Les Amis du Parc de la Gatineau
Friends of Gatineau Park

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Biodiversity

Mapping forest structure using air photos as an indicator of biodiversity

by Jon Pasher and Doug King, Ph.D.

Carrying out intensive field surveys in order to assess biodiversity in Gatineau Park would be a daunting task that would require an exorbitant amount of resources. For this reason, the development of indicators, or surrogate measures, of biodiversity is essential in order to provide a means for measuring and monitoring changes in biodiversity in forests, and specifically forests of great conservation interest such as Gatineau Park.

Dr. Doug King, a professor in Geography and Environmental Studies at Carleton University and a local Chelsea resident, has been carrying out research in Gatineau Park for more than 10 years. His research involves studying forest health and structure using aerial photography and satellite remote sensing, including mapping damage following the 1998 ice storm. His research is carried out as part of the Geomatics and Landscape Ecology Research Laboratory (glel.carleton.ca) which is an interdisciplinary research facility set up at Carleton to advance modelling / mapping and species conservation science through the synergistic integration of geomatics and landscape ecology research.

Dead trees are important structures in the Park and provide excellent habitat for a variety of species including Pileated woodpeckers.

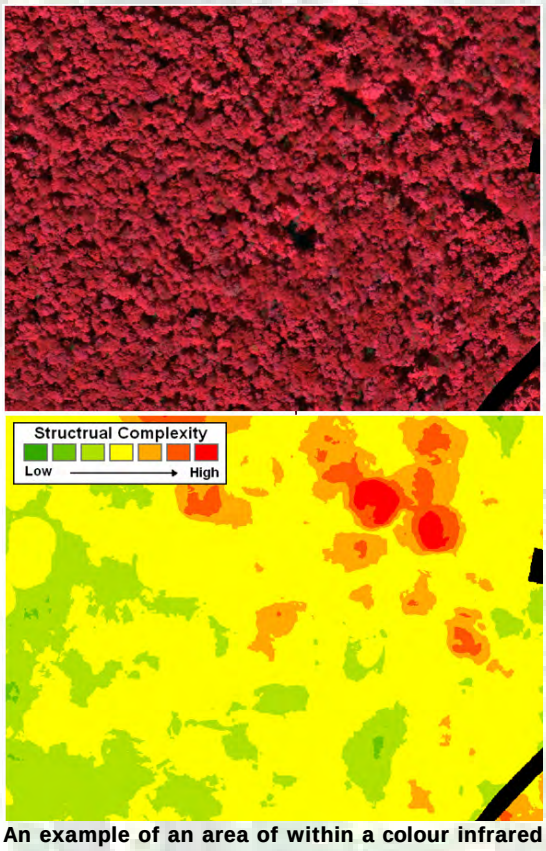
Currently, Jon Pasher, conducting his PhD research under Doug King's supervision, is using high resolution (20 cm pixels) multispectral (including information in the near infrared portion of the spectrum) digital air photos to develop models that will help answer the questions: *How complex is the forest*? and *Where are the areas of high complexity vs low complexity?* This project is based on the 'habitat heterogeneity hypothesis', which assumes that areas of the forest that are more structurally complex provide a greater number, and wider variety, of potential habitats, and therefore should support greater biodiversity. For example, deadwood within Gatineau Park offers excellent habitat, providing necessary food and shelter, for a wide variety of species, including birds (e.g. pileated woodpeckers), small mammals (e.g. fishers), and many species of invertebrates, amphibians, and reptiles.

Measures of forest structure, including, for example the sizes of trees, the amount of deadwood in the forest, as well as variations in the height of ground vegetation, were taken in field plots that were set up in the Park. These data provided ground information in order to build and calibrate models developed from remotely sensed imagery and topographic data. Various pieces of information, including

Example of an air photo showing individual tree crowns, shadows in the canopy, and individual dead trees, which all provide information that can be used to model and map structural complexity.

measurements of the canopy and shadows in the forest, were then extracted from the air photos at the exact locations (known from field measurements using sub-meter GPS equipment). This information was used to explain the structural complexity that was measured on the ground. These computer based models were then used to create spatially continuous maps of predicted structural complexity across the forest.

The results show that forest structural complexity can be modeled well using measures extracted from high resolution imagery and topographic data. The structural complexity maps can be used for monitoring changes in the forest over time, but also as a spatially extensive indicator for habitat and biodiversity within Gatineau Park. Additionally, this information can be used for management and conservation purposes in order to help protect important regions within the forest that support very high levels of biodiversity.



An example of an area of within a colour infrared air photo and mapped structural complexity for the imaged region.

This research is part of ongoing habitat modelling and mapping projects being carried out by Dr. King and his graduate students at Carleton University, including another ongoing project that is attempting to develop habitat models for the endangered *Blandings turtle* that is found in wetlands in the La Pêche sector of the Park.

These research results were presented at the 2008 Research Forum.

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Heritage

The big story of the small Herridge cottage

by Jean-Philippe Rheault

Halfway between O'Brien Beach and Wakefield, along trail 50 that runs parallel to Harrington Lake, skiers seeking refuge and the warmth of a woodstove can find shelter in a typical log-construction building. The house does not readily reveal its secrets; however, a little research shows that it was once owned by an important figure in Canadian politics.

Source: Barclay Fortin, blog Ski Glisse

In November 2006, the NCC completed a major renovation and restoration of this 1880s farmhouse so it could offer its shelter for a long time to come. Its story begins with the Caffertys, an Irish family who struggled to farm the land for 26 years. Unfortunately, the house was then ownerless for several years.

In the 1920s, a lawyer bought the property, which he would use as a cottage for 40 years. The son of a pastor settled in Kingsmere, William Duncan Herridge, knew the area well. His father was responsible for St. Andrew's Church in Ottawa. In 1916, Herridge had married a childhood friend, the granddaughter of industrial entrepreneur J. R. Booth, whose immense home on the north shore of Kingsmere Lake is now no longer in existence.

Upon returning from the Great War, he befriended his former commanding officer. Together, they established the *Canadian League* for veterans. Viscount Byng became Governor General in 1921, when Herridge took to politics by becoming involved with the Conservatives.

Herridge was deeply affected by the death of his wife Rose in 1925. He even considered abandoning his political career. However, his passion for politics was rekindled by a constitutional crisis. Herridge became a close advisor to party leader R. B. Bennett. During the 1930 election, he wrote Bennett's speeches and helped him devise the Conservative electoral strategy. After their victory, Herridge acted on his love for the Prime Minister's sister, Mildred, and married her in 1931. He secured the title of Canadian Ambassador in Washington, thus succeeding Vincent Massey who, incidentally, was Herridge's former classmate and friend in law school at the University of Toronto.

In the 1935 election, the Conservatives were defeated; consequently, Herridge was no longer Ambassador. When Bennett left politics in 1938, Herridge had just lost his wife Mildred and did not get along with the new Conservative Party leader (Manion). The following year, he created a new movement, *New Democracy*, derived from Roosevelt's *New Deal* in the United States. In the 1940 election, the Party had 17 candidates but only three of these got a seat. The Party garnered less than 2% of the vote, and Herridge failed to get elected.

He died in September 1961 at age 73.

Source: Archives de la Ville de Montréal, BM1-S5-P0397

William Duncan Herridge

Sources:

NCC, *Canadian Encyclopedia*, *Heritage Pontiac*, Stephen Hoogenraad (thesis, Carleton University, 2000), Denis Messier (*The Gatineau Park Chronicle*, Fall 2007), Skiglisse (blog), Ulysse (Guide to the TransCanada trail), *Time* (April 13, 1931), City of Montreal.

Biodiversity

The escarpments: rock-solid yet so vulnerable

by André Lapointe, FloraQuebeca

At first glance, this wide rocky range known as the escarpments stands as a deeply rooted barrier. Almost vertically shifted, this wall barely supports scarce vegetation, as it resembles a hanging garden. So many trenches hide in this old wrinkled face, as to suggest all forgotten events of a long past. Shredded as a pealing scalp, teetering blocks often detach themselves over time to make their final descent in their graveyard in the valley below. Now all peaks appear more rounded, winds and water clapping continuously on its forehead.

Escarpments do reveal a wide range of attractions. Numerous botanists have witnessed this throughout the last 2008 season in their quest to characterize these great ecosystems and identify many of its particularities. Among these is the exceptional concentration of rare plants, whose profile is better represented in the Park than anywhere else in the province.

A typical ecosystem throughout the escarpments is the open forest dominated by the red oak. This species is easily recognizable in the fall when the forest canopy glitters with colors of reddish brown. It is frequently accompanied by the white pine and occasionally by the red pine. Another species, the white oak, can sometimes be seen on the forest floor. Scarcer than the red oak, it is still noticeably found throughout the range of the escarpments, the Gatineau Park counting more individuals than anywhere else in the province.

The different vegetation stands vary not by altitude, because the drop remains too insignificant to allow a well-established forest story as in an alpine environment, but rather on account of the abundance of sunlight. There are actually several rare species, referred as heliophyte, that cannot evolve under the shade. A good example is the woodland sunflower. Another factor plays a major role, that is, the presence of water. While the most abrupt escarpments only feed with precipitation water running superficially, masses of rocks in the foot slope capture water in the interstices between individual blocks. On the other hand, several shelves occasionally appear near the summits trapping water in the mossy mats which often contain a well diversified vegetation.

The significant presence of the oak colony is particularly attractive to many animal species, in such a way that the area literally becomes a zoological park when all acorns fall. Other than the rather common squirrel, the black bear and the Virginia deer are regular inhabitants gathering for a great feast before the coming of winter. Porcupines and even wild turkeys, have also been observed in the area. This wildlife party can also have an negative impact on several species of wildflowers and low shrubs. In some areas, the forest floor lying beneath the oak stands is so heavily threaded that it looks like a trail crossing. White oak acorns are such a sought-after meal that not a single one could be seen on the forest ground.

While botanists surveyed more than a hundred new rare plants all along the escarpments, they questioned the medium term viability of these colonies in light of the wildlife concentration. Many questions still persist as to knowing, for example, if the annually-harvested plantlets of such species as the Eastern red cedar or the white oak can withstand this phenomenon without suffering from habitat lost.

For now, one thing remains clear. The actual vegetation in the escarpments typically promotes a higher concentration of animal species. However, the frequency and length of their presence are not well established. Many animal species may use these open forests as a preferred habitat, namely the black bear, which often dens among the cavities of rockfall. The summits of most of the escarpments are also a habitat for a sea of blueberries, available from mid-June. Again, one might easily encounter a wandering bear or raven.

Should we then apprehend the possible loss of several rare plant species from the escarpments? Should the presence of fauna be controlled? Should we plan a series of protected areas?

Mr. Lapointe presented these results at the 2008 Research Forum.