

ECOLOGICAL STRESS IDENTIFICATION PROCESS FOR ONTARIO'S PROVINCIAL PARKS

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Abstract

Ontario Parks is responsible for the management of provincial parks across Ontario and is accountable to the public of Ontario to manage those protected areas in a sustainable manner. Sustainable management requires an adaptive approach whereby management continually improves as a result of learning by doing. To facilitate adaptive management, and thereby ensure sustainable management of parks, Ontario Parks has initiated a process to assess ecological stresses affecting parks across the Province. The first step in this process is to identify those possible ecological stresses. Identification of stresses is carried out through structured discussion sessions with staff and others most knowledgeable about the individual parks. Ninety of Ontario's 292 provincial parks are currently under investigation. This process is also being considered for the identification of possible stressors acting on conservation reserves across the Province. A similar process has been used by other jurisdictions across Canada and around the world.

Introduction

Ontario Parks is developing a comprehensive approach to monitor ecosystem sustainability within the system of protected areas. This approach recognises ecological integrity, social well-being and economic health as fundamental aspects of sustainable ecosystems. The monitoring of ecological integrity requires that monitoring include the status of both individual protected areas and the system as a whole. Due to its complexity, ecosystem sustainability cannot be measured or assessed using a single tool, so a number of tools will be required as part of an ecological monitoring toolkit.

One tool for ecological monitoring is an assessment of the stressors acting on protected areas, individually and collectively. The first step in stress assessment is the identification of potential stressors and possible impacts. Identifying the types and possible effects of stressors increases awareness of those factors that are affecting the integrity of the protected areas. Stress identification also helps to identify monitoring and research needs and priorities and increases awareness of real and potential stresses on protected areas environments.

Stress assessment is one in a suite of tools and the identification of possible stressors is the first step in stress assessment. Similar approaches have been used for Canada's National Parks (Parks Canada, 1994 and 1997; AXYS, 2002), Provincial Parks in British

Columbia, Canada (B.C. Parks) and for the State Parks of Victoria, Australia (Parks Victoria, 2000).

Why a Stress Assessment?

Protected areas throughout Ontario are subject to a variety of internal and external stresses, ranging from recreational activities to intensive agriculture or forestry on adjacent lands and the effects of climate change. In an attempt to determine the impacts of those stressors, Ontario Parks has implemented a stress assessment as part of the ecological component of a comprehensive monitoring program.

There are four objectives associated with the stress identification that relate both to individual protected areas and to the system of protected areas as a whole:

1. identify possible stressors and impacts;
2. determine Ontario Parks' response to stresses;
3. identify monitoring needs and priorities; and,
4. identify research needs and priorities.

Stress identification will help to determine monitoring and research priorities and will contribute valuable information to state of the resource reporting efforts in the future.

Stress Identification Procedure

The stress identification process is led by a team composed of representatives of each of the six administrative zones and the Planning and Research Section of Ontario Parks. Stress identification is a qualitative process, conducted on a park-by-park basis through structured discussions with the park superintendent and others knowledgeable about the specific park. Discussion sessions are led by members of the stress assessment team.

Criteria for the selection of parks included:

- park superintendents who have recently retired, are about to retire or are about to change parks – we need to get the most from their experience;
- parks that are thought to be under considerable stress at this time – to document those stressors and stresses; and,
- parks with current or pending planning needs – to respond to program priorities.

Discussion sessions were conducted during the winter months and required less than one day to complete for each park. Staff discussed 61 potential stressors (Table 1) based on a set of pre-determined questions about each stressor (see Stressor Information Variables). During the discussions, information was recorded about each potential stressor in an electronic database.

Table 1. Stress assessment categories, sub-categories and stressors for Ontario Parks stress identification sessions.

DEVELOPMENT AND INFRASTRUCTURE		
▪ administrative footprint		▪ corridors
PERMITTED ACTIVITIES	<i>Recreational Activities</i>	
▪ aircraft landing	▪ interior camping	▪ snowshoeing
▪ all terrain vehicles	▪ mountain biking	▪ spelunking
▪ boating	▪ picnic grounds	▪ swimming
▪ canoeing/kayaking	▪ playgrounds	▪ facility based nature/historical appreciation
▪ car camping	▪ rock climbing	▪ hiking
▪ cross-country skiing	▪ sailing/sailboarding	
▪ horseback riding - trail	▪ scuba/skin diving	
	▪ snowmobiling	
	<i>Commercial Activities</i>	
▪ outfitting services	▪ outpost camps commercial	▪ resorts/lodges
		▪ restaurants
TOXINS AND POLLUTANTS		
	<i>Air</i>	<i>Soils</i>
	<i>Noise</i>	<i>Water</i>
MANAGEMENT PRACTICES	<i>Lands and Waters</i>	
▪ aggregate extraction	▪ land disposition	▪ petroleum
▪ agriculture	▪ mineral exploration and extraction	▪ water control structures
▪ hydro development		
	<i>Flora</i>	
▪ insect/disease suppression	▪ forestry	▪ prescribed burning
▪ fire suppression	▪ herbicides	▪ vegetation management
	▪ lawn/roadside mowing	
	<i>Fauna</i>	
▪ fish stocking	▪ wildlife habitat management	
▪ wildlife population management	▪ fish habitat management	
FLORA AND FAUNA		
	<i>Exotic Species</i>	
▪ aquatic fauna	▪ terrestrial fauna	
▪ aquatic flora	▪ terrestrial flora	
	<i>Harvest Mortality</i>	
▪ commercial bait fishing	▪ scientific collecting	▪ sport hunting
▪ commercial fishing	▪ species at risk	▪ traditional/Aboriginal
▪ poaching	▪ sport fishing	▪ trapping
HYPER-ABUNDANT SPECIES		
NON-HARVEST MORTALITY		
▪ disease and parasites		▪ vehicle kill

Participants in Stress Identification Sessions

The stress identification sessions involved zone representatives, a park team and a main office representative. The park team included the park superintendent and others knowledgeable about the specific park. These 'others' included zone or park planners and ecologists, other zone or park staff, main office staff and in a few cases, retired staff and representatives from "Friends of ..." groups and the Nature Conservancy of Canada.

Stressors

A total of 61 potential stressors were identified in five major categories - development and infrastructure, permitted activities, toxins and pollutants, habitat modifiers, and flora and fauna (see Table 1). Four of these, development and infrastructure, permitted activities, toxins and pollutants, and habitat modifiers, are potential stressors on the park environment. The fifth category, flora and fauna, is a mix between measures of responses (i.e., losses), based on the first three categories, and actual stressors (e.g., exotics). Climate change was also a topic that was considered. Stressors both inside and outside of parks were considered.

Stressor Information Variables

Fourteen information variables were evaluated for each stressor, organised into four major themes — stressor data, stressor information, stressor impact and response to stressor. These themes and the associated variables are discussed below.

Stressor Data

The objective in this theme was to assess the data or information about the stressor. In other words, "Is adequate knowledge about the stressor available and accessible or is further work required?".

Quality of Data

- none – no data or information available;
- poor – anecdotal information only;
- intermediate – incidental observations only, non-standardised methods; and,
- good – systematic, established protocol.

Data Source

- provide source of the information, whether from parks report, research paper, etc.

Stressor Information

This theme involved the application of the stressor/stress data to assess the stressor and the resulting stress. This theme relied on personal knowledge and experience and the results of monitoring and research type studies.

Stress Occurring

- is the stress actively affecting the park environment?
- yes – stress is occurring;
- no – stress is not occurring;
- unknown – uncertain if stress is occurring, may be used for stresses known to occur, but currently not affecting park environment; and,
- legacy – source removed, but stressor continues to stress park environment.

Intensity of Stress

- low – little or no impact on park environment;
- medium – some impact on park environment;
- high – major impact on park environment; and,
- unknown.

Origin of Stress

- internal – specify location, including specific zone; and,
- external – specify location, e.g., watershed.

Extent of Stress

- specify area (ha) or feature affected (e.g., trail or river).

Timing of Stress

- describe timing of occurrence; and,
- may be seasonal, annual, cyclic or periodic.

Duration of Stress

- specify duration of stress; and,
- may be a day, week, month, season – may be cyclical or periodic.

Stressor Impact

This theme dealt with the outcome or impact of the stress on the park environment. Personal knowledge provided insight into the impacts or demonstrated a need for further work. Monitoring or research efforts may be required to determine the degree of the impact.

Observed Ecological Impacts

- included such things as changes in population size or community structure, habitat loss, etc.

Trends

- increasing;
- decreasing;
- stable; and,
- unknown.

Response to Stressor

The purpose of this theme was to determine what has been done or can be done to alleviate the stress on the park environment, along with an assessment of what may be involved. Again, personal experience was important.

Recommended Management Action

- what action is recommended to mitigate the stress?

Mitigation Time

- what time would be required to mitigate the stress?

Recovery Time

- once the stressor is removed, what time is required for the recovery of the park environment – specific information should be included in the comments
- short term – < 5 years;
- medium term – 5 - 10 years; or,
- long term – > 10 years.

Information Sources

A number of sources of information were considered as possible aids in preparation for discussions of specific stressors affecting the park. These were just a starting place, and any relevant information was to be considered, both historical and up-to-date. Personal experience was also a valuable source of information.

Internal Sources/Contacts – these include surveys, reports and/or activities specific to the park:

- Park Management Plan;
- Life Science Checksheet/Inventory;
- Earth Science Checksheet/Inventory;
- Research Strategy;
- Park Statistics 2000;
- Natural Heritage Education Attendance Statistics in Park Statistic 2000;
- Park User Survey, Day Visitor and Camper Statistical Summaries 1996, 1998, 2000;
- Ontario Parks water sampling reports;
- Ongoing research activities; and,
- Park Staff.

External Sources/Contacts – these are sources that could be contacted prior to meeting to acquire pertinent information:

- Ontario Ministry of the Environment (MOE);
- Ontario Ministry of Agriculture and Food (OMAF);
- Ministry of Transportation for Ontario (MTO);

- programs and staff of the Ontario Ministry of Natural Resources (OMNR);
- Species at Risk Program;
- District Staff;
- Forest Management Staff;
- Aviation, Fire and Flood Management Staff;
- Enforcement Staff;
- Conservation Authorities;
- Municipalities; and,
- Local First Nations.

Some Preliminary Findings

Ninety of Ontario's 292 provincial parks are currently under study. Approximately 66 staff, five others (members of Friends groups and staff from the Nature Conservancy of Canada) and the nine members of the provincial stress identification team have participated in the discussion sessions. All staff were enthusiastic about the discussion sessions, eager to discuss their individual parks and to show their concern and consideration for park environments. Protection is the first objective of Ontario Parks.

Analysis of the data collected during the discussion sessions is not yet complete. However, as anticipated, in some cases there was little or no information about some of the stressors or some of the information variables. While some of these sources of information are available, they are often not accessible, or are unknown to park staff. Generally, staff were much more knowledgeable about in-park activities and possible associated stresses than potential stresses from external sources. Also, there was more information about operating parks than non-operating parks, largely because of the staff presence in operating parks.

These discussions have revealed what is and is not known. They are the first step, and will help to identify monitoring and research needs and direct future efforts of Ontario Parks. This process may be extended to include conservation reserves in the future.

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