

The Wildlife Quilt

Often, in bygone days, a patchwork quilt was made to commemorate some special occasion in the life of a family. The 50th anniversary of the Canadian Wildlife Service (CWS) inspired Leslie Van Patter and Robert Lyon to explore this traditional Canadian art form. Their design, composed of many interlocking pieces, is a fitting symbol of the range of CWS programs - from habitat management to environmental monitoring and the protection of endangered species. Its many images depict Canada's biological diversity, as represented by some of our best-known birds and mammals. The living tapestry of wildlife is a treasured part of our national heritage, to be passed down from generation to generation. The task of caring for it never really ends.

Species List:

- 1 Snow Goose
- 2 Common Loon
- 3 Atlantic Puffin
- 4 Trumpeter Swan
- 5 Herring Gull
- 6 Polar Bear
- 7 White-Throated Sparrow
- 8 Mallard
- 9 Thick-Billed Murre
- 10 Whooping Crane
- 11 Wood Bison
- 12 Great Blue Heron
- 13 Barren-Ground Caribou
- 14 Peregrine Falcon
- 15 Semipalmated Sandpiper

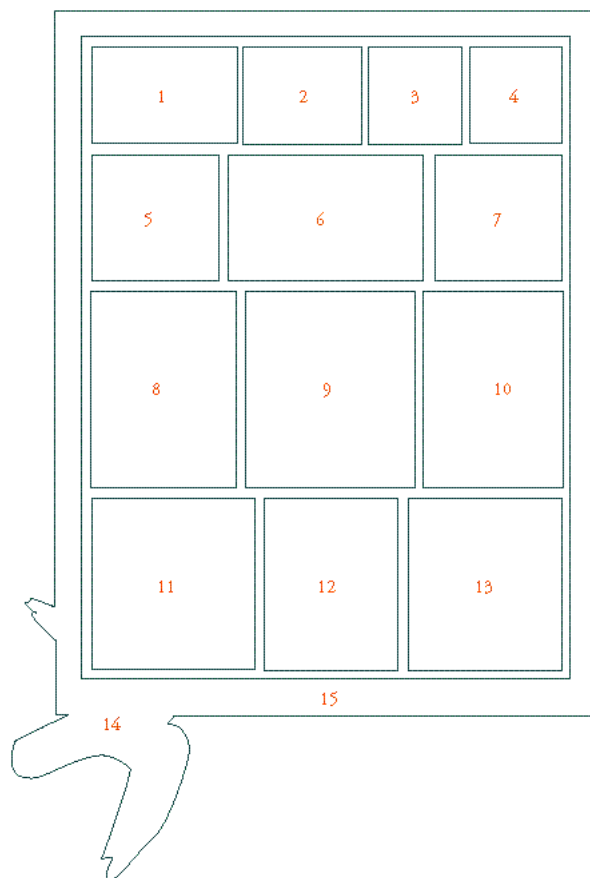




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Foreword

In 1996, federal, provincial and territorial environment ministers signed a national pledge to use Canada's Biodiversity Strategy as a guide to conserving our natural heritage. The Strategy recognizes that the diversity of wild species and ecosystems plays a fundamental role in the spiritual, social and economic well-being of all Canadians. It also reflects Canada's role in implementing the United Nations Convention on Biological Diversity.

In 1997, the Canadian Wildlife Service of Environment Canada celebrated its 50th year as a federal agency responsible for conserving wildlife. These responsibilities include protection and management of migratory birds, nationally-significant habitat and endangered species, as well as work on other wildlife issues of national and international importance. In addition to its biological research, the Canadian Wildlife Service is also known for its studies on the socio-economic importance of wildlife.

This report describes the initiatives of Environment Canada and other federal departments that contribute to implementing the wildlife and habitat diversity provisions of the Canadian Strategy. The actions described in this report are part of an ongoing conservation effort involving partnerships with the provinces and territories, conservation organizations and the private sector. These partnerships play an important role in the wise use of our natural heritage and are the product of a long history of cooperation in wildlife management across Canada.

As Environment Minister, nature is one of my four key priorities, along with climate change, clean air and water. We must work to ensure that nature is a part of our legacy to future generations. Canadians attach enormous importance to nature, not only as an intrinsic part of our national identity, but also as a source of considerable economic and other benefits.

Fortunately, there are many examples of Canadians helping nature. Still, the future of wildlife and their habitats must not be taken for granted. To prevent further losses of species and habitats, a continued effort is required on the part of all Canadians. The actions contained in this report are those that will lead the federal government, in partnership with other Canadians, in meeting the challenge of conserving Canada's wildlife diversity, now and into the new millennium.



Minister of Environment

Introduction

In 1992, Canada became the first industrialized country to ratify the United Nations Convention on Biological Diversity, which came into force on December 29, 1993 (United Nations Environmental Program 1994). The Convention recognizes that biological diversity is an important asset to current and future generations, affirms that conserving biodiversity is a common concern of mankind, and notes that it is vital to anticipate, prevent and attack the causes of biodiversity loss at their source.

The Convention's three objectives are to: conserve biological diversity; use the components of biological diversity in a sustainable manner; and ensure the fair and equitable sharing of the benefits that arise from the use of genetic resources.

Biological diversity is defined in the Convention as the variability among living organisms and the terrestrial, aquatic and marine biological complexes of which they are part. Among other things, it requires contracting parties to:

- ✦ promote the protection of ecosystems and natural habitats and the maintenance of viable populations of species in natural surroundings; and
- ✦ integrate consideration of the conservation and sustainable use of biological resources into national decision making.

To guide national efforts to implement the Convention, representatives from various sectors of Canadian society, led by the federal, provincial and territorial governments, developed the Canadian Biodiversity Strategy. The Strategy was formally endorsed by federal, provincial and territorial governments in April 1996. This was brought about through broad-based consultations with industry, the scientific community, conservation groups, research institutions, indigenous and local communities and the public (Environment Canada 1995a).

The Strategy outlines comprehensive measures for the conservation and sustainable use of biodiversity and encourages all jurisdictions, including the federal government, to report on the specific activities and programs they will undertake to implement these measures.

The goals of the Canadian Biodiversity Strategy are to:

- ✦ conserve biodiversity and use biological resources in a sustainable manner;
- ✦ improve our understanding of ecosystems and increase our resource management capability;
- ✦ promote an understanding of the need to conserve biodiversity and use biological resources in a sustainable manner;
- ✦ maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources; and
- ✦ work with other countries to conserve biodiversity, use biological resources in a sustainable manner, and share equitably the benefits that arise from the use of genetic resources.

This report describes how the federal government will address these five goals in respect of wildlife.



About This Report

This is primarily an Environment Canada report. It describes departmental actions for the period 1995-2000 that have contributed or will contribute to the implementation of the strategic directions on wildlife and habitat found in the Strategy, and focuses largely on birds and mammals. Specific departmental targets and actions are provided for goals one, three, four and five of the Strategy. The initiatives described are drawn largely from the departmental business plan, so that progress in meeting these goals of the Strategy can be easily measured (Environment Canada 1996a).

The report also notes various wildlife diversity initiatives that have been undertaken by the Canadian Museum of Nature, Parks Canada, the Canadian Forest Service - Natural Resources Canada, Agriculture and Agri-Food Canada, Statistics Canada, Department of National Defence, and Indian and Northern Affairs Canada. Where applicable, the reader is referred to other federal reports on the implementation of the Strategy for more information.

The actions detailed in this report recognize the significant achievements and contributions the conservation community has already made to wildlife biodiversity, particularly for species and habitats at risk. The actions also illustrate how shared jurisdiction over wildlife in Canada has evolved through partnership and cooperation to conserve wildlife and habitat diversity across Canada's landscape.

This report on wildlife diversity is one in a series of federal government reports on implementing the Strategy and the Convention. Others in the series examine the protected areas, agriculture, forestry and aquatic biodiversity, and ecosystem management (goal two) aspects of biological diversity conservation. A summary report on the federal implementation of the Strategy is also planned.

Canadian Biodiversity Strategy Canada's Response to the Convention on Biological Diversity

One of the key obligations for parties that have ratified the Convention is to prepare a national strategy. The Canadian Biodiversity Strategy is a response to this obligation and has been developed as a guide to the implementation of the Biodiversity Convention in Canada.

The Strategy presents a vision for Canada of a society that lives and develops as a part of nature, values the diversity of life, takes no more than can be replenished and leaves to future generations a nurturing and dynamic world, rich in its biodiversity.

The Canadian Biodiversity Strategy recognizes existing constitutional and legislative responsibilities for biodiversity in Canada. It also emphasizes the importance of intergovernmental cooperation to create the policy, management and research conditions necessary to advance ecological management.

Successful implementation of the Strategy will be determined, in large measure, by the degree to which all parts of society adopt its vision and principles and contribute to achieving its goals. Ultimately, the conservation of biodiversity and the sustainable use of biological resources will require the support and participation of individual citizens, local and indigenous communities, urban and regional governments, conservation groups, business and industry, and educational and research institution (Environment Canada 1995a).





Section 1: Wildlife and Habitat Diversity in Canada

A. Key Concepts in Wildlife Diversity Conservation

The preservation of biological diversity has always been a fundamental goal of Canada's wildlife management agencies. Biodiversity is commonly described as having three main components:

- ✿ genetic diversity;
- ✿ species diversity; and
- ✿ ecosystem diversity.

Genetic diversity is the genetic variation within species. When a species occupies a large geographic area, the populations in each area of the range usually differ genetically from one another. Genetic diversity is the attribute that enables wildlife to survive by adapting to variations in climate and habitat. It allows co-evolutionary responses to other organisms, such as predators and parasites. Genetic diversity is preserved both by conserving populations of species in their natural settings and by collecting and storing genetic material.

Species diversity refers to the variety of species present in a geographic area. Such characteristics as soil type, climate, topography and latitude have a significant influence on species richness and abundance. Monitoring species variety over time enables scientists to learn valuable information about the health and stability of populations and their supporting habitat.



An ecosystem is usually defined as a dynamic complex of species populations interacting within a particular environment. Forests, grasslands and wetlands are all examples of different types of ecosystems. The term "wildlife habitat" is used to denote the environment of individual wildlife species, and may include several different types of ecosystems. Habitat conservation and the maintenance of healthy ecosystems are critical to sustaining wildlife diversity.

These concepts mask the considerable difficulty that scientists encounter when studying wildlife population dynamics and habitat change. Questions such as the optimum size of wildlife management areas, or the impacts of human uses of wildlife habitat, require a spatial and temporal understanding of species requirements, rates of natural change and human effects. Because our understanding of these complex relationships is poor, finding answers to these and other wildlife and habitat management questions is often difficult.

As a result, and responding to a sense of urgency, many wildlife biologists believe that a "coarse filter" management approach must be taken to preserve the diversity of wildlife at a local, regional and international scale. This involves taking steps to preserve a variety of ecosystems, selected so as to ensure that they will contain most of the species in a given region. It is also necessary for wildlife agencies to adopt a complementary "fine filter" approach for the conservation of individual species that are not adequately protected by ecosystem-scale conservation efforts or that may already be endangered (Savard, Freemark and Reynoldson 1994).

The Commissioner of Environment and Sustainable Development

In April 1995, the Minister of the Environment tabled amendments to the Auditor General Act to establish the Commissioner of Environment and Sustainable Development. The Commissioner will review the sustainable development strategies of federal government organizations, consider submissions from the public, and report to the House of Commons on these agencies' progress in implementing their strategies (Environment Canada 1997c).

<http://www.oag-bvg.gc.ca>

B. The Importance of Biodiversity

One of the underlying causes of declining wildlife diversity on earth is the failure of societies to consider the value of wildlife and wildlife habitat in decision making. Since the major effects of this decline are felt outside the marketplace, the costs to biological diversity, sustainable use and ecosystem function are often ignored. Determining the economic value of biodiversity and incorporating this information into economic and policy decisions is therefore essential to conserving wildlife and habitat.

Both the Convention and Strategy recognize the importance of sustaining wildlife and ecosystems for their own sake, and for the sake of long-term human health and prosperity. Ecosystems and their component plants, animals and microorganisms provide food, clothing, shelter, medicine and other products that are essential to human survival and health.

Wildlife viewing and other recreational activities also create significant benefits to local and regional economies (Heywood 1995). Researchers estimate the value of direct harvesting and the recreational use of biological resources in Canada at billions of dollars.

In addition to these economic benefits, ecosystems perform key functions that are necessary for life on this planet. These include oxygen production, groundwater recharging, flood control, transportation of nutrients, carbon sequestering, decomposition and soil creation (Perrings 1995).

The Ecological Monitoring and Assessment Network (EMAN)

A national decentralized network, established in 1994 and facilitated by Environment Canada, EMAN has partnerships at all government levels, with all levels of the educational community, and with industry and the conservation community. Its overall aim is to describe what is going on in the environment and why. The national issues being addressed by EMAN are: climate change; biodiversity change; primary productivity change; impacts of toxics; and impacts of harmful ultraviolet radiation.

The basic unit of the network is the EMAN site, an area where ecological monitoring and research are co-located and where both local and national concerns are addressed. Currently, there are approximately 100 terrestrial sites organized by ecozone into Ecological Science Cooperatives. The sites belong to a variety of partners, including national and provincial parks, Biosphere Reserves, research stations, university field stations, model forests, and Department of National Defence bases.

The Biodiversity Science Board of Canada, established by EMAN, recommends methods for biodiversity monitoring, gives oversight and direction to EMAN's biodiversity initiatives, and advice and council to a variety of clients when called upon.

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Sustainable Development Strategy, Environment Canada, April 1997

All federal departments are responsible for preparing sustainable development strategies to guide them in greening policies, programs and operations.

Environment Canada's long-term mission is to foster a national capacity for sustainable development that will result in a safe and healthy environment and a sound and prosperous economy. This basic mission will continue to be relevant as Canada enters the next century, even though specific policy instruments and their uses may evolve substantially. Sustainable development represents a long-term approach that will enable us to fulfill this mission.

Through its first sustainable development strategy, Environment Canada has identified four strategic approaches that it will take to enhance its contribution to sustainable development. They are:

- ❖ to strengthen the Department's ability to meet sustainable development goals;*
- ❖ to be a more effective advocate of sustainable development;*
- ❖ to give Canadians the tools they need to make sound decisions in a changing environment; and*
- ❖ to set a good example in the greening of government operations (Environment Canada 1997c).*

<http://www.doe.ca/>

C. Wildlife Diversity in Canada

Canada is a country of great biological, geographical and cultural diversity. One of the largest nations in the world, Canada encompasses a land mass of 9.9 million square kilometers, touches on three oceans, and has 224 000 kilometres of coastline.

Canada plays a particularly important role as global steward of major portions of the world's tundra, temperate and boreal forest, and marine and freshwater ecosystems. Almost half of Canada is forested land, representing about 10 percent of the world's total. Canada's Arctic constitutes about 20 percent of the world's circumpolar land area. Rivers and lakes make up at least 7.6 percent of Canada's surface area and provide nine percent of the world's fresh water supply. One quarter of the remaining wetlands on the globe are found in Canada (Mosquin et al. 1995).

A National Ecological Framework for Canada

Views from satellites serve as a reminder of the great variety of ecosystems that lie within our borders. Environment Canada, in cooperation with other federal departments and provincial and territorial agencies, has refined Canada's ecological framework by characterizing and mapping its terrestrial and marine ecosystems using a hierarchical system. At its broadest level, the system comprises 15 terrestrial ecozones and five marine ecozones. Within the terrestrial ecozones alone are 194 ecoregions and some 1020 ecoregions. The Canadian ecological framework has recently been used as the model for an ecological framework that will cover all of North America and another that will cover the northern circumpolar region (Ecological Stratification Working Group 1996).

The abundance of wildlife species that inhabit Canada is impressive, although diversity is low when compared to tropical regions. Canadians are responsible for some of the largest herds of free-ranging caribou in the world, as well as some of the largest wild populations of bears, wolves, martins, beavers, lynx and other fur bearers. Many of North America's migratory forest birds, shorebirds, ducks and geese take up residence here during the spring and summer.

Canada is also home to 54 endemic species of vascular plants, mammals, and freshwater fish and mollusks (Mosquin et al. 1995). None of these species are found anywhere else in the world. Often associated with habitat in Canada that was not covered by glaciers during the last ice age, these species include the Vancouver Island marmot and the Acadian whitefish.

Since the early days of colonial settlement, Canada's rich natural resources—both renewable and non-renewable—have provided the basis for the country's wealth. Beginning with the fisheries and fur trade, natural resources have been a direct source of employment and income, and have stimulated commercial activity in other sectors of the economy. Today, the population of Canada is over 30 million, with the vast majority of people living within 160 kilometers of our southern border.

Canadians have long recognized the importance of conserving our biological resources, and can point with pride to the many initiatives this country has undertaken to monitor and conserve wild species. The first migratory bird sanctuary in North America, for example, was established in the late 1800s at Last Mountain Lake, Saskatchewan. Over the past decades, changes in policy and legislation have significantly increased the populations of some species of wildlife. The presence of healthy numbers of most waterfowl and our extensive network of protected areas are indicators of the success of these dedicated efforts.



As awareness of the importance of wildlife increases, so too does evidence that money spent on conservation is paid back with interest. Today, activities that depend on wildlife are a vital part of the everyday lives of most Canadians. Many Canadians carry out volunteer work on behalf of wildlife, and the harvesting of wildlife provides food and clothing to aboriginal communities. According to a survey conducted by Statistics Canada for Canada's wildlife agencies, nearly 19 million Canadians spent \$8.3 billion in 1991 pursuing wildlife-related activities such as hunting, fishing, camping, taking special trips to observe and photograph wildlife, and enjoying wildlife around their homes and cottages (Federal Provincial Task Force on the Importance of Wildlife 1994).

Nationally, wildlife-related recreational activities have significant economic impacts, including contributions of \$10.2 billion to Canada's gross domestic product, \$5.4 billion in income generated primarily by the 187 791 jobs sustained by these activities, and \$4.6 billion in government revenues from taxes and license sales (Filion 1994). For every dollar spent by governments on wildlife conservation and management, the Canadian people receive significantly more in benefits, financial and otherwise.

As Canada's population increases, the number of people who take part in wildlife-related activities is also expected to increase. A growing proportion of these people is likely to participate in non-consumptive activities, such as wildlife viewing and photography. Researchers point out that there is still a significant untapped market for wildlife-related activities. These trends hold important implications for the programs and activities of Canada's wildlife management agencies, particularly as they seek increasingly to engage Canadians in the direct stewardship of land and wildlife resources.

D. Understanding Our Wildlife Heritage

Canada's diverse landscape supports a rich and unique flora and fauna—ranging from mammals, reptiles, amphibians, fish, birds and vascular plants to less visible but equally important invertebrates, non-vascular plants and microorganisms. However, our knowledge of the

Cooperation Among Wildlife Enforcement Agencies

Conservation of wildlife depends heavily on the willingness of individuals, organizations and property owners to abide by the laws and regulations that protect wildlife and habitat. The responsibility to enforce wildlife legislation rests with the provincial, territorial and federal governments. To be more effective, close cooperation between enforcement agencies is often required (e.g., sharing of information, conducting of joint investigations).

To help ensure that these links are maintained, Environment Canada participated in the establishment of a Canada-wide enforcement coordination committee responsible for maintaining ongoing cooperation and information exchange. In addition, the Department was instrumental in the establishment of the continent-wide North American Working Group on Wildlife Enforcement. This working group, which compliments the environmental provisions of the North American Agreement on Environmental Cooperation, consists of enforcement agency representatives from Canada, the United States and Mexico.

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taxonomy, ecological requirements and population status of wild species varies enormously. Approximately 97 percent of Canada's species have not been studied in any depth, and much of the biological data we have is not readily available or widely shared for analytical purposes.

Although virtually all larger organisms, including most vertebrates, larger insects, higher plants and ferns, have been described, we know virtually nothing about their distribution, ecological relationships, and status. A smaller number of these—primarily harvested species of fur bearers, ungulates, fish and waterfowl, as well as endangered species—are intensively studied and managed through science-based programs. Numerous other organisms, including most species of insects, fungi, non-vascular plants, bacteria and protozoa, have not been identified or are poorly understood. Although scientists have recorded some 71 000 species of wild plants and animals in Canada, an estimated 68 000 have yet to be discovered (Mosquin et al. 1995).

E. Threatened and Declining Wildlife

Since most of our wildlife species are widely distributed and few are endemic, Canada has lost relatively few known species as compared to tropical regions. This does not change the fact, however, that 10 distinct species have disappeared from this country since 1884, including the great auk, passenger pigeon, Labrador duck, Dawson caribou, sea mink, Banff long-nose dace, deepwater cisco, longjaw cisco, eelgrass limpet and blue walleye. An additional 281 species of land and marine mammals, reptiles, amphibians, birds, fish, mollusks, vascular plants and lichens have been designated "at risk" in Canada, and that list is growing as more species are assessed (Canadian Wildlife Service 1997b). Eighteen species were added to the national list of species at risk in April 1998.

Some species that are not threatened or endangered at present are also declining. Populations of woodland nesting birds (Partners in Flight—Canada 1996) and shorebirds (Morrison et al. 1994) are two examples. Although habitat loss is understood to be a major factor in many of these declines, in many cases biologists do not have the information required to reliably determine population trends or to understand the factors causing such declines.

The National

State of Environment Report (1996)

The third national State of Canada's Environment report is now available. The 1996 edition includes a chapter on biodiversity change that describes the general state of biodiversity in different regions of Canada, identifies various agents involved in these changes, and profiles a number of international and national conservation efforts.

<http://www1.ec.gc.ca/~soer/>

Analyzing the State of Biodiversity Science

Environment Canada carried out a scientific appraisal of biodiversity issues in Canada and their implications for policy and research. The Biodiversity Science Assessment reviews what is known about the biodiversity effects of major human activities, including forestry, agriculture, fishing and urbanization. The assessment has broad-ranging recommendations, including a call for more ecologically-sound forestry practices, the protection of non-crop habitat on farmland, and codes of practice for genetically-modified organisms (Biodiversity Science Assessment Team 1994).

E. The Status of Canada's Wildlife Habitat

Human settlement and resource use has always had an effect on biological diversity, particularly through the harvesting of natural resources and the alteration of habitats. Although our knowledge about the impacts of human land use and occupancy on the distribution and abundance of most wildlife species is incomplete, we do know that these effects are widespread. Taking steps to manage human uses of the landscape and natural resources is therefore essential to sustaining wildlife and wildlife habitat across Canada (Wildlife Habitat Canada 1991).

Significant negative impacts on wildlife and habitat in Canada have occurred since the arrival of Europeans early in the 17th century. However, pressures on ecosystems and species have intensified greatly over the past decades as a result of population growth, settlement and industrial expansion. These changes are particularly acute in regions of high human population such as southern portions of Ontario and Quebec, and in areas such as prairie Canada where much of the landscape has been adapted to agriculture. Other factors, including the introduction of alien species, chemical pollution (Mineau et al. 1994), global warming and climate change, threaten to alter entire ecosystems so rapidly that neither wild species nor their habitats will be able to adapt (Biodiversity Science Assessment Team 1994).

The conservation of wildlife diversity involves the protection and management of entire ecosystems. Environment Canada estimates that 14 of Canada's 177 terrestrial ecoregions are at a high risk of biodiversity loss, largely because of such land uses as agriculture and urbanization. More than 60 percent of Canadian grasslands have been lost and only a few hectares of tallgrass prairie remain intact. The Carolinian forest survives only in tiny patches in southern Ontario due to agriculture and urban development, and extensive cutting has left only small stands of old red and white pine in central Canada. In the Maritimes, old-growth forests exist only in small patches. In the West, only fragments of the "pocket desert" of the South Okanagan remain in a relatively natural state due to increasing urban and agricultural expansion. In the Georgia Basin, on Canada's west coast, old-growth Douglas fir forests have become rare, and the extent of uncut rain forest continues to shrink (Biodiversity Science Assessment Team 1994).



Canada's freshwater and marine ecosystems are a focal point for settlement, economy and transportation. As such, they are highly vulnerable to human stressors. In the settled parts of Canada, drainage and conversion have reduced wetlands and estuaries by as much as 90 percent. In eastern Canada, acid rain is causing thousands of small lakes to lose fish, amphibian and shellfish communities, and is having a continuous effect on shallow soils, particularly in the boreal shield. Although the long-term impacts are not completely clear, the health of trees and other organisms in forested ecosystems is being affected (Acidifying Emissions Task Group 1997). The Great Lakes ecosystem has been greatly altered by intensive commercial fishing, successive invasions and deliberate introductions of alien species, pollution and habitat alteration. For many decades, the Gulf of St. Lawrence has received the accumulated discharge of toxic wastes, municipal sewage and agricultural run-off from the Great Lakes and elsewhere in the St. Lawrence River watershed. Atlantic coastal waters have experienced a considerable reduction in their stocks of northern cod and other harvested fish. The Georgia Basin, including the Fraser River estuary, continues to see losses to its rich wetland ecosystems through intense upland development pressures affecting their integrity, hydrology, and water quality and quantity.



Volunteers Vital in Monitoring Biodiversity

Volunteers are playing an increasingly important role in monitoring biodiversity.

Among the growing number of volunteer programs is the Breeding Bird Survey, a major source of data on population changes in species of terrestrial birds in North America. Launched in maritime Canada and the eastern United States in 1966, the survey is now continent-wide and involves nearly 300 Canadian volunteers. In Canada, the Breeding Bird Survey is coordinated by the Canadian Wildlife Service

<http://www1.ec.gc.ca/~cws/bbs1.html>

The Marsh Monitoring Program, which uses marsh birds and amphibians as indicator species to monitor the condition of marshes in the Great Lakes Basin, is another such program. Begun in Ontario in 1994, the Marsh Monitoring Program recently expanded into the United States. Hundreds of volunteers are now involved in monitoring some 220 survey routes in both countries. Environment Canada helps fund the program, which is led by the Long Point Bird Observatory

<http://www.doe.ca/ecs/biodiv/biodiv.html>

The Ecological Monitoring and Assessment Network (EMAN) is currently working on monitoring protocols that volunteers are encouraged to use for amphibians, fish, zooplankton, parasites, earthworms, arthropods, fungi, trees and other plants. When implemented with training facilitated by EMAN, these protocols are expected to involve a broad range of volunteer groups and individuals in monitoring species numbers and distribution. EMAN is cooperating with a wide range of schools and non-government organizations to expand volunteer monitoring associated with Ecological Science Cooperatives across Canada.

<http://www.cciw.ca/eman-templintro.html>



Section 2: Implementing the Canadian Biodiversity Strategy

A. Wildlife Conservation in Canada

i. A Wildlife Policy for Canada

In 1990, the Wildlife Minister's Council of Canada adopted A Wildlife Policy for Canada, a national policy that provides a framework for federal, provincial, territorial and non-governmental policies and programs (Wildlife Minister's Council of Canada 1990). The objectives of the Policy are to: maintain and restore ecological processes; maintain and restore biodiversity; and ensure that all uses of wildlife are sustainable.

These goals are met through a variety of program and regulatory initiatives across Canada that provide for effective wildlife management. These initiatives include:

- ❧ cooperation among stakeholders, including those involved in land and water management, agriculture, forestry, and pollution prevention;
- ❧ knowledge of species, their habitats and their interdependencies within ecosystems;
- ❧ management of wildlife populations and habitats throughout their breeding, nesting, migration and wintering range;
- ❧ efforts to recover species and habitats that are in decline; and
- ❧ the dissemination of information on wildlife conservation and sustainable use.

These national objectives and strategies for conservation remain valid today, although the context for their delivery at the federal level has changed as a result of budgetary reductions and other government reforms.

ii. Management Responsibility

Jurisdictional authority over natural resources and public lands rests largely with the provinces and territories. This authority gives the provinces and, to a lesser extent, the territories the primary lead in wildlife and habitat conservation and biological-resource management (Attridge 1996). Each province administers and regulates the use of its own lands, forests, water, wildlife and fisheries and has undertaken to establish a multitude of programs and initiatives for conservation. In the Yukon and Northwest territories, the federal government retains control over most of the land and fresh water, while the territories are responsible for wildlife.

Federal government responsibilities for wildlife and wildlife habitat cover migratory birds, fish, marine mammals, federal protected areas, and the wildlife trade. The administration of federal lands, pollution-prevention controls, and the promotion of sustainable forestry and agriculture also have a bearing on wildlife conservation. These federal responsibilities are met directly through the administration of legislation, regulations and programs, and through participation in cooperative programs with the provinces and territories, conservation organizations, the private sector, aboriginal communities and other countries (Privy Council Office 1995).

iii. Environment Canada's Conservation Role

Environment Canada is implementing the Canadian Biodiversity Strategy in collaboration with other federal departments, the provinces and territories, and other stakeholders. The Department's Biodiversity Convention Office is a focal point for Canada's implementation of the Convention on Biological Diversity, both federally and nationally.



The Department has specific responsibilities related to wildlife, including the management and conservation of migratory birds and, in cooperation with the provinces and territories, other wildlife of national and international concern, including endangered species. While the Canadian Wildlife Service has the lead role in wildlife and habitat conservation, other programs in Environment Canada play an important role in the regulation of pollutants and in addressing climate change and other threats to ecosystem integrity. To carry out these responsibilities, Environment Canada:

- ❖ conducts research and monitors populations of migratory birds and other wildlife to identify and respond to threats;
- ❖ regulates the harvest and other uses of migratory game birds to ensure both the sustainability of their populations and the associated cultural and socio-economic benefits;
- ❖ supports the delivery of national programs and implements international trade provisions for endangered species;
- ❖ establishes migratory bird sanctuaries and national wildlife areas, which currently total more than 11 million hectares in Canada;
- ❖ participates in wildlife management, habitat protection and environmental programs with other federal departments, the provinces and territories, conservation organizations, aboriginal groups, and other countries;
- ❖ regulates substances that affect the environment and the quality of wildlife habitat; and
- ❖ promotes ecosystem-based approaches to the management of lands and resources.



B. Conservation and Sustainable Use

Implementing Goal One of the Canadian Biodiversity Strategy

The first goal of the Strategy calls for enhanced research on species and populations combined with monitoring and indicator programs, and for action to conserve wildlife habitat at the ecosystem level. Other strategic directions encourage action on the sustainable harvest of wild species and the protection of ecosystem health through pollution prevention.

Developing Indicators of Biodiversity Change

Environment Canada's State of the Environment Directorate coordinated the development of a biodiversity component for Canada's national environmental indicators. Environmental indicators are tools for translating and communicating concise and scientifically-credible environmental information in a manner that can be readily understood and used by decision makers at all levels of society. The biodiversity indicators focus on national trends in biodiversity, stresses that influence these trends, and societal responses to adverse trends (Environment Canada 1995e).

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i. Wild Flora and Fauna

Many organizations within the federal government contribute to wild flora and fauna conservation in such key areas as research, habitat protection, harvest regulations and environmental protection. Often, these efforts are conducted in partnership with provincial and territorial agencies, conservation groups, aboriginal organizations, and agencies in other countries. In particular, the Government of Canada supports the implementation of international agreements and programs for the conservation and sustainable use of migratory birds and other trans-boundary wildlife.

Strategic Direction

1.1 Use ecological planning and management approaches with more emphasis on landscape/waterscape-level planning to integrate economic and social objectives with biodiversity conservation objectives.

Target:

Conserve wildlife by implementing integrated resource management at the landscape level in partnership with communities, organizations and other jurisdictions.

Actions:

- ✦ promoting ecological planning and management through five regional ecosystem-based initiatives—the Atlantic Coastal Action Program, St. Lawrence Vision 2000, Great Lakes 2000, the Northern River Basin Study and the Fraser River Action Plan;
- ✦ continuing implementation of the North American Waterfowl Management Plan through landscape-based habitat joint ventures across Canada (United States Department of Interior 1994);
- ✦ participating, through the Ecological Monitoring and Assessment Network, in the development of common protocols for the long-term monitoring of forest, grassland, tundra, wetland, freshwater and marine ecosystems, and creating links among 100 long-term ecological monitoring sites across Canada; and
- ✦ expanding the role of the Biosphere Reserves in cooperation with other Man and the Biosphere programs in the use of monitoring and research results for creating and implementing new sustainable management strategies and monitoring the results.

mabexsec@symptico.ca

The Salmon River: A Test Case for the Fraser River Action Plan

The Salmon River, near Salmon Arm, British Columbia, is one of several Fraser River Action Plan demonstration projects.

It began with a strong local push to restore a watershed where salmon runs had declined and water quality had deteriorated due to the impacts of ranching, farming and forestry practices. The Fraser River Action Plan has helped fund the hiring of a project coordinator, the establishment of a watershed resource centre, and the creation of an educational video about the project.

To help restore the watershed, the Fraser River Action Plan supports habitat improvement projects—in partnership with local groups—in several areas that are suffering from bank erosion and habitat damage.

<http://www.pwc.bc.doe.ca/ec/frap.html>



Strategic Direction

1.2 Conserve ecosystems and critical habitats in order to support populations of wild flora and fauna.

Target:

Identify and prioritize vulnerable ecosystems and wildlife habitat and conserve them through the development of ecosystem, regional and sectoral strategies.

Actions:

- ✦ restoring 13 coastal harbor and watershed areas and supporting 36 community-based management initiatives under the Atlantic Coastal Action Plan;
- ✦ restoring ecosystems along the St. Lawrence River by protecting 7000 additional hectares of habitat, reducing toxic effluent from 56 priority sites, and supporting 140 community-based projects under the St. Lawrence Vision 2000 Program;
- ✦ through the Great Lakes 2000 Program protecting 3000 additional hectares of wetland, restoring habitat integrity in 17 areas of concern, helping to recover endangered species in the watersheds, conducting an extensive science program and developing ecosystem-based management plans for lakes Ontario, Erie and Superior;
- ✦ completing the Northern Rivers Basin Study in 1996 and publishing a report on lessons learned (Irwin Huberman Consulting 1997); and
- ✦ procuring, protecting and enhancing critical wildlife habitats under the Fraser River Action Plan, including protecting 1000 hectares of estuary habitat, enhancing 3000 hectares of upland habitat, and completing seven demonstration projects on wetland and other habitat restoration.

Regional Ecosystem Initiatives

Environment Canada has five regional ecosystem-based initiatives: the Atlantic Coastal Action Program, St. Lawrence Vision 2000, Great Lakes 2000, the Northern River Basins Study, and the Fraser River Action Plan. Pollution prevention is a strong component of these initiatives, which are intended to provide examples of an ecosystem approach to sustainable development. They integrate scientific, management and socio-economic expertise within the Department and with partners from other federal and provincial agencies, aboriginal groups, and the private and public sectors. Experience with these initiatives suggests five keys to success: an ecosystem approach, partnerships, community involvement, science and leadership (Environment Canada 1995f).

http://www.ec.gc.ca/issues_e.html

Target:

Ensure the protection and enhancement of habitat critical to the survival of wildlife populations, including migratory birds.

Actions:

- ✦ securing and enhancing 2.1 million hectares of wetland and upland habitat and influencing land use on an additional 1.6 million hectares by 2001 under the North American Waterfowl Management Plan;
- ✦ coordinating Partners in Flight—Canada, a national program for the conservation of landbirds in Canada;
http://www.ec.gc.ca/cws-scf/canbird/pif/p_intro.htm
- ✦ publishing atlases of critical wintering sites for migratory shorebirds in Mexico and Central America;
- ✦ assisting in the protection of areas for bird conservation through the Important Bird Areas Program and the Western Hemispheric Shorebird Reserve Network;

- ✦ continuing to support implementation of the North American Waterfowl Management Plan, and promoting wetland awareness and providing policy and scientific advice on wetland conservation through the North American Wetlands Conservation Council (Canada);
- ✦ maintaining the focus on cooperation and partnership with Wildlife Habitat Canada, established in 1984 to assist in conserving wildlife habitats across Canada; and
- ✦ designating protected sites for monarch butterflies in Canada in cooperation with Mexico.

Target:

Protect habitat integral to the conservation of wildlife through the establishment and management of protected areas and designated sites (see section Bii Protected Areas for additional details).

Actions:

- ✦ participating in and supporting the implementation of the Ramsar Convention on internationally-significant wetlands, including the dedication of additional Ramsar sites in Canada;
- ✦ supporting the Western Hemispheric Shorebird Reserve Network nomination of new shorebird reserve sites and the dedication of two additional reserves; and
- ✦ establishing cooperative management plans for the Cold Lake Air Weapons Range (Alberta, Saskatchewan), and the Nanoose and other CFB Esquimalt properties (British Columbia), in partnership with the Department of National Defence.

Invest in Canada's Wildlife

Established in 1984 by Environment Canada, Wildlife Habitat Canada (WHC) is a national non-profit organization dedicated to working with private citizens, government, non-government organizations, and industry to conserve the great variety of wildlife habitats across Canada. Revenues from the sale of Canada's conservation stamp, required to validate federal migratory bird hunting permits, contribute to the habitat conservation programs of WHC. In its first 10 years, WHC has:

- ✦ *broadened understanding of and support for habitat conservation initiatives;*
- ✦ *developed programs designed to foster cooperation and leadership;*
- ✦ *contributed over \$20 million toward wildlife conservation and enhancement projects, communication and education initiatives, and research and scholarship programs; and*
- ✦ *provided financial resources, project planning and scientific expertise (Wildlife Habitat Canada 1997).*

For more information:

*Telephone: (613) 722-2090
Facsimile: (613) 722-3318*



Strategic Direction

1.3 Through research, increase our understanding of the status, genetic diversity and ecological relationships of species and populations to improve ecological planning and management.

Target:

Develop and transfer the knowledge and tools necessary to understand the interactions between wildlife species and their habitats, including changes brought about by human use.

Actions:

- ✦ maintaining inventories of migratory game and non-game bird species and making regular improvements to survey methodology;
- ✦ monitoring populations of arctic- nesting geese and black ducks and conducting research projects to improve our knowledge of these species and their habitat requirements;
- ✦ monitoring forest bird populations and habitat associations through the Breeding Bird Survey, the Forest Bird Monitoring Program and other surveys outlined in the Canadian Landbird Monitoring Strategy;
- ✦ implementing a protocol and volunteer-based program to monitor forest bird population and habitat trends in Ontario and British Columbia;
- ✦ improving understanding of migratory bird breeding and wintering distribution using DNA and isotope techniques;
- ✦ supporting directed research on wildlife and landscape ecology at the graduate level through the Atlantic Cooperative Wildlife Ecology Research Network and the Pacific Cooperative Wildlife Research Network;
- ✦ continuing research on trends, habitat, toxicology, harvesting, etc. of migratory birds and other wildlife, including mammals, birds, amphibians and reptiles, through the National Wildlife Research Center;
- ✦ completing a multi-year project on biodiversity in Labrador through the linking of science with traditional ecological knowledge;
- ✦ monitoring the sources and pathways of mercury in the ecosystem as part of the Ecological Monitoring and Assessment Network's Mercury Working Group, a multi-agency team working in Kejimikujik National Park, Nova Scotia;
- ✦ developing new techniques to detect organisms and toxins that cause avian botulism in Canadian bird populations;
- ✦ operating centers of expertise in ecosystem science, aquatic and terrestrial systems, toxic chemical pathways in ecosystems, compliance/emergencies, sediment and water quality (i.e. National Hydrology Research Institute, National Water Research Institute, Centre Saint-Laurent, Atlantic Laboratories and the Pacific Wildlife Research Center);
- ✦ documenting the biodiversity status of freshwater mussels in the lower Great Lakes basin through research conducted by the National Water Research Institute;
- ✦ maintaining partnership with the Canadian Cooperative Wildlife Health Center for wildlife disease advice and diagnostic services;
- ✦ preparing an inventory of research and development activities in Environment Canada;
- ✦ documenting the role of birds and habitat in the biocontrol of insect and plant pests through research conducted by the National Wildlife Research Center;
- ✦ assessing the linkages between atmospheric change and biodiversity (Atmospheric Change and Biodiversity Workshop, February 1996) to support the development of a science plan and practical mitigation and adaptation measures (Munn 1996);

- ✦ developing a partnership with Agriculture and Agri-Food Canada for the sharing of information on the biosystematics of plants, insects, arachnids and fungi;
- ✦ developing population models for shorebirds, linking habitat requirements to migratory stop-over sites; and
- ✦ conducting an annual national science meeting, hosted by the Ecological Monitoring and Assessment Network, where a wide range of scientists and others discuss ecosystem research and monitoring results.

Workshop on Establishing a Canadian Biodiversity Data Policy Framework Ottawa, July 7-8, 1997

As a party to the Biodiversity Convention, Canada must track the effectiveness of its implementation strategy for domestic and international reporting purposes.

Over 60 provincial, territorial and federal representatives participated in a two-day workshop to determine the need for and potential barriers to establishing a policy framework for managing Canada's extensive biodiversity data. As a result, the National Biodiversity Information Initiative was launched by a partnership among Environment Canada, Agriculture and Agri-Food Canada, the Canadian Forest Service and the Canadian Museum of Nature. This is a phased program aimed at increasing our national ability for electronic access to biodiversity data and information. The first phase calls for the completion by March 31, 1998, of an analysis of the state of biodiversity data accessibility across Canada, a costed work plan for future phases and a roster of partners and participants.

For more information:

Telephone: (613) 566-4540

Facsimile: (613) 364-4021

Atmospheric Change and Biodiversity

Atmospheric Environment Service scientists have assisted in many ways in the formulation of national and international science agendas on atmospheric change and biodiversity. These include:

- ✦ *co-sponsoring the Atmospheric Change and Biodiversity Workshop: Formulating a Canadian Science Agenda (Munn, R. E., ed. 1996. Atmospheric Change and Biodiversity: Formulating a Canadian Science Agenda. Toronto: Institute for Environmental Studies.);*
- ✦ *organizing the Climate and Biodiversity Change During the Last Millennium Workshop;*
- ✦ *assisting agencies in establishing forest climate-monitoring systems to understand the thermal buffering of forest ecosystems and species;*
- ✦ *collaborating with the Ecological Monitoring and Assessment Network and other agencies throughout Canada to establish the Canadian Biodiversity Network, the Biodiversity Science Board, biodiversity training workshops and links with other networks and boards such as the Global Change Program, the National Air Issues Coordinating Committee and the Climate Program Board;*

<http://www.cciw.ca/eman-temp/intro.html>

- ✦ *helping international agencies like the Smithsonian Institution, United Nations Environment Program (UNEP), North American Institute for Global Change Research, United Nations Education, Science and Culture Organization and others address these questions: What is the relative effect of atmospheric change on biodiversity? What can we do about it?, and How is biodiversity changing?; and*
- ✦ *conducting science assessments, including developing standardized protocols.*

<http://www.tor.ec.gc.ca/aes.html>

Strategic Direction

1.4 Ensure that the harvest of wild flora and fauna is sustainable and minimize the adverse impacts of harvesting on non-target species.

Target:

Achieve or maintain sustainable populations of migratory game and non-game birds and other wildlife in partnership with other jurisdictions, agencies and organizations.

Actions:

- ✦ developing annual hunting regulations and issuing hunting permits under the Migratory Birds Convention Act;
- ✦ implementing a continental monitoring scheme to track trends and harvests in migratory game-bird populations and their habitats to ensure sustainable harvesting practices and to identify species and populations in need of attention;
- ✦ reducing the ecological impacts of lead shot by currently regulating its use for hunting waterfowl and by banning lead shot for waterfowl hunting in Canada in 1999;
- ✦ implementing the Canadian Landbirds Strategy through Partners in Flight—Canada;

- ✦ undertaking an extensive review of the Migratory Bird Regulations, beginning with a consultation phase in 1997;
- ✦ implementing the International Agreement on Humane Trapping Standards in cooperation with the Fur Institute of Canada, the International Fur Trade Federation and the provinces and territories;
- ✦ upgrading the skills of Canada's aboriginal and northern trappers to meet current provincial and territorial licensing requirements through the five-year Fur Program of Indian and Northern Affairs Canada; and
- ✦ participating in the implementation of international conservation agreements for polar bears and the Porcupine caribou herd.

Target:

Strengthen partnerships with aboriginal communities for the stewardship of natural resources.

Actions:

- ✦ negotiating wildlife co-management agreements with aboriginal groups in Labrador and with others involved in comprehensive land claims negotiations across Canada; and
- ✦ implementing wildlife co-management agreements in northern Quebec, and the Yukon and Northwest territories.

Protecting Habitat for Bowhead Whales

A new national wildlife area—to be called Igalirtuuq—is being established to protect the endangered eastern Arctic population of bowhead whales. Located at Isabella Bay on the coast of Baffin Island, this is an important summering area and migration stopover that contains abundant food for bowheads and offers protection from killer whales. The site is part of a larger area proposed for Canada's first marine biosphere reserve. Environment Canada is working with other government departments, Inuit agencies, and the community of Clyde River to establish and manage the national wildlife area.



The North American Wetlands Conservation Council (Canada)

The Council was established in April 1990. It advises the Minister of the Environment on the development, coordination, and implementation of wetland conservation initiatives of national or international importance.

The 12-member Council, composed of federal, provincial, and non-government agencies, works in close cooperation with the North American Wetlands Conservation Council (USA) and the Instituto Nacional de Ecología (Mexico). Major activities include:

- ✦ providing a national forum to oversee the coordination and implementation of Canada's North American Waterfowl Management Plan habitat joint ventures (Pacific coast, prairie habitat and eastern habitat);*
- ✦ coordinating and submitting Canadian habitat projects to the United States for funding approval under the North American Wetlands Conservation Act;*
- ✦ monitoring the development and implementation of wetland conservation policies and wetland awareness programs in Canada; and*
- ✦ serving as a national forum for facilitating Canadian involvement in international wetland conservation initiatives, particularly the RAMSAR Convention.*

The Council publishes reports on wetland policies, the use of wetlands for wastewater management, wetland evaluation techniques, and impact mitigation and compensation.

*Telephone: (613) 228-2601
Facsimile: (613) 228-0206*

www.wetlands.ca

Strategic Direction

1.5 Reconnect fragmented ecosystems, where practical and necessary, providing corridors and protecting habitats for isolated species or populations.

Responsibility for implementing this strategic direction rests largely with the provinces. Federal government contributions to fragmented wildlife habitat. (e.g., for shorebirds or wetlands) are described elsewhere in this report. In particular, the reader is referred to the target and actions detailed under strategic directions 1.1 and 1.2.

Amphibians and Reptiles in Great Lakes Wetlands: Threats and Conservation

Wetlands are important to the survival of amphibians and reptiles. Two-thirds of the Great Lakes coastal wetlands have been lost to drainage and reclamation for harbors, farmland and urban development. The surviving wetlands and the amphibians and reptiles they contain continue to be threatened by exotic species, contaminants and habitat loss. Environment Canada has prepared a fact sheet that examines the various threats to these animals and to our remaining Great Lakes wetlands, and describes ongoing efforts to protect existing wetlands, including wetland restoration projects at Black Ash Creek, Cootes Paradise and Oshawa's Second Marsh (Environment Canada 1996b).



Strategic Direction

1.6 Modify or eliminate elements of government policies and programs that create unintentional adverse impacts on wild flora and fauna and other wild organisms on private and public property.

Although no policy reviews are being undertaken specifically for wildlife and wildlife habitat, programs, policies and regulations are assessed on an ongoing basis—through regulatory planning and review, impact assessment and policy development—to determine their impacts and level of environmental acceptability. These reviews include the existing wildlife programs of the federal government.

Assessing Biodiversity Impacts

The Canadian Environmental Assessment Agency (CEAA) and the Biodiversity Convention Office of Environment Canada have produced A Guide for Proponents Assessing Environmental Effects on Biodiversity. This document is intended to highlight the importance of biodiversity considerations in project and policy planning and to help meet the environmental assessment requirements of the Biodiversity Convention, the Canadian Biodiversity Strategy and the Canadian Environmental Assessment Act. Examples are provided of spatial and temporal biodiversity parameters requiring investigation throughout the normal conduct of impact assessment, mitigation and monitoring (Canadian Environmental Assessment Agency 1996).



Strategic Direction

1.7 Strengthen measures to reduce and eliminate the release of substances or quantities of substances that are harmful to ecosystem, species and genetic resources.

Target:

Reduce impacts of toxins and other substances that are harmful to wildlife.

Actions:

- ✦ coordinating pesticide research and providing information to the federal Pest Management Regulatory Agency regarding:
 - advances in the determination of avian toxicity;
 - protocols for protecting non-target plant species;
 - mapping sensitive aquatic habitats; and
 - assessments of the uses of fenitrothion and carbofuran;
- ✦ implementing the Federal Toxic Substances Management Policy (Environment Canada 1995b) and the Pollution Prevention Strategy (Environment Canada 1995c);
- ✦ implementing the Federal Action Plan on Climate Change (Environment Canada 1995d);
- ✦ developing and implementing national environmental-quality guidelines for water, sediment and soil to guide measures aimed at reducing the release of toxic substances;
- ✦ completing an assessment in southwestern Nova Scotia of the implications of mercury levels in wildlife, including common loons and fish;

- ✦ continuing the implementation of Canada's ozone layer protection program in conjunction with the provisions of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (Environment Canada 1997a);
- ✦ conducting wildlife toxicology research and surveillance on pesticides, metals and other contaminants (National Wildlife Research Center and Centre Saint-Laurent);
- ✦ participating in an analysis of the environmental biological human health and other effects of acid rain. (Acidifying Emissions Task Group 1997); and
- ✦ continuing research in the Pacific and Yukon Region on toxic pathways of agricultural pesticides, using the bald eagle as an indicator of stress.

Strategic Direction

1.8 Ensure that both economic and ecological factors are considered in designating pests and in implementing pest management strategies.

The bulk of responsibility for implementing this strategic direction rests with provincial agencies. The reader is referred to separate federal reports on biodiversity in the forestry and agriculture sectors for information on the federal role in assessing pest impacts and regulating control strategies. Activities related to monitoring toxicity and wildlife are noted in this report in the actions detailed for strategic directions 1.3 and 1.7, in particular those of the federal Pest Management Regulatory Agency.



Strategic Direction

1.9 Develop indicators to monitor trends and support the management of wild populations, species, habitats and ecosystems.

Target:

Develop sound conservation strategies for migratory game and non-game birds through an understanding of their status, population trends and the causes of population change.

Actions:

- ✦ continuing to carry out population surveys, banding/marking, habitat surveys, and harvest surveys for waterfowl;
- ✦ developing national environmental indicators for forest biodiversity that include indicators on species at risk, population trends of forest birds and forest habitat;
- ✦ continuing to coordinate and report on results from Canada's Breeding Bird Survey, which is designed to measure annual and long-term changes in breeding bird populations; <http://www1.ec.gc.ca/~cws/bbs1.html>
- ✦ providing support to and participating in the preparation of breeding bird atlases and the mapping of bird distribution;
- ✦ continuing to coordinate the Forest Bird Monitoring Program in Ontario; and <http://www1.ec.gc.ca/~cws/fbmp.html>
- ✦ publishing a comprehensive report on the conduct and status of Canada's bird monitoring programs (Dunn et al. 1997).

Target:

Contribute to the development of indicator and monitoring tools required to understand ecosystem-level changes.

Actions:

- ✦ continuing development of the Ecosystem Monitoring and Assessment Network, including establishment of ecosystem science cooperatives across Canada;
- ✦ completing a compendium of ecosystem health goals, objectives and indicators (Environment Canada 1997b); and
- ✦ establishing EMAN bio-climatic monitoring sites at: Rocky Point, CFB Esquimalt; Yoho National Park, British Columbia; Waterton Biosphere Reserve, Alberta; Grasslands National Park, Saskatchewan; CFB Shilo, Manitoba; the Center for Atmospheric Research Experiments, Egbert, Ontario; Long Point Biosphere Reserve, Ontario; La Mauricie National Park, Quebec; and Kejimikujik National Park, Nova Scotia.



Understanding The Landscape and Waterscape of Labrador

Although scientists know little about the ecology and biodiversity of Labrador, the use of land in this northern region has increased for a variety of different purposes. These include low-level flying for the North American Treaty Organization and the development and operation of the world's largest nickel-copper-cobalt deposit at Voisey's Bay. Management of the area is complex, as it is home to significant wildlife populations, such as the massive George River barren-ground caribou herd and tens of millions of waterfowl and seabirds. A comprehensive study is underway to collate all landscape, waterscape and ecological information, including traditional knowledge, into a data base that will be of assistance to addressing land-use issues in Labrador.

Strategic Direction

1.10 Maintain or improve measures that prevent *in situ* populations from becoming jeopardized by specimen collecting for *ex situ* conservation and other purposes. (When only a single population of a species exists and it is in a highly endangered state, it may be necessary to move all of its members to *ex situ* conservation facilities in order to build up its numbers and eventually re-establish *in situ* populations).

Federal controls on the collection of migratory birds from the wild are provided through the regulations of the Migratory Birds Convention Act. The Act specifies that such species may be collected for scientific purposes or for propagating endangered species, however a permit is required.

The removal of highly-endangered species from the wild to *ex situ* conservation facilities—in order to rebuild numbers and address habitat and other limiting factors—is a recovery strategy that Canadian wildlife agencies have used for such species as the whooping crane, swift fox, black-footed ferret, peregrine falcon and loggerhead shrike. The Canadian Wildlife Service has been an active participant in these and other recovery efforts.

Strategic Direction

1.11 Foster the participation of non-government *ex situ* conservation experts and institutions in *in situ* conservation efforts, and improve the participation of government agencies in non-government *ex situ* conservation efforts.

Strengthening partnerships between the government and non-government agencies involved in the *ex situ* and *in situ* conservation of endangered species remains an important strategy for recovery efforts in Canada. Agencies involved in *ex situ* conservation not only provide valuable assistance in captivebreeding programs, but also conduct research on animal and vascular plant reproduction and adaptation, thereby providing information that can be used for *in situ* conservation.

A detailed list of actions is provided in the section of this report which deals with the restoration and rehabilitation of species. (see section 2, Biii)

Strategic Direction

1.12. Implement mechanisms to conserve and use in a sustainable manner trans-boundary native wild populations, species, habitats and ecosystems in cooperation with other countries and organizations.

Target:

Cooperate with western hemispheric and circumpolar countries to manage shared wildlife populations and ecosystems (see also section E on International Cooperation).

Actions:

- ✦ implementing the 1916 Canada/United States Migratory Birds Convention in cooperation with the United States Department of the Interior and United States flyway councils by:
 - implementing agreements for cooperative research and surveys;

- conducting a joint review of waterfowl population and habitat status and harvest regulations; and
- cooperating on other regulatory, compliance and enforcement matters;

✦ implementing the North American Waterfowl Management Plan in cooperation with Mexico and the United States by:

- providing policy, scientific, financial and communications support to the habitat and research joint ventures;
- providing national coordination through the international coordinating committee, the North American Wetlands Conservation Council (Canada) and the CWS; and
- participating in the 1998 review and update to the waterfowl management plan;

✦ implementing international agreements for polar bears and caribou;

✦ supporting migratory bird research through the Latin American Program;

✦ implementing the 1996Canada/Mexico/United States agreement on wildlife, plant and ecosystem conservation;

✦ implementing the International Murre Conservation Strategy and International Eider Conservation Strategy; and

✦ supporting the ongoing activities of the Commission on Environmental Cooperation, including the development of a North American ecological framework and other projects.



North American Waterfowl Management Plan

Since 1986, partners involved in the North American Waterfowl Management Plan (NAWMP) have invested more than \$1.7 billion in wetland and upland habitat across the continent. As a result of these efforts, more than 3.2 million hectares of priority habitat have been purchased, leased, restored or enhanced. NAWMP has also sponsored an intensive research program on arctic-nesting geese and on black ducks.

The Plan is scheduled for an update in 1998. Partners and others who have been consulted on its future agree that, to sustain waterfowl into the next century, the Plan must increase coordination with other avian conservation efforts and those involved in environmental policy, agriculture programs and economic planning (United States Department of the Interior 1994).

*For more information contact the Canadian Wildlife Service at:
Telephone: (819) 997-2392
Facsimile: (819) 994-4445*

ii. Protected Areas

Establishing protected areas under federal legislation is an effective means of conserving wildlife habitat. This responsibility is shared among three departments: Canadian Heritage (Parks Canada), Environment Canada and Fisheries and Oceans Canada.

A separate report compiled by Parks Canada provides a comprehensive description of federal efforts to implement strategies for protected areas (Parks Canada 1997). Actions described in the report that are directly related to wildlife conservation include:

- ✦ the establishment of national parks (currently, 24 of the 39 natural regions identified by Parks Canada are represented within Canada's 38 national parks and national park reserves);
- ✦ the establishment of four national wildlife areas (Igalirtuuq, NT; CFB Suffield, AB; Îles de Varennes, QC; and Kentville Ravine, NS) and two migratory bird sanctuaries (Gros Mecatine, QC, and Inkerman, NB), protecting almost 600 000 hectares of wildlife habitat;
- ✦ the establishment in Canada of additional Wetlands of International Importance under the Ramsar Convention;
- ✦ the development of a marine wildlife areas strategy for Environment Canada and regulations to permit the establishment of marine wildlife areas under the Canada Wildlife Act;
- ✦ the development of criteria for consultation to guide the identification and selection of marine wildlife areas under the Canada Wildlife Act;
- ✦ efforts to complete implementation agreements with the provinces and territories for the certification of gifts and receiving agencies under the Income Tax Act (to establish extended taxation benefits and remove taxation barriers for private and corporate landowners donating land of value to environmental conservation); and
- ✦ the assessment of federal properties (outside national parks) with the goal of seeking protection of ecologically-significant lands.

For more information, contact:
Canadian Heritage
Parks Canada
Director General, National Parks
25 Eddy Street
Hull PQ K1A 0M5

A Database for Protected Areas

Canada's system of parks and protected areas has been built around contributions from government and non-government organizations. These areas (including parks, migratory bird sanctuaries, wilderness areas and ecological reserves) provide varying degrees of protection to over 78 million hectares of land. The Canadian Conservation Area Database (CCAD) was created to track achievements in the field of protected areas and provide a basis for assessing gaps that still exist in reaching a nationally-comprehensive system. CCAD is linked to the Ecological Framework created by Environment Canada and Agriculture and Agri-Food Canada, and uses information from these sources to evaluate ecosystem representation and integrity.

<http://www.doe.ca/>

iii. Species at Risk

Restoration and Rehabilitation

In addition to projects aimed at preventing wildlife declines, such as those described in the preceding section, it is also essential that the federal government restore and rehabilitate declining species and habitats under federal jurisdiction.

A Nationwide Effort to Conserve Species at Risk – 1996

Environment Canada, in cooperation with provincial and territorial agencies, has developed a national approach to endangered species conservation. This approach emphasizes cooperation among governments, with the primary goal of preventing any species from becoming extinct as a consequence of human activities. Major components include evaluating and monitoring the status of species, managing habitat to prevent extinctions, and developing recovery plans for species at risk. In support of this approach, a National Accord for the Protection of Species at Risk in Canada was agreed to in principle on October 2, 1996, by federal and provincial Ministers responsible for wildlife.

Species assessment and recovery planning in Canada is a cooperative effort involving provincial, territorial and federal wildlife agencies, other departments affected by recovery plans, and national conservation groups. Canadian species at risk are assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Recovery planning in all jurisdictions is coordinated by the Committee for the Recovery of Nationally Endangered Wildlife (RENEW). Since the causes of species loss worldwide include illegal trade in endangered wild animals, plants and their products, Canada is also a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Implementation of CITES in Canada is now facilitated through the new federal Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA).

Legal Protection for Wild Species

The Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act received Royal Assent in December 1992. The Act prohibits trafficking in Canadian and foreign endangered species and their products. It is also intended to prevent wild animals and plants from being brought into Canada if their import violates foreign conservation laws. Similarly, if the import of wild animals and plants contravenes domestic wildlife laws, the Act prohibits both their transport across provincial and territorial borders and their export from Canada.

Current federal objectives include: strengthening the legislative capacity to support endangered species recovery; establishing cooperative mechanisms for endangered species conservation; developing and implementing strategies and actions for species recovery; supporting international recovery efforts; and applying ecosystem, regional and sectoral strategies for the conservation of biodiversity.



Strategic Direction

1.21 Federal, provincial and territorial governments will review their current legislation to determine if improvements are required in order to protect species at risk and their habitats, determine the benefits and costs of a more harmonized legislative approach, and pursue harmonization where appropriate and practical.

Target:

Develop and introduce comprehensive federal legislation and strengthen our national approach to conserving species at risk.

Actions:

- ✦ introducing new federal legislation for the protection of species at risk, following consultation with provinces, territories, conservation organizations, industry, aboriginal organizations and others; and
- ✦ joining the provincial wildlife ministers in the October 1996 signing of the National Accord for the Protection of Species at Risk, which commits jurisdictions to adopt a national approach to the protection of species at risk.



Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

Mandate: COSEWIC determines the national status of wild species, subspecies, varieties and nationally-significant populations that are considered to be at risk in Canada. Designations are made on all native species of fish, amphibians, reptiles, birds, mammals, mollusks, lepidoptera, vascular plants, mosses and lichens. 307 species are listed at risk nationally.

Membership: COSEWIC comprises representatives from each provincial and territorial government wildlife agency, four federal agencies (Canadian Wildlife Service, Parks Canada, Fisheries and Oceans, Canadian Museum of Nature), three national conservation organizations (Canadian Nature Federation, Canadian Wildlife Federation, and World Wildlife Fund Canada) and the chairs of the scientific subcommittees. The Committee meets annually in April to consider status reports on candidate species (Canadian Wildlife Service 1997b).

Strategic Direction

1.22 Federal, provincial and territorial governments will work toward harmonizing methodologies to designate species at risk.

Implementation of this strategic direction is underway. In October 1996, federal and provincial ministers responsible for wildlife agreed in principle to a National Accord for the Protection of Species at Risk. The Accord outlines a national approach based on complementary federal, provincial and territorial legislation, and the provision of an independent process for assessing the status of species nationally.

Committee on the Recovery of Nationally Endangered Wildlife (RENEW)

RENEW was established in 1988 by the Wildlife Ministers' Council as a cooperative response to recover endangered species. Chaired by CWS, the RENEW Committee consists of provincial and territorial wildlife directors and representatives from the Canadian Nature Federation, the Canadian Wildlife Federation, and the World Wildlife Fund Canada.

RENEW's national objectives are to:

- ❧ prevent endangered species in Canada from becoming extirpated or extinct;*
- ❧ prevent species from becoming threatened or uplisted to endangered;*
- ❧ when and where possible, reintroduce extirpated species to Canada;*
- ❧ prepare recovery plans for all threatened and endangered species; and*
- ❧ initiate recovery programs, where feasible, aimed at removing species from threatened, endangered or extirpated status.*

RENEW's activities stem from the work of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), a body of government, academic and non-government experts that categorize species at risk as extinct, extirpated, endangered, threatened or vulnerable. As of April 1998, COSEWIC had listed 307 species at risk nationally.

At present, RENEW's mandate focuses mainly on the protection and recovery of terrestrial vertebrates, including mammals, birds, reptiles and amphibians. However, its mandate may expand in the near future to include such other biota as plants, fish, marine mammals and insects (Canadian Wildlife Service 1997a).

Strategic Direction

1.23 Determine the ecological requirements of species at risk and develop, implement and evaluate the success of recovery plans for species that are defined as extirpated, endangered or threatened, where practical and necessary. Consider the recovery of vulnerable species on a case-by-case basis.

The actions called for in this strategic direction are implemented through:

- ❧ producing status reports using information compiled by COSEWIC on the biology and conservation status of individual species;
- ❧ implementing the RENEW strategy and developing and implementing recovery plans. Work includes:
 - the production of 467 status reports on 421 species since 1978;
 - the production of 29 draft and final recovery plans under RENEW's auspices since 1988;
 - the provision of secretariat services by the Canadian Wildlife Service to both COSEWIC and RENEW; and
 - the provision of continued support to the Endangered Species Recovery Fund (established jointly with the World Wildlife Federation), including more than \$3 million spent on over 200 species since 1988;
- ❧ publishing Canadian Species at Risk (Canadian Wildlife Service 1997b);
- ❧ publishing RENEW Report Number Seven (Canadian Wildlife Service 1997a); and
- ❧ publishing Recovery: An Endangered Species Newsletter (Canadian Wildlife Service 1997c).

Strategic Direction

1.24 Consider multi-species/habitat recovery plans for areas that contain a number of species at risk.

Target:

Recover species at risk through cooperative programs for threatened habitats.

Action:

- ✦ working through the Acadian flycatcher and hooded warbler recovery teams to produce a first multi-species recovery plan for submission to RENEW;
- ✦ establishing a south Okanagan recovery team that will consider the habitat of the pygmy short-horned lizard, the white-headed woodpecker, the sage thrasher, the yellow-breasted chat and other species in its recovery plan; and
- ✦ ensuring a multi-species approach to wetland and upland habitat conservation through the programs of the habitat joint ventures of the North American Waterfowl Management Plan.

For more details on Canadian recovery efforts, see *RENEW Report Number Seven* (Canadian Wildlife Service 1997a).

Strategic Direction

1.25 Encourage the involvement of ex situ facilities and expertise in the recovery of species at risk.

A number of agencies are involved in conservation and research for the recovery of species at risk in partnership with wildlife agencies. These facilities and the species they are helping to recover include:

- the Metro Toronto Zoo, Toronto, Ontario (Vancouver Island marmot, black-footed ferret, loggerhead shrike);
- the Calgary Zoo, Calgary, Alberta (whooping crane);
- McGill University, Montréal, Quebec (loggerhead shrike); and
- the Cochrane Wildlife Reserve, Cochrane, Ontario (swift fox).

The Importance of Nature to Individual Canadians

Environment Canada is working closely with Statistics Canada, other federal departments and provincial governments to gather new information to help “green” our national accounts. The ongoing Survey on the Importance of Nature to Canadians is being expanded to address the socio-economic value Canadians place on ecosystems. Statistics Canada conducted the survey in February 1997 on a sample of 83 000 individuals, questioning them about their outdoor activities in Canada’s natural areas during 1996. The findings of this comprehensive study will provide new socio-economic insights that will benefit wildlife and biodiversity and help support conservation programs at the local to national levels.



Canadian Wildlife Service: Fifty Years of Conservation

This year, the Canadian Wildlife Service (CWS) celebrates its 50th anniversary. Over the decades, the CWS has played a vital role in conserving Canada's wilderness heritage and enhancing the environmental awareness of Canadians. It has earned a global reputation for excellence in a wide range of conservation activities. For example:

- ✦ The CWS is a founding member of the Committee on the Status of Endangered Wildlife in Canada, and has been a leader in efforts to save the peregrine falcon, piping plover, burrowing owl, and many other species at risk;*
- ✦ The CWS has established a network of National Wildlife Areas and Migratory Bird Sanctuaries that total more than 11 million hectares of protected areas for wildlife;*
- ✦ The CWS helped to develop the North American Waterfowl Management Plan and, with its partners in the Plan, has restored 3.2 million hectares of wetland habitat for waterfowl. Waterfowl numbers have increased by an estimated 35 million since 1985;*
- ✦ Through the use of its migratory game bird hunting permit, which was introduced in 1966, Canada has developed the world's most complete system of waterfowl harvest surveys;*
- ✦ Thousands of CWS reports have added substantially to the world's knowledge of waterfowl, seabirds, shorebirds, songbirds, arctic mammals, migration and other topics; and*
- ✦ The CWS has developed a variety of important conservation policies and legislation, including the Canada Wildlife Act and the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act.*

For more information:

*Canadian Wildlife Service
Telephone (819) 997-1095
Facsimile: (819) 997-2756*

<http://www.ec.gc.ca/cws-scf>

Strategic Direction

1.26 Federal, provincial and territorial governments will continue to participate in and support COSEWIC, RENEW and new programs such as the Canadian Nature Federation's Endangered Plants and Invertebrates of Canada program (EPIC).

Target:

Develop and implement plans and strategies for species at risk.

Actions:

- ✦ providing core funding for the production of COSEWIC status reports;*
- ✦ protecting migratory game birds that are at risk through regulation under the Migratory Birds Convention Act;*
- ✦ continuing with the ongoing implementation of approved recovery plans for the Henslow's sparrow, burrowing owl, whooping crane, swift fox, marbled murrelet, harlequin duck, roseate tern, piping plover, loggerhead shrike and peregrine falcon;*
- ✦ developing and implementing a revised plan for the piping plover;*
- ✦ developing recovery plans for the Acadian flycatcher, hooded warbler, Kirtland's warbler, king rail, sage thrasher, white-headed woodpecker, mountain plover, yellow-breasted chat and prothonotary warbler;*
- ✦ developing recovery plans for newly-listed threatened and endangered species; and*
- ✦ conducting ongoing research on and monitoring endangered species populations and the causes of population decline, and establishing databases for endangered species.*

For more details on recovery efforts, see *RENEW Report Number Seven* (Canadian Wildlife Service 1997a).

Target:

Enhance cooperation for the conservation of species at risk across Canada.

Actions:

- ✦ recognizing COSEWIC as a source of independent advice on the national status of species at risk through provisions of the National Accord for the Protection of Species At Risk (1996);
- ✦ providing secretariat and other support for the ongoing operation of COSEWIC and RENEW;
- ✦ renewing the Endangered Species Recovery Fund agreement with the World Wildlife Fund;
- ✦ continuing to cooperate with the Conservation Data Centers in Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia;
- ✦ supporting the establishment of a Conservation Data Center in the Atlantic region;

Biodiversity and the Classroom

Environment Canada helped fund the production of Backyard Biodiversity and Beyond, a student-teacher handbook produced by the British Columbia Department of Environment in cooperation with other federal agencies. The publication introduces school children to the concept of biodiversity and helps them learn about issues that range from local to global in scale. It includes five study modules and a community-action tool kit to assist students and teachers with conservation projects (Binder, Guy and Penn 1995).

- ✦ creating the Canadian Endangered Species Conservation Council; and
- ✦ working closely with Parks Canada on a variety of species at risk, including the whooping crane, wood bison, Blanding's turtle, and piping plover.

Strategic Direction

1.27 Expand the mandate of COSEWIC and RENEW to encompass further taxonomic groups, and add groups incrementally.

Target:

Broaden the scope of national assessment programs for species at risk to focus attention on the recovery of a greater number of animals and plants.

Action:

- ✦ creating new COSEWIC sub-committees to assess the status of mosses, lichens, lepidopterans and mollusks;
- ✦ adapting RENEW guidelines to species other than terrestrial vertebrates; and
- ✦ developing recovery plans for species other than terrestrial vertebrates, with an emphasis on multi-species ecosystem recovery plans.

Strategic Direction

1.28 Enhance participation of urban and regional governments, local and indigenous communities and landowners in species recovery projects from early planning phases through implementation.

The involvement of local and regional groups, government, landowners and others is essential to the delivery of recovery plans for many species at risk in Canada.

This strategic direction is being implemented through RENEW's recovery planning efforts and through the projects supported by the Endangered Species Recovery Fund. Current recovery plan teams often involve federal and provincial or territorial agencies as well as the private sector, volunteers and university researchers.

For more information see *RENEW Report Number Seven* (Canadian Wildlife Service 1997a).

Other steps that are being taken include:

- ✦ sending Recovery: An Endangered Species Newsletter to public libraries, local governments and interested individuals;
- ✦ providing copies of Endangered Species Recovery Fund reports and recovery plans to partners and other groups and agencies; and
- ✦ continuing to establish recovery teams involving multiple partners.

Strategic Direction

1.29 Support and promote international efforts to recover species at risk by: participating in mechanisms, such as CITES, that regulate or control trade in species at risk; supporting the recovery of migratory and trans-boundary species at risk; and participating in other international efforts, such as the International Union for the Conservation of Nature (IUCN) Species Survival Commission.

Target:

Support international cooperation, including coordination between enforcement agencies, in order to identify, protect and recover species at risk.

Actions:

- ✦ participating in international wildlife and habitat conservation agreements and programs such as the Migratory Birds Convention (1916), Ramsar, the North American Waterfowl Management Plan, the Western Hemispheric Shorebird Reserve Network Program, and CITES;

- ✦ implementing WAPPRIITA, including the development of regulations;
- ✦ supporting the preparation of CITES identification guides for butterflies, turtles, tortoises, furs and hunting trophies in order to assist customs officers responsible for enforcing wildlife trade legislation in Canada and other countries;
- ✦ participating in international enforcement groups such as Interpol, the World Customs Organization and the North American Working Group on Wildlife Enforcement;
- ✦ signing, in 1997, the Canada/United States framework for cooperation in the protection and recovery of species at risk;
- ✦ continuing to participate in the ongoing programs of the Species Survival Commission, including the polar bear and other specialist groups of the International Union for the Conservation of Nature;
- ✦ encouraging technical cooperation between US and Canada recovery teams for species such as: whooping crane, peregrine falcon, piping plover and harlequin duck; and
- ✦ development, through the Ecological Monitoring and Assessment Network, of monitoring protocols for invasive species and species that are being put at risk.



iv. Sustainable Use of Biological Resources

While protected areas play a role in biodiversity conservation, much of Canada's working landscape is devoted to agriculture, forestry and other economic activities. These landscapes also provide habitat for wildlife across Canada. The Strategy acknowledges that the sustainable use of our water, forest, and soil resources is necessary in order to conserve Canada's biological diversity.

Partners in Flight—Canada

Canada now has a nationally-coordinated partnership program for landbirds—that is, species with a principally land-based life cycle, such as hawks, grouse, woodpeckers and passerines. The goal of Partners in Flight—Canada is to ensure the long-term viability of native Canadian landbirds across their range of habitats.

To date, the program has produced the Framework for Landbird Conservation in Canada, the Canadian Landbird Monitoring Strategy, as well as a national priority-setting scheme for birds. These documents are intended to provide regional groups interested in bird conservation with the necessary planning tools to identify priorities.

Partners in Flight—Canada involves the CWS, Bird Studies Canada, Canadian Wildlife Federation, Canadian Pulp and Paper Association, Canadian Nature Federation, Society of Canadian Ornithologists, Wildlife Habitat Canada, World Wildlife Fund Canada, Ducks Unlimited Canada, and the National Agriculture Environment Committee.

Framework for Landbird Conservation in Canada:

<http://www.ec.gc.ca/cws-scfc/canbird/piff/frame.htm>

Canadian Landbird Monitoring Strategy:






<http://www1.ec.gc.ca/~cws/strat.html>

A multitude of federal programs pertain to each resource sector. The departments involved recognize the impact that resource use can have on biological diversity, and have incorporated biodiversity objectives into their program areas. Depending on the sector, these objectives can vary from specific nation-wide targets for migratory birds and improved understanding of the impact of chemicals on birds and their habitats to the promotion of biodiversity-friendly farming practices and the long-term monitoring of forest ecosystems.

Reports that respond to the agriculture and forestry sections of the Strategy have been prepared by Agriculture and Agri-Food Canada and the Canadian Forest Service of Natural Resources Canada, respectively. A report on aquatic areas and biodiversity is also forthcoming. The next several pages of this report highlight federal wildlife conservation projects involving these resource sectors.

v. Agricultural Areas

Agriculture and Agri-Food Canada has prepared a biodiversity action plan that details its commitments under the Strategy (Agriculture and Agri-Food Canada 1997). The plan contains a variety of initiatives aimed at supporting wildlife diversity. They include:

-  encouraging the conservation of natural lands within agro-ecosystems;
-  encouraging the adoption of appropriate range-management principles and practices;
-  encouraging proactive cooperation between agricultural organizations and environmental conservation groups to preserve and restore natural habitats;
-  preventing the introduction and spread of alien or domestic animal and plant pests and diseases that threaten cultivated, domestic and wild species under the Plant Protection Act and Health of Animals Act;
-  developing major systematic treatments, identification guides, and taxonomic catalogues—in printed and electronic form—on insect biocontrol agents, weeds and aquatic plants, cultivated crops, toxic and allergenic

fungi, and mycorrhizal fungi in partnership with Environment Canada, the Canadian Forest Service of Natural Resources Canada, the Canadian Museum of Nature and various universities;

- ✦ sampling native woody-plant populations in the Prairies and establishing a nursery for the *ex situ* conservation of native plant material such as the plains cottonwood;
- ✦ identifying and prioritizing indigenous wild plant species of value to the agri-food sector and developing partnerships to ensure their conservation;
- ✦ providing access to the genetic resources present *in situ* on community pastures, including valuable native plant materials, subject to the operational needs of the pasture system and the potential environmental impacts of access and collection;
- ✦ considering vulnerable, threatened and endangered species and rare, unique and fragile ecosystems in the environmental assessment of projects, policies and programs;
- ✦ protecting endangered, threatened and vulnerable species and their habitats in collaboration with partners and pasture patrons; and
- ✦ undertaking, with clients, partners and other stakeholders, re-vegetation projects using native vegetation species, particularly in areas that have been affected by development.

For more information contact:
Agriculture and Agri-Food Canada
Environment Bureau
Sir John Carling Building
930 Carling Ave, Room 367
Ottawa ON K1A 0C5

<http://www.agr.ca>

An Avian Alternative to Pesticides?

The growing concern about synthetic pesticides has led the Canadian Wildlife Service (CWS) to investigate the role of insect-eating birds as a biological control alternative. The CWS has recently completed a comprehensive review of the literature on insectivorous birds and their ecological services. Further proposed research involves looking at the value of insectivorous birds associated with hedgerows in an intensive agricultural area of Quebec. These efforts complement the ongoing research and development being carried out by agronomists and agricultural ecologists in the area of environmentally-benign pest control.

Environment Canada is also involved in various programs that help maintain wild organisms and their habitats in agricultural landscapes. These include:

- ✦ implementing numerous private/public land stewardship initiatives under the habitat joint ventures established by the North American Waterfowl Management Plan;
- ✦ developing and implementing recovery programs for endangered migratory birds in agricultural landscapes;
- ✦ carrying out the Partners in Flight—Canada program, which combines planning, outreach, monitoring, research and applied conservation in a national framework for Canadian land-birds;
- ✦ compiling existing conservation guidelines in Canada for biodiversity conservation in agricultural and other rural regions (Mosquin 1996);
- ✦ documenting the role of birds and habitat in the biocontrol of insect and plant pests through research conducted by the National Wildlife Research Center;

- ✿ supporting the establishment of a volunteer monitoring program for earthworms that involves schools;
- ✿ conducting research into the toxic effects of insecticides and herbicides on birds and other wildlife through the National Wildlife Research Centre; and
- ✿ conducting research with other partners on the impacts of major land uses (forestry, agriculture, mining) on hydrological processes and ecological responses.



Restoring Agricultural Watersheds

The Quebec Eastern Habitat Joint Venture (EHJV), part of the North American Waterfowl Management Plan, has joined with the St. Lawrence Vision 2000 Program in a recovery plan for the Boyer River watershed near Quebec City.

The plan was originally intended to improve water quality and enhance rainbow smelt spawning grounds. With EHJV involvement, it has been expanded to incorporate waterfowl production objectives as well. These objectives include: determining the factors limiting waterfowl production in agricultural areas; recommending changes in farming practices that will benefit waterfowl; and evaluating the effectiveness of the recommended measures.

vi. Forested Areas

The Canadian Forest Service of Natural Resources Canada has prepared a biodiversity action plan that sets out its commitment under the Canadian Biodiversity Strategy.

Key actions include:

- ✿ establishing guidelines for the conservation of genetic diversity in natural and managed forests;
- ✿ developing new forest-harvesting techniques and guidelines to minimize negative effects on soil fertility, biodiversity and aquatic systems;
- ✿ developing biodiversity conservation strategies and ecological recovery plans for rare and threatened forest vegetation species;
- ✿ implementing a national research program based on the identification of major issues related to the environmental impacts of the use of genetically-engineered trees;

- ✿ implementing methods for the production and release of natural enemies such as insect parasites, predators and nematodes for the control of exotic pests introduced to Canada; and
- ✿ periodically assessing national forest health, including the collection of data on the status of forest tree species, forest insects and other forest organisms.

For more information see Biodiversity in the Forest—The Canadian Forest Service Three-Year Action Plan for Implementing the Canadian Biodiversity Strategy (Natural Resources Canada — Canadian Forest Service 1997).

Contact:

Canadian Forest Service,
Natural Resources Canada
Science Branch
580 Booth Street
Ottawa, ON K1A 0E4

<http://nrcan.gc.ca/cfs/index.html>

Canadian Biosphere Reserves

Canada is an active participant in the UNESCO MAB program and has six biosphere reserves recognized by UNESCO as belonging to the International Biosphere Network. Currently, there are several candidate areas seeking international biosphere reserve status. The objectives of the reserves are: sustainable use of resources; conservation; and education, training and communication. The six reserves are: Charlevoix and Mont St.-Hilaire, Quebec; Long Point and Niagara Escarpment, Ontario; Riding Mountain, Manitoba; and Waterton, Alberta.

For information, contact the Canada/MAB Committee at 130 Albert Street, Box 1047, Ottawa, Ontario, K1P 5Y8, or consult their

website: <http://www.cciw.ca/mab.htm>

Forest Bio-Monitoring and the EMAN Program

The Ecological Monitoring and Assessment Network, with the assistance and advice of the Biodiversity Science Board, is implementing a monitoring program on species diversity and change over time. On the advice of the Board, standard methods are being recommended for use at all sites. Where possible, widely-adopted international methods are being selected. One of these is the Smithsonian Institution/MAB plot for long-term monitoring of all species. Since its introduction in Canada in 1994, approximately 70 of these plots have been established in forests from British Columbia to the Atlantic Provinces. The method is suitable for use by researchers and student volunteer groups. These plots are also a focus for monitoring earthworms, arthropods, herbaceous vegetation and other organisms. Many of these monitoring methods are also suitable for non-forested areas.

<http://www.cciw.ca/eman/>

Environment Canada is also active in forest conservation, including:

- ✿ monitoring forest-bird populations and habitat associations through the Breeding Bird Survey, the Forest Bird Monitoring Program and other surveys outlined in the Canadian Landbird Monitoring Strategy;
- ✿ establishing partnerships with the Canadian Forest Service of Natural Resources Canada and other agencies to reduce or eliminate the adverse ecological effects of forest management practices (e.g., the effects of timber harvesting on migratory songbirds);
- ✿ supporting research on current and potential landscape-level influences of forest fragmentation caused by forestry (commercial forest) and agriculture (forest fringe) on boreal forest bird communities in Saskatchewan;

- ✦ in partnership with the Fundy Model Forest, completing the investigation of effects of forest harvesting practices at Hayward Brook; and
- ✦ in partnership with the Department of National Defence (DND) and the Canadian Forest Service of Natural Resources Canada, working to establish forest-based conservation areas in coastal Douglas fir forests on DND property in British Columbia.

vii. Harmful Alien Organisms

The Strategy contains measures aimed at preventing the introduction of harmful alien organisms, mitigating the adverse effects of those that have already been introduced, and promoting research to assess their impacts on biodiversity. It recognizes that preventing the introduction of harmful organisms is far more cost effective than trying to limit the spread of an established organism, and places considerable emphasis on improving our ability to assess the risk associated with such introductions.

The responsibility for implementing these provisions of the Strategy and for managing introductions of alien organisms rests with both the federal and provincial governments.

Many alien organisms, including most of Canada's agricultural crops, have been intentionally introduced, and benefit all Canadians. Others, however, have entered our ecosystems accidentally. Introductions that have not been properly assessed can harm indigenous flora and fauna by preying on native species, competing for food and space, degrading habitat, and spreading disease and parasites. Some well-known examples are the sea lamprey and zebra mussel, which have had considerable impact on the Great Lakes ecosystem, and purple loosestrife, which has spread rapidly throughout our wetland areas.

Controlling alien organisms that are able to compete with and displace native species is often difficult. Scientists are knowledgeable about only a few of the thousands of alien species that occur on this continent. Budget reductions at government laboratories, universities and museums have led to a further decline in scientific capacity to identify and catalogue these species. Except for the use of biological controls (e.g., importing a parasite that is harmful to the alien organism), there is often little that can be done to control these populations. Prevention, either by placing the organism in quarantine prior to introduction or by other measures such as inspection and import prohibitions, is usually the most effective solution.

Federal initiatives that address the issue of harmful alien organisms include:

- ✦ controlling the trans-boundary movement of specifically-identified alien organisms through WAPPRIITA;
- ✦ implementing the Biodiversity Mapping Program to establish databases for mapping endangered and alien species;
- ✦ preventing the introduction and spread of alien and domestic animal and plant pests and diseases that threaten cultivated or domesticated species under the Plant Protection Act and the Health of Animals Act administered by Agriculture and Agri-Food Canada;



- ❧ monitoring the expansion and effects of zebra mussels and continuing to participate in Canada's purple loosestrife awareness and control program; and
- ❧ in partnership with agencies in the United States, continuing to monitor and assess the impact of introduced cordgrass to Pacific estuarine areas, and developing a response plan.

Mapping Biodiversity

In cooperation with other federal departments, Environment Canada is helping sponsor the development of the Biodiversity Mapping Program (BIOMAP). BIOMAP is establishing an inventory of digital data bases and map files to depict and analyze the ranges of selected elements of Canada's flora and fauna. Using geographic information system technology, BIOMAP is compiling range information and background documentation on the biology of such groups as nationally- endangered species, invasive exotics and endemics. BIOMAP information is being used to support the biodiversity-related activities of various agencies, as well as for public education.

<http://infoweb.magi.com/~ehaber/biomap.html>

C. Education and Awareness

Implementing Goal Three of the Canadian Biodiversity Strategy

The conservation and sustainable use of Canada's wildlife depends on the collective actions of individual Canadians, private landowners and communities. Accordingly, goal three of the Strategy encourages governments to promote biodiversity awareness through a variety of means, including periodic reports, fact sheets, and electronic information systems.

Action 21

Action 21 is an Environment Canada program that encourages Canadians to take action in their communities to support a healthy environment. The program has two components:

- ❧ *a public awareness initiative to encourage Canadians to participate actively in environmental solutions; and*
- ❧ *a community funding program that provides financial support to non-government, non-profit groups carrying out local environmental projects that support national priorities.*

Ecosystem- and biodiversity-related topics are among the areas of interest for projects, which might address the conservation or rehabilitation of natural areas, the protection of wild animals and plants, or the prevention of habitat loss. For example, members of the Montague Watershed Enhancement Co-op in Prince Edward Island are using funding from Action 21 to improve their habitat for fish and migratory birds.

A parallel education program for children has also been developed: Rescue Mission for Planet Earth.

Action 21 is now accessible through Environment Canada's Green Lane on the Internet at:

<http://www.doe.ca>



Biodiversity awareness is an important element of the federal government's effort to promote responsible environmental citizenship by helping Canadians use timely information and advice in an effective manner. Highlights of federal projects and initiatives that incorporate information on wildlife and wildlife habitat conservation include:

- ✿ publishing the *Fish and Wildlife Habitat Rehabilitation Newsletter*, which reports on habitat projects supported by the Great Lakes 2000 Cleanup Fund;
- ✿ producing a tri-monthly international NAWMP newsletter, *Waterfowl 2000* (for more information, visit the site at: <http://www.fws.gov/~r9nawwo/homepag.html>);
- ✿ producing and distributing the RENEW annual report, *Endangered Species Newsletter*, status reports and recovery plans;
- ✿ publishing the *Fraser River Action Plan Progress Update* and providing regular updates on pollution control, habitat protection, wildlife conservation and other efforts being undertaken in the watershed;
- ✿ supporting the establishment of a Canada-wide network of botanical gardens and arboreta in partnership with the Royal Botanical Gardens in Hamilton, Ontario;
- ✿ publishing *Bird Trends*, a report on the health and status of migratory game and non-game birds in Canada;
- ✿ releasing, via the Internet and on hard copy and CD ROM, the 1996 State of Canada's Environment Report (for information on how to obtain copies, phone 613-954-5791 or visit EC's home page at <http://www.doe.ca>);
- ✿ publishing *The Ontario Peregrine Falcon Newsletter* in cooperation with the Ontario Ministry of Natural Resources and other partners in Ontario's Peregrine Falcon Recovery Program;
- ✿ continuing to work in partnership with the Canadian Wildlife Federation on such initiatives as National Wildlife Week, Oceans Day and Habitat 2000, an innovative wildlife habitat improvement project for schools and youth groups;
- ✿ publishing fact sheets on the status of the St. Lawrence River and on forest ecosystem research in the Fraser Basin;
- ✿ building student capacity in taxonomy and systematics for biodiversity conservation and sustainable use through the International Summer School on Biosystematics and Technology, initiated by the Canadian Museum of Nature in partnership with several universities;
- ✿ introducing, in 1997, a major new "Arctic Forever" exhibit at the Canadian Museum of Nature that features biodiversity in Canada's north and reflects the importance of traditional knowledge in conservation;
- ✿ creating a Canadian clearing-house mechanism on biodiversity to complement the development of a similar international mechanism to be established under the Convention on Biological Diversity; <http://www1.ec.gc.ca:81/biodiversity>

A Novel Approach to Conserving Prairie Habitat

In Alberta, the North American Waterfowl Management Plan has an array of initiatives to maintain, restore and enhance prairie habitat. One of the newest of these is the Land Use Exchange Program (LUEP), an on-the-farm initiative that combines sustainable agriculture with wildlife conservation. LUEP works by trading agricultural use on lands acquired through lease or purchase in exchange for improved conservation practices on a neighboring landowner's property. In its simplest form, LUEP provides a landowner with access to additional neighboring acreage for haying or pasture in exchange for a commitment to enhance the grass cover on his or her own land.

- ✦ distributing a newsletter and maintaining a web page (http://www.ec.gc.ca/cws-scf/can_bird/pif/p_intro.htm) on the activities of Partners in Flight-Canada;
- ✦ continuing, with other partners, the production of community stewardship manuals, including the west coast Shorekeeper Guide and a series on backyard habitat restoration;
- ✦ informing, in partnership with the North American Wetland Conservation Council (Canada) and through the Encounters with Canada Program, senior secondary-school students across Canada about wetland conservation issues;
- ✦ preparing a series of regional fact sheets featuring information on the Great Lakes Wildlife Toxicology Research Program and the Great Lakes Wetlands Conservation Action Plan;
- ✦ preparing, in cooperation with the Nunavut Wildlife Management Board and the Baffin Divisional Board of Education, an Inuktitut-English reference guide to the 70 different birds that make Nunavut their home;
- ✦ providing regular information on migratory game-bird populations and harvest regulations;
- ✦ working in partnership with farm organizations, industry, educational institutions, professional associations and stakeholder groups to develop information material on biodiversity and agriculture (Agriculture and Agri-Food Canada);
- ✦ implementing the Action 21 Program, a community funding program designed to assist organizations in taking action through grassroots projects in such areas as wildlife habitat and species protection;
- ✦ publishing Wildlife Watchers: Report on Monitoring, a regular newsletter on wildlife monitoring programs in Ontario, including the Amphibian Call Count, Project Feeder Watch, Canadian Lakes Loon Survey and Hawk Migration Counts;
- ✦ publishing a manual to assist companies in developing their own biodiversity strategies; and
- ✦ assisting in the development of biodiversity curricula by Canadian universities and colleges.

A Biodiversity Information Clearing House

The Conference of Parties to the Convention on Biological Diversity has called for a clearing-house mechanism to help promote international, technical and scientific cooperation. Environment Canada's Biodiversity Convention Office is coordinating Canadian efforts in this area, including the development of a Canadian Biodiversity Information Network web site. One specific project being considered is to identify expertise and technologies that could contribute to the implementation of the Convention. The information would be available in electronic format for distribution to other countries via the clearing house. At present, Canadian information can be accessed through the Canadian Biodiversity Information Network website.

<http://www1.ec.gc.ca:81/biodiversity>



D. Incentives and Legislation

Implementing Goal Four of the Canadian Biodiversity Strategy

- ✦ Goal four of the Strategy encourages governments to maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources.

The federal government recognizes that significant gains can be achieved for the conservation of wildlife and habitat through the application of economic incentives, appropriate legislation and regulatory action. Examples of current efforts in these areas are provided in the following sections.

Income Tax Relief for Private Conservation Lands

The Government of Canada amended the Income Tax Act in June 1996 to facilitate greater tax deductions and credits for the donation of private, ecologically-sensitive lands to charities and municipalities.

The Act assigns responsibility for the administration of these amendments to Environment Canada. Environment Canada led consultations with partner agencies across the nation and discussions with Revenue Canada and Finance Canada on this issue.

The Department is also heading the development of agreements with provincial and non-government interests across Canada to implement this tax initiative.

i. Incentives

Federal efforts to maintain or develop incentives that support the conservation of biodiversity and the sustainable use of biological resources are directed first at sustainable-use policies and programs and second at enhancing capabilities to value biological resources and ecological functions. Highlights of these efforts include:

- ✦ implementing the North American Waterfowl Management Plan, which identifies the modification of policies and economic trade activities as potential areas for investigation and action in achieving wetland and migratory waterfowl goals;
- ✦ implementing new provisions of the Income Tax Act allowing extended tax benefits to donors of “ecological gifts” (ecologically-sensitive land covenants and easements) for conservation purposes;
- ✦ implementing Environment Canada’s Sustainable Development Strategy, which contains measures that will contribute to conserving wildlife diversity (Environment Canada 1997c);
- ✦ conducting the 1997 Survey on the Importance of Nature to Canadians (Statistics Canada);
- ✦ under the Memorandum on Science and Technology for Sustainable Development in the Natural Resource Sector, assessing the value of Canada’s natural capital and developing indicators of sustainability through a newly-established working group created by Environment Canada, Natural Resources Canada, Agriculture and Agri-Food Canada and Fisheries and Oceans Canada; and
- ✦ establishing a database on biodiversity valuation in partnership with the American Environmental Protection Agency.

ii. Legislation

Legislation and regulations can have a significant impact on the conservation and sustainable use of biological resources, particularly in the areas of wildlife conservation and ecosystem health.

Environment Canada’s responsibility for the implementation of federal wildlife legislation includes the Migratory Birds Convention Act, the Canada

Wildlife Act and WAPPRITA. Federal legislation for endangered species is also under consideration. In addition, Environment Canada is responsible for implementing the Canadian Environmental Protection Act. Within these legislative and regulatory responsibilities, implementation of key wildlife elements of the Canadian Biodiversity Strategy is being achieved through the following major initiatives:

- ✦ developing, by 1997-98, regulations for WAPPRITA;
- ✦ participating in a working group on wildlife-enforcement cooperation that involves Canadian, American and Mexican enforcement officials;
- ✦ amending the 1917 Migratory Birds Convention Act and Regulations to allow subsistence hunting of waterfowl and murre hunting;
- ✦ renewing the Canadian Environmental Protection Act; and
- ✦ developing new federal legislation for the protection of endangered species.

E. International Cooperation

Implementing Goal Five of the Canadian Biodiversity Strategy

Wildlife conservation relies heavily on the maintenance of healthy habitats. Where wildlife is harvested, conservation also depends on a science-based harvest management regime that promotes and encourages compliance by all users. Wildlife does not respect political boundaries, therefore its management often requires cooperation among countries. In Canada we share individual populations of wildlife, such as migratory birds, mammals and fish, with the United States and Mexico, as well as with circumpolar, Latin and South American countries. Goal five of the Strategy acknowledges this requirement by encouraging cooperative efforts to conserve biodiversity at the international level.

The Ramsar Convention

The Ramsar Convention, more formally known as the Convention on Wetlands of International Importance, has evolved into one of the world's most successful conservation and sustainable development efforts, now involving over 100 countries. Canada has been active in the Convention since 1981, with Environment Canada leading its national implementation. As part of an international network of important wetlands, Canadian federal, provincial and non-government agencies have designated 35 Ramsar sites to date. The Federal Policy on Wetland Conservation, announced in 1992, is modeled on the "wise use" principles of the Convention

For more information:

Ramsar Bureau

Telephone: 011229990170

Facsimile: 011229990169

<http://iucn.org/themes/ramsar/>

Current federal efforts that support this goal include:

- ✦ implementing international agreements for migratory birds, polar bears, caribou and seabirds;
- ✦ participating in and supporting the implementation of the Ramsar Convention on internationally- significant wetlands and CITES;
- ✦ implementing the Arctic Environmental Protection Strategy through the Arctic Council (Indian and Northern Affairs Canada);
- ✦ cooperating with many international conservation organizations, including the International Union for the Conservation of Nature, Western Hemispheric Shorebird Reserve Network, Wetlands International, and Wetlands for the Americas;
- ✦ assisting developing countries in preparing national strategies and action plans and in conducting country studies to implement the Biodiversity Convention;

- ✿ participating in the revision of the International Plant Protection Convention under the auspices of the Food and Agriculture Organization (Agriculture and Agri-Food Canada);
- ✿ providing Canadian scientific expertise to support biodiversity conservation through the Latin American Program and international cooperative studies;
- ✿ participating in the UNESCO program on Man and the Biosphere, the world network of biosphere reserves, and the International Tundra Experiment;
- ✿ conducting the Economic Valuation of Biological Diversity Workshop (Chile 1996) in partnership with the United Nations;
- ✿ participating in the ongoing deliberations of the Biodiversity Convention, including the development and implementation of work programs for aquatic ecosystems, sustainable forestry and agriculture, impact assessment and ecosystem management;
- ✿ continuing to participate in the Canada/United States International Joint Commission, including regional boards for the Great Lakes and elsewhere across Canada;
- ✿ cooperating with the United States, Mexico, Australia and other countries in wetland policy development.

Helping the Monarch Butterfly

As part of the Canada-Mexico Environmental Co-operation Program, federal environment ministers from the two countries have established a joint conservation and research program for the monarch butterfly. The program includes support for monarch reserves in Mexico and research on linkages between the rearing and over-wintering habitats of this migratory species. In Canada, reserves for the monarch butterfly have been established at the Prince Edward Point and Long Point national wildlife areas and at Point Pelee National Park in Ontario. These efforts complement the Monarch Butterfly Conservation Program that the Commission for Environmental Cooperation is undertaking to ensure the viability of the monarch butterfly throughout North America.





Section 3: Conclusions

Canadians, wherever they reside, treasure the rich biological heritage of their country and place a high value on ensuring that future generations enjoy the same benefits. Many of our biological resources, such as wetlands and migratory wildlife, are of global significance.

Canada's conservation achievements to date have been significant. Many protected areas have been created for wildlife, and our current wildlife management programs continue to sustain many of the larger species of vertebrates. Yet much remains to be done.

Wildlife stewardship cannot depend exclusively on protected areas, but needs to be promoted across the working landscapes and in the urban areas of Canada. As a nation, we need to develop a better understanding of lesser-known species, such as invertebrates, non-vascular plants and microorganisms, and their ecological roles. It is also essential to recognize that habitats are under continued threat in many areas. The difficulties involved in controlling harmful alien species once they are established and reproducing must be recognized and acted upon. Other threats to habitat quality, such as water and air pollution and climate change, are of continuing and growing concern to wildlife managers and users alike.

Wildlife conservation cannot be achieved exclusively by governments. Local stewardship, supported by knowledge about trends, issues and opportunities, remains the key safeguard to healthy wildlife habitats and populations across Canada. This is particularly important for conservation on private lands.

The Canadian Biodiversity Strategy provides a blueprint for a more aggressive program of work in the area of biodiversity conservation. In response, this report serves as a benchmark of progress in the initial stages of implementing the Strategy, and covers a portion of the federal program for flora and fauna conservation. Other subsequent reports on the implementation of the Strategy are planned.

Many of the actions described here are being carried out in partnership with other federal departments, the provinces and territories, the private sector, non-government organizations and the aboriginal community. Together, these planned actions represent a significant commitment to wildlife conservation and to the sustainable use of wildlife and wildlife habitat across Canada and beyond our borders.



Appendix A:

Glossary of Terms

Biological Diversity: the variability among living organisms from all sources, including inter alia, terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part. This includes diversity within species, between species and of ecosystems.

Conservation: the maintenance or sustainable use of the earth's resources in a manner that maintains ecosystem, species and genetic diversity and the evolutionary and other processes that shaped them. Although conservation may involve the use of resources, certain areas, species or populations may be excluded from human use as part of an overall landscape/waterscape conservation approach.

Ecosystem: a dynamic complex of plants, animals and micro-organisms and their non-living environment, interacting as a functional unit. The term ecosystem can describe small-scale units, such as a drop of water, as well as large-scale units, such as the biosphere. Ecological Services: services that humans derive from ecological functions such as photosynthesis, oxygen production and water purification.

Endangered Species: species that are threatened with immediate extinction or extirpation if the factors threatening them continue to operate. This includes species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Endemic Species: species that exist in only one specific area or ecological zone.

In situ Conservation: the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive characteristics.

Ex situ Conservation: the conservation of components of biological diversity outside their natural habitats, often in such institutions as zoos, museums, botanical gardens, aquariums and gene banks.

Habitat: the place or type of site where an organism or population naturally occurs. Species may require different habitats for different uses throughout their life cycle.

Harmful Alien Organisms: organisms that enter an ecosystem, either through deliberate or inadvertent actions by humans, in which they are not naturally known to exist and thereby pose a threat to native species.

Landscapes: complexes of terrestrial ecosystems in geographically-defined areas.

Protected Area: geographically-defined areas designed or regulated and managed to achieve specific conservation objectives.

Sustainable Use: the use of components of biodiversity in a way and at a rate that does not lead to their long-term decline, thereby maintaining the potential for these components to meet the needs and aspirations of future generations. Sustainable use in the Strategy refers to consumptive uses of biological resources.

Threatened Species: species that are likely to become endangered if the natural or human pressures causing them to be vulnerable are not reversed.

Vulnerable Species: species that are at risk because they exist in low numbers or in restricted ranges due to over exploitation, extensive habitat destruction or other factors.

Acronyms

AAFC	.....	Agriculture and Agri-Food Canada
BCO	.....	Biodiversity Convention Office, Environment Canada
CFS	.....	Canadian Forest Service, Natural Resources Canada
CITES	.....	Convention on International Trade in Endangered Species
CMN	.....	Canadian Museum of Nature
COSEWIC	.....	Committee on the Status of Endangered Wildlife in Canada
CWS	.....	Canadian Wildlife Service
EMAN	.....	Ecological Monitoring and Assessment Network
INAC	.....	Indian and Northern Affairs Canada
MBCA	.....	Migratory Birds Convention Act
NAWMP	.....	North American Waterfowl Management Plan
RENEW	.....	Recovery of Nationally Endangered Wildlife Program
UNEP	.....	United Nations Environment Program
WAPPRIITA	.....	Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act
WHSRN	.....	Western Hemispheric Shorebird Reserve Network

Appendix B:

Sources of Additional Information

For more information on the Canadian Biodiversity Strategy, contact:

Biodiversity Convention Office
Environment Canada
Place Vincent Massey
351 St. Joseph Blvd., 9th Floor
Hull QC K1A 0H3

Telephone: (819) 953-4374
Facsimile: (819) 953-1765
e-mail: bco@ec.gc.ca

For information on the Convention on Biological Diversity and the activities of the Secretariat to the Convention, contact:

Secretariat of the Convention on Biological Diversity
World Trade Center
393 St. Jacques Street, Office 300
Montréal QC H2Y 1N9

Telephone: (514) 288-2220
Facsimile: (514) 288-6588
e-mail: chm@biodiv.org
Internet: <http://www.biodiv.org/chm.html>

For information on the wildlife programs of Environment Canada, contact:

Canadian Wildlife Service
Telephone: (819) 997-1095
Facsimile: (819) 997-2756
Internet: <http://www.ec.gc.ca/cws-scf>

For more information on Environment Canada's regional programs, contact:

Atlantic Region
Environmental Conservation Service
Environment Canada
PO Box 1590 - 63 East Main Street
Sackville NB E0A 3C0

Telephone: (506) 364-5011
Facsimile: (506) 364-5062

Région du Québec
Conservation de l'environnement
Environnement Canada
1141, route de l'Église, 9e étage
Case postale 10 100
Sainte-Foy QC G1V 4H5

Telephone: (418) 648-7808
Facsimile: (418) 649-6591

Ontario Region
Environmental Conservation Service
Environment Canada
4905 Dufferin Street
Downsview ON M3H 5T4

Telephone: (416) 739-5839
Facsimile: (416) 739-4408

Prairie and Northern Region
Environmental Conservation Service
Environment Canada
Twin Atria Building
2nd Floor, 4999 - 98 Avenue
Edmonton AB T6B 2X3

Telephone: (403) 468-8903
Facsimile: (403) 495-2615

Pacific and Yukon Region
Environmental Conservation Service
Environment Canada
Airport Square
700-1200 West 73rd Avenue
Vancouver BC V6P 6H9

Telephone: (604) 940-4700
Facsimile: (604) 946-7022

For more information on the wildlife diversity activities of the other federal resource departments whose activities are noted in this report, contact:

Agriculture and Agri-Food Canada Environment Bureau
Sir John Carling Building
930 Carling Ave, Room 367
Ottawa ON K1A 0C5

Natural Resources Canada
Canadian Forest Service
Science Branch
580 Booth Street
Ottawa ON K1A 0E4

Canadian Heritage
Parks Canada
Director General, National Parks
25 Eddy Street
Hull QC K1A 0M5

Canadian Museum of Nature
Program Director, Biodiversity
240 McLeod Street
PO Box 3443
Ottawa ON K1P 6P4

Department of National Defence
Director General, Environment
101 Colonel By Drive
Ottawa ON K1A 0K2

Internet Sites of Further Interest

AAFC (Agriculture and Agri-Food Canada):
<http://www.agr.ca>

Action 21:
<http://www.ns.doe.ca/action21/menu.html>

AES (Atmospheric Environment Service):
<http://www.tor.ec.gc.ca/aes.html>

BBS (Breeding Bird Survey):
<http://www1.ec.gc.ca/~cws/bbs1.html>

BCO (Biodiversity Convention Office)
<http://www.cbin.ec.gc.ca/biodiversity/en/bco/default.cfm>

CCME (Canadian Council of Ministers
of the Environment):
<http://www.mbnet.mb.ca/ccme>

CFS (Canadian Forest Service):
<http://nrcan.gc.ca/cfs/index.html>

CHM (Clearing House Mechanism Secretariat
of the CBD, Montréal):
<http://www.biodiv.org/chm.html>

CLMS (Canadian Landbird Monitoring Strategy):
<http://www1.ec.gc.ca/~cws/strat.html>

Commissioner of the Environment
and Sustainable Development:
<http://www.oag-bvg.gc.ca>

COSEWIC (Committee on the Status
of Endangered Wildlife in Canada):
http://infoweb.magi.com/~ehaber/b_intro.html

CWS (Canadian Wildlife Service):
http://www.ec.gc.ca/cws-scf/cwshom_e.html

EARTH SUMMIT (Agenda 21):
<http://www.un.org/dpcsd/earthsummit>

EC Greenlane, Issues and Topics:
http://www.ec.gc.ca/issues_e.html

EMAN (The Ecological Monitoring and Assessment Network):
<http://www.cciw.ca/eman-temp/intro.html>

EnviroLink Network:
<http://www.envirolink.org>

Environment Canada's Green Lane:
<http://www.doe.ca/>

FBMP (Forest Bird Monitoring Program):
<http://www1.ec.gc.ca/~cws/fbmp.html>

FLCC (Framework for Landbird Conservation in Canada):
<http://www.ec.gc.ca/cws-scf/canbird/pif/frame.htm>

Frogwatch:
<http://www.ednet.ns.ca/educ/museum/mnh/educ/frogwatch/index.htm>

FRAP (Fraser River Action Plan):
<http://www.pwc.bc.doe.ca/buildings/frap/index.html>

MAB Canada (Man and the Biosphere Canada):
<http://www.cciw.ca/mab/mab.htm>

MERP (Marsh Ecology Research Program):
<http://www.ducks.ca/iwwr/merp/merp.htm>

MFP (Model Forest Program):
<http://mf.ncr.forestry.ca/>

NAWMP (The North American Waterfowl Management Plan):
<http://www.wetlands.ca/whoswet/nawmp.html>

Partners in Flight—Canada:
http://www.ec.gc.ca/cws-scf/canbird/pif/p_intro.htm

Ramsar Convention:
<http://iucn.org/themes/ramsar/>

SOER (State of Canada's Environment Infobase):
<http://www1.ec.gc.ca/~soer/>

St. Lawrence Vision 2000:
<http://www.wul.qc.doe.ca/vis2000/indexe.html>

WHSRN (Western Hemisphere Shorebird Reserve Network):
<http://www.wetlands.ca/wi-a/whsrn/whsrndex.html>



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