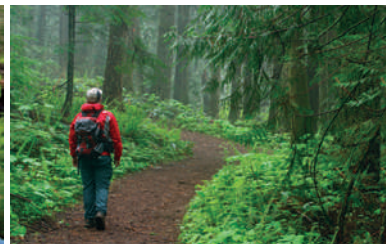
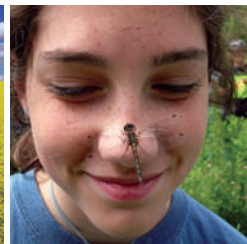


Caring for Canada's biodiversity

Highlights of Canada's
4th national report
to the Convention on Biological Diversity



Caring for Canada's biodiversity : highlights of Canada's 4th national report to the Convention on Biological Diversity

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Caring for Canada's biodiversity

**Highlights of Canada's
4th national report
to the Convention on Biological Diversity**

Caring for Canada's biodiversity



Highlights of Canada's

4th national report

to the Convention on Biological Diversity

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Canada's biodiversity: an introduction

The value of biodiversity

Biodiversity is the term used to describe the diversity or variety of life on earth. It refers to the millions of species that have developed over billions of years of evolution.

The foundation of all life on the planet, biodiversity is essential not only for healthy ecosystems but also for human health, prosperity, security, and well-being. In addition to offering many recreational, aesthetic, and cultural benefits, biodiversity provides goods and services that are essential to human survival. These include the production of food, fuel, and medicine; the regulation of climate, flood, and disease control; the purification of air and water; the pollination of plants; and the cycling of nutrients.

The innumerable economic, social, and ecological benefits of these ecosystem services have an estimated worth of trillions of dollars globally. For example, a 2006 study estimated the value of ecosystem services in Canada's boreal at \$93 billion, or roughly nine percent of Canada's gross domestic product (GDP), per year. This figure is two and a half times greater than the net market value of all resource extraction in the region combined.

Loss of biodiversity affects the ability of ecosystems to deliver these services. The depletion and degradation of ecosystem services represents a loss of natural capital, the cost of which is poorly reflected in conventional economic indicators of well-being.

Conserving biodiversity, on the other hand, helps to maintain this natural capital and maximizes our ability to adapt to unanticipated changes in both the environment and economy. Healthy and diverse natural systems create *ecological resilience* to stresses such as climate change and the *economic resilience* to maintain a competitive edge in the global economy.

DID YOU KNOW

- Canada is home to over 1000 species of pollinating insects.
- Pollinators are responsible for fertilizing over a billion dollars worth of apples, pears, cucumbers, melons, and berries, as well as a large variety of other crops in Canada.
- Citizens can help to protect pollinator populations by taking part in the Pollination Canada Program, which encourages people to observe pollinators in action and to record and report on their findings.



The importance of nature to Canadians

To understand the economic benefits of wildlife-related recreational activities, surveys on the *Importance of Wildlife* to Canadians were undertaken by Statistics Canada in 1981, 1987, and 1991. Work was then reframed in the 1996 Survey on the *Importance of Nature to Canadians*, which was expanded to address more nature-related activities, such as camping and boating. The survey found that Canadians spent \$11 billion on such activities in 1996 alone.



Canada's biodiversity

Canada is defined by its vast expanses of wilderness, rich natural heritage, and cultural diversity. The second-largest nation in the world, it encompasses a surface area of 9.98 million km² and is bordered by three oceans with 243,000 km of coastline.

Canada is the steward of major portions of the world's tundra, boreal and temperate forest, and aquatic ecosystems. About 40 percent of the country is forests and woodlands, representing about 10 percent of the world's total forest cover. Canada has an estimated 24 percent of the world's wetlands and constitutes about 20 percent of its circumpolar area. It is also one of the few countries in the world that maintains large, relatively unfragmented ecosystems with functioning natural processes.

Species occurring in Canada's diverse ecosystems include some of the largest herds of free-ranging caribou in the world, two thirds of the world's polar bear population, and large populations of bears, wolves, lynx, and other mammals. Many of North America's migratory birds, including songbirds, waterfowl, and shorebirds, reside in Canada during the spring and summer.

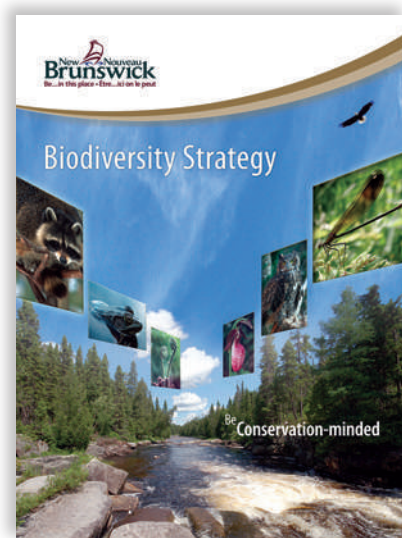
Biodiversity is also a cornerstone of the Canadian economy, including both Canada's traditional natural resource sectors and emerging sectors such as ecotourism, biotechnology and pharmaceuticals. As such, biodiversity makes an invaluable contribution to the health and wealth of Canadians.

New Brunswick's biodiversity strategy

New Brunswick launched a Provincial Biodiversity Strategy on June 18, 2009. The Strategy provides a framework for advancing a coordinated and collaborative approach to the conservation and sustainable use of biological resources, representing a significant evolutionary step forward. Influenced by the Biodiversity Outcomes Framework for Canada, the strategy will be followed by the development of a biodiversity action plan. In the last year, the leadership and coordination structure identified in the strategy was put in place, leading to the establishment of a biodiversity secretariat, an interdepartmental implementation committee and a deputy minister biodiversity steering committee. Currently the Biodiversity Secretariat is meeting with some key stakeholders to discuss the best path forward to develop an action plan.

DID YOU KNOW

- The Great Lakes are the largest system of fresh surface water on earth, containing roughly 18 percent of the world's fresh surface water.
- Canada's boreal region covers 34 percent of the country's land mass and represents 21 percent of the world's total boreal forest. The boreal forest is the largest terrestrial carbon sink in the world.
- Canadian forests are home to a large diversity of species. In Canada, approximately two thirds of all species are associated with forests.



Managing biodiversity – a shared approach

Responsibility for the conservation and sustainable use of biodiversity is distributed across the breadth of Canadian society. In general, the federal government assumes the lead role for migratory birds as well as wildlife on federal lands. It also has primary responsibility for managing Canada's marine resources. Provinces are typically responsible for land and resource use within their boundaries, including the regulation of hunting and angling and the management of wildlife populations.

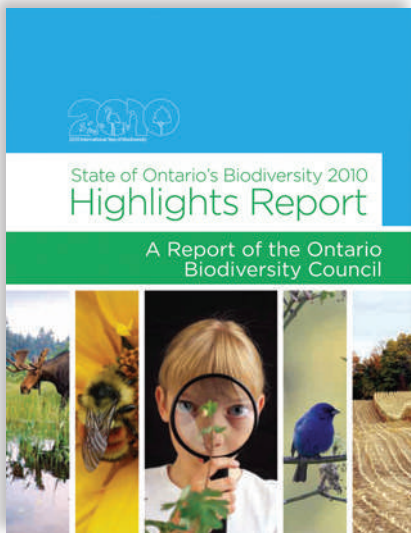
As Canada's first inhabitants, Aboriginal peoples have a unique relationship with its ecosystems, species, and resources. This relationship is reflected in their cultural and spiritual practices as well as their direct participation in traditional activities such as harvesting. As such, the effective engagement of Aboriginal communities in biodiversity-related initiatives is critical to Canada's ability to meet its biodiversity goals.

The negotiation of Aboriginal land claims and finalization of other agreements have helped to develop partnerships that promote mutual respect and the protection of cultural and ecological values. Aboriginal peoples are now extensively involved in all aspects of biodiversity conservation in Canada.



Ontario and Northwest Territories release state of biodiversity reports

In May 17, Ontario's Biodiversity Council released the *State of Ontario's Biodiversity 2010* report and the *Biodiversity Strategy Progress Report* for Ontario. On May 22 (International Biodiversity Day), the Northwest Territories also released a report, *State of the Environment – Biodiversity Edition 2010*.



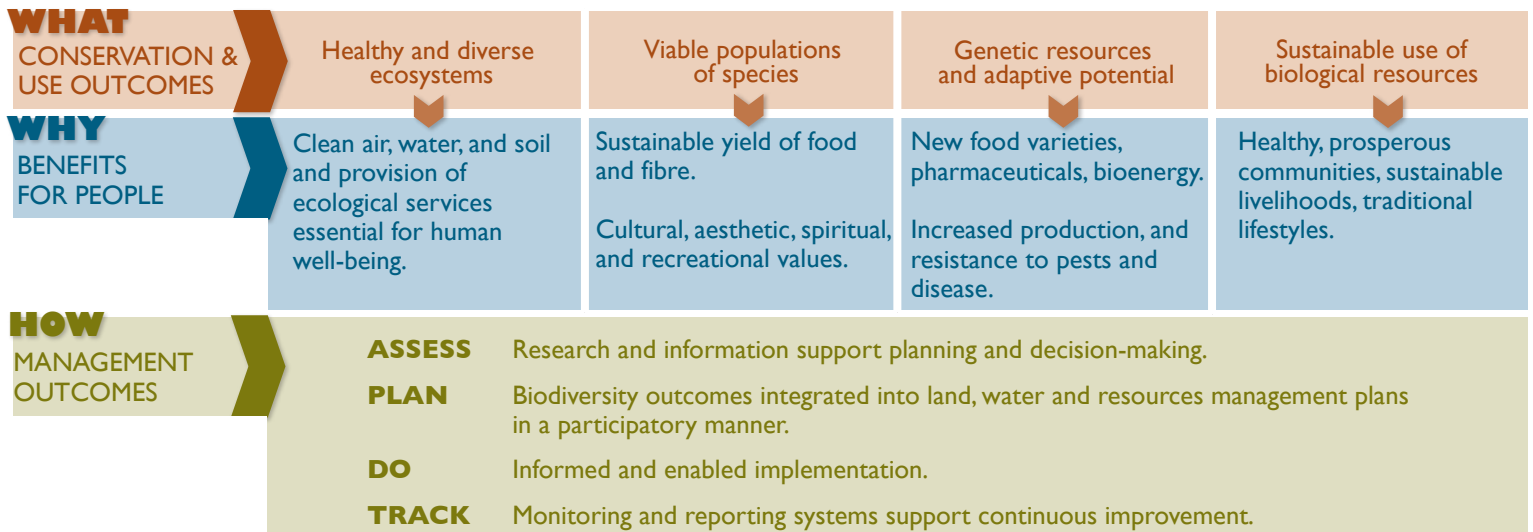
In recognition of their shared responsibility for managing biodiversity, the federal, provincial, and territorial governments jointly developed the 1996 *Canadian Biodiversity Strategy*. The intent of the Strategy was to respond to the *United Nations Convention on Biological Diversity*, which Canada signed in 1992, and to set out strategic directions for the conservation and sustainable use of Canada's natural capital. Many provincial and territorial governments, including Saskatchewan, Ontario, Québec, New-Brunswick, and the Northwest Territories, have or are developing their own biodiversity strategies and action plans.



In 2005, the Canadian Councils of Resource Ministers agreed that a more outcomes-based framework was required to systematically identify priorities and report on progress nationally. As such, they endorsed the Biodiversity Outcomes Framework in 2006. This Framework outlines a suite of biodiversity outcomes governments wish to achieve, as well as an ecosystem and adaptive management approach to support effective planning and decision-making.

A biodiversity outcomes framework for Canada

The actions highlighted in this document represent progress made across the country towards Canada's Biodiversity Outcomes. Information on efforts to assess, plan, and track biodiversity-related action was collected in partnership with government agencies and non-government partners across the country.



Maintaining healthy ecosystems

Overview

Maintaining healthy and diverse ecosystems is a key goal shared by all Canadian governments. These ecosystems, however, are facing an increasing range of pressures from urbanization and industrial activity. Air and water pollution, invasive alien species, wildlife diseases, and climate change are also having impacts on ecosystems across the country.

A significant increase in temperatures over the past 50 years, for example, is driving other ecological changes, such as significant reductions in snow-cover duration, earlier spring thaws, and the thawing of northern permafrost. Melting glaciers and ice caps are leading to increases in freshwater flowing into the Arctic Ocean, thereby altering temperature, salinity, and the availability of nutrients in marine environments, especially in near-shore waters.

In addition, Canada is experiencing a significant decline in both the extent and quality of summer sea-ice in the Arctic. In 2007 and 2008, the summer sea-ice extent dropped to its lowest and second-lowest levels, respectively, since satellite measurements began in 1979. It is now 34 percent lower than it was on average between 1979 and 2000. This loss has had profound effects on the region, in particular on the myriad species that have adapted to life on top of and under the ice.

Other key indicators of ecosystem health relate to loss of or changes in land cover. Canada has experienced significant historical loss of wetlands in the southern parts of the country, and many of those that remain have been degraded or fragmented. In addition, Canada's native grasslands, most of which are found in the Prairies, have been largely converted to other land uses. For example, tallgrass prairie, North America's most endangered type of grassland, has been reduced to one percent of its original extent.

In contrast, Canada still has relatively large tracts of intact natural areas and the amount of forested land permanently converted to other uses each year is relatively small. However, changes in the quality of Canadian forests suggest that their composition may be changing. Changes are also being observed in our marine environments. For example, the acidification of our oceans is having an effect on coral reefs and shellfish.

Wild bergamot in Grasslands National Park (Saskatchewan)



How Canada is responding

Maintaining healthy and diverse ecosystems in Canada involves a variety of strategies. They include

- protecting ecologically important natural areas,
- conserving private land,
- connecting conservation and resource management strategies across whole landscapes and seascapes through integrated planning and management,
- reducing human impacts on working landscapes, and
- restoring damaged ecosystems.

Protecting ecologically important areas

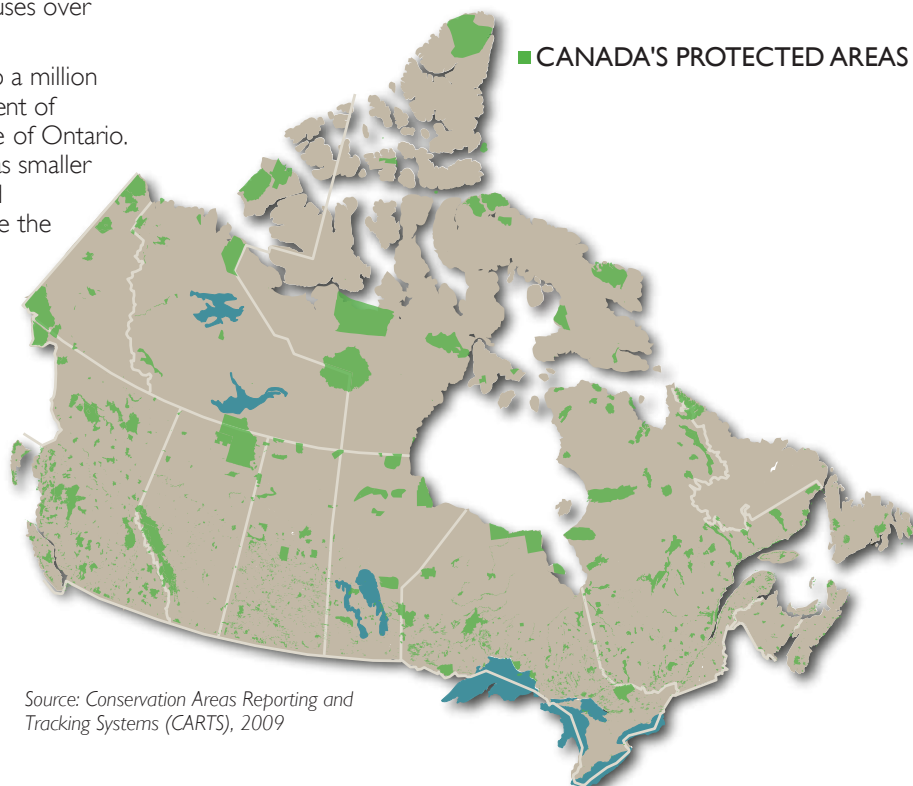
Protected areas are one of the longest-established conservation tools employed by governments to maintain healthy ecosystems. Protected areas conserve representative samples of natural areas, preserve ecological features and processes, and can act as benchmarks to assess the sustainability of various land uses over time.

Canada's terrestrial protected areas now cover close to a million square kilometres, representing approximately 10 percent of Canada's land base and an area almost equal to the size of Ontario. They include areas of international significance as well as smaller areas that are representative of unique and endangered ecosystems. This percentage, however, does not include the full range of protection, conservation, and stewardship activities being undertaken by local governments, the private sector, Aboriginal communities, and conservation organizations that also contribute to Canada's "conservation scorecard".

Aboriginal communities have become a driving force behind the establishment of many protected areas, particularly in the northern territories. For example, Aboriginal communities are leading key provincial and territorial initiatives under both the *Northwest Territories Protected Areas Strategy* and Manitoba's *East Side Traditional Lands Planning and Special Protected Areas Act*.

DID YOU KNOW

- The largest park in Canada is Wood Buffalo National Park, which spans 44 807 km² of land in Alberta and the Northwest Territories. It is home to North America's largest bison herd and is the only nesting site of the endangered whooping crane.



Source: Conservation Areas Reporting and Tracking Systems (CARTS), 2009

Progress is also being made towards the establishment of marine protected areas (MPAs). Existing MPAs cover over 56,000 km² of Canada's oceans and Great Lakes—an area roughly equivalent to that of Nova Scotia. This includes the Lake Superior National Marine Conservation Area, which is the largest freshwater protected area in the world.

Of the 797 MPAs in Canada, 705 are managed provincially, 83 federally, and the remaining nine by non-governmental organizations or through co-management arrangements. The level of protection provided by different jurisdictions varies depending on both their mandate and the conservation objectives of the site.

Fisheries and Oceans Canada, the Parks Canada Agency, and Environment Canada are collaborating to develop a national system of MPAs. In 2005, the *Federal Marine Protected Areas Strategy* was established to enhance cooperation with Aboriginal peoples and others in support of MPAs. Provincial and territorial programs are also in place to protect marine ecosystems.

Expansion of the Nahanni National Park Reserve

Nahanni National Park Reserve of Canada is located in the southwest corner of the Northwest Territories, in the traditional territory of the Dehcho First Nations. Until now, Nahanni has covered an area of 4766 km² and encompassed only the lower reaches of the South Nahanni and Flat Rivers. The recent approval of a proposed expansion to the park, however, will increase its size by more than six times.



© Parks Canada / D. Harvey

Nahanni River near Rabbitkettle Hot Springs, Nahanni National Park Reserve (NWT)

Nahanni's new park boundary will protect 30,000 km² of crucial habitat for grizzly bears, woodland caribou, and Dall sheep. It will also protect the length of the South Nahanni River in the Dehcho, the highest mountains and largest glaciers in the Northwest Territories, and the deepest canyons in Canada. The globally unique caves, canyons, rock towers, poljes, and sinkholes of the Nahanni North Karst will also lie within the new park boundary.

Gwaii Haanas National Marine Conservation Area

Gwaii Haanas National Marine Conservation Area was formally established in 2010 through an agreement that commits Parks Canada, Fisheries and Oceans Canada, and the Haida Nation to share its planning, operation, and management. In total, the combined existing park reserve and new marine conservation area will protect approximately 5000 km² of wilderness, from alpine mountain tops to the sea floor.



© Parks Canada / C. Cheadle

Gwaii Haanas National Park Reserve (British Columbia)

The ongoing and effective management of protected areas is essential to ensure that healthy and intact ecosystems are maintained or, if necessary, restored. The Canadian Parks Council recently developed the first Canada-wide principles and guidelines for ecological restoration, which provide protected-area agencies across the country with an approach that can be applied according to their needs.

Reintroducing key natural processes can be an important aspect of efforts to maintain or restore ecosystems. For example, ecological processes linked to natural fires and grazing by large herbivores have been recreated by Parks Canada and partner agencies through the Prairie Persists project in Grasslands National Park, Saskatchewan. In 2006, the release of 71 plains bison, prescribed burns, and efforts to reduce exotic and invasive species were undertaken in the park, helping to restore the overall ecological integrity of one of the most threatened ecosystems in the country.

Maintenance of ecological integrity is embedded in Canada's *National Parks Act*. Parks Canada has a comprehensive science-based monitoring system in place to assess ecological integrity. For each major park ecosystem, a set of monitoring measures is chosen based on an understanding of ecosystem structure, ecological function, and the stressors affecting the ecosystem. Monitoring results are recorded in an information system that provides regular updates of each park's ecological condition, which are disseminated to the public through "state of parks" reports. When monitoring indicates ecological impairment, park managers incorporate corrective measures in the park's management plan and act accordingly.

Nunavut parks and cultural landscape resource assessment

In 2008, Nunavut Parks started working with residents of Kugaaruk to develop a cultural landscape-based resource inventory framework that could be applied to all territorial parks throughout Nunavut. The project will also produce a training manual to allow future community joint planning and management committees to use the framework to record and analyze all natural and cultural resources, capture related Inuit Qaujimagatuqangit, and maintain a record of oral histories and knowledge related to all park landscapes. In addition, a new ecological and cultural landscape-based system plan for Nunavut Parks will be developed, setting a precedent for ecosystem-based planning that incorporates both cultural and natural resources.

Akpait National Wildlife Area, Nunavut



Garry Donaldson

Conserving private land

The protection of ecologically sensitive lands through agreements with private landowners has become more effective and widespread over the last 25 years. This is a result of both the many land trust organizations now in place across the country and a commitment by federal and provincial governments to improve legislation, investment, and tax incentives for these initiatives.

A unique federal program in Canada is the Ecological Gifts Program, which enables individual and corporate landowners to protect nature by donating ecologically sensitive land to environmental charities or the government. An "ecogift" is a donation of private land or a partial interest in land, such as a conservation easement, covenant, or servitude, that has been certified by Environment Canada as ecologically sensitive or of ecological value. The Program, which was established in 1995, provides assurance to donors that the land will be managed in perpetuity based on mutually agreed-upon conservation goals and objectives. Donors are also eligible to receive income tax benefits for their donations, based on the fair market value of the property.

Tending a bird catching net at the Tatlayoko Lake Bird Observatory



Nature Conservancy Canada

DID YOU KNOW

- The number of land trusts in Canada roughly doubled from 1995 to 2005, to over 150 organizations. As of April 2010, the 50 member groups of the Canadian Land Trust Alliance had protected over 27,500 km² of land through the involvement of 20,300 volunteers, 217,000 members and supporters, and 800 staff.

Investing in conservation on private lands

Launched in 2007, Canada's Natural Areas Conservation Program contributes to the securing of ecologically sensitive lands in collaboration with non-profit, non-government organizations. Through the program, the federal government matches funds with the Nature Conservancy of Canada and its partners including such organizations as Ducks Unlimited Canada. Priority is given to conserving lands that are nationally or provincially significant, protecting habitat for species at risk and migratory birds, or enhancing connectivity or corridors between existing protected areas. such as National Wildlife Areas, National Parks and Migratory Bird Sanctuaries. To date, the program has led to the acquisition of more than 122,000 ha of land and the protection of habitat for 79 species at risk.

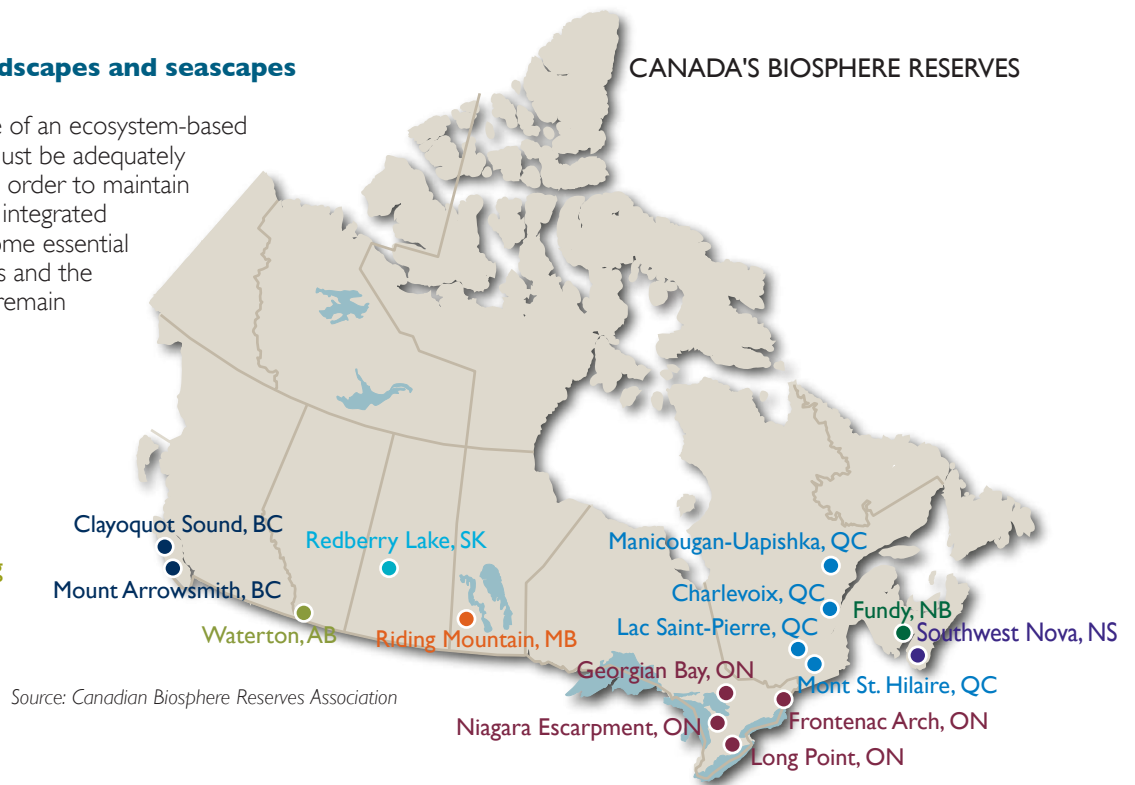
The receipt of over 800 donations made through the Canadian Ecological Gifts Program has ensured the conservation of more than 138,600 ha of ecologically sensitive land valued at over \$500 million.

Connecting across whole landscapes and seascapes

While protected areas form the core of an ecosystem-based management approach, these sites must be adequately managed, connected, and buffered in order to maintain truly healthy ecosystems. As a result, integrated planning and management have become essential to ensuring that both protected areas and the ecosystems in which they are found remain healthy.

Canada's biosphere reserves

Canada's biosphere reserves are excellent examples of community-based initiatives that protect our natural environment while ensuring the continued growth of the local economy in an ecologically sustainable way.



Niagara Escarpment (Ontario)



Photos © Photos.com, 2010

Conservation of Canada's boreal forest

The Canadian Boreal Initiative brings together government, industry, conservation groups, major retailers, financial institutions, scientists, and First Nations communities to create new solutions for boreal forest conservation. The initiative's goal is to protect at least half of Canada's boreal forest and ensure that the remainder is sustainably developed. It takes an "interconnected landscape approach" that fosters cross-sectoral partnerships focused on the whole landscape and on a strong relationship between government and Aboriginal communities. So far, Québec has committed to protecting half (59 million ha) of its boreal forests north of 49 degrees latitude, the Northwest Territories has committed to protecting over 14 million hectares of boreal forest, and Ontario has committed to the protecting more than 50 percent (22 million ha) of its Far North boreal region. Manitoba and Ontario have also signed a Memorandum of Understanding respecting an Interprovincial Wilderness Area that encompasses over 940,000 ha of boreal forest that provides habitat for species at risk such as the woodland caribou, bald eagle, and wolverine.

On May 21, 2010, 21 member companies of the Forest Products Association of Canada and nine leading environmental organizations unveiled the Canadian Boreal Forest Agreement, which applies to 72 million ha of public forests licensed to the Association's members. When fully implemented, the Agreement will conserve significant areas of Canada's vast boreal forest, protect threatened woodland caribou, and provide a competitive market edge for participating companies.

BOREAL FOREST ZONE



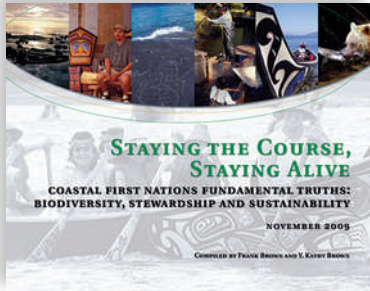
Source: Brandt, J.P. 2009

Boreal forest



Canadian Forest Service

Most provinces have developed new or revised land-use policies and planning acts that emphasize ecosystem-wide approaches. British Columbia was a pioneer in this area: by 2008, approximately 85 percent of the province was covered by 26 strategic land-use plans.



Conserving biodiversity in British Columbia

Biodiversity BC, a partnership between non-government conservation organizations and the provincial, federal, and local governments, recently released two important reports.

Taking Nature's Pulse (2008) is the province's most recent scientific report on its natural environment. The provincial government concurrently released the Conservation Framework for British Columbia to address many of the report's findings, including the status and significance of the province's ecosystem, species, and genetic diversity. The Framework also provides a set of science-based tools and actions for conserving species and ecosystems in the province.

Staying the Course, Staying Alive—Coastal First Nations Fundamental Truths: Biodiversity, Stewardship and Sustainability, released in 2009, gives voice to the ancestral knowledge of BC's Coastal First Nations by presenting a set of seven fundamental truths that have guided them for thousands of years.

British Columbia's Central Coast and North Coast Land and Resource Management Plan

British Columbia's Central Coast and North Coast Land and Resource Management Plan (2006) is a powerful example of an integrated land-use approach. Covering a total area of approximately 6.4 million ha, of which approximately 1.8 million is protected, the plan is an unprecedented collaboration involving First Nations, industry, environmentalists, federal, provincial and local governments, and many other stakeholders. This unique partnership aims to support economic opportunity while preserving some of the province's most spectacular wilderness areas and protecting habitat for a number of species, including the rare spirit bear. By striking a careful balance between the needs of the environment and the economy, land-use decisions not only protect vast areas of temperate rain forest but also provide an ecosystem-based management framework within which the forest industry can operate successfully.

Spirit Bear looks for fish on Princess Royal Island (British Columbia)



The *Saskatchewan Prairie Conservation Action Plan* envisions healthy native prairie ecosystems as vital to vibrant, strong communities. Aimed at conserving and restoring the health and biodiversity of these ecosystems as part of a functioning landscape, it engages 27 partners from the government, non-government, business, research, and academic sectors in a framework to connect local communities to native prairie ecosystems, practice sustainable land-use and development, manage invasive alien plant species, and value ecological goods and services.

Integrated planning initiatives are also emerging within the marine context. For example, the federal government has committed to establishing Large Ocean Management Areas for all of Canada's marine regions. These areas will extend from the coastline to the limits of Canadian jurisdiction and will address large-scale ecosystem and economic development issues through the collaborative development and implementation of integrated ocean management plans.

Similar efforts are underway in freshwater ecosystems, with governments and a broad spectrum of partners working together to maintain or restore ecosystem function in the Atlantic Coastal region, the St. Lawrence River Basin, the Great Lakes, Lake Winnipeg, and elsewhere across the country.

Alberta's land-use framework

Alberta's provincial government released a new land-use framework in 2008 to address the cumulative impacts of multiple industrial developments on the province's ecosystems. Regional plans facilitated by the *Alberta Land Stewardship Act*, created to provide new conservation and stewardship tools to protect heritage landscapes, will make Alberta the first jurisdiction in Canada to compensate landowners whose property values are affected by conservation and stewardship restrictions. Albertans will be consulted to help define future land-use in their region, with future developments to take into consideration their cumulative impacts on land, air, water, and biodiversity.

Restoring Lake Winnipeg

The Lake Winnipeg Stewardship Board (Manitoba), a partnership involving federal, provincial, and municipal governments, First Nations, the fishing and agriculture industries, urban land-use groups, and non-

government organizations, is working to reduce nitrogen and phosphorus contents in Lake Winnipeg to pre-1970 levels. A basin-wide watershed management plan using a consensus-based process will direct and integrate individual basin plans that are currently under development by watershed authorities. The International Institute for Sustainable Development recently completed an Ecosystem Services Assessment of the Lake Winnipeg Watershed, funded by Environment Canada, that estimates that billions of dollars could be gained by restoring the natural environment of Lake Winnipeg.



Dreamstime.com / Pictureguy66

Sustaining viable populations of species

Overview

Canada is home to over 70,000 known species and countless others that have yet to be discovered. These species face a variety of threats, including habitat fragmentation and degradation, pollution, unsustainable harvesting, invasive alien species, wildlife disease, and climate change.

A 2010 assessment of the overall status of 11,950 wild species in Canada determined that among resident native species, 77 percent of those examined were considered secure and 12 percent either at risk or may be at risk. The four ocean regions (in particular, the Eastern Arctic) had relatively high proportions of species at risk.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) oversees the scientific assessment that results in species being listed as threatened or endangered. To date, the Committee has assessed 602 species.

Among particular groups of species, land bird populations are showing statistically significant declines in four of the five major habitat types, although trends for individual species and regions vary. Similarly, most populations of seabirds are in decline, although these trends vary both among regions and over time.

Atlantic Habitat Partnership Initiative

In May 2009, the Government of Canada joined the governments of the four Atlantic provinces and Ducks Unlimited Canada in the Atlantic Habitat Partnership Initiative. The three partners are contributing \$3 million each toward this five-year conservation initiative – illustrating a significant investment and commitment to the conservation of Atlantic wetlands biodiversity.

The partnership is designed to maintain critical infrastructure to sustain wetlands across Atlantic Canada in order to conserve habitat for migratory birds and other wildlife. Building on these prospects, the Atlantic Habitat Partnership Initiative is designed specifically to maintain the necessary infrastructure to sustain 560 water-control pipes and systems, 150 fish ladders, and over 170 km of dykes on more than 400 km² of wetlands. Many of the wetlands were created or maintained over the past 15 years under the North American Waterfowl Management Plan and its agent in the Maritimes, the Eastern Habitat Joint Venture.

Ducks flying off from a lake north of Hazenmore (Saskatchewan)



iStock / Jerry Mayo

How Canada is responding

While conservation efforts targeted at ecosystems as a whole sustain most species, others require special attention. Governments are working to improve the status of species at risk and ensure that no more species become extinct due to human activities.

Protecting species at risk in Canada

There is a long history of cooperation with respect to wildlife management, among Canadian federal, provincial, and territorial governments. Building on that cooperation, in 1996, they agreed on the Accord for the Protection of Species at Risk, the primary goal of which is to prevent species in Canada from becoming extinct as a consequence of human activity.

Protecting species at risk in Canada is a process that involves the assessment of conservation status, the listing of species at risk, and recovery planning and implementation. As of August 31, 2010, there are 131 species covered by recovery strategies, as well as 189 species for which a recovery strategy is in development. Recovery planning is often carried out in cooperation with a variety of federal, provincial, and other partners. The National Recovery Working Group oversees the Recovery of Nationally Endangered Wildlife Program and has produced a handbook that outlines roles, responsibilities and best practices for such efforts.

Canada's Habitat Stewardship Program

The federal government established the Habitat Stewardship Program as part of Canada's *Species at Risk Act* to contribute to the recovery of species at risk and to prevent other species from becoming a conservation concern. By engaging Canadians in conservation actions to benefit wildlife, the Program has contributed to the legal securement of more than 46,000 ha of habitat and the temporary protection of about 150,000 ha every year. It has undertaken habitat improvement actions on 54,054 ha of land and funded more than 800 projects totalling \$41.5 million. These projects have, in turn, leveraged an additional \$108.7 million in contributions.



M. Cuthbert

DID YOU KNOW

- For decades, scientists thought the black-footed ferret was globally extinct. Then, in 1981, a small population was found in Wyoming, and several of these ferrets were collected in the hope that the species could be saved and eventually restored to its natural habitat. Descendants of those ferrets have been successfully bred in captivity. Thirty four ferrets were released into Grasslands National Park in the fall of 2009, 12 of which survived their first winter. In August 2010, wildlife officials celebrated the first wild-born litter of kits in Canada in over 70 years.



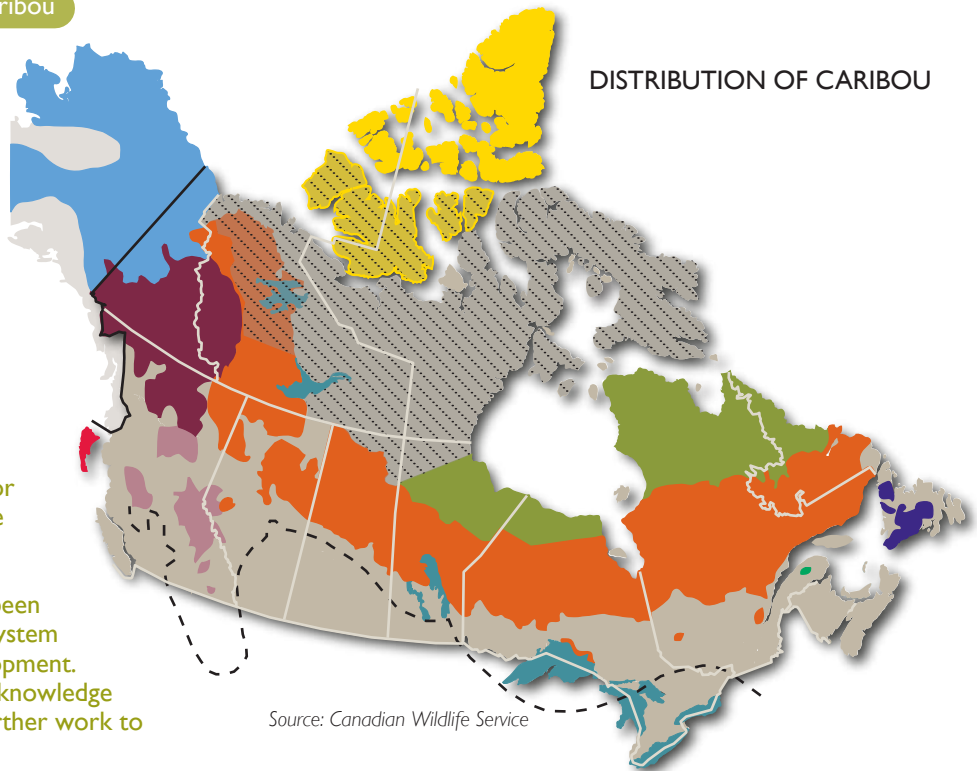
© Parks Canada / Paul Knapa

Habitat restoration at Blackie Spit, Surrey (British Columbia)

Towards a recovery strategy for Woodland Caribou

A member of the deer family and a key species in northern ecosystems, caribou are migratory and may move thousands of kilometres per year. Caribou play an important role in nutrient cycling as the only mammal adapted to feed mainly on lichen, a vegetation with the combined characteristics of fungi and algae. Lichens grow extremely slowly and do not disperse easily, so they are found in less disturbed northern ecosystems and old growth boreal forests, which explains the distribution of Caribou in these areas.

Caribou play a critical ecological role in Canada and continue to be an important food source for many northern communities; however, they are under increasing threat due to habitat loss, degradation, and fragmentation. Once present over much of Canada, their historic range has been moving steadily northward in response to ecosystem change, human settlement, and resource development. A 2009 national science review on the state of knowledge for woodland caribou will form the basis for further work to develop a recovery strategy for this species.



Cape Bathurst barren-ground caribou bull grazing in early July



Woodland Caribou Populations

- Boreal (i.e., Boreal Caribou)
- Migratory
- Northern Mountain
- Southern Mountain
- Atlantic-Gaspésie
- Newfoundland
- Barren-ground Caribou
- Peary Caribou
- Grant's Caribou
- Dawson's Caribou (extinct)
- - - - - Southern extent of historical caribou distribution

Working across borders to maintain healthy wildlife populations

In response to concerns over many declining populations of once abundant birds, Canada, Mexico, and the United States formed the North American Bird Conservation Initiative in 1999 to enhance the coordination and cooperation of conservation efforts across the continent. A collaborative effort involving a variety of partner organizations and agencies, the Initiative has identified 12 Canadian Bird Conservation Regions for which conservation plans are now being developed.

Binational efforts have also taken place with respect to waterfowl conservation. The *North American Waterfowl Management Plan* serves as a key mechanism to support wetland habitat conservation for migratory birds in all parts of North America. The Plan is considered one of the most successful conservation initiatives in the world.



© Ducks Unlimited Canada

Green winged teal pair

Towards a polar bear conservation strategy

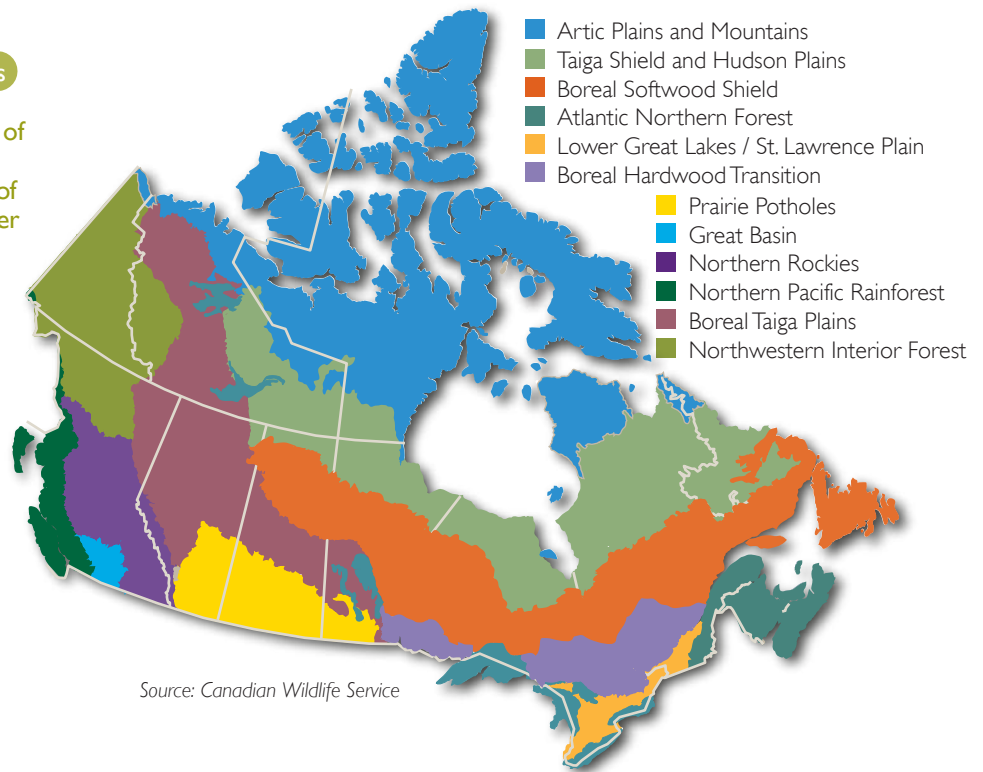
In 2009 a national roundtable was held to determine how to protect Canada's approximately 15,500 polar bears. In October 2009, Canada's Environment Minister signed a memorandum of understanding (MOU) with Nunavut's Minister of the Environment and Greenland's Minister of Fisheries, Hunting and Agriculture to ensure the protection of shared polar bear populations. The MOU proposes the creation of a joint commission that would recommend a combined total allowable harvest for Canada and Greenland and a fair division of the shared harvest. The commission, which would include representatives from the Canadian Inuit organizations Nunavut Tunngavik Incorporated and the Qikiqtaaluk Wildlife Board, would also be used to coordinate science, traditional knowledge, management, and outreach activities.



iStock / Visual Communications

Conservation plans for bird conservation regions

Environment Canada is leading the development of conservation plans for the 12 Canadian Bird Conservation Regions. Because of the large size of many of the regions and provincial jurisdiction over land management, most plans are being prepared based on political sub-units. As such, 25 all-bird conservation plans are currently targeted for completion in 2010, providing a comprehensive conservation framework across the country. The information contained in the plans will be the foundation for Canada's bird conservation programs and will aid in the identification of potential areas for land acquisition or protection and project effects under the *Canadian Environmental Assessment Act*.



Grey jay



Reducing threats to wildlife

Invasive alien species are a major threat to biodiversity, second only to habitat loss. These species take over the food sources, habitats, roles, and functions of indigenous species, thereby reducing their numbers and survival rates. These non-native species cause billions of dollars worth of economic damage each year in Canada and are cited as a threat to 24 percent of the species at risk listed by COSEWIC. The combined economic losses and direct costs associated with the invasion of 16 alien species are estimated to be between \$13 and \$35 billion per year.

At the national level, Canada is working to manage invasive alien species and protect ecosystems from their effects. *An Invasive Alien Species Strategy for Canada* (2004) provides a framework to help prevent new invasions, detect and respond to new invasive alien species, and manage established invasive alien species through eradication, containment, and control. In its 2010 budget, the federal government announced a renewal of federal programs under the Strategy to reduce the risk of invasive animal and plant species being introduced into Canada. The Strategy is complemented by provincial and territorial plans and initiatives to support the management and control of invasive species.

Invasive Alien Species Partnership Program

The Invasive Alien Species Partnership Program was one of the first federal activities developed to implement *An Invasive Alien Species Strategy for Canada*. The Program, which empowers grassroots-level work, engages multiple stakeholders, and employs Canadians, has provided nearly \$4.6 million in funding to 143 projects led by provinces, territories, municipalities, Aboriginal communities, educational institutions, and non-government organizations. Funded projects have targeted over 215 invasive alien species, resulting in the improved detection and reduction of harmful introductions and better understanding and awareness of the issue among Canadians.

Lythrum salicaria (Purple loosestrife)



Steve Dewey, bugwood.org

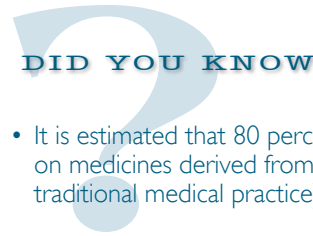
Maintaining genetic diversity

Overview

Genetic diversity is nature's insurance policy. It is the diversity within species that allows them to evolve and adapt. Genetic resources help increase productivity, ensure ecological resilience, and maintain options for future innovations. Conserving genetic diversity provides us with opportunities to discover and develop new food varieties, pharmaceuticals, timber, and bioenergy products. It will also be key to the ability of agricultural species to adapt to new climatic conditions.

Conservation and management of genetic resources within domesticated species is very important for human well-being. People have been improving food production for thousands of years by growing and tending plants and animals and then selecting and nurturing the best individuals for future use. There are currently about 50,000 edible species of plants and animals worldwide.

Many human uses for plant and animal species are still unknown and await discovery. The opportunity to derive benefits from these species will be lost if they disappear before new uses are discovered. Many common medications such as aspirin, tamoxifen, and quinine were found through observation of the natural defences of plants and animals against pests and predators. Had these natural biological functions gone unrecognized, we might have failed to conserve these species.



DID YOU KNOW

- It is estimated that 80 percent of the world's population depends on medicines derived from nature (used in either modern or traditional medical practice) for primary healthcare.



How Canada is responding

A range of activities is underway across the country to help maintain genetic diversity and ensure the adaptive potential of species.

For example, Canada is playing an important role in advancing DNA barcoding for species identification in both terrestrial and marine environments. Canada is the leading force behind the International Barcode of Life project and also participates in the Consortium for the Barcode of Life, which includes 200 member organizations based in 50 countries.

Access and benefit sharing

The fair and equitable sharing of the benefits arising from the utilization of genetic resources is one of the three objectives of the *Convention on Biological Diversity*. The Convention adopted the 2002 *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization* as voluntary guidance to countries in developing their domestic access and benefit sharing (ABS) policies. A new international ABS regime is currently being negotiated for possible adoption at the 10th Meeting of the Parties to the Convention in October 2010.

In parallel with discussions at the international level, Canada has been working with provincial and territorial governments to develop a domestic approach to ABS. Aboriginal organizations and communities have also been engaged, as given that they are the holders of traditional knowledge, regarding specific properties and uses of genetic resources, such as knowledge about the location of unique species harvested for medicines, food, and fibers.

Although Canada does not yet have an official ABS system in place, there are practices, laws, and regulations that affect access to genetic resources and the sharing of benefits from their use. These include permits to access/collect biological resources in national parks; agreements to transfer genetic material between academic institutions, researchers, and private businesses; the establishment of institutions to support research activities; and Aboriginal community protocols/guidelines.

Canada leading International Barcode of Life

The Canadian Barcode of Life Network represents the first national network dedicated to large-scale DNA barcoding. The Network is made up of hundreds of scientists and technicians and 20 working groups working towards the development and application of an accurate, rapid, cost-effective, and universally accessible DNA-based system for species identification. It is funded by a broad range of institutions across the country, with initial work focusing on barcoding species of particular economic, social, or environmental importance.



Photos © Photos.com, 2010

Conservation of genetic resources

A wide variety of initiatives related to the conservation of forest genetic resources are in place across the country. For example, most provinces and territories have clone banks, seed orchards, and provenance trials for commercial and indigenous tree species. Seed banks that are managed at both the provincial and national levels, such as the National Tree Seed Centre, also serve as an important resource to national and regional efforts.

Within the agricultural sector, Canada faces the significant erosion of cultivated animal and plant genetic resources, with an estimated three quarters of the agricultural crop species that existed in the early 1900s now extinct. A wide variety of efforts are underway involving Agriculture and Agri-food Canada (AAFC), plant gene banks and research centers, and non-government organizations such as Seeds of Diversity to help conserve crop genetic resources for future generations.

AAFC has also established the Canadian Animal Genetic Resources Program in collaboration with Rare Breeds Canada to conserve, preserve, enhance, and increase the utilization of the genetic diversity of plants, animals, microbes, and plant viruses of economic importance to Canada, includes some wild species.

There are also a number of initiatives aimed at conserving the genetic diversity of Canadian wildlife. These programs, which include captive breeding programs, seed and gene banks, and the designation of species at risk, involve a wide range of partners—including governments, non-government environmental organizations, museums, botanical gardens, zoos, and aquariums.

In addition, the importance of microbial genetic conservation is being increasingly recognized in Canada. Microbes are a large part of the diversity of life and are used in many areas of agriculture, sold as part of compounds in the food and beverage business, and studied as disease or biocontrol organisms. Initiatives such as the Expert Committee on Plant and Microbial Genetic Resources, which brings together representatives from governments, industry and academia, will help support the formulation of relevant policies and programs in Canada and internationally.

MacPhail Woods Ecological Forestry Project

Combining genetic, species, and ecosystem conservation and education, the MacPhail Woods Ecological Forestry Project in Prince Edward Island has collecting seeds from a wide variety of rare native trees and shrubs for propagation in the group's nursery since 1991. The Trout River Environmental Committee has partnered with MacPhail Woods to deliver two large-scale projects that involve the restoration of Acadian forest species on a watershed basis. These projects saw thousands of native trees and shrubs and hundreds of rare native species planted on over 20 ha of land.



Agriculture and Agri-Food Canada

Sustainable use of Canada's living resources

Overview

Canada's biodiversity sustains the productive capacity of its ecosystems, which in turn supports both our economy and our society. For example, harvesting remains an important occupation in many indigenous communities across the country, while hundreds of other communities depend directly or indirectly on employment in fisheries, forestry, agriculture, and tourism.

Maintaining healthy ecosystems and economies requires us to ensure that the consumption of natural resources respects ecological limits. Finding this critical balance is a key challenge for all governments and sectors of society.

How Canada is responding

Governments have responded to these challenges in a number of ways. For example, many now require the development of sustainable development strategies that provide broad policy guidance on sustainable use and the conservation of biodiversity. Governments have also incorporated biodiversity conservation and sustainable-use principles into management practices for all natural resource sectors.

Nova Scotia's environmental goals

The Government of Nova Scotia has set ambitious legislated targets through its *Environmental Goals and Sustainable Prosperity Act* and *Climate Change Action Plan*, both of which set out long-term goals and actions that will contribute to sustainable development and climate change adaptation in the province. Some of these actions include creating a fund to encourage adaptation research and development, developing statements of provincial interest on adaptation to provide guidance on land-use planning, making the conservation of coastal wetlands a policy priority, and developing a strategy to ensure the sustainability of the province's natural capital in forests, minerals, parks, and biodiversity.

Newfoundland and Labrador's Sustainable Development Act

Newfoundland and Labrador approved the *Sustainable Development Act* in 2006 to ensure that the province's renewable and non-renewable resources are developed to maximize benefits while protecting the natural environment for the use of future generations. It provides force of law for the enshrinement of sustainable development principles and calls for the creation of a strategic environmental management plan that will establish goals, policies, and implementation strategies for the province. The Act also calls for the development of sustainability indicators upon which sound decisions and reports on the province's resources can be based.



Photos © Photos.com, 2010

Canadian Model Forests and the Forest Communities Program

The Model Forest Program has been replaced by the Forest Communities Program, a five-year program launched in 2007 that funds a number of sites located in different geographic regions of the country as well as other national projects. Partnerships include a mix of urban, rural, and Aboriginal communities. The Forest Communities Program differs from the Model Forest Program in that it has a strong focus on the sustainability of forest-based communities; however, the concept of the original initiative continues through the use of partnership and on-the-ground solutions to sustainable forest management issues.

Canada: world leader in forest certification

Canada is a world leader in third-party forest certification, with approximately 145.7 million ha of forest (more than 87 percent of its productive forest land) certified under one or more of three internationally recognized certification schemes.

Sector-specific initiatives

Forestry

Forest management plans, which are typically developed by forest companies and subsequently reviewed by the appropriate jurisdictions, increasingly reflect biodiversity objectives. Programs also exist in virtually every province to encourage private woodlot owners to manage their resources sustainably.

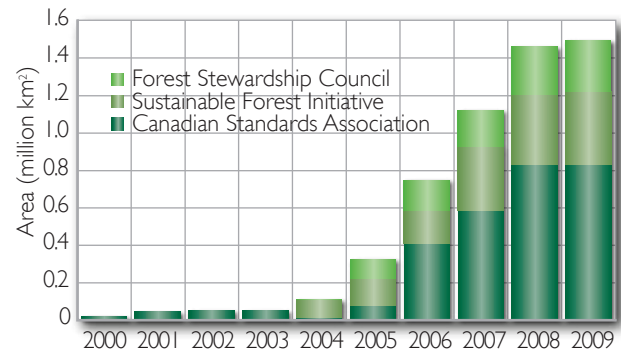
A key contributor to sustainable forest management in Canada is the Canadian Model Forest Network. The Network brings together a variety of stakeholders to increase knowledge of sustainable forest management in 14 model forests across the country.

A variety of certification standards are used by industry to demonstrate the sustainable use of Canada's forests, including Canada's National Standard for Sustainable Forest Management, the International Social and Environmental Accreditation and Labelling Alliance, and the Forest Stewardship Council.



Source: Natural Resources Canada

FOREST CERTIFICATION IN CANADA



Source: Metafore's Forest Certification Resource Centre, 2009

Fisheries

Within the fisheries sector, the Department of Fisheries and Oceans is leading efforts to ensure the sustainable use of Canada's aquatic areas. The department is engaged in fisheries renewal efforts to achieve an economically viable and diverse industry that is supported by a modern fisheries governance system. A variety of voluntary codes of practice are available to support the industry in its sustainable use of resources. Aboriginal groups are actively involved in the process through the *Aboriginal Fisheries Strategy* and other programs. British Columbia is becoming a leader in this area and is aiming to have all of its major commercial fisheries either certified or in the process of being certified by the Marine Stewardship Council within the next two years. Credible eco-labelling such as this will help position Canadian companies in increasingly competitive markets.

Agriculture

The Department of Agriculture and Agri-Food Canada has launched a number of initiatives to encourage sustainable agriculture in recent years. For example, the department introduced provincially delivered Environmental Farm Planning Programs to decrease the impact of agricultural practices on biodiversity and the environment. By 2008, approximately 34 percent of annual crop producers and 40 percent of livestock producers had developed environmental farm plans.

Wildlife-related initiatives

Wildlife harvesting is an integral part of traditional Canadian life, especially in Aboriginal communities, and still contributes to the provision of essential goods in communities around the country. An estimated six million Canadians participate in recreational hunting, fishing, and trapping every year and contribute to programs that help maintain and enhance wildlife. Wildlife ministers for Canada have established principles for hunting regulations that have guided sustainable wildlife management for decades.

Since 1985, Environment Canada and Wildlife Habitat Canada have raised close to \$33 millions for habitat conservation, restoration, and enhancement initiatives in Canada through the sale of the Canadian Wildlife Habitat Conservation Stamp, which is required to validate the Migratory Bird Hunting Permit.

Certification of a northern shrimp fishery

The Gulf of St. Lawrence northern shrimp fishery has been certified under the Marine Stewardship Council's eco-label. Certification is the culmination of a three-year joint effort involving the fishery harvesters and processors, the Department of Fisheries and Oceans, and provincial partners. In addition to certification, a variety of voluntary codes of practice are available to support the fisheries industry in the sustainable use of resources. Five fisheries have now been certified and 12 are pending.

Environmental farm planning

The National Environmental Farm Planning Initiative was put in place to encourage producers to develop environmental farm plans, implement beneficial management practices, and continuously evaluate their environmental performance – ultimately leading to the better management of Canada's agricultural resources. Through provincially delivered Environmental Farm Planning Programs, producers were provided with information, tools, and technical

assistance to conduct an assessment of the environmental risks and benefits of their operation and develop an action plan for mitigating potential risks. Plans were developed individually or by a group of producers with common interests on a watershed or commodity basis. Between 2003 and 2008, over 84,000 or 37 percent of Canadian producers participated in a provincially delivered Environmental Farm Planning program, while over 60,000 or 28 percent developed a formal action plan to address risk and enhance stewardship.



Wildlife Management Boards

Wildlife Management Boards, which are established under land claim agreements, exist across Nunavut, the northern Northwest Territories, the Yukon, and parts of Québec and British Columbia. Their role is to provide direction on the sustainable use of wildlife resources within their jurisdictions.



John A. Nagy, GNWT

Boreal caribou females in southern Gwich'in Settlement Area during late fall/post-rut

The Fur Institute of Canada

The overall mission of the Fur Institute of Canada is to promote the sustainable and wise use of Canada's fur resources. As a national non-profit organization, the Institute has acted as a roundtable for fur trade, animal welfare, and furbearer conservation

issues since 1983. As the coordinator for the overall implementation of the Agreement on International Humane Trapping Standards in Canada, the Institute promotes the conservation of furbearers and their habitats through the evaluation, promotion, and advocacy of the principles of wise and sustainable use and applied management. It also supports the continued improvement of animal welfare through ongoing research such as the Trap Research and Testing Program; the development of national and international trapping standards (including participation in international fora); and respect for Aboriginal and treaty rights through an Aboriginal communications program.

American Beaver, La Mauricie National Park



© Parks Canada / J. Pleau

Improving the knowledge base for conservation and sustainable use

Overview

Governments are taking steps to improve Canada's knowledge of ecosystem health and coordinate the collection of biodiversity data. For example, significant investments are being made in building databases such as the National Land and Water Information System, the National Forest Information System, and the recently launched Canadian Healthy Oceans Network.

Significant progress has been made to enhance reporting on ecosystem status and trends at the national level. In 2007, the Federal, Provincial and Territorial Ministers responsible for Biodiversity mandated the production of the *Canadian Biodiversity: Ecosystem Status and Trends Report 2010* as a first deliverable under the Biodiversity Outcomes Framework. Using designated ecozones to collect data on status and trends across the country, the report is scheduled for release in fall 2010.

Canada is monitoring Arctic biodiversity through participation in the Circumpolar Biodiversity Monitoring Program, an initiative of the Arctic Council's Conservation of Arctic Flora and Fauna Working Group. The Program is a mechanism for harmonizing and enhancing long-term biodiversity monitoring efforts across the Arctic in order to improve the detection of and reporting on significant trends and pressures. In May 2010, it released *Arctic Biodiversity Trends 2010*, synthesizing scientific findings on the status and trends of selected biodiversity in the Arctic.

Arctic Biodiversity Trends 2010: Selected Indicators of Change

Arctic Biodiversity Trends 2010 was produced by some of the world's leading experts on Arctic ecosystems and biodiversity. The Arctic Council's contribution to the United Nations International Year of Biodiversity in 2010, it is a preliminary product under the Arctic Council's Arctic Biodiversity Assessment project. Based on 22 indicators, the report provides a snapshot of the trends being observed in Arctic biodiversity today. Although the polar bear is one of the most well-known species affected by changes in the Arctic, it is not the only one. The indicators show that many other species of local or global importance are declining and that unique habitats for flora and fauna are also disappearing.

Alberta Biodiversity Monitoring Institute

The Alberta Biodiversity Monitoring Institute is a proactive risk-management tool that provides an early warning to resource managers about biodiversity change so they can make informed land-use decisions and take corrective actions before costly recovery programs are necessary. The Institute has a high degree of consistency across Alberta, enabling decision-makers to compare changes among multiple regions or within a single region over time. This scientifically credible arms-length program, encompasses all aspects of biodiversity monitoring, responding rapidly to new and emerging needs.



Enhancing our knowledge of species

For the past 10 years, federal, provincial, and territorial governments have been cooperating to produce a report on the general status of wild species in Canada. *Wild Species 2000* and *Wild Species 2005* provided an assessment of more than 7000 species in Canada, with *Wild Species 2010* to be available in early 2011.

Canada has eight independent Conservation Data Centres covering every province and the Yukon. The Centres conduct biological inventories to find and document populations of rare species, study and classify vegetation communities, analyze critical conservation issues, provide customized information products and conservation services, and make their data widely available to the public via the Internet. Each facility serves as a clearinghouse for reliable and current scientific information about plants, animals, and vegetation communities within its respective jurisdiction. Staff members include field biologists, ecologists, geographic information system specialists, and data managers who use their expertise to serve the conservation information needs of government, corporations, researchers, conservation groups, and the public. All of Canada's Conservation Data Centres are linked by NatureServe Canada.

Census of Marine Life is a global network of researchers engaged in a 10-year initiative to assess and explain the diversity, distribution, and abundance of marine life in the oceans. The Federal Biodiversity Information Partnership is also working to create a distributed network of biodiversity information that can be easily accessed and shared.

Canadians are also contributing to our understanding of species through a variety of citizen science programs. These include bird-monitoring programs such as the Breeding Bird Survey, which began in 1966 and is one of the oldest surveys of its kind in North America. Other citizen science programs include Frogwatch, which uses frogs and toads as indicator species for monitoring the health of wetlands, and Plantwatch, which records flowering times as an important indicator of a changing climate.

DID YOU KNOW

- Ontario Guelph's proposed 45 ha Pollinator Park will be one of the first and largest pollinator initiatives in the world.



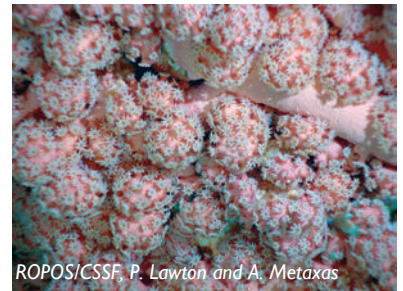
Photos © Photos.com, 2010

Addressing pollinators decline

NSERC-CANPOLIN is a new strategic network created by the Natural Sciences and Engineering Research Council of Canada and the Canadian Pollination Initiative that will address the growing problem of pollinator decline and crop pollination in agricultural and other ecosystems in Canada.

DID YOU KNOW

- In early August 2010, when the Census of Marine Life released its first inventory of species distribution and diversity in key global ocean areas, it had gathered together an inventory of 114,000 known marine species. By October 2010, when an updated report is scheduled to be presented, the species tally is expected to exceed 230,000, with scientists adding new discoveries almost every day.



ROPOS/CSSF, P. Lawton and A. Metaxas
The common name of the coral (*Paragorgia arborea*) is bubblegum coral, which is shown here at 860 m on the Nova Scotia continental slope

Learning more about genetic diversity

Studying the genetic blueprint of species provides information that is not only useful for conservation and recovery but also can be applied to agriculture, industrial design, and human health.

Research and technology development

Research and technology development are key tools that enable governments and other sectors to more effectively understand and plan for the sustainable use of Canada's natural resources. For example, research on the impacts of forest management practices has led to the development of new forest management guidelines for sensitive and indicator species. Improved understanding of natural disturbances, such as fire, has also been incorporated into planning efforts. Research networks such as the Sustainable Forest Management Network make a valuable contribution to these efforts.

Agriculture and Agri-Food Canada has developed a set of Agri-Environmental Indicators to assess how well agriculture and agri-food systems manage and conserve natural resources and how compatible they are with natural systems and processes in the broader environment. These indicators are a practical means of assessing environmental sustainability by combining current scientific knowledge and understanding with available information on resources and agricultural practices. The intent is to provide an objective, science-based assessment of the environmental sustainability of agriculture.

The Canadian Healthy Oceans Network is a large, interdisciplinary research network that aims to provide scientific criteria for ensuring sustainable management and use of the country's ocean biodiversity resources. Funded by the Natural Sciences Engineering Research Council of Canada, Fisheries and Oceans Canada, and the Government of Newfoundland and Labrador, the Network will bring together Canada's marine science capacities and provide a baseline for information against which future changes in the oceans can be monitored and understood. Three main

Studying the bee genome

Dr. Laurence Packer, of York University, has collected over 100,000 bees from around the world to be identified. Dr. Packer heads up the bee portion of the Barcode of Life project, which aims to greatly increase the efficiency of studies in agriculture, pollination, and biodiversity. The researchers in his laboratory have also published a guide to the genera of bees of eastern Canada and are completing a key for the families of bees of the world.

A number of Canadian initiatives address the decline in honeybees across the country. A new research project by Genome British Columbia will develop a set of tools to identify disease resistance in natural bee populations. By understanding the traits that make bees naturally resistant to pathogens, the long-term hope is that beekeepers will no longer need to use miticides, fungicides, and antibiotics to control them. Bees are also a model organism for studying human health issues such as immunity, allergic reaction, antibiotic resistance, development, mental health, longevity, and diseases of the X chromosome. Established in 2000, Genome BC is one of six Genome Canada centres across the country.

Daisy Brittle Star, Saguenay-St. Lawrence National Marine Park (Québec)



© Parks Canada / L. Falardeau

research themes will focus on marine biodiversity, ecosystem function, and population connectivity.

As a major forest nation, Canada must have reliable, current, and consistent information on the extent and nature of its forests in order to enable their sustainable management. Authoritative information on forest change is also required to support the development of policies to address both existing and emerging issues, such as climate change impacts and adaptation.

Canada's National Forest Inventory monitors a network of sampling points covering one percent of Canada's land mass to provide ongoing, accurate, and timely information on the state and sustainable development of Canada's forests. This information, which is shared with collaborators and the public, is used to inform domestic forest policies and positions, support science initiatives, and fulfill regional, national, and international reporting commitments. The Inventory is the product of a successful collaboration between provincial and territorial jurisdictions and the federal government.

Canadian Environmental Sustainability Indicators

In recognition of the need to effectively track efforts towards sustainable use, governments are working together to develop national indicators of freshwater quality, air quality, and greenhouse gas emissions. These indicators provide Canadians and decision-makers with more regular and reliable information on the state of their environment and how it is linked with human activities. Canadian Environmental Sustainability Indicators bring together environmental information from federal, provincial, and territorial governments who share responsibility for environmental management and emphasize the important relationships between the economy, the environment, and human health and well-being.

Canadian Museum of Nature researchers preparing for work on the Rideau River Biodiversity Project, Ottawa, Ontario



© Canadian Museum of Nature

A role for all Canadians

Overview

Achieving our biodiversity goals requires extensive collaboration and cooperation by all parts of society. This includes all levels of government, Aboriginal peoples, educational and scientific institutions, environmental non-government organizations, business, individual citizens and youth.

Canada has gained an international reputation for its strong stewardship and volunteer programs. There are millions of active environmental stewards in Canada, along with several thousand organizations dedicated to preserving biodiversity through a broad range of activities. The contribution these individuals and groups make to biodiversity is invaluable.

Volunteers proudly display the results of their tree planting efforts



Nature Conservancy Canada

Ontario's Stewardship Program

The Ontario Ministry of Natural Resources' Ontario Stewardship Program includes 46 community-based stewardship councils

involving thousands of partners. Approximately 16,000 volunteers take part in more than 600 Ontario Stewardship projects every year, including natural resource education, shoreline restoration, wildlife habitat enhancement, and forest-related, community-driven initiatives. Under Ontario Stewardship, more than 1000 educational events have been hosted, over 1500 ha of wetlands and headwater areas have been restored, and more than 40 km of shoreline have been rehabilitated.

What Canadians are doing

Aboriginal peoples

Aboriginal peoples in Canada have, over thousands of years, developed an intimate cultural and spiritual relationship with nature. Many of these communities, in particular those in the North, depend on biological resources for subsistence.

Aboriginal leadership in biodiversity, ecosystem conservation, and land-use planning is exemplified in the creation and maintenance of protected areas, particularly in the northern territories. To date, Aboriginal peoples have been involved in establishing over one quarter of the total lands within Canada's protected areas. Many of the most significant protected area gains made in Canada in recent years stem from land-use planning exercises that take place following land claim negotiations, such as those in the Dehcho, Sahtu, and Akaitcho regions of the Northwest Territories.

DID YOU KNOW

- There are more than 50 indigenous languages still spoken in Canada today.



Photos © Photos.com, 2010

Nunavut Coastal Resource Inventory

The Government of Nunavut has conducted Coastal Resource Inventories in six communities. The inventories consist of information on resource use and marine species found in Nunavut waters. Data were collected through interviews with community members, reports, maps, and other research—with careful consideration given to integrating traditional Inuit Qaujimagatjuqangit and science. This information was then mapped to assist in resource development, management, and conservation.

The successful completion of the Igloodik Coastal Resource Inventory Pilot Project in 2008 spawned inventories in five other communities over the following two years: Kugluktuk, Chesterfield Inlet, Arctic Bay, Kimmirut, and Qikiqtarjuaq. The final reports on the inventories will be completed in fall 2010 and presented back to the communities.

Walrus at one of many ugait areas on land where they haul out of the ocean during ice-free periods, on Walrus Island in Fisher Strait, Nunavut



Garry Donaldson

SARA also requires that an Aboriginal traditional knowledge subcommittee be established under COSEWIC to facilitate access to the best available Aboriginal traditional knowledge and to integrate that knowledge into COSEWIC's status assessment process. In addition, the National Aboriginal Council on Species at Risk has been established to improve the involvement of Aboriginal peoples in all relevant aspects of the implementation of SARA, including species assessment and listing; recovery strategy, action plan, and management plan development and implementation; permitting and related agreements; and critical habitat protection.

Aboriginal communities and parks agencies are also collaborating increasingly in park management activities. For example, Tombstone Park is managed through a cooperative effort by First Nation and the Yukon Government. Aboriginal tourism businesses are also emerging as models for sustainable use.

DID YOU KNOW

- The economic importance of the Canadian boreal region to indigenous people, who depend on it for subsistence, is up to \$575.1 million. This does not include the spiritual and cultural significance of the region, which cannot be measured.

Inuit Impact and Benefit Agreement

The Inuit Impact and Benefit Agreement, negotiated among the Government of Canada, Nunavut Tunngavik Inc., and four regional Inuit associations, allows for the creation of three new National Wildlife Areas on Baffin Island to protect local species and habitat – including a population of bowhead whales, which are threatened in Canada.

The Agreement also provides for the preparation of cultural resources inventories, which will support the development of interpretative materials and management plans

for the 10 existing and three new protected areas in the Nunavut Settlement Area (Akpatit, Qaulluit and Niginganiq National Wildlife Areas). Through these efforts, the Agreement aims to foster new options for economic development, such as ecotourism. This will help to diversify the local economy, confirm the ecotourism value of National Wildlife Areas, and assist the Inuit in adapting to evolving socio-economic conditions.

The ecological, economic, and cultural benefits associated with the Agreement mark a significant step forward with respect to community-based management, sustainable development, and the conservation of internationally significant areas.

Iceberg adrift in the waters of Davis Strait off of Baffin Island, Nunavut



Garry Donaldson

Educational and research institutions

Universities, research institutes, museums, zoos, aquariums, and botanical gardens all play an important role in biodiversity education and are some of the best places to explore biodiversity, especially in our urban areas. For example, the Royal Botanical Gardens are home to a vast variety of plant species, boasting areas that contain some of the highest documented plant diversity in Canada.

Canada's 25 botanical gardens cooperate on a variety of projects related to education and the conservation of plant diversity. In addition, the Canadian Association of Zoos and Aquariums teaches over 1.3 million children and adults about the impact of human activities and the importance of species conservation.

The province of Newfoundland and Labrador has developed an Institute for Biodiversity and Ecosystem Sciences and Sustainability, bringing together the academic community, government departments and agencies, industry, and non-government organizations to conduct research on natural resources conservation, management, and sustainability. Other specific areas of research include ecosystems ecology, climate change, fisheries and aquaculture science, and land-use planning.

Environment Canada's Biosphere in Montréal (Québec) also developed Biokits to encourage Canadians to go outdoors and discover the biodiversity in their neighbourhoods, parks and urban spaces.

The Canadian Museum of Nature

The Canadian Museum of Nature (Ottawa, Ontario) has promoted significant outreach with regard to biodiversity in Canada. Its Canadian Centre for Biodiversity established the online Native Plants Crossroads, which features resources and information on local conservation and community initiatives as well as information on pollination and invasive alien species. The Museum contributes large amounts of data to conservation data centres, is the national focal point for the Global Taxonomy Initiative, and is leading Arctic research through such efforts as Flora of the Arctic, an International Polar Year research project.

The Alliance of Natural History Museums of Canada

The Alliance of Natural History Museums of Canada was created in 2002 from the common vision of directors and senior curatorial staff at Canada's key natural history museums. The Alliance provides enhanced public programming with national reach, contributes to informed decision making in areas of public policy, and enhances collections planning and development to facilitate public and scientific access to information in members' collections.

Collectively, Alliance members house an estimated 19 million specimens of biota from all regions of Canada. They provide historic documentation on the living environment dating back to the 19th century as well as information and documentation related to the Earth's prehistoric and geologic time periods and environments.

A key element of this collaboration is the advancement of a national collections development strategy, through which the membership strives to maintain a record of Canada's natural history that is geographically, taxonomically, and temporally comprehensive.

Grand reopening of the Canadian Museum of Nature (Ottawa, Ontario), Saturday May 22nd, 2010



Environmental non-government organizations

Canadian environmental non-government organizations (ENGOS) are spearheading a wide variety of initiatives that support biodiversity, including education, stewardship, and partnerships with business, governments, communities, and Aboriginal groups. Key networks connecting these organizations include the Canadian Environmental Network, with its 600 member organizations, and Nature Canada's Canadian Nature Network, which brings together 375 ENGOS representing a combined membership of approximately 100,000 Canadians. The Canadian Wildlife Federation has also been instrumental in bringing educational material on biodiversity to schools across Canada through its outreach programs.

ENGOS that are active across the country include the Nature Conservancy of Canada, which has helped to conserve close to 809,371 ha of ecologically significant land nationwide since its inception, and Ducks Unlimited Canada and Bird Studies Canada, which engage thousands of volunteers in supporting conservation initiatives.

Best practices handbook

To mark the International Year of Biodiversity in 2010, the Canadian Environmental Network launched a “best practices/case studies” contest to gather innovative and effective examples of the work ENGOS are doing to help increase or protect biodiversity. The 12 winning projects were selected from within seven of Canada's terrestrial ecozones as representative of best practices from coast to coast. They are featured in the *Biodiversity Best Practices Handbook 2009*: Case studies from the environmental non-government sector.



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Industry and business

By taking action to conserve biodiversity, businesses can often increase the sustainability and productivity of their resources, maintain the ecosystem services that their operations depend on, improve their consumer reputation, and become leaders in their field.

In addition to pursuing independent certification, a number of natural resource sectors have developed and implemented codes of practice to promote the sustainable use of biodiversity. Stewardship codes have been developed by a number of organizations, including the Mining Association of Canada, the Canadian Association of Petroleum Producers, and the Canadian Electrical Association.

Industry members are also increasingly participating in multi-sectoral dialogues aimed at improving on-the-ground practices and developing shared solutions. For example, the Nova Scotia Colin Stewart Forest Forum includes both forest companies and non-government organizations in efforts to identify suitable sites to address gaps in the provincial protected-areas system.

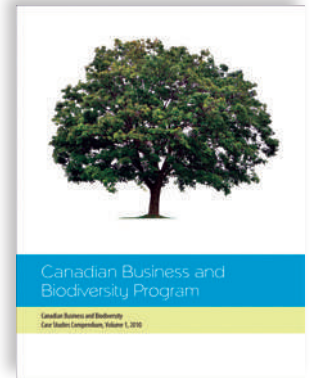
Clearwater Seafood

Clearwater Seafood, a Nova Scotia company, has demonstrated a strong commitment to harvesting high-quality products while pursuing the sustainable use of the fishery's natural resources. In the company's code of business, the protection of the environment is outlined as an integral factor in all decision-making. Clearwater uses a variety of methods to reduce the incidental catch of non-target species and reduces habitat destruction by conducting extensive ocean-bottom mapping in partnership with offshore scallop operators, the Canadian Hydrographic Service, and the Geological Survey of Canada. Clearwater also pursues species-specific conservation through seed boxes, voluntary coral closures, and coral codes of practice, while maintaining relationships with government, non-government, academic, and industry partners.

The Canadian Business and Biodiversity Program (CBBP)

The Canadian Business and Biodiversity Program was created in 2008 as a partnership among government, business, non-government organizations, and academia to showcase best practices in conservation, catalogue and share lessons learned, and help Canadian businesses integrate biodiversity conservation in their strategies and operations.

As part of Canada's contribution to the International Year of Biodiversity, the Program released the first volume of the *Canadian Business and Biodiversity Case Studies Compendium*. The compendium offers examples of best practices related to biodiversity conservation by Canadian businesses. These case studies, along with the forthcoming *Biodiversity Conservation Guide for Canadian Business*, are intended to assist businesses and others with biodiversity conservation planning.



Courtesy of Clearwater Seafoods Limited Partnership

Industry taking action

The **Canadian Electricity Association** has an Environment Commitment and Responsibility Program that commits its members to stewardship-related activities and includes a third-party verification system. The Association has also signed a memorandum of understanding with Fisheries and Oceans Canada to address habitat issues, identifying stewardship as one of five areas of cooperation. One of its members, Ontario Power Generation, has implemented a voluntary biodiversity management plan (with implementation and monitoring protocols) that is focused on species at risk and their habitats.



The **Mining Association of Canada** launched the Towards Sustainable Mining initiative in 2004 to align industry actions with the priorities and values of stakeholders and to improve the mining industry's sustainable development performance. Member companies follow guiding principles and report on indicators that measure their performance for specific mining activities. The Association's protocol for biodiversity conservation management underwent its first round of self-assessments in 2009, leading to public reporting in 2010. Recipient of the 2005 Globe Foundation Award in the industry association category, the Mining Association has a history of engagement with conservation organizations such as the Species at Risk Working Group, Biodiversity Stewardship in Resource Industries, and the North American Bird Conservation Initiative.



Canada has 25 percent of the world's peatlands, covering almost 113 million ha of the country, with more than 70 million tons of peat accumulating each year. Of this, Canada's sphagnum peat moss industry harvests only 1.3 million tons. Members of the **Canadian Sphagnum Peat Moss Association** adhere to its Preservation and Reclamation Policy, which includes identifying bogs for preservation, leaving buffer zones of original vegetation, leaving a layer of peat below harvesting levels to encourage rapid regrowth, and returning harvested bogs either to functioning ecosystems, forests, wildlife habitats, or agricultural production areas. The Association is examining sustainability accounting and evaluating the potential of establishing sustainable peatland standards and certification systems.



Urban areas

The total area of urban land in Canada has almost doubled since the 1970s. In addition, Canada has undergone major demographic shifts in recent years. It is now a highly urbanized, multicultural society with more limited access to, and connections with, biodiversity.

As such, Canadian urban areas and the municipal governments that manage them have a significant role to play in biodiversity conservation. A number of Canadian municipalities have already begun to incorporate biodiversity considerations into their programs and policies.

Edmonton, Alberta is one of 21 cities around the world participating in a three-year international study of local governments' involvement in biodiversity protection. The Local Action for Biodiversity Project is headed by Local Governments for Sustainability, an international association of local governments and governmental organizations committed to sustainable development.

In 2008, Edmonton completed a biodiversity report that provides an overview of the City's ecology, outlines its conservation governance structure, and includes an inventory of city- and community-led biodiversity initiatives. One of the city's new planning tools, the Ecological Design Report, aims to ensure that ecological design principles are integrated into development plans for new neighbourhoods, thus protecting biodiversity by reducing the impact of urban development.



Alain Chagnon

DID YOU KNOW

- The Québec City-Windsor (Ontario) corridor is home to almost half of Canada's threatened or endangered species as well as half of Canada's population.
- In recognition of the International Year of Biodiversity (IYB), Environment Canada's EcoAction Community Funding Program targeted biodiversity-related project proposals such as urban re-naturalization and habitat restoration for 2010. As a result, 58 biodiversity projects were supported in communities all across Canada.

Saint-Michel Environmental Complex in Montréal

Part of Montréal's network of large parks, the Saint-Michel Environmental Complex is a one-of-a-kind site that has won many international environmental awards for its integration of culture, community, and sustainability. Previously a limestone quarry and the second-largest urban landfill site in North America, the site was acquired by the City of Montréal and turned into a waste sorting and elimination center. It eventually became the focus of the most extensive environmental rehabilitation project ever undertaken by the city, with areas where waste was previously landfilled being progressively developed into a large and beautiful park. The park features displays aimed at making people more aware of both built and natural environments, how nature changes, and how humanity fits into nature.

Youth

While every part of society has a responsibility for maintaining the environmental integrity of the community, young people have a particular interest in preserving a healthy environment, since they are the ones that will inherit it. Youth can be a potential catalyst for change in their communities or in cooperation with young people from other nations. In 2009, Ottawa hosted the International Youth Symposium for Biodiversity. From that symposium emerged the International Youth Accord on Biodiversity, which will be carried by youth representatives to the 10th Meeting of the Convention on Biological Diversity in Nagoya, Japan. The Canadian Environmental Network's Youth Caucus is also sending a youth delegation to Nagoya. Young people are also leading many other biodiversity initiatives in communities all across Canada.



Macoun Marsh

Macoun Marsh is a small urban wetland located on the property of Beechwood Cemetery in Ottawa. In 2003, a local teacher and his students successfully convinced Canada's National Cemetery to preserve this natural habitat and had it declared an environmentally sensitive area. Since then, St-Laurent Academy students have taken on the role of protecting, researching, and documenting this wetland ecosystem as part of the Macoun Marsh Biodiversity Project. To date, this multifaceted research and education initiative has studied and preserved a unique inner-city wetland and identified more than 1300 species.

Looking forward

Despite the many actions being taken in Canada, biodiversity loss continues. Species and ecosystems will come under increasing pressure in the future, as land is converted to urban and industrial use, the integrity of ecosystems is compromised by industrial pollution and invasive alien species, and the changing climate challenges their capacity to adapt.

Canada is fortunate to still have large, relatively intact ecosystems and the opportunity to proactively manage them for adaptation and resilience in a rapidly changing world. The following represent some of the important challenges we must face to ensure that biodiversity continues to meet the needs of Canadians for healthy communities and sustainable livelihoods.

The ecosystem approach and adaptive management are fundamental to ensuring sustainable decision-making that considers cumulative impacts on biodiversity and supports continuous learning and improvement. Biodiversity targets and outcomes, developed in a participatory fashion, are being incorporated in water, land, and resource management plans. Protected areas are increasingly viewed within broader landscape and seascape approaches and supported by sustainable management regimes on working landscapes. Efforts to expand Canada's network of marine protected areas will help to ensure the ecological integrity of marine ecosystems and the sustainability of marine resources.

Consistent, long-term monitoring and reporting of biodiversity status and trends is important to determine the rate of loss of biodiversity in Canada, support ecosystem-based and adaptive management, and evaluate the effectiveness of biodiversity initiatives. Due for release in 2010, Canada's first Ecosystem Status and Trends Report will provide a baseline for future reporting and identify priority monitoring requirements and information gaps.

Addressing threats such as invasive alien species and climate change, which often emanate from outside our borders, will require enhanced monitoring, research, and prediction as well as ecosystem-based approaches and international co-operation. For many species, reducing fragmentation and focusing on the maintenance of connectivity will enhance ecological resilience and the adaptive capacity of species and ecosystems. For some species and ecosystems, however, adaptation may not be possible. It will, therefore, be important to assess vulnerability and plan for adaptation.

Life-cycle management and eco-certification are being increasingly adopted by industry to support sustainable production and consumption. By reducing resource and energy usage, cutting down on the production of emissions and waste, and harvesting sustainably, the impact of industrial processes and resource development on Canada's biodiversity will be lessened.



Photos © Photos.com, 2010

Identifying the economic contribution of ecosystem goods and services leads to policy development as well as to land- and resource-use decisions that ensure the continued provision of these goods and services. In light of growing pressures, including the impacts of climate change, such analyses are becoming more and more important to our ability to plan for the long-term sustainability of Canada's natural assets. Most valuation studies focus on a small selection of ecosystem goods and services, and the overall documentation of Canadian ecosystems is both limited and fragmented.

With close to half of Canada currently under land claims and self-government agreements, the role and contribution of Canada's Aboriginal peoples has never been more important. There is a growing number of examples of Aboriginal involvement and co-management related to land-use planning, protected-area creation, wildlife management, and species at risk.

Canada must build on these positive examples of collaborative planning and management while recognizing and respecting the knowledge, innovations, and practices of Aboriginal communities.

There are many examples of action being taken by all sectors, both public and private, yet biodiversity continues to be lost. Canada's ecosystems, species, and genetic resources provide the country with economic and ecological resilience, while shaping its diverse cultures and lifestyles. Conserving and using Canada's natural resources sustainably is everyone's responsibility. By making continuous learning and improvement a priority, Canadians can continue to benefit from and be enriched by these natural assets.



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Ontario
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Prince Edward Island
<http://www.gov.pe.ca>

Québec
<http://www.gouv.qc.ca>

Saskatchewan
<http://www.gov.sk.ca>

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<http://www.gov.yk.ca>

Provinces and territories

Alberta
<http://alberta.ca>

British Columbia
<http://www.gov.bc.ca>

Manitoba
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New Brunswick
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