

Ecological Integrity in National Parks Policy:

Evolution of the Concept

“The day will come when the population of Canada will be ten times as great as it is now, but the national parks ensure that every Canadian...will still have free access to vast areas possessing some of the finest scenery in Canada, in which the beauty of the landscape is protected from profanation, the natural wild animals, plants, and forests preserved, and the peace and solitude of primeval nature retained.”

James B. Harkin,
Commissioner, Dominion Parks Branch (c. 1920)

Parks are hereby dedicated to the people of Canada for their benefit, education, and enjoyment, subject to the provisions of this Act and Regulations, and such Parks shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations.

National Parks Act (1930)

Ecological and historical integrity are Parks Canada’s first considerations, and must be regarded as prerequisites against use. Protection of heritage resources is fundamental to their use and enjoyment by present and future generations.

Parks Canada Policy (1979)

Maintenance of ecological integrity through the protection of natural resources shall be the first priority when considering Park zoning and visitor use in a management plan.

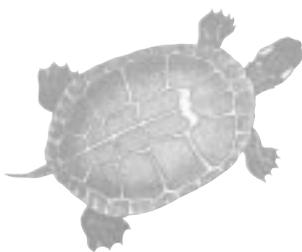
National Parks Act Amendments (1988)

Protecting ecological integrity and ensuring commemorative integrity take precedence in acquiring, managing, and administering heritage places and programs. In every application of policy, this guiding principle is paramount. The integrity of natural and cultural heritage is maintained by striving to ensure that management decisions affecting these special places are made on sound cultural resource management and ecosystem-based management practices.

Parks Canada,
Guiding Principles and Operational Policies (1994)

Whereas it is in the national interest...to maintain or restore the ecological integrity of national parks ... to maintain ecological and commemorative integrity as a prerequisite to the use of national parks and national historic sites, and... to manage visitor use and tourism to ensure both the maintenance of ecological and commemorative integrity and a quality experience in such heritage and natural areas for this and future generations.

Parks Canada Agency Act (1998)



SECTION A: A PANEL EXAMINES THE ISSUES

CHAPTER 1: A SACRED TRUST

Protecting Ecological Integrity: A Vital Mission

Conserving, restoring and maintaining ecological integrity is the core of Parks Canada's mandate for national parks, yet some Canadians have expressed concern for the ecological integrity of their national parks. In 1996,

the Banff-Bow Valley Task Force documented the serious environmental pressures in Banff National Park, raising questions about whether the ecological integrity in other parks was also under pressure. In 1998, the Minister of Canadian Heritage, Hon. Sheila Copps, asked a panel of Canadians with expertise in ecological sciences and related fields "to assess

the strengths and weaknesses of Parks Canada's approach to the maintenance of ecological integrity in Canada's national parks and, based on this assessment, provide advice and recommend how best to ensure that ecological integrity is maintained across the system of Canadian National Parks."

Members of the Panel on the Ecological Integrity of Canada's National Parks ("the Panel") travelled to a series of representative national parks to speak with park staff and other interested Canadians, to see first-hand the problems and stresses that threaten Canada's national parks, and to develop a sense of how to address these problems. The Panel's membership and methods are described in Appendix A.

Canadians love their national parks. That clear message was common across the land as we spoke with Canadians about the future of national parks. Through our travels, meetings and discussions with the hundreds of dedicated Parks Canada employees, Aboriginal peoples, park neighbours, advocates and friends who shared their time and sacred places with us, we began to grasp the challenges in protecting, unimpaired, Canada's wonderful national parks. The task at hand is vital, it is urgent and it is complicated. Achieving the goal of maintaining ecological integrity will require dedication, co-operation, learning and agreement from all Canadians, politician to park manager, park visitor to park neighbour.

The following report contains our thoughts on the path ahead.

According to a cross-Canada poll taken in November 1999, 91 per cent of Canadians feel it is important that governments take action to protect the wilderness, 83 per cent believe it is important for Canada to be seen as an international leader in protecting wilderness, and 80 per cent want to see protected areas established before lands are committed to industrial development.

from an article by John Turner
in *The Globe and Mail*
December 8, 1999

Cameron Lake, Waterton
Lakes National Park.
Blackbird Design





Figure 1-1 Canada's national parks (as of December 1999). The focus parks visited by the Panel are shown in red.

National Parks in the Canadian Mind

National parks are a Canadian institution. Their role in Canadian society is far greater than their actual area within the Canadian landscape. These are the places where Canadians protect, study and learn about the living diversity of nature; where Canadians celebrate their identity as citizens of a uniquely wonderful land. Just as national historic sites and other cultural heritage places help root Canadians in a shared and diverse history, so do national parks and other protected areas help root Cana-

dians in the geographic and biological diversity that defines the Canadian people — even if day-to-day urban lives of most Canadians seem to have little connection with nature.

The Canadian psyche nurtures the belief that just beyond the country's cities and towns exists a wild area that makes Canada a better country simply because such wilderness exists. This myth of Canadian wilderness is increasingly challenged by widespread environmental changes.



Canadians' love for and spiritual connection to the land, especially wild places, has generally not been celebrated through rituals or rites. Yet the message that national parks are special, even sacred, places rang out in the diverse ways that people spoke to the Panel about their devotion and pride in Canada's most magnificent spaces.

Many people spoke to us about the intrinsic worth of parks: places where nature unfolds as it always has, where ecosystems, species, genetic varieties and ecological processes endure in

"We believe passionately that national parks may hold answers to some of the most profound questions troubling humanity as it tries to find its place on Earth. Those answers have to do with our need for restraint, for compassion towards other forms of life and the processes which sustain them, and for far-sightedness in terms of time and space when it seems the present is under siege and the future so uncertain. But if we can set aside self-interest in favour of the larger interest – whether that is defined in ecological, social, or even spiritual values – and care as much about those who follow us as we do about our immediate gratification, what may seem impractical or unrealistic today, may well be possible tomorrow. National parks will flourish only where pragmatism is tempered by boldness of vision."

submission to the Panel

all their diversity and complexity; places that help to revitalize the surrounding, more intensively worked lands. In national parks, nature and its component species and systems are valued in their own right, and not just for their usefulness to humanity.

Other people told us of their personal experiences of parks. Some recalled family memories and traditions entangled with the waters, trees, mountains, fish and wildlife of the parks. Some spoke of the parks as havens for the soul and

for replenishment, where they seek peace, solitude, and pure pleasure from wilderness. And some who only rarely visit parks talked of them as green spaces in the mind, giving comfort simply from the awareness that they are there, unimpaired, as they always have been. From Aboriginal peoples we heard of the spiritual, cultural, and traditional harvesting values of the lands in the parks, and of how deeply — in community and across time — these traditional values are held.

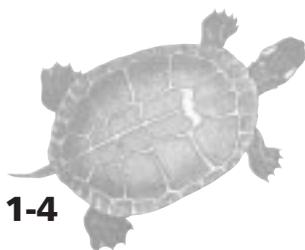
What the Panel heard from individual Canadians is consistent with broader surveys of public attitudes. Seventy-one per cent of Canadians see national parks among the top four "very important" symbols of Canadian identity, right alongside the Charter of Rights and the flag, and behind only the health care system. Canadians rank national parks well above the national anthem, the Royal Canadian Mounted Police, the Canadian Broadcasting Corporation, and hockey (Environics, 1997).

In Trust for the Whole Planet

The responsibility for managing Canada's national parks is not only a trust with implications for Canadians, it is also a trust with broad environmental implications for the planet. In October 1999, world population reached six billion, and is projected to increase to between seven and nine billion in the next 50 years (Worldwatch, Sept. 23, 1999). It is against this backdrop of human population growth and the associated rise in resource consumption and environmental pressures that the global significance of Canada's national parks must be appreciated.

Most countries in the world have a system of protected areas. In an often-chaotic world, parks and protected areas are a point of human agreement. Certainly protected areas are practical approaches to biodiversity conservation, but they also speak to the other parts of the human condition. Protected areas are human statements that nature is more than a resource to be counted and that the wonder of life on Earth deserves preservation for its own sake.

Wilderness is increasingly precious. The doors have already closed for maintaining significant expanses of wilderness in many other regions of the globe. Twenty per cent of the world's remaining wilderness lies within Canada's borders. Of the Canadian wilderness areas that are protected, 40 per cent



are within national parks (provincial and other protected areas make up the

balance). Thus Canadian national parks are a key part of both Canadian and global conservation strategies. This internationally important ecological role was the basis for the inclusion of nine Canadian national parks within World Heritage Sites. In addition, three sites within national parks are designated Ramsar sites (wetlands of international importance, designated under an international convention signed in Ramsar, Iran) and two national

parks lie within United Nations Educational, Scientific and Cultural Organization (UNESCO) Biosphere Reserves. According to the World Wildlife Fund, Canada is home to one quarter of the world's temperate coastal forest, one third of the world's boreal forest, nearly all of the remaining old-growth red and white pine, one third of the global population of wolves, more than half the world's barren ground caribou and two-thirds of all the world's polar bears.

Protected Areas in the Canadian Landscape

In 1990, the federal government promised to represent each of Canada's 39 natural regions with a national park, and is slowly implementing this promise (at the end of 1999, 39 national parks had been established in 25 terrestrial natural regions, leaving 14 regions yet to be represented). The October 1999 Speech from the Throne committed the federal government to expanding the national parks system.

National, provincial and territorial parks and wilderness areas, First Nations lands and privately-owned lands protected under conservation easements or other mechanisms are types of protected areas. Such areas must link together, to function as a network that protects ecosystems across borders and boundaries. National parks are administered by Parks Canada, but the continued well-being of these much-loved places is a responsibility for all Canadians, collectively and as individuals.

Once a national park is established, the more enduring task of maintaining its ecological integrity begins. This mission is no less urgent than the mission of designating new parks, which currently enjoys a higher profile. To remain unimpaired for the enjoyment of future generations, national parks must remain areas with whole and complete biological systems, including species, landscape elements and processes.

With their ecological integrity protected, parks will also be able to provide humans with spiritual inspiration and physical renewal, and serve as centres for regional ecological research and understanding, learning and education. Communities, businesses and land use agencies in or near national parks benefit economically and in terms of quality of life from the national park in their midst. National parks also contribute to the healthy functioning of ecological "services" such as nutrient

The Global Context

Despite the growing worldwide recognition of the importance of national parks and protected areas, less than five per cent of the planet's surface is afforded protection under IUCN [World Conservation Union] categories. The distribution of these areas is not biogeographically balanced; some key ecosystems, such as tropical dry forests, fresh waters, temperate rainforests, temperate grasslands, Mediterranean-climate areas, and oceanic islands are under represented.

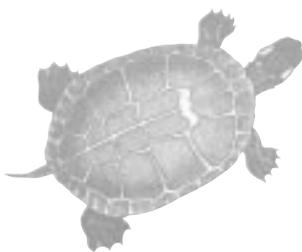
Recommendation 16, Expanding the global network of protected areas, IUCN report of the IVth World Congress on National Parks and Protected Areas (1992)

World Heritage Sites

National parks in Canada that lie within designated World Heritage Sites:

Banff, Jasper, Yoho and Kootenay national parks
Gros Morne National Park
Kluane National Park Reserve
Nahanni National Park
Waterton Lakes National Park
Wood Buffalo National Park

Rafting on the Nahanni River below Virginia Falls. Butterill/
Parks Canada



cycling, clean drinking water supply and flood control, climate control, fish spawning grounds, pollination and natural pest control. These processes underpin the everyday functioning of the economy and many jobs.

Centres for Understanding and Education

Canadians want to know about the state of their land. By understanding the ecological condition of national parks, Canadians can understand the ecological condition of Canada. National parks, by design, are spread across Canada and represent different

natural regions. A park's ecological integrity is greatly influenced by the condition of the larger region. Parks are sentinels, ecological benchmarks against which change in the larger region can be assessed. They have a powerful potential to be centers of regional ecological research and understanding.

In signing the international Convention on Biological Diversity (1992), Canada pledged to set

aside protected areas for conservation, to monitor change in biological diversity, to conduct research into biological diversity and to make the public aware of diversity's importance. National parks are perfectly suited for meeting this commitment.

Parks also provide opportunities for education, through formal research, through interpretation centres and programs, through outreach programs and through direct experience of wild places.

Divergent Futures

The extent of ecological stresses on most of the national parks has been documented in the 1994 and 1997 State of the Parks Reports. In looking at these pressures, the Panel was conscious that we were only hearing about the pressures of today. Yet greatly amplified pressures undoubtedly lie ahead. Population growth, urban expansion, resource exploitation disturbances, habitat fragmentation, and increased demand for leisure opportunities will only intensify the stresses on nature within and surrounding national parks.

Canadians stand at a junction with divergent paths. Each leads towards a different kind of national park, and a different natural landscape for Canada. Canadians are currently travelling the path that leads to parks that will become islands unable to support natural processes, where animals once abundant and free-ranging will grow scarce or disappear altogether. Along this path, the sacredness of the places that form such an important part of Canadian identity will be lost.

Along another path, Canadians will awaken to the perils that threaten these precious places. Canadians will unite to preserve what is so special. Parks Canada will tenaciously embrace the maintenance of ecological integrity as the overriding priority for managing national parks — consistently, unreservedly, and with pride — in fact and action as it so clearly already is in law and in official policy. With stronger legislation, expanded science capacity and understanding, and new tools to work with neighbouring land managers, Parks Canada will be able to play a pivotal role in restoring ecological integrity to the greater landscape, working in collaboration with others. Along this path, Canada will retain its distinct wilderness heritage in trust for the world.

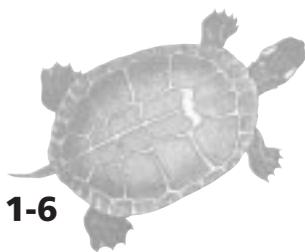
National Parks as Ecological Benchmarks

“The most important role for national parks is to act as benchmarks against which we evaluate change. When we harvest forests, or fish, or grow crops, we need benchmarks to ensure our activities are sustainable. National parks are places where we don't harvest or grow crops. Yes, they are important as places to be in wild nature. But they are even more important as benchmark areas where we understand how our actions are changing the rest of the landscape. National parks are a crucial part of a grand strategy of sustainability.”

submission to the Panel

“Without more intense effort by Parks Canada and the provinces, our mountain parks will be like the Alps — beautiful to look at but lacking any ecological integrity.”

research scientist,
submission to the Panel



A Vision for Canada's National Parks

Throughout this report, we identify problems, concerns or issues and make specific recommendations to address them. What follows below is a vision that sets the framework into which all the following chapters and recommendations fit.

This vision is a look into the future, a statement of “how things are” in 2025, one generation from now. The Panel feels strongly that if Canadians do not achieve this vision within one generation, nature will foreclose on Canada's ecological debts, and national parks with ecological integrity will be an ever-dwindling option.

This vision statement uses the words “we,” “us” and “our.” By these words the Panel means all Canadians, for national parks are lands that truly belong to everyone across the country.

It is 2025. Canadians have a personal connection to wilderness and we manifest that connection by choosing to protect wild places. We choose to protect wild places because such places speak directly of our respect for all forms of life and for the land, air and water that sustain us and our understanding that we are part of the same interdependent ecosystem. We choose to protect wild places so that nature can operate under its own rules, so we can understand nature's fundamental ways. We choose to protect wild places so that we may go there to touch the Earth in its wild state, to satisfy our need for emotional and spiritual ties to our sacred land. We choose to protect wild places so that our children and theirs may know the same awe, challenge, fascination and love that we feel in these places. And we choose to protect wild places so that each and every Canadian can collectively celebrate and appreciate wild places.

In 2025 Canada has an extensive system of national parks, established through bold moves of Parliament and the Canadian public. From Terra Nova in the east to Gwaii Haanas in the west, from Quttinirpaaq on Ellesmere Island in the north to Point Pelee in the south, our national parks system includes at least one national park in each of Canada's terrestrial and marine natural regions. Canadians recognize that it is our duty to hold these lands in trust on behalf of the global community, because rising populations and resource exploitation have diminished the extent of wilderness elsewhere.

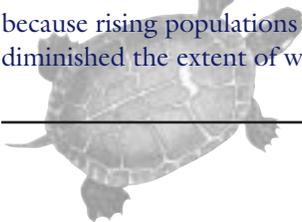
In recognition that national parks by themselves cannot sustain ecological integrity, even their own, Canada's national parks are embedded within a mosaic of protected areas — provincial, territorial, and municipal parks, Aboriginal lands, private lands and a myriad of other protected areas. The diverse components of these protected areas have different management purposes but all contribute to the protection of wildlife and vegetation, air and land and water. The protected areas network compliments a broader landscape managed for sustainability. The broader landscape includes carefully managed farms and forests, mines and other uses that meet the material needs of Canadians. This landscape allows for the free movement of wildlife and protects habitat such that endangered species are rebuilding viable populations.

The protected areas network is recognized by Canadians as necessary to protect biodiversity, which in turn is valued for its own sake and is regarded as necessary to provide benchmarks against which change in other areas can be measured and evaluated. Canada is recognized as a world leader in protecting and understanding biodiversity. National parks act as regional centres of ecological understanding, working with schools and acting as resource centres for citizens and industry.

This protected areas network is the result of co-operation and partnerships. Protected areas are managed co-operatively by those responsible for land use decisions that influence national park ecosystems. This co-operative management is based on respect, equity and empowerment; as a result, local communities support and treasure nearby national parks.

Aboriginal peoples across Canada have active roles in the national parks within their respective traditional lands. Aboriginal peoples are at home in national parks and Canadians celebrate Aboriginal knowledge. We are confident that the holistic approach to land and resource use, as practiced traditionally by Aboriginal peoples, respects the land, air, water, wildlife and vegetation.

National parks staff are committed to the protection of ecological integrity. Staff at all levels are confident in the pursuit of their mandate, supported by legislation and guiding principles that clearly identify the protection of ecological integrity as the first priority of national parks.



They are innovative, creative and bold in their approach to finding solutions to challenges that may affect ecological integrity.

National parks staff firmly advocate for protection beyond national park boundaries, and that influence has created awareness and sparked action among other jurisdictions to support land use decisions that protect land, air, water, wildlife and vegetation. In particular, provincial and territorial governments, and industrial leaders, work closely with national parks and other protected area managers to find sustainable solutions to development issues.

Innovative ecosystem-based management is possible because of Parks Canada's extensive capacity in the social and natural sciences, enabling national parks to make sound decisions within park boundaries. By sharing this excellence with other partners, national parks are able to

influence decisions made in surrounding landscapes.

Above all, Canadians recognize and embrace our individual responsibility to help conserve that which is unique and special about national parks. Those of us who live in urban areas, far from a national park, appreciate and celebrate the existence of protected natural landscapes as much as frequent park visitors. Our national parks are places of learning and enjoyment; they are also catalysts for personal growth and action, places that can and do change our lives.

Canadians and guests from around the world embrace the notion of use without abuse so that national parks will continue to occupy a position of honour in the Canadian mind, icons that reflect the very soul of Canada to Canadians, and to the world.

Ecological Integrity: Issues and Fundamental Concepts

Our Main Message: A Mandate in Peril

There is much more to protecting ecological integrity than simply designating an area as a national park. How can Parks Canada achieve ecological integrity in places as small as St. Lawrence Islands National Park — nine square kilometers of fragmented tiny islands in the busiest shipping lane in Canada — or as enormous as Wood Buffalo National Park, where the processes of fire, flood and grazing are at scales almost beyond human comprehension? Maintaining and restoring ecological integrity in such a diverse national park system is an immense undertaking.

The Panel was deeply troubled to learn that despite many good efforts, ecological integrity is being eroded in most national parks. According to Parks Canada's own State of the Parks 1997 Report, only one of the 38 national parks that were established at that time (there are now 39) was considered to be in pristine condition (Figure 1-2).

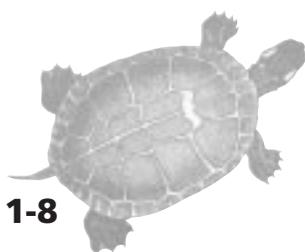
Thirty-one of 38 national parks reported ecological stresses from significant to severe, and in 13 parks these stresses had increased in intensity since 1992. The majority of parks are reporting significant and accelerating loss of ecological integrity. This is most true in the smaller and more southern parks, but is occurring even in the larger and more northerly parks.

While many Canadians have heard about ecological problems in Banff National Park, there appears to be a general lack of public appreciation that many other national parks also have serious ecological problems. Banff may have the highest visitation levels of any Canadian national park, but its problems are not at all unique.

The Panel concurs with the conclusions in the State of Parks 1997 Report. Ecological integrity in our national parks is in peril.

Despite many examples of excellent work in parks to maintain and restore ecological integrity, the challenge is growing and in many cases we are losing ground.

Parks Canada, State of
Parks 1997 Report



Key Findings of the Panel on Ecological Integrity

- Ecological integrity in Canada’s national parks is under threat from many sources and for many reasons. These threats to Canada’s national sacred places present a crisis of national importance.

- To successfully manage national parks with a conservation focus, Parks Canada must establish a clear vision around the primary objective of protecting ecological integrity, and align the whole organization behind this agenda. Shifts in decision-making, staffing, training and

relations with employees and park neighbours are needed to accomplish this transformation. Making these shifts, to create an internal culture of conservation, is the single biggest challenge facing Parks Canada.

- Despite a great deal of planning activity, and the fact that policies to enact management for ecological integrity are clearly in place, Parks Canada is still grappling with how to translate policies into plans, how to translate plans into action, and how to evaluate the consequences of those actions to adapt to constantly-changing circumstances. Parks Canada must restructure planning in a way that puts ecological integrity at the core of the whole process.

- Parks Canada currently lacks the necessary capacity in both the natural and social sciences to effectively manage for, and inform society about, ecological integrity in national parks. With notable individual exceptions, all levels of Parks Canada lack a well-established culture for conducting, using, and appreciating science as part of park management, interpretation and regional integration. Knowledge derived from the natural and social sciences, including Aboriginal peoples’ naturalized knowledge, should be the basis for informed decisions, management actions and education within parks and beyond park boundaries.

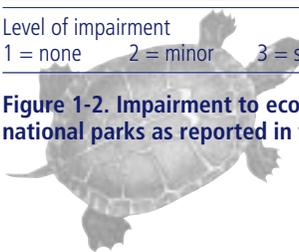
- Parks Canada’s Guiding Principles and Operating Policies state that ecosystems should evolve in the absence of most human intervention. However, a policy of laissez faire management in national parks may undermine ecological integrity, especially if past actions are not considered. In order to compensate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

- Assessing and understanding ecological integrity requires three interrelated tools: inventory, research and monitoring. Understanding ecological integrity is a complex task that will require significant investment in expertise as well as internal training. Parks Canada is already well along the road to an operational understanding of ecological integrity and has an opportunity to take on a leadership role in understanding the state of Canada’s ecosystems.

Park	Cumulative Impacts of all stressors	Impacts from external sources	Impacts from internal sources
Vuntut	1	1	1
Auyuittuq	2	2	1
Ellesmere	2	2	2
Mingan Archipelago	2	2	1
Wapusk	2	2	1
Aulavik	3	3	1
Cape Breton Highlands	3	4	2
Forillon	3	4	2
Gros Morne	3	3	3
Gwaii Haanas	3	4	2
Ivvavik	3	3	1
Kluane	3	3	2
Nahanni	3	3	1
Prince Albert	3	5	3
Wood Buffalo	3	3	2
Banff	4	3	4
Waterton Lakes	4	4	2
Bruce Peninsula	4	4	3
Elk Island	4	5	3
Fundy	4	5	3
Georgian Bay Islands	4	4	2
Grasslands	4	4	3
Jasper	4	4	4
Kejimikujik	4	4	3
Kootenay	4	4	3
Kouchibouguac	4	4	4
La Mauricie	4	5	3
Pukaskwa	4	4	2
Riding Mountain	4	4	3
Terra Nova	4	4	4
Yoho	4	4	3
Revelstoke, Glacier	4	5	3
Prince Edward Island	5	5	4
Pacific Rim	5	5	3
Point Pelee	5	5	5
St. Lawrence Islands	5	5	2

Level of impairment
1 = none 2 = minor 3 = significant 4 = major 5 = severe

Figure 1-2. Impairment to ecological integrity in Canada’s national parks as reported in the State of the Parks 1997 Report.



- Until recently, national parks' creation and ongoing activities have largely ignored the Aboriginal human aspect of park ecology. As a result, naturalized knowledge and values are now generally lacking in national parks. This ignorance of naturalized knowledge has contributed to the decline of ecological integrity in many parks. A process of healing is needed to develop trust and respect and to facilitate two-way communication and education between Parks Canada and Aboriginal peoples.

- National parks today are one part of a complex network of federal, provincial, territorial and First Nations protected areas. In the last few decades, private land conservation agreements have played an increasing role in southern Canada, and voluntary stewardship is now an important part of the protected areas mosaic. A comprehensive national protected areas strategy that folds in the myriad layers of conservation goals does not yet exist. In addition, although Parks Canada strives to provide the best possible representation of each region's biophysical characteristics, the final choice of park candidate area has often been dictated by factors not related to ecology.

- In much of Canada, protected areas have become ecological islands, disconnected from other areas of remaining natural habitat. Increasingly, national parks and other conservation lands are surrounded by urban development, agriculture, industrial forestry or other land uses that affect the viability of park ecosystems. To maintain ecological integrity, the network of national parks and other protected lands needs to be managed as part of greater ecosystems. This requires the co-operation and contribution of provincial and territorial governments, First Nations governments, communities, adjacent landowners, non-governmental organizations and industry.

- Interpretation is a key purpose for national parks. Parks Canada is currently not well-positioned to serve its target audiences in terms of this vital education role. Much of Parks Canada's existing interpretation information, assets and materials are out-dated. More effective communication on ecological integrity requires attention to policy, strategy, partners, and evaluation related to interpretation. Public support for protecting ecological integrity will come from strong messages emphasizing the positive aspects of ecological integrity. Parks Canada needs to explore new media and means of delivering interpretation messages to non-traditional audiences.

- Use and enjoyment have been among the historical goals for Canada's national parks, and must continue to be major elements of the Canadian character and heritage.



Recreation may be harming the delicate dunes of Cavendish Beach in Prince Edward Island National Park. T. Grant/Parks Canada

In order to protect ecological integrity, human use in national parks must be based on the principle of responsible experience: use without abuse. Human use must also pass the dual tests of allowability and appropriateness. These tests are currently not clearly defined and thus policies of use are inconsistent and uncertain. Parks Canada must develop a formal assessment program on both allowable and appropriate activities, and clearly define the term "basic and essential services" so that strong and consistent decisions can be made at the park level.

- The built environment of national parks, including infrastructure, visitor facilities, and the procedures needed to maintain them, directly affects ecological integrity and visitor's perceptions of Parks Canada's commitment to it. Successfully limiting the size and impact of the built environment will require that responsibility and accountability for ecological integrity become part of the daily tasks of every national park staff person. Additionally, protection of ecological integrity must translate into appropriately-designed and operated infrastructure.

- To pursue its objective of protecting ecological integrity in Canada's national parks, Parks Canada will need a supportive financial framework alongside a supportive management framework. The strengthening of natural and social science capacity, and the interpretation and partnership programs recommended by the Panel will require substantial additional financial resources. This new money is a necessary condition for giving a more rigorous focus to ecological integrity, but money alone will not suffice. Several "first steps" are needed to improve the broader management framework for ecological integrity in Parks Canada that should be implemented before the allocation of any new funds.

Ecological Stresses Are Significantly Affecting Most National Parks

Stresses originate from both inside and outside the parks. Inside the parks, the presence of alien species, the suppression of natural fires, high levels of visitor use, transportation corridors, non-conforming activities, and inappropriate infrastructure all affect ecological integrity. Stresses from outside also cause problems, ranging from regional to global in nature. Regional stresses come from landscape fragmentation due to human uses of the lands adjacent to national parks, such as urban development, logging, mining, agriculture, and transportation. Stresses of a global nature, such as long-range movement of air pollutants and climate change, are also affecting ecological integrity within parks. Parks are part of interconnected ecosystems and very much reflect the state of the larger regions where they are located.

A sample of the broad internal and external issues facing Canada's parks includes:

- **habitat loss** - in Canada, over 90 per cent of Carolinian forests have been converted to farmland or towns. On the prairies, 99 per cent of the native tall-grass communities and 75 per cent of mixed grass communities have disappeared. In Atlantic Canada, 65 per cent of the coastal marshes have been drained or filled. Across northern Canada, only 35 per cent of the boreal forest remains undisturbed. Largely as a result of this habitat loss, many Canadian species are currently threatened;
- **habitat fragmentation** - fragmentation of remaining habitat is as serious a problem as habitat loss. Many species, from grizzly bears to flying squirrels and salamanders have difficulty surviving in habitats that are broken into isolated fragments.

Even within parks, fragmentation occurs as a result of developments



A young black bear killed on a road in Riding Mountain National Park. Parks Canada

such as communities, facilities, trails, roads and railways. Roads and railways also cause direct wildlife mortality. Hundreds of large mammals and thousands of birds, amphibians and other creatures are killed on park roads each year;

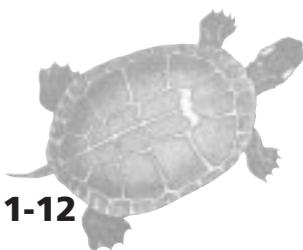
- **losses of large carnivores** - across Canada and especially in the south, large carnivores are disappearing or are absent, spinning natural predator-prey relationships and systems out of control. Even though large carnivores are protected within national parks, these predators are threatened by stresses such as human use and development inside parks, as well as hunting, land development, and other pressures that occur outside park boundaries. From Ontario eastward, wolves are gone from all national parks except Pukaskwa and La Mauricie. In the west, wolves have been extirpated from Elk Island and Grasslands national parks. In several national parks — including Riding Mountain, La Mauricie, Banff and Waterton — wolf populations are low and struggling;





Loons in some national parks are exhibiting high mercury levels in their feathers.
B. Morin/Parks Canada

- **air pollution** – airborne pollutants, such as those which cause acid rain, continue to harm many parks. Atlantic Canada and southern Québec have been called the “tailpipe of North America” because this area lies downwind from the major urban and industrial regions of the continent. More than two decades of research at Kejimikujik National Park show that low pH levels in the park’s waters are associated with decreased reproductive success of brook trout. Georgian Bay Islands and La Mauricie national parks continue to face the risk of acid deposition in excess of the ability of landscapes within these parks to buffer sulphate and other acidic compounds;
- **pesticides** - pesticides used outside of parks are being detected within parks. For example, the pesticide toxaphene was widely used (outside of national parks) until two decades ago. It can disrupt endocrine systems, damage lungs, livers and kidneys, and cause problems with reproductive and immune systems, developmental disorders and cancer. Research at Bow Lake in Banff National Park has found toxaphene in some zooplankton, while trout in Bow Lake have toxaphene concentrations up to 20 times greater than other fish in the lake and up to 1000 times greater than trout from other lakes in the park. A study in La Mauricie National Park showed high mercury levels in the blood and feathers of the park’s loons; mercury in their feathers is higher than any other studied site in North America. Mercury levels in loons from Kejimikujik National Parks are also high, leading to reduced nesting and hatching success. The pesticide DDT has been found at significant levels in lake sediments and in fox snakes at Point Pelee National Park. High DDT levels have been correlated with reduced frog populations and species loss in several other parks and wildlife reserves along the northern edge of Lake Erie;
- **alien species** - invading non-native species, both plants and animals, cause problems for parks across Canada. In Point Pelee National Park, garlic mustard is invading Carolinian forests and out-competing native species. In Riding Mountain National Park the high number of alien plant species in the native rough fescue grasslands is a cause for concern as native plants are out-competed by the invaders. In Gros Morne National Park, moose and snowshoe hares introduced to Newfoundland several decades ago are altering habitat and vegetation regimes inside the park;
- **over-use** - growing levels of human use within most national parks have created crowding, overuse of facilities and infrastructure such as sewage treatment systems, over-development and a myriad of other problems that in turn degrade water and air quality, cause erosion and damage wildlife habitat. In Waterton Lakes National Park, every valley has either a road or a hiking trail — or both. Only the most northerly parks have not yet been subject to high use demands. Canada’s national parks receive over 14 million visits every year. With a predicted annual growth rate of approximately 4.5 per cent, that figure will double in just 15 years.



In the parks we visited, the Panel found:

- on the lands around Waterton Lakes National Park, changing land values threaten to convert extensive ranchlands to small acreage housing developments that would lead to landscape fragmentation. Inside the park every major valley has a road and even the minor valleys have trails and backcountry campsites. These conditions make it difficult for large predators such as wolves and grizzly bears to maintain populations in the area. Fire control has severely reduced fire as a natural process, changing vegetation patterns;
- around Fundy National Park, the park boundary is defined by clearcuts, many of which are converted to plantations of non-native trees. The rivers in Fundy are now devoid of Atlantic salmon, where up to 1000 returning fish once spawned;
- at La Mauricie National Park, the surrounding region is being fragmented by intensive forestry. Wolves, which once inhabited the park, are now absent except in winter, when visitor numbers are low. High levels of sport fishing and introduced alien fish species have affected native trout populations;
- in Riding Mountain National Park, inadequate sewage treatment facilities are putting excessive nutrient loads into aquatic systems. Wolf populations have declined to very low levels and the park appears to be cut off from wolf populations further to the north because of regional land use changes. Alien plants are invading the fescue grasslands, displacing native species;
- even the vast and remote Wood Buffalo National Park has development encroaching from the south, and a forthcoming winter road through the park. Oil and gas exploration is increasingly surrounding the park with seismic lines and access roads;
- in its proposed five-year harvesting plan, a large forest-products company operating near Pacific Rim National Park Reserve wishes to create over 37 new cut blocks near the park boundaries while several others are within 75 meters of the park. The park's Broken Group Islands receives very high levels of backcountry use and recreational fishing threatens local populations of rock cod. Resources in the park are so low that staff cannot adequately patrol the area or even put up proper signage;



Are Canadians loving their national parks to death?
J. Pleau/Parks Canada



- Georgian Bay Islands National Park has an area of only 25 square kilometers and is a naturally fragmented island group.

Some Published Definitions of Ecological Integrity

Biological integrity is the capability of supporting and maintaining a balanced, integrated, adaptive community of organisms having a species composition and functional organization comparable to that of the natural habitat of the region.

Karr and Dudley (1981)

When a community is dominated by native species, is relatively stable and shows other attributes of "health," it is said to have integrity.

Noss (1990)

Ecological Integrity is defined as a state of ecosystem development that is optimized for its geographic location, including energy input, available water, nutrients and colonization history.

Woodley (1993)

Ecological integrity is the condition of an ecosystem where:

- the structure and function are unimpaired by human-caused stresses; and
- the ecosystem biological diversity and supporting processes are likely to persist.

Parks Canada, State of the Parks 1997 Report

- St. Lawrence Islands National Park experiences intense summer use levels of 5000 visitors per square kilometre. Very high levels of human disturbance are threatening many populations of reptiles, including the rare fox snake. Native large carnivores have been eliminated and the high deer population is affecting the native plant communities and increasing the invasion of alien plant species.

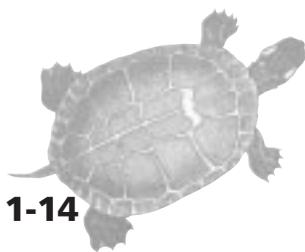
Clarifying Ecological Integrity: Concept and Definition

The idea of conserving nature unimpaired has been part of national parks' legal mandate since 1930. The term "ecological integrity" was put into the 1988 amendments to the National Parks Act, but was in park policy as early as 1979.

The use of the term "ecological integrity" attempts to put a measurable and defensible definition around the idea of impairment. Ecological integrity is used by many groups, companies and agencies, but in Canada the term is not yet in common public use. It is important that Parks Canada and its partner groups agree upon and operate around a common understanding of the concept of ecological integrity.

While the concept of ecological integrity is based on biological understanding, it is not necessary to be a biologist to understand ecological integrity. "Integrity" denotes wholeness, entirety, or soundness. In simple terms, ecological integrity refers to whole and complete biological systems, including species, landscape elements, and processes. For example, Vuntut National Park has ecological integrity — that is, the park has a full complement of native species and ecological processes and structures — whereas a cornfield in southern Ontario lacks ecological integrity because it has an altered species complement and changed ecosystem functions relative to the historical "whole" or "unimpaired" state. Note that humans are part of both these ecosystems.

The Panel has no particular problem with the existing definitions. However, we learned that park staff at many levels want to be held accountable for managing for ecological integrity, but feel they lack guidance on the definition. In order for managers and auditors to be able to defend appropriate management decisions and actions based on ecological integrity,



the definition needs to be clear and unambiguous. This definition has to be simultaneously:

- narrow enough to focus Parks Canada's efforts to a common, system-wide goal;
- rigorous enough to pass scientific scrutiny; yet,
- flexible enough to account for the fact that some national parks today are highly altered from their historical condition by human activity, yet may nevertheless be managed in ways that might restore integrity, if not necessarily the historical condition.

In addition, the definition must embody some notion of what ecological integrity looks like so that Parks Canada can build defensible policies and plans to get there. The definition, if not the concept, must provide guidance in the sense of direction. Parks Canada needs

to "know ecological integrity when they see it" in order to decide when and where management action needs to be directed.

We propose a definition of ecological integrity that incorporates elements from many published definitions. It is slightly different from the existing Parks Canada definition in that it emphasizes the park as characteristic of the natural region the park represents.

Our proposed definition also de-emphasizes the clause "unimpaired by human-caused stressors" which is in the current Parks Canada definition. That clause is often misinterpreted to mean that people are not part of the ecosystem, or are unwelcome. Certainly people are part of, and even dominate, most world ecosystems. The act of setting aside national parks is an explicit means to hold some lands sacred for their wild state, where humans do not dominate the ecosystem.

RECOMMENDATION

1-1. We recommend this revised definition of ecological integrity:

"An ecosystem has integrity when it is deemed characteristic for its natural region, including the composition and abundance of native species and biological communities, rates of change and supporting processes."

In plain language, ecosystems have integrity when they have their native components (plants, animals and other organisms) and processes (such as growth and reproduction) intact.

For national parks, this characteristic state must respect the following criteria:

- ecological integrity should be assessed with an understanding of the regional evolutionary and historic context that has shaped the system;

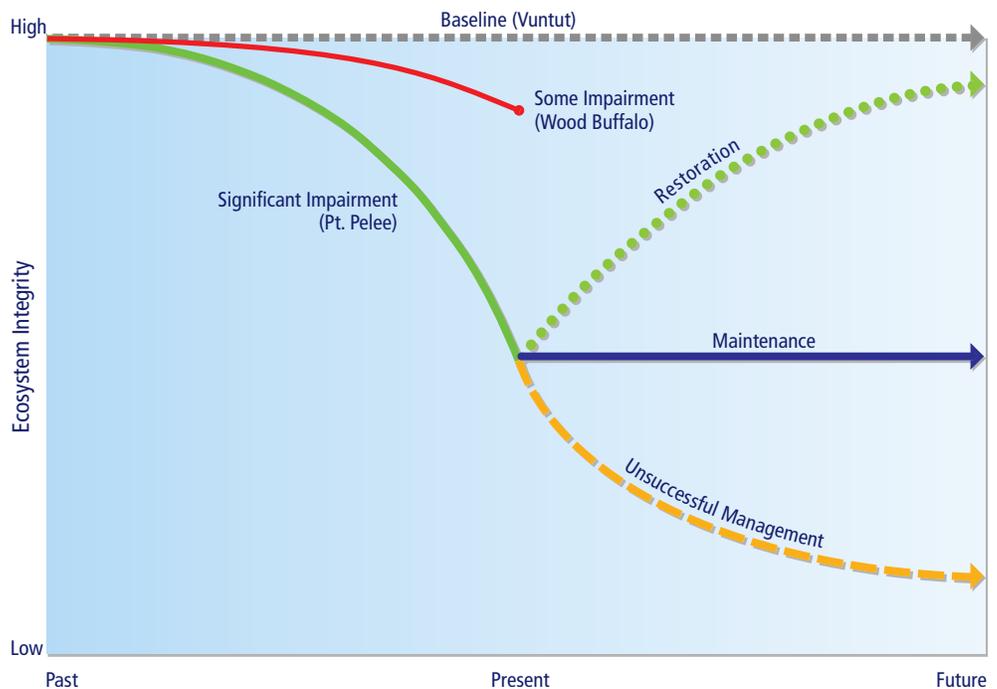
- because ecosystems are dynamic, conservation strategies should maintain or restore key ecological processes within their natural range of variability;
- ecosystems are multi-scaled and conservation should be considered at many scales. National parks are part of larger ecosystems and must be managed in that context;
- functional connections between parks and equivalent protected areas within the regional ecosystem should be maintained or restored, to allow wildlife movement;
- populations of species should be managed to levels that have a high likelihood of persistence;



- ecosystems have characteristic rates of change. Understanding rates and direction are critical to understanding the system;
- parks have a finite capacity to withstand use. Human use and facilities should be compatible with park ecosystem protection in type, amount, and timing;
- ecological integrity must be assessed and understood at a landscape scale. While ecological integrity cannot be assessed at the scale of a single forest stand, campground, or parking lot, it can be compromised at any scale. Even small scale impacts can have cumulative effects and should be considered in this light;
- the goal of conserving ecological integrity is best addressed by maintaining or restoring the diversity of genes, species and communities native to the region. It is simply consistent with the vision of integrity, which is “wholeness” — if parts are missing, the ecosystem is not whole.

Figure 1-3. Managing National Parks for Ecological Integrity: Three Sample Parks

This illustrates various management choices in relation to increasing impairment of ecological integrity. In the case of Vuntut National Park, with pristine ecological integrity, no management is required. As integrity becomes impaired, managers can either maintain the current level or actively intervene to restore the park’s ecological condition. Unsuccessful resource management, or a failure to act, will result in a decline in ecological integrity.



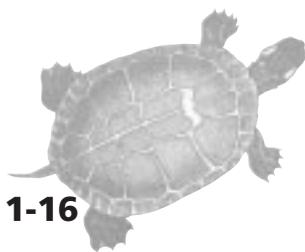
Advantages of the New Definition

Our proposed definition has advantages over the existing Parks Canada definition of ecological integrity.

Our definition facilitates management according to the precautionary principle. There is no implied requirement for “proof” that particular components of the ecosystem are necessary for

its persistence, nor to engage in any debate about it. It is enough to manage the ecosystem to avoid loss of, or to restore, native genes, species and communities because the system simply lacks ecological integrity in their absence.

Our definition also justifies active management. For example, where it is unlikely that some native predators will occupy certain parks again, the



Western Brook Pond, Gros
Morne National Park. H. Quan



definition facilitates the active control of herbivores to densities where native plant communities persist. So too, maintenance of natural processes such as fire is encouraged, even if these processes are actively managed.

By using our definition, Parks Canada's mandate to manage for ecological integrity will be buffered from criticism that it is managing for steady state, or turning back the clock. However, the Panel contends that by managing for historic ranges of variation, processes that may take the ecosystem into the future are also conserved. Further, by referring to variation, the definition is immune to red herring arguments about which particular time periods represent the "original" state of ecological integrity. The idea of targets for indicators of ecological integrity imbedded in the definition implies thresholds below which some kinds of human use are compatible and appropriate, and above which Parks Canada can just say "no."

The proposed definition facilitates accountability through goals, direction, and audits, all of which are implied. Finally, our definition facilitates a prioritization of indicators for monitoring ecological change, based on the reliability of data about targets for indicators.

Fundamental Tools

Adaptive Management and the Precautionary Principle

Throughout this report, we refer to two fundamental tools that we feel will aid Parks Canada in its progress toward achieving its mandate. These are adaptive management and the precautionary principle.

In its broadest sense, adaptive management is done whenever the dual goals of achieving management objectives and gaining reliable knowledge are accomplished simultaneously; it is a scientifically defensible means of, literally, learning while doing.

Chapter 3 contains a detailed explanation of how the adaptive management process can be successfully applied within Parks Canada's planning framework; other chapters present similar ideas illustrating how the adaptive management model can be used in other fields.

The other tool that we believe will serve Parks Canada well in embracing ecological integrity is the precautionary principle. As the name implies, the principle emphasizes the need for care and caution when changes to the natural environment are contemplated. This is particularly important when knowledge of a natural system is incomplete or when an area is unusually susceptible to damage.



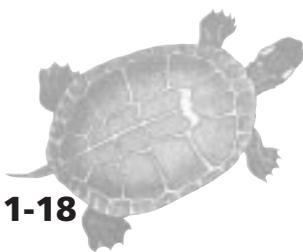


Pacific Rim National Park Reserve. P.Wilkinson

The precautionary principle is based on several premises (adapted from the Banff-Bow Valley Study):

- nature has intrinsic value;
- governments must be willing to act in favour of conservation in the absence of evidence of negative environmental effects;
- people proposing a change are responsible for demonstrating that the change will not have a negative effect on the environment;
- today's actions are tomorrow's legacy;
- all decisions have a cost. Exercising caution may mean some people must forgo opportunities for recreation or profit.

The precautionary principle should be the guiding rule in determining appropriate action for protecting or restoring ecological integrity in national parks and in daily management. Currently, precautionary approaches to decision-making and management are not supported in Parks Canada. Always taking the side of ecological integrity places ecological integrity squarely in the centre of every management decision, instead of relegating it to an "add-on" that can be easily forgotten or quickly discounted.



Protecting Ecological Integrity *With* National Parks

National parks are essential in maintaining and restoring ecological integrity across much larger landscapes, areas large enough for natural processes and succession to occur and for viable populations of wide-ranging species to be maintained.

National parks exist amid a world full of environmental changes and stresses. National parks are Canada's icons — they are also bellwethers. Detecting ecological stresses inside national parks is a warning of larger and more serious stresses that threaten from the outside.

Throughout this report, we document many examples of national park successes in managing for ecological integrity. There are problems, definitely — but things are not so bad that they cannot be changed. There is tremendous opportunity for innovation, bold new thinking and decisive action.

About This Report

It is important to note that our report contains two volumes. "Volume I: A Call to Action," is an umbrella document that describes the serious threats that beset Canada's national parks, presents an overview of values that may be lost if the threats are not resolved, and identifies roles and key actions for all Canadians and particularly Parks Canada to help resolve the threats. "Volume II: Setting a New Direction for Canada's National Parks" identifies specific issues and problems and makes equally specific recommendations to the Minister and to Parks Canada on how these issues could be addressed.

The chapters that follow elaborate on the Panel's observations, findings and recommendations. The report first examines the corporate culture of Parks Canada, then looks into the planning and science capacity of the organization. External issues follow — working with Aboriginal peoples, establishing new parks and regional integration of national parks in a network of protected areas. Next the report examines "people" issues — interpretation, appropriate use, and the ecological footprint within national parks. Finally, we make recommendations regarding new and existing funding for national parks. Because many of these themes and issues we explore have consequences in more than one field or area, there are links and internal cross-references throughout Volume II.

Given the Panel's mandate to address ecological integrity in national parks, this report deals only with those parks established under the National Parks Act, which contains reference to the maintenance of ecological integrity. Our report therefore excludes analysis of marine conservation areas, which fall under a different act; however, we expect many of these concepts and recommendations would apply to marine conservation areas. Consequently, the term "national park" used throughout this report refers only to terrestrial national parks and national park reserves.

While there are branches of the Parks Canada Agency concerned with national historic canals, national historic sites, and other locations or structures, in this report the term "Parks Canada" is used specifically with reference to those departments and branches of the Parks Canada Agency that have jurisdiction over national parks.

Appendix B is a glossary of other terms used in this report.

