

# THE ROLE OF SOCIAL SCIENCE IN PARKS CANADA'S NATIONAL MONITORING PROGRAM

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## **SUMMARY**

Parks Canada is in the process of establishing a national ecological integrity monitoring program. The paper examines the existing and potential contribution of social science to the implementation of the national ecological integrity monitoring program. Key issues addressed from a social science perspective include: humans as part of the ecosystem; scales for monitoring; identifying priority stressors; defining management goals and objectives; and selecting indicators and targets that relate human use stressors to ecological integrity. These key issues are also considered within the broader context of the link between monitoring, planning and reporting.

## **1. INTRODUCTION**

The 1988 amendments to the National Parks Act (1) required Parks Canada to begin reporting on the state of ecological integrity in national parks. However, in the late 1970s and early 1980s, Parks Canada had already started to implement a systematic approach to gather and analyse detailed natural resource information as part of the Natural Resource Management Planning Process (2) which in turn fed into the park management planning process. The management plans of that era became a "statement on the park's ecosystem and desirable state, as well as a strategy for achieving it. Park conservation plans identify[ed] threats and required remedial actions"(3).

In the late 1980s and early 1990s Parks Canada also recognized that many of the problems influencing the ecological integrity of national parks originated from increasing human use, as well as a growing diversity of visitor activities and supporting services and facilities. In response, Parks Canada developed and implemented the Management Process for Visitor Activities or VAMP (4, 5) as it came to be known. This process encouraged multi-disciplinary teams of park's staff to assess the state of provision of opportunities, activities, services and facilities for visitors both within the park and in the region. This situation analysis then provided a basis for defining the visitor activity concept for the management plan and more detailed direction on levels of service in a park service plan.

In the State of the Parks 1997 Report (3), Parks Canada presented: a refined framework for assessing and reporting on ecological integrity; results of the 1996 Stress Survey Questionnaire; and a synopsis of each park's state of ecological integrity. While the framework, stress survey and synopsis of the state of ecological integrity of each park all identified humans related activity (e.g., number of visitors, roads, pollutants etc) as stressors, the respondents were primarily parks managers who completed the stress questionnaires using available information.

In fact, the contribution of social science to the 1997, 1999 (6) and 2001 (7) State of Parks Report section on the state of ecological integrity was minimal. Part of the explanation for this is that, while these reports were being developed, the social science capacity in the national office had been virtually removed, followed by major reductions in regional offices (now service centres) (8). At the same time that social science function lost more than 50 per cent of its staff, the visitor activities function was undergoing similar downsizing at both the national office and regional office levels. Payne's examination of the state of Visitor Information Management in Canada's National Parks (9) provides a good summary as well as three case studies that illustrate

the state of social science research at the park and regional level in Parks Canada at this time period.

## **2. CURRENT SITUATION**

The Panel on the Ecological Integrity of Canada's National Parks (10) made recommendations on monitoring to Parks Canada which included: the integration of monitoring within the management accountability framework; further development of the ecological monitoring framework; hiring a national monitoring coordinator; the investment of significant resources in park level monitoring; and an improvement in the link between monitoring and reporting. The Parks Canada Action Plan (11) and subsequent First Priority Report (12) confirmed that Parks Canada would proceed to improve ecological integrity monitoring. Parks Canada has started to do so, even in the absence of new resources, as identified in the Parks Canada Agency Annual Report 2001-2002 (13). The hiring of a National Monitoring Coordinator, the establishment of a National Ecological Integrity Monitoring Working Group and the initiation of work to inventory the status of monitoring activity at parks across the country is coinciding with a number of other activities in the area of social science.

After functioning for more than five years with a minimal social science research capacity, Parks Canada senior management recognized the need to re-examine its investment in social science research. The Review of Priorities for Social Science Within Parks Canada (8), the Panel on the Ecological Integrity of Canada's National Parks, the Parks Canada Action Plan and First Priority Report all confirmed the need to reinvest in social science. A Parks Canada Science Strategy (14) has been developed which includes both ecosystem sciences and social sciences and clearly defines priority areas for investment in social science research. Elsewhere, the 2001/2002-2005-2006 Corporate Plan (15) and the Parks Canada Performance Information Action Plan (16) commit Parks Canada to develop a results framework for the measurement of the impact of visitors. Initially this work is to focus on national parks and will be developed conjointly with ecological integrity monitoring and reporting framework.

## **3. KEY ISSUES TO BE ADDRESSED**

When examining the role of social science in Parks Canada's national monitoring program, a number of key issues quickly emerge. The following is a short, but, by no means exhaustive, list of issues.

### **3.1 Humans as Part of the Ecosystem**

The Ecological Integrity Monitoring Framework (Figure 1), describes humans or human activity solely as a negative stress to the ecosystem (3). In Parks Canada's Guiding Principles and Operating Policies, (17) humans are recognized as part of the ecosystem. Nepsted and Nilsen (18) (Figure 2) and other sources (19, 20) (Figure 3), present other models that illustrate the complexity of the interactions and relationships between people, places and process (human and natural). Social science can play an important role in providing more comprehensive conceptual frameworks and help to define and quantify both the negative and positive affects of human activity on ecosystems.

**Figure 1**  
[nilsenfigure1.doc](#)

**Figure 2**  
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**Figure 3**  
[nilsen figure 3.doc](#)

### 3.2. Scale

Grumbine (21) and others (18, 20, 22) acknowledge that ecosystems are hierarchical in structure and function and that ecological monitoring must take into consideration this hierarchy and the connections between various scales. Machlis (23) describes the critical importance of scale in the partnership between science (social and biological) and conservation. The scales he presents include: protected area, bioregion, national protected area system, realm and global system. Woodley (24) presents a scale which includes: individuals, populations, communities, ecosystems. McLennan (25) is proposing a monitoring pyramid with three levels: local (park specific), bio-regional (ecozone) and national (system wide).

In the near term, Parks Canada needs arrive at some consensus on the question of scale for monitoring so that the contribution of social science at each scale can be defined (see Table 1).

Currently, a majority of the social science research is at the site level scale (campsite/trail use/related impact) and park scale (e.g., attendance data, patterns of visitor use, visitor surveys). Some data is available at the bioregional or greater park ecosystem scale through census data and other socio-economic indicators. Work by Stephenson and others (26) in Ontario has emphasized the importance of understanding the human dimensions of greater park ecosystems. This external focus is particularly relevant in Ontario, where the majority of parks are relatively small and under considerable stress from the human activity in the greater park ecosystem. National or system-wide social science data is available, but has not been analysed extensively to demonstrate its contribution to monitoring. This includes, but is not limited to, census data, Canadian Travel Survey data, client satisfaction survey results, syndicated polling results, attendance data, and national public opinion polling data.

Table 1.

<b>Scale</b>	<b>Data Types/Sources</b>
Site	campsite/trail use/related impact
Park	attendance data, patterns of visitor use, visitor surveys
Greater Park Ecosystem	census data, other socio-economic indicators
National	census data, Canadian Travel Survey data, client satisfaction survey results, syndicated polling results, attendance data, and national public opinion polling data

### **3.2 Identifying Priority Stressors**

Successive Parks Canada State of Parks Reports have identified stressors for each national park within the program. The 1997 report (3) made a distinction between stresses originating inside a park, those originating both inside and outside of a park, and finally those originating outside the park. The 1999 report (4) includes an appendix that summarizes the top five stressors for each national park, as well as the status of actions that are being taken on each stressor. Given the complexity of issues and limited resources, the question of which stressors are a priority and at which scale needs to be addressed, so that social science can focus its contribution to the national monitoring program.

A simple approach could be to categorize those stressors that are at the a) landscape level e.g., acid rain (largely beyond Parks Canada's direct control); b) park/site level e.g., human disturbance of wildlife (can be partially influenced by Parks Canada); and c) park level e.g., park operations (directly under Parks Canada's influence). Logic would suggest that, initially, concentrating on those stressors directly under Parks Canada control would be a good place to start.

The field of risk management also offers some techniques to assist in the establishment of priorities. Cole and Landres (27), for example, suggest considering criteria such as "the intensity, longevity and area extent of impacts as determined by threat characteristics (intensity, areal extent, frequency, timing, predictability, and others) and vulnerability (resistance, resilience) of the affected attribute." Figure 4 illustrates these relationships.

**Figure 4**  
(adapted from Cole and Landres)  
[nilsen figure 4.doc](#)

This kind of analysis may lead one to conclude that habitat fragmentation as a result of road construction or forestry activities on adjacent lands should be considered priority stressors.

### **3.3 Defining Management Goals and Objectives**

Wiersma and Campbell state that "One of the most important aspects of a monitoring program is to articulate clearly the management goals. These are based on the values people hold, and can be derived from legislated mandates, policies, managers, visitors, the regional community and from the broader Canadian and International public" (20).

Elsewhere in the same paper, the authors present a summary of the results of a monitoring survey of 21 national parks and the results indicate that more than 50 % of the parks surveyed lacked a park vision that had goals which could be monitored. This was also an issue identified by the Panel on the Ecological Integrity of Canada's National Parks. Direction to include ecosystem protection, heritage presentation and visitor use management goals and objectives in park management plans has been reaffirmed in the most recent revision to the Parks Canada Guide to Management Planning (27). It will take several years, however, for park management plans to include adequate goals and objectives statements that can provide a good basis for monitoring. Resolving these shortcomings in management plans is a high priority for Parks Canada.

Human use or visitor management processes, such as the Parks Canada Visitor Activity Management Process or others e.g., Limits of Acceptable Change, Visitor Impact Management and the Visitor Experience and Resource Protection (VERP) ( 30), also provide frameworks to

help define goals and objectives. All these approaches rely heavily upon social science data and information and provide a systematic framework for its application and integration with ecosystem science.

### **3.4 Choosing Indicators and Targets**

Stankey and McCool (29) distinguish between factors (broad categories of issues), indicators (one or more variables that can indicate conditions) and standards (measurable aspects of indicators - targets). In a paper that compares five different visitor planning and management frameworks, Nilsen and Tayler (30) state that each of these approaches “vary considerably in the language they use and the degree of emphasis they place on factors, indicators and standards”. Part of this is a reflection of the scale at which these planning processes are operating at and whether the planning approaches are being used in a proactive manner or a reactive manner. Manning (31) also provides a good summary of the role of indicators and standards (targets) in various carrying capacity frameworks and provides a detailed list of standards of quality that have been derived over the years from a number of sources. From a Parks Canada perspective, individual planning and social science research investigations have drawn heavily upon this literature to develop many types of visitor surveys and client satisfaction surveys, with varying degrees of success. Studies by Vaske (32) in Jasper National Park at the Icefields Centre provide an example of the contribution of social science to establishing social carrying capacity indicators and targets.

### **3.5 Inputs, Outputs, Clients Reached and Outcomes**

Another issue that arises in the area of indicators and targets is the link back to public sector reform and the current emphasis on results based management and performance measurement. In the past, measures of success (indicators and targets) have focussed on measurement of inputs (e.g number of visitors) and to some degree outputs (e.g., revenue, economic impact).

Within the Government of Canada considerable emphasis is being placed on performance measurement that is based on logic modelling (33). Such modelling requires consideration of inputs, outputs, clients reached and outcomes (short, medium and long term). This type of thinking provides a more holistic frame of reference which can be readily used to demonstrate social sciences contribution to ecosystems management and monitoring. For example, social science can be used to assist in the measurement and analysis of inputs: e.g., attendance; vehicles entries; patterns of use; and use of buildings, roads, infrastructure. It can be used to assist in measuring outputs, for example, visitor contacts, programs delivered, brochures distributed, economic impact in the community. Social science can also provide data, e.g., visitor use numbers, that can then be related environmental outputs (e.g solid waste and sewage). Social science also has a valuable contribution to make in terms of defining, measuring and helping understand the characteristics of clients reached. More importantly in the current context of results management, social science has much to offer in measuring outcomes at a variety of scales. This can include: satisfaction, increases in awareness, increases in understanding, and behaviour changes. There is also an extensive body of social science literature on the measurement of benefits (34, 35) and previous Parks Canada surveys have sought to periodically incorporate the concept of benefits measurement. This work needs to be revisited in the context of the Government of Canada’s emphasis on performance measurement and the current initiatives to develop a Parks Canada ecological integrity monitoring program.

## **4. NEXT STEPS**

To be successful, the national ecological integrity monitoring program must utilize a combination of both natural and social sciences to establish goals, objectives, with appropriate indicators, targets and associated protocols at a variety of scales, to monitor and report on the state of ecological integrity in national parks. While there are already an array of monitoring initiatives that focus on the natural components of park ecosystems, the state and potential contribution of existing Parks Canada social science research to the national ecological integrity monitoring

program need to be further defined. The recently completed Parks Canada Science Strategy (14) has identified priority areas for improved social science data and research. A priority is being placed on improving management plans so that they better define management goals and objectives, as well as indicators and targets. Ecosystems scientists and social scientists within Parks Canada are working closely together to define and integrate the social science component into the national monitoring framework. An important first step will be to agree upon a revised conceptual framework that recognizes human environment relationships as being more complex than the simple stress/response model. It is only through this close collaboration that issues, such as conceptual frameworks, scale, priority stressors, goals and objectives, selecting indicators and targets, as well as implementing results based management, will be addressed.

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