

EXECUTIVE SUMMARY: Report on Gatineau Park Ecosystems



BACKGROUND

Gatineau Park, the Capital's conservation park, is beloved to the over 700,000 people who make more than 2.7 million visits to the Park each year (NCC internal data). Local residents, recreational enthusiasts and tourists frequent the Park intensively on a year-round basis to enjoy its beaches, parkways, hiking, biking, skiing and snowshoeing trails, as well as its cultural attractions such as the Mackenzie King Estate.

The Park has many unique and diversified ecosystems and heritage features. It covers 36,131 hectares (361 square kilometres) of land, providing habitat for over 5,000 species, including rare species found nowhere else in the region, and 156 federally and provincially listed species at risk (2015, NCC internal data).

In the 2005 Gatineau Park Master Plan (National Capital Commission, 2005), conservation was confirmed as the primary vocation of the Park, along with providing recreational experiences that are respectful of the environment, and encouraging discovery of the Park's natural and cultural heritage.

Valued Natural Ecosystems and Habitats

Five valued natural ecosystems (Eardley Escarpment, Eardley Plateau, Three-lakes Chain, La Pêche Lake, Pink Lake Plateau) and two valued natural habitats (Folly Bog, Lac des Fées) were identified in Gatineau Park in 2007 (Del Degan, Massé, 2007). The boundaries of these important natural areas were slightly revised in 2012, based on the availability of more detailed information about the location of key natural elements. The following figure shows the location of these habitats and ecosystems.

Management Recommendations for the Valued Natural Ecosystems and Habitats of Gatineau Park

Location of Gatineau Park's Valued Natural Ecosystems and Habitats

-  Gatineau Park Boundary
-  Valued Natural Ecosystems and Habitats

Note: The VNEH boundaries shown on this map were revised in the context of the present study

Source: National Capital Commission, 2012
 Database: National Capital Commission, 2012

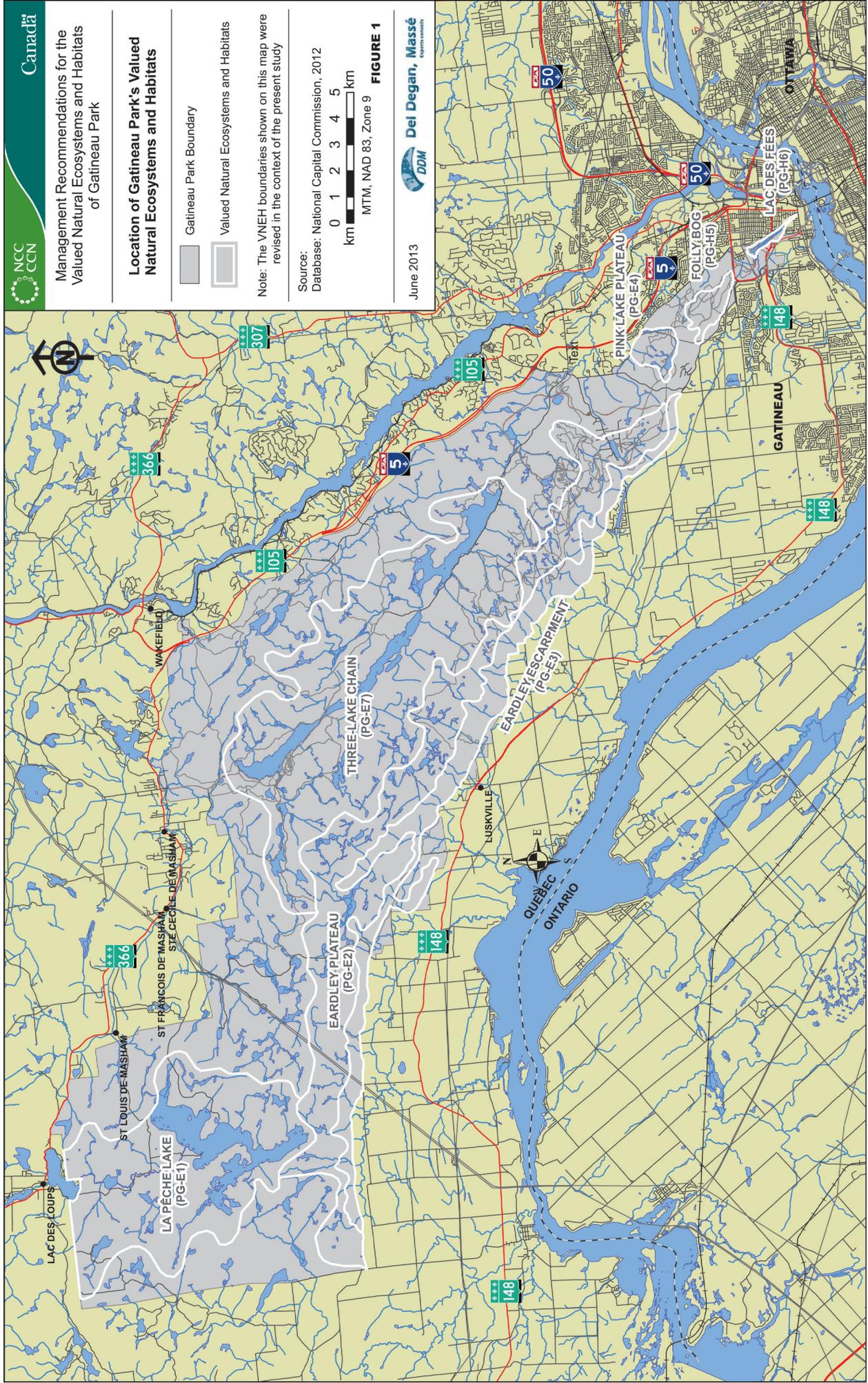


MTM, NAD 83, Zone 9

June 2013



FIGURE 1



PREVIOUS ASSESSMENT OF ECOLOGICAL HEALTH

A preliminary assessment of the ecological health of Gatineau Park was conducted in 2006 (Del Degan, Massé, 2006), based on existing information and sporadic monitoring data.

In the 2006 assessment, the overall condition of Gatineau Park was determined to be “acceptable,” and relatively stable, although a deteriorating trend was noted in the Eardley Escarpment and the three-lake chain ecosystems.

EVOLUTION OF INDICATORS

Since 2006, Gatineau Park has been monitoring a suite of environmental indicators (measures), from which broader inferences about the condition of the Park’s health can be made. These indicators have subsequently been revised; this report focuses on the revised indicators and the relevant data available at the time of writing.

Revised suite of indicators

Indicator	Management issue	Monitoring frequency	Biodiversity	Stressors	Ecosystem function
Loons	Impact of aquatic recreational activity, pollution	3 years	✓	✓	
Water quality (lakes and streams)	Impact of recreational and other activities on aquatic habitat	2 years		✓	✓
Frogs	Habitat quality in wetlands, effects of stressors	3 years	✓	✓	
Nesting birds	Habitat quality in different ecosystems, general index of biodiversity	3 years	✓		
Invasive plant species	Presence and expansion of aggressive alien species	3 years	✓	✓	
White-tailed deer	Impact of deer on vegetation	10 years	✓	✓	
Soil fertility	Forest ecosystem functioning	10 years (variable)			✓
Plant species at risk	Impact of recreational activities on species at risk	5 years	✓		
Fragmentation	Effect of linear disturbance on habitat quality and connectivity	8 years		✓	
Shoreline condition	Impact of human activity and land management practices on shorelines	5 years		✓	
Landscape connectivity	Degree of connection between Park and surrounding natural areas	8 years		✓	✓
Infrastructure footprint	Impact of infrastructure on habitat quantity and quality	3 years		✓	

Reporting indicator results

Evaluation of condition

Where possible, the monitoring results for the indicators will be assessed in terms of the overall *condition* of the element being monitored. Widely accepted thresholds of condition already exist for some measures, such as water quality. In other instances, it is possible to identify statistical thresholds for condition based on the degree of variation in data observed over time. No determination of condition will be made for indicators where neither of the above conditions apply.

For the purposes of this report, the condition of indicators is considered to be one of the following:

Good (**green**)

Fair (**yellow**)

Poor (**red**)

Where more than three condition categories have been identified for certain indicators, they will be regrouped into the above categories.

Evaluation of trend

Related, but distinct from a determination of condition, is the determination of a *trend* in a measure. A measure must be repeated over a number of years in order to be able to ascertain if changes in the measure are occurring over time and, if so, if the changes are both statistically and ecologically significant. Wherever possible, trends in measures will be reported as one of the following:

-  Improving
-  Stable
-  Deteriorating

Summary of ecosystem health indicators

For a detailed analysis of the indicator monitoring results, please see the full report.

Valued natural ecosystem or habitat (results determined at level of VNEH)

Valued Natural Ecosystem or Habitat	Loons	Streams	Lakes	Shorelines
Eardley Escarpment				
Eardley Plateau			↑	
La Pêche Lake	↔			↔
Pink Lake Plateau			↑	
Three-Lake Chain	↔		↔	↔
Folly Bog				
Lac des Fées				

General ecosystem health indicators (results are general to the Park)

General indicators	
Frogs	↕
Invasive plants	↕
Deer	↔
Soil fertility	
Fragmentation (IDP)	↓
Infrastructure	
Nesting birds	

LEGEND

Ecological condition	
	Good
	Fair
	Poor

Trend	
↑	Improving
↔	Stable
↓	Deteriorating

Discussion

It is difficult to ascertain an overall condition or trend for Gatineau Park based on the monitoring results obtained to date. Defensible thresholds and ecologically significant trends are not available for all of the indicators. In general, however, the indicators suggest that the overall condition of the Park is good, and that the condition appears to be relatively stable. Water quality, deer impacts, loon populations and frog diversity are within normal parameters. Certain indicators in certain areas, however, point to issues of concern. These are discussed below.

Issues of concern

Fragmentation: Both the fragmentation (IDP) and the infrastructure indicators point to a negative cumulative effect of linear disturbances, including roads and the recreational (both official and unofficial) trail network. The results in this report are based on baseline data, but it is well known that unofficial trails have proliferated over the past decade. These linear features vary in degree of negative impact, based on width, extent of use and location with respect to sensitive natural features in the Park. However, the overall effect is increased habitat fragmentation. The risks of this progressive fragmentation include the introduction of invasive species, avoidance by disturbance-intolerant and interior-habitat species, increased levels of stress on wildlife, erosion, soil compaction and trampling of plants, including species at risk.

Invasive species: Monitoring results show that the colonies of invasive alien species within established plots are increasing significantly in size. New invasions have been recently detected, predictably along roadways and pathways entering the Park (NCC internal data). If left unchecked, invasive species could pose a significant threat to native biodiversity and the health of the ecosystems and habitats in the Park.

Shorelines: By and large, the major lakes in Gatineau Park are in near-natural condition. However, certain zones of the Meech Lake and Philippe Lake shorelines are moderately to highly degraded. Some of this degradation is explained by Park infrastructure: beach areas, boat launches and so on. At Meech Lake, private property infrastructure, and resident and visitor use of shorelines are also affecting the shoreline. It can be expected that most of this infrastructure will remain, and so this indicator is not expected to significantly improve, though some restoration is possible. The initial results for Lac des Fées point to decades of deterioration in a highly urban setting. There is little specific infrastructure that explains the high proportion (29 percent) of highly degraded shoreline. Restoration efforts at Lac des Fées could improve the condition of the shorelines, and possibly contribute to improved health of this urban lake.

Water quality: Water quality is generally good in Gatineau Park's lakes and streams, with several exceptions. Lac des Fées has poor water quality, due in part to a high concentration of salt, attributable to runoff from major roadways in this urbanized sector (Genivar, 2014). Meech Creek is in fair condition, based on higher turbidity and suspended solids. This result could be explained by soil instability in the sector, which often leads to landslides into the creek. In both of these instances, water quality could be improved by enhancing the shoreline condition and stability.

Soil fertility: Deficiencies in both humus and soil potassium in long-term maple stand plots could point to deteriorating conditions of maple stands. Acid rain is one possible factor that could lead to these results. The Forest Ecosystems Research and Monitoring Network is currently analyzing data from 2014, and the results will be carefully interpreted to determine if there is cause for further investigation or concern.

Loons: The number of equivalent couples of loons on Meech, Philippe and La Pêche appear to be generally stable and within a normal range of variation, though the overall numbers on each lake are small. This is not surprising, given that loons can live up to 25 years, and so we are likely observing the same animals year after year. The lack of observed juveniles over the past several years is of potential concern. A more intensive effort to determine nesting success is warranted.

Condition of Lac des Fées: A number of indicators point to the degraded condition of this valued natural habitat. Located within the city of Gatineau, Lac des Fées is subject to numerous urban stressors. A major road network, recreational pathways, polluted water runoff from adjacent roads, invasive species and shoreline deterioration are all factors that are having a negative impact on the ecological health of this habitat. Water quality in the lake is considered poor, and frog species (spring peeper and grey tree frog) and abundance appear to have declined. The condition of this habitat can be expected to continue to deteriorate, unless restoration efforts are put in place.

Landscape connectivity: The Gatineau Park Conservation Plan (National Capital Commission, 2010) recognizes the importance of ensuring that the Park retains functional ecological connections to the surrounding landscape. In 2012, a report identified and characterized the 12 remaining ecological connections adjacent to Gatineau Park (Del Degan, Massé, 2012). The trend toward ecological isolation of the Park is increasing, in particular due to progressive residential development adjacent to the Park. Collaborative engagement with regional jurisdictions would be required in order to stabilize this trend.

Recent management efforts

Consistent with the Gatineau Park Master Plan (National Capital Commission, 2005) and the Gatineau Park Conservation Plan (National Capital Commission, 2010), a number of actions have been taken to enhance understanding of the ecological health of the Park and to undertake targeted restoration.

Rock climbing sites on the Eardley Escarpment: Gatineau Park undertook a detailed study (Genivar, 2010) to determine the ecological condition of rock climbing sites on the species-rich and ecologically sensitive Eardley Escarpment. The degraded nature of many of the sites, combined with a high degree of ecological sensitivity, led the NCC to close a number of the rock climbing sites and to carry out restoration efforts at others. Three rock climbing faces and several associated trails have recently been restored, with the collaboration of the rock climbing community. Natural materials are in place to prevent further erosion and to assist in the natural regeneration of the sites.

Reducing the impact of unofficial trails: In 2014, Gatineau Park initiated a process to work with Park user groups to reduce the negative impacts of fragmentation caused by the creation and use of unofficial trails. A detailed analysis of trails and their impacts was carried out, and the NCC continues to consult with groups to enhance the overall trail offer, while reducing the footprint of the extensive network of unofficial trails.

Conversion of Gamelin Street: The former Gamelin Street between Rue des Fées and Saint-Raymond Boulevard was converted to a recreational pathway in 2013. The removal of vehicle traffic and the reduction in width, along with the landscaping, of the former roadway reduce the impact of habitat fragmentation in the Gateway Sector of the Park.

Meech Lake shoreline: Another study (Genivar, 2011) was carried out to evaluate the condition of the shorelines of the three major recreational lakes in Gatineau Park (Meech, Philippe and La Pêche), and to determine restoration needs. Initial shoreline restoration work was carried out at Meech Lake in 2014 and 2015, when the McCloskey shoreline and Blanchet Beach were restored. Further work will involve collaboration with the Municipality of Chelsea and private landowners.

Characterization of Folly Bog: In partnership with the Université de Montréal, the NCC has acquired more detailed knowledge of the nature and species characterization of the Folly Bog valued natural habitat (Talbot, Demers-Thibault, Lapointe-Elmrabti, Pelletier and Paillard, 2015). The bog is in fact considered to be a peat swamp, part of which is disconnected from the water table. Five new species for the Park were identified during the study, and the presence of an invasive species was detected.

Southern sector study: The NCC commissioned a detailed study (Genivar, 2014) to better understand the condition and stressors of the southern portion of the Park, including Lac des Fées. The results of the study provided insights about water quality, amphibian habitat and presence, wetland characterization, the impact of road salts and the impact of the road network on animal mortality. The report provides useful information about possible approaches to restoration.

Plans in development

Several plans are in development to further address the issues identified in this report:

- An action plan to manage and mitigate the impacts of aggressive invasive alien species
- A restoration plan for the Lac des Fées habitat
- A shoreline restoration plan for Meech Creek

Limitations of data

This report brings together all of the available monitoring data for the revised list of Gatineau Park ecological health indicators. Long-term data sets exist for some of the indicators, while others have only baseline data available, and several more are still in development. The conclusions from this data are therefore preliminary, and represent the expert opinion of Gatineau Park biologists. The NCC recognizes the limitations of the data, including non-independent variables and small sample sizes, which limit the statistical power to detect trends. Future reports will integrate new data as it becomes available.

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