



ACTION ON THE GROUND

*Ecological Integrity
in Canada's National Parks*



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Catalogue No.: R62-372/2005

ISBN: 0-662-68974-7

Message from Canada's Minister of the Environment

Ecological Integrity and Environmental Protection are Essential to Our Future

Few countries are as blessed with natural riches as Canada. Our national parks system is envied around the world, and our system of national marine conservation areas promises to be held in equal esteem when it is ultimately completed. Canada's protected heritage areas are truly special places. They are icons of our nation and its rich natural heritage, part of national identity, and a source of pride for all Canadians.

As the Minister of the Environment and the Minister responsible for Parks Canada, I am committed to the conservation of our national parks and national marine conservation areas for present and future generations, and to providing opportunities for Canadians to experience them in their natural state. The Government of Canada shares this commitment. In both Budget 2003 and Budget 2005, we made significant long-term investments in the ecological integrity of Canada's national parks. We did so because these places are national treasures that belong to all Canadians – places of beauty and wonder that foster and support conservation.

National parks are very important to me. I believe that the future of Canada's sustainable economy depends on our commitment, as a nation, to protect our environment; that our environmental health will be a barometer of our economic health, and that tremendous opportunities exist for Canada to become a leader in the use of green technologies. In the future, our most valuable assets will be our clean water, our healthy ecology, and our natural heritage. All of these assets are in rich abundance in Canada's national parks and national marine conservation areas.

Maintaining our national parks in good ecological health has not been easy. It has required dedication and commitment on the part of Parks Canada and its partners in conservation, from environmental organizations to the scientists who have participated in collaborative research projects with the Agency. A major achievement occurred with the formation of the Panel on the Ecological Integrity of Canada's National Parks, and the release of its report in January 2000. The panel not only provided a realistic picture of the threats to our national parks, and of the stressors affecting their ecological integrity, it provided a blueprint for action.



The Honourable Stéphane Dion
Minister of the Environment

Through its report, the panel issued a challenge to Parks Canada, the federal government, and all Canadians. It urged us to take immediate action to conserve our natural heritage, and our national parks. We responded quickly and effectively. By March 2000, an action plan was in place to implement the panel's recommendations, and in early 2001 the Government made a commitment to invest in the ecological integrity of Canada's national parks.

Parks Canada has taken the lead in implementing the panel's recommendations, and in developing programs, scientific expertise, and partnerships in support of ecological integrity. The greater national park ecosystem partnership program, which recognizes that many of the stressors affecting the ecological integrity of our national parks originate outside their boundaries, is a case in point.

This publication highlights many of the ecological integrity initiatives and projects that have been undertaken in recent years. It is a book of success stories. Stories that demonstrate how effective we can be when we work together toward a common cause, and how our national parks continue to be models for environmental protection in Canada. The partnerships between Parks Canada, governments, communities, Aboriginal people and universities that have contributed to the success of our efforts to maintain or improve the ecological integrity of our national parks speak to this.

Protection is truly a shared responsibility. We can all take pride in the work we have done to maintain or improve Canada's national parks to sound ecological health, and in the work that we will do in the future. Much remains to be done, however. On behalf of all Canadians, I wish to congratulate Parks Canada on this publication, and on its leadership. Accomplishments such as the ones recounted in the following pages provide the inspiration we need to ensure that Canada's national parks will remain the wonderful places they are today, and continue to hold a special place in the hearts of Canadians for generations to come.



The Honourable Stéphane Dion,
Minister of the Environment

Table of contents

Message from Canada’s Minister of the Environment	i
Table of contents	iii
Message from the Chief Executive Officer, Parks Canada	1
Letter from Jacques Gérin	3
Acknowledgements	4
Better Park Management	5
The return of the cougar!	6
Elk and the town of Banff – finding the balance	7
Taking the lead against greenhouse gases in national parks	9
Restoring the integrity of aquatic ecosystems in Mountain National Parks	11
Piping plovers are making a comeback in Kejimikujik’s Seaside Adjunct	13
Ecosystem Restoration	15
Restoring Saskatchewan’s mixed prairie grasslands	16
Restoration initiative blends with recreational use at high-profile national park facility	17
Bringing back Kootenay’s original dry grasslands and open forests	19
Restoring Laurentian aquatic ecosystems	21
Battling invasive species in Garry oak ecosystems	23
Saint-Ours Canal National Historic Site of Canada restores ecological connections	25
Granddaddy of restorations maintains remnant of Carolinian Zone	27
Engaging Canadians	29
New learning centre to draw visitors into Fundy’s ecoscape	30
First-ever comprehensive inventory of Inuvialuit traditional plant knowledge in the Western Arctic	31
Community stewardship reverses steady decline of salmon stock in Terra Nova National Park of Canada	33
Ensuring badgers remain a vital part of the East Kootenays is the aim of an international, public-private sector partnership	35
Local residents, Aboriginal communities and fishers work together to restore Soft-shelled clams	37
Promoting Regional Partnerships	39
Wood turtle recovery in La Mauricie National Park of Canada	40
Jasper National Park of Canada is burning for conservation	41
National Parks hold the line between Mountain pine beetle epidemic in British Columbia and Alberta’s commercial forests	43
Achieving bovine TB-free status in domestic cattle and park wildlife	45
Parks Canada joins a partnership to heal Canada’s temperate rainforest	47

Message from the Chief Executive Officer, Parks Canada

By ensuring that our national parks are models of sound environmental protection and management, Parks Canada is helping to build the next generation of environmental stewards.

It gives me great satisfaction to introduce this set of stories that showcase our ongoing efforts to protect ecological integrity in Canada's national parks and national historic sites. These stories speak to the dedication and commitment of Parks Canada's employees, who have worked exceptionally hard, often with limited resources, to ensure that our natural heritage is conserved for the benefit of all Canadians. They also speak to the importance of the partnerships that Parks Canada has forged with stakeholders, organizations, and Aboriginal communities to achieve this all-important goal.



Alan Latourelle
Chief Executive Officer
Parks Canada Agency

The challenges Parks Canada faces in improving and maintaining the ecological integrity of our national parks and national historic sites are significant. When the Panel on the Ecological Integrity of Canada's National Parks released its report in 2000, it painted a frank, comprehensive and disturbing picture of the ecological condition of our parks. The panel concluded that Canada's national parks were threatened, and that urgent action was needed to bring them back into good ecological health. This assessment has shaped Parks Canada's corporate priorities over the past several years, and resulted in the Agency receiving significant new funding to achieve its ecological integrity goals.

We now have the resources we need to build on the success described in these projects, and to employ the lessons we have learned from them across our national parks, national marine conservation areas, and to some extent, the national historic sites systems. The projects describe some of the significant milestones we have reached on our ecological integrity journey, including: making ecological integrity central to park management; collaborating with Aboriginal peoples and allowing them to practice traditional activities in national parks; developing ecological integrity training programs for employees; increasing dialogue with other levels of government and federal agencies to promote cooperative ecological integrity activities; raising awareness of the ecological integrity challenges facing national parks to engage Canadians in their conservation; and initiating public education projects. We also set new standards for park management plans, which now include long-term ecological integrity visions, as well as ecological integrity objectives and indicators.

The successes recounted in this publication are primarily focused on collaborative efforts that have occurred between Parks Canada and our stakeholders and partners. Choosing these showcase projects was not easy. There are many other success stories from around the country that are equally significant. However, these few examples provide a good overview of the work being carried out in our national parks and national historic sites.

We are very proud of our ongoing partnerships with provincial, territorial, and municipal governments, and of how this collaboration has helped to promote effective ecosystem-based management across administrative boundaries. This strategy has led to the creation of biosphere reserves, model forests and world heritage programs, as well as to initiatives such as the Parks and People Program with Nature Canada and our Greater Park Ecosystem Initiative. We have also worked with partners and stakeholders on site restoration, species at risk initiatives, and the use of traditional knowledge for better ecosystem management, among other projects.

The success we have enjoyed over the past several years in restoring our national parks to good ecological health has depended, to a significant degree, on the strong funding support we have received from the federal government. With this support, we have been able to develop targeted ecological integrity and species at risk projects, and we have had sufficient flexibility to deal with the enormous challenges inherent in natural resource management. We are also grateful to the many provincial and territorial governments, academic and research institutions, non-governmental conservation organizations, local and indigenous communities, industries and thousands of volunteers who have invested their time and resources in our parks.

Finally, I wish to thank the Parks Canada team for planning, implementing and presenting these projects. I hope their inspiring projects will serve as examples of best practices that will be applied widely both within Canada and abroad.

This publication is organized into four main themes that reflect Parks Canada's outlook on the business of ecosystem conservation: ecosystem restoration, better park management, engaging Canadians, and regional partnerships. We believe that our success depends on a careful mix of science and partnerships, on truly engaging Canadians in our mandate, and on ensuring memorable visitor experiences in order to foster a culture of conservation in Canada.



Alan Latourelle
Chief Executive Officer
Parks Canada Agency

JACQUES GÉRIN

March 18, 2005

Mr. Alan Latourelle
Chief Executive Officer
Parks Canada Agency
Gatineau, Quebec
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Dear Sir:

At the end of the recent Minister's Round Table, I had an opportunity to express my satisfaction with the progress made toward a conservation culture at Parks Canada, particularly with respect to implementation of the recommendations of the Panel on the Ecological Integrity of Canada's National Parks and the action plan that the Agency established for itself.

I wanted to salute the work of the whole Parks Canada team and the leadership that you provide.

I also wanted to point out the challenges that the Agency is now facing, including three that I consider major:

- Holding firm: This conservation culture must be firmly established throughout the organization and must remain fundamental, regardless of the vagaries of the moment.

- Doing a lot with a little: Even though we all welcomed the budget increases, which do give us cause to rejoice, there will always be more to do than there will be resources available. It will always be necessary to innovate, prioritize and emphasize the actions that will have the most impact in the long term.

- Promoting, both within and outside the Agency, with employees, visitors and the public, ecological integrity of the parks as a positive and constructive goal for raising all Canadians' awareness of and interest in the need to protect our parks now and in the future, for their enjoyment by present and future generations of Canadians.

Congratulations on what has been accomplished so far. I wish you every success in the work to come.

359 Mountbatten Ottawa, Ontario K1H 5W2

Acknowledgements

The following Parks Canada staff were involved in the projects outlined in this publication. They also contributed to writing and editing the articles.

- ***The return of the cougar!*** Renee Wissink
- ***Elk and the town of Banff – finding the balance*** Cliff White
- ***Taking the lead against greenhouse gases in national parks*** Cam McKillop and Greg Shaw
- ***Restoring the integrity of aquatic ecosystems in Mountain National Parks*** Nancy Glozier, Robert Crosley, Larry Mottle and David Donald
- ***Piping plovers are making a comeback in Kejimikujik’s Seaside Adjunct*** Chris McCarthy
- ***Restoring Saskatchewan’s mixed prairie grasslands*** Adrian Sturch
- ***Restoration initiative blends with recreational use at high-profile national park facility*** Jane Watts and Barb Porter
- ***Bringing back Kootenay’s original dry grasslands and open forests*** Rick Kubian and Alan Dibb
- ***Restoring Laurentian Aquatic Ecosystems*** Albert Van Dijk
- ***Battling invasive species in Garry oak ecosystems*** Brian Reader
- ***Saint-Ours Canal National Historic Site of Canada restores ecological connections*** Sylvain Paradis
- ***Granddaddy of restorations maintains remnant of Carolinian Zone*** Dan Reive
- ***New learning centre to draw visitors into Fundy’s ecoscape*** Michael Murray and Thierry Bouin
- ***First-ever comprehensive inventory of Inuvialuit traditional plant knowledge in the Western Arctic*** Ed Mclean
- ***Community stewardship reverses steady decline of salmon stock in Terra Nova National Park of Canada*** David Coté and Andrea Coté
- ***Ensuring badgers remain vital part of East Kootenays is aim of international, public-private sector partnership*** Nancy Newhouse and Alan Dibb
- ***Local residents, Aboriginal communities and fishers work together to restore Soft-shelled clams in Kouchibouguac National Park of Canada*** Eric Tremblay
- ***Wood turtle recovery in La Mauricie National Park of Canada*** Jacques Pleau and Denis Masse
- ***Jasper National Park of Canada is burning for conservation*** Kevin Van Tighem
- ***National Parks hold the line between Mountain pine beetle epidemic in British Columbia and Alberta’s commercial forests*** Dave Dalman and Jane Park
- ***Achieving bovine TB-free status in domestic cattle and park wildlife*** Todd Shury
- ***Parks Canada joins a partnership to heal Canada’s temperate rainforest*** Bob Hansen

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BETTER PARK MANAGEMENT

Better Park Management: recognizing that national parks are not stand-alone conservation spaces but are part of larger, integrated ecological systems, the Agency's park management approach works on a regional ecosystem basis rather than being limited to individual species at risk. This perspective has led to a more active and engaged management that is willing to intervene in ecosystems to maintain the values that our parks were created to protect.



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The return of the cougar!

Parks Canada researchers make positive ID of fabled “ghost” of New Brunswick forests

Researchers at Fundy National Park of Canada have solid DNA evidence that hair samples taken from two test sites are from cougars, an animal last confirmed in New Brunswick in 1938. These cougars were attracted to “scent posts” resembling large cat scratching posts that were baited with a lure that includes cougar urine. When a cougar comes to investigate the scent, it rubs against the posts, leaving behind hair on Velcro®-like strips attached to the posts. These hairs, collected bimonthly by park warden staff, are the cougar’s genetic calling card. Once retrieved, the hairs are sent for DNA analysis at the Laboratoire d’écologie moléculaire et d’évolution, Université de Montréal.

Thought to be extirpated since the early 1900s, the elusive Eastern cougar (*Felis concolor cougar*) is currently listed on the “data deficient” list of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The analysis so far does not confirm the population origin of the Fundy cougars. The animals could be a remnant of the Eastern cougar, or an exotic animal that may have escaped or been released into the wild, or a long-distant migrant from the west. What we do know is that this is the first solid evidence that the so-called “ghost” of New Brunswick forests exists.

Unconfirmed cougar sightings have been reported in the area of Fundy National Park since before the park was established in 1948. Today, the many New Brunswickers whose reports of cougar sightings over the years were dismissed as foolish can take some sense of satisfaction from the new findings.

With this information in hand, Parks Canada and its partners will expand and modify its monitoring network of scent posts and remote cameras to capture a greater quantity of higher-quality hair samples for analysis. Fundy National Park is in the second year of an Eastern cougar monitoring program. Similar monitoring programs are also taking place in Kouchibouguac, Cape Breton Highlands, La Mauricie and Forillon National Parks.



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Elk and the town of Banff – finding the balance

Removing elk to bring back aspen and willow—an evolving strategy restores the balance between plants, predators and prey in Banff National Park of Canada

Elk are magnificent animals, as well as a vital part of Banff National Park of Canada's ecosystem. They are the main herbivore, or plant eater, in the park and, in turn, are a major food source for predators such as wolves and cougars. However, very high elk concentrations in the town of Banff over the last 15 years have resulted in serious declines in aspen and willow trees, upsetting predator/prey relationships and increasing public safety concerns.

Archaeological and historical records indicate that large numbers of elk were generally not prevalent on the eastern slope of the Canadian Rockies. However, by the mid-1990s, conditions in Banff National Park had changed, leading to a large increase in the number of elk. Intense human activity in Banff's Bow Valley had scared away the elk's natural predators and high densities of unhunted elk congregated in the town of Banff, along highways and in other predator-free zones. In addition to threatening public safety, the presence of such a large number of elk was rapidly reducing native aspen and willow, an important habitat for songbirds and beaver.

In 1999, Parks Canada and the community-based Elk Advisory Committee implemented the Banff National Park Elk Management Strategy. With an adaptive management approach, the plan had two key goals: restoring ecological balance to the lands outside the town, and reducing elk-human conflicts.

Parks Canada and its partners moved quickly on the plan and undertook a series of intensive restoration activities from 1999 to 2003. Human activity was sharply reduced in wildlife corridors near the town of Banff. The presence of corridors meant that wolves and cougars returned to hunt in the lower Bow Valley, re-establishing the original predator-prey relationship. The number of elk was further reduced when park wardens captured 251 "town elk" (those who had become habituated to town life with humans), and relocated them outside the Bow Valley. Once these animals were moved, aversive conditioning began on the remainder

of the herd to increase the wariness of elk toward humans and restore their migratory behaviour. In the final stage of the restoration project, a large prescribed burn was completed east of the town. Residents and businesses replanted many areas with natural vegetation.

Today, there are far fewer elk in the Bow Valley. Willows are thriving and trembling aspen is abundant in the area of the prescribed burn. Banff is returning to a more natural balance of plants, predators and prey.



© Parks Canada, W. Lynch, 1989

Results

- The number of elk in and around the town of Banff declined from over 500 in the 1990s to fewer than 200 by 2003. The elk population target was met one year early.
- Public safety target met: reports of aggressive elk incidents are down from 106 (in 1999) to 19 (in 2003).
- Elk wariness levels have increased through aversive conditioning, thus improving chances that elk will avoid the town site in the future.
- An increased number of elk engage in migratory behaviour.
- Corridor restoration has improved predator access to prey.
- Willows are thriving. Aspens are regenerating in the prescribed fire area near town.



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Taking the lead against greenhouse gases in national parks

Wind-power generation comes to Prince Edward Island National Park of Canada, while Riding Mountain National Park of Canada “greens its fleet” with electric cars

Two national parks are at the forefront of efforts to cut greenhouse gases while “doing business”. Their initiatives are impressive and instructive for visitors.

At Prince Edward Island National Park of Canada, power generation has switched from the grid to wind power with the November 2004 installation of a wind turbine to power the Cavendish Campground. Part of a five-year rehabilitation project to improve the park’s ecological integrity and visitor experience, the wind turbine is also a striking example of the park’s leadership in promoting environmental stewardship.

The renewable energy produced by the turbine will reduce the park’s greenhouse gas emissions by 20 tonnes of CO₂, equivalent to the amount of CO₂ produced by three Canadian households annually. Park visitors for the 2005 camping season will find new interpretive stations explaining the initiative and the need to reduce greenhouse gases. Visitors will learn that even the construction of the turbine followed strict environmental requirements, a further testament to the park’s commitment to practicing good ecology. A wind-analysis survey determined the turbine’s best location for minimal adverse impact on the environment. All construction activity occurred after the critical bird nesting period, and the clearing of undergrowth was kept to a minimum. As well, all unsalvageable wood was chipped and used on the site during the final rehabilitation phase.

The local community welcomed the turbine project, which was the first of its kind in Canada’s national parks system, and worked closely with staff. Many other organizations and groups collaborated on the project, including: Natural Resources Canada, Environment Canada, Canadian Wildlife Service, Transport Canada, Frontier Power System Inc., GPCo Inc. and Vision Quest Windelectric Company.

With the introduction of electric cars to Riding Mountain National Park, park staff were delighted to have the means to tackle greenhouse gas emissions on an everyday basis. Previously, they had used large, older pickup trucks with less-efficient engines. The new electric cars—manufactured by Dynasty Motorcar of Delta, British Columbia—are completely battery powered, which means they don’t emit harmful gases and are extremely quiet. The cars have plastic and fibreglass bodies, two seats and a large cargo area that is big enough to carry a two-metre stepladder. They can be used for a full workday, then plugged in overnight to be ready for the next morning. with their immediate benefits to the environment, these zero-



© Parks Canada, K. Bachewich, 2003

emissions cars provided another boon for park staff — the opportunity to “show off” how the average Canadian car owner can cut greenhouse gases. Staff were overwhelmed by the cars’ impact on visitors. The vehicles triggered an avalanche of questions about their technology, cost and highway performance. Park staff received so many questions about the cars that it began to interfere with their work. To get the word out more efficiently, staff taped a set of frequently asked questions (and answers) to the cars’ windshields, letting the parked cars “speak for themselves”.

Results

First-ever installation of a wind turbine in a national park

- Provides approximately 20% of the electrical needs of the Cavendish Campground on an annual basis.
- Reduces the park’s greenhouse gas emissions by 20 tonnes of CO₂, equivalent to the amount of CO₂ produced yearly by three Canadian households.
- Offers an on-site demonstration of renewable energy for educational purposes.
- Earns revenue for the park, as electricity generated when the campground is closed is sold to the local utility.
- Has caused no bird or bat mortality since installation, as assessed by weekly monitoring.

Little electric cars match function to form cleanly

- Function very well as park vehicles and are 80% more efficient to operate than a gasoline equivalent.
- Provide zero tailpipe emissions.
- Reduce greenhouse gas emissions by 2 tonnes annually.
- Raise environmental awareness—especially as it relates to global warming and Canada’s commitments under the Kyoto Protocol—as crowds of curious park visitors, suppliers and local community people press staff for information about the vehicles.
- Forced the retirement of over-sized, older pickup trucks with less-efficient engines.
- Reduce noise pollution, as battery-operated cars are extremely quiet.



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Restoring the integrity of aquatic ecosystems in Mountain National Parks

30 years of monitoring shows improved water quality is directly related to better park management practices

A long-term water-monitoring program conducted by Parks Canada and Environment Canada reveals significant improvements in overall water quality for key headwater aquatic systems in Alberta. The positive trend in water quality over the past 30 years is directly related to improved water-quality management practices within Banff National Park of Canada and Jasper National Park of Canada.

Water quality has been monitored monthly in the Mountain Parks since 1973, in the watersheds of the Bow, North Saskatchewan and Athabasca rivers. Improvements in concentrations of nutrients and bacteria were recorded at downstream sites, and were particularly evident in the lower Bow River below the town of Banff.

This assessment examined over 60 water-quality parameters, paying particular attention to nutrient levels. Nutrients are essential for aquatic life, but an excessive nutrient build-up (especially phosphorus and nitrogen resulting from human activities) can lead to eutrophication. Eutrophication results in algal blooms that can adversely affect water supply, livestock watering, irrigation, navigation, angling and water sports.

The significant improvements observed in the lower Bow, particularly in the last decade, are directly related to improvements to Banff's sewage treatment facility. The extreme coliform concentrations observed in the early years of the study period (1970s-1980s) have virtually disappeared. Increasing phosphorus trends, which began before 1989, have significantly dropped off and average concentrations have been reduced.

Although the lowering of nutrient concentrations is substantial so far, nutrient enrichment remains the main concern for aquatic ecosystems within these national parks. Treatment plants can remove significant amounts of wastewater contaminants such as grit, debris, suspended solids, pathogens, oxygen-depleting wastes, nutrients, roughly 200 different metals, persistent organic compounds and other chemicals. A "tertiary treatment" capacity allows for an advanced wastewater treatment approach, using additional filtering or chemical or biological processes to remove specific compounds or materials that remain after the initial treatment.

In 2003, after the completion of upgrades raising the Banff, Lake Louise and Jasper municipal treatment facilities to a full tertiary treatment level (including phosphorus removal), the downstream sites on the Bow and Athabasca rivers are expected to recover even more. These upgrades are major steps toward maintaining and

restoring water quality and aquatic biodiversity to park waters. Parks Canada will continue to monitor water quality and the relationship to the ecosystems these waters support.

Responsibility for the management of water resources in Canada is shared among municipal, provincial, territorial and federal governments. The extensive data gathered by this program monitoring Canadian rivers advances efforts to standardize information about the quality of surface and ground water sources across Canada and about the ecological effects of pollutants in aquatic ecosystems.

The drinking water for Alberta cities flows out of the Mountain National Parks. Success in protecting water quality in these parks is good news for Albertans and good news for the parks' ecosystems.

Results

- Improved concentrations of nutrients and bacteria at downstream sites, especially in the lower Bow River.
- Improvements are directly related to upgrading the sewage treatment facility in Banff.
- The extreme coliform concentrations observed in 1970s and 1980s have virtually disappeared.
- The increasing phosphorus trends seen before 1989 have been curtailed and average phosphorus concentrations have been reduced.
- Continuous, long-term and broad coverage of this monitoring program provides unique data on key Canadian rivers and sets the standard for coordinating and integrating data from provincial, national and other sources.
- The quality of drinking water in Alberta's cities has improved.



Piping plovers are making a comeback in Kejimikujik's Seaside Adjunct

Kejimikujik National Park and National Historic Site of Canada reduces human-induced stressors to restore and protect habitat of these endangered shorebirds

The nest of the Piping plover (*Charadrius melodus*) is different from many other birds' nests. These small shorebirds arrive in Atlantic Canada in late April or May and stay through the summer to breed and fledge their young. Their nests consist of small depressions in the sand, and are situated just above the high-tide line on exposed sandy or gravelly ocean beaches, sand spits or barrier beaches. The nests may contain small shells and pebbles for camouflage, making it difficult for predators and for hikers walking along the beaches to see them.

The Committee on the Status of Endangered Wildlife in Canada listed Piping plovers as "endangered" in 1985. Plover monitoring in Atlantic Canada reported 449 adult Piping plovers in 2000 (222 pairs, 5 singles), and 483 adult plovers in 2001 (220 pairs, 43 singles). It has become clear that sustaining plover habitat is a key factor in sustaining plovers. Human disturbance around breeding pairs is a major risk, as it places a great demand on the birds to defend their nests, which they do through displays. The displaying also causes them to spend time off their nests, which causes developing eggs to cool. Garbage left behind by people on the beaches also poses a risk, as it can attract the predators (crows, gulls, foxes and raccoons) that prey on the plover's eggs and young. Off-leash pets also pose a considerable threat.

A unique restoration effort is underway at the Kejimikujik Seaside Adjunct, the coastal portion of Kejimikujik National Park of Canada. While resource conservation staff have successfully controlled predators and people within plover nesting areas, the number of nesting pairs still declined from a high of 27 pairs in 1977

to just 4 pairs in 2003. Researchers noted that dense mats of vegetation (mostly Marram grass) had begun to threaten suitable plover nesting habitat. Also, in 2003, Hurricane Juan flooded and eroded a full third of the remaining favourable habitat in the Adjunct.

To help the Atlantic Piping plover recover, Parks Canada is collaborating with many other organizations in a National Recovery Plan for the Piping plover. Dense mats of Marram grass have been cleared to create new habitat at the Seaside Adjunct. Now in its second year, the restored habitat has helped

plovers to successfully raise four chicks. As well, Kejimikujik National Park has



© Parks Canada, J. Sylvester

created a new staff position that combines the role of researcher with the duties of an interpreter. This new position has raised public awareness about the plover's plight and about efforts to restore its habitat, as the public learns first-hand about the researcher's work.

Recovery team members are aiming to achieve a self-sustaining and well-distributed population of 670 adult plovers (335 pairs) within 10 years. They hope to create a habitat that will be able to sustain as many as 400 pairs and protect at least 65% of plover nesting habitat.

Results

- The plover fledging rate within Kejimikujik Seaside Adjunct has consistently met or exceeded recovery targets.
- To reduce human disturbance, sections of beaches and trails are closed to the public until chicks have fledged. Nesting areas are usually closed from early May until late July or early August.
- Plover monitors place predator exclosures around all nests to protect eggs up to the hatching stage. Made of wire mesh, the exclosures have openings large enough for adult plovers and chicks to pass through, but too small for predators. Predator exclosures within the park have led to increased hatching success and overall productivity.
- Thick mats of beach grass were removed from breeding areas in 2002 to restore an old plover breeding site. A few plovers returned to the area the following year, and in 2004, a plover pair successfully nested and fledged chicks in the area.
- A roving researcher/interpreter provides visitors with up-to-date information on the endangered bird. This information has reached 40% of all visitors to the area.



ECOSYSTEM RESTORATION

Ecosystem Restoration: intervening in an ecosystem to re-establish the historical mix of species, numbers and processes. Ecosystem restoration can be done by reintroducing native species where they are absent, removing species that are not naturally occurring within the ecosystem, and adjusting ecological processes to occur at rates that are natural for the region.



© Parks Canada, J. Watts, 2003

Restoring Saskatchewan's mixed prairie grasslands

Parks Canada and dedicated volunteers transform cultivated fields back into native prairie

Located in southwestern Saskatchewan, Grasslands National Park of Canada is the first national park in the country to preserve a portion of mixed prairie grasslands. Mixed prairie grasslands abound with a variety of plants and grasses, both short and medium sized. This habitat provides a home for a unique blend of prairie-adapted species, from the endangered Sage grouse and Burrowing owl, to the Black-tailed prairie dog.

When Grasslands National Park was established in 1988, roughly 1,280 acres (1% of park land) were under cultivation by local farmers. Restoring these lands became a high priority, given that cultivation removes nutrients from the soil and reduces habitat for native species. Moreover, in Saskatchewan, only 19% of the original mixed grass prairie ecosystem remains intact, and much of it is fragmented into small parcels.

Grasslands National Park is providing the direction and resources to help return the cultivated lands to their original mixed prairie grassland ecosystem. The first step was research to determine appropriate seeding rates and methods; restoration could then begin.

Restoration is a long-term, collaborative effort. Not all of the cultivated lands can be restored at once. Until a particular piece of land is scheduled for restoration, farmers continue to cultivate it, while ensuring that soil erosion and non-native plant invasion are minimized. Dedicated volunteers in the Prairie Grow Program and the Prairie Wind & Silver Sage Friends of Grasslands aid the effort by growing native wildflowers to produce seeds for planting in the park. Ranchers, farmers, representatives from the federal and provincial governments, from conservation groups and from universities have all participated in efforts to promote mixed grass prairie restoration.

Over 630 acres of cultivated lands have been re-seeded since 1997, and the park is on-target to restore all remaining cultivated lands (i.e. 1280 acres) by 2012. Diverse native plant species have been re-established at high rates, providing habitat for species at risk. Thanks to the help of hard-working volunteers, Blue grama grass, which is an historic favourite of bison, may soon return to Grasslands National Park's once-cultivated fields.



© Parks Canada, P. Lebel, 2004

Restoration initiative blends with recreational use at high-profile national park facility

Reversing decades of degradation, the restoration of Dickson Brook helps bring ecological integrity to an historic golf course

Years ago, Dickson Brook flowed through farmland, and before that, through Acadian mixed forest. Today, it flows through a nine-hole golf course in Fundy National Park of Canada. Opened in 1950, the golf course was one of the last courses designed by world-renowned landscape architect Stanley Thompson. Although Thompson was an environmentalist, and ahead of his time, his design required re-aligning sections of Dickson Brook. Subsequent modifications further compromised the brook, leaving it in an environmentally degraded condition.

The course was created at a time when there was less understanding of environmental issues in national parks. Attempts to canalize the flow of the brook and prevent damage to the golf course only made Dickson Brook more susceptible to flooding and erosion. Artificial embankment structures designed to channel the water and prevent floods washed out and were replaced several times at considerable environmental and economic cost. The stream channel was narrowed, reducing its ability to accommodate high-water flows triggered by heavy rainfalls. Erosion accelerated, raising concerns that mercury from the past use of pesticides and fungicides on the greens could be released into the aquatic ecosystem.

The natural stream features, such as pools, riffles and large rocks, which provide habitat and cover for fish, had disappeared from Dickson Brook. Improperly installed culverts blocked fish from their spawning and rearing areas, and stream banks lacked the native vegetation that would provide cooler water temperatures for fish and habitat for other wildlife.

Since then, much has been learned at Canada's national parks about maintaining ecosystems while still sustaining facilities such as golf courses. Today, Parks Canada is restoring the ecological integrity of Dickson Brook. The benefits are already becoming visible. The multi-year restoration will ensure the playability of the Fundy National Park Golf Course while it continues to reflect much of Stanley Thompson's original design, setting a fine example of ecological integrity initiatives integrated with recreational use.

Canada staff began restoration work in July 2004 on a 200-metre stretch of the brook, reconfiguring a channel meander to allow a more natural flow of water. Large rocks have been placed in the streambed to restore the riffle profile and provide habitat for fish. Planting native trees, shrubs and ground vegetation has stabilized the stream banks and provided habitat for wildlife. Before and after indicators, such as the number of fish in Dickson Brook, will be monitored as the restoration continues.



The benefits of this work will not be limited to Dickson Brook. A video is being made, aimed at park managers and golf course owners who are interested in similar stream restorations. Government departments in Canada and the United States, as well as local universities, have all expressed interest in the project.

Dickson Brook can serve as a model for stream restoration, demonstrating that restoration and recreation need not be incompatible. As an ecologically sound brook flows through his historic course, surely Stanley Thompson would approve.

Results

- The restoration of Dickson Brook at the Fundy National Park Golf Course demonstrates Parks Canada's ability to integrate ecological integrity initiatives with the recreational use of a high-profile national park facility.
- The Dickson Brook project moves Parks Canada closer to certification under the Audubon Cooperative Sanctuary Program for Golf Courses, an internationally recognized environmental stewardship program.
- Park staff restored a 200-metre section of Dickson Brook, using innovative stream restoration technology.
- Seven specially designed rock riffles were constructed to restore the natural riffle profile of the brook and provide fish with a passage through a large concrete culvert.
- A video for use by park managers and golf course superintendents interested in similar stream restorations is being developed.



Bringing back Kootenay's original dry grasslands and open forests

Using mechanical harvesters and prescribed fire, the Redstreak Restoration Project in south Kootenay National Park restores habitat integrity for native species

Kootenay National Park of Canada in the southwest Canadian Rocky Mountains is home to diverse landscapes and ecology, from the high peaks of the Continental Divide to the semi-arid Rocky Mountain Trench. The southwestern corner of the park—home of the Columbia Valley and Radium Hot Springs—is a dry, low-elevation valley that supports rich biodiversity and critical wildlife habitat. This area contains the only example of dry Douglas-fir/Ponderosa pine/wheatgrass vegetation in Canada's national parks and provides important winter range for wildlife, including the Rocky Mountain Bighorn sheep (*Ovis canadensis canadensis*). It is also the site where most of the human activity in the region occurs.

For thousands of years, natural fires maintained a variety of habitats in the Columbia Valley, creating a healthy mixture of young, middle-aged and old forests, shrublands, open meadows and dry grassy slopes. But now, after almost a century of successful fire suppression efforts in the region, the ecology has dramatically changed. Without the regenerative benefits of periodic, low-intensity surface fires, the Columbia Valley has been transformed into an even-aged blanket of mature forests that is encroaching on and dominating the original mosaic of species and habitats. Moreover, the dense forest now overtaking the area sets the stage for catastrophic wildfires, such as those seen in the summer of 2003.

To return ecological integrity to the valley and reduce wildfire risk, Parks Canada is restoring the rare and beautiful grasslands and open forest biodiversity of the South Kootenays through the Redstreak Restoration Project. The Redstreak Campground area near Radium Hot Springs was chosen as the site for the most ecologically appropriate tool to restore fire-maintained ecosystems—the mechanical harvesting of trees followed by carefully planned and managed burns.

The first phase of the project (2002-2003) focused on tree harvesting and removal in and around the campground in order to decrease the amount of fuel available for the prescribed fires. Hundreds of hectares have already been restored, using mechanical harvesting as a preparatory step for controlled fires. While mechanical tree harvesting is an odd sight to witness in a national park, it is an essential component of ecosystem restoration efforts. Periodic low-intensity fires are scheduled to begin in spring 2005, provided the right conditions are present.

Just as the forests that burned in the 2001 Mount Shanks fire are now full of wildflowers, and the 1968 Vermilion Pass burn

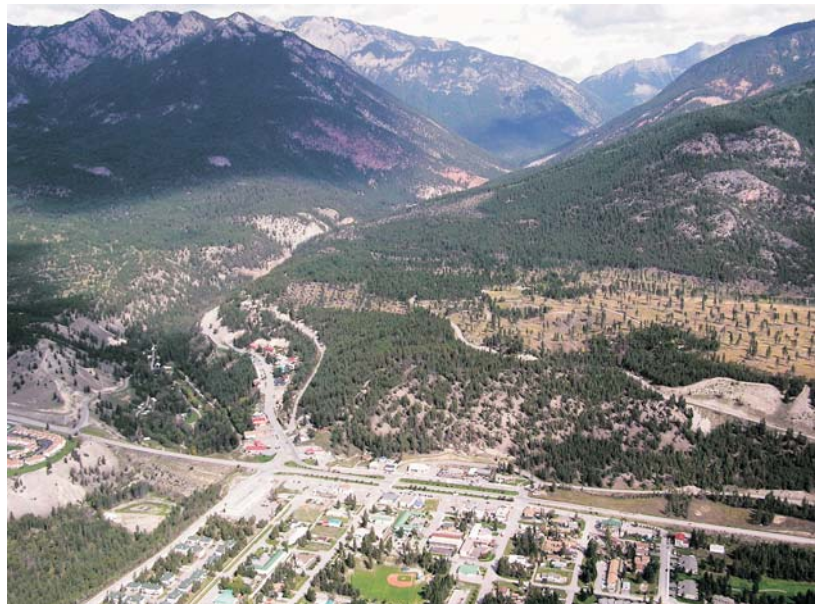


© Parks Canada, A. Dibb, 2005

provides prime habitat for lynx and moose, the dry grassy slopes of the Columbia Valley will once again provide a fertile habitat for Bighorn sheep and other native species.

Results

- Because tree removal requires heavy equipment that can damage soils, small plants and shrubs, Phase 1 of the project took place during winter, when the ground was frozen and covered with snow. This minimized the damage to the land and to small flora. The harvested trees were then sold, and the revenues returned to support the project.
- Controlled, low-intensity fires reduce both dangerous forest fuel loads and the risk of catastrophic fires. Trees were cut and removed from three areas totalling about 100 hectares. This form of “fuel reduction” allows low-intensity fires to be safely introduced.
- Managed fires will burn out young trees from among large, fire-resistant Douglas firs, and will also recycle nutrients and restore open forest.
- Between 350 and 400 hectares of fire-maintained open forests and grasslands will be restored in the Columbia Valley.
- Ten local adult Bighorn sheep have been radio-collared so that detailed location data can be obtained and used to monitor habitat selection and seasonal movement routes. Knowledge gained from monitoring will allow the Radium-Stoddart Bighorn Sheep Working Group to evaluate progress and refine restoration efforts as needed.



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Restoring Laurentian aquatic ecosystems

Lakes in La Mauricie National Park of Canada are once again supporting unique Brook trout and Arctic char populations

A vast ecological restoration program is underway to restore the health of aquatic ecosystems in La Mauricie National Park of Canada. The program includes the extensive removal of former dumps and dams and the restoration of aquatic bird nesting sites, as well as forest rehabilitation, anti-poaching surveillance and environmental evaluation. As part of this larger effort, park biologists have begun to implement a plan to restore a sub-species of the Brook trout (*Salvelinus fontinalis*) in the park's lakes. This sub-species is unique to the park.

La Mauricie National Park, in the heart of Quebec, is a landscape of rounded hills, deep valleys and extensive waterways characteristic of the lower Laurentian Mountains. The park has over 150 lakes, all interconnected by a network of brooks and small, cascading rivers that ultimately flow into the Matawin and Saint-Maurice rivers. These waterways support diverse fish species, including Brook trout, Speckled trout, Lake trout, Northern pike, Small-mouth bass, Yellow perch and Walleye. Français Lake supports the only Arctic char (*Salvelinus alpinus*) population in the region, which is the southern-most end of its range.

Park staff found that habitat destruction caused by earlier logging activities, poaching and non-native fish introductions by human beings has seriously threatened the existence of many species of indigenous fish. For 120 years, logging and log driving occurred on the majority of what are now park waters. These



© Parks Canada, M. Mills, 1997

activities have left a legacy of old dams, logging roads, accumulations of logs on lake bottoms, eroded sediments, and dragged streams. The impact of these activities greatly compromised fish habitat.

In response, Parks Canada has removed a number of dams and stream blockages. At Lac Édouard, park staff replaced the old dam structures with three sills created from rock fill, giving the site a natural flow and appearance. Spawning areas were also created upstream from the dam and between the sills. The drop in the average water level to within natural fluctuation levels for this lake made it possible to enlarge the nearby beach and to recreate many shoreline areas at the northern end of the lake.

The other challenge to the park's aquatic ecosystem is invasive fish species. Today, there are roughly 19 new species of fish that have been voluntarily or involuntarily introduced by people. These species have become a threat to the Brook trout.

Park staff have built a vast inventory of scientific knowledge about the natural wealth of the park's aquatic ecosystems and have directed that knowledge toward efforts to reintroduce and stabilize Brook trout populations. This past year, biologists collected fertilized eggs from this sub-species for over-wintering in an aquaculture facility. This spring, these eggs will be re-introduced into the lakes that their ancestors once inhabited in great numbers.

Results

- Improvements to the ecological integrity of 8% of surface waters (487 hectares) of La Mauricie National Park.
- The 83% increase in the number of lakes with restored fish ecosystems illustrates the significant reduction in the negative impacts caused by logging debris and other human activities.
- The Brook trout has been re-introduced in four lakes. Its genetic integrity has received enhanced protection.
- The removal of six dams and blockages to eight lakes has restored habitat for the Brook trout and Arctic char.



Battling invasive species in Garry oak ecosystems

One of Canada's most rare and most diverse ecosystems is at risk, but with the help of Parks Canada and volunteers, a unique habitat is being restored

A mosaic of woodlands, meadows, grasslands and scattered stands of transitional forests, Garry oak ecosystems are important not only for their great beauty, but also for their biological diversity. Thousands of plant, animal and insect species inhabit these ecosystems, among them the Garry oak, which is the only oak native to British Columbia.

However, Garry oak ecosystems are at risk, along with many plants and animals that depend on this unique habitat. The Garry oak ecosystem is home to over 100 species at risk. Of these species, 23 are threatened or endangered through their global range, and 21 are listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being at risk nationally.

In Canada, Garry oak ecosystems are found only on southern Vancouver Island, the nearby Gulf Islands, and in two small stands on the mainland. Within this area, most of the original Garry oak ecosystems have been cleared and converted to agricultural, residential and industrial uses. Over 95% of the original plant cover has already been lost. Encroaching suburbs and invasive species continue to threaten what remains of this diverse habitat. At Fort Rodd Hill National Historic Site of Canada, a 54-hectare site with a significant Garry oak ecosystem, non-native plants once introduced into gardens now comprise more than 40% of the vegetation, presenting a serious challenge to maintaining ecological integrity. Daphne, Scotch broom and other invasive species choke out native plants as they compete for space, light, water and nutrients.



Parks Canada staff and volunteers have worked together to stem this tide. Since 2002, funding from the Agency's Species at Risk Program has supported an invasive species control program at Fort Rodd Hill. Local community members, university students and Scouts worked alongside staff to hack, pull and remove invasive species from the site. Staff and volunteers removed 9.5 tonnes of invasive plants

in 2003 alone. In 2004, staff broke through tangled masses of invasive shrubs to reconnect beautiful tracts of Garry oak habitat. A newly cleared, 1.3-hectare site was fenced to protect new seedlings from rabbits and deer. Seeds collected from native plants at Fort Rodd Hill are being grown in greenhouses and will be transplanted to the fenced site to restore native plant cover.

Parks Canada is educating as it restores, raising awareness about these rare ecosystems. In 2004, a large, full-colour interpretive sign providing information about Garry oak ecosystems was erected at Fort Rodd Hill. This was the first time that a sign of this nature had been erected at a site primarily dedicated to military history. However, Garry oak ecosystems need not be relegated to history. With the help of Parks Canada and dedicated volunteers, these ecosystems will remain a part of our present as well as of our past.

Results

- Site staff and Garry Oaks Ecosystem Recovery Team botanists conducted a plant inventory at Fort Rodd Hill in 2002, finding 336 plant species. Seven of these species were rare, two of them at risk nationally.
- Last seen in the 1960s, the rare Deltoid Balsamroot was rediscovered at Fort Rodd Hill in 2002. Seeds have been collected and are being grown in a greenhouse. They will be transplanted later to help this endangered species survive.
- At Fort Rodd Hill, staff and volunteers continue to work to remove invasive species. In 2003, over 80 volunteers contributed 543 hours of labour. By the summer of 2004, about 12.5 tonnes of invasive species had been removed from the site.
- The Gulf Islands National Park Reserve of Canada was established in 2003, further aiding in the protection of Garry oak ecosystems.



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Saint-Ours Canal National Historic Site of Canada restores ecological connections

Ingenious passageway gives endangered fish access to Chambly spawning grounds and strengthens the Richelieu River's biodiversity

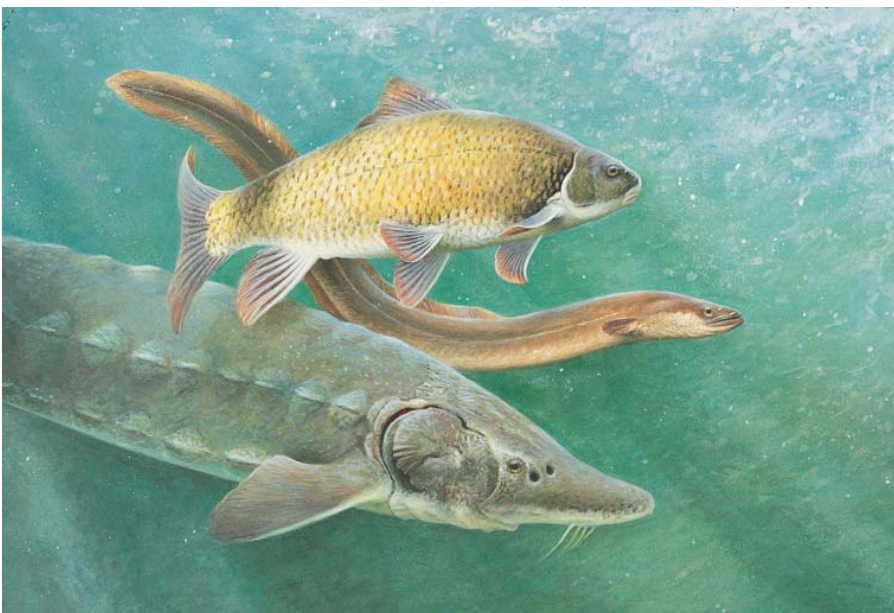
The Richelieu River, one of the largest tributaries of the St. Lawrence River, flows through the heart of Quebec's most populous area and is home to over 60 species of fish. The Saint-Ours dam, built in 1846, opened navigation on the Richelieu as far as New York City. The original dam added a fish ladder so that the impact on fish movement was minimal. However, when Transport Canada rebuilt the dam in 1969, the fishway was not replaced, with the result that by 1972, when Parks Canada acquired the site for the Saint-Ours Canal National Historic Site of Canada, the Saint-Ours dam had become a significant obstacle to fish.

Among those fish being blocked from swimming upstream to feed and spawn were four species at risk: Lake sturgeon, American shad, River redhorse and Copper redhorse. The only vertebrate species exclusive to Quebec, the Copper redhorse (*Moxostoma hubbsi*) has never been found anywhere else on earth. It inhabits a limited range that is increasingly threatened by agriculture, industrialization and urbanization. Today, the Richelieu River appears to be home to the only reproducing Copper redhorse population. The larger of two known spawning grounds is located in the Chambly Rapids, approximately 30 kilometres upstream from the Saint-Ours dam. The Copper redhorse was designated an endangered species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2004, as well as under *Quebec's Loi sur les espèces menacées ou vulnérables* in the spring of 1999.

In 1996, Parks Canada and the Ministère de l'Environnement et de la Faune met to plan a solution. Parks Canada formed a partnership with St. Lawrence Vision

2000—the multi-sector organization charged with protecting the St. Lawrence River—to begin addressing this problem. The design of the fish passage posed considerable technological challenges because the characteristics of the different fish had to be accommodated.

Specialists in hydraulic engineering, fish biology and fish ladder construction pooled their expertise and



came up with plans for a multi-species fish ladder and a second fishway specifically designed for the American eel. Although fish ladders for salmon are commonly constructed, a multi-species fish ladder had never been built before. Designers had to consider factors such as the ability of various species to clear a vertical obstacle, the size of the pools required to hold the fish, water flow and different spawning run periods.

Parks Canada and its partners overcame these challenges and, in May 2001, the Vianney-Legendre Fish Ladder opened. Fish swarmed the ladder immediately. A year later, the first Copper redhorse was seen, swimming upstream to spawn.

Results

- The fish ladder was built to enable four vulnerable species of fish to again reach habitats located between the Chambly and Saint-Ours dams. In total, some 60 species of fish could benefit from the fishway.
- Over 32 species of fish have been observed in the fish ladder since it first opened in May 2001, including the Copper redhorse, the only vertebrate species exclusive to Quebec.
- The American eel, a much-valued commercial species that was once highly profitable in the St. Lawrence and Richelieu rivers, has regained access to Lake Champlain.
- Parks Canada and its partners overcame significant technical challenges to master the design and construction of a multi-species fish ladder. The fishway consists of single vertical slits for the redhorse, sturgeon and shad, as well as an eel ladder (an inclined surface next to the fish ladder), which was inspired by an experimental ladder used by Hydro Québec at the Chambly dam. European and American engineers have expressed interest in the innovative design.



© Parks Canada, S. Paradis

Granddaddy of restorations maintains remnant of Carolinian Zone

Over 70 years of perseverance restores natural environment in Point Pelee National Park of Canada

For most Canadians, the mention of Point Pelee National Park of Canada conjures up images of migrating birds and monarch butterflies, an expansive marsh, and unique flora and fauna at the southernmost tip of the country. Few people realize that Point Pelee National Park is also a “grand elder” in the national park system. With the last remaining private property in the park purchased in 2003, the most ambitious restoration project in the history of national parks is nearly complete at Point Pelee.

Founded in 1918, the original national park—or, “the Point”—totalled only 13.7 square kilometres: 2.7 square kilometres of terrestrial habitat and 11 square kilometres of marsh. The narrow peninsula of Carolinian forest and Red cedar savannah was characterized by tulip, sycamore, hackberry and sassafras trees, with Red mulberry, Kentucky coffee trees and Eastern prickly pear cactus found in the savannah. Early bird watchers and ornithologists had long recognized the Point’s importance as a vital stopover on North American migration flyways. At the same time, farmers tilled the park’s sandy soils, growing apples, asparagus and other crops.

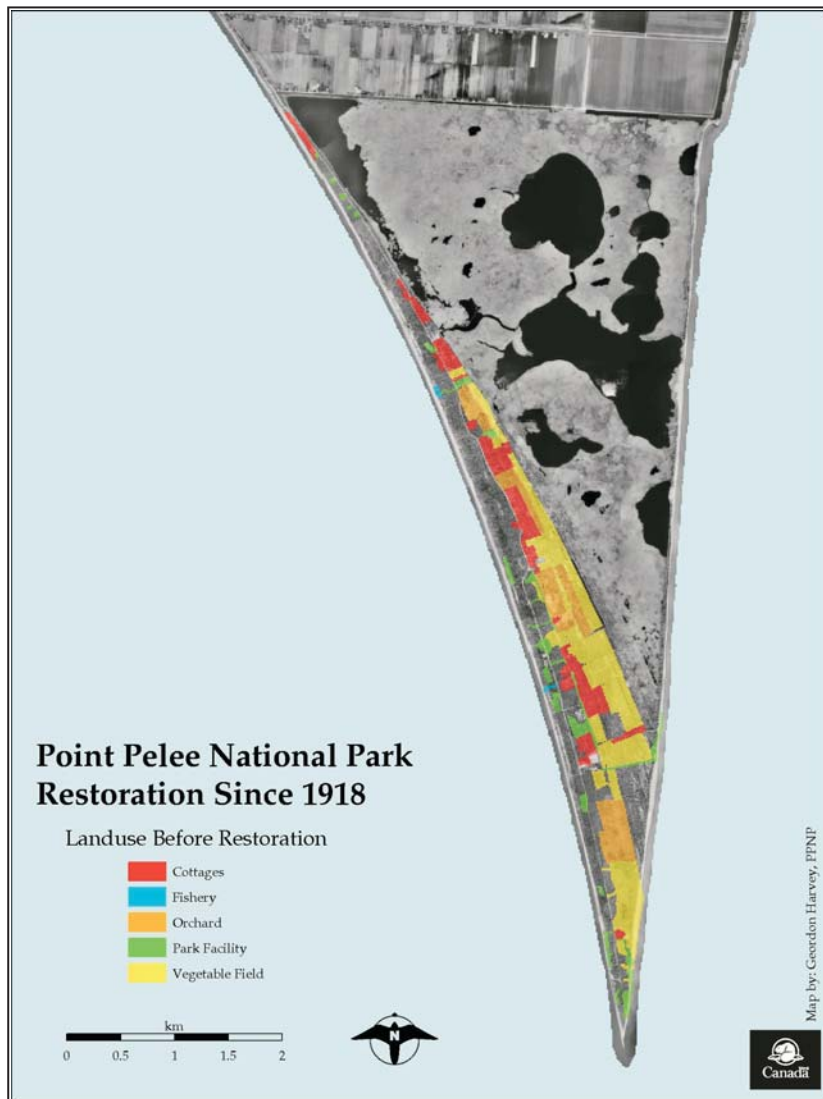
Since 1933, over 50% of Point Pelee’s dryland habitat has been restored. More than 100 hectares of agricultural fields and orchards have been removed, along with 6 commercial fisheries, 20 kilometres of roads and nearly 400 buildings. In the early 1970s, an exotic plant management program was established. This resource management program was designed to advance natural restoration by eliminating aggressive, invasive flora left behind by former farmers and cottagers.

Over the last 35 years, Parks Canada has increased conservation efforts by accelerating the purchase of private property within the national park and implementing a comprehensive restoration plan. Private lands and cottages were bought up and park facilities downsized throughout the 1970s. By the end of the 1980s, the national park had grown by an additional 125 hectares and large portions of the fragile shoreline were now protected. Removal of the east main park road was completed in 1998. Administrative and maintenance facilities were relocated outside the park in 2000. Visitation has stabilized at about 325,000 annually. The park’s infrastructure and services continue to be assessed and “right-sized” in response to ecological integrity goals and changing visitor use patterns.

Essex County, surrounding the park, was at one time home to expansive tallgrass prairie, swamp forests and rich wetlands. Today, only 6% of the original natural environment remains. In response, the park and its greater park ecosystem partners are expanding conservation and restoration efforts with the goal of re-establishing the mix and numbers of species and ecological processes that have disappeared

or been compromised. Re-establishment of green corridors and linkages to natural habitat outside the park is essential for improving the ecological integrity of the ecosystems protected within Point Pelee National Park.

In an area where the scope and complexity of ecosystem restoration can appear overwhelming, Point Pelee National Park has proven it is possible and has become a Canadian success story of what vision, hard work and perseverance in restoring and sustaining our natural environment can accomplish.



© Parks Canada, H. Bishop, M. Smith, 2002; G. Harvey, 2005

ENGAGING CANADIANS

Engaging Canadians: developing the means for and fostering public participation in protected area management and ecological integrity. The more Canadians know about their national parks, the issues and the challenges that the parks face, the more likely they will be to appreciate these heritage places and support the work required to preserve and protect them.



© Parks Canada, A. Sturch, 2004

New learning centre to draw visitors into Fundy's ecoscape

Fundy National Park of Canada steps up its ecological integrity education programming in stewardship, conservation and science

Parks Canada takes its mandate of ensuring the integrity of the natural places in its care very seriously. It also strives to inspire the many visitors to national parks and to instil in them a sense of ownership and a personal stake in protecting these wild spaces.

At Fundy National Park, a new Ecological Integrity (EI) Learning Centre is in the works. This new centre will increase visitors' awareness, understanding and appreciation of the natural world of the park and beyond. As a key component of the park's enhanced EI Education Project, the Centre will boost the staff's ability to engage visitors in ecology and conservation by showcasing the full range of Fundy's ecoscape. Visitors will become more knowledgeable about the environmental stewardship, conservation and scientific efforts currently taking place at Fundy and nationwide, such as:

- reintroducing and monitoring the inner Bay of Fundy Atlantic salmon;
- restoring and naturalizing disturbed areas; and
- monitoring park ecosystems.

New interpretive stations located throughout the park will enhance visitors' learning experiences by "decoding" aspects of the park for visitors even as they see and experience them.

Support for this important Maritime initiative comes from Fundy National Park, the Atlantic Service Centre and the Fundy Guild, a registered non-profit association and park partner. Fundy's EI Education Project is in its initial planning phase with a completion date set for the summer of 2007.



© Parks Canada, J. Pleau, 2002

First-ever comprehensive inventory of Inuvialuit traditional plant knowledge in the Western Arctic

Interviewing and filming Inuvialuit Elders about their knowledge helps preserve ecological integrity in the Western Arctic

Among the Inuvialuit of the Western Arctic, knowledge about local plants and their uses has traditionally been passed from one generation to the next as part of oral tradition. Today, Inuvialuit Elders still possess much of the traditional knowledge about how to use plants for food, medicine and tools. However, due to the pressures of acculturation and other factors, that knowledge is not being passed to the next generation. As more of the key knowledge-holders pass away each year, the need to collect, preserve and present this unique information is urgent.

The Inuvialuit Ethnobotany Project addresses this need. Conducted over four years (from 2003 to 2006) and directed by a multi-stakeholder steering committee, the project is the first comprehensive inventory of traditional plant use among the Inuvialuit people. To date, over 40 Inuvialuit Elders from all six communities in the Inuvialuit Settlement Region have been interviewed. The interviews, as well as demonstrations of traditional plant use, have been captured on audio- and videotape. Plant specimens collected earlier in the project are preserved in herbaria across Canada. As well, work has begun on a professional, visually appealing book documenting the collected knowledge.

The project also aims to promote the wise use and conservation of plant resources within the Inuvialuit Settlement Region, which encompasses Ivvavik, Aulavik and Tukturnogait National Parks of Canada, as well as the Pingo Canadian Landmark. By collecting traditional Inuvialuit plant knowledge, preserving that knowledge and promoting education, the sharing of knowledge can continue.

Stakeholders from across the Inuvialuit Settlement Region have joined the project's steering committee, including representatives from Parks Canada (Western Arctic Field Unit), the Inuvialuit Cultural Resource Centre, the Aurora Research Institute (Government of the Northwest Territories), the Inuvialuit Game Council and local communities. Partners provide funding, as well as advice and recommendations, to ensure that project results are accurate, relevant and useful. Additional



© Parks Canada, B. Bandringa, 2003

funding and in-kind support is provided by the University of Laval's Aboriginal Capacity and Developmental Research Environment (ACADRE) Program, the University of British Columbia and the Canadian Museum of Nature.

The Inuvialuit and their traditional culture are part of a healthy northern landscape. Many continue to live a traditional way of life, with close ties to the land. Through its collaborative approach, the Inuvialuit Ethnobotany Project preserves and shares that way of life. The unique information captured by the project helps maintain an important relationship between the Inuvialuit and their greater ecosystem. That ecosystem and tradition will both be enhanced by keeping the connections between the Inuvialuit, their living traditional culture, and their landscape strong.

Results

- Over 40 Inuvialuit Elders from all six communities in the Inuvialuit Settlement Region have been interviewed by the project's ethnobotanist, both in their homes and on the land.
- Several hundred hours of recorded interviews and traditional plant use demonstrations have been stored on audio- and videotape. All interviews have been transcribed and verified.
- Roughly 3,500 photographs of traditional plants and their use have been archived.
- Almost 100 species, including algae, bryophytes, lichens and vascular plants have been collected as archival specimens.
- Collections are now preserved in herbaria across Canada including: the Aurora Research Institute, Inuvik, Northwest Territories; the University of British Columbia, Vancouver, British Columbia; the Canadian Museum of Nature, Ottawa, Ontario; and the Prince of Wales Northern Heritage Centre, Yellowknife, Northwest Territories.
- The steering committee, a staff ethnobotanist and a creative design company have begun developing and producing a professional, visually appealing book documenting the knowledge collected. Publication is targeted for March 2006.



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Community stewardship reverses steady decline of salmon stock in Terra Nova National Park of Canada

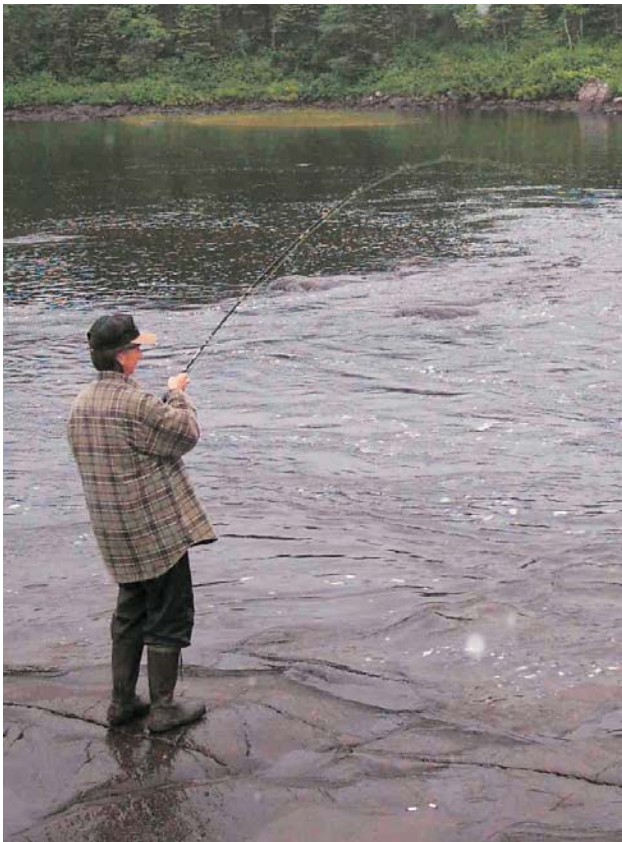
Local residents have a renewed sense of pride in the beautiful and productive Northwest River

Located on the eastern coast of Newfoundland, where the boreal landscape meets Atlantic fiords, Terra Nova National Park of Canada is the country's most easterly national park. The Northwest River, near the eastern boundary of Terra Nova, is a beautiful, rugged river that is popular with kayakers and anglers. It flows over 60 kilometres from its headwaters in the Bay du Nord Wilderness Area, through open, barren country and cascading falls before emptying into the Atlantic Ocean in Terra Nova National Park. For generations, local community residents have enjoyed angling for salmon on the Northwest.

However, by the mid-1990s, the salmon stock in the Northwest River was at risk. Declining numbers of salmon returning to Newfoundland's rivers forced the commercial salmon fishery to close in 1992, but stock levels in the Northwest River failed to substantially improve. To protect the remaining salmon, Parks Canada closed the Northwest River to recreational salmon fishing in 1996. A fish-counting fence showed that, despite stopping all fishing, the number of returning salmon still continued to decline. The problem was illegal fishing.

Traditional solutions clearly weren't working, so in 2002, Parks Canada joined with the Department of Fisheries and Oceans and local residents to try a new approach. Together, they formed the Northwest River Atlantic Salmon Conservation Working Group. Led by two local citizens, this advisory group supported a population recovery and conservation plan. Community stewardship was key to the plan. Recreational fishing could resume only if enough fish to ensure the future health of the stock passed through the counting fence. Each salmon caught illegally reduced the likelihood that the river would reopen for angling, threatening the goal desired by the community.

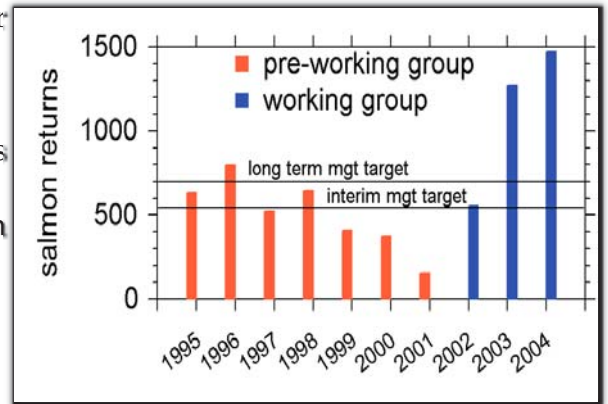
The group set short- and long-term goals to recover the stock, determining the minimum number of spawners needed to sustain the population. The group then calculated how many salmon could safely be harvested. After those targets



© Parks Canada, M. Langdon, 2004

were met, Parks Canada reopened the Northwest River to anglers in summer 2003. In subsequent years, this same management process has been applied.

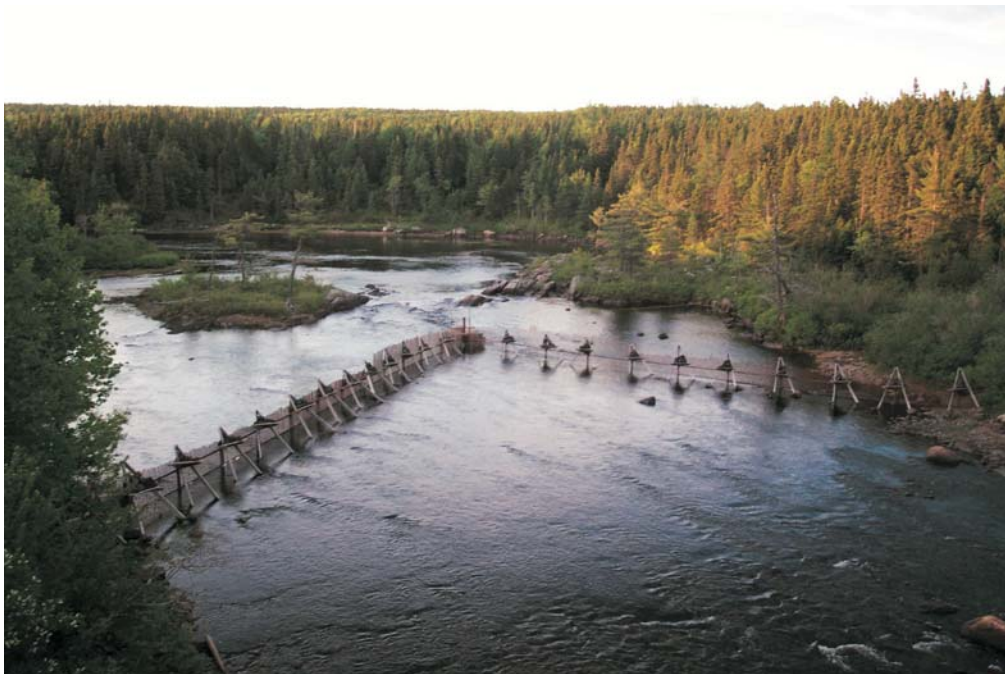
Through their partnership with Parks Canada, residents now have a meaningful role in managing their local resources. Community pride in this local river system has been renewed. As well, the number of salmon returning to the Northwest River continues to climb.



Results

- In 2001, the Northwest River was Newfoundland's poorest performing river, with only 152 spawners. By 2003, it had become the best, with over 1,200 returning salmon.
- One year after the formation of the Northwest River Atlantic Salmon Conservation Working Group, returning salmon exceeded the goal of 550 spawners by over 100%.
- In 2004, 1,472 salmon were counted—the highest number since the counting fence was installed in 1995.

© Parks Canada, David Côté



© Parks Canada, D. Côté, 2004

Ensuring badgers remain a vital part of the East Kootenays is the aim of an international, public-private sector partnership

Local landowners and Kootenay National Park of Canada help conserve the endangered badger as well as rare grassland habitat

Four subspecies of American badger occur in North America. In Canada, the endangered *Taxidea taxus jeffersonii* lives only in British Columbia's dry interior, such as the Columbia Valley at the southern end of Kootenay National Park. Despite having few natural predators, British Columbia badger numbers are in decline because of loss of habitat, a decrease in prey species, and death caused directly by human activities. There are fewer than 350 remaining adults.

Badgers live in grasslands, shrub-steppe habitats or open-canopied forests of Ponderosa pine or Douglas fir that supply the right soil for burrowing and enough small mammals to prey on. The only carnivore that burrows after and eats other tunnelling animals, the badger is a key predator of ground squirrels, mice and voles. Badgers play an important role in grasslands ecosystems. When badgers dig to pursue prey or to excavate a burrow, they improve soil conditions for various plants. In addition, their large burrows provide shelter for other wildlife, such as Burrowing owls and snakes.

Initiated in 1995 with the participation of Parks Canada, the East Kootenay Badger Reintroduction and Threat Mitigation Project is a collective effort to improve and restore badger populations in the region. The project, supported by the Species at Risk Recovery Fund, includes Canada's first intensive radio telemetry-based long-term study of badger ecology and distribution. For the research phase of the project, badgers are live-trapped and implanted with a radio transmitter. They are then returned to their burrows and can be tracked using a radio-telemetry receiver. Researchers assess badger population trends, habitat needs and the effects of human activities.

Since 2002, in cooperation with United States-based researchers, 16 badgers have been moved (or translocated) from northwestern Montana to the East Kootenays' upper Columbia Valley to "kick-start" the recovery phase of the Columbia Valley badger population. Research has shown that the key to conserving these animals is stewardship on private land. Along with their many partners, Parks Canada staff, summer students and volunteers are working with the public to promote practices that will protect the badger and its habitat within and across park boundaries.



© Tim McAllister

Results

- The project is Canada's first intensive radio telemetry-based study of badger ecology and distribution.
- Thirty-two badgers from Radium Hot Springs to Cranbrook have been implanted with radio transmitters to determine: movement rates and home range size; patterns of habitat use and dispersal; birth rates and reproductive success; and causes of death.
- Of the 16 badgers translocated from Montana to the south end of the East Kootenays, all three translocated females successfully reproduced in 2004, adding eight kits to the population.
- Radio-tagged badgers have been shown to use culverts to cross highways. Parks Canada and the British Columbia Ministry of Transportation built the first badger tunnel in the province. Badger crossing signs were installed elsewhere to encourage drivers to slow down in badger habitat.
- Project biologists work closely with golf course managers, highway designers, private landowners and conservation organizations to encourage stewardship practices for the recovery of badgers and their prey, ground squirrels.



© Richard Klafki

Local residents, Aboriginal communities and fishers work together to restore Soft-shelled clams

Restoration and maintenance of valuable resource requires input from all stakeholders

Harvesting Soft-shelled clams (*Mya arenaria*) has always been a part of life for local people in Kent County in eastern New Brunswick. This invertebrate symbolizes the profound link the people of the area—especially First Nations communities—have with the land and what is now the coastal area of Kouchibouguac National Park of Canada. Soft-shelled clam harvesting is recognized as a traditional fishery activity in the park by the federal government. Parks Canada understands that the long-term restoration and conservation of the species depends on strong support from local residents and users of this important resource.

Since 1981, the local population has been allowed to practice traditional activities such as commercial fishing and soft-shelled clam harvesting in park territory. However, no effective management system was in place to ensure the long-term viability of the clam population under harvesting pressure. By the late 1990s, data collected by park ecologists on soft-shelled clam stocks over the past 25 years demonstrated that clams in all age classes were being over-harvested.

In response to the data, Parks Canada developed a Soft-shelled Clam Management Plan for the park in 1999. Two years later, a joint management committee was struck, which brought local commercial fishers into the management decision-making process. The commercial clam fishers, park conservation staff, Maritime Fishermen's Union and First Nations agreed to close the clam beds in 2001 to allow the clam population to recover.

The goal of the management plan is to restore the clam population within the park to a viable level by working closely with local communities, commercial and recreational fishers and the First Nations communities surrounding the park. In 2001, the Kouchibouguac Commercial Clam Fishermen Association was established. The association's 11 members work in the field with park staff on several aspects

of clam management, such as the Clam Guardian Program, population inventories and active restoration techniques. The association's in-kind support is a major contributor to the success of the management plan. Now, even more participants have been invited into the management process, including watershed groups, other fishers' associations, surrounding communities and First Nations representatives.

The overall project will see 11 commercial fishers and one Aboriginal technician trained in scientific methods relating to conducting restoration work



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and inventories of clam beds and spat (young clams). These participants will be able to share their expertise and train other groups in research techniques and resource management practices. A “Clam Management Handbook” is being developed so that all groups use standardized methods to carry out clam inventory and management practices.

Another important component of this project is the scientific evaluation of clam spat fall collection techniques, more commonly called “clam tents.” These techniques use a variety of steel structures covered with fine netting to promote breeding. After spawning, the clam larvae attach themselves to the structure and colonize the bottom of the estuary.

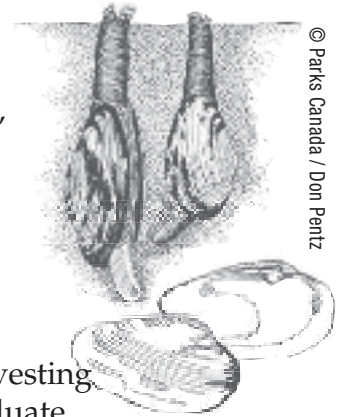
Clam tents had never been used in Atlantic Canada until the summer of 2003, when the Kouchibouguac Commercial Clam Fishermen Association suggested that the technique be tested in the park’s lagoon. Because no harvesting had taken place that year, it was an excellent occasion to scientifically evaluate the efficiency of the technique. With funding from the New Brunswick Department of Agriculture, Fisheries and Aquaculture, a preliminary trial was undertaken in the park by Parks Canada staff, scientists from the Université de Moncton, commercial fishers and the federal Department of Fisheries and Oceans. Preliminary results indicate that this technique could work in a coastal sandy environment.

Stakeholders and committed partners are looking to Kouchibouguac National Park of Canada to provide leadership and technical expertise in communicating continued restoration techniques and best practices relating to Soft-shelled clam research, management and restoration. Already, several other groups have approached park staff to conduct inventories and restoration work in the Richibucto estuary, using the knowledge gained at Kouchibouguac through the collaborative clam management program.

By “exporting” proven technologies to Aboriginal fishers and other fishers outside the park, Parks Canada is supporting and engaging these groups in the active restoration of their clam beds. Once the clam beds outside the park are restored, the harvesting pressure on the park-based clam stocks will be greatly reduced.

Results

- Data on clam beds are analyzed and mapped with a Geographic Information System (GIS), allowing representation of each clam size class and of clam bed distribution. For the first time, managers have access to a spatial representation of clam beds, which is a critical management tool.
- New methods allow managers to implement rotation-type harvesting by being able to determine the beds currently ready for harvesting and predict the year that other beds could be open for harvest.
- Eleven commercial fishers and one Aboriginal technician will be trained by Parks Canada staff in scientific methods relating to conducting inventories of clam beds and clam spat.



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PROMOTING REGIONAL PARTNERSHIPS

Promoting Regional Partnerships: a network of partners and stakeholders in the management of lands for conservation purposes is crucial to achieving virtually any of Parks Canada's key results. The establishment and protection of national heritage areas involves the consent, support and co-operation of other levels of government, Aboriginal groups, local and regional businesses, community groups, researchers and private landholders.



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Wood turtle recovery in La Mauricie National Park of Canada

Parks Canada crosses park boundaries to help ensure future of unique population of Wood turtles near Shawinigan River, Quebec

One of Canada's largest known populations of the Wood turtle (*Glyptemys insculpta*) inhabits an area near the Shawinigan River at the southern edge of La Mauricie National Park of Canada, in Quebec. Among Wood turtle populations in Quebec, the genetic diversity of the Shawinigan River population is unique. Yet, human activity and natural predators—the same factors that led to designating the Wood turtle as vulnerable in Canada—threaten the Shawinigan River population.

Committed to ensuring the future of this fragile population, biologists at La Mauricie National Park surveyed the Shawinigan River Wood turtles in collaboration with the ministère des Ressources naturelles et de la Faune du Québec, a local environmental group, and graduate students from nearby universities. The survey, which included tracking adult turtles through radio telemetry, discovered that 40% of the females use a single nesting site close to the park's boundary. Should anything happen to this site, the pressure on the population would be extreme.

The nesting site has been protected since 1996. Park biologists and volunteers locate and protect the nests, laying down wire netting to keep out predators. Over one three-year period, such efforts allowed more than 700 hatchlings to safely reach the Shawinigan River, compared to less than 100 before the project began. The nesting site land was purchased by the Fondation de la faune du Québec in 2000. Protection continues under the Saint-Lawrence Valley Natural History Society, which manages the area.

A well-targeted public education program was established to protect the turtles and their habitat through stewardship. Riverside property owners were educated about the importance of this rare population. Groups organizing outdoor activities in the area were instructed on how to minimize disturbances to the turtles and their habitat. Where logging activities occur on public lands, forestry practices have been adapted to maintain quality habitat.

Using demographic, genetic and habitat-use data, biologists at La Mauricie National Park plan the release of juvenile turtles within the park. By increasing the number of turtles on protected land while continuing to maintain their habitat outside the park, Parks Canada and its partners hope to maintain steady population growth. The future of the La Mauricie Wood turtle population looks bright.



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Jasper National Park of Canada is burning for conservation

Through a unique approach to community protection, Jasper National Park of Canada conserves its biodiversity and improves fire safety

Forest fires have shaped the landscape of Jasper National Park for centuries, maintaining a healthy mixture of young and old forests, shrublands and open meadows, and providing habitat for an abundance of wildlife. However, since the 1930s, effective fire suppression has created an unnaturally old forest with reduced biodiversity and, ironically, increased the risk of a large, catastrophic fire. Artificially old forests produced by decades of fire suppression are not unique to Jasper. Such landscapes dot North America, raising questions about how best to allow fires in order to improve biodiversity without risking communities and facilities inside and outside the park.

Jasper is working to resolve this issue through its partnership in the Foothills Model Forest, a regional partnership that includes 2.75 million hectares. The fire management initiative is called *FireSmart–ForestWise*. This program aims not only to reduce the threat of wildfire to residential and commercial developments within the park (*FireSmart*), but also to improve ecological integrity by restoring a more natural balance to the forest (*ForestWise*).

The community of Jasper has rallied behind the project, starting in 2002-2003, with neighbourhood “work bees.” Residents thinned small demonstration sites, removing trees and other vegetation that clogged the forest floor. In the winter of 2003-2004, light-impact logging equipment was used to thin larger areas, further protecting residential areas.



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FireSmart–ForestWise is well on its way to achieving its ultimate goal: creating a thinned forest fringe surrounding the town of Jasper and the Lake Edith cottage subdivision. This thinned forest will help protect the town from wildfires and will allow using prescribed fires to return the forest to more natural stands. A partnership made these results possible, and a partnership will benefit from them as well. The knowledge gained through *FireSmart–ForestWise* will advance ecological integrity and fire safety not only in the Foothills Model Forest, but also in forest communities across Canada.

Results

- *FireSmart–ForestWise* techniques, perfected through community “work bees” and careful experiments, now protect people, communities and infrastructure from severe wildfires in Jasper National Park.
- In 2003-2004, 115 hectares of forest were thinned using specialized logging equipment. Over three years, 350 hectares will be treated.
- A partnership co-funded by Jasper National Park and the Métis Nation of Alberta enabled workers to receive training, knowledge and skills to aid in career development while performing valuable work for the project.



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National Parks hold the line between Mountain pine beetle epidemic in British Columbia and Alberta's commercial forests

Governments and other land management partners work collaboratively to protect the economic value of forests and achieve ecological integrity objectives

About the size of a grain of rice, the Mountain pine beetle [*Dendroctonus ponderosae* (*Scolytidae*)] is a native insect of the southern Rocky Mountains. As do other bark beetles, Mountain pine beetles live throughout Lodgepole pine forests. While insect outbreaks are natural ecological processes that contribute to forest diversity, a 10-year beetle infestation—the largest insect epidemic in the province's history—is having a huge economic impact on the forest industry of British Columbia, especially in the west-central interior.

With the epidemic devastating the commercial forests of its neighbours, Alberta and its forest industry want to stop the beetles at the Continental Divide, which is also the provincial boundary and the location of the Mountain National Parks. Due to the long history of frequent fires in the montane eco-region and foothills, there have been few stands on the northeastern slopes of the Rockies susceptible to Mountain pine beetles. Several outbreaks have occurred in the Mountain National Parks. However, until 1999, there had been none in Jasper National Park of Canada.

Bringing stakeholders together was the first step in efforts to protect both the economic value of the provincial forests and the ecological integrity of the affected national and provincial parks. A senior management-level Strategic Direction Council was established to manage efforts to prevent, detect and control the beetle, and to ensure effective public communications concerning forest health issues in Alberta. The Council represents the Canadian Forest Service, Alberta Sustainable Resource Development, Alberta Community Development, and Parks Canada. Its goal is to use aggressive, short-term approaches to control the beetles in high-risk areas, together with long-term strategies to increase biodiversity. The Council also works with industry, interest groups, affected local communities and the public to ensure their interests are represented.

In addition to the large-scale scope of the Council, Banff National Park of Canada is involved with the Bow Valley Mountain Pine Beetle Control Team. This regional working group consists of representatives from Banff National Park of Canada, Alberta Sustainable Resource Development, Alberta Community Development, the Town of Canmore, the Municipal District of Bighorn, industry partners and non-profit organizations such as the Biosphere Institute.

Annual monitoring has been replaced with aggressive monitoring for Mountain pine beetles on a coordinated, regional or ecosystem basis, in partnership with all



land managers. Beetle population growth in the lower Bow Valley since 2003 has remained static and is even declining in some areas. Although it appears that the threat is decreasing, park managers must continue to be vigilant.

A management goal for all Mountain National Parks is to restore 50% of the historic fire cycle. The careful implementation of prescribed fire and the management of wildfire are gradually building public support for using fire as a management tool. There are numerous benefits related to controlled fire, including directly reducing Mountain pine beetle populations and beetle habitat, renewing forest health, improving wildlife habitat and reducing susceptibility to wildfire.

In Jasper National Park, approximately 27,000 hectares of prime-age Lodgepole pine-beetle habitat were burned, providing an effective fireguard on the south side of the Athabaska River Valley. In Banff National Park, the Mountain pine beetle population is being intensively monitored, and prescribed fire plans will be implemented as conditions permit. This area has become an important staging ground for ongoing scientific research to better understand Mountain pine beetle ecology, ecosystem management processes and their effects on both the natural environment and public perception.

Thus far, the program has strengthened inter-agency and industry working relationships and the effective management of public lands for future generations. The expansion of the beetle populations in the Mountain National Parks has been slowed, bringing short-term protection to Alberta's commercial forests. The results also confirm the theory that dealing with the growth of Mountain pine beetle populations early, before the population moves beyond the first stage of growth, can be effective in preventing epidemics.

Results

- The expansion of Mountain pine beetle populations in the Mountain National Parks of Alberta has been mitigated, resulting in short-term protection of the province's commercial forests.
- Strengthened inter-agency and industry partnerships and coordinated efforts have created more opportunities for multi-jurisdictional, ecosystem-based management.
- Public awareness and understanding of the Mountain pine beetle and of the prescribed fire program have grown.
- In 2004, the Bow Valley Mountain Pine Beetle Control Team received the Silver Premier's Award of Excellence.

Achieving bovine TB-free status in domestic cattle and park wildlife

Manitoba Bovine Tuberculosis Management Program recognized as excellent model for other animal disease control efforts

The rolling hills and valleys of Riding Mountain National Park of Canada appear above the surrounding plain as a bluish other-world dominating the horizon. Forming part of the Manitoba Escarpment, this "island" reserve protects a wide variety of wildlife and vegetation areas. It is also home to a population of free-roaming elk (*Cervus elaphus manitobensis*) that is infected with *Mycobacterium bovis*, the agent of bovine tuberculosis (TB). The disease has also appeared in a number of cattle herds and in deer near the park.

Bovine tuberculosis is a serious infectious disease affecting cattle, sheep, goats, bison, members of the deer family and many other species. It is suspected that the disease has been transmitted between elk, deer and cattle when wildlife feeds from the hay bales put out for cattle to eat in the winter. TB can have a devastating impact on the cattle industry. Following three separate outbreaks of TB in eight cattle herds surrounding the park, Parks Canada joined other government agencies, community leaders and wildlife and agricultural representatives to reduce the spread of TB in wild and domestic animals.

Beginning in 2000, the Task Group for Bovine Tuberculosis quickly mounted a concerted, collaborative and multi-faceted management program that is already proving effective in disease control and prevention. The Task Group includes the Canadian Food Inspection Agency, Manitoba Agriculture and Food, Parks Canada and Manitoba Conservation, along with the Manitoba Cattle Producers Association and Manitoba Wildlife Federation.

Park staff and their partners are working to ensure that, while the disease is being fought, it does not have a negative impact on the park's ecological integrity. Experience gained from the Manitoba Bovine Tuberculosis Management Program regarding multi-agency cooperation, wide public consultation and an integrated response to disease management can be directly applied to other disease-control efforts. It has also strengthened partnerships among park staff, local landowners, rural municipalities, First Nations and other stakeholders who will benefit from Riding Mountain National Park in the future.



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Results

- To date, 313 elk have been live-captured and tested. Of these, 122 animals have been removed as suspect bovine TB cases. A total of 2,550 elk and 3,200 deer from hunter-killed animals have also been tested for TB. It is estimated that 9% of the elk population is infected with TB. The numbers are lower in deer and the disease has also been found in wolves and coyotes.
- The Canadian Food Inspection Agency provides enhanced testing of cattle and other domestic livestock surrounding the park. Roughly 55,000 breeding cattle on 650 premises make up the designated Riding Mountain TB Eradication Area, representing 10% of Manitoba's cattle herds and 1% of all Canadian cattle herds.
- To prevent contact between cattle and elk, over 100 eight-foot-high wire barrier fences have been erected around 95% of the hay storage yards within three kilometres of the park. This effort, which was supported by the Province of Manitoba and Parks Canada, with the help of local First Nations contractors, has shut down a primary disease transmission route.
- Hunting seasons in the two game hunting areas surrounding the park have been extended. As well, more hunting permits have been made available by Manitoba Conservation. The *Manitoba Wildlife Act* was also changed to make the baiting of elk outside the park illegal.
- Provisions to protect wolves were enacted, given that they are the main predators of elk in the park.
- A total of 202 elk have been captured and radio-collared, resulting in 33,000 geo-referenced locations of elk movements that will provide a model for the potential spread of disease.
- Prescribed forest burns have improved elk forage habitat within the park and encourage elk to remain within park boundaries during the winter when food is limited.
- Local First Nations technicians have been hired and trained to collect and examine tissues to sample from hunter-harvested animals at the new regional wildlife health laboratory and provincial centre established for diagnosing chronic wasting disease and bovine TB in Manitoba.
- The Task Group for Bovine Tuberculosis received the 2004 Manitoba Federal Council's Exceptional Contribution Award for cooperative management of bovine TB in Riding Mountain National Park.



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Parks Canada joins a partnership to heal Canada's temperate rainforest

The clear-cut forests and damaged creeks of the Clayoquot Sound ecosystem are being restored

On the West Coast of Canada, a massive rainforest drips with water and abounds with life. In Pacific Rim National Park Reserve of Canada, Parks Canada staff work to protect the ecological integrity of this special place, while still offering great adventures for visitors. Striking this balance is challenging, however, and cannot be accomplished alone. To safeguard the greater ecosystem surrounding Pacific Rim National Park Reserve, Parks Canada joined with the Central Westcoast Forest Society, International Forest Products (Interfor), and representatives from the public, First Nations and government on an ecosystem-based restoration project for the Kennedy Flats watershed in South Clayoquot Sound.

About mid-way between Ucluelet and Tofino on Vancouver Island, Kootowis Creek, Staghorn Creek and Lost Shoe Creek drain the low-lying area known as Kennedy Flats. Adjacent to the park, the Kennedy Flats watershed covers 129.4 square kilometres and drains through the park to the Pacific Ocean. Logging carried out before today's more rigorous controls were established had left Kennedy Flats and its creeks in a compromised position. Logging waste clogged the streams, blocking the passage of fish. Collapsed culverts and bridges had further degraded fish habitat and diverted segments of the creeks. Salmon production, which had once measured in the thousands in this area, had dropped significantly by the early 1990s.

The Kennedy Flats Restoration Project began with the hand-clearing of wood debris. To minimize the impact on the site, helicopters were used to remove wooden waste. However, cleaning up was only the first step; natural stream conditions had to be restored. Large logs or root balls were anchored into the stream to re-create natural pools and eddies. Gravel was added for spawning salmon, and plant cover for small fish.

Each year since 1995 (when the Central Westcoast Forest Society began restoration work in the area), a few more kilometres of streams and creeks were cleared, clear-cut slopes were stabilized, and more old roads were closed down. The restoration plan for the Kennedy Flats takes a comprehensive and coordinated approach to restoring both the aquatic and terrestrial ecosystems. The Society describes its activities as "giving Mother Nature a boost; accelerating the natural healing process". In 2005, positive results are being seen.



The work has already improved fish access through the removal of logjams that had been obstructing their passage. Creeks, streams and surrounding forests have been made healthier due to better-defined creek channels, more overhead cover and reduced flooding of the riparian zone (the 30 to 50 metres of land along each side of a stream). Work on the project has also had positive impacts on humans, providing unique training and stewardship opportunities for displaced fishers, forestry workers and local First Nations.

Plans call for further work inside as well as outside of the Pacific Rim National Park Reserve. Parks Canada is supporting the restoration of riparian slope stability to keep sediment from collecting in fish creeks for portions of Lost Shoe Creek within the park. Fisheries Renewal BC is funding the work planning through the Regional Aquatic Management Society. With funding help from Fisheries Renewal BC and Environment Canada's EcoAction Community Program, work began in 2001 to restore segments of Sandhill Creek within the park.

The ecosystem is not bound by park borders. Increased ecological integrity on one side of the park border means increased ecological integrity on the other. Just as creeks flow heedless of borders, effective restoration efforts cannot be confined by human boundaries. Collaborative restoration efforts, such as the Kennedy Flats Restoration Project, benefit us all.

Results

- Over 16 kilometres of streams have been restored, permitting salmon to return to former spawning beds and restoring flooded land to its natural state.
- In 1994, salmon returns for Kennedy Flats were less than 10,000 adult salmon. In 2004, the Tofino Stream Enhancement Society reported the best year ever with between 40,000 and 50,000 returned adult salmon.
- The habitat improved in 2000 alone could produce 122,000 Coho fry based on Department of Fisheries and Oceans standards.
- A five-kilometre walking trail and a longer 16-kilometre driving loop allow visitors to view portions of the restored streams.
- The success of the Kennedy Flats Restoration Project sets a standard for future ecosystem-based management efforts.



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