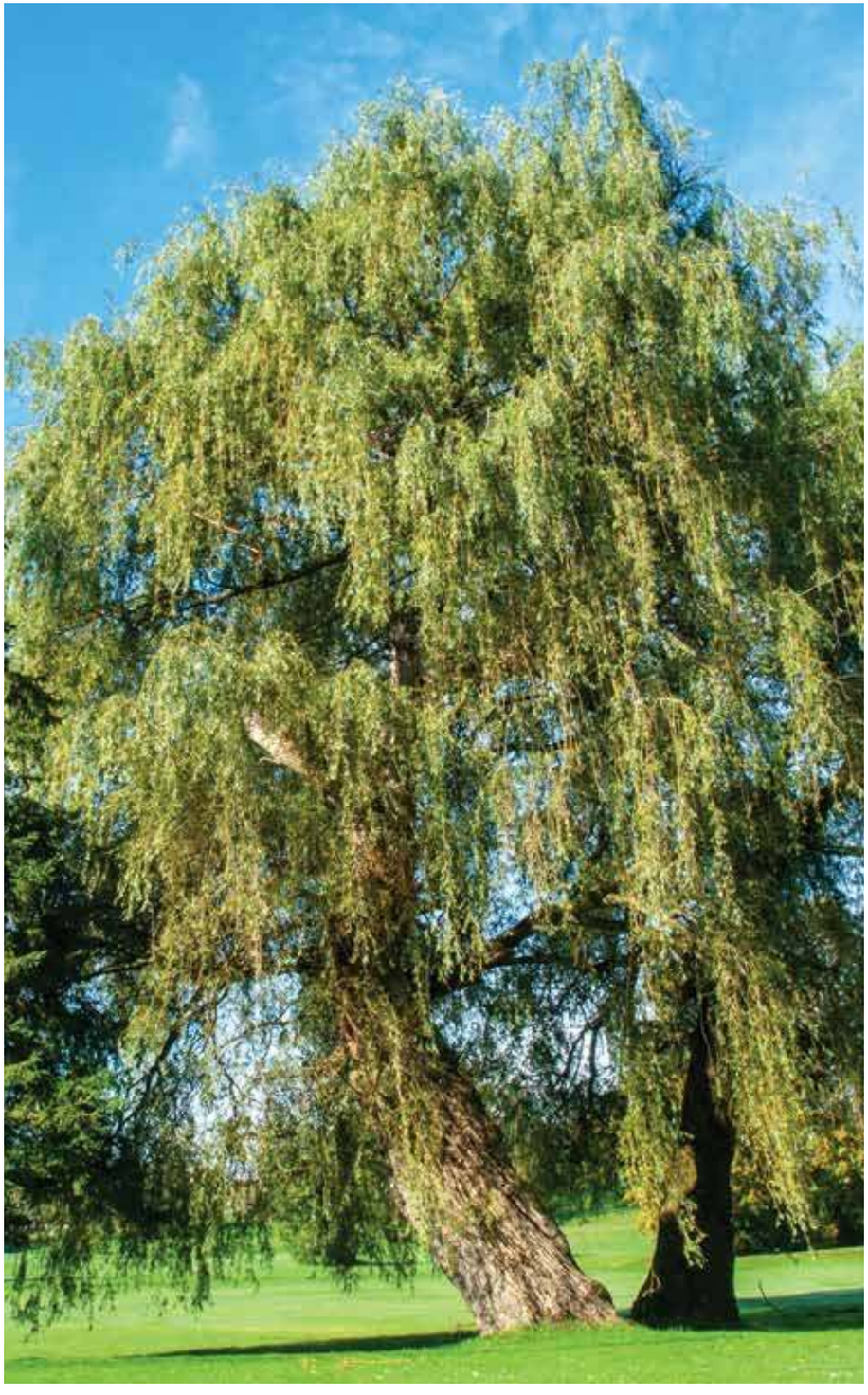
The eastern hop-hornbeam belongs to a tiny botanical genus of the birch family, containing barely 10 species known around the world. Three of them are native to North America, but only one is found in Canada: the country's very own ironwood. Indeed, the hornbeam is made up of extremely hard wood — the hardest, in fact, of all our native species, even harder than the oak. It is heavy, tough, very resistant and extremely fine-grained. Traditionally, it was used to make axe handles, sledgehammers, levers for extremely heavy objects, plough parts, wagons and carts. If there is one tree that worked "hard" helping the first settlers clear and work the land, it is the eastern hop-hornbeam. Today, however, its wood is not used nearly as much, since it rarely reaches a commercial size owing to its slow growth, and it contains fibres that make it difficult to split.

At first sight, there is nothing terribly special about this species' appearance, with its average height, narrow trunk, coarse greyish-brown bark, thin twigs and sensitivity to air pollution. But taking a closer look reveals ornamental aspects that make it a landscaping candidate. Its simple, alternate leaves have doubly serrated margins. A luminous yellow-green (paler on the underside), the leaves turn yellow or bright orange or even scarlet in the fall. At the end of the summer, the tree displays one of its most striking characteristics: two or three clusters of pale, greenish sacks on the tips of the annual shoots. These pretty seed heads, whose drooping clusters look a lot like a thinner version of hop cones, contain papery bags filled with small, flattened nuts or nutlets. This is the true fruit of the hornbeam.

The eastern hop-hornbeam is an excellent companion to other species. This powerful, if somewhat overlooked, creature is a shade species that typically grows beneath other large hardwoods, like the American beech, sugar maple, red oak and basswood. It rarely reaches the upper level of the forest canopy. Playing its companion species role to the hilt, it colonizes fast-draining areas, such as steep slopes or peaks, where it helps combat the die-off of less adaptable species. In this way, the eastern hop-hornbeam helps build stable communities, particularly in stands of sugar maples and basswood and stands of sugar maples and yellow birch.



◂ Typical of its species, this eastern hop-hornbeam in Vincent Massey Park features a trunk covered with burrs and outgrowths and whose leathery bark shreds into straight, narrow strips that curl off the trunk.



Golden Weeping Willow

SALIX X *SEPULCRALIS* SIMONKAI

In the National Capital Region, the golden weeping willow is often found in damp yet sunny areas. This open-space species is at its best growing alone, free from any shade that would greatly curtail its growth. Open spaces constitute the ideal environment, giving the tree's powerful creeping taproots room to spread. That is why the golden weeping willow is increasingly rare near private homes and increasingly common in public green spaces, like the one here at the Champlain Golf Course. A hardy species, it withstands frost, cool, damp or even wet soil, and clay soil. In fact, its only true enemy is drought. Since its wood is fragile and breaks easily, and in view of its preference for wet soil, it serves exclusively as an ornamental tree.

The yellow willow that was crossbred with the *Salix babylonica* to produce the golden weeping willow was the *Salix alba* var. *vitellina* (L.) Stokes. The name of this variety is derived from the Latin *vitellus*, meaning egg yolk. This yellow willow is to thank for the lovely golden hue of the weeping willow's magnificent weeping branches, which are all the more striking in the spring when the twigs are engorged with sap. Introduced on the European market in 1888 by the Spaeth family's celebrated German nursery, this variety took off upon its arrival in North America 20 years later.

◀ These twin weeping willows are on the Champlain Golf Course. The Latin name for these hybrid willows, *sepulcralis*, recalls the sad use to which these elegant trees have often been put: in the past, they were planted in cemeteries.

American Beech

FAGUS GRANDIFOLIA EHRHART
AJAWEMINJ (ANISHINAABEMOWIN NAME)

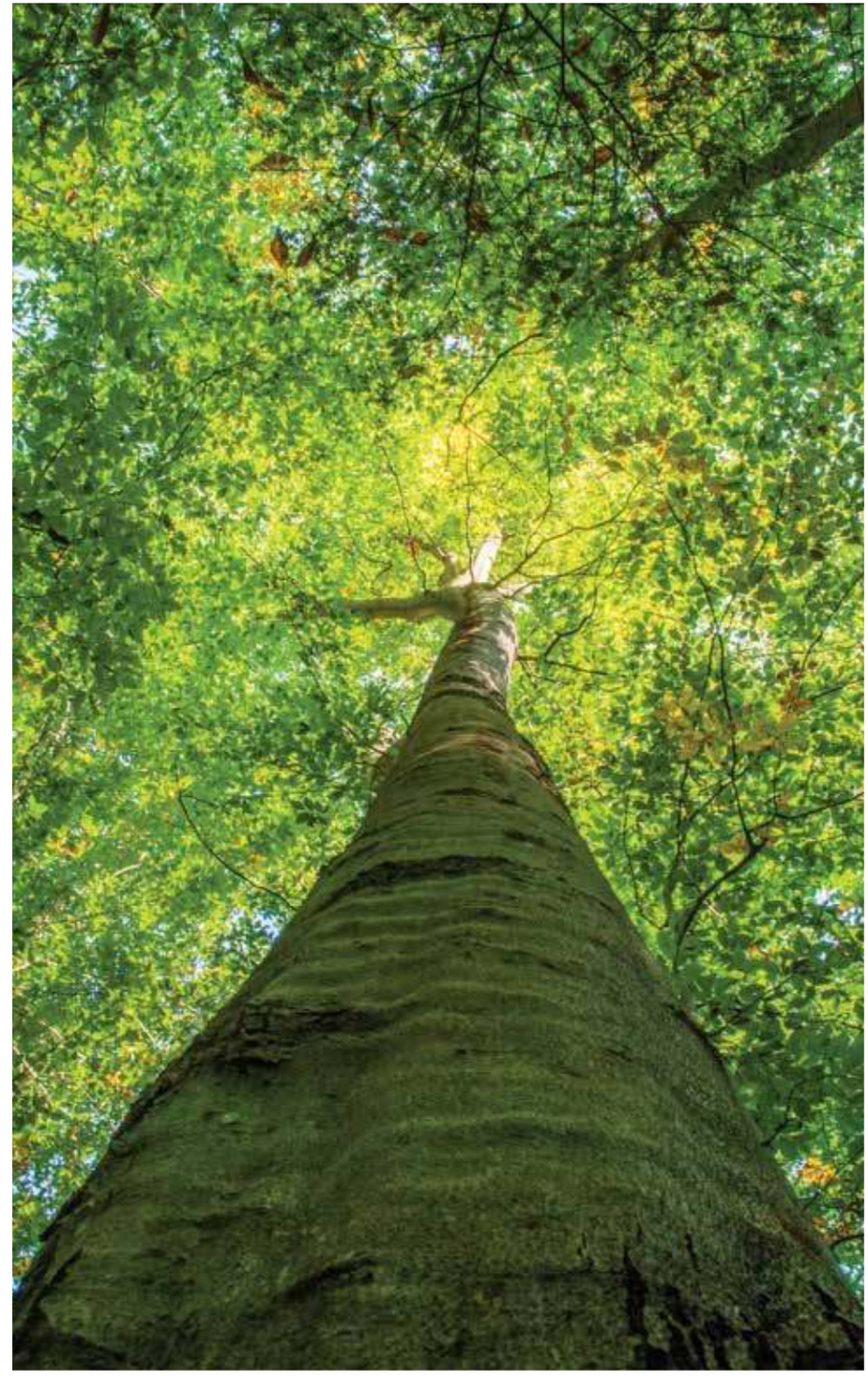
This remarkable American beech shares this farm woodlot with other scattered beech trees, along with some sugar maples and representatives of its favourite companion species, the eastern hemlock. As it ages, this wooded area will eventually evolve into a stable forest stand: a grove of beech and hemlock. The individuals in this ecosystem will also see their crowns join together and close off the sky, forming a marvelous cathedral-like forest once they reach the age of 300 or 400.

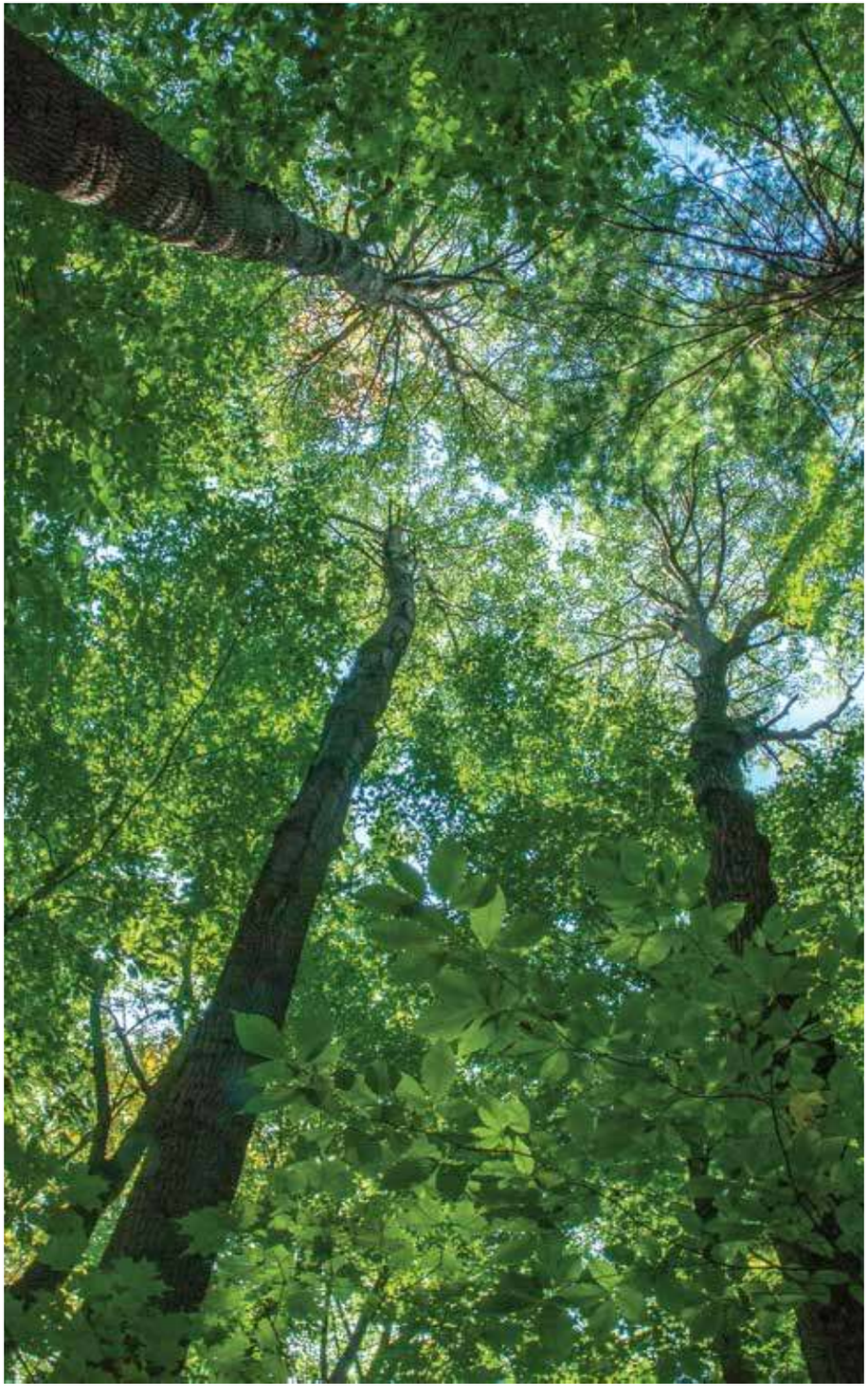
For now, those out for a stroll in the Champlain Corridor woods can already appreciate these fine 100-year-old American beech. Gazing up toward the sky, it's impossible not to admire the trees' long, elegant yet robust trunks, branchless until halfway up and sporting a glossy, mottled steel-grey bark that never seems to age.

The matted surface roots of this octopus-like beech have yielded numerous young stems, or saplings, that cluster like infants around their mother, forming a colony, or indeed a clone: they are the next generation. This behaviour is not seen in a positive light, because the tree's suckers prevent companion species from regenerating. The American beech also proliferates through sexual reproduction. The tree is affected by soil compaction, fire damage, air pollution and heatwaves. Global warming and acid rain prevent its roots from absorbing the calcium it needs; this can prove fatal.

▸ This venerable American beech is only too happy to share this small Champlain Corridor woodlot with its companions. No surprise, really, since this beech is one of the most shade-tolerant species around.

◂ After fertilization, the involucres in which the female flowers huddle become increasingly woody and their spines fill out as if to better defend the fruit gestating within: beechnuts.





Large-toothed Aspen

POPULUS GRANDIDENTATA MICHAUX
AZAD (ANISHINAABEMOWIN NAME)

The genus *Populus* comprises 35 species scattered throughout cold and temperate regions of the northern hemisphere, where they form numerous hybrids — both natural and artificial. The large-toothed aspen, also known as the large-leaved aspen or American aspen, is a pioneer native species that resembles the trembling aspen. In overly restrictive conditions, such as dry, depleted soil, this native of the northeastern United States and southeastern Canada grows slowly — shrub-like, in fact. But in conditions to which it is ideally suited, it can reach a height of 20 to 25 metres, with a trunk measuring 30 centimetres in diameter, and can grow to age 60 or more.

In habitats where it flourishes, it is not uncommon for the large-toothed aspen to form small pure stands from the root suckers of a single tree, as is the case with the group of elderly specimens in the old farm woodlot along the Champlain Corridor, where they have enjoyed fertile soil and maximum sunlight. Just like any other fast-growth pioneer species, the large-tooth aspen requires damp, fertile soil. And what does it get in return for its pioneering efforts? A rather limited lifespan. The large-toothed aspen also fares well in mixed stands, particularly alongside the trembling aspen, paper birch, eastern white pine, balsam fir, white spruce, willow and alder.

◀ The old farm woodlot along the Champlain Corridor is home to trees of all ages, including a small pure stand of nicely sized large-toothed aspen that, in all likelihood, came from the root suckers of a single tree some 60 years ago.

▶ The gear-like leaves of the large-toothed aspen intermesh with hairy white buds. These distinctive leaves have unevenly serrated margins and a hairy underside.

Trembling Aspen

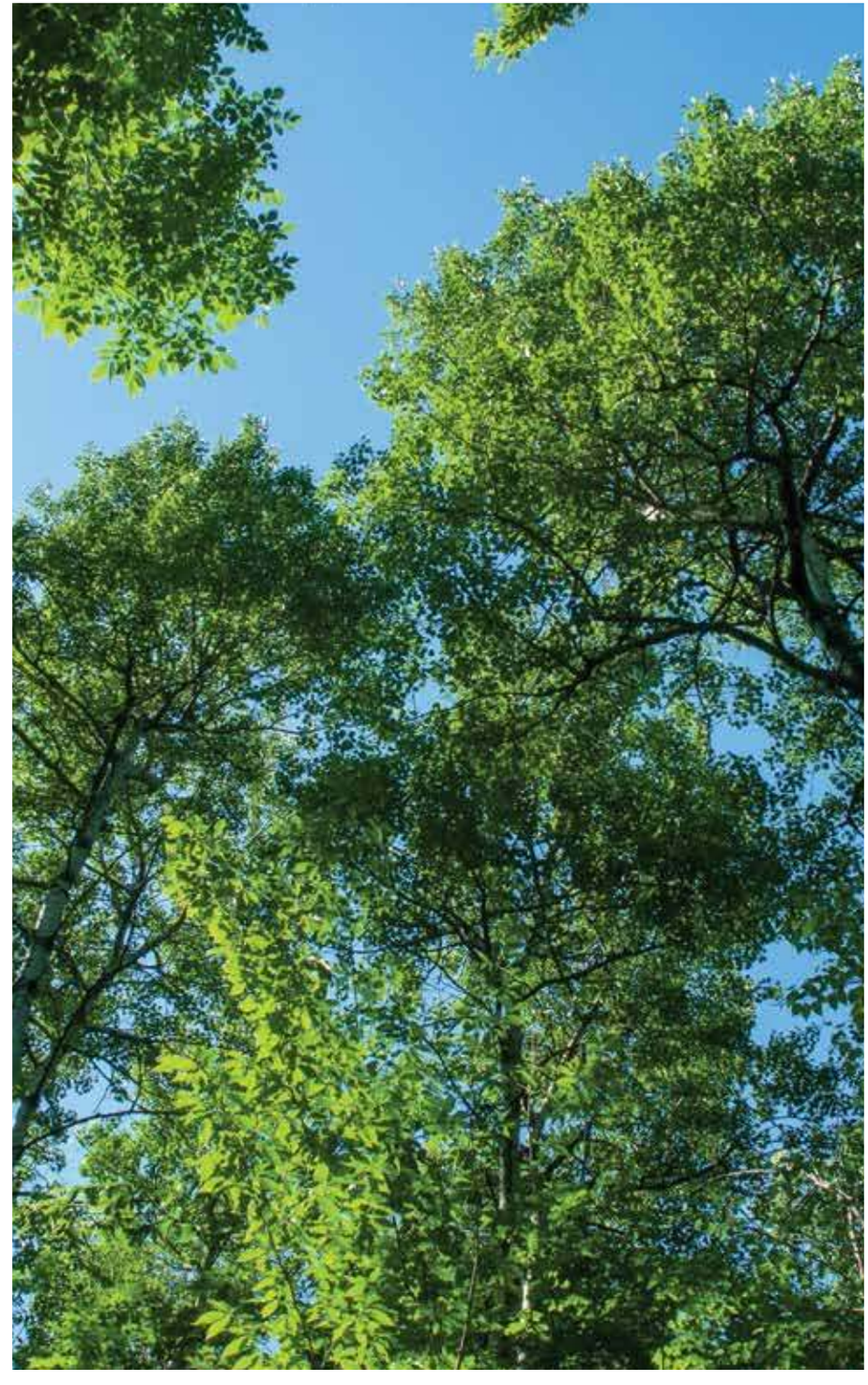
POPULUS TREMULOIDES MICHAUX
AZAD (ANISHINAABEMOWIN NAME)

The trembling aspen is one of the most widely occurring species in North America. It is found in every forest region of Canada. Its thin crown and delicate foliage bring a tender, sunny touch to the country's boreal forests, where rare hardwoods struggle to stand apart from the dark-toned conifers. As a pioneer species, the trembling aspen must satisfy its hunger for light and nutrients to grow to its optimum size. It likes loamy clay and limestone soils where it can grow to a height of 35 metres, conditions that it finds in a few areas of the National Capital Region.

Although it routinely forms pure stands, the trembling aspen grows nicely in the company of other species, including the eastern white pine and balsam poplar. It readily colonizes a wide diversity of soils and territories where no tree has lived before. It becomes easily established in gaps left in conifer forests by previous clearcutting or forest fires, and in windswept areas subject to wild temperature swings. There it tends to form pure stands where its main predators are the hare, white-tailed deer, moose, porcupine and beaver, which munch on its suckers and twigs or damage its trunk.

▸ This small group of aspen trees, six of which are pictured here, can be accessed via the bicycle path or the trails near the Relais plein air du parc de la Gatineau. This perfectly illustrates the trembling aspen's habit of forming pure stands.

◂ Bud break is a touching stage in the trembling aspen's annual phenology. Its new ovoid or kidney-shaped apple green leaves, attached by long, laterally flattened petioles, flutter endlessly in the breeze. Shiny on the surface but duller on the underside, their fluttering makes them appear more vibrant.



Hybrid Siberian Crab Apple

MALUS X BACCATA

The hybrid Siberian crab apple and its hybrids have a prominent place in the ornamental plant history of the National Capital Region. This species, which originated in eastern Siberia, Mongolia and northern China, is the planet's northernmost flowering ornamental crab apple. In 1784, this most hardy of crab apple trees made its first appearance in the Western hemisphere when German botanist Johann Andreas Graeffer sent some seeds to the Kew Royal Botanical Gardens in London. From then on, scores of hybridizers the world over began cross-breeding the species to create a multitude of hardy varieties from the hybrid Siberian crab apple.

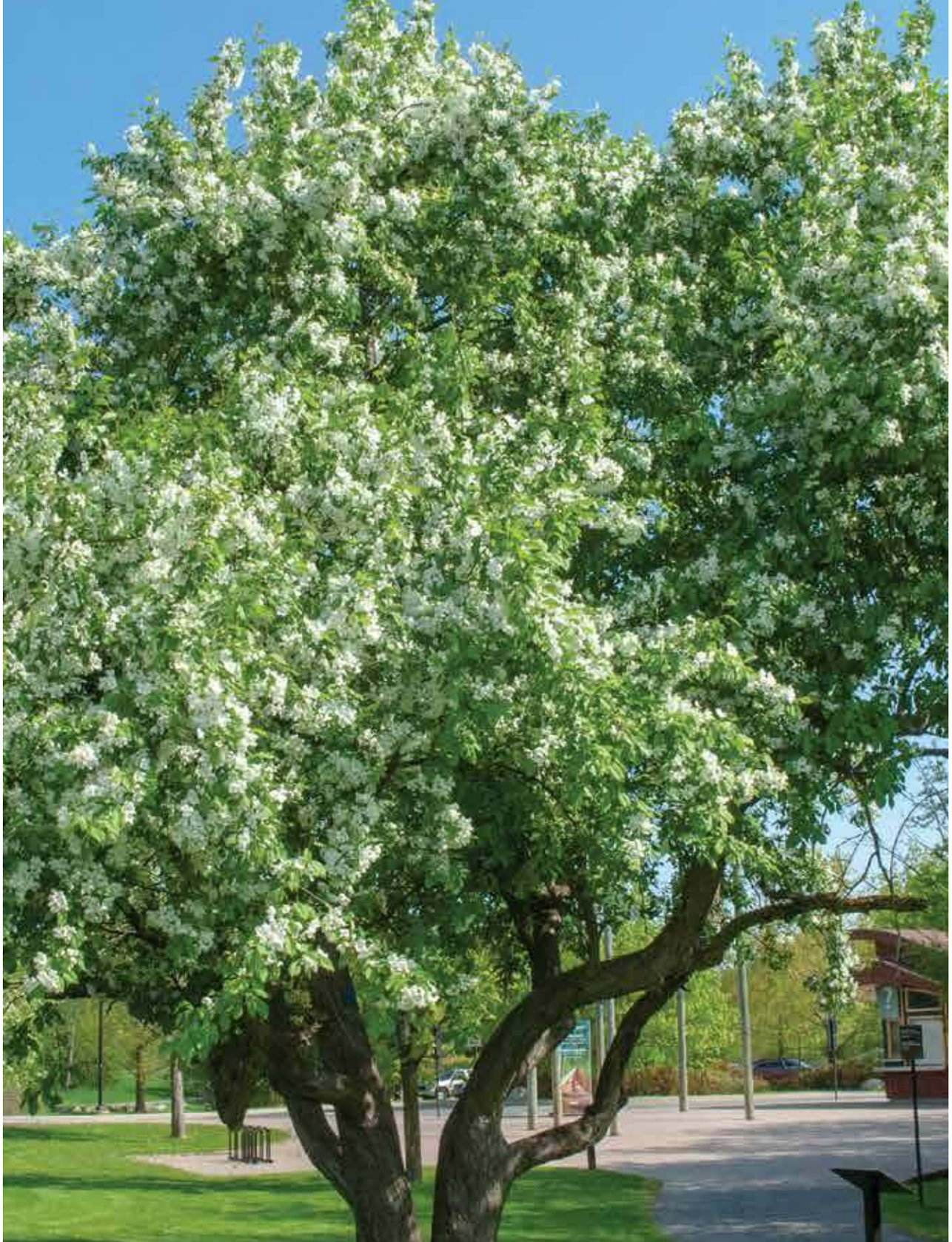
In the early days of Ottawa's Central Experimental Farm, director William Saunders, himself an esteemed orchardist, set about creating hardy varieties of apple and crab apple trees that could withstand the harsh climate of the Canadian Prairies. In 1887, he obtained hardy hybrid Siberian crab apple seeds from the Royal Botanical Gardens in St. Petersburg, Russia, to grow the species and also to use it for hybridization.

In 1900, Saunders teamed up with Auguste Dupuis, chair of the Conseil d'agriculture du Québec, on the Canadian delegation to the Paris Exhibition. Commissioned for the occasion by Agriculture Minister Sydney Arthur Fisher, they co-published a text on the history and status of Canadian fruit growing, entitled *La culture fruitière au Canada*. In it, the authors relate how the Fruit Growers' Association of Abbotsford, established in 1874 not far from Granby, Quebec, was the first local organization for the encouragement of fruit growing in the province. In 1884, this cutting-edge association "made importations of Russian apple trees for test in different parts of Quebec, and a few of these varieties have been found useful."

And so it was that just a few years later, Saunders himself to introduced the hybrid Siberian crab apple, the exact same species as the Russian apple tree, as genetic material for hybridization and the creation of hardy varieties at Ottawa's Central Experimental Farm. To give readers a sense of the scope of their enterprise, Saunders and Dupuis also mentioned in their brochure that by the year 1900 there were already 700 varieties of apple and 22 of Siberian apple on the Central Experimental Farm.

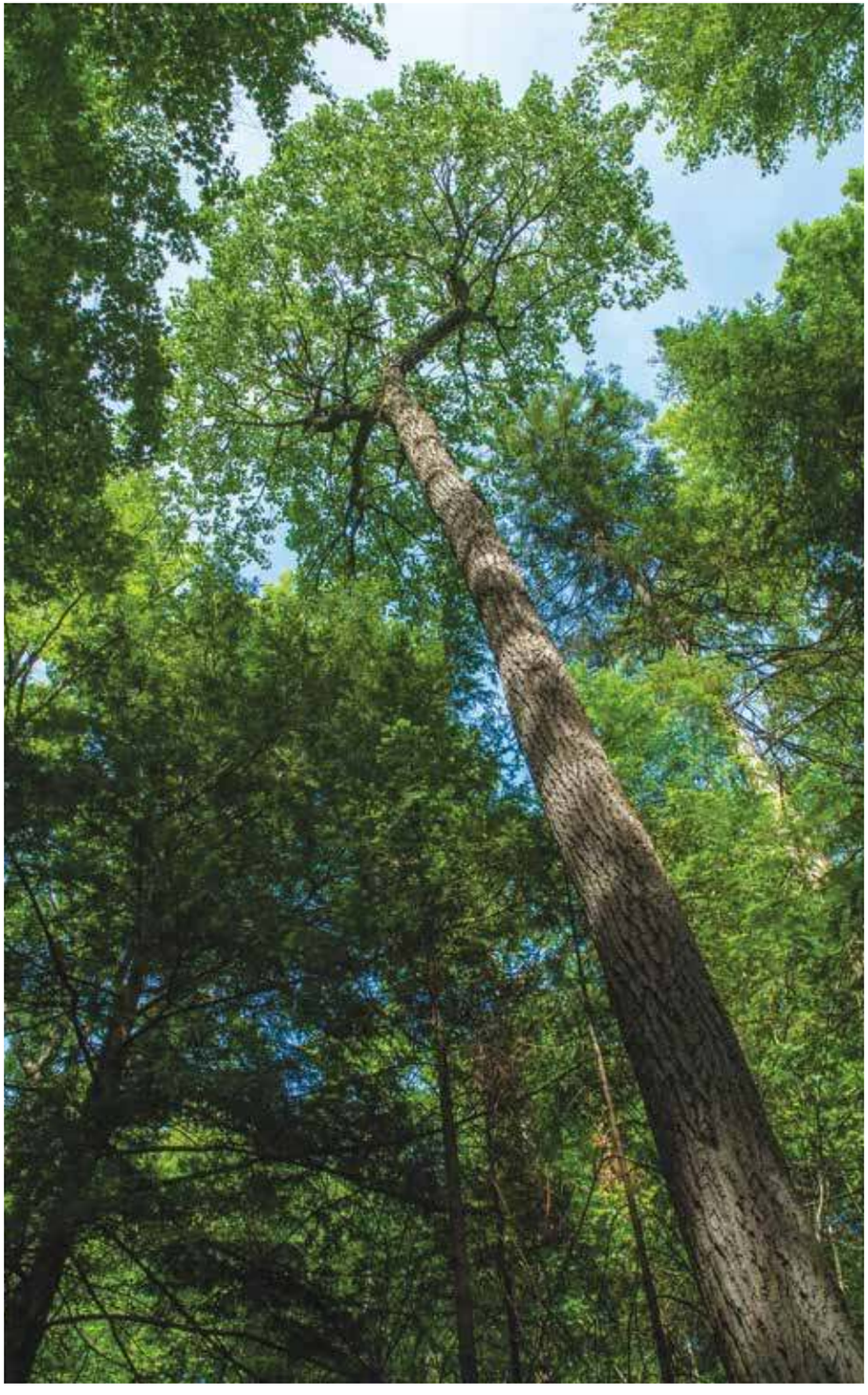
The hybrid Siberian crab apple shows its true colours during leafing. Its leaves, curled up in their buds, remain twisted even after they develop. Self-fertile, the hybrid Siberian crab apple has hermaphrodite flowers that fertilize one another on the same tree, such that a single tree suffices to produce fruit. Rather small for crab apples, the fruit looks like two-toned marbles (yellow and orange). A source of food for migrating birds, the crab apples remain attached to the twigs well after the leaves have fallen.

Although the hybrid Siberian crab apple is used as a root stock or occasionally as a bonsai, it is first and foremost a highly ornamental tree in its own right. Around six metres high and with a lifespan of 40 years or more, it grows best in the full sun and in well-drained, moist soil — although it is suited to a vast array of soil types: sandy, silty and clay.



▲ The hybrid Siberian crab apple, like most ornamental crab apples, is a prized species among growers. It is characterized by its profusion of fragrant springtime flowers. Hardy and fast-growing, it deals well with urban conditions.

◀ The hybrid Siberian crab apple planted here, at the southern entrance of Gatineau Park (parking lot P3), is similar to the pure species to which it was hybridized. It was cultivated in the National Capital Commission's nursery in Blackburn Hamlet, in Ottawa's east end.



Large-toothed Aspen

POPULUS GRANDIDENTATA MICHAUX
AZAD (ANISHINAABEMOWIN NAME)

While it looks like a trembling aspen, the large-toothed aspen has a far smaller native range. In Ontario and southern Quebec, its stands begin at Temiskaming Shores, wind southeast along the Ottawa River and follow the St. Lawrence River all the way to the Gaspé Peninsula. There is also a population at the border between Ontario and Minnesota.

This large tree belongs to the same family as the quaking aspen (*Populus tremuloides* Michx.), which itself resembles the European poplar (*Populus tremula* L.). The three species share similarities: all have smooth green bark on much of their trunk, except at the base where it is grooved and darker, and all three produce leaves whose banded petioles are flattened perpendicular to the blade, such that they flutter endlessly in the slightest breeze.

With the trembling aspen and the large-toothed aspen, there is both vegetative propagation and sexual reproduction. Root suckering is abundant and vigorous, so the suckers are soon able to overcome the surrounding competition. But unlike the trembling aspen, the large-toothed aspen prefers flat or slightly sloped land and aerated, well-drained soil, such as that found in highlands with medium to roughly textured sand. Over the years, the trunk of both species acquires black diamond-shaped marks, but this is more common with the large-toothed aspen.

◂ Desperate for light, this large-toothed aspen took advantage of a gap in the canopy to reach for the sky, near Trail 27 in Stony Swamp, part of the Greenbelt. This trail leads to a giant eastern white pine and other companion trees.

Balsam Fir

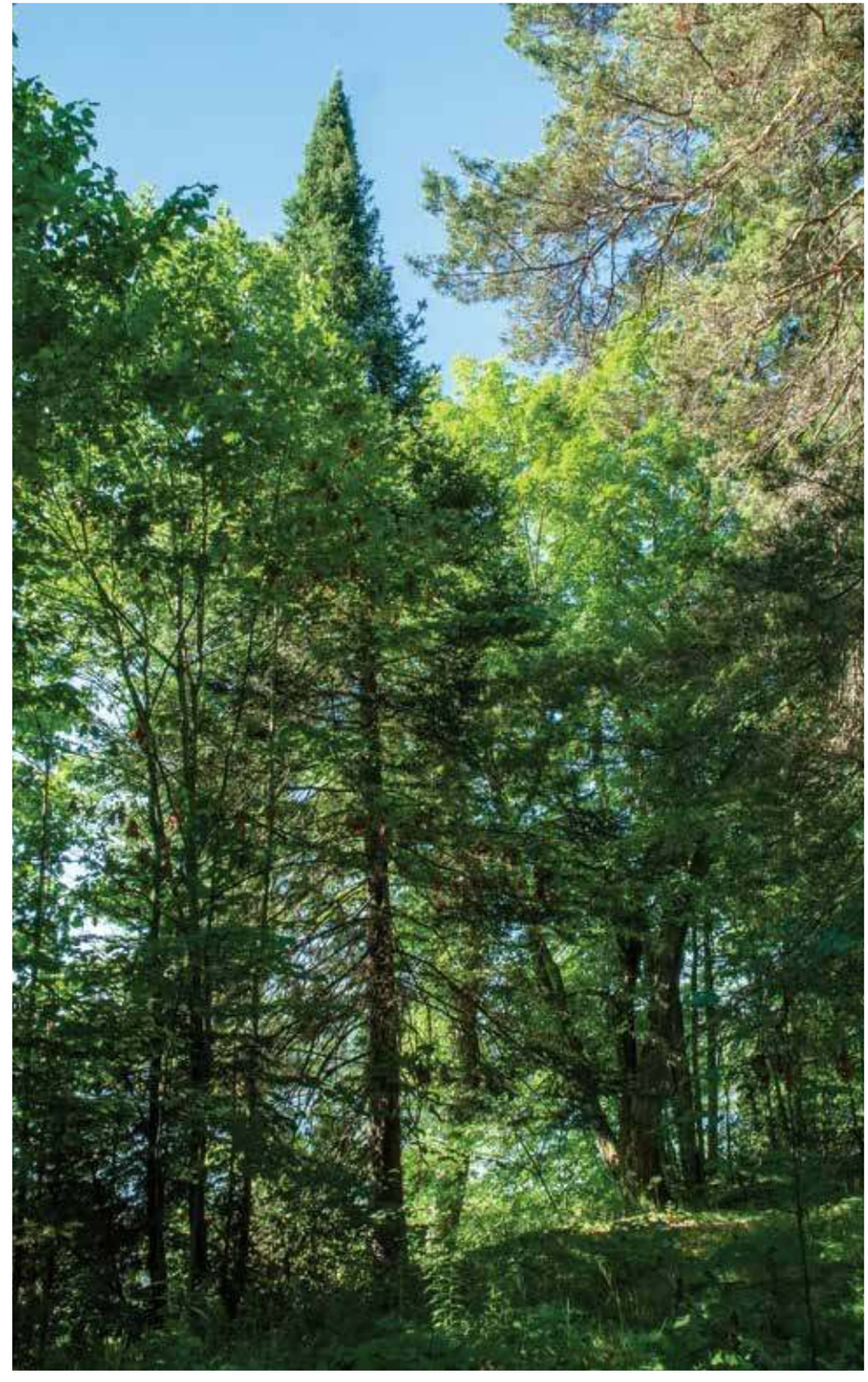
ABIES BALSAMEA (LINNAEUS) MILLER
SHINGOB (ANISHINAABEMOWIN NAME)

The balsam firs near Philippe Lake's Breton Beach were most likely planted during the first few years of the National Capital Commission. In 1958, this organization — charged with protecting and managing Gatineau Park — planned to redouble efforts to reforest the municipality of La Pêche, where it had built a bridge. This municipality, tucked away in the Gatineau Hills, was formed in 1975 by the amalgamation of the townships of Wakefield (1845), Aldfield (1877), Wakefield village (1917) and Sainte-Cécile-de-Masham (1940), previously South Masham (1913). The names of these townships each correspond to the name of a town in Yorkshire, a county in northeastern England that was home to many of the settlers who came to this territory, starting in 1847. Before this colonization, logging companies had felled many of the trees in this region, and the settlers were attracted by the prospect of farming the newly cleared fields.

The balsam fir was a wise choice for reforestation. It is the strongest Canadian softwood. It develops to its full potential in cold climates and wet soil, but it can adapt to just about any habitat. Cleared or abandoned land, clearings and forest edges give it all the light and space it needs to thrive.

▸ Great care must have gone into making these balsam firs so beautiful and so perfect. They were selected, planted and optimally maintained by the brand-new National Capital Commission.

◂ The balsam fir is slow to grow during its first few years, but it grows faster for the next 60 years and then gradually slows down until the tree reaches its maximum age of 150.



Sugar Maple

ACER SACCHARUM MARSHALL
SIZIBAKWADO-ININATIG (ANISHINAABEMOWIN NAME)

The Vanier sugar bush, the world's largest urban maple sugar bush, is in the National Capital Region. It sits within Vanier, a highly urbanized, Franco-Ontarian part of present-day Ottawa. In the 1990s, a charitable group, Action Vanier, decided to initiate a community pride project using an enduring symbol of Vanier's vitality: the Vanier Sugar Shack. Through fundraising, the group was able to build a maple showpiece complete with a sugar shack and an evaporator, in a four-hectare urban woodlot, all within plain sight of Parliament Hill. Today it welcomes thousands of area residents, schoolchildren and dignitaries. The forest was first purchased by the Catholic religious order known as the Pères Blancs (White Fathers) in the 1930s. Well known for their missionary work in Africa, the White Fathers tapped the first trees in the 1930s, built the first sugar shack in the 1950s and produced maple syrup until the land was sold in the 1970s to the federal government. The land was transferred to the City of Vanier, which authorized the construction of the shack. It opened in 1999, the year after a devastating ice storm; in fact, some of the maple wood used for the ceiling of the building came from trees lost in the storm. Today over 1,000 taps yield 400 litres of syrup each year, which is enjoyed by people across Canada and the world.

◀ Vanier Museopark's Sugar Shack in the heart of the national capital.

Source: © Vanier Museopark, www.museoparc.ca

American Hornbeam

CARPINUS CAROLINIANA WALTER

The American hornbeam is a small, tormented-looking tree. Its twisted, forked trunk supports a small number of randomly arranged, low-lying, bumpy and sagging branches. For such a peculiar looking tree, it is extremely strong; indeed, it has always been known as an "ironwood." In Ancient Europe, hornbeam wood, known for its tremendous resistance, was used to make yokes for draught animals. In fact, this practice is the source of its Latin name *carpinus*, derived from the Celtic words *car* and *pin*, meaning wood and head, respectively.

In Stony Swamp, an area of exceptional species diversity, the American hornbeam benefits from the wetlands created by beaver activity and from the rich ecological habitat. It is here that this midget lives practically underwater, in the asphyxiating conditions of the riparian forests of the swamps, where drainage leaves a lot to be desired. A plastic (as in malleable) species, the hornbeam manages to grow just as well in the full sun as under a dense canopy of hardwoods.

In 1831, William Green wrote that when the First Nations needed fine fibre textiles, they would use the internal bark covering the long branches of a few different species, including the American hornbeam, that they would macerate and then boil in a wood-ash solution. The fibre strands would then be washed in water and pounded with a sort of pestle to separate the fibres into smaller and smaller fibres that could then be woven or braided.

◀ Like the eastern hop-hornbeam, the American hornbeam is also nicknamed "ironwood." Both small-growing species practise an efficient brand of photosynthesis by increasing the size of their leaves as they edge closer to the tips of the twigs, where they take full advantage of the light.

▶ The American hornbeam, shown here on Jack Pine Trail in the Greenbelt, colonizes the wettest sites on former riverbeds. Its surprisingly strong stalks were once used by log drivers to attach wood piles to the rafts.

Key Challenges Facing the Capital

In 1980, Arthur R. Buckley (1908–1995) wrote *Trees and Shrubs of the Dominion Arboretum*, published by the Department of Supply and Services Canada. His book examined the performance and hardiness of the species grown at the Central Experimental Farm's Dominion Arboretum since its inception. Curator of this living museum and botanical garden for 35 years (1938 to 1973), he was ideally positioned to advise Canadians on the best varieties of trees and shrubs to plant.

◂ Damages at Bruce Pit, caused by a tornado on September 23, 2018.
Source: NCC

In his introduction, Buckley indicates that because of its "north of 45° latitude, the Dominion Arboretum is the most northerly arboretum on the continent and is especially useful in testing for hardiness of plant materials." He cites meteorological statistics gleaned from observations dating back to the early 1940s. One such statistic is a revealing indicator of tree health: the spread between the average temperatures of the coldest month (–11°C in January) and hottest month (16°C in July) month was 27°C. Even more striking is the fact that about 40 years later, the spread between the average temperatures in January (–10.5°C) and July (21°C) is 31.5°C, an increase of 16.7 percent.

This increasing spread is sorely testing the hardiness of the region's trees. For a long time now, the Dominion Arboretum has conducted experiments on trees with a more southerly native range. One such experiment was launched in 1890 on the Kentucky coffee-tree, some specimens of which were planted at Rideau Hall and along Queen Elizabeth Driveway. Another experiment was started in 1893 on the river birch, which could now be called on to replace the native birch trees that are suffocating in the overheated atmosphere of our cities. The sycamore, planted around the same time, is now reputed to be the most successful one on the northern part of the continent.

These temperature spreads are but one piece of the global warming puzzle. The warming of the planet is turning oceans into reservoirs of heat and humidity, playing tricks with rainfall patterns and increasing the frequency and severity of climate events. Trees are having to contend with lengthier and more frequent heatwaves, record-breaking summer highs, altered precipitation, increasingly intense and lengthy forest fires, and more frequent episodes of freezing rain. They are also dealing with new insects and diseases linked with the growing spread of disease-causing pathogens.

▲ Ice storm in the National Capital Region, 2012.
Source: NCC

In this unprecedented environment, protecting the tree cover is a daunting challenge, but our future quality of life depends on it. The presence of trees is all the more crucial in that they play leading ecological, health, esthetic and economic roles. They capture pollutants, sequester carbon dioxide, produce oxygen, shelter and protect wildlife, offer protection from wind, prevent erosion, improve water quality, promote biodiversity, enhance landscapes and increase property values — not to mention the psychological benefits they offer. Fortunately, we are now able to select more southern species that better tolerate breakage caused by freezing rain, snow and fire and are more resistant to drought, flooding, insects and disease. Protecting the urban forest also means avoiding air-mass disturbances, heat islands and the trapping of air pollutants caused by large buildings. Trees that are resistant to gusting winds must also be planted. It is vital to conserve existing trees, which have stood the test of time, and to encourage the planting of species adapted to the third millennium.

Red Ash

FRAXINUS PENNSYLVANICA MARSHALL
AGIMAK (ANISHINAABEMOWIN NAME)

Standing in the heart of North American cities, ash trees — and in particular the red ash — were likely the most common urban tree at one point. These trees do not have an easy life, although they germinate easily and sprout up lightning-quick from a variety of soil types. They quickly reach their optimal size and volume and become the highest and most massive trees found in urban environments. Ash trees have been grown on a massive scale, because they seemed indifferent to insects and pollution. Today it is almost inconceivable how the emerald ash borer, such a small insect, has been able to conquer most of the area's large ash. This beetle, originally from Asia, has proven to be a destructive force.

Since its introduction to North America, the emerald ash borer has decimated hundreds of millions of trees, all species combined, in Canada and the United States, and it continues to spread to new areas, wreaking economic and ecological havoc wherever it goes. First discovered in Detroit in the summer of 2002, the emerald ash borer is present today in 31 American states, as well as in Manitoba, Ontario, Quebec and New Brunswick. The first infestation in the region dates back to 2008, and the beetle's spread is showing no signs of slowing down. This is yet another giant challenge for urban forest managers in the National Capital Region.

◀ This red ash in the Woodroffe area near New Orchard Avenue, along the Sir John A. Macdonald Parkway, is one of the trees injected by the National Capital Commission against the emerald ash borer on some of its urban land, in an effort to save as many ash as possible.

▶ Since ash account for 20 to 25 percent of all urban and rural trees in the capital region, and since most ash are affected by the emerald ash borer, the key to an effective replacement strategy is to plant a diversity of species.

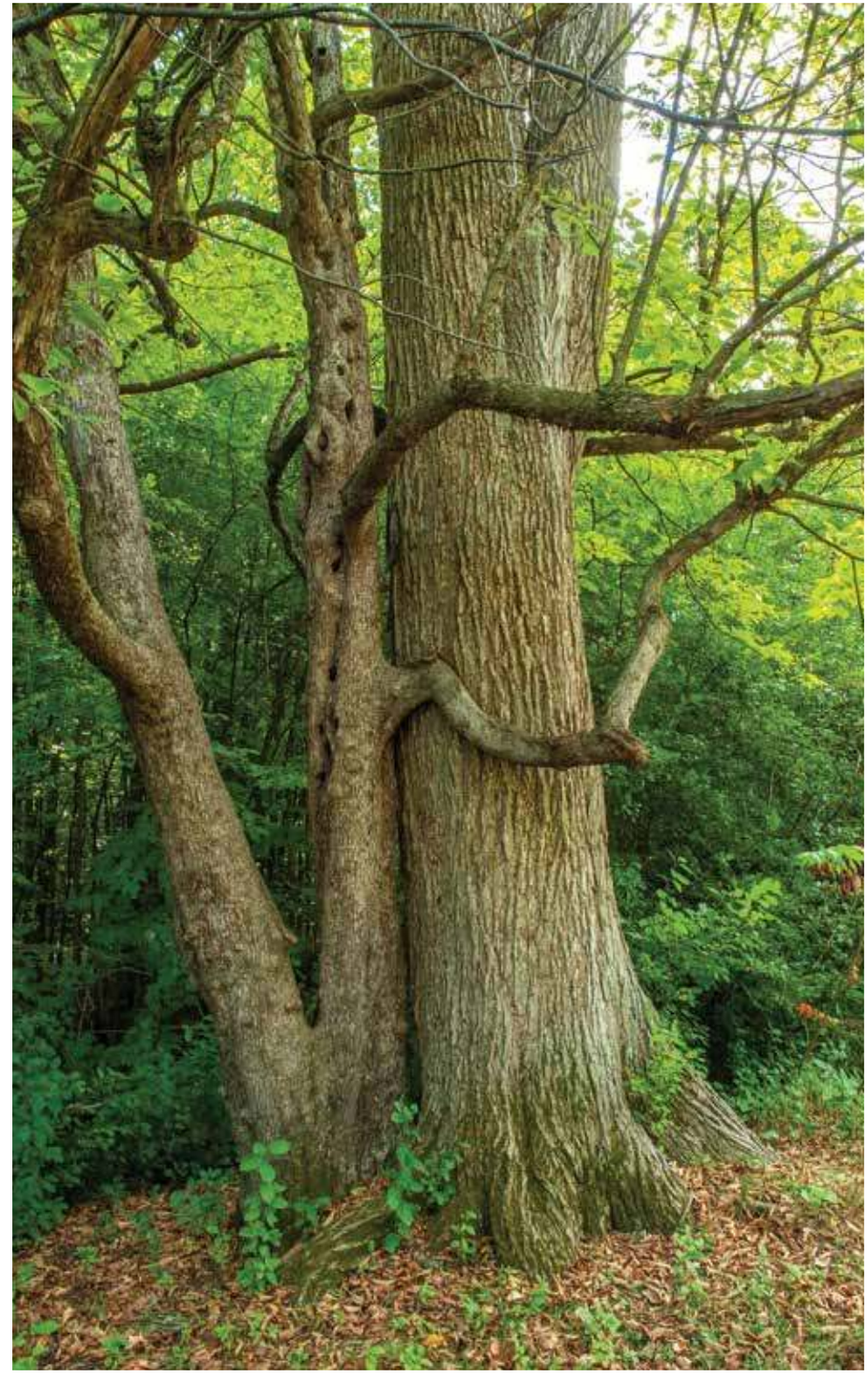
American Elm and Eastern Hop-hornbeam

ULMUS AMERICANA LINNAEUS AND *OSTRYA VIRGINIANA*
ANIB / MANAN (ANISHINAABEMOWIN NAME)

This inseparable couple, entwined in the sugar maple stand near Trail 68 in Gatineau Park, consists of an eastern hop-hornbeam and an American elm. For its part, the American elm has been cultivated a great deal over the past 300 years, in both the city and country, and this type of cohabitation is not surprising to see. Although joined at the hip for better or worse, these specimens have one good thing in common: they get along well with other hardwoods, which is not to say that they do not have their own life to live. Each spring, following an early bloom and even before leafing, this elm produces fruit in the form of light horseshoe-shaped keys, covered with hundreds of hairs.

The eastern hop-hornbeam's native range falls completely within that of the American elm, which extends east to the Atlantic coast, south to northern Florida and as far west as Saskatchewan. In other words, in Canada's Capital, the two trees enjoy equally favourable bioclimatic conditions. They form a common front against climate disruptions. Both tolerate wind well and are at risk less from tornadoes than from insects and disease, which lower their life expectancy.

In the early 18th century, William Sheppard noted that a concoction made from the wood of the eastern hop-hornbeam was known in Canada as a cure for intermittent fever — an alternative, perhaps, to the bark from the yellow or red cinchona, which grow in Central and South America and yield quinine.



▸ This eastern hop-hornbeam displays a double trunk, rather than the straight bearing typical of the species. The elm seems to grip the ground with its buttress roots, as though afraid of being uprooted by its alter ego, whose knobby, sprawling branches have it in its clutches.

◂ At the end of summer, in the shade of its unlikely spouse, the hop-hornbeam takes centre stage and produces, at the tip of each annual shoot, fruiting heads whose delicate utricles contain tiny nuts.

Rock Elm

ULMUS THOMASII SARGENT
ANIB (ANISHINAABEMOWIN NAME)

The twin elms of Tunney's Pasture belong to a native species deemed at risk in both Quebec and Ontario. Developed in the 1950s according to the principles of environmental conservation espoused by urban planner Jacques Gréber, Tunney's Pasture houses federal office buildings. This elm duo is a vivid reminder of the importance of the Dutch elm disease management program co-developed by the National Capital Commission and the Department of Natural Resources after the disease was detected in the 1970s. Thanks to these early prevention efforts, which included the micro-injection of a systemic fungicide, many of the capital region's elms were spared an early death.

The rock elm is easily distinguished from the American elm and slippery elm by the presence of darkish, irregularly shaped corky wings that form along its branches in three or four rows. These cork-like ridges appear after barely two years. As the branches age and fill out, the wings become thicker and more visible, at least on certain branches. The rock elm's leathery leaves narrow to a slender point, and their base is a little less asymmetrical or uneven than those of other elms. They are a pretty, shiny dark green (paler on the underside) and turn bright yellow in the fall, giving the tree considerable esthetic value.

◀ This robust rock elm pair grows in Tunney's Pasture, a 49-hectare area named after Anthony Tunney, who came to Ottawa from Ireland in 1867. Tunney was hired to oversee the pasture by the Ottawa Lumber Merchants Association, founded in 1836.

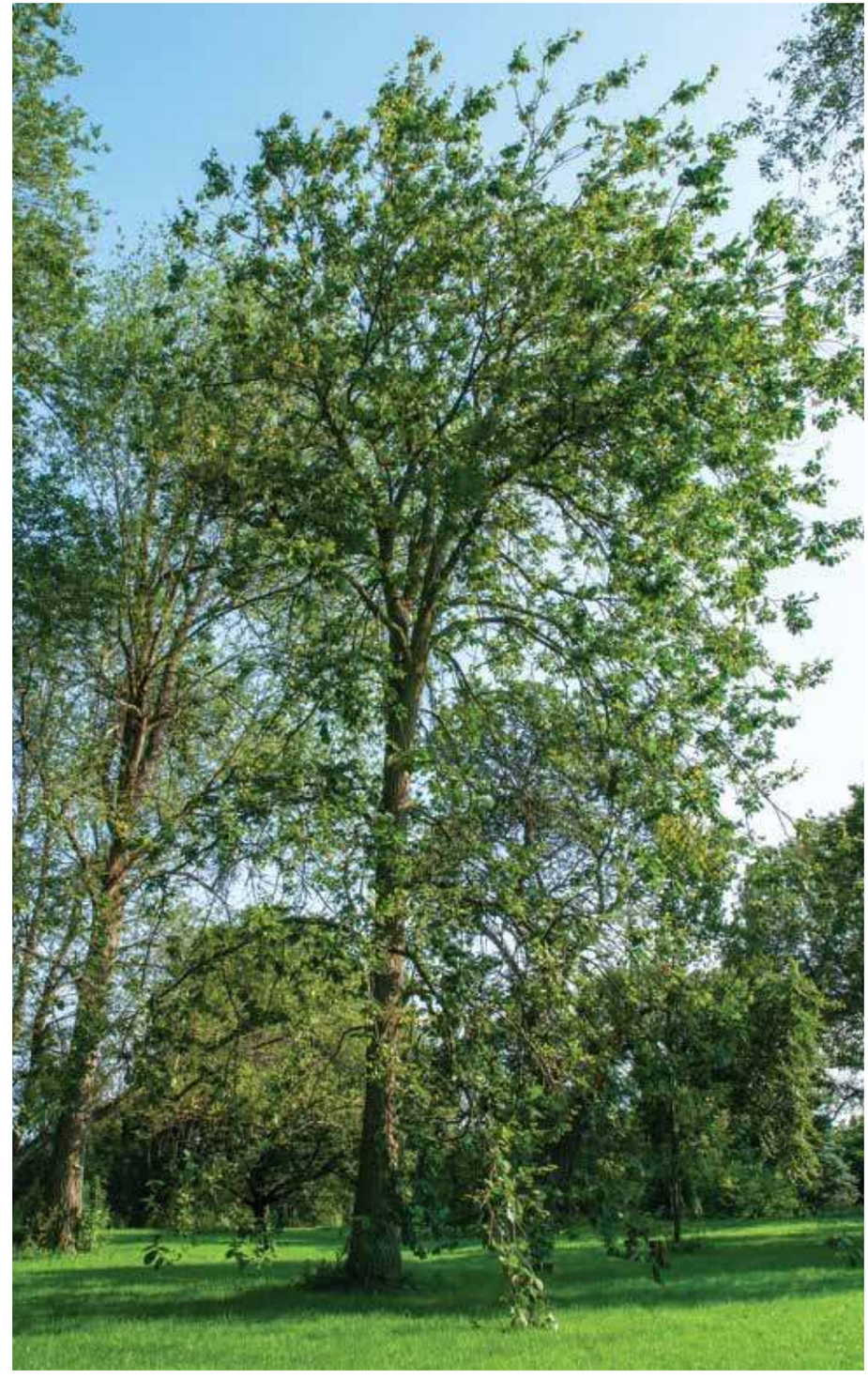
▶ Rock elm leaves are a glossy dark green — paler on the underside — and turn a bright yellow in the fall. They are covered with a silky down, particularly on the veins, which extend out in straight lines from the midrib to a large incurved tooth on the margin.

Rock Elm

ULMUS THOMASII SARGENT
ANIB (ANISHINAABEMOWIN NAME)

The rock elm is a typical species of central-eastern North America but found nowhere else on the planet. Its native range is centred on a large, crescent-shaped region south of the Great Lakes comprising U.S. states found in the upper valley of the Mississippi River. It is also found sporadically outside this central area, as far away as the northeastern states of New England as well as in southern Ontario and southwestern Quebec. In fact, Sainte-Élisabeth, in Quebec's Lanaudière region, marks the northeastern limit of the rock elm's native range in North America — and, for that matter, the entire world.

As with all tree species that reach the northern boundaries of their native range, climate factors severely limit the possibility of rock elm expansion in Ontario and Quebec. Myriad other factors over the centuries have played a role in diminishing and eliminating natural colonies: urban and agricultural development, quarrying, accidental felling of individual trees, various forestry practices inhibiting regeneration of the species and attacks of Dutch elm disease. With the accelerated pace of climate change, this small elm, found on rocky slopes and limestone outcrops in the capital region, may push further north, but not without having to contend with its arch enemies: bark beetles, wood-rotting fungi and Dutch elm disease.



▸ This magnificent rock elm, a horticultural form of the species, has grown in the Dominion Arboretum for about a half century, further evidence of national arboretum's exceptional contribution to the conservation and reproduction of the genetic heritage of at-risk native plant species.

Slippery Elm

ULMUS RUBRA MÜHLENBERG
ANIB (ANISHINAABEMOWIN NAME)

In Mooneys Bay Park in 2017, the ribbon was cut on the largest playground in Canada. It is on an artificial bay that was created during the construction of the Rideau Canal when a dam was built, creating Hog's Back Falls and Locks. The park was named after three generations of the family responsible for the locks for 87 years. The widening of the river likely flooded part of the shoreline, helping these spectacular slippery elms take root.

At first blush, the slippery elm has a similar, if smaller, bearing to that of the American elm, which it occasionally grows alongside on wetlands. However, the proportion of the slippery elm's trunk that is free of branches is larger, and the tree's delicate branches curve upwards rather than droop.

That this uncommon tree became established here comes as no surprise, since the slippery elm, rarely used as an ornamental tree, far prefers damp natural habitats bordering fields or along creeks, in sunny locations where the soil is rich and fertile — a perfect description of Mooneys Bay. In this era of global warming and extreme precipitation, the slippery elm's resistance to wet soil, rot and floods makes it ideally suited to shore stabilization efforts.

◂▸ It is very rare to find a slippery elm in its natural state that is as tall and as thick trunked as these two spectacular specimens, both growing in the park at Mooneys Bay.

▸ This slippery elm grows near the Terry Fox Athletic Facility. The fact that it occupies land along the Rideau Canal makes it a likely contemporary of the other slippery elms in Mooneys Bay Park.

▸ The fragrant leaves of the slippery elm are rigid, coarse-surfaced and attached to short petioles. They seem to unfurl and float horizontally in space, as though they were levitating.

Hybrid Elm

ULMUS X

Dutch elm disease is usually associated with the American elm on account of the tree's popularity and the public's attachment to its huge fan-like crown in urban and rural landscapes. In reality, though, the disease attacks all species of *Ulmus*, including exotic elms like the mountain elm. The slippery elm is less vulnerable than the American elm, but the rock elm is just as vulnerable. Fortunately, there are natural hybrids and those created specifically from resistant specimens whose hybrid vigour — that is, the capacity of an offspring to improve over its parents thanks to genetic mixing — is put to good use.

These hybrid elms are unlikely to fall victim to Dutch elm disease, which today infests the entire native range of the American elm, from the Maritimes to Florida and from Saskatchewan to Texas. First detected in 1944 in Quebec and in 1946 in Ontario, the disease did not reach the Capital's trees until 1970. The National Capital Commission saved many trees by identifying diseased elms of every species, having them felled and replacing them with resistant varieties or different species. Preventive measures taken by the NCC also included pruning the dead portions of otherwise healthy elms and proceeding with micro-injections of fungicide. The epidemic waned considerably but returned with a vengeance around the year 2000, when the integrated arsenal of measures to combat the disease was immediately called back into service.

▸ This magnificent hybrid elm was planted to replace an American elm that died of Dutch elm disease along the main artery of Ottawa's Central Experimental Farm, the NCC Scenic Driveway.

◂ Sunset affords the best view of this impressive, nearly perfect hybrid elm, which stands alone on the Ontario shore of the Ottawa River, near the access to Champlain Bridge. A source of pride, this specimen is periodically assessed to ensure that it remains healthy.

Butternut

JUGLANS CINEREA LINNAEUS
PAGANAKOMINAGANJ (ANISHINAABEMOWIN NAME)

This species has been under attack from butternut canker disease (caused by the fungus *Ophiognomonia clavigignenti-juglandacearum*) for over 35 years. This virulent disease, potentially devastating for one of Canada's most noble hardwoods, was first reported in 1990 in the region around Fort Coulonge. It attacks not only the native butternut but also the black walnut, a species from southernmost Ontario that is often cultivated, and certain hybrid walnuts. Since its appearance in Wisconsin in 1967, the tiny butternut canker fungus has killed millions of trees in North America, practically wiping the species off the map. In Canada, the butternut is considered an endangered species and protected under the *Species at Risk Act*. The main challenge facing the Capital is to keep identifying and protecting disease-resistant butternuts (both species and hybrids alike), helping them reproduce and planting their offshoots everywhere that is suitable to the species.

Despite the tremendous value attached to the butternut and the measures taken to combat the epidemic, its future is uncertain. Foresters grow it to regenerate farmland left sterile by over-farming and to repopulate shorelines, but until a better understanding of the disease's etiology is gained, the best hope is to plant walnut trees from resistant specimens.

◀ This low-angle view shows this tall, magnificent butternut in all its splendor. Situated in a Gatineau Park sugar maple stand along Trail 2, it can be admired next to beautiful native spring-flowering plants. Unfortunately, its days might be numbered.

▶ The butternut continues to reproduce despite its decline and a disadvantageous physiology — because its female flowers appear after its male ones have blossomed, it cannot self-pollinate, which means that two or more individuals must always be grown together to be able to harvest a decent quantity of nuts.

River Birch

BETULA NIGRA LINNAEUS

The river birch is a small, totally American birch: its native range is limited to the eastern United States (from Massachusetts to Florida) and the western United States (from Minnesota to Kansas). It can withstand stifling summer temperatures and yet is hardy enough to tolerate Ottawa winters. It was introduced here more than 125 years ago.

The staff at the Dominion Arboretum, where this birch species has grown since 1893, have long appreciated its performance and rapid growth. With the impacts of climate change already appearing, it is becoming clear that the river birch will eventually be called upon to replace European birch (weeping and non-weeping), as well as the native birch (paper and yellow birch), which suffer in overly hot summers with extended heatwaves. The river birch grows so naturally in moist, wet but permeable environments, such as along the banks of a river, that it was easy to name it. It is often used to combat erosion or to consolidate riparian strips, something that will be increasingly necessary with rising waters as a result of climate change.

The river birch can also be grown in a variety of other conditions, since it is the species of birch most tolerant to summer heat. The tree's main feature is its reddish-brown bark: when it peels, it leaves curly strips, exposing a pinkish white underside and an assortment of textures and hues that are pleasing to the eye.

The glossy leaves of the black birch are called "rhombic," because they are diamond-shaped. The leaves' sawtooth edges have a series of smaller teeth filling the spaces between the more accentuated teeth.

The river birch is a medium-sized species measuring 12 to 25 metres high in the wild. Situated in the Dominion Arboretum's willow section, this specimen is the largest of its species on the Central Experimental Farm.

Black Walnut

JUGLANS NIGRA LINNAEUS

A species native to North America, the black walnut was an instant commercial favourite. On an even footing with oak for its superior quality wood, it fetches a similar price. It was logged, then and now, to make veneer wood to finish furniture. According to Volume 3 of *Curieuses histoires de plantes du Canada*, during the Great Exhibition of the Works of Industry of All Nations, held in London in 1851, chairs finely sculpted from black walnut were presented to Queen Victoria by the ladies of Montréal, an indication of just how prestigious black walnut was considered. Some years before it was grown as part of the hardiness studies conducted at the Ottawa Experimental Farm in 1899, a young Ottawa man made tree growing his life's passion. His name would forever be associated with the black walnut, a mostly southern species that he prized for its tremendous commercial value.

Herbert Hunton Blanchet, son of Ludger Blanchet (an accountant with the Post Office Department) and of Marie Amelia Hunton, was born in 1871 in Ottawa. He was also known as Ludger Herbert Hunton Blanchet. In 1894, around the age of 23, he began growing trees at his Meech Lake summer residence — eight years after 100,000 black walnuts were planted in Sainte Croix by Henri-Gustave Joly de Lotbinière, a former premier of Quebec. This plantation was likely a source of inspiration for Blanchet, because his great uncle, Joseph-Godric Blanchet, had been at once a member of both the federal and provincial legislatures at a time when Joly de Lotbinière himself occupied both functions simultaneously, which was allowed until 1874.

By 1937, Blanchet's Meech Lake tree plantation numbered 21,000 trees of various species spread over 700 acres of land. This included 7,000 specimens of a hardy type of black walnut that he had created — a tree capable of withstanding winter temperatures as low as –40°C. Blanchet spent his entire life promoting large-scale cultivation of the black walnut, a generally lucrative pursuit even when the surface area under cultivation was limited. He distributed the nuts produced by his trees throughout the world. At one point, he shipped 60,000 of them to England, where they were used to reforest the southern portion of the country. This earned him the gratitude of David Lloyd George, prime minister from 1916 to 1922.

In 1942, Blanchet received 1,000 black walnut nuts as a gift from the Mount Vernon Ladies' Association in Virginia, a group dedicated to preserving the estate of the first American president, George Washington. These nuts were from black walnut trees planted by Washington himself — the trees having come from nuts brought back from England. In turn, Blanchet shipped some of these nuts back to England so that they could be planted near the house where Washington was born. In response, the King and Queen of England sent him a letter commending him for his efforts, which was delivered to him by the governor general.

Still active in 1945, Blanchet continued to ship thousands of black walnut nuts throughout the world. It was said at the time that some 5,000 black walnut trees spread all over Canada had been planted thanks to his efforts, not to mention the 20,000 specimens planted in New York's Central Park.

▲ As with the sugar maple, black maple and butternut, the black walnut's stamens and pistils mature at different times, but unlike the butternut, its female flowers are the first to appear and mature.

◀ This black walnut found in parking lot P13 at Meech Lake, in central Gatineau Park, is the legacy of a passionate, self-taught grower named Herbert Hunton Blanchet, nicknamed the Walnut King. Some of the many trees he grew still stand in the park.

▲ This specimen of buartnut is a remnant of an old orchard, in which there remain only a few well-camouflaged fruit trees amid the surrounding vegetation on Moore Farm. Its healthy appearance is thanks to hybridization.

Buartnut

JUGLANS LINNAEUS X

The spectacular hybrid at the Experimental Farm owes its name to a linguistic hybrid: the first two letters come from “butternut,” while the last six come from the genus *cordiformis*, or "heartnut.” Hybrids of this type first appeared in North America in the early 20th century and have been cultivated more and more since then by lovers of nut trees for their rapid growth rate and seeming immunity to the butternut canker fungus. The disease caused by the fungal pathogen *Ophiognomonia clavigignenti-juglandacearum* has killed millions of North American walnut trees, placing the species on the endangered list. This tall buartnut owes its exotic appearance to its immense metre-long leaves, which it inherited from its Asian parent, the Japanese walnut.

The pioneer of walnut hybridization in North America was Luther Burbank, an American horticulturalist, botanist and geneticist born in Massachusetts in 1849. Inspired by Darwin’s *The Variation of Animals and Plants Under Domestication*, Burbank founded a vast experimental farm in 1875 in Santa Rosa, California, where he tested over 30,000 plant varieties until his death in 1926. His numerous experiments with crossbreeding and selective breeding produced some 800 plant varieties, including many fruit bushes and trees (plum, apricot and peach trees and raspberry bushes) and nut trees, a few varieties of which bear his name (think: Burbank plums, which are still grown today).

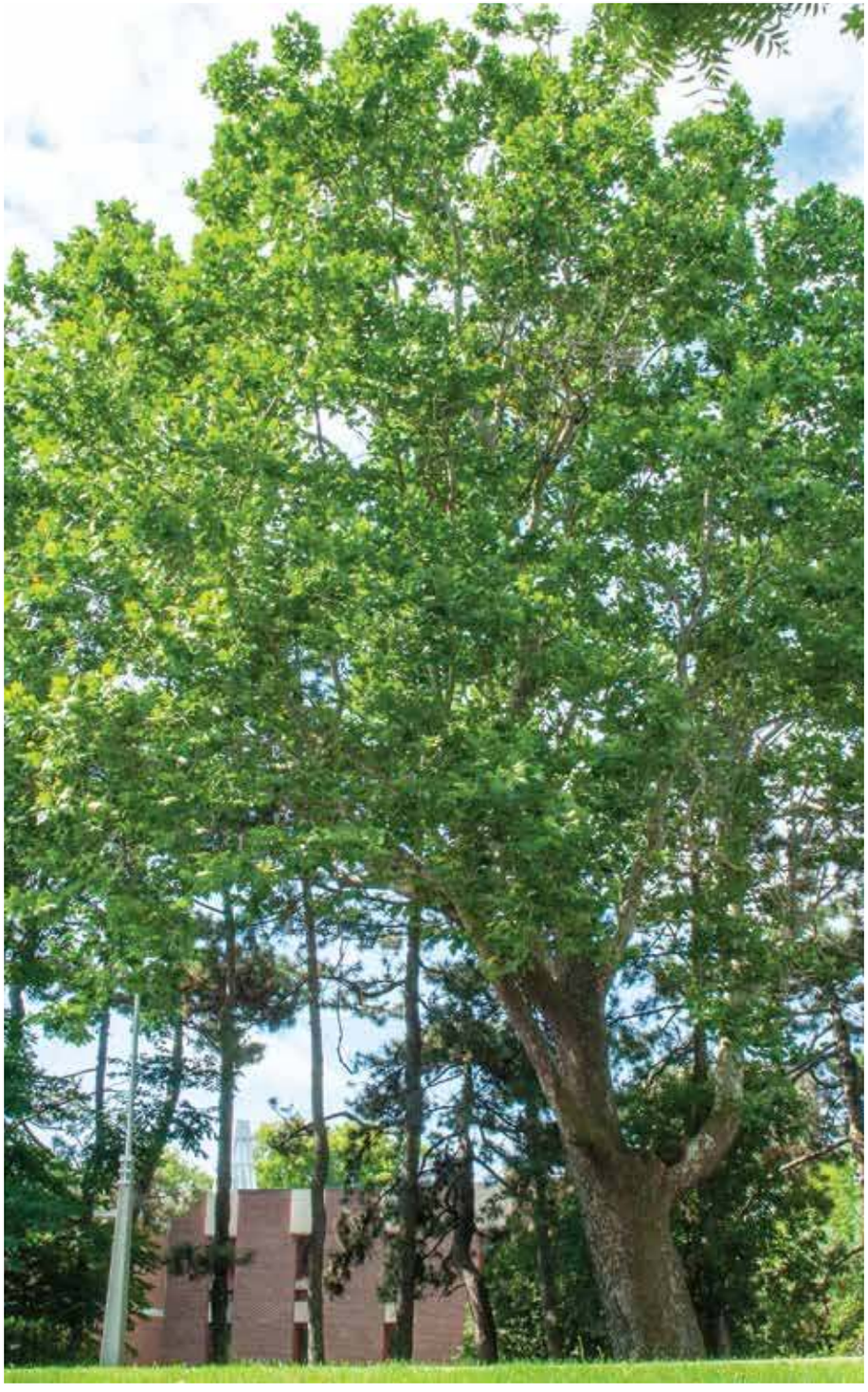
In Canada, the pioneer of the hybridization of nut bushes and trees was James U. Gellatly. Between 1920 and 1969, he created hardy varieties on a farm developed in 1905 by his father, David E. Gellatly, in British Columbia’s Okanagan Valley. Convinced that it was possible to grow nut shrubs and trees wherever apple and other fruit trees were grown, James spent nearly 40 years developing hardy nut-producing species capable of replacing varieties imported from Europe and Asia. He created a hazelnut–filbert hybrid by crossbreeding native hazelnut species with exotic ones. He also created blight-resistant chestnuts from Asiatic species of the same genus.

Gellatly’s claim to fame, though, was the creation of numerous buartnut cultivars via hybridization of the native butternut, the *Juglans cinerea*, with the heartnut-type Japanese walnut, the *Juglans ailanthifolia* var. *cordiformis*, whose Latin and English names evoke the heart shape of its nuts, once removed from their husk. Over the years, Gellatly distributed the myriad cultivars of nut bushes and trees he had created to producers throughout Canada, the northern United States and Central Europe.

It is still possible today to visit the farm where this trailblazer conducted his hybridization and selective breeding experiments. Gellatly Nut Farm Regional Park in British Columbia is home to some of the unique-pedigree nut bushes and trees used as hybridization material back in the day. In addition, certain Japanese walnut specimens produced from seedlings used as genetic material in the hybridization process, as well as some of their offspring, can still be found in the Morgan Arboretum in Sainte Anne de Bellevue, on the western tip of Montréal Island.

▲ This impressively sized buartnut is the epitome of what is referred to as hybrid vigour. It is no doubt hybridized from the North American butternut, as evidenced by its distinctive longish fruit encased in a sticky husk.

◀ This buartnut, one of whose parents, the butternut, is considered endangered and in rough shape in the wild, seems immune to the fungus that decimated — and continues to decimate — pure individuals of its parent's species. That, in a nutshell, is the magic of hybridization.



Sycamore

Platanus occidentalis Linnaeus
chikimeminij (Anishinaabemowin name)

The sycamore's native range comprises mainly the central and eastern United States, although it extends as far north as southernmost Ontario and as far south as Texas, with a few populations in certain parts of Mexico. In the 19th century, this large-sized species was already being grown mainly as an ornamental tree. At that time, it was known to fare well in Montréal-area woods, despite less than optimal bioclimatic conditions. The sycamore is prized for its exotic appearance and especially for its three-toned bark flecked with light yellow and green. The secret of this marbling lies in the scaling of the external grey bark on the branches, which, while exfoliating, reveal their internal bark, whose contrasting tones can be chalk white, yellowish and greenish.

The sycamore's leaves appear only in late spring after an initial leafing often attacked by anthracnose, making tree growers fear the worst: could it be that this 100-plus-year-old giant, which has seen its share of winters, has not survived the winter or succumbed to disease? But inevitably, this patriarch shows signs of life: its new creamy white shoots and young leaves covered with grey, rusty or silver hairs illuminate its branches. Accompanied by visible stipules, the leaves grow so well that they become twice as wide as they are long and curiously asymmetrical. They have an interesting way of spreading horizontally, as though they were gliding, like pairs of bat wings.

◂ This sycamore's roots can be traced back to the early days of the Ottawa Improvement Commission. Between 1899 and 1904, 14,000 trees and shrubs were planted by Central Experimental Farm staff along the scenic parkway now known as Queen Elizabeth Driveway, with 11,000 others waiting their turn in the nursery.

▸ The sycamore's male and female flowers are arranged on the tree in the form of separate globular structures. The flower heads have the same globular shape. They contain dry fruit clumped together and covered with woolly hairs. They bob up and down on the tips of fine stalks before breaking apart the following winter.

Cucumber Tree

MAGNOLIA ACUMINATA LINNAEUS

The Magnoliaceae family encompasses some of the most spectacular flowering trees, but it is also of great botanical interest in that it is among the oldest families of higher plants. Numerous fossils of extinct Magnoliaceae species have been discovered in northern regions such as Alaska and Greenland, where they lived some 60 million years ago. There are about a dozen botanical genera still in existence, accounting for most of the 200 species growing in eastern Asia. Four of these genera are found in North America, two of which are tree species: the genus *Liriodendron*, represented by the tulip tree, and the genus *Magnolia*.

The importance of national arboretums for the survival of rare and at-risk species cannot be overstated. In addition to the Kentucky coffee-tree, sycamore and cucumber tree, other species hailing from the Carolinian forest have been grown in the National Capital Region for over a century: the tulip tree, common hackberry, black walnut, pin oak, honey locust, redbud and common hop-tree. Growing these species conserves valuable elements of biodiversity while at the same time recreating an urban forest better able to ward off the effects of climate change. Among its most attractive features, this magnolia boasts long and graceful yellow-green leaves with a downy silver underside, tapering to a fine point — hence the *acuminate* designation.

▸ Planted at the Ottawa Experimental Farm in 1897, this cucumber tree is a fine specimen of the only magnolia species native to Canada. It is considered at risk, because its very limited native range is confined to the Carolinian forest.

◂ The greenish yellow flowers of the cucumber tree often go unnoticed, because the tree blooms right when its foliage is coming in. Bell-shaped and high in the tree, these odourless flowers have bluish green petals. Formed months in advance, the flower buds — plump and silky like rabbit feet — lend the tree its winter charm.

Tulip Tree

Liriodendron tulipifera Linnaeus

According to paleobotanical studies, plant species related to the genus *Liriodendron* existed in both the New and Old World. But only two species are left today: the Chinese tulip poplar and the tulip tree.

One thing that distinguishes the tulip tree is that its tulip-like flowers have a central pinecone-shaped structure made up of a double helix of carpels. This female reproductive organ is surrounded by a spiral of stamens with outward turned anthers. Another rare feature of this tree is its unique leaves: they are wider than long, and their bright green blades are V-notched with four or six lobes along the edge. They are attached to long, spindly petioles, so that the tree seems to vibrate when the wind blows. In fall, the tulip tree's luminous light-yellow colouring makes the tree all the more charming.

It is to its credit that the National Capital Commission decided to plant this Carolinian forest species. In Canada, the tulip tree has only a tiny southern Ontarian enclave to call home, in the heart of a highly industrialized zone. This incredibly lush forest is severely threatened today by urban sprawl. Cultivating the tulip tree keeps alive a part of Canada's national biodiversity. This is all the more crucial given that the climate conditions felt in the Capital, where temperatures are a few degrees higher than in rural regions and perfectly suited to this tree.

◂ Three specimens of tulip tree were planted recently in Commissioners Park. People going for a stroll here in spring can admire flowerbeds bursting with the most colourful tulips in all the capital.

▸ A member of the magnificent magnolia botanical family, this tulip tree, like some of its fellow magnolias, has large flowers composed of six greenish yellow petals and three outer green sepals. But what makes these flowers stand apart is the rich orange pigment at the petal base.

▸ The area surrounding Champlain Bridge, where motorists stuck in traffic spend considerable time with nothing to do but admire the scenery, is a prime location for an urban landscape featuring a rare species like the tulip tree. Killing time has never been so pleasant.

Pin Oak

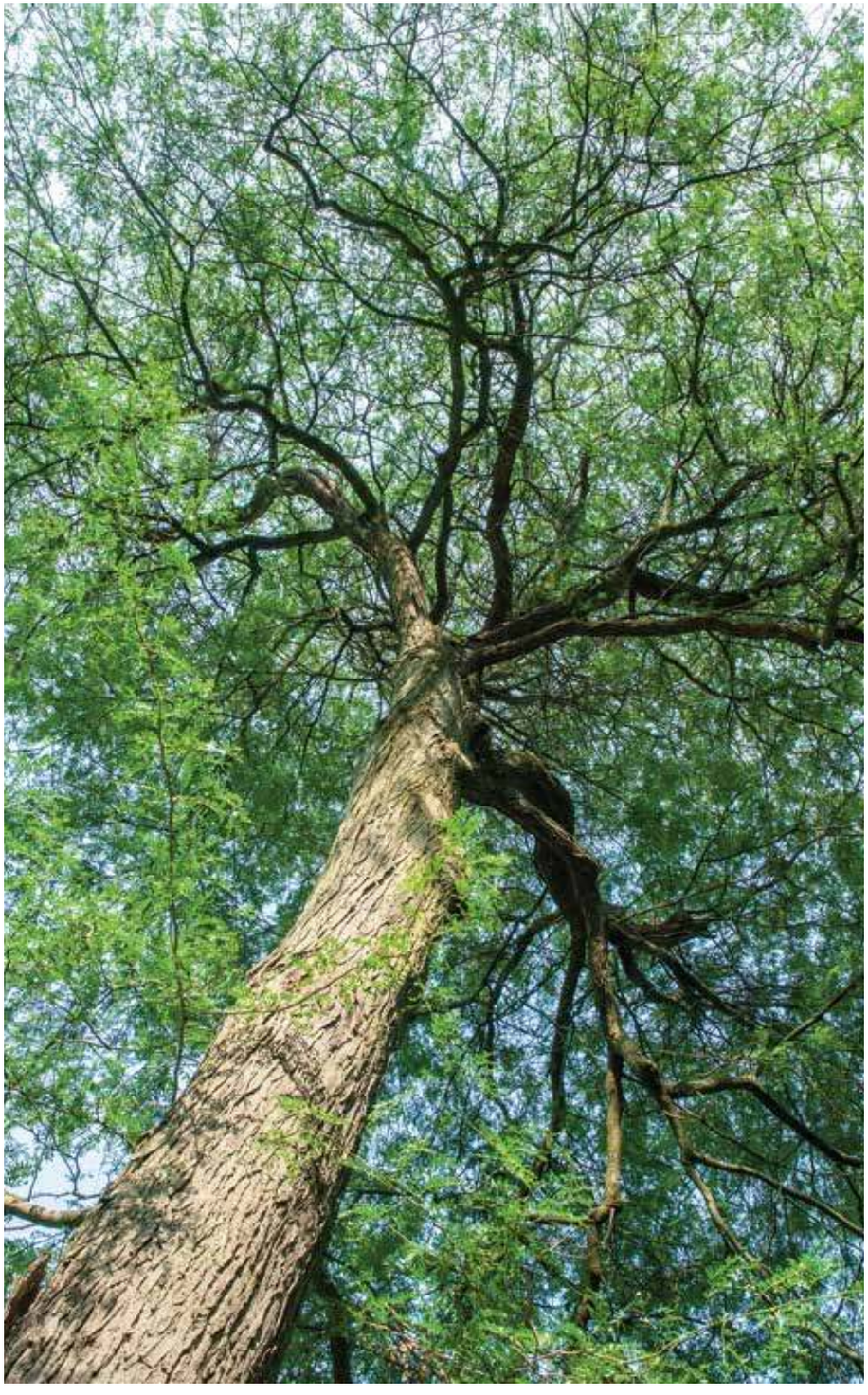
QUERCUS PALUSTRIS MUENCHHAUSEN

Successfully cultivated at the Experimental Farm since 1898, this pin oak belongs to the same family as the northern red oak. And like the red oak, the outer tips of its leaves, where the lobe veins end, feature a small tuft of down beyond the margin. The acorns mature by the end of the pin oak's second year of growth.

The Rideau Hall pin oak was planted in 1983 by Prince Charles and Princess Diana. It is part of the collection of ceremonial trees planted to mark the visits of dignitaries, a tradition dating back to 1906. This species is found mainly in the central-eastern United States but also is native to southernmost Ontario and the easternmost and westernmost areas around Lake Erie. It grows on wetlands around bogs and waterways, or in locations flooded in spring. Paradoxically, it can also grow in fairly dry and sandy soil with no ill effects and is resistant to pollution and disease. The Arboretum's successive curators have always had a soft spot for it: its glossy and rubbery leaves notched with geometric indentations intercept the sun and cast a characteristic checkermark shadow on the ground. The leaves turn a dazzling red by late fall, according to a particular pattern: first the leaves on the outer edges turn scarlet red, and then the rest turn crimson and, finally, a bright dark red.

This Rideau Hall pin oak specimen is a marvelous representative of its species. Its straight trunk tapers evenly to a single pyramidal canopy, whose strong and stiff — albeit relatively small — branches are covered with a profusion of delicate twigs, giving the tree a fine texture.

The pin oak is characterized by its differently pointing branches: the upper branches point upwards, its middle branches are horizontal, and its long lower branches droop gracefully downwards. The resulting symmetry and lush cover afford the tree much ornamental value.



Honey Locust

GLEDITSIA TRIACANTHOS LINNAEUS

The Dominion Arboretum has been growing the honey locust only since the Second World War, although its botanical genus, *Gleditsia*, has been known since 1753, when the famous Swedish naturalist Carl Linnaeus christened it thus to pay tribute to his friend, Johann Gottlieb Gleditsch (1714–1786), a German botany professor who led the Berlin Botanical Garden in the 18th century. Today the genus counts about a dozen species, two of which are native to North America (including the honey locust). The others grow in the wild in South America, central and eastern Asia, and tropical Africa.

The locust's distinguishing feature is the presence of long, sharp thorns that often form clusters growing out of the branches and even the trunk. An attractive light green in their youth, they seem to spring up from nowhere. In fact, though, they come from shoots, like those that produce twigs, camouflaged in the deeply grooved iron grey bark. Betraying their origin, some of the spines are even leaved. With age, the spines turn light or dark red and become finely polished — pioneers would use them as needles. Fortunately, numerous thornless horticultural cultivars have been selectively bred and developed to avoid the risk of injury. In the space of 150 years, more than 30 ornamental varieties have been created from a thornless natural hybrid of the North American locust, which was reproduced asexually.

◂ The honey locust's delicate foliage filters out just enough of the sun's rays to make this a prized urban species. It adapts to everything a city environment throws its way, from air pollution to compacted soil filled with road salt. In 1996, it was recognized as Manhattan's most plentiful street tree.

▸ At the end of the hottest summers, which are increasingly frequent, the locust produces scores of long, narrow, flat and aromatic seedpods that go from amber to reddish brown and become twisted. In France, this has earned the locust the nickname of escargot tree.

▸ In Canada, the tiny southern Ontario portion of the Carolinian forest constitutes the sole natural refuge of the honey locust. In the American portion, it grows in damp, fertile soil near waterways, particularly in the swamp forests along the old meanders of the Mississippi forming the Louisiana bayous.

Redbud

CERCIS CANADENSIS LINNAEUS

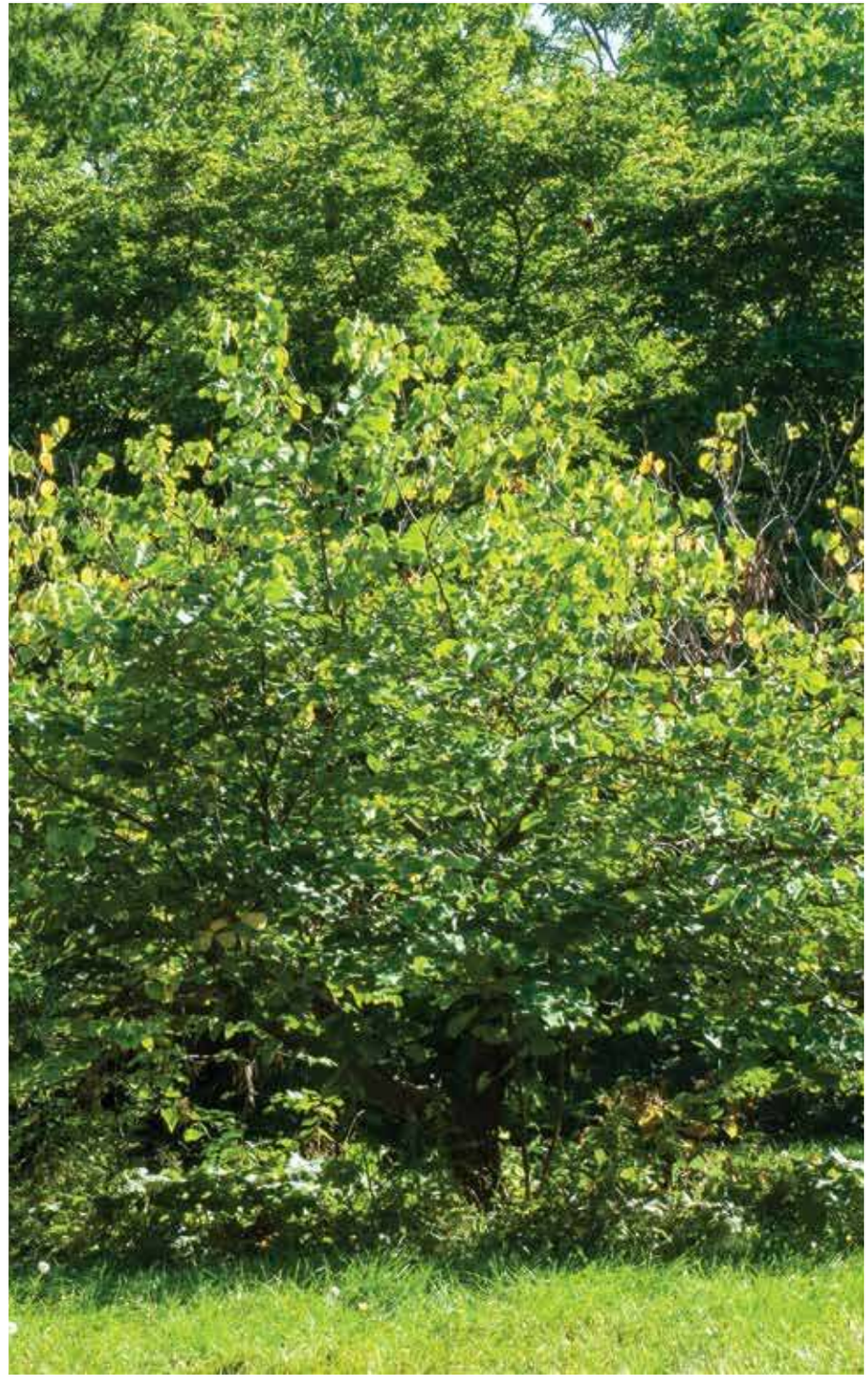
The origin of tree names can be fascinating. The botanical genus to which the redbud belongs, *Cercis*, is derived from an ancient Greek word meaning a shuttle for a loom. In Antiquity, it was the name given by the philosopher Theophrastus to the European species *Cercis siliquastrum*, or Judas tree, because of the resemblance of its flat seedpods to a weaver's shuttle. And contrary to what its species' name, *canadensis*, might suggest, the redbud occupies a vast North American native range, in addition to occurring rarely in Canada.

Grown for some 60 years at Ottawa's Dominion Arboretum, the redbud is first and foremost a small-developing native tree. Its native range on Canadian soil is hard to pinpoint, given the propensity of this frequently planted, cute ornamental species to escape into the wild. But there is every reason to believe that the redbud is indeed a native species at risk. The famous Canadian botanist explorer John Macoun probably harvested a native specimen in 1892 on Pelee Island off Lake Erie. Thus, the species would seem to belong to the fragile and minuscule Canadian enclave of the Carolinian forest.

The redbud is especially prized in ornamental cultivation for the spectacular effect of its cloud-like pink or purple blossoms, which appear early in the spring, while the flowers are attached to the previous year's twigs or to the still bare trunk, well before bud break.

▸ A small shrub-like tree, the redbud has heart-shaped leaves similar to lilac leaves. Illustrating the relation between geographic origin and hardiness, a specimen must be chosen from a variety adapted to the climate conditions of the location where it will be transplanted.

◂ The redbud's fruit looks like a thick stalky pod with a papery and fairly rigid texture. The shape of the seedpod is distinctive: the lower potion is curved, while the upper portion is straight and tipped with the remnants of the flower's thick style.



Common Hop-tree

PTELEA TRIFOLIATA LINNAEUS

The common hop-tree belongs to a botanical group comprising some 10 species of small trees and shrubs native to North America. The name of the genus is *Ptelea*. This is the only hop-tree that belongs to the *citrus* family, and it exists in the wild nowhere else in the world.

The common hop-tree is a perfect example of the adage: "no one is a prophet in their own land." When Louis Nicolas was in New France between 1664 and 1675, he spoke about the hop-tree's "stinky wood," which was ideal for making arrows or starting a fire with by rubbing it against some cedar. He also praised the gently purgative qualities of its bark and roots. Yet although this curious shrub has been cultivated at the Dominion Arboretum since 1939, it is practically unknown in Canadian nurseries, whereas it has been grown for 300 years in Europe, where its ornamental aspects have been developed by selecting original cultivars.

Since its natural habitat continues to deteriorate, the situation of this rare species is troubling, so much so that it is protected under the *Endangered Species Act* of Ontario and the *Species at Risk Act* of Canada.

The survival of the common hop-tree is critical to the survival of the giant swallowtail (*Papilio cresphontes*), North America's largest butterfly. Since the giant swallowtail is found at the northern edge of its range and its caterpillars feed almost exclusively on citrus, it has to be able to rely on the only native *citrus*, the hop-tree.

◀ The common hop-tree is a small tree confined in Canada to a small native range in southwestern Ontario, encompassing the coastline of lakes Erie and St. Clair, the Lake Erie islands and the shoreline forests of Lake Ontario in the Niagara region.

▶ The name *Ptelea*, the former name given to the elm, was transferred to the hop-tree because of the resemblance of their winged fruit. However, the common hop-tree clearly belongs to the *citrus* family. A strong citrus odor emanates from the oil glands of its leaves and its other organs when they are bruised.

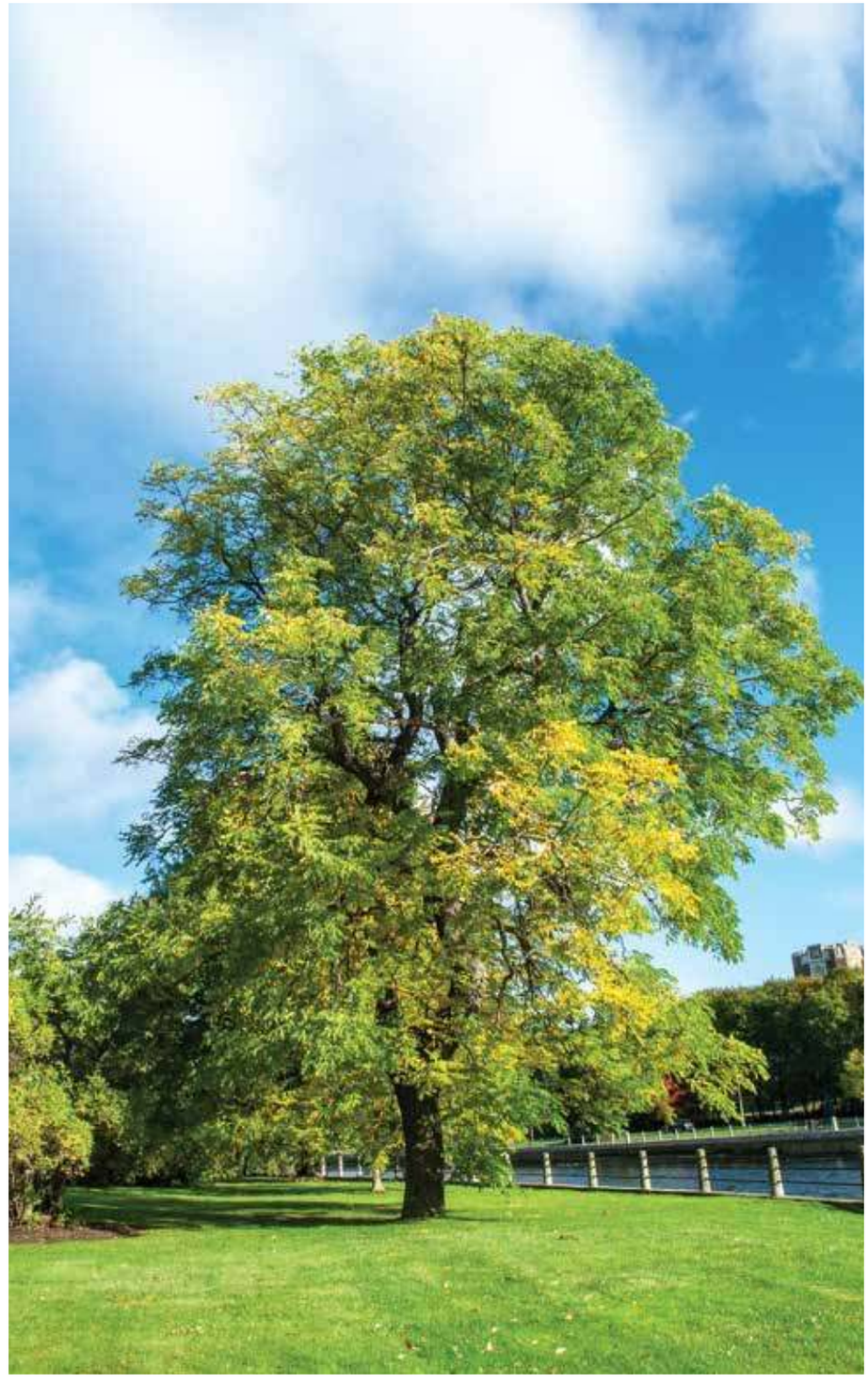
Kentucky Coffee-tree

GYMNOCLADUS DIOICUS (LINNAEUS) K. KOCH

Fossils 50 million to 70 million years old speak to the presence in Europe of the botanical genus *Gymnocladus*, of which a mere two species remain today — one Chinese and one North American, namely the Kentucky coffee-tree. In Canada, its native range consists solely of southwestern Ontario. In fact, some researchers consider it an ecological anachronism. It once grew in North America with the help of species that are now extinct — large mammals, such as the mammoth, which would disperse its seeds by cracking open its tough seedpods without being poisoned by the pulp or seeds. The Kentucky coffee-tree has long been prized by growers for its huge bipinnate compound leaves, which are much larger than those of any other native species. The tree was promoted by Charles Gibb of the Fruit Growers' Association, who in 1882 sang the praises of this rare, exotic species in *Ornamental and Timber Trees Not Native of the Province of Quebec*.

As most trees grow, the number of branches and twigs multiply, and the surface exposed to precipitation increases, increasing their risk of breaking under the weight of freezing rain. The reverse is true for the tough and robust Kentucky coffee-tree, which explains its growing popularity in urban environments as an ornamental park tree and a street tree. It is an excellent choice in this era of climate change.

◀ The leaves of the Kentucky coffee-tree are as big as 90 cm and concentrated at the tip of the tree's widely spaced, squat twigs. When they eventually grow in, they cover the tree's skeletal frame. The tree's late leafing means that it remains bare for much of the year, making it appear dead.



▶ At the beginning of the 20th century, amid the general enthusiasm for growing rare North American trees, Saunders oversaw the planting of several Kentucky coffee-trees near the parkway now called the Queen Elizabeth Driveway, which was under construction at the time.

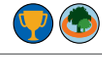
* See details in the Index on page 203

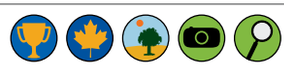
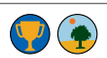
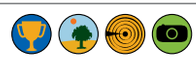
Index of Trees and Remarkability Criteria

ENGLISH NAME [latin name]	LATITUDE	LONGITUDE	REMARKABILITY ICONS[1]	LOCATION	PAGE	TREE NUMBER[2]
American beech [*Fagus grandifolia* Ehrhart]	N45.38940	W75.73914		Hampton Park	161	74
	N45.42437	W75.77974		Champlain Corridor, section located at head of Champlain Golf Course	171	75
American elm [*Ulmus americana* Linnaeus]	N45.39647	W75.68707		Queen Elizabeth Driveway, near Broadway Avenue	132	95
	N45.58351	W75.90564		Gatineau Park, from P15 parking lot, trail leading to Herridge and Healey shelters	147	96
American elm [*Ulmus americana* Linnaeus] and **eastern hop-hornbeam** [*Ostrya virginiana* (Miller) K. Koch]	N45.45245	W75.78385		Gatineau Park, close to trail #68	183	97
American hornbeam [*Carpinus caroliniana* Walt.]	N45.29212	W75.81390		Greenbelt, Jack Pine Trail	179	17
Amur corktree [*Phellodendron amurense* Ruprecht]	N45.39355	W75.70670		Dominion Arboretum of Ottawa, Arboretum section	112	112
	N45.3879	W75.7121		Dominion Arboretum of Ottawa, Experimental Farm section	112	113
Amur maple [*Acer tataricum* subsp. *ginnala* (Maximowicz) Wesmael]	N45.45584	W75.67078		Sir George-Étienne Cartier Parkway, Hillsdale and Sandbridge junction	149	56
Austrian pine [*Pinus nigra* F. J. Arnold]	N45.38955	W75.70805		Dominion Arboretum of Ottawa, Experimental Farm section	47	124
	N45.41780	W75.74504		Brébeuf Park	48	125
Balsam fir [*Abies balsamea* (Linnaeus) Miller]	N45.39122	W75.70499		Dominion Arboretum of Ottawa, Arboretum section	129	143
	N45.61507	W76.00786		Gatineau Park, Philippe Lake sector, Breton Beach	177	144
Basswood [*Tilia americana* Linnaeus]	N45.53596	W75.91946		Gatineau Park, Wolf Trail (#62)	35	160
	N45.44078	W75.76279		Gatineau Park, Pionniers Trail	41	161
	N45.37365	W75.69768		Hog's Back Park	146	162
Bebb's oak [*Quercus* X *bebbiana* C.K. Schneider]	N45.38766	W75.70617		Dominion Arboretum of Ottawa, Arboretum section	98	25
Bitternut hickory [*Carya cordiformis* (Wangenheim) K. Koch]	N45.39146	W75.70403		Dominion Arboretum of Ottawa, Arboretum section	31	5
	N45.44108	W75.76357		Gatineau Park, Pionniers Trail via Lac des Fées	32	6

[1] See page 11 for icon descriptions.
[2] See the maps on pages 9, 202, and 211.

Bitternut hickory [*Carya cordiformis* (Wangenheim) K. Koch]	N45.44409	W75.68889		Rideau Hall, public area	154	7
Black cherry [*Prunus serotina* Ehrhart]	N45.38913	W75.70616		Dominion Arboretum of Ottawa, Arboretum section	66	12
	N45.38907	W75.73915		Hampton Park	162	13
Black cherry [*Prunus serotina* Ehrhart] **and Yellow birch** [*Betula alleghaniensis* Britton]	N45.42540	W75.75827		Moore Farm	65	14
Black locust [*Robinia pseudo-acacia* Linnaeus]	N45.44130	W75.69279		Stanley Avenue Park	120	141
Black maple [*Acer nigrum* Michaux]	N45.38027	W75.72143		NCC land, corner of Trent and Fisher	128	57
	N45.44421	W75.69106		Rideau Hall, public area	152	58
Black spruce [*Picea mariana* (Miller) Britton, Sterns & Poggenburgh]	N45.39037	W75.51063		Greenbelt, Mer Bleue Bog Trail	17	47
Black walnut [*Juglans nigra* Linnaeus]	N45.38784	W75.72586		NCC land, Fisher and Holland Avenues	127	93
	N45.54308	W75.90974		Gatineau Park, Meech Lake area, Blanchet Beach parking lot	191	94
Bottlebrush buckeye [*Aesculus parviflora* Walter]	N45.38985	W75.70585		Dominion Arboretum of Ottawa, Arboretum section	109	80
Bristlecone pine [*Pinus aristata* Engelmann var. *aristata*]	N45.38919	W75.70791		Dominion Arboretum of Ottawa, Experimental Farm section	84	115
Buartnut [*Juglans* Linnaeus X]	N45.39183	W75.71516		Dominion Arboretum of Ottawa, Experimental Farm section	193	91
	N45.42196	W75.75840		Moore Farm	192	92
Bur oak [*Quercus macrocarpa* Michaux]	N45.35999	W75.77437		Pinecrest Creek, near Highway 417	34	18
	N45.41135	W75.76568		Champlain parking lot, Voyageurs Pathway	53	19
	N45.41434	W75.68335		Queen Elizabeth Driveway, at the corner of Argyle Avenue	134	21
Butternut [*Juglans cinerea* Linnaeus]	N45.52813	W75.90354		Gatineau Park, trail accessible from P12 parking lot	188	90
Chinese catalpa [*Catalpa ovata* G. Don]	N45.39215	W75.71412		Dominion Arboretum of Ottawa, Experimental Farm section	115	10
Common hackberry [*Celtis occidentalis* Linnaeus]	N45.39058	W75.70488		Dominion Arboretum of Ottawa, Arboretum section	49	87
	N45.38723	W75.68260		Nordic Circle Park	50	88
Common hop-tree [*Ptelea trifoliata* Linnaeus]	N45.38933	W75.70641		Dominion Arboretum of Ottawa, Arboretum section	200	140

Common horse chestnut [*Aesculus hippocastanum* Linnaeus]	N45.42806	W75.69853		Major's Hill Park	124	81
Common horse chestnut 'Baumannii' [*Aesculus hippocastanum* Linnaeus 'Baumannii']	N45.39078	W75.70900		Dominion Arboretum of Ottawa, Experimental Farm section	110	82
Crack willow [*Salix fragilis* Linnaeus]	N45.42850	W75.69801		Major's Hill Park	158	147
Cucumber tree [*Magnolia acuminata* Linnaeus]	N45.39092	W75.70997		Dominion Arboretum of Ottawa, Arboretum section	195	77
Cut-leaf silver maple [*Acer saccharinum* Linnaeus 'Laciniatum Wieri']	N45.39031	W75.70903		Dominion Arboretum of Ottawa, Experimental Farm section	106	55
Cypress oak [*Quercus robur* Linnaeus f. *fastigiata* (Lam.) O. Schwarz]	N45.40445	W75.68236		Queen Elizabeth Driveway, from Fifth Avenue	136	30
Dawn redwood [*Metasequoia glyptostroboides* Hu & Cheng]	N45.39330	W75.70743		Dominion Arboretum of Ottawa, Arboretum section	22	86
Douglas-fir [*Pseudotsuga menziesii* (Mirbel) Franco var. *menziesii*]	N45.42760	W75.72509		Ruisseau de la Brasserie (Brewery Creek)	57	38
	N45.38920	W75.70958		Dominion Arboretum of Ottawa, Experimental Farm section	58	39
	N45.39890	W75.70421		Commissioners Park	59	40
Downy hawthorn [*Crataegus mollis* (Torrey & A. Gray) Scheele var. *mollis*]	N45.38840	W75.70580		Dominion Arboretum of Ottawa, Arboretum section	101	1
Eastern cottonwood [*Populus deltoides* ssp. *deltoides* Bartram ex Marshall]	N45.45374	W75.72426		Leamy Lake	166	110
Eastern hemlock [*Tsuga canadensis* (Linnaeus) Carrière]	N45.42429	W75.78602		Champlain Corridor, portion located north of Hélène-Boullé	27	137
	N45.53411	W75.93458		Gatineau Park	28	138
	N45.44761	W75.68432		Pine Hill woods	122	139
Eastern hop-hornbeam [*Ostrya virginiana* (Miller) K. Koch]	N45.38136	W75.69516		Vincent Massey Park	168	105
Eastern red cedar [*Juniperus virginiana* Linnaeus]	N45.55821	W76.05403		Gatineau Park: below the Eardley Escarpement, via horse riding path accessible from Pilon Road	14	69
	N45.30482	W75.87252		Greenbelt, Old Quarry trail	15	70
	N45.45537	W75.67852		The Rockeries	141	71
Eastern white cedar [*Thuja occidentalis* Linnaeus]	N45.44838	W75.69276		Rockcliffe Park	19	153
	N45.39086	W75.71021		Dominion Arboretum of Ottawa, Experimental Farm section	92	154
	N45.571	W75.94		Gatineau Park, Herridge shelter	148	155

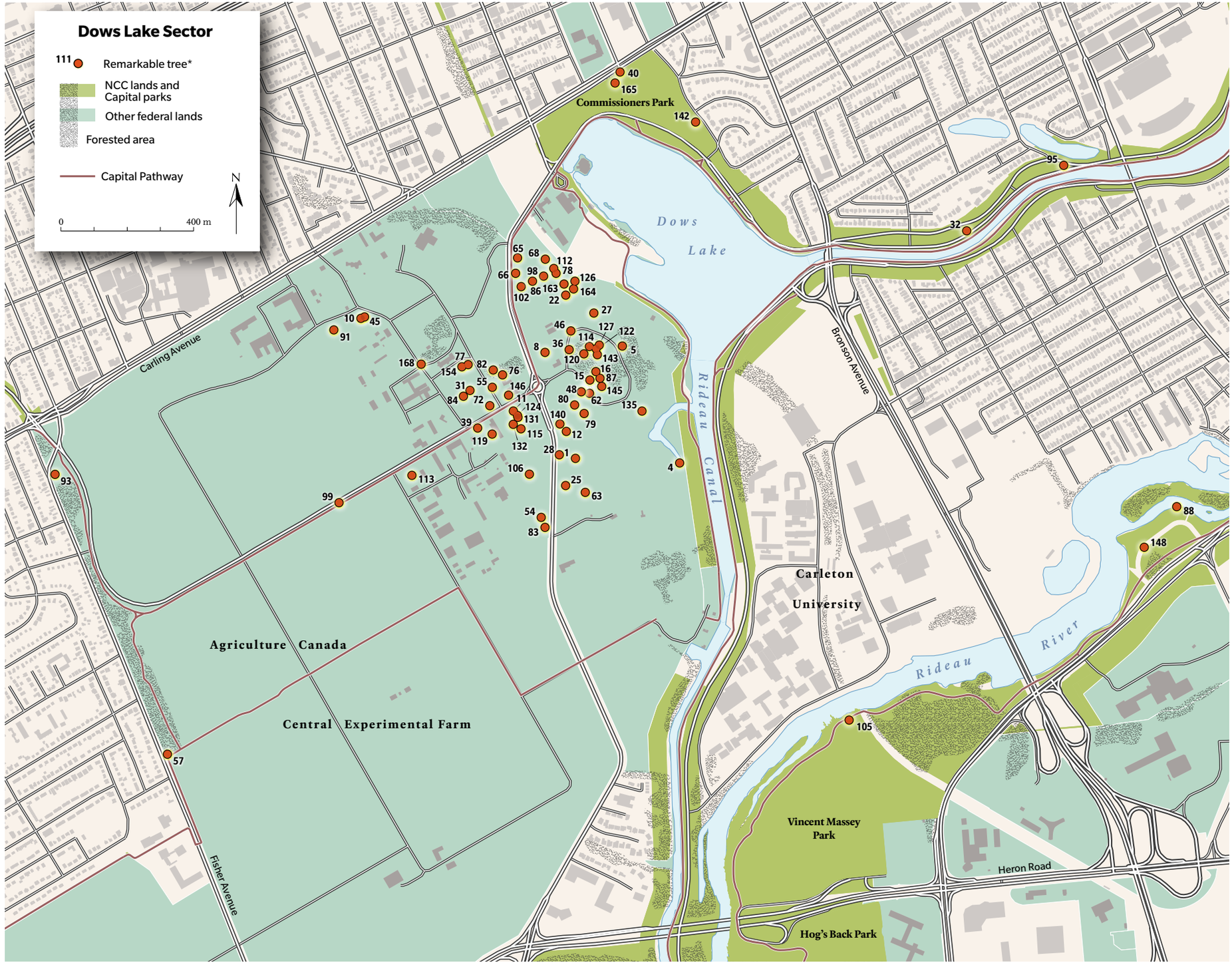
Eastern white pine [*Pinus strobus* Linnaeus]	N45.32401	W75.81076		Greenbelt, trail accessible from P13 parking lot	56	116
	N45.48330	W75.84826		Gatineau Park, Mackenzie King Estate	68	117
	N45.44984	W75.68661		Rockcliffe Park	121	118
English oak [*Quercus robur* Linnaeus]	N45.38785	W75.70633		Dominion Arboretum of Ottawa, Experimental Farm section	61	28
	N45.42751	W75.72534		Brewery Creek	62	29
European buckthorn [*Rhamnus catharticus* Linnaeus]	N45.37404	W75.69792		Hog's Back Park	51	89
European larch [*Larix decidua* Miller]	N45.39006	W75.71014		Dominion Arboretum of Ottawa, Experimental Farm section	83	84
European linden [*Tilia* X *europaea* Linnaeus]	N45.39313	W75.70630		Dominion Arboretum of Ottawa, Arboretum section	118	163
Golden weeping willow [*Salix* x *sepulcralis* Simonkai]	N45.40814	W75.68199		Queen Elizabeth Driveway, from the Rideau Canal side	138	149
	N45.41084	W75.68331		Queen Elizabeth Driveway, from the area surrounding the Rideau Canal near Pretoria Bridge	138	150
	N45.41570	W75.77841		Champlain Golf Course	170	151
Greek fir [*Abies cephalonica* Loudon]	N45.39036	W75.70481		Dominion Arboretum of Ottawa, Arboretum section	89	145
Hamilton's spindle-tree [*Euonymus hamiltonianus* Wall]	N45.39383	W75.70810		Dominion Arboretum of Ottawa, Arboretum section	103	65
Hinoki cypress [*Chamaecyparis obtusa* (Siebold & Zucc.) Endlicher]	N45.39076	W75.70504		Dominion ArboretumOfOttawa, Arboretum section	91	16
Honey locust [*Gleditsia triacanthos* Linnaeus]	N45.38748	W75.70541		Dominion Arboretum of Ottawa, Arboretum section	198	63
Horned scotch elm [*Ulmus glabra* Hudson 'Cornuta']	N45.39334	W75.70709		Dominion Arboretum of Ottawa, Arboretum section	96	98
Hybrid elm [*Ulmus* X]	N45.38714	W75.71490		NCC land, corner of Morningside and The Driveway	187	99
	N45.40329	W75.75377		Island Park Drive, at the Champlain Bridge exit to Ottawa	187	100
Hybrid Siberian crab apple [*Malus* X *baccata*]	N45.43965	W75.76182		Gatineau Park, P3 parking lot	175	136
Hybrid white willow [*Salix* x *fragilis* Linnaeus]	N45.38612	W75.68384		Nordic Circle Park	67	148
Jack pine [*Pinus banksiana* Lambert]	N45.54417	W75.99583		Gatineau Park, Eardley Escarpment	16	121
	N45.39138	W75.70504		Dominion Arboretum of Ottawa, Arboretum section	73	122

Jack pine [*Pinus banksiana* Lambert]	N45.30351	W75.87166		Greenbelt, Old Quarry Trail (#23) from P5 parking lot	74	123
Japanese tree lilac [*Syringa reticulata* (Blume) H. Hara]	N45.39065	W75.70864		Dominion Arboretum of Ottawa, Experimental Farm section	113	76
Katsura tree [*Cercidiphyllum japonicum* Siebold & Zucc.]	N45.38967	W75.70821		Dominion Arboretum of Ottawa, Experimental Farm section	23	11
Kentucky coffee-tree [*Gymnocladus dioicus* (Linnaeus) K. Koch]	N45.41859	W75.68108		Queen Elizabeth Driveway, from Somerset Street	201	35
Large-leaved Linden [*Tilia platyphyllos* Scopoli]	N45.40731	W75.68244		Queen Elizabeth Driveway, from Fifth Avenue	137	156
Large-leaved linden 'Laciniata' [*Tilia platyphyllos* Scopoli 'Laciniata']	N45.39300	W75.70593		Dominion Arboretum of Ottawa, Arboretum section	100	164
Large-leaved linden 'Vitifolia' [*Tilia platyphyllos* Scopoli 'Vitifolia']	N45.42685	W75.69612		Major's Hill Park	157	157
	N45.42713	W75.69647		Major's Hill Park	157	158
Large-toothed aspen [*Populus grandidentata* Michaux]	N45.42667	W75.78273		Champlain Corridor, section located at head of Champlain Golf Course	172	107
	N45.32339	W75.80974		Greenbelt, trail accessible from P13 parking lot	176	108
Little-leaved linden [*Tilia cordata* Miller]	N45.42399	W75.69506		Confederation Square	145	159
Macedonian pine [*Pinus peuce* Grisebach]	N45.39124	W75.70551		Dominion Arboretum of Ottawa, Arboretum section	86	120
Maidenhair tree [*Ginkgo biloba* Linnaeus]	N45.38981	W75.70912		Dominion Arboretum of Ottawa, Experimental Farm section	21	72
	N45.44395	W75.68683		Rideau Hall, public area	21	73
Manitoba maple [*Acer negundo* Linnaeus]	N45.41779	W75.74570		Moussette Park, Gatineau	52	49
Northern catalpa [*Catalpa speciosa* Scopoli]	N45.43873	W75.69286		Green Island	131	9
Norway spruce [*Picea abies* (Linnaeus) Karsten]	N45.39219	W75.71398		Dominion Arboretum of Ottawa, Experimental Farm section	82	45
Norway spruce reginae Amelia [*Picea abies* (Linnaeus) Karsten]	N45.39186	W75.70602		Dominion Arboretum of Ottawa, Arboretum section	82	46
Ohio buckeye [*Aesculus glabra* Willdenow]	N45.38652	W75.70695		Dominion Arboretum of Ottawa, Experimental Farm section	111	83
Pin oak [*Quercus palustris* Muenchhausen]	N45.44410	W75.68713		Rideau Hall, public area	197	26
Pitch pine [*Pinus rigida* Miller]	N45.39148	W75.70492		Dominion Arboretum of Ottawa, Arboretum section	88	127
Ponderosa pine [*Pinus ponderosa* Douglas ex P. & C. Laws]	N45.39321	W75.70588		Dominion Arboretum of Ottawa, Arboretum section	87	126

Princess tree [*Paulownia tomentosa* (Thunberg) Steudel]	N45.38796	W75.70757		Dominion Arboretum of Ottawa, Experimental Farm section	114	106
Red ash [*Fraxinus pennsylvanica* Marshall]	N45.37576	W75.77973		Sir John A. Macdonald Parkway, near New Orchard	182	64
Red maple [*Acer rubrum* Linnaeus]	N45.39320	W75.51266		Greenbelt, near start of Mer Bleue Bog Trail	40	59
	N45.39151	W75.73990		Hampton Park	163	60
	N45.41039	W75.77925		Champlain Golf Course	167	61
Red oak [*Quercus rubra* Linnaeus]	N45.39022	W75.70989		Dominion Arboretum of Ottawa, Experimental Farm section	119	31
	N45.39467	W75.69079		Queen Elizabeth Driveway, from Broadway Street	135	32
	N45.44449	W75.68889		Rideau Hall, public area	155	33
	N45.45473	W75.71781		Leamy Lake	165	34
Red pine [*Pinus resinosa* Aiton]	N45.61462	W76.00852		Gatineau Park, Philippe Lake sector, Breton Beach	75	128
	N45.32665	W75.73655		Greenbelt, Pinhey Forest	76	129
Redbud [*Cercis canadensis* Linnaeus]	N45.39380	W75.70703		Dominion Arboretum of Ottawa, Arboretum section	199	68
River birch [*Betula nigra* Linnaeus]	N45.38830	W75.70178		Dominion Arboretum of Ottawa, Arboretum section	189	4
Rock elm [*Ulmus thomasii* Sargent]	N45.40620	W75.74220		Tunney's Pasture Complex	184	101
	N45.39305	W75.70795		Dominion Arboretum of Ottawa, Arboretum section	185	102
Rocky Mountain Douglas-fir [*Pseudotsuga menziesii var. glauca* (Beissner) Franco]	N45.39135	W75.70608		Dominion Arboretum of Ottawa, Arboretum section	80	36
	N45.45087	W75.68638		Outskirts of Rockcliffe Park, corner Buena Vista and Lisgar	81	37
Sawara cypress [*Chamaecyparis pisifera* (Siebold & Zucc.) Endlicher 'Filifera']	N45.39053	W75.70527		Dominion Arboretum of Ottawa, Arboretum section	91	15
Scots pine [*Pinus sylvestris* Linnaeus]	N45.41800	W75.74223		Brébeuf Park	45	130
	N45.38950	W75.70803		Dominion Arboretum of Ottawa, Experimental Farm section	46	131
Serbian spruce [*Picea omorika* (Pancic) Purk.]	N45.42741	W75.72488		Ruisseau de la Brasserie (Brewery Creek)	142	41
	N45.42239	W75.69224		Confederation Park	142	42

Shagbark hickory [*Carya ovata* (Miller) K. Koch var. *ovata*]	N45.39127	W75.70701		Dominion Arboretum of Ottawa, Arboretum section	33	8
Shandong maple [*Acer truncatum* Bunge]	N45.38998	W75.70535		Dominion Arboretum of Ottawa, Arboretum section	104	48
Shingle oak [*Quercus imbricaria* Michaux]	N45.39235	W75.70514		Dominion Arboretum of Ottawa, Arboretum section	99	27
Siberian fir [*Abies sibirica* Ledeb.]	N45.39010	W75.70840		Dominion Arboretum of Ottawa, Experimental Farm section	90	146
Silver maple [*Acer saccharinum* Linnaeus]	N45.38679	W75.70710		Dominion Arboretum of Ottawa, Experimental Farm section	105	54
Slippery elm [*Ulmus rubra* Mühlenberg]	N45.36971	W75.69047		Riverside Drive, Terry Fox Sports Complex	186	103
	N45.36790	W75.69030		Riverside Drive, Terry Fox Sports Complex	186	104
Sugar maple [*Acer saccharum* Marshall]	N45.4530	W75.7834		Gatineau Park, close to trail #68	39	50
	N45.48300	W75.84852		Gatineau Park, Mackenzie King Estate	70	51
	N45.45074	W75.68711		Rockcliffe Park	123	52
	N45.32408	W75.81018		Greenbelt, trail accessible from P13 parking lot	123	53
Swamp white oak [*Quercus bicolor* Willdenow]	N45.39283	W75.70623		Dominion Arboretum of Ottawa, Arboretum section	97	22
Swedish whitebeam [*Sorbus intermedia* (Ehrhart) Persoon]	N45.42736	W75.72528		Ruisseau de la Brasserie (Brewery Creek)	63	152
Swiss stone pine [*Pinus cembra* Linnaeus]	N45.38904	W75.70902		Dominion Arboretum of Ottawa, Experimental Farm section	85	119
Sycamore [*Platanus occidentalis* Linnaeus]	N45.38931	W75.70821		Dominion Arboretum of Ottawa, Experimental Farm section	94	132
	N45.41918	W75.68240		Queen Elizabeth Driveway, from Somerset Street	194	133
Sycamore maple [*Acer pseudoplatanus* Linnaeus]	N45.39017	W75.70528		Dominion Arboretum of Ottawa, Arboretum section	107	62
Tamarack [*Larix laricina* (Du Roi) K. Koch]	N45.39027	W75.51136		Greenbelt, Mer Bleue Bog Trail	20	85
Trembling aspen [*Populus tremuloides* Michaux]	N45.46444	W75.78080		Gatineau Park, Relais Plein Air sector	173	111
Tulip tree [*Liriodendron tulipifera* Linnaeus]	N45.39860	W75.70440		Commissioners Park	196	165
	N45.41307	W75.76595		Champlain Bridge, Quebec shoreline	196	166
Umbrella tree [*Magnolia tripetala* Linnaeus]	N45.39342	W75.70661		Dominion Arboretum of Ottawa, Arboretum section	93	78
Ussurian pear [*Pyrus ussuriensis* Maxim.]	N45.42156	W75.69286		Confederation Park	143	134

Weeping Siberian crab apple [*Malus baccata* Borkhausen 'Gracilis']	N45.38970	W75.70325		Dominion Arboretum of Ottawa, Arboretum section	102	135
Wester white pine [*Pinus monticola* Douglas Ex. D. Don]	N45.39144	W75.70530		Dominion Arboretum of Ottawa, Arboretum section	60	114
White fir [*Abies concolor* (Gordon & Glendinning) Hildebrand]	N45.39756	W75.70128		Commissioners Park	140	142
White oak [*Quercus alba* Linnaeus]	N45.37039	W75.79851		Mud Lake	37	23
	N45.43861	W75.70710		Jacques-Cartier Park	159	24
White poplar [*Populus alba* Linnaeus]	N45.32165	W75.69800		Black Rapids Locks, via Prince of Wales	139	109
White spruce [*Picea glauca* (Moench) Voss]	N45.48356	W75.84815		Gatineau Park, Mackenzie King Estate	71	43
	N45.42025	W75.56598		Greenbelt, Anderson Ridge junction	72	44
Yeddo spindle-tree [*Euonymus hamiltonianus* Wall ssp. *sieboldianus* (Blume) H. Hara]	N45.39341	W75.70817		Dominion Arboretum of Ottawa, Arboretum section	103	66
Yellow birch [*Betula alleghaniensis* Britton]	N45.45353	W75.54892		Chapel Hill neighbourhood	38	2
	N45.39319	W75.51268		Greenbelt, Mer Bleue Bog Trail	29	3
Yellow buckeye [*Aesculus flava* Aiton]	N45.38962	W75.70548		Dominion Arboretum of Ottawa, Arboretum section	108	79
Yellow-wood [*Cladastris lutea* (Michaux) K. Koch]	N45.42723	W75.69638		Major's Hill Park	125	167
	N45.39092	W75.71178		Dominion Arboretum of Ottawa, Experimental Farm section	126	168



* See details in the Index on page 203

Glossary

Acicular

Pointed and linear like a slender, needle-like body.

Acuminate

Denotes a leaf that tapers to a point.

Achene

Any dry indehiscent fruit containing a single unattached seed.

Anastomosing

Forming a physical connection between two structures.

Angiosperms

Plants that develop their seeds from within closed cavities

Anther

The top of the stamen, which contains the pollen.

Anthropogenic

Having its direct or indirect origin in the activities of humans.

Aril

Fleshy outgrowth that forms around seeds to give them the appearance of fruit. Arils are false fruit.

Berry

Indehiscent, fleshy fruit containing multiple seeds dispersed in the pulp (Swedish whitebeam); opposite of drupe.

Bilobate

Pertaining to an organ divided into two lobes by a notch a third of the way up the organ.

Bipinnate

Said of a compound leaf subdivided into leaflets arranged on both sides of the main axis of the leaf.

Blade

The flat, broad portion of the leaf.

Bract

Leaf-like structure at the base of the flower, inflorescence or infructescence.

Canopy

Top level of forest cover formed collectively by the crowns of all adjacent trees and exposed to the direct influence of the sunlight; also called crown canopy.

Capsule

Dry fruit that opens through pores, a lid or valves and that contains multiple seeds.

Carpel

Floral leaf bearing ovules along the margins inside the flowers' ovaries.

Chestnut-bur

Prickly envelope, formed by fused bracts, that surrounds the dry fruit of the chestnut and buckeye trees.

Compound leaf

Leaf divided into several leaflets along a common axis (Kentucky coffee-tree).

Conelet

A little cone; denotes the immature female cone (strobilus) on conifers.

Cordate

Denotes the heart-shaped blade of a leaf.

Cosmopolitan

Said of a species whose range extends over several continents (Scots pine).

Crown

Portion of a woody plant comprising the upper trunk, branches and foliage, whose shape varies by species (pyramidal, spreading, excurrent, etc.). Sometimes synonymous with treetop.

Cupule

Cup-shaped structure surrounding the fruit of certain plants (oak acorn).

Cultivar

Variety of plant species cultivated through hybridization, mutation, selection or other means.

Cyme

Multi-axis inflorescence where the flower at the end of the central axis blooms first and terminates the axis.

Deciduous

Leaves become detached and fall off annually.

Dendrology

Botanical discipline concerned with trees and woody plants.

Dehiscent

Fruit that opens itself at maturity to disperse its seeds (aspen, willow, locust).

Dichogamy

Physiological characteristic of plants having male and female flowers, whose sexual elements mature at different times (black maple, sugar maple).

Dioecious

Said of unisexual species that have the male and female flowers or cones on separate plants, or of a plant whose staminate (male) flowers and pistillate (female) flowers are borne on two different individuals.

Double samara

Indehiscent dry fruit consisting of two carpels, each containing a seed whose pericarp extends into a wing (maple).

Drupe

Fleshy indehiscent fruit whose endocarp generally contains a single seed (autumn cherry tree).

Edaphic

Pertaining to a factor associated with the nature of a soil.

Evergreen

Said of foliage that persists a number of years, as in the case with most conifers.

Exotic

Pertaining to an introduced (rather than native) species.

False fruit

A fruit in which some of the flesh is not derived from the ovary; arils and galbuli are false fruit (eastern red cedar).

Fruit

Plant product derived from the ovary after fertilization of the flower and containing seeds. There are fleshy fruits (berries, drupes, pods) and dry fruits (nuts, achenes, capsules).

Gymnosperm

A seed-bearing plant whose unenclosed ovules and then seeds are borne on the surface of a sporophyll rather than in a closed fruit.

Husk

Thick shell encasing the hull of a nut until maturity, particularly in the walnut family (hickory and walnut trees).

Indehiscent

Fruit that does not spontaneously open at maturity (samara from the maple, elm and ash).

Inflorescence

The mode in which the flowers of a plant are arranged in relation to the axis.

Infructescence

The mode in which the fruits of a plant are arranged in relation to the axis.

Leaflet

A single segment of a compound leaf.

Lenticel

A pore in tree bark and on the surface of branches that allows a pathway for air passage.

Lobe

Rounded portion between two wide notches in leaves or petals.

Melliferous

Said of a plant whose nectar is gathered by bees and other pollinizers.

Monoecious

Of a species having the unisexual, or male and female, flowers or cones on the same plant, or having the stamens and the pistils on the same plant.

Native

Pertains to a plant that grows naturally in a region, that originated in the country where it grows.

Naturalized

Said of an exotic plant that has become acclimated to the point of behaving like a native plant and becoming an integral part of the country's flora (buckthorn).

Needle

Round or flat leaf that is narrow, glossy and sharp, characteristic of most conifers.

Nut

Hard, dry single-seed fruit that does not open until maturity (walnut).

Ovary

In flowers, element of the female reproductive system (gynoecium) containing the ovules that, once fertilized, transform into fruit.

Palmately lobed

Said of leaves having palmate ribbing and pronounced lobes.

Panicle

Inflorescence composed of small clusters, themselves arranged in a principal cluster more or less triangular in shape; cluster of clusters.

Papery

Said of an organ with the texture and thickness of paper.

Peduncle

Stalk supporting a flower, inflorescence, fruit or infructescence.

Petiole

Portion of the leaf that joins the blade to the stalk or twig.

Photosynthesis

Series of chemical reactions that plants produce from carbon dioxide and water in the presence of light, and by which they manufacture their own food and oxygen and pass energy through a food chain.

Pine nut

Seed produced by certain species of pine (Swiss stone pine).

Proterandry

Said of hermaphrodite flowers whose stamens mature before the pistils (dichogamy).

Proterogyny

Said of hermaphrodite flowers whose pistils mature before the stamens (dichogamy).

Samara

Monosperm indehiscent dry fruit having a membranous wing stemming from the pericarp (elm, beech).

Sepal

Each of the parts (often green) forming the calyx of a flower.

Shell

Woody envelope surrounding certain fruits and seeds.

Stamen

Male reproductive organ of a flower (androecium), which produces the pollen.

Stigma

Tip of the gynoecium that receives the pollen grain.

Stipule

Membranous, foliaceous or spiny appendage located at the point where the leaf inserts into the stem, often by pairs.

Strobilus

Reproductive organ present in most conifers, composed of scales grouped around a central stem.

Sucker

New shoot arising from a root; suckers can become autonomous, in which case they produce a natural clone genetically identical to the mother plant.

Trilobed

Pertaining to an organ divided into three lobes a third of the way up the organ.

Twig

Each of the smallest and last divisions of a branch.

Valve

Segment of the envelope encasing a dehiscent fruit that opens at maturity to disperse its seeds.

Vein

Protrusion located on the lower surface of foliaceous organs (leaves, bracts, stipules, etc.) made up of the phloem-woody bundles that run along the blade and form both its skeleton and circulatory system.

Vernacular

Refers to the common name of a plant as distinguished from its Latin scientific name.

Windfall

A tree or stand of timber that has been blown down, uprooted or broken by the wind or under the weight of snow, ice or age.

Witch's broom

Bushy deformity on the branches and twigs of a woody plant, accompanied by short internodes, an excessively dense mass of shoots and abnormally shaped leaves.

Woody

That which has the nature and consistency of wood.

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(Consulted between April 1 and April 4, 2019)

Drawing by Angelina Tolley, Kitigan Zibi student, entitled Wigwas, which means "birchbark" in Anishinaabemowin. Reproduced with her permission.

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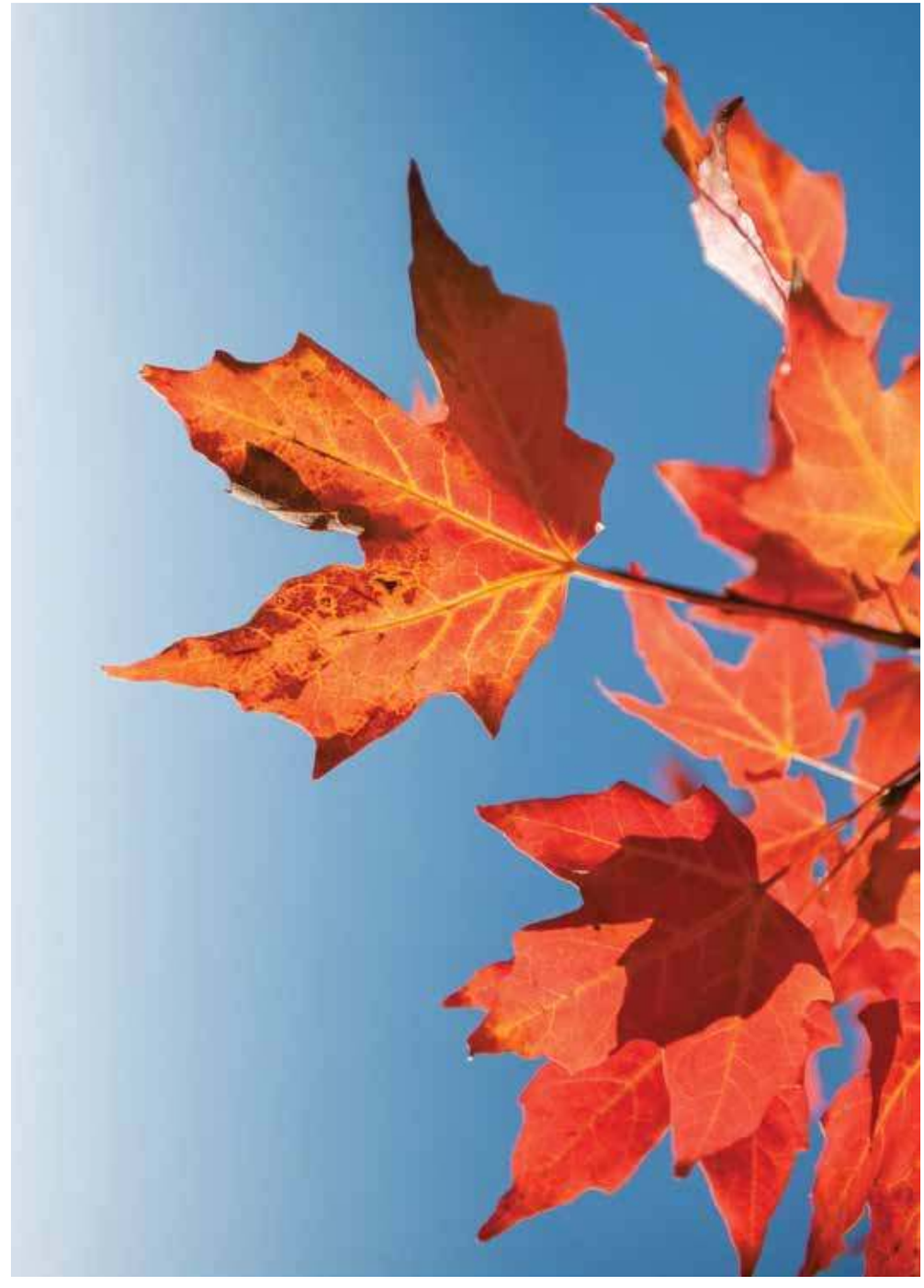

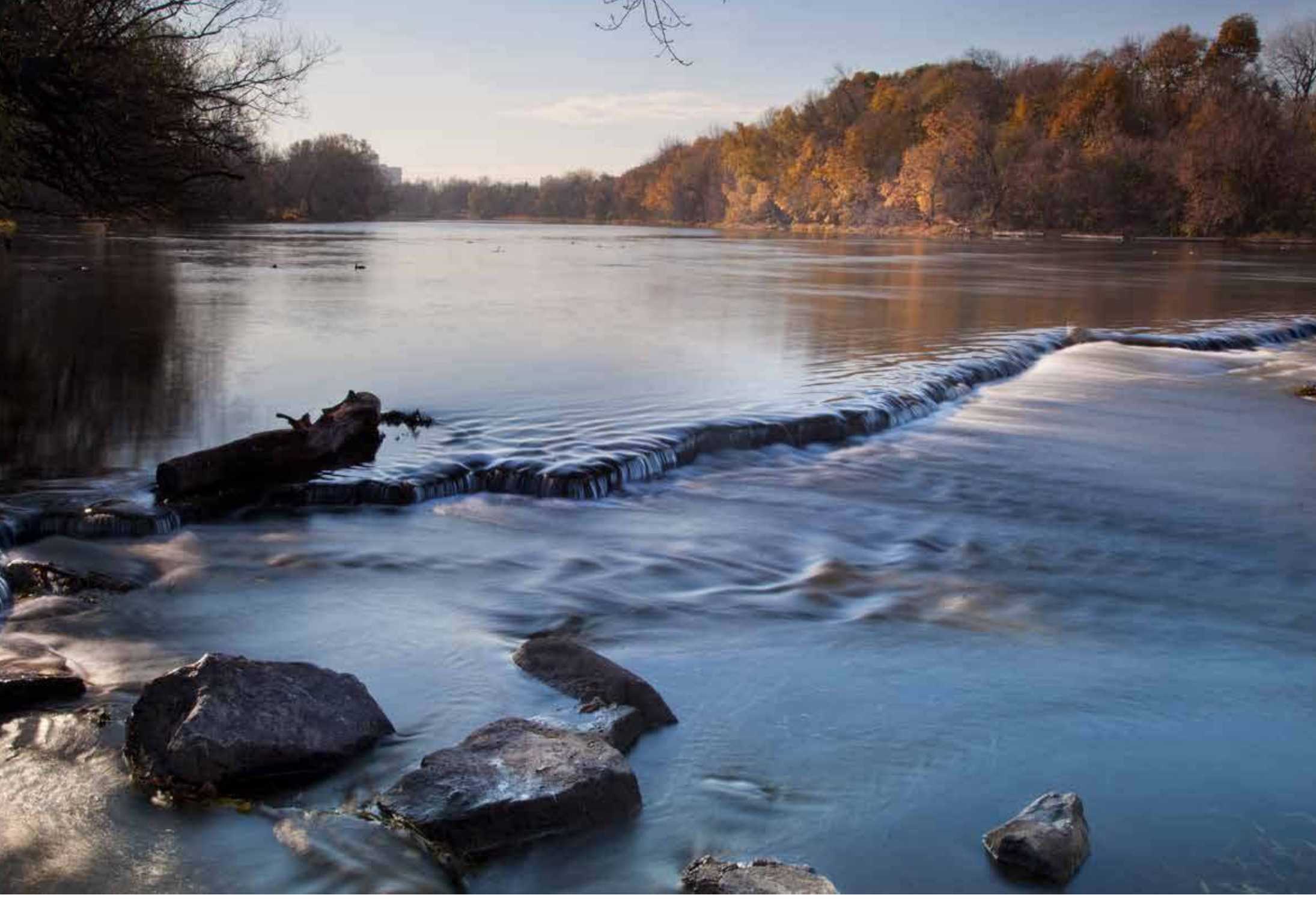

▲ Calm waters on the Rideau River.
Source: NCC

A LIVING LEGACY:

Remarkable Trees of Canada's Capital

Every capital in the world has its own special treasures and exceptional features that make it unique and in which it takes particular pride. For their citizens and for people around the world, national capitals are showcases of elements of urban, architectural, artistic and natural beauty that contribute to the country's national identity. The natural heritage of Canada's Capital Region is a fine example of this type of national treasure. Its preservation and beautification are the responsibility of the National Capital Commission, which, in this book, presents examples of a precious living legacy: the remarkable trees of the region.

Showcasing the biodiversity and some of the rare specimens of trees found in this northern part of the world, the book also takes us through the geological history of the region, to the First Peoples who shared their knowledge of trees, to the vast forests of noble hardwoods that were soon to be exploited and exported. It takes us through the years, telling the stories of visionary scientists determined to improve the hardiness of various species, to the conservation challenges that urbanization and climate change present today.

In short, this book is an invitation to discover some of the most beautiful and exceptional trees in the region.