

CHAPTER 5: THE NEED FOR ACTIVE MANAGEMENT AND RESTORATION



Restoring the role of fire in national parks.
J. Pleaus/Parks Canada

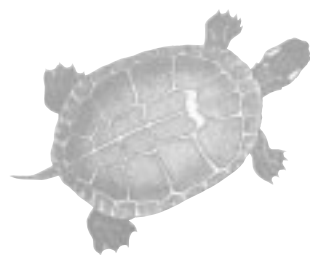
Parks Canada's Guiding Principles and Operating Policies state that ecosystems should evolve in the absence of most human intervention. However, a policy of laissez-faire management in national parks may undermine ecological integrity, especially if past actions are not considered. In order to compensate for past actions, active management may be required to restore processes or species within national parks.

Active management should occur where there are reasonable grounds that maintenance or restoration of ecological integrity will be compromised without it. Because of the difficulty in predicting ecosystem response, active management should be undertaken in national parks using adaptive management techniques.

Changing Ideas, Changing Approaches

Active management covers a range of possible actions in such areas as fire restoration, periodic flooding, restoration of key disturbances, species re-introduction, management of harvested species, and management of hyperabundant native or non-native species. At the extreme end of the scale active management may involve restoration of entire communities, such as a tall grass prairie ecosystem.

Generally speaking, management of ecosystem processes within national parks has been minimal. But laissez-faire management can be inconsistent with a goal of maintaining or enhancing ecological integrity. Although Parks Canada's Guiding Principles are clear on the need for active management, it has been a difficult concept to put into operation across the national park system and currently there is little consistency in approach.



National park ecosystems will be managed with minimal interference to natural processes. However, active management may be allowed when the structure or function of an ecosystem has been seriously altered and manipulation is the only possible alternative available to restore ecological integrity.

Parks Canada, Guiding Principles and Operational Policies (1994)

Some landscapes in which parks are situated, especially in southern Canada, have been highly altered from their historical condition. Active management may be needed to allow species or ecosystems to persist in parks where otherwise they might be lost. To the extent that a park may be the last stronghold for a particular species, if lost from the park that species could be lost from the larger region, too. Thus, if parks are to include species and ecosystems characteristic of the surrounding natural region, park landscapes and species populations may have to be actively managed in order for certain species to persist there.

The influence of Aboriginal traditional activities has largely been eliminated from national parks in the southern and eastern portions of the country, less so in western and northern parks. Re-integrating Aboriginal traditional uses to national parks may mean a larger role for Aboriginal use of fire, harvesting and other activities that essentially constitute "active management."

An Adaptive Management Approach

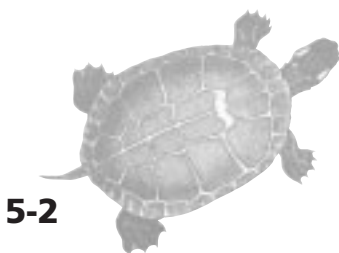
Active management requires a firm, rational foundation for undertaking actions in such potentially controversial areas as fire restoration or controlling hyperabundant species. Because ecological systems are complex, there will typically be debate about why changes are occurring and whether or not such changes are detrimental to ecological integrity. To avoid gridlock due to the continuing argument over whether or not action is warranted, we suggest the use of an adaptive management approach.

Under an adaptive management framework, actions can be taken simultaneously with testing the hypothesized effects on ecological integrity. Through feedback, results of the actions can be used to adapt or change future actions for improved results.

RECOMMENDATION

5-1. We recommend that Parks Canada formally reaffirm that active management is an important part of conserving ecological integrity in all national parks. Active management can be used as a fundamental conservation tool as long as the following conditions are met:

- the goals for active management are explicitly defined and reviewed by knowledgeable persons;
- active management occurs within the context of an adaptive management framework;
- the active management program is formally evaluated at fixed intervals.



The peregrine falcon has been re-introduced in Fundy National Park.
M. Burzynski/Parks Canada



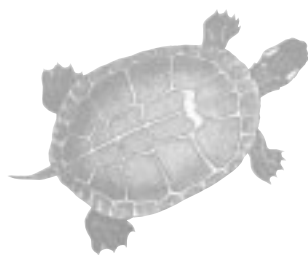
Parks Canada and Active Management: Successes and Challenges

The Panel heard of many areas where Parks Canada has carried out successful active management, as well as some ongoing challenges. Here are some examples:

- abiotic processes – many older national parks are left with an historical legacy of flood control, with many dams and created channels that have altered key natural flow and flood regimes. Prince Albert National Park recently removed a dam on the Kingsmere River. This action will restore biodiversity to a section of flooded rapids. Challenges still remain. For example, in Waterton Lakes National Park there is an active delta at the north end of Waterton Lake. Frequent flooding has formed a mosaic of grassland, cottonwoods and willow. For decades, the park has tried to control the flooding process in order to maintain a road in the area. Active management is required to remove the flood control structures and allow the area to return to its highly dynamic state.

- species re-introduction – Parks Canada has engaged in species re-introductions across Canada and has had many successes. Peregrine falcons now have a healthy population in the Bay of Fundy area, after Fundy National Park successfully released 87 young falcons in the 1980s. Southern flying squirrels were successfully re-introduced to Point Pelee and pine marten to Riding Mountain. Swift foxes are currently being re-introduced to Grasslands National Park.

Other re-introduction programs have been unsuccessful, such as caribou in Cape Breton Highlands National Park, bison in Jasper and Atlantic salmon in Fundy. Re-introductions are difficult, requiring sound knowledge of the biology of the species, why the species was extirpated in the first place and how people will react to its renewed presence. In most cases, species re-introductions are greeted with public enthusiasm. However, some potential re-introductions, such as wolves or rattlesnakes, will require more social science information than biological information.



Restoring Fire — Righting 50 Years of Active Suppression



La Mauricie National Park has an active fire restoration Program. J. Pleau/Parks Canada

Fire management is a unique problem for park managers. There is an historical legacy of “Smokey the Bear” informing the public that fires are “bad,” in contrast with more recent scientific understanding that fire is an essential ecological process in most park ecosystems. Fire management is a complex activity requiring both fire use and fire control. Despite the positive ecological effects of fire, there is also the very real threat to people, facilities and neighbouring lands.

Fire suppression was identified in the State of Parks 1997 Report as causing significant impact to ecological integrity in 15 national parks. Fire restoration was identified as a key need in the Banff-Bow Valley Study, resulting in a number of targets for “area burned” in the Park Management Plan.

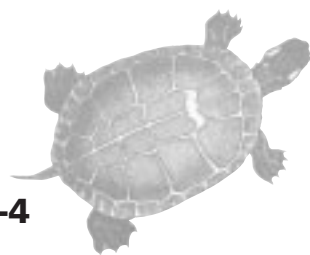
Restoring Fire at La Mauricie National Park

In 1990, La Mauricie National Park organized a workshop that laid the groundwork for the current active fire management program to help maintain fire-dependent plant communities.

This program was developed based on the research on the natural role of fire in the park and the larger surrounding ecosystem, climate data, the current composition of the forest canopy and park fauna. The expertise of numerous partners from federal and provincial agencies and universities also proved to be very valuable. The continuous training of Parks Canada personnel in fire management and behaviour, the acquisition of adequate equipment to follow up on the fire weather index and the staging of controlled burns were essential components in the implementation of this fire management program.

The first controlled burn was carried out in September 1991. To date, the park has been the scene of seven controlled burns covering 180 hectares. Four burns were performed to bring about natural regeneration under old white spruce plantings and three were done to restore the white pine populations that were not regenerating and hence disappearing. A monitoring program was established in each case to determine whether the objectives in the controlled burn plans were achieved.

The active fire management program at La Mauricie is developing continually. Results of each controlled burn can yield surprising discoveries, requiring adjustments to the plans, preparation, staging and monitoring of subsequent burns. This active fire management program is a good example of adaptive management supported by good science.



After 50 years of active fire suppression Parks Canada has recognized the need to restore this ecological process using a combination of zoning and prescribed fire. Prescribed fire has been successfully used in 15 national parks. This is a start on a successful fire restoration program and Parks Canada is showing leadership in this area.

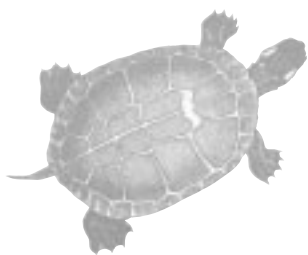
To date, the combination of prescribed fire and naturally-caused wildfire is still at only 10 per cent of the historical long-term average. Parks Canada currently lacks staff, expert control crews and equipment to advance much beyond this level. The internal goal for fire restoration has been set at 50 per cent of the long-term historical average. Under an adaptive management framework, this appears to be a reasonable place to start.

In many parks the historical fire regime was partly the result of Aboriginal use of fire. Aboriginal peoples used fire to create wildlife habitat, maintain grasslands and for other purposes. In understanding a given park's historical fire regime the role of Aboriginal peoples in creating the ecosystem must be considered. In many cases Aboriginal peoples can help Parks Canada understand and use prescribed fire for ecological integrity.

RECOMMENDATION

5-2. We recommend that, in appropriate parks, Parks Canada actively manage to restore fire, within an adaptive management framework, to 50 per cent of the long-term average, using the following means:

- create a fire restoration fund to complete the task of re-establishing this essential natural process to national parks. The level of funding should be based on internal Parks Canada calculations to restore fire to 50 per cent of the long-term average through a combination of prescribed fire and zoning. (Cost: \$6 million per year in addition to the current levels of funding);
- make fire restoration a management accountability by setting fire restoration targets as part of the Park Management Plan in appropriate parks as was done in the Banff Management Plan;
- where possible Parks Canada should work with Aboriginal peoples to understand the history of Aboriginal fire use and its application to prescribed fire.



Species Restoration – Species at Risk



A program to re-introduce pine martens in Riding Mountain National Park.
D. McArthur/Parks Canada

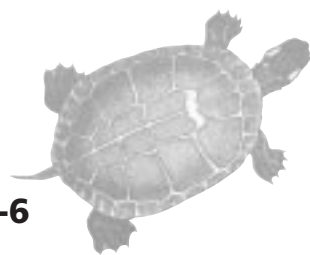
National parks have a long involvement in some aspects of managing species at risk. Parks Canada has long been a member of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which evaluates the status of species in Canada. COSEWIC defines “at risk” species as being vulnerable, threatened or endangered.

While Canada’s 39 existing national parks cover a little over 2.5 per cent of the country’s area, a majority of Canada’s native terrestrial and freshwater vascular plant species (70.6 per cent) and vertebrate animal species (80.9 per cent) are found within Canadian national parks. This is largely the result of the parks’ distribution across the length and breadth of the country and the fact that a number of parks are located in species-rich areas. The national parks also contain numerous species at risk: 56.9 per cent of vascular plants and 48.4 per cent of vertebrates

designated by COSEWIC as “at risk” reside in Canada’s national parks.

Parks Canada conducts both species restoration and species re-introduction programs. Programs include re-introduction of peregrine falcons, pine martens, trumpeter swans and flying squirrels. Some of the re-introductions have been very successful and Parks Canada can be proud of its efforts. However, species re-introductions are complex and need to be understood in an ecosystem context, and should be conducted within an adaptive management framework. For example, Point Pelee National Park, the Friends of Point Pelee National Park and the University of Guelph co-operate to conduct annual census of flying squirrels introduced to the park, to simultaneously restore the species and to test hypotheses about factors that affect small populations. Questions such as “Why did the species disappear in the first place?” and “What will be the implications of returning the species?” require careful consideration. Often Parks Canada lacks the capacity to conduct such detailed evaluations.

At the time the Panel was preparing this report there was a large national effort to develop legislation for managing species at risk in Canada. The legislation arising from this effort could have profound implications for national parks and species restoration. Parks Canada currently lacks the capacity to take on additional responsibilities for species at risk. The Panel is concerned that new responsibilities may be added through Species at Risk legislation without additional resources being allocated within Parks Canada.



RECOMMENDATION

5-3. We recommend that Parks Canada be active in species restoration and that Parks Canada must have the required new resources.

Site Restoration

There are many degraded sites within national parks that require active restoration. Examples include gravel pits, old roadbeds, abandoned military installations (Distant Early Warning [DEW] Line sites), old clear cuts and other logging sites, farms and housing sites. In the mountain parks alone, the Panel was told there are more than 100 abandoned gravel pits. Parks Canada does not have a formal policy on site restoration and it is unclear how much restoration is sufficient for a given site or disturbance.

In most parks these sites are simply abandoned and natural revegetation is occurring slowly, but there are problems with this laissez-faire approach. In the absence of site restoration, which normally includes re-establishing natural landscape contours, features such as ditches or roadbeds remain. Abandoned sites are often places where non-native plant species can thrive. At some sites there are toxic wastes

that must be remedied or accumulations of waste, such as oil drums, that must be removed. In some cases, parks have done partial site restoration, such as replanting gravel pits without re-contouring.

Aquatic ecosystems, both fresh-water and marine, are also in need of site restoration. Many parks have old dams that block fish movement or change hydrological regimes. In the older southern parks it is difficult to find a park without existing dams; in the State of Parks 1997 Report, 18 parks reported significant ecological impacts from dams. Other types of sites in need of restoration include abandoned wharves and submerged log piles left from log driving.

The Panel was told that funds for site restoration are often lacking. Restoration is often not seen as an immediate priority and generally loses out to more pressing needs.

RECOMMENDATIONS

5-4. We recommend that Parks Canada establish a set of guidelines for site restoration, in order to guide the many questions that remain at the field level regarding restoration. The guidelines should include targets for acceptable levels of toxic substances, restoration of landforms and hydrological patterns. The guidelines should also include guidance of the removal or remodeling of historical structures in order to meet site rehabilitation needs.

5-5. We recommend that Parks Canada establish a dedicated site restoration fund of \$5 million per year to ensure that funds are available and that restoration is not directly competing with other immediate priority issues. The fund should be allocated based on a national priority list for site restoration in national parks. As there are a limited number of sites that need restoration, the fund can be re-evaluated after five years to see if it has met its objective.



Dealing With Alien Species



Brome grass, an alien species, is invading native rough fescue communities in Riding Mountain National Park.
Parks Canada

The majority of national parks in southern Canada report that “exotic” or “alien” organisms (invertebrates, fish, birds, mammals, vegetation and microorganisms not native to the park) are causing significant ecological impacts. For example, in the State of the Parks 1997 Report, 21 of 38 parks indicated that alien vegetation represented a major stress, though it is not always clear whether there is sound evidence of deleterious ecological effects. Currently, Parks Canada does not have the scientific capacity to evaluate the nature of ecological effects and as a result may waste precious resources

managing alien species that are not invasive and are not causing ecological damage.

Several parks have successfully removed invasive alien organisms that threatened ecological integrity. Gwaii Haanas National Park Reserve successfully restored native vegetation on a few offshore islands by eliminating introduced mammals (black-tailed deer, raccoons and Norway rats). Although there are currently many efforts underway to eliminate alien species from national parks, most park managers are unsure about what constitutes an “alien” species, and when such species should be of concern. Most park managers have not developed a priority list of alien species, nor have they established a list of appropriate control actions.

Understanding the effect of alien species on the ecological integrity of protected areas, especially under conditions of projected climate change, is of global importance. The spread of alien species is predicted to increase dramatically, but present federal and provincial legislation and regulations do not address this concern. Invasive alien organisms are known to negatively affect biodiversity, and are of concern to all levels of government under the Biological Diversity Convention signed by Canada.



Parks Canada has done some policy development in the area of alien species but there is no national policy. An existing report written by Mosquin (1997) could form the basis for a policy. The first step in developing sound management strategies for invasive alien species is to develop a clear definition. The definition of an "alien organism," developed by the Alien Species Focus Group, Environment Canada 1994 (in Mosquin 1997) is: *"An alien species is one that enters an ecosystem beyond its historic range, including any organisms transferred from one country or province to another."*

This definition, modified from the United States National Park Service, implies no positive or negative impact by the alien organism. The definition includes organisms entering through natural range extension and dispersal, through deliberate or inadvertent introduction by humans, and as a result

of habitat changes caused by human activity. Alien species do not necessarily impair ecological integrity, so a further distinction is warranted, to the effect that "alleged negative effects of invasive species are evaluated and demonstrated, in order to aid prioritization of alien species designated for active management."

Determining the effect of alien species on ecosystem structure and function is imperative. Many alien species, especially plants, are relatively benign — they do not invade and alter native ecosystems. From a management perspective it would be most efficient to be able to predict the probability that a newly detected alien would invade and damage native ecosystems. Unfortunately there is currently no way of predicting how invasive an alien species may be. Only early detection via monitoring, with an evaluation of ecosystem effects, can determine whether a species should be removed.

RECOMMENDATIONS

5-6. We recommend that Parks Canada develop a national policy and guidelines on the definition of invasive alien species and appropriate criteria for control and removal methods.

5-7. We further recommend that Parks Canada improve the management of alien species by working with local experts, museums, universities and other government departments to routinely monitor for new species invasions. In addition, improved manage-

ment of alien species will result from implementing recommendations made in Chapter 12 concerning the elimination of non-native plant species in parks. To foster public support for the elimination of alien plant species from national parks, we recommend that Parks Canada design and implement interpretive programs and other information as recommended in Chapter 10.



Harvesting



Sport fishing is the only form of harvest that is currently legal in all national parks.

Jean Audet/Parks Canada

Most Canadians assume that national parks are protected from harvest or resource extraction. In reality, most parks have active harvest or extraction. The most common type of harvest is sport fishing. Fish are the only organisms that can be legally harvested in national parks by any park visitor. Most other harvest or extraction activities are based on the recognized rights of First Nations, or are based in individual park establishment agreements.

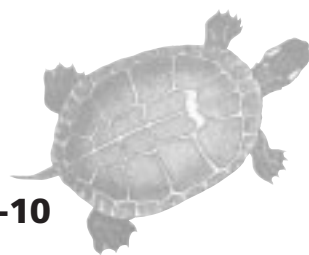
Active harvest of a population requires scientific capacity to provide an ongoing assessment of the population levels, age-specific birth and death rates, an understanding of environmental variability, and a model projecting populations over time. This information is rarely, if ever, available for harvest or extraction in national parks. Even for sport fishing, with the exception of La Mauricie National Park, we found no comprehensive assessment of fishing pressure on fish populations.

The Panel recognizes that Parks Canada does not fully control the harvest of some organisms, especially in the North where Parks Canada works through wildlife management boards and similar arrangements with First Nations. However, even in these areas Parks Canada can be a voice for establishing sound harvest levels, based on ongoing population assessments, harvest assessments and the creation of benchmark areas where no harvest occurs. Additional discussion on the topic of Aboriginal harvest is in Chapters 7 and 11 of this report.

Figure 5-1. Harvest in National Parks

| Type of Harvest or Extraction | Number of Parks Reporting Harvest |
|--|-----------------------------------|
| Sand and gravel for park construction | 5 |
| Aboriginal harvest | 8 |
| Non-Aboriginal wildlife (non-fish) harvest | 6 |
| Sport fishing | 22 |
| Commercial fishing | 4 |
| Problem or surplus wildlife | 10 |
| Domestic grazing | 5 |
| Domestic wood harvest | 1 |

State of the Parks 1997 Report



Rabbit snaring is allowed under the park establishment agreement for Gros Morne National Park.
P. Wilkinson



The Panel notes that the recreational harvest of native fish in national parks is an anomaly, and is inconsistent with protecting ecological integrity. Just as most national park users are forbidden to hunt or gather, there is no justification in terms of ecological integrity for the recreational harvest of native fish in national parks. There are many other areas outside national parks where

fishing is permitted. By permitting fishing, parks cease to be true ecological benchmarks for comparison with areas outside of parks where harvesting is allowed. Currently, the time spent by parks staff in regulating sport fishing appears to be a drain on scarce resources, both time and money, that could be better spent elsewhere.

RECOMMENDATION

... sport fishing is permitted in parks where fish populations are large enough to sustain some harvesting without compromising viability.

State of the Parks 1997
Report, p. 31

Sport fishing is reported to be negatively affecting fish populations, and causing changes in genetics and the structure of fish community in 19 parks, including the majority of southern national parks.

State of the Parks 1997
Report, p. 44

5-8. We recommend that Parks Canada establish guidelines for the management of any harvested populations in a park. We recommend that no harvest be allowed to occur unless these guidelines are met and that any harvest under the jurisdiction of Parks Canada that does not meet these principles should be discontinued. We note that some harvest regimes within some national parks are not under the jurisdiction of Parks Canada and thus Parks Canada could advocate a position in these cases.

We recommend the following principles for harvesting within national parks:

- all harvest levels should be based on an ongoing assessment of basic population parameters, including population size, sex ratio, age class distribution and age-specific birth and mortality rates;
- all harvested population should have an ongoing assessment of age-specific and sex-specific harvest rates as well as location;
- for all harvested populations, there should be areas of the park where harvest is not permitted, designed to act as benchmark areas.

Managing Hyperabundant Species



Elk in Banff townsites are habituated to humans, but remain wild and dangerous.

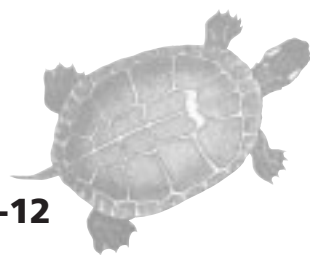
Blackbird Design

Species can be defined as hyperabundant when their numbers clearly exceed the upper range of natural variability that is characteristic of the ecosystem, where there is a demonstrated impact on ecological integrity. This can happen when predators are removed from the ecosystem, or when there is a food subsidy, such as available garbage. Species present in extreme high numbers can have profound effects on other species. For example, Kejimikujik National Park reported high levels of predation by hyperabundant raccoons on nests of rare Blanding's turtles.

Some parks have lost key species and such losses, in turn, affect other species. One view holds that reduced abundance of large carnivores such as wolves has led to hyperabundant populations of such prey species as elk and moose, and to significant changes in the abundance of other species. For example, the park communities of

Banff and Jasper have serious problems with town-adapted elk resulting from a dysfunctional predator-prey system — with resulting impacts on vegetation. Other species may be hyperabundant because parks, as last enclaves, afford protection. Large populations within a park may be subsidized by extensive alternate food sources outside of the park. This is the case with deer in southern Ontario. In Gwaii Haanas, deer were introduced to islands with both abundant food and few predators.

In several parks, Parks Canada routinely manages hyperabundant populations. For example, there is a well-developed program in Elk Island National Park to remove bison and elk from the park, to keep populations of these animals down in the absence of predators and other natural controls. Despite these successes, many park managers have been reluctant to engage in such intense management.





White-tailed deer are hyper-abundant in some national parks. A. Corneilier/Parks Canada

Deer Management in Point Pelee National Park

Many protected areas in southern Ontario report problems caused by abundant white-tailed deer, regardless of what might have caused increases in deer populations in the first place. Compared to provincial parks, like Long Point, Rondeau or Grand Bend, or the National Wildlife Area on Long Point, Point Pelee National Park has been singularly successful in reducing locally abundant deer in the park through a series of culls conducted over several years with minimal public outcry. There are several reasons for the park's successful management of deer:

- park management clearly articulated their vision of ecological integrity in a way that the public could accept, highlighting that high deer populations are inconsistent with protecting ecological integrity. The park is intended to be, so far as is possible, representative of a functioning Carolinian ecosystem.
- park staff conduct the cull and the park is closed during the cull. Park management has not submitted to pressure from groups claiming that they can do the cull at less cost; to allow a cull by non-park staff would be a first step on the slippery slope to introducing a non-conforming use to the park (hunting) and would lead to confusion among interest groups and the general public about whether a cull conducted by non-staff is sport hunting or not.
- Point Pelee management strategically invested aggressively in research into alternative methods of control, indicating clearly that they were aware of public sensitivities regarding the shooting of deer.

RECOMMENDATION

5-9. We recommend that Parks Canada confirm the role for control of hyperabundant species in national parks through active management, to maintain or restore ecological integrity, as long as the following conditions are met:

- the reasons for the hyperabundance are well understood;
- there are clear objectives and numerical targets for the control program;
- the impacts of the control measures are predicted;
- there is a monitoring system in place to examine the causes of hyperabundance, the dynamics of the population being controlled and the predicted impacts of the control measures;
- the management program is conducted under an adaptive management framework where the original assumptions are subject to review.

