BIODIVERSITY MONITORING ON NATIONAL CAPITAL COMMISSION LAND

SUMMARY

Presented to the:

NATIONAL CAPITAL COMMISSION

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1. INTRODUCTION

This document summarizes the content of a detailed study of biodiversity on National Capital Commission (NCC) land. The original study comprises three voluminous reports (in excess of 1,000 pages of text) and is based on a clearly argued, well-documented scientific approach (see Section 6).

1.1 BIODIVERSITY IN BRIEF

In the *Convention on Biological Diversity,* biodiversity is defined as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems".

1.2 BIODIVERSITY: A VISION OF THE FUTURE

In the last fifteen years, the notion of biodiversity has spread thanks to growing international awareness of the need to act in order to protect ecosystems from the impacts of human development and activities. Factors that have had an impact on the natural environment and its balance include habitat fragmentation, urbanization, the conversion of forests into farmland, global warming and wetland destruction.

1.3 BIODIVERSITY AND THE LAW

The *Canadian Biodiversity Strategy* requires the different levels of government to report periodically on the state of biodiversity, in order to comply with the *Convention on Biological Diversity*.

1.4 THE NATIONAL CAPITAL COMMISSION CARES ABOUT YOUR ENVIRONMENT

By monitoring biodiversity, it is possible to preserve, protect and ensure the sustainable use of natural resources. Species loss and changes in the composition of communities threaten ecosystem health. Biodiversity monitoring allows the authorities concerned to make informed decisions and introduce suitable measures to protect and ensure the sustainable development of an area, by reconciling the natural environment with human disturbances. It was for this reason that the NCC initiated a study to characterize and monitor the biodiversity on its lands.

1.5 A NEW KIND OF PROGRAM

According to the literature, very little has so far been done to create a general and effective biodiversity monitoring program. There is currently no methodology that could be used systematically in all biodiversity assessment projects. A methodology was therefore developed specifically for the NCC by Del Degan, Massé et Associés Inc., in order to carry out a biodiversity monitoring program that is simple, effective and economic.

2. PURPOSE OF THE STUDY

The main purpose of the study is to characterize and prepare a biodiversity monitoring program for NCC lands located in the National Capital Region (see Figure 1).

More specifically, the study's goals are to:

- Determine the current level of biodiversity in the natural areas present in the NCC's various land portfolios (see Figure 1):
  - Gatineau Park (361 km^2);
  - the Greenbelt (223 km^2);
  - Urban lands (26 km^2);
- Prepare a simple, effective and economic methodology for the monitoring program;
- Implement an initial biodiversity monitoring phase, and plan subsequent phases.

3. METHODOLOGY

3.1 CHARACTERIZING BIODIVERSITY

To characterize biodiversity on NCC lands, a database was created, containing a list of the species and habitat classes found within each portfolio. The database was prepared following consultations with the NCC and several other agencies in order to obtain copies of biophysical studies carried out in recent years on NCC lands.

3.2 THE BIODIVERSITY MONITORING PROGRAM

To monitor biodiversity, representative sectors were identified in each portfolio, along with biodiversity indicators.

The representative sectors have characteristics that are typical, in many respects, of the plant, animal and ecosystem diversity of the NCC's three portfolios. This particular method was selected in order to spread the monitoring effort across the three portfolios and obtain as complete a profile as possible of diversity on NCC lands. In all, 15 representative sectors were selected with input from the NCC's land managers (see Figure 1).

The indicators were selected with a view to obtaining a general overview of biodiversity. They provide information on the state of the ecosystems and the pressures affecting ecosystems, plant and animal populations and the natural processes required to maintain biological integrity. The indicators, if taken individually, do not cover all of the elements of biodiversity. Together, however, if selected properly, they provide an accurate overview of the current situation.

Indicators were selected by consulting the literature, talking to recognized experts on the subject of biodiversity, and assessing relevance. After an analysis of the various potential indicators, the following 12 biological indicators were chosen for the program:

- Vascular plants
- Bird species
- Micromammals
- Freshwater molluscs
- Anurans (frogs and toads)
- Species at risk
- Plants at risk
- Invasive plants
- Common Loon
- Habitat mosaic

- Habitat fragmentation
- Plant and wildlife potential

These indicators will be assessed at different intervals within the selected representative sectors as part of the biodiversity monitoring program. Following consultations with various experts a detailed methodology was developed for each indicator (including study protocols and assessment methods).

By monitoring this series of indicators, managers will quickly be able to identify changes in the NCC's various ecosystems and land portfolios. The indicators will therefore become points of reference for the preservation and maintenance of species and ecosystem biodiversity.

The proposed program requires monitoring and data collection over a period beginning in 2004 and ending in 2020. An initial review of the program will take place in 2012.

4. RESULTS

4.1 CHARACTERIZATION OF BIODIVERSITY

The characterization study determined the current level of biodiversity in the NCC's three land portfolios. Based on the information collected 3,717 plant and animal species (59 mammals, 294 birds, 82 fish, 17 amphibians, 16 reptiles, 1,771 plants and 1,478 invertebrates) as well as nine habitat classes are found on NCC lands. Excluding the invertebrates, Gatineau Park and the Greenbelt have a higher level of biological diversity than the Urban Lands. Together, they are home to 66% of all the species present on NCC lands (excluding invertebrates), compared to just 48% for the Urban Lands. Of the nine habitat classes found on NCC lands, eight are natural and are conducive to plants and wildlife. The last class contains non-natural environments (i.e. those that have been disturbed, harvested or urbanized). Table 1 presents the current profile (2004) of biodiversity in the three portfolios.

4.2 THE BIODIVERSITY MONITORING PROGRAM

Monitoring of vascular plants began in 2004. The biodiversity and spatial analysis databases were used to assess the baseline (current situation) of four other indicators. A baseline has now been established for five indicators in all. They will be monitored for a second time in accordance with the proposed timeline. With regard to the other seven indicators, initial monitoring is currently underway and will need to be completed before a baseline can be established for them.

The results of the program will help to complete the biodiversity database and establish the status and evolution of ecological integrity and biodiversity throughout the NCC's territory and land portfolios. Thanks to the analysis methods developed for the program, it will be possible to assess troubling or critical situations as they arise at indicator level and at NCC territory level.

TABLE 1
PROFILE OF BIODIVERSITY ON NCC LAND

	GATINEAU PARK		GRENBELT		URBAN LANDS		NCC TERRITORY	
GROUPS	SPECIES							
	No.	%	No.	%	No.	%	No.	%
Mammals	53	2	49	3	15	1	59	2
Birds	234	8	277	18	274	23	294	8
Fish	52	2	25	2	78	7	82	2
Amphibians	17	1	13	1	16	1	17	<1
Reptiles	11	< 1	9	1	13	1	16	<1
Plants	1,105	39	1,106	71	687	60	1,771	48
SUB TOTAL	1,472	-	1,479	-	1,083	-	2,239	-
Invertebrates	1,382	48	75	5	75	6	1,478	40
TOTAL	2,854	100	1,554	100	1,158	100	3,717	100
AREA	HABITATS (General)							
	ha	%	ha	%	ha	%	ha	%
Aquatic	1,929	5	191	1	51	2	2,170	4
Wetlands	2,194	6	2,429	11	15	< 1	4,638	8
Terrestrial	32,008	89	19,555	88	1,979	75	53,541	87
No data	0	0	142	< 1	595	23	737	1
TOTAL	36,131	100	22,317	100	2,640	100	61,086	100
AREA	HABITATS (Detail)							
	ha	%	ha	%	ha	%	ha	%
Mature hardwood	19,080	53	3,782	17	614	23	23,476	38
Young hardwood	245	1	2,506	11	220	8	2,971	5
Mature mixed	3,894	11	300	1	71	3	4,265	7
Young mixed	4,912	14	839	4	57	2	5,807	10
Mature softwood	498	1	96	< 1	4	< 1	598	1
Young softwood	844	2	1,355	6	1	< 1	2,200	4
Aquatic environments	1,928	5	191	1	124	5	2,243	4
Wetland environments	2,194	6	2,429	11	16	< 1	4,639	8
Other	2,535	7	10,826	48	1,527	58	14,888	24
TOTAL	36,131	100	22,323	100	2,633	100	61,087	100
NUMBER OF HABITAT CLASSES	9		9		9		9	

Other: Bare land, clearcuts, brushland, power lines, plantations, farmland, communication towers, grassy areas, recreation and tourism zones (golf courses, ski centres), urban areas and undesignated lands.

Note: The small number of invertebrates identified in the Greenbelt and Urban Land categories is due to the fact that no specific, systematic inventory has been carried out in these portfolios.

5. CONCLUSION

With approximately 60% of the species found in Canada, the NCC lands have a high level of biodiversity characterized by a wide variety of environments. The Gatineau Park portfolio offers the best potential for biodiversity and ecological integrity, due to the extent of its natural environments and the limited number of human disturbances to which it has been subjected. Although surrounded by urban development, the Greenbelt and Urban Lands portfolios host a number of specific environments that are conducive to species diversity. Indeed, biodiversity levels in the Greenbelt are comparable to those in Gatineau Park. The lack of available information on the Urban Land portfolio may explain in part the low level of diversity observed for some species groups.

The natural wealth of the NCC's lands is therefore clear in all three portfolios. This wealth constitutes a unique natural heritage, especially for urban and peri-urban areas such as the NCC's territory. It is important to be able to identify the ever-growing pressures and stressors on this heritage, and to assess changes in biodiversity over time.

Determining the level of biodiversity and ecological integrity on NCC land is therefore a priority for conservation and sustainable development. It was from this perspective that the biodiversity monitoring program was addressed. The program is based on the use of indicators that are tailored to the features of NCC lands. This approach has the advantage of concentrating on key components that are representative of all natural communities and ecosystems in the areas in question. The use of indicators also helps keep costs down and simplifies the monitoring procedure.

The program is more than a simple assessment; it is based on scientific data and provides the NCC's managers with a valuable tool that will enable them to make informed decisions and identify their conservation priorities. As a result, the NCC will be able to protect the natural components of the National Capital Region in the long term.

6. FOR FURTHER INFORMATION

DEL DEGAN, MASSÉ ET ASSOCIÉS INC. (2005). *Suivi de la biodiversité. Caractérisation de la biodiversité et identification des indicateurs pour le suivi de la biodiversité sur le territoire de la CCN,* Component 1 Report presented to the National Capital Commission.

DEL DEGAN, MASSÉ ET ASSOCIÉS INC. (2005). *Suivi de la biodiversité. Protocoles de suivi de la biodiversité sur le territoire de la CCN,* Component 2 report presented to the National Capital Commission.

DEL DEGAN, MASSÉ ET ASSOCIÉS INC. (2005). *Suivi de la biodiversité. Suivi de référence (2004) sur le territoire de la CCN,* Component 3 Report presented to the National Capital Commission.