

HABITATS AND BIODIVERSITY of the Deschênes Forest

**ECOFORESTRY INVENTORY
- PHASE ONE**



FONDS
VERT



Alliance Parc Deschênes



Abstract

An urban forest in the heart of Aylmer (Gatineau), along the Ottawa River, is home to many species of animals and is appreciated by walkers, naturalists and artists. One objective of the Deschênes Park Alliance, a non-profit organisation, is to seek a formal designation of this forest, which we call the “future Deschênes Park”. The Alliance is working to better understand the forest habitats, biodiversity, and carbon storage capacity of the future Deschênes Park. We conducted an ecoforestry inventory during summer 2022. With the help of enthusiastic volunteers, 18 400-m² plots were sampled. The forest includes three forest types – red oak forest, silver maple forest, and sugar maple-hickory forest. A large number of plant species demonstrates its biodiversity. In the inventoried zone we identified 211 species of herbaceous plants, 28 species of trees and 29 species of shrubs. The forest stores the equivalent of 193 tons of CO₂ per hectare.

Une forêt urbaine au cœur d’Aylmer (Gatineau) en bordure de la rivière des Outaouais offre une résidence à de nombreuses espèces d’animaux et sa beauté aux promeneurs, naturalistes et artistes. L’OSBL Alliance Parc Deschênes aspire à la création d’un statut particulier pour cette forêt que l’on nomme le futur « Parc Deschênes ». L’Alliance travaille à mieux connaître les habitats forestiers, la biodiversité et la capacité de stockage du carbone du futur Parc Deschênes. Pour y parvenir, un projet d’inventaire écoforestier a été réalisé au cours de l’été de 2022. Avec l’aide de bénévoles passionnés, 18 placettes de 400 m² chacune ont été mesurées. La forêt compte trois principaux milieux forestiers: l’érablière argentée, l’érablière à caryer et la chênaie rouge. La riche biodiversité de la forêt est mise en évidence par le grand nombre d’espèces de plantes. Dans la zone inventoriée, 211 espèces de plantes herbacées, 28 espèces d’arbres et 29 espèces d’arbustes ont été recensées. La forêt séquestre l’équivalent de 193 tonnes de CO₂ à l’hectare.



Once upon a time ...

Once upon a time, there was an oasis of nature in the heart of the city of Gatineau along the Ottawa River which was almost destroyed in the summer of 2020. Citizens organised a protest movement to protect this much-loved urban forest. Today, walkers, naturalists, artists, skaters, dogs, bears, deer, migratory birds, turtles, garter snakes, frogs and others continue to mingle here as the seasons pass.

Can you locate this little paradise between Deschênes Rapids and Fraser Road in the Aylmer sector? The communities of Deschênes, Glenwood and Wychwood surround the natural area known as Deschênes Park.

Have you observed the plants and trees there? Are you familiar with its main ecosystems? Have you noticed its rich biodiversity? How much carbon

does this forest store? Deschênes Park Alliance has the answers to these questions. The Deschênes Park Alliance (DPA) was born out of the citizen mobilisation to protect the Deschênes Forest natural area. Since 2021, the Alliance has been working to identify the forest habitats and ecosystems of the future Deschênes Park, in order to gain a better understanding of its biodiversity and carbon storage capacity. To help achieve this, an ecoforestry inventory was planned and carried out between 2021 and 2022 with the help of volunteers and a grant from the City of Gatineau's Fonds vert (Green Fund) in 2022.

Where and how did we work?

The ecoforestry inventory area was delimited based on the City's land registry. Deschênes Park includes private lots, lots belonging to the City of Gatineau and others belonging to the Québec Ministry of Transport. The grant from Gatineau's Fonds vert (Green Fund) restricted the inventory to lots belonging to the municipality, so data were collected in the area bounded by Fraser Road and the cycle path.

The sample includes 14 plots selected systematically and 4 additional plots to cover rarer natural environments. This total of 18 plots surveyed was spread over 17 hectares of forest. Measurements were taken in 2021 and 2022. The summer of 2021 was mainly devoted to preparing a rigorous methodology for the inventory. The first phase of the ecoforestry inventory took place in the summer of 2022. Gatineau volunteers of all ages, with a passion for plants, took measurements weekly in the forest from June to November.



Figure 1 : Map of the future Deschênes Park with the 18 plots of the ecoforestry inventory. — The black line represents the outline of the future park (not definitive). ● The plots in yellow were surveyed in the systematic ecoforestry inventory. ● The orange plots are points added in rarer environments. — The cycle path (Route verte) is shown as a dotted red line and ● the background of the map shows the trees of the forest.

WHAT MEASUREMENTS WERE TAKEN?

Each plot covered 400 m². Ecological data on the physical environment, the flora and the forest were recorded for each plot. The nature, thickness, stoniness and texture of the soil were the elements of the physical environment noted; plant species were identified and their abundance and size were recorded for the tree, shrub and herb layers. The forest was characterised by measuring the diameter and height of mature trees in each plot¹.

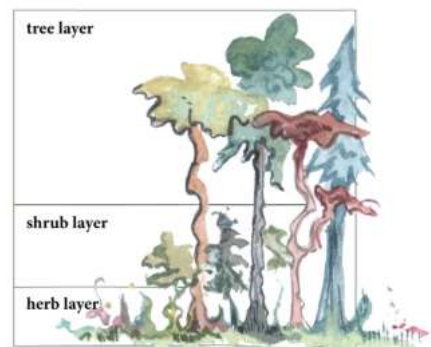


Figure 2: The three forest layers.

¹ Measurements were taken following “Normes techniques, le point d’observation écologique” (Technical Standards protocol, the ecological observation plot) (Québec Ministère des Ressources naturelles, 1994) and “Guide de reconnaissance des types écologiques” (Guide to identification of ecological types) (Québec Ministère des Ressources naturelles 2011).

What we observed in the forest

Looking overhead, we identified 22 tree species, 90% of which are native². These include species that are rare in Quebec, such as shagbark hickory and white oak, and uncommon species such as hornbeam.

A total of 168 trees with a diameter of at least 9.1 cm were measured. Of these, silver maple, red oak, bur oak and cottonwood were the most common (>10%). The tallest tree was 27 metres high and the thickest had a diameter of 112 cm.

Analysis of the inventory data gives an average density of 300 trees per hectare with a volume of 126 m³ per hectare (Table 1). Based on the methodology of the Intergovernmental Panel on Climate Change (IPCC), it is estimated that Deschênes Park forest stores 193 tonnes of CO₂ per hectare, the equivalent of what a Ford F-150 would have emitted travelling 519,000 km!

Table 1. Results of the inventory compilation.

<i>FOREST CHARACTERISATION</i>	<i>ESTIMATION</i>
Density of trees per hectare	300 trees / hectare
Volume of trees per hectare	126 m ³ / hectare
CO ₂ equivalent	193 tonnes of CO ₂ / hectare

²A species is defined as indigenous to a given region if its presence in that region is the result of natural processes, without human intervention.



Three types of oak are found in our forest: red oak, bur oak and white oak. The presence of these three native oak species is an exceptional asset. The following characteristics distinguish the three species.



Figure 3: White oak (*Quercus alba*).

WHITE OAK (*Quercus alba*)

The leaf has rounded lobes and deep sinuses. The acorn is enclosed in a scaly, warty cup.

BUR OAK (*Quercus macrocarpa*)

The leaf has rounded lobes with deep sinuses toward the base and shallower sinuses nearer the tip. The acorn is enclosed in a highly fringed cup.



Figure 4: Bur oak (*Quercus macrocarpa*).

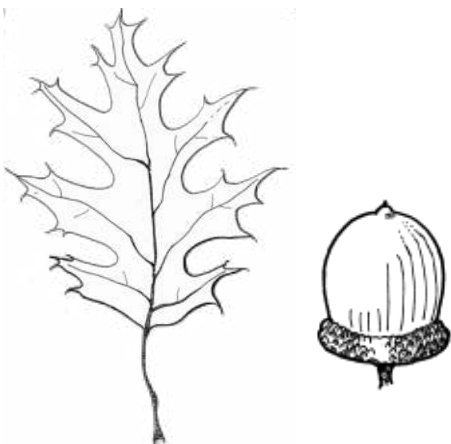


Figure 5: Red oak (*Quercus rubra*).

RED OAK (*Quercus rubra*)

The leaf has acute lobes with pointed tips. The acorn is enclosed in a scaly, beret-shaped cup.

FACE TO FACE: THE SHRUB LAYER

In the shrub layer, young trees and shrubs grow side by side. In all, 52 species were identified. Hornbeam, honeysuckle, dogwood, serviceberry and hawthorn are all part of this highly diverse layer. The shrub layer is virtually absent in some parts of the forest and very dense in others. The most common species are honeysuckle,

buckthorn, ash, bur oak and elm. The abundance of young bur oaks is a positive sign that renewal of the forest in the future Deschênes Park will continue!



Shrubs contribute colour and flowers to the Deschênes forest. For example, dogwood and sumac are two native shrubs that colour the landscape red. Dogwood likes to have its feet in the water, while sumac prefers dry places.

RED-OSIER DOGWOOD (*Cornus stolonifera*)

The red-osier dogwood is a shrub with bright red branches found on wet sites in the forest, particularly around Lamoureux marsh. Autumn and spring are the ideal seasons for spotting this shrub!

STAGHORN SUMAC (*Rhus typhina*)

Sumac prefers sunny, rocky spots. This native plant with its large red panicles brings its beauty to the edge of the forest. In autumn its foliage turns from green to bright orange.

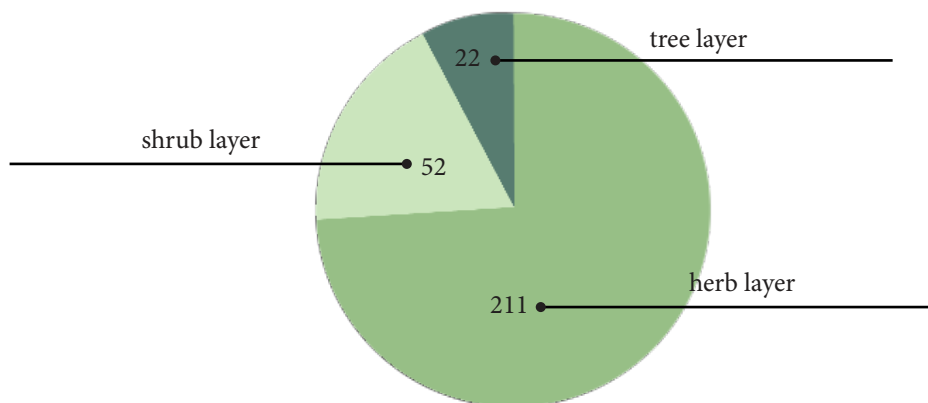


Figure 6: Number of plant species observed in each forest layer.

UNDER OUR FEET: THE HERB LAYER

The biodiversity of the Deschênes forest is highlighted by the large number of plant species in the herb layer. In all, 211 species were identified in the inventory. The complex environment explains this rich biodiversity: the forest includes wetlands and

drylands, woodlands and rocky areas. As a result, the forest has a rich natural and human history, which is reflected in its landscape and flora.



Biodiversity was particularly high in two plots, each with more than 50 species. The first, at the edge of the forest on the banks of the Ottawa River, includes the remains of an abandoned dwelling. Human influence is obvious in the high biodiversity here, with a plant community that includes medicinal plants, flowering plants, forest and prairie plants. In the second plot there is a transition from a dry to a wet environment. A total of 63 species were identified here. In this plot, plants that like to have their feet in the water are found along with dryland plants, a result of the micro-relief that creates hollows and high spots on the forest floor. There are also early successional forest plants³ and meadow plants.

HOG-PEANUT (*Amphicarpaea bracteata*)

In the first plot, with traces of human presence such as old low walls, we find the hog-peanut, a native climbing plant in the legume family. It is unusual in producing two types of seed from two distinct flowers. The first flower, pale lilac in colour, can cross-pollinate and contain one to four inedible seeds. The second flower, which is closed and self-pollinating, sinks into the earth (like a peanut) and produces a large edible pea.

BLUE FLAG IRIS (*Iris versicolor*)

Blue flag iris is found in the second plot which includes the transition from dry to wet environment. This native plant, remarkable for its beautiful violet flowers with white centres, is found in the intermediate zone between the marsh and the dry slope.

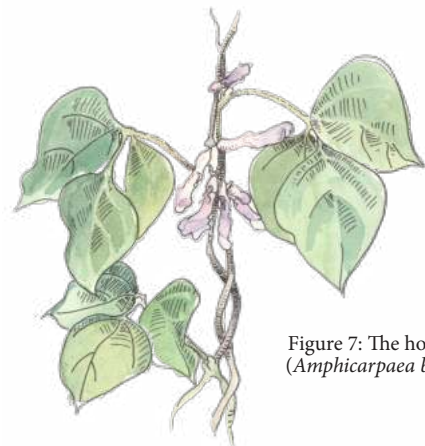


Figure 7: The hog-peanut (*Amphicarpaea bracteata*).

³ Early forest succession is a process by which plants repopulate a forest area following a disturbance such as a harvesting. Early successional forest plants are fast-growing and tolerant of high levels of sunlight.

HABITATS

Three main habitat types occur in the Deschênes Forest: silver maple forest, sugar maple - hickory forest and red oak forest.

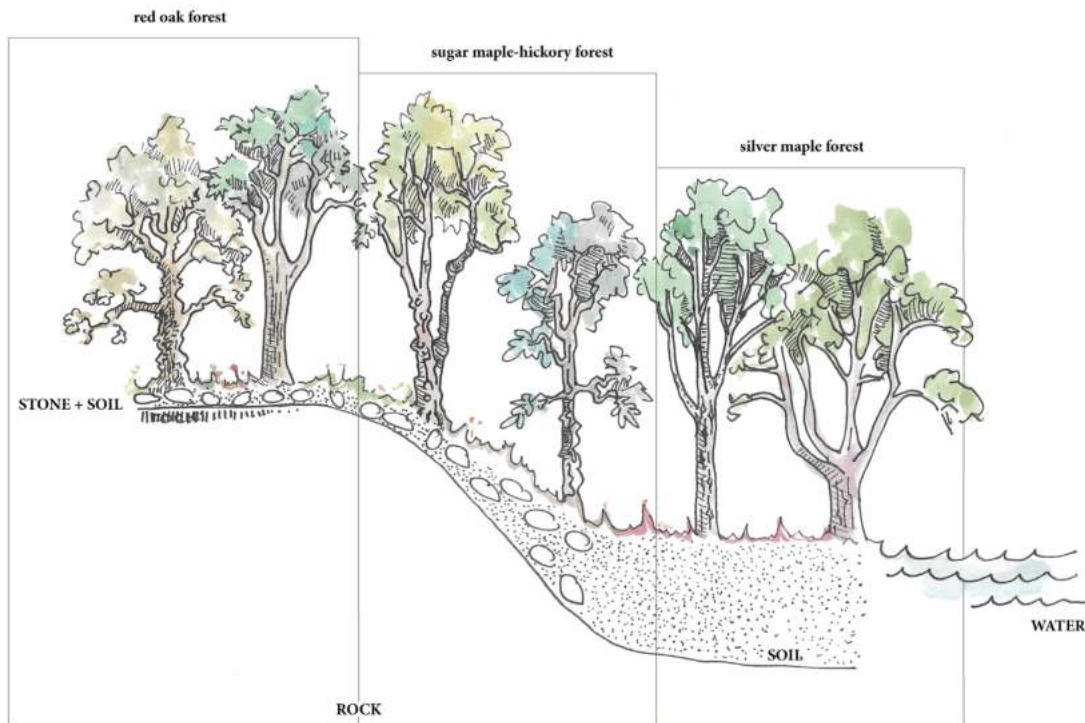


Figure 8: Toposequence of the three habitats in the Deschênes forest: red oak forest, sugar maple - hickory forest and silver maple forest. Trees shown from left to right: bur oak, red oak, sugar maple, shagbark hickory, poplar and silver maple.

SILVER MAPLE FOREST

Silver maple forest is characteristic of the wetlands along the Ottawa River. These areas are regularly flooded in spring, creating difficult conditions for most tree species, but silver maple, elm and cottonwood tolerate these wet conditions fairly well. Over the long term, these species dominate in these environments.

RED OAK FOREST

In parts of the Deschênes forest, soils are very thin with frequent rocky outcrops. These dry environments are particularly suited to red oak. It becomes the dominant species, accompanied by white oaks and a few bur oaks.

SUGAR MAPLE - HICKORY FOREST

Cool environments, neither too dry nor too wet, are ideal for the establishment and growth of bur oak, shagbark hickory, sugar maple, American ash and basswood. These species are dominant in these environments. Red oak is also abundant.

Here are the answers!

Deschênes Park Alliance considered a number of questions about the Deschênes forest. The ecoforestry inventory provided answers that will help us better understand this urban park ecosystem and support better preservation and protection of this unique and precious environment.

WHAT ARE ITS MAIN ECOSYSTEMS?

The Deschênes forest has three main types of habitat: silver maple forest, sugar maple – hickory maple forest and red oak forest.

HOW MUCH CARBON DOES THE FOREST STORE?

The Deschênes forest stores the equivalent of 193 tonnes of CO₂ per hectare.

IS BIODIVERSITY HIGH IN THE FOREST?

A total of 268 plant species - 28 tree species, 29 shrub species and 211 herbaceous plant species - were recorded in the sampled area. The full list of tree, shrub and herbaceous species can be found in the appendix to this document.

Appendix

List of plant species observed during the 2021-2022 ecoforestry inventory on the territory of the future Parc Deschênes.

Tree species

Acer negundo
Acer saccharinum
Acer saccharum
Carpinus caroliniana
Carya ovata
Fraxinus americana
Fraxinus pennsylvanica
Juglans cinerea
Ostrya virginiana
Populus balsamifera
Populus deltoides
Populus grandidentata
Populus tremuloides
Prunus nigra
Prunus virginiana
Quercus alba
Quercus macrocarpa
Quercus rubra
Rhamnus cathartica
Robinia pseudoacacia
Salix amygdaloides
Sorbus americana
Sorbus aucuparia
Thuja occidentalis
Tilia americana
Ulmus americana
Ulmus pumila
Ulmus sp.

Shrub species

Acer spicatum
Amelanchier sp.
Cornus amomum
Cornus rugosa
Cornus stolonifera
Corylus cornuta
Crataegus sp.
Diervilla lonicera
Frangula alnus
Juniperus communis
Lonicera sp.
Lonicera xylosteum
Rhus typhina
Ribes americanum
Rubus allegheniensis
Rubus idaeus
Rubus occidentalis
Rubus odoratus
Rubus strigosus
Salix bebbiana
Salix discolor
Salix nigra
Sambucus racemosa
Spiraea alba
Spiraea japonica
Toxicodendron rydbergii
Vaccinium angustifolium
Viburnum acerifolium
Viburnum rafinesqueanum

Herbaceous species

Acalypha rhomboidea
Achillea millefolium
Agrostis capillaris

Agrostis gigantea
Agrostis scabra
Agrostis stolonifera
Alisma triviale
Alliaria officinalis
Ambrosia artemisiifolia
Amphicarpaea bracteata
Anemonastrum canadense
Anemone cylindrica
Anemone virginiana
Apios americana
Apocynum androsaemifolium
Apocynum cannabinum
Aralia nudicaulis
Arctium minus
Arctium sp.
Artemisia vulgaris
Asclepias incarnata
Asclepias syriaca
Athyrium filix-femina
Barbarea vulgaris
Bidens cernua
Bidens frondosa
Bidens vulgata
Butomus umbellatus
Calystegia sepium
Campanula rapunculoides
Carex crinita
Carex granularis
Carex leptonevia
Carex merritt-fernaldii
Carex pensylvanica
Carex pseudocyperus
Carex radiata
Carex retrorsa
Carex scoparia
Carex stipata
Carex tenera
Carex tuckermanni
Cerastium fontanum
Chenopodium sp.
Cichorium intybus
Circaea canadensis
Cirsium arvense
Cirsium vulgare
Convallaria majalis
Cyperus strigosus
Danthonia spicata
Daucus carota
Dianthus armeria
Dichanthelium acuminatum
Dichanthelium linearifolium
Digitaria ischaemum
Digitaria sanguinalis
Doellingeria umbellata
Euphorbia maculata
Euphorbia vermiculata
Eurybia macrophylla
Euthamia graminifolia
Festuca rubra
Fragaria vesca
Fragaria virginiana
Galium mollugo
Galium palustre
Galium tinctorium

Geum aleppicum
Geum canadense
Geum fragaroides
Geum urbanum
Glechoma hederacea
Helianthus tuberosus
Hemerocallis fulva
Hemerocallis lilioasphodelus
Hesperis matronalis
Heteranthera dubia
Hieracium aurantiacum
Hieracium pilosella
Hypericum ellipticum
Hypericum perforatum
Impatiens capensis
Iris versicolor
Juncus nodosus
Juncus tenuis
Lactuca serriola
Lathyrus pratensis
Leersia oryzoides
Leersia virginica
Lemna minor
Lepidium campestre
Leucanthemum vulgare
Linaria vulgaris
Lindernia dubia
Lolium perenne
Lotus corniculatus
Ludwigia palustris
Lycopus americanus
Lycopus europaeus
Lycopus laurentianus
Lycopus uniflorus
Lysimachia nummularia
Lythrum salicaria
Maianthemum canadense
Maianthemum racemosum
Medicago lupulina
Medicago sativa
Melilotus albus
Mentha arvensis
Mentha canadensis
Mimulus ringens
Muhlenbergia frondosa
Myriophyllum sp.
Nuphar microphylla
Nymphaea odorata
Oenothera biennis
Onoclea sensibilis
Oxalis stricta
Panicum capillare
Panicum tuckermanni
Parthenocissus sp.
Persicaria amphibia
Persicaria hydropiper
Persicaria maculosa
Phalaris arundinacea
Phleum pratense
Phragmites americanus
Pilea fontana
Plantago lanceolata
Plantago major
Plantago rugelii
Poa annua

Poa compressa
Poa nemoralis
Poa palustris
Poa pratensis
Polygonum aviculare
Pontederia cordata
Potentilla argentea
Potentilla recta
Prunella vulgaris
Ranunculus acris
Rorippa sylvestris
Rumex crispus
Rumex mexicanus
Rumex obtusifolius
Rumex verticillatus
Sagittaria cuneata
Sagittaria graminea
Sagittaria latifolia
Sagittaria rigida
Schoenoplectus tabernaemontani
Schoenoplectus torreyi
Scirpus atrocinctus
Scirpus atrovirens
Securigera varia
Sedum acre
Setaria pumila
Setaria viridis
Silene antirrhina
Silene vulgaris
Sisyrinchium montanum
Solanum dulcamara
Solidago altissima
Solidago canadensis
Solidago juncea
Solidago nemoralis
Solidago rugosa
Sonchus arvensis
Sparganium eurycarpum
Sporobolus michauxianus
Streptopus lanceolatus
Symphytotrichum ciliolatum
Symphytotrichum cordifolium
Symphytotrichum lanceolatum
Symphytotrichum lateriflorum
Symphytotrichum novae-angliae
Symphytotrichum ontarionis
Tanacetum vulgare
Taraxacum officinale
Tragopogon pratensis
Trifolium aureum
Trifolium campestre
Trifolium hybridum
Trifolium pratense
Trifolium repens
Typha angustifolia
Typha latifolia
Urtica procera
Verbascum thapsus
Veronica officinalis
Veronica scutellata
Vicia cracca
Vincetoxicum rossicum
Vitis riparia
Xanthium strumarium

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