Caring for Canada's Biodiversity: Canada's First National Report to the Conference of the Parties to the Convention on Biological Diversity

1. INTRODUCTION

1.1 The Nature of Canada's Biodiversity

Canada is defined by its great biological, geographical and cultural diversity. The second-largest nation in the world by area, it encompasses a land mass of 9.9 million km², and is bordered by three oceans that provide 224 000 km of coastline and the second largest continental shelf, with an area of 3.7 million km². Rivers and lakes make up at least 7.6% of Canada's surface and provide at least 9% of the world's freshwater supply. The country is characterized by a wide range of climates, which, along with many other factors, shape its diverse landscapes and waterscapes.

Canada is a steward of major portions of the world's tundra, temperate forest, and aquatic ecosystems, and of smaller expanses of grassland and cold-winter desert ecosystems. Almost half of Canada is forested land, representing about 10% of the world's total. Canada's Arctic constitutes about 20% of the world's circumpolar area. One quarter of the remaining wetlands on the globe are found in Canada.

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. Canada is home to 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 mammals. Many of North America's migratory birds, duck and geese take up residence in Canada during the spring and summer. Approximately 54 species of vascular plants, mammals and freshwater fish and molluscs are known to be endemic to Canada.

1.2 The Importance of Biodiversity to Canadians

Canada's biodiversity is important to all Canadians. Many Aboriginal communities, particularly in the North, depend on the sustainable harvesting of biological resources for their subsistence. This harvesting provides a large portion of their food and income. Aboriginal peoples have also, over thousands of years, developed an intimate cultural relationship with nature.

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, Canada's rich resources contribute billions to the gross domestic product, and millions of Canadians are employed by resource-based industries. In addition, eco-tourism and outdoor recreational activities are important parts of the Canadian economy and depend on biological resources, as do pharmaceutical and bio-technological research and development.

The Importance of Wildlife to Canadians

According to a Statistics Canada survey, nearly 19 million Canadians spent $8.3 billion in 1991 on fishing and other wildlife-related activities in Canada, such as wildlife photography, birdwatching, hunting and fishing, leading to the creation of 200 000 jobs and contributing $5 billion in government tax revenues and $11 billion to Canada's Gross Domestic Product. Wildlife resources also provided additional direct benefits to Canadians of over $700 million. This shows a 33% increase in expenditure since 1981. In addition, about 1.8 million tourists from the United States traveled to Canada to take part in these activities. They spent an estimated $800 million.

For many Canadians, the diversity of spaces and species in this country is a source of emotional, artistic, and spiritual inspiration and cultural identity. Canada's diverse ecosystems and species—often captured by painters, writers, and musicians—help define Canada to its citizens.

Many Canadians believe that each species has its own intrinsic value, regardless of its value to humanity, and that human society must be built on respect for all life. They believe that biodiversity should be conserved for its own sake, regardless of economic or other values.

Canadians are becoming more and more aware of the need to maintain the earth's biodiversity and use biological resources in a sustainable manner. Since all biological resources have potential benefit, Canadians recognize that conserving biodiversity will help to keep options open for future generations. Conserving biodiversity enhances our ability to be creative, productive, and competitive, and provides opportunities to discover new foods, drugs, and industrial products. For example, many of Canada's native plant species must endure both cold winters and hot summers. These plants may possess genetic material that could be used to develop agricultural crops that can withstand greater temperature ranges. Conserving biodiversity is an investment in the future, makes good business sense, and underpins our ability to achieve sustainable development.

For the most part, Canada's biodiversity remains in a sufficiently healthy state that current and future conservation and sustainable-use measures will go a long way toward safeguarding the needs of future generations. There are still large tracts of grasslands, forests, arctic areas, mountain regions, and fresh water and marine ecosystems. The vast majority of Canada's wildlife species exist at viable levels, with several previously-threatened species actually increasing in numbers.

However, there are also many biodiversity-related challenges facing Canadians. A few ecosystems have almost been completely lost as a result of human development and settlement patterns. In some instances, harvest rates have exceeded the capacity of stocks to regenerate themselves. Each year the number of threatened or endangered species in Canada grows. The major threats to Canada's biodiversity are described in Section 1.4.

1.3 Shared Responsibilities for Biodiversity in Canada

Responsibility for the conservation and sustainable use of biodiversity is distributed across the breadth of Canadian society. Due to the complexity and pervasive nature of biodiversity and its importance to Canadians, much of the responsibility for ensuring its conservation and the sustainable use of biological resources remains in the hands of the various orders of government. Governments are enacting laws for environmental protection and conservation, facilitating and developing public policies for land and resources, acquiring land for conservation purposes such as parks and wildlife reserves, developing national policies and programs, entering into international treaties, providing conservation and sustainable-use incentives, undertaking scientific research and analysis, and supporting public education and awareness programs.

Shared responsibility for biodiversity among governments in Canada often results in the joint development of strategies, policies and action plans, a recent example being the Canadian Biodiversity Strategy itself. In addition, each government has a wide variety of conservation and sustainable-use legislation, policies and strategies in place. Some provinces have also developed specific strategies and action plans to address the conservation and sustainable use of biodiversity, such as Quebec's Biodiversity Implementation Strategy and Action Plan*.*

Canada's Aboriginal peoples also play a key role in conserving biodiversity and ensuring the sustainable use of biological resources, as they are gaining a greater share of authority over the management and development of their traditional lands. Self-government agreements and land claims, including co-management arrangements, are important components in the management of biodiversity in Canada.

The role of private landowners is also critical to conserving biodiversity and the sustainable use of biological resources. In the southern parts of Canada, over 90% of the landscape is under private ownership and is used for agricultural production, forestry, and other purposes. Many areas of public land are also leased for a variety of land uses, such as grazing. In these areas, governments and non-government organizations must work with landowners and land managers to achieve biodiversity goals and objectives.

Forestry, mining, oil and gas and other private sector industries are also land owners and lease holders that have biodiversity responsibilities. They contribute to the conservation of biodiversity by ensuring that their activities comply with laws and regulations and through various conservation and sustainable resource-use measures.

Canada is fortunate to have numerous non-government organizations that have taken on responsibilities for the conservation of biodiversity and the sustainable use of biological resources. Their activities include enhancing public awareness, raising funds for projects, providing expertise, acquiring land for conservation purposes, and helping to develop and improve strategies, policies, legislation and programs. The Canadian Biodiversity Forum is the primary non-government body for advising governments on national biodiversity planning and implementation. Its membership includes

representation from industry, academia, conservation groups, Aboriginal organizations and the scientific community.

1.4 Threats to Canada's Biodiversity

For the most part, Aboriginal peoples in Canada have used biological resources in a sustainable manner for thousands of years. European settlement, however, brought with it many changes to Canada's native biodiversity. Early exploitation was characterized by non-sustainable harvesting. Over many years, this led to the extinction of several species such as the passenger pigeon and the great auk. Other species such as bison, elk and beaver declined significantly. Newcomers to Canada also brought with them alien species with the potential to dramatically alter ecosystems.

Settlement and increasing population growth over the past 100 years has had an even greater impact on Canada's biodiversity. This period of Canada's history has focused on landscape modification—particularly agricultural, industrial and urban development in the southern portions of Canada. There has also been increased harvesting of forest and fishery resources, some of it non-sustainable.

At present, the principal threats to Canada's biodiversity include:

- continued permanent alteration of ecosystems and habitats;
- the introduction of harmful alien species;
- degradation of ecosystems from pollution and other factors;
- global climate change and other atmospheric change; and
- non-sustainable harvesting practices.

Addressing these threats requires concerted national action in a number of key areas, including:

- *Assessing the overall impacts of climate change on our forests, fish populations and agriculture.* Potential impacts on biodiversity could be significant and could include:
    - longer growing seasons and extension of agriculture further north, but also risks such as moisture deficits, pests, disease and fires;
    - increased impacts on fish populations in the Arctic, and decreased impacts on populations in northern areas of the Pacific coast, particularly the lakes and rivers of the Canadian Shield; and,
    - risks to waterfowl populations due to lower water levels in lakes, rivers and wetlands.

- *Conserving the remains of terrestrial ecosystems that have been significantly reduced in size*. For example, less than 1% of Canada's tallgrass prairie remains intact, the Carolinian forest survives only in tiny patches in central Canada, and old growth forests in the Maritimes exist only in small stands. In addition, urban and industrial expansion has had an affect on biodiversity, including habitat fragmentation, especially in the southern portions of Canada.

- *Conserving and rehabilitating many freshwater and marine ecosystems*. In the settled parts of Canada, wetlands and estuaries have been drained or significantly altered. Thousands of small lakes in eastern Canada continue to lose fish, amphibian and shellfish communities due to transboundary acid precipitation, much of which emanates from the United States. The Great Lakes ecosystems have been greatly altered by intensive commercial fishing, successive invasions and deliberate introductions of alien species, pollution and habitat alteration. For many decades, the St. Lawrence River watershed has received the accumulated discharge of toxic wastes, including those from sources discharging into the Great Lakes, municipal sewage, and agricultural runoff.

- *Ensuring the survival of Canada's vulnerable, threatened and endangered species*. Since 1884, 10 known species have disappeared from Canada. An additional 281 species of land and marine mammals, reptiles, amphibians, birds, fish, molluscs, vascular plants and lichens have been designated "at risk" in Canada, and that list is growing as more species are assessed each year by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and by provincial committees in relation to their own legislation.

- *Implementing measures to ensure the sustainable use of biological resources*. Atlantic and Pacific coastal waters have experienced a massive reduction in their stocks of northern cod, salmon and other harvested fish. As intensively-harvested stocks such as salmon and cod decline in numbers, there is concern about a greatly diminished gene pool, which could have long term effects on species survival. A recent report by the Auditor General of Canada finds that of the 4906 stocks of salmon in the province of British Columbia and the Yukon, 600 are at high risk, 63 are at moderate risk and 57 are of special concern. Habitat loss, urban development, forestry activity and non-sustainable use are believed to be the causes.

- *Preventing and reducing the release of pollutants that can have both immediate and long-term impacts on biodiversity*. For example, contaminants from distant regions are being deposited in the arctic region and having negative impacts on arctic flora and fauna, just as acid precipitation from American point sources is acidifying many lakes in eastern Canada. We are also now beginning to understand the cumulative effect of toxic substances in areas like the Great Lakes.

- *Determining the habitat requirements and ecological relationships of Canada's diverse flora and fauna to ensure their survival while also creating opportunity for economic growth*. Many questions regarding the impacts of human activities on ecosystems remain unanswered.

2. LAYING THE FOUNDATION TO IMPLEMENT THE CONVENTION ON BIOLOGICAL DIVERSITY

Our experience in Canada has demonstrated the importance of broadly-based commitment, effective communication and coordinated action to the development of

measures and mechanisms for the conservation of biodiversity and the sustainable use of biological resources.

2.1 A Commitment to Biodiversity Conservation and the Sustainable Use of Biological Resources

Canadians have long recognized the importance of conserving biodiversity, and can point with pride to the many initiatives this country has undertaken to monitor and conserve ecosystems, wild species and their habitat. Canadians also recognize that conserving biodiversity and using biological resources in a sustainable manner are essential to achieving sustainable development.

In the spring of 1996, all the provinces and territories and the federal government signed a National Statement of Commitment to conserve biodiversity and use biological resources in a sustainable manner. Governments also committed to using the Strategy as a guide for their actions, and invited all Canadians to join them in their efforts.

Canada has been a signatory to and is conscientiously implementing a number of international treaties, conventions and declarations that support biodiversity conservation and sustainable use. These include the 1971 (Ramsar) Convention on Wetlands of International Importance Especially as Waterfowl Habitat, the 1972 UNESCO Convention for the Protection of the World Cultural and Natural Heritage, the 1973 Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Migratory Birds Convention, the 1982 World Charter for Nature, the 1982 United Nations Convention on the Law of the Sea (signed but not yet ratified) and the 1983 International Tropical Timber Agreement.

Canada is currently amending its legislation in order to ratify the United Nations Fisheries Agreement (UNFA) on the conservation and management of straddling fish stocks and highly-migratory fish stocks. Canada is also an active participant in the IUCN (the World Conservation Union) and its many biodiversity-related programs. Canada has also entered into regional environmental agreements such as The Arctic Environmental Protection Strategy and the North American Agreement for Environmental Cooperation (under the North American Free Trade Agreement). Canada is proud to have been selected to host the Secretariat of the Convention on Biological Diversity in Montreal and considers this honour a global recognition and testimony to our commitment to the Convention. Canadians and its governments have also made numerous national commitments to the conservation of biodiversity and the sustainable use of biological resources. These include the Canadian Biodiversity Strategy, which commits Canada to implement the Convention on Biological Diversity; a national forest strategy that demonstrates a commitment to sustainable forest management; a national Statement of Commitment to Complete Canada's Networks of Protected Areas; the Arctic Marine Conservation Strategy; the Federal Policy on Land Use; the Green Plan; and the Federal Wildlife Policy, to name a few.

These commitments and many others are often shared with provincial and territorial governments, non-government organizations, corporations, and research, education

and conservation institutions. Examples are found throughout this report and in the Annex.

The commitment of provinces and territories to biodiversity is reflected in the broad array of conservation and sustainable-use strategies, policies and programs related to land and resource use. In addition, provinces such as Quebec have invested much effort in developing a comprehensive biodiversity strategy and action plan involving several provincial government departments as well as non-governmental interests. There is also growing evidence that municipalities are incorporating biodiversity into their land-use planning activities.

Non-government organizations have been instrumental in advancing biodiversity conservation efforts and contributing to related law and policy in Canada. These organizations have purchased land for conservation purposes, produced guides and training materials, raised public awareness and worked cooperatively with government and industry on joint ventures ranging from large ecosystem projects to local watershed planning and species-recovery programs.

Corporations also make commitments to conservation and sustainable use through corporate environmental statements, codes of practice, resource management plans and development guidelines.

Research, education and conservation institutions have made critical commitments. Facilities such as zoos, aquariums, universities, museums, arboreta and botanical gardens are committed to biodiversity research and education, and direct such areas as the captive breeding of endangered species.

2.2 Engaging Canadians in Planning and Decision Making

In Canada, the development of strategies, policies, programs and legislation must include significant opportunities for public involvement. A variety of communication and participatory mechanisms are employed to ensure that all Canadians have the opportunity to and are encouraged to become involved in decisions relating to the environment. These include model forests, biosphere reserves, green community initiatives, watershed management initiatives, co-management boards, and local, provincial and national round tables.

The process used to develop the Canadian Biodiversity Strategy reflects the high degree to which consultation and participation figure in the development of national environmental strategies and policies in Canada. Key elements of this process included:

- agreement by provincial, territorial and federal ministers to develop the Strategy;
- the assignment of responsibility for developing the Strategy to an inter-governmental working group consisting of representatives from federal, provincial and territorial government agencies;

- the creation of a national biodiversity advisory group, now called the Canadian Biodiversity Forum, with representation from conservation organizations, research and education institutions, business interests, Aboriginal peoples, and labour groups, to provide advice to the intergovernmental working group;

- the establishment of expert groups when advice was required on specific aspects of the Strategy, for example on how to improve biological inventories and enhance the sharing of data and information;

- the widespread distribution and public review of the draft version of the Strategy to ensure opportunities for input from interested Canadians and organizations;

- the approval by each jurisdiction to release the strategy in November 1995; and

- the signing by provinces, territories and the federal government of a National Statement of Commitment to the conservation of biodiversity and the sustainable use of biological resources in April 1996.

2.3. Building A Framework for Decision Making and Coordinated Action

Forging a New Relationship with Nature

Many view the Convention on Biological Diversity as a landmark treaty. Not only is it seen to be the most comprehensive environmental treaty ever signed, it is the first global treaty to take a holistic, ecosystem-based approach to environmental protection. It suggests a new way of looking at environment and development issues and provides the world with a more integrated framework for sustaining nature. It is a framework that has helped to launch new processes and partnerships in Canada, and can do the same globally.

Translating the Convention into the Canadian Context

From the outset, Canada responded enthusiastically to the goals and spirit of the Convention. Not only did it make good environmental sense, it made good management sense. The Convention is a non-prescriptive framework for conserving biodiversity and using our biological resources in a sustainable manner. There are no global targets, timetables or lists of biodiversity hotspots. The onus is on individual countries to interpret the treaty from a national perspective and develop a response that reflects national circumstances and priorities.

Canada saw this, particularly through early implementation of Article 6, as an opportunity to create a national framework that would guide decision making at the local and regional levels, within sectors and across sectors. It was also viewed as an opportunity to advance the work and thinking that had already begun with respect to integrated planning and decision making, and to engage a wide range of interests in the process.

The Canadian Biodiversity Strategy

The Canadian Biodiversity Strategy is a national framework that puts the Convention on Biological Diversity into the Canadian context. Recognizing the shared responsibility for conserving biodiversity and using biological resources in a sustainable manner, it provides a context within which each jurisdiction can determine its own priorities and actions, individually and in co-operation with others. It builds upon the many policies and programs from all orders of government that already contribute to the achievement of the Convention's objectives. And it moves Canada closer to its goal of sustainable development by emphasizing the importance of intergovernmental co-operation in creating the policy, management and research conditions necessary to advance ecological management.

The five goals of the 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
- collaborate with other countries to conserve biodiversity, use biological resources in a sustainable manner, and share equitably the benefits that arise from the utilization of genetic resources.

In order to ensure effective and coordinated implementation of the Canadian Biodiversity Strategy, in accordance with each jurisdiction's priorities and fiscal capabilities, federal, provincial and territorial governments have agreed to:

- strengthen linkages at the ministerial level to oversee the implementation and monitoring of the Strategy;
- report on policies, programs, strategies and actions in place or being developed to implement the Strategy, and subsequently report publicly on progress made;
- within each jurisdiction, maintain or develop mechanisms to provide opportunities for meaningful participation of regional and urban governments, local and indigenous communities, interested individuals and groups and the scientific community in implementing the Strategy;
- coordinate elements of the Strategy that require national participation in order to help develop international positions on biodiversity matters and oversee the development of national and international progress reports;
- ensure that mechanisms exist that enable non-government organizations and members of the public to participate in the implementation of the Strategy and the development of international biodiversity agreements;
- report periodically to Canadians and the international community on the status of Canada's biodiversity;
- challenge and invite all Canadians to conserve biodiversity and use biological resources in a sustainable manner; and
- explore mechanisms to provide opportunities indigenous communities to participate in implementing the Strategy through a variety of mechanisms, such as resource management agreements, management boards, model forest programs and other means.

The degree to which the Canadian Biodiversity Strategy is able to enhance our national capacity to conserve biodiversity and achieve sustainable development will be the measure of its success. It states that it will have made a difference if:

- the value and importance of biodiversity is reflected in the actions and decisions of all sectors of society, from corporations to individual consumers, private property owners and various orders of government;

- we are capturing existing information, generating new knowledge about biological resources and conveying that knowledge in a useful, timely and efficient way;

- we are no longer planning and making decisions based exclusively on a species-by-species or sector-by-sector basis but are practicing ecological management;

- opportunities are being created through technological innovation, application of traditional knowledge, scientific discoveries and new applications of sustainable use; and

- we are maintaining biodiversity for future generations and contributing to conservation and sustainable-use efforts worldwide through financial assistance, knowledge, expertise and the exchange of genetic resources.

Canada has now entered the next phase of activity—action planning, implementation and reporting on a jurisdictional basis. This involves analyzing, interpreting and responding to strategic directions that reflect regional and jurisdictional circumstances and priorities. Although this work is not yet completed, two jurisdictions—Quebec and British Columbia—have already produced plans and reports on the implementation of the Strategy.

Federally, plans and reports have been released on the implementation of the Strategy within the context of wildlife diversity, protected areas, agriculture and forestry. Subsequent reports on aquatic biodiversity, ecological management, education and awareness, and international co-operation are planned for the spring of 1998. These reports identify both actions that have been taken in response to the Strategy and planned activities. Some reports address biodiversity conservation and sustainable use within a particular sector, such as agriculture or forestry. Others are more integrative and take a more cross-sectoral approach. There has also been an attempt to integrate biodiversity into new and existing federal and provincial resource and land-use plans, strategies and legislation.

It became evident during the development of the Canadian Biodiversity Strategy that there would be a number of challenges in implementing it. Perhaps the greatest is to truly integrate biodiversity conservation with economic objectives. The major challenges in implementing the Convention in Canada and in integrating its objectives with Canadian economic, social and cultural goals are described in the following section.

3. MAJOR CHALLENGES AND EARLY RESPONSES TO IMPLEMENTING THE CONVENTION IN CANADA

The following sets out some of the key challenges faced by Canada in its implementation of the Convention and its national strategy. It also describes how Canada is attempting to respond to these challenges.

3.1 Enhancing Our Capacity to Integrate Biodiversity Considerations into Decision Making

Perhaps the biggest challenge we face is the integration of biodiversity considerations into economic and development decision making. This section describes how Canada is attempting to address deficiencies in its capacity to make decisions that do not adversely affect biodiversity.

Science and Information for Decision Making

i. Enhancing Our Understanding of Ecosystems

Enhancing our understanding of both the short- and long-term impacts of human activity on the ecosystem is fundamental to the conservation of biodiversity and the sustainable use of biological resources. Only when the impacts of human activities are understood can environmental, economic, social and cultural objectives be fully integrated. Improving our understanding of the human uses of ecosystems will not only improve biodiversity conservation approaches, but also assist in reducing negative economic impacts from environmental policies and programs.

State of the environment reporting has provided an important means for governments to report on changes to ecosystems, and to propose action to achieve specific environmental goals. State of the environment reporting has been conducted both federally and by the provinces. This area of science is essential for decision making that responds to the needs of biodiversity.

Environment Canada continues to provide information on the changing nature of the Canadian environment, but in a more cost-effective manner that focuses on individual areas or issues as opposed to producing a National State of the Environment Report. Ecosystem-specific reports are prepared to increase awareness of threats in specific areas. Examples of these reports include the State of Forests Report, the State of the Great Lakes Report, the Northern River Basins Study and the State of the Parks Report.

Although much effort has gone into improving our knowledge of ecosystems and how they function, there is still much that we do not understand. In 1994, Environment Canada carried out a scientific appraisal of biodiversity issues in Canada and their implications for policy and research. The Biodiversity Science Assessment reviewed what is known about the effects of resource development activities such as forestry, agriculture, fishing and urbanization on biodiversity. The assessment contains 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.

A national working group comprising federal, provincial and territorial governments as well as representatives from the private sector and universities has developed the *National Ecological Framework for Canada*. This framework is intended to facilitate the integration of data in a manner that is useful to as many stakeholders and interest groups as possible. The framework serves as a directory of ecological units that builds a comprehensive profile and understanding of Canada's ecosystems. This ecosystem information is a critical component of integrated planning and ecological management.

Continued investment in enhancing our understanding of ecosystems is key to the successful management of our fisheries, forest and agriculture resources. It is also necessary to better plan the recovery of endangered species, select and design protected areas and implement other conservation strategies.

ii. Improving Biological Inventories

Comprehensive and reliable biological inventories at the landscape, species and genetic levels, are a fundamental requirement to making decisions for the conservation and sustainable use of biological resources. Inventories provide a basis for determining the changing status of biological resources, setting sustainable harvest rates, conducting research, developing resource- and land-use plans, and assessing impacts of decisions on ecosystems.

Our knowledge of the taxonomy, ecological requirements and population status of wild species varies enormously. Although 71 000 species of wild plants and animals have been recorded in Canada, scientists estimate that 68 000 have yet to be discovered and named. Of those discovered, approximately 97% have not been studied in depth.

Inventory efforts have focused on larger organisms that have been described, including most vertebrates, larger insects, higher plants and ferns. We must continue to improve our understanding of their distribution, ecological relationships and status. A smaller number of species of fur bearers, ungulates, fish and waterfowl, as well as endangered species, have been or are being intensely studied and managed. Numerous other organisms, including most species of insects, fungi, non-vascular plants, bacteria and protozoa, have not been identified or, if they have been, have not been well studied. In addition, very little is known about the genetic diversity of Canada's flora and fauna.

There is a need, therefore, for a significant amount of work to be carried out in the area of taxonomy and biosystematics. Systematics allows us to identify, organize and communicate biodiversity in a meaningful way. This challenge comes at a time when the numbers of taxonomists and biosystematists are shrinking and fewer students entering universities see taxonomy and biosystematics as a viable career choice. In addition, Canada has lost some of the volunteers who have made substantive contributions through the use of sampling and processing protocols that acquire scientifically-useful data. Efforts are underway, however, to coordinate taxonomic and

biosystematic research within the federal government to better focus research on gaps and priorities.

Ecosystem- or bioregional-level inventory work is being carried out across Canada by federal, provincial and territorial agencies. Ecosystem-level inventories are used for a variety of purposes, including providing a basis for establishing protected areas that are representative of Canada's diverse landscapes; undertaking land-use and watershed plans; and providing a framework for state of the environment reporting. Ecological-level inventories continue to be refined over time in Canada. The challenge is to continue to develop cost-effective ecological inventories at scales that will support various planning and management needs.

There are two basic challenges regarding biological inventories. The first challenge is to make better use of the data and information that we have already collected to support land and resource decision making. For example, research is required to determine appropriate indicator species to measure the success or failure of management practices. Indicators species are necessary, as comprehensive inventories at a landscape-management level are generally cost prohibitive.

The second basic challenge is to improve our biological inventories at all levels. Ecosystem-level inventories need to be refined, and gaps in our inventory at the species level must be filled. Development of cost-effective technologies to improve understanding of genetic resources is also necessary to conserve and properly manage some resources.

Canada has initiated efforts to improve its biological inventories. Governments, non-government organizations, research institutions and private-sector interests are collaborating on a number of fronts to overcome gaps, but the task is great and the resources are few. An integrated and collaborative approach is required to ensure that efforts focus on serious deficiencies and priority areas.

iii. Improved Management and Distribution of Information and Data

Effective use of data and information from a wide range of sources is key to developing sound biodiversity strategies, policies and programs. Many challenges exist in developing an effective data and information network.

Integration of data sets is one of the key challenges. Coupled with the huge gaps that exist in our scientific information is our inability to properly access and use the extensive information and data that already exists in information holdings across the country. Not only are individual data sets often hard to access, there is also an incompatibility among data management systems that often impairs data sharing. This problem stems in part from a lack of standardization in the way information has been collected, stored and managed.

A partnership of federal government departments and the Canadian Museum of Nature has resulted in an initiative to examine our inability to share existing data and information, with a view to improving national accessibility to biological and related data

holdings to enable analysis for sound decision making. The project is called the Canadian National Biodiversity Information Initiative, and its goal is to facilitate the formation of a distributed federation of Canadian partners that will have the content, expertise, tools and willingness to share biodiversity data electronically.

A second key challenge is to build and improve our existing database to support biodiversity conservation and the sustainable use of biological resources. A wide range of data sets, including biological, physical, chemical, social, cultural and economic data are required by resource planners and managers.

Numerous government agencies, non-government organizations, research institutions and private-sector interests are working to improve or develop new databases for biodiversity planning and management. One of the many efforts underway has been the creation of Conservation Data Centres in Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia. Staff at the centres collect and assemble data on rare and endangered species and communities to determine their status and map their distribution. This information is linked through the United States Nature Conservancy to data collected throughout North, Central and South America, creating an effective network that provides a means to assign global and local status to species and improve efforts to conserve them.

Another major challenge is to develop effective ways to distribute biodiversity-related data and information to the wide interests that could make valuable use of it. Some of these interests require raw data while others need information and interpretation. Many organizations are forming partnerships to improve their ability to collect and share data and information. For example the Canadian Pulp and Paper Industry is developing a database that facilitates the sharing of forest biodiversity projects among member companies. Canada is developing the Canadian Biodiversity Information Network (CBIN), an Internet-based resource centre that is part of a global information-sharing network collectively known as the clearing-house mechanism (CHM). As part of the CHM, the CBIN will provide a venue for and information about Canadian biodiversity-related data, technologies, skills, publications, discussion groups, and activities being undertaken to implement the Convention and the Canadian Biodiversity Strategy. The next step in the implementation of the CBIN is to establish partnerships with information brokers and suppliers before widespread release to the public. The CBIN is expected to be operational in 1998.

iv. Traditional Knowledge

Many opportunities have yet to be pursued in considering and using traditional knowledge in decision making processes. Many communities, families and individuals have accumulated traditional knowledge that is relevant to the conservation of biodiversity and the sustainable use of biological resources. For example, farmers, loggers, trappers and other people that depend directly on natural resources have experience and knowledge that is valuable to addressing biodiversity needs. Measures must be employed that allow and facilitate these individuals to control and communicate their knowledge and information as part of land and resource planning and management.

Aboriginal knowledge is based on observation, direct experience, testing, teaching and recording in the collective memory through oral tradition, storytelling, ceremonies and songs. This knowledge is exercised within the context of the social values of the tribe—that is, that the earth and every animal, plant and rock is sacred and should be treated with respect. Aboriginal people believe that all things are connected and must be considered within the context of their interrelationships. Aboriginal knowledge necessitates the studying of cycles, relationships and connections between things; hence the need to look ahead when making decisions.

This holistic approach to learning and using knowledge has direct application to the study and use of biodiversity, and much effort is now being expended to reduce the gap between traditional scientific approaches and aboriginal approaches with a view to combining the best of both.

Examples of indigenous participation in decisions that affect biodiversity and the environment in Canada include participation in environmental assessments and review panels, and the participation of Aboriginal peoples in a national indigenous knowledge working group to assist with Canada's implementation of Article 8j of the Convention.

The Canadian working group on Article 8j was created in March 1997 to develop Canada's position and organize its participation at the Workshop on Traditional Knowledge and Biodiversity, held in November 1997 in Madrid, Spain. The group provided an open forum whereby government officials and Aboriginal peoples, including representatives from seven national aboriginal organizations, collaborated on the national implementation of the article. Seven of the 13 Canadian delegates who attended the Madrid Workshop were Aboriginal persons. They worked collaboratively with government delegates, provided examples of Canadian indigenous experiences and played a prominent role in Workshop discussions.

Training and Education

i. Bridging the Science-Public Perception Gap: Education and Awareness

Although the rate of biodiversity loss is a major concern for most conservation biologists, it is often not high on the public or political agenda. There are many reasons for this. Biodiversity is a multi-dimensional, multi-faceted issue that is hard to understand readily, except in a very narrow or superficial way. It is also, for the most part, an invisible issue. In countries such as Canada that seem to abound with wildlife and wilderness, biodiversity loss is not felt personally by most citizens unless it affects them directly, as in the case of fishermen who have lose their jobs due to depleted cod stocks. As most of Canada's population now lives in large urban centres, many people have lost what was once an intimate connection with nature. When the media reports on the disappearance of old growth forests or the loss of prime grizzly bear habitat, there is a sense of regret and loss, but no real sense of urgency except among the most devoted environmentalists.

Controversy surrounding the protection of endangered species and development in and around protected areas does attract public attention, however, it also tends to draw attention away from the larger and more important challenge of managing biodiversity across 100 per cent of the landscape and waterscape. Furthermore, biodiversity at the species level is about more than protecting species at risk. Variations within domestic plants and animals and the sustainable use of these are important for agricultural production and our livelihood.

Improving public understanding of the value of biodiversity and our dependence on it is the first major challenge to the successful integration of conservation and development goals. We must reinforce the notion of civic responsibility and help to identify the actions required to ensure full societal support for developing and implementing new and improved strategies, policies, plans, programs, legislation and management approaches. Public acceptance of the need to conserve biodiversity and use biological resources in a sustainable manner is essential if we are to achieve sustainable development.

Within Canada, environmental education and awareness have traditionally been high priorities for educational institutions, government agencies, conservation organizations and private-sector interests. Since Canada's ratification of the Convention, there have been an increasing number of educational materials and programs focused on biodiversity. In the spring of 1998, Canada will produce a report on best practices in the area of biodiversity education, awareness and training that will include examples from all orders of government, educational institutions, the private sector, and non-governmental organizations

ii. Training and Education

Biodiversity education and training are necessary to achieve the objectives of the Convention. Most of Canada's citizens support biodiversity conservation goals, but often are unaware of the activities they could undertake to achieve them. Farmers, loggers, miners and others often request information and training on how they can reduce impacts on the environment while continuing their economic activities. Therefore, training and education are key components of Canada's efforts to conserve biodiversity and use biological resources in a sustainable manner. Numerous government agencies, non-government organizations and private-sector interests are engaged in training and education. Quebec, for example, is promoting the creation of local biodiversity resource centres to provide easy access to biodiversity planning information for resource managers and local government.

Our experience with education and training indicates that it is often most effective to create forums in which all participants may exchange ideas and information. For example, an initiative called Prairie Care seeks to integrate agricultural practices with wildlife management and is one of the key programs under a major project called the North American Waterfowl Management Plan. Prairie farmers in Alberta, Saskatchewan and Manitoba receive advice, technical assistance and financial compensation from their province for modifying farming approaches to better benefit wildlife. The program engages farmers, wildlife biologists and other resource managers in a manner that enables them to better understand each others goals and needs. Rather than a one-way flow of information, this creates a situation where parties educate each other. Some specific activities of the program are:

- co-management of wetlands and uplands;
- deferred grazing systems to promote cattle and wildlife co-existence;
- delayed haying to provide wildlife habitat while maintaining agricultural production;
- conversion of crop lands to forage with delayed cutting programs;
- wetland conservation and restoration; and
- improving mechanisms to share information among farmers.

iii. Guides for Decision Makers

A key component of biodiversity training and education in Canada is the development of guides to aid decision makers. Resource managers, developers and landowners all make decisions that could have significant impacts on biodiversity. In Canada, we are beginning to see the development of training programs and guidelines for these front-line decision makers to help them understand how the decisions they make can have a significant impact on biodiversity. Guides targeted at managers and owners of biological resources help them understand the interrelationship of biodiversity and the decisions they make. Some work is underway, but more needs to be done.

The preparation of biodiversity guides and guidelines is challenging, because complex data and information must be presented in a manner that allows non-experts to use it. Guides and guidelines must present options, wherever possible, to ensure flexibility and

adaptability to different situations and needs. Ensuring that these training materials get into the hands of those that can best use them is also a challenging task.

Legislation and Incentives

i. Enhancing Economic Valuation of Biodiversity

In a world governed by short-term economics, we often risk losing plants, animals and habitats that have no obvious or current commercial value. Not only is it a challenge to assign value to individual lifeforms, it is even more challenging to assign value to the variety of lifeforms. It is only in the last few years that we have come to realize that a tree farm is not a forest and that monocultures run counter to natural evolutionary processes by dangerously narrowing the gene pool.

The economic valuation of the many goods and services that biodiversity provides to people is a fundamental requirement for sustainable development. Many of these goods and services, such as recreational opportunities, ecological functions and sources of gene pools, are public goods and, by their very nature, are not traded in the marketplace. Because of the general lack of economic data, these non-market goods tend to be undervalued or even ignored in decision making. Economic valuation is an attempt to correct for such market imperfections by assigning values to these goods and services.

A key challenge to achieving an integrated decision-making approach is to better understand the economic values of biodiversity. While we fully understand and appreciate that biodiversity has many non-monetary values, we believe that being able to better assign economic values to biodiversity will lead to improved decision making

In Canada, considerable research has been initiated in the area of economic valuation of biodiversity. We still have a considerable distance to go before we can truly say that natural capital is adequately reflected in the national accounts. This work is also important for land and resource decision-making and for the development of appropriately targeted and calibrated social and economic incentives.

Environment Canada is working closely with Statistics Canada, and 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 used to determine the socio-economic value Canadians place on ecosystems. This information contributes to program and policy applications in wildlife, biodiversity, water, wetlands, forests, parks, fisheries and tourism. The 1997 survey will be significantly expanded to address emerging needs for new information on the socio-economic significance of nature-related activities.

ii. Economic and Social Incentives

Incentives can play an important role in influencing land- and resource-use decisions, particularly in areas that have a high degree of private land ownership. Economic incentives, for example, can provide an effective means to ensure that landowners do

not unfairly bear the burden of conservation measures that benefit society as a whole. A variety of incentives, some financial and some not, are being implemented in Canada. Research and testing are required to determine what types are needed, and how they can be successfully employed.

Both governments and non-government organizations use incentives to achieve biodiversity goals in Canada. For example, conservation covenants and easements are legal instruments that have been adopted in several provinces to allow landowners to protect their land for conservation purposes. They are registered with the land title and are binding on successive owners.

In Prince Edward Island, a non-government conservation organization called the Island Nature Trust acts as a broker between landowners and the government. The Trust works with the landowner to develop a covenant specifying the natural features to be conserved. When agreement has been reached, the covenant is transferred to the provincial government.

Amendments to the Income Tax Act were adopted by Parliament on June 20, 1996, to facilitate the donation of ecologically-sensitive lands. To date, over 30 gifts of title, covenants, or easements related to properties identified as ecologically-sensitive lands have been made across Canada. Gifts have been made to incorporated municipalities and qualified non-government conservation organizations.

iii. Legislation

Experience in Canada has shown that legislation is an important component of an overall approach to conserve biodiversity and ensure the sustainable use of biological resources. Federal, provincial and territorial governments have enacted numerous acts and regulations that affect biodiversity, including:

- the Canada Wildlife Act and the provincial and territorial wildlife acts;
- the provincial endangered species acts;
- the National Parks Act and provincial parks, wilderness and ecological reserves acts;
- federal and provincial environmental protection acts;
- the Migratory Birds Convention Act;
- the Fisheries Act;
- the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act;
- the Oceans Act;
- the provincial forest acts; and
- the provincial land use planning acts.

All jurisdictions routinely review and revise their legislation as required. The main challenge is to provide legislation as part of an overall approach that employs a range of policy tools, including education and incentives. Some jurisdictions have found it necessary to pass very detailed and comprehensive legislation, for example for the

management of forests. Other jurisdictions have developed legislation that is less prescriptive and that functions more as a framework for decision making. Experience indicates that both approaches can work. Under the National Accord for the Protection of Species at Risk, federal, provincial and territorial ministers responsible for wildlife have committed to establishing complementary legislation and programs that provide for effective protection of species at risk throughout Canada.

iv. Environmental Assessment

Environmental assessment (EA) has been recognized as a key element in meeting the obligations of the Convention on Biological Diversity and the Canadian Biodiversity Strategy. Article 14 of the Convention recognizes EA as an important decision-making tool for ensuring the protection of biological diversity. In addition, EA provides a useful model for integrated ecological management.

Although EA processes in Canada already incorporate consideration of biodiversity impacts, *A Guide on Biodiversity and Environmental Assessment* was developed in 1996 by the Canadian Environmental Assessment Agency to highlight the importance of biodiversity conservation and to assist environmental assessment practitioners in assessing the impact of proposed projects on biodiversity. The objectives of the Guide are to:

- provide an overview of the legal responsibilities related to biodiversity conservation and sustainable use under the Convention and the Strategy;
- provide general guidance to EA practitioners in considering biodiversity conservation and sustainable use within current EA approaches; and
- emphasize what a good EA should include and that biodiversity conservation and sustainable use is a cornerstone of EA.

Environmental assessments are an essential component in determining the feasibility and design of many large-scale projects. Some jurisdictions also use environmental assessments to assess the impacts of new policies. For example, Quebec has worked toward the inter-sectoral harmonization of policies and regulations regarding EA. The main challenge, in assessing the impact of proposed projects on biodiversity, is to ensure that the best information is available for use in the assessment. Improving our biological inventory base and enhancing our ability to assign economic, social, cultural and ecological values to the components of biodiversity will greatly improve the quality of this information. Most importantly, improved understanding of the impacts of human activities on biodiversity will improve the effectiveness of environmental assessments as decision-making tools.

3.2 Integrating Biodiversity Considerations into Decision Making

i. Improving Integrated Land and Resource Use Management Practices

Another critical challenge is the design of integrated, participatory, decision-making models that translate strategies and polices into plans and action. Canada employs a

wide range of approaches to achieve integrated decision making, including *inter alia* land-use planning, integrated resource-management plans, environmental impact assessments, river-basin plans, national, provincial, territorial and local round tables and model forests.

Although we are beginning to see better and better examples of integrated land and watershed management and resource planning, we continue to witness decisions that favour short-term economic gain over longer-term ecological sustainability. Improving our integrated management ability will require a commitment to enhancing management capacity, especially at the local or bioregional level. Building capacity at a local level will require cooperation among all orders of government. Truly integrated decision making requires the establishment of mechanisms that provide opportunities for all interested parties to work together to integrate environmental, economic, social and cultural goals.

Local management will need to be supported by government agencies, research institutions, non-government organizations, private-sector interests and others. These groups must collaborate to: improve understanding of the impacts of human use on ecosystems; undertake multi-disciplinary or systems-based research to improve the integration of social, economic and environmental objectives; improve inventories; enhance monitoring and valuation of biodiversity; develop conflict resolution mechanisms; provide biodiversity training programs for resource managers; and evaluate progress.

The use of transparent and open decision-making processes is recognized to be important in Canada. These processes bring together not only environmental and economic issues, but also a range of social and cultural values. The most notable example of these processes is the use of round tables in which all members have equal authority and represent the full range of societal interests.

Canada is fortunate to have successfully developed a variety of models that integrate conservation, economic, social and cultural goals. The challenge we face is to find the resources to continue to develop and improve these models at the local level, as significant investments of human and financial resources are required.

Protected Areas Plans and Strategies

The establishment of protected areas is an important element of Canada's effort to conserve biodiversity. Protected areas contribute to the conservation of biodiversity, but they must be complemented by sound stewardship across the entire country, and close attention must be paid to the areas surrounding them. Just as the purposes of protected areas vary, so too do the levels of protection afforded them. In some human activities and access are strictly limited, while in others multiple land-use objectives are pursued. Some protected areas fulfill more than one purpose and are zoned for different levels of protection.

Many jurisdictions in Canada are using a landscape approach to protected areas. Federal, provincial, territorial, regional and urban governments and individuals and private organizations acquire and manage lands to conserve biodiversity. Within each

jurisdiction there are examples of efforts being made to ensure that ecologically-significant and sensitive areas are protected.

For more than 100 years, the federal government has been establishing and managing national parks, national wildlife areas and other kinds of protected areas. The legislative and policy basis for the establishment and management of protected areas is well established, and continues to evolve.

The federal report *Implementing the Canadian Biodiversity Strategy: Protected Areas* highlights federal plans for implementing eight of the CBS strategic directions related to the establishment and management of protected areas. With clearly-stated targets, the report describes the federal government's plans for fulfilling its commitment to complete the federal network of protected areas representative of Canada's land-based natural regions by the year 2000.

On November 25, 1992, the three councils of federal, provincial and territorial ministers of the environment, parks and wildlife signed the Statement of Commitment to Complete Canada's Network of Protected Areas. The ministers committed to:

- complete the national network of protected areas by the year 2000 and accelerate the protection of areas representative of Canada's marine natural regions;
- accelerate the identification and protection of Canada's critical wildlife habitat;
- adopt frameworks, strategies and time frames for the completion of the protected areas networks;
- continue to cooperate among jurisdictions and disciplines in the protection of ecosystems, landscapes and wildlife habitat; and
- ensure that protected areas are integrated into sustainable development strategies.

The Statement was, in large part, Canada's response to the report of the World Commission on the Environment.

There are many challenges to completing and managing networks of protected areas. There are scientific questions to be answered regarding the selection, size and design of the areas. In some cases, their establishment requires negotiation with parties that have interests in resources like minerals, oil or gas. Such negotiations can be difficult, especially when individuals and companies have made a significant investment in the area. It is also a major challenge to integrate protected areas with adjacent land uses to minimize conflicts both inside and outside the area. Despite these challenges, all jurisdictions in Canada are making progress toward completing their networks of protected areas.

ii. Integrating Biodiversity into Sectoral Policies, Plans and Programs

A key challenge for ensuring the conservation of Canada's biodiversity is to integrate conservation with resource use, especially within the sectors that depend on biological resources. In Canada, this means developing integrated policies and strategies, especially for our forested and agriculture lands and aquatic areas.

a. Forestry and Biodiversity

Given the importance of forests to Canadians and the diverse uses that take place in forested areas, integrated management practices are essential. Management decisions must be based on the best understanding of forest ecosystems and the implications of various forest uses. Some specific biodiversity issues in forestry are: fragmentation and habitat loss; forestry practices; living modified-organisms; wildlife species at risk; protected areas; conservation and exchange of forest genetic resources; atmospheric pollutants and climate change; and acceptable methods of valuing and measuring biodiversity.

The Canadian Council of Forest Ministers (CCFM), comprising the 13 federal, provincial and territorial ministers responsible for forests, is the primary mechanism for cooperation in national and international forestry matters. Following extensive consultations, the CFCM released a scientifically-based framework of criteria and indicators of sustainable forest management in October 1995. *Defining Sustainable Forest Management: A Canadian Approach to Criteria and Indicators* identifies six criteria and 83 indicators that express values held by Canadians, and their views on forests and their use.

Biodiversity in the Forest: The Canadian Forest Service Three-Year Action Plan to Implement the Canadian Biodiversity Strategy

In 1997, the federal government produced a three-year action plan to implement the commitments contained in the Canadian Biodiversity Strategy relating to the conservation and sustainable use of forest ecosystems. The action plan identifies actions already under way that contribute to fulfilling elements of the Strategy, as well as actions that will further contribute to the goals of the Convention on Biological Diversity. Specifically, the goals of the action plan are:

- to define and measure selected elements of forest biodiversity in terms of genes, species, ecosystems and landscapes;
- to further understanding of the impacts of forest management and other human and environmental pressures on the biodiversity of landscapes, ecosystems, species and genes; and
- to provide recommendations and advice on forest conservation strategies in Canada and internationally.

In 1992, Canada developed a national forest strategy entitled Sustainable Forests: A Canadian Commitment, which expresses a new vision for the future of Canadian forests. Biodiversity conservation and the sustainable use of biological resources are an important theme throughout the strategy, and action is taking place across the country to ensure that these aims are met. The strategy is currently being reviewed for a second five-year period. Some of the actions being undertaken under the strategy include:

- completion of an ecological classification of forest lands;

- increased basic and applied research on forest ecosystems and their response to human activities;
- forest management guidelines to maintain biodiversity;
- inclusion of measures for conserving biodiversity in management plans;
- inclusion of measurable objectives for the state of the forest ecosystem in forest management plans;
- evaluation of local soil, climate and wildlife conditions as part of planning for roads, harvesting and silviculture practices;
- national reporting on the state of forest biodiversity;
- building on working definitions of forest biodiversity and old-growth forests; and
- completion of a network of forest protected areas.

The 1997 final evaluation report on the National Forest Strategy identified the following four commitments as critical to its success:

- completion of an ecological classification of forest lands;
- completion of a network of protected areas representative of Canada's forests;
- establishing forest inventories that include information on a wide range of forest values; and
- developing a system of national indicators of sustainable forest management.

Many provinces have developed forest management plans, codes of practice and model forests in order to conserve forest biodiversity and adopt more sustainable forestry practices. In addition, provinces such as Quebec and British Columbia have conducted extensive scientific reviews of forest management practices in their provinces, and have subsequently identified areas that require action and made recommendations for a more ecosystem-based approach to forest management.

Conserving Biological Diversity in Canada's Forests: The Canadian Pulp and Paper Association

The Canadian pulp and paper industry has made a clear commitment to biodiversity conservation, an essential element of sustainable forest management. As part of this commitment, member companies of the Canadian Pulp and Paper Association (CPPA) have developed the CPPA Biodiversity Program. The objective of this program is to help industry become a leader and partner in biodiversity conservation and sustainable use. Companies are involved in more than 150 biodiversity activities in the areas of forest-species biology, wildlife population and habitat monitoring, water quality protection, and sustainable forest-practices development. More details on this initiative are included in the Annex to this report.

b. Agriculture and Biodiversity

Approximately 7% of Canada's land base is under some form of agricultural production. Farmers are increasingly aware that agriculture can benefit, in certain circumstances, from the maintenance and enhancement of populations of wild flora and fauna. From an ecosystem perspective, farmers are aware of the need to examine their farm as a

whole unit—combining areas where crops, livestock and “beneficial biodiversity” such as soil organisms, pollinators and predators are grown, with wild areas that contain other forms of biodiversity. Awareness of the value of biological resources is increasing, but more work needs to be done to understand and communicate that value. More programs are needed that offer incentives to preserve the older genetic varieties of agricultural crops and livestock, as well as programs that better demonstrate what farmers can do to positively affect and protect biodiversity on their land. Efforts underway include:

- Optimizing the use of agricultural lands by determining the most suitable crops for particular soil types and other conditions. This land optimization is not only an essential element of agriculture but is a way of contributing to the conservation of biodiversity by enhancing crop production without expanding the land base.

- Implementing new management approaches to conserve biodiversity and ensure the sustainable use of biological resources. For example, several environmental stewardship programs have been initiated to conserve wildlife habitat. Other programs aim to reduce environmental impacts from pesticide use or promote soil and water conservation. Research is being undertaken to develop new and improved conservation techniques and reduce pesticide use.

- Participating, as many farmers do on a volunteer basis, in projects and programs that: protect wetlands for waterfowl; manage grazing systems to protect wildlife habitat during crucial parts of its life cycle; protect riparian areas and, therefore, fish habitat; and encourage the development and maintenance of shelter belts and hedgerows, including planting shrubs that have fruit of interest to wildlife. Farmers are also involved in projects aimed specifically at species protection and retaining older genetic varieties.

- Continuing federal-provincial agreements on environmentally-sustainable agriculture that help producers design and implement activities focused on issues such as water quality, waste management and soil conservation. Farmers are forming rural conservation clubs and developing environmental farm plans in Ontario, Atlantic Canada and Quebec. In Manitoba, Saskatchewan and Alberta, the farmer-owned Wheat Pool has developed guides to assist farmers in preparing environmental farm plans and addressing specific issues and risks.

Agriculture and Agri-Food Canada Biodiversity Action Plan

The department of Agriculture and Agri-Food Canada (AAFC) has long recognized the need to conserve biodiversity and has initiated, with other federal departments, provinces and producers, a number of programs aimed at conserving biodiversity. The AAFC Biodiversity Action Plan was developed subsequent to the Canadian Biodiversity Strategy, and sets a course for the implementation of many of the goals of the Strategy. The four main goals of the action plan are to:

- promote sustainability in agro-ecosystems while respecting natural ecosystems;
- increase awareness and understanding of biodiversity in agriculture;

- conserve and facilitate access to genetic resources that are important to agriculture, and share knowledge, expertise and technologies in a fair and equitable way; and
- integrate biodiversity conservation objectives into departmental policies, programs, strategies, regulations and operations.

Agriculture in Harmony with Nature: Strategy for Environmentally-Sustainable Agriculture and Agri-Food Development in Canada

This strategy provides a scan of production trends and environmental issues, including the effects of agriculture on biodiversity. Agriculture depends on biological resources to ensure a diverse genetic base for crop and livestock development, maintain soil health and control pests. However, some wild flora and fauna, such as pest species, compete for the same resource lands and cause economic damage to crops and livestock. Agriculture has adversely affected biodiversity at the species and ecosystem level through the restructuring of landscapes and the use of chemicals, yet it contributes to the preservation of biodiversity through practices such as conservation tillage, planting shelter belts, and maintaining farm wood lots and range lands. The strategy seeks, among other things, to:

- enhance water quality and conserve water resources in agricultural landscapes and adjacent areas;
- conserve and enhance the health and productivity of agricultural land and soil;
- conserve biological diversity used and affected by agriculture at the genetic, species and ecosystems levels; and
- contribute to the stabilization of greenhouse-gas emissions and minimize the emissions of ozone-depleting substances.

Agricultural Biodiversity Initiatives

This report is an inventory that illustrates how Canadian agricultural producers are active participants in the maintenance and enhancement of biodiversity. Grasslands are being managed to maximize both wildlife habitat and forage production, riparian and wood lot habitats are being enhanced, and the impacts of agricultural activities on water resources are being actively mitigated. Producers are planning for the future of their communities by participating in numerous research projects and by implementing environmental farm plans. Endangered wildlife species, such as the burrowing owl and swift fox, are being assisted through reintroductions being carried out on private agricultural lands. Producer motivation varies depending upon the program and the individual, however an interest in conservation and environmental stewardship is reflected in the number and diversity of activities documented in the report.

c. Fisheries Management and Aquatic Biodiversity

Canada is a coastal state with sovereign interests in three bordering oceans. Approximately 6.5 million Canadians (23% of the population) live in coastal communities. In Canada, the federal government has authority over oceans and marine biological resources. Provincial and territorial governments have jurisdiction over shorelines, some marine areas and most land-based activities. Aboriginal people are

gaining greater control over specific resource management concerns in some regions. Canadian governments have begun to pursue ocean-related policies that reflect an ecosystem approach, incorporating principles of sustainable use and integrated management. These principles are embodied in the new Canada Oceans Act (COA), which received royal assent in December 1996.

Key to the COA is the development of an Oceans Management Strategy (OMS). Based on the principles of sustainable development, the integrated management of activities in estuaries, coastal and marine waters, and the precautionary approach, the OMS will set the stage for many oceans activities. The OMS also calls for the creation of marine protected areas. Canada is currently developing a national framework and policy statement for the management of marine protected areas, following which pilot projects will be initiated.

In response to declining fish stocks around the world, the result of ineffective and non-sustainable fisheries management practices, the federal government and the fisheries industry have drafted principles and guidelines for the Canadian Code of Conduct for Responsible Fishing Operations. The Code is targeted at giving greater responsibility to fishers for the conservation of the fisheries resources.

Canada is developing a National Program of Action for the Protection of the Marine Environment from Land Based Sources of Marine Pollution, to be completed by 1998. Focusing on regional implementation, it will be developed and implemented as a partnership among federal, provincial and territorial governments in consultation with a wide range of Canadian interests.

Canada is also collaborating with arctic nations to develop an Arctic Regional Program of Action under the auspices of the Arctic Environmental Protection Strategy and the Arctic Council. The federal government has taken legislative and policy steps to address marine pollution in the Fisheries Act, the Toxic Substances Management Policy and the Canadian Environmental Protection Act.

The conservation and sustainable utilization of fisheries resources remains a primary focus of ocean-related activities in Canada. The federal government is pursuing a strategy to advance industry restructuring and introduce changes to fisheries policies and management practices domestically and internationally. With the objective of an economically- and environmentally-sustainable fishing sector, Canada is guided by the following principles: conservation comes first; aboriginal rights must be respected; industry capacity must be balanced with sustainable carrying-capacity; and government and industry must move toward operating in partnership. In addition, the federal government has recently made changes to the Canada Shipping Act in order to improve Canada's ability to address marine pollution. The Act provides an important framework for marine oil pollution prevention, preparedness, response and enforcement in Canada.

Canada’s rich endowment of freshwater ecosystems account for almost 9% of the world’s freshwater runoff. Although relatively limited in freshwater biodiversity at the species level, Canada’s freshwater biodiversity is comparatively rich at the genetic

level, which provides these species with the capacity to adapt to environmental change. Freshwater biodiversity is particularly vulnerable to habitat destruction and the invasion of exotic species. During the last century, the building of canals and damming, diverting and channeling of many of Canada's great waterways has drastically altered the migration routes and habitats of species and populations dependent on these rivers, lakes and associated wetlands. We have also created many new pathways for the inter-basin transfer of invasive alien species. Given that many of Canada's watersheds are easily diverted, this country now has more inter-basin transfer of water, primarily to produce hydroelectricity. At the same time that we have been dramatically altering our freshwater ecosystems, we have seen a gradual diminishing in our capacity to monitor and assess what is actually happening to these freshwater basin ecosystems.

The Canada Water Act has, for the past quarter century, provided a legislative framework and financial resources for promoting integrated watershed management. The Act typically enabled the federal and provincial governments to negotiate basin studies, which they would then jointly fund. The Federal Water Policy outlines the federal government's objectives for freshwater management in Canada. The current federal objectives are to protect and enhance the quality of freshwater resources and to promote their wise and efficient management and use.

An estimated 24% of global wetlands are found in Canada. The Federal Policy on Wetland Conservation articulates strategies for the sustainable use and management of wetlands on federal lands. The policy commits the federal government to "no net loss of wetland functions", mitigation of the impacts of federal actions on wetlands, co-operation with non-government organizations, native groups and the public, and the development of a sound science base and research for wetland management. Many provinces have also developed policies and programs for the conservation and protection of wetlands.

Initiatives such as the Great Lakes, Fraser River, St. Lawrence and Atlantic coastal action plans, the Arctic Environmental Strategy, Northern River Basins Study and the North American Waterfowl Management Plan demonstrate how federal, provincial and territorial governments work together with communities and non-governmental organizations on large ecosystem watershed-management plans.

Since much of Canada's population is concentrated along its southern border, the management of boundary and transboundary waters has been a major preoccupation throughout Canada's history. This gave rise to the Boundary Waters Treaty and the International Joint Commission established under the Treaty. Together they provide a framework for joint fact-finding, dispute resolution and collaboration with the United States of America. They have also resulted in many innovative arrangements, the most ambitious being the Great Lakes Water Quality Agreement.

d. Mining and Biodiversity

Mining activities in Canada involve many land use decisions that have an impact on habitat conservation and environmental quality. However, the mining industry is also undertaking many activities to minimize its impact on diversity. These include: recycling

minerals and metals; adopting a life-cycle approach to managing the use of minerals and metals; decommissioning and reclaiming land after mines closures; and conducting land-use plans that mitigate harmful effects on biodiversity at the genetic, species and ecosystem levels based on comprehensive environmental assessments of proposed mining projects. Recent efforts have been made by the sector to incorporate biodiversity considerations into mining plans and activities, most notably the Whitehorse Mining Initiative (WMI).

The WMI Leadership Council Accord, signed by government, mining, aboriginal, labour and environmental organizations, has as one of its principles that environmentally-responsible mining exploration, development, operations and public policies are predicated on maintaining a healthy environment and, on closure, returning the mine sites and affected areas to viable, and, wherever practicable, self-sustaining ecosystems compatible with a healthy environment and human activities.

The federal government developed a sustainable development policy for the Canadian minerals and metals sector in 1996 entitled the Minerals and Metals Policy of the Government of Canada: Partnerships for Sustainable Development. The policy incorporates many of the principles of the WMI Accord and supports the protection of certain marine and terrestrial areas from development as essential contributions to Canada's environmental health, diversity and ecological processes.

e. In Situ *Conservation and Management of Wildlife*

A sound ecological management approach requires the maintenance of wild and native flora and fauna and other wild organisms in their functioning ecosystems, landscapes and waterscapes. Results of conservation biology research indicate that the key to conserving species is to maintain viable populations across their natural geographic range. In Canada, numerous conservation and wildlife management strategies, policies and programs have been initiated. These include management strategies for game species, habitat conservation and restoration programs, and efforts to conserve and enhance populations of threatened and endangered species.

Numerous programs are being implemented to maintain or restore populations of wild flora and fauna and other wild organisms. These include programs to manage species or populations that are harvested for commercial, subsistence and recreation programs, as well as those that are not used for consumptive purposes. Many of these programs have been very successful in ensuring the sustainable use of biological resources. Efforts are underway to create a safety net for those species rendered vulnerable to extinction as a result of non-sustainable land- and resource-use decisions.

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. The three objectives of the policy are to: maintain and restore ecological processes; maintain and restore biodiversity; and ensure that all uses of wildlife are sustainable. Federal, provincial and territorial governments have recently agreed to review and update the policy.

The federal report, *Conserving Wildlife Diversity: Implementing the Canadian Biodiversity Strategy,* highlights contributions made mainly by Environment Canada to implement the key wildlife provisions in the Strategy. However, the report also recognizes valuable contributions to this goal made by other federal departments, museums and the public conservation community, particularly for species and habitats at risk. Canada's conservation achievements to date have been significant. Our current wildlife management programs continue to sustain many species of wildlife, yet much remains to be done. The cooperative efforts of all orders of government, institutions and the private and public sectors can have a positive impact on conserving wildlife and habitat diversity across Canada's landscape.

National Accord for the Protection of Species at Risk

In October 1996, all federal, provincial and territorial wildlife ministers agreed in principle to a National Accord for the Protection of Species at Risk. The Accord commits all parties to provide complementary legislation and programs that will effectively protect species at risk throughout Canada. Under the terms of the Accord, the two orders of government are cooperating to ensure that complementary legislation and programs are in place to give endangered species across Canada the level of protection they need. In October 1997, the ministers met again to re-confirm their commitment to the protection of species at risk and develop a national strategy by spring 1998 in order to implement the Accord.

Endangered Species Legislation

Many provinces, including Manitoba, Saskatchewan, Ontario, New Brunswick and Quebec, have legislation in place that provides for the identification and protection of endangered species.

The federal government is currently re-examining the proposed Canada Endangered Species Protection Act*,* intended to provide for the early identification, protection, and recovery of species at risk. The Act, which will apply to migratory birds, fish and marine mammals, species that range across international boundaries and all species on federal lands, will provide for broad partnerships in species protection and recovery.

Designation and Recovery of Species at Risk

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is a body of government, non-government and academic experts that designates species at risk as extinct, extirpated, endangered, threatened or vulnerable. The Recovery of Nationally Endangered Wildlife (RENEW) strategy was established by the Wildlife Minister's Council of Canada in 1988 as a cooperative response to the growing number of endangered species in Canada. The RENEW Committee consists of government (federal, provincial and territorial) and non-government members whose mandate is to focus on the recovery of extirpated, threatened and endangered species. To date, RENEW has focused its attention on terrestrial vertebrates. New ways of dealing with species recovery are being tested, such as multi-species and ecosystem recovery. As part of the endeavor to develop a national strategy to implement the National Accord for

the Protection of Species at Risk, the roles and mandate of COSEWIC and RENEW are currently under review.

Rehabilitation and restoration actions often involve many partners and require significant local community involvement. The Atlantic Coastal Action Plan (ACAP) is an example of one of the many community-based projects that have been successfully launched in Canada. The Plan's mission is to serve and assist communities in defining their common environmental objectives and in developing plans and strategies to achieve those objectives. Its vision is to secure a diversity of prosperous, vibrant, and healthy Atlantic coastal communities for present and future generations.

ACAP has been referred to as an environmental management initiative, a sustainable development initiative, and an integrated coastal-zone management initiative. Yet, to many community stakeholders, ACAP is seen as a sustainable, economic prosperity initiative. The restoration of shellfish and sport fisheries, the retention of topsoil, and the responsible pursuit of aquaculture and eco-tourism opportunities are the concerns driving most stakeholders.

f. Ex Situ *Conservation: Part of Canada's Approach to Achieving the Objectives of the Convention*

Ex situ conservation plays a valuable role in Canada in supporting biodiversity conservation efforts and efforts to achieve the sustainable use of biological resources. Zoos, aquariums, botanical gardens and other types of *ex situ* facilities are playing critical roles in the conservation and recovery of threatened and endangered species. The Metro Toronto Zoo, for example, is engaged in captive breeding programs to support the recovery of the black-footed ferret and the Puerto Rican toad. In addition, threatened and endangered species native to Canada are being bred in captivity at Canadian zoos for re-introduction into the wild. This includes species such as the whooping crane and swift fox, which are in captive breeding programs at the Calgary Zoo. Peregrine falcons have been brought back from the brink of extinction largely as the result of captive breeding programs. Since 1976, over 1200 birds have been successfully raised in captivity and released into the wild. Most of these birds were born and raised at a specially-designed facility operated by Environment Canada.

The Canadian Botanical Conservation Network (CBCN) is currently researching the role to be played by botanical gardens in the implementation of the Convention. Of particular note is the invitation of the Royal Botanical Gardens in Hamilton, Ontario, by the Royal Botanic Gardens in Kew, the United Kingdom, to represent Canada in an international program to harmonize the practices and policies of botanical gardens with the access- and benefit-sharing provisions of the Convention.

The role of *ex situ* conservation is often not fully appreciated as an integral part of achieving the sustainable use of biological resources in some sectors. *Ex situ* conservation in Canada's agriculture sector plays a critical role in providing continued access to viable seed stocks and cell lines that would otherwise be lost. Efforts are underway inside and outside government to preserve rare breeds of domesticated plants and animals. There is growing recognition that these genetic resources should be maintained for possible future use.

The federal government's Plant Genetic Resources Network preserves over 100 000 samples of plant and genetic resources for food and agriculture. Agriculture and Agri-Food Canada (AAFC) maintains the main Seed Genebank and the Clonal Genebank (trees and small fruits). The mandate of the Network is to protect, preserve and enhance the genetic diversity of plants of economic importance by acquiring, evaluating, researching, documenting and distributing samples of plant genetic resources for food and agriculture. Fundamental genetic building blocks are thereby provided for crop variety development and plant genetic studies both nationally and internationally.

The AAFC also maintains the Canadian Collection of Fungal Cultures, which is the largest living collection of fungal isolates (over 10 000 strains) in Canada. Emphasis is on Canadian sources, culturable plant pathogens, wood decay species, biocontrol agents, food and feed spillage species, and native saprophytic species.

Ex situ conservation efforts also contribute to achieving the sustainable use of biological resources within Canada's fishery and forestry sectors. *Ex situ* hatched fish are released into lakes to support recreational and commercial fishing. Seeds are being collected and stored at gene banks to conserve and study the genetic diversity of Canada's trees.

Ex situ facilities not only play a valuable role in conserving species and genetic resources, they provide valuable opportunities to conduct research and promote public understanding and awareness of biodiversity issues.

3.3 Charting our Progress

i. Monitoring Trends and Measuring Performance

Achieving agreement across society on desired environmental goals and measuring performance is a difficult task. It is often extremely difficult to set specific biodiversity performance targets and implement monitoring programs for broad goals such as the conservation of biodiversity and the sustainable use of biological resources. Despite the many challenges, several government agencies, research institutions, private-sector interests, and conservation organizations are attempting to establish biodiversity performance measures and cost-effective monitoring programs.

Federal and provincial governments have begun to work with program audit and evaluation specialists to help better define and measure management results. The Office of the Commissioner for the Environment and Sustainable Development has also initiated the first phase of an audit of the implementation of Canada's Biodiversity Strategy. Work on biodiversity indicators and monitoring and assessment is being advanced, and is coordinated by the Ecological Monitoring and Assessment Program within Environment Canada.

In 1996, the Canadian Standards Association finalized national forest certification standards for sustainable forest management. The standards will assist forest companies in setting goals and achieving measurable outcomes, including those related to the conservation of biodiversity. Independent auditors will be used to evaluate performance.

Several jurisdictions in Canada are establishing performance indicators as part of their efforts to report on the state of the environment. Collaboration among many agencies and organizations is necessary within countries, as well as beyond national boundaries, to implement effective monitoring programs. Cooperation is also necessary to develop agreements on what should be measured, how progress will be evaluated, and who will carry out the evaluation.

Non-government organizations such as the Sierra Club of Canada and the World Wildlife Fund also release periodic reports on Canada's performance in meeting key commitments. The Sierra Club's annual Rio Report Card assigns grades to provinces, territories and the federal government in meeting commitments under the Convention on Biological Diversity. The World Wildlife Fund reports annually on federal, provincial and territorial performance with respect to meeting protected areas goals.

4. INTERNATIONAL COOPERATION—SHARING OUR EXPERIENCE

Canada is strongly committed to finding lasting international solutions to the global loss of biodiversity. It is cooperating with developing countries on a broad range of activities aimed at developing their capacity to conserve biodiversity and use biological resources in a sustainable manner. Through contributions to the Global Environment Facility, Canada has provided new and additional funding to address global environmental concerns, including biodiversity loss. Canada's Official Development Assistance programs provide resources and technical assistance to support sustainable development in developing countries, including projects and programs designed to help these countries reap long-term benefits from the sustainable use of their biological resources. Other Canadian governments and non-government organizations also carry out valuable work in developing countries that support the objectives of the Convention.

Since 1992, Canada has supported more than 30 specific projects designed to achieve the objectives of the Convention. For example, in Costa Rica, Canada supports a conservation project to preserve the diverse natural resources of the Arenal region, which contains 36% of the country's biodiversity. In Africa, Canada is involved in a project to conserve the biodiversity of Lake Malawi, one of the planet's largest freshwater bodies and home to a large variety of fish. In the South Pacific, Canada supports a project for the protection and survival of sea turtles, six of the seven species of which live in the region.

Canada is also working to help other nations meet their sustainable agriculture objectives. Through the International Development and Research Centre (IDRC), Canada supports research on food systems in regions where problems of food insecurity, poverty and environmental degradation are most urgent. Through the IDRC's

Sustainable Use of Biodiversity program, the capacity of local and indigenous peoples to protect, access and sustainably use biodiversity and knowledge of biodiversity is enhanced. In addition, the Canadian International Development Agency supports projects that promote environmentally-sound farming practices and rural economic diversification in developing countries.

Since Canada committed at UNCED to provide initial funding to expand an international network of model forests, interest in the concept continues to grow. More than 25 countries are considering joining the network. Canada also participates in various exercises related to criteria and indicators for the sustainable management of boreal and temperate forests, particularly those outside Europe.

Since UNCED, Canada has taken part in a series of global negotiations that devote particular attention to the needs and capacities of developing countries. For example, Canada has helped fund both the process and the involvement of developing states in negotiating and implementing the Convention to Combat Desertification.

Canada has also supported the Convention on Biological Diversity by co-sponsoring workshops and symposia in Costa Rica, Chile and Côte d'Ivoire; participating in and hosting meetings of the UNEP Expert Panels; and playing an active role in the three meetings of the Conference of the Parties to the Convention and meetings of the Subsidiary Body on Scientific, Technical and Technological Advice. At the first two meetings of COP in the Bahamas and Indonesia, Canada co-hosted a Biodiversity Technology Fair. Through the Commission for Environmental Cooperation, Canada has entered into cooperative biodiversity programs with NAFTA partners, and the Canadian Museum of Nature is assisting other countries in producing biodiversity country studies. Canada is also collaborating on an OECD project to develop biodiversity indicators and, with the Convention Secretariat, on the creation of an international clearing-house mechanism for the exchange of scientific and technical information. Canada is an active participant and supporter of the IUCN through its chairmanship of the Species Survival Commission and its hosting of the World Conservation Congress in 1996, the largest international environmental gathering since Rio.

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INTERNET SITES OF INTEREST

Federal Government Departments

Agriculture and Agri-Food Canada
http://www.agr.ca/

Natural Resources Canada
http://www.nrcan.gc.ca/

Canadian Heritage
http://www.pch.gc.ca/

Canadian International Development Agency
http://www.acdi-cida.gc.ca/

Department of Fisheries and Oceans
http://www.dfo-mpo.gc.ca/

Environment Canada
http://www.ec.gc.ca/

CHM: Canada's Biodiversity Clearing House Mechanism
http://www.achilles.net/%7Erfi/pages/index2.html

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

CBIN: Canadian Biodiversity Information Network
http://199.212.18.79/Biodiversity/

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

National Round Table on the Environment and the Economy
http://www.nrtee-trnee.ca/

Canadian Museum of Nature
http://www.nature.ca/

Canadian Geospatial Data Infrastructure
http://cgdi.gc.ca/

Provincial Departments

British Columbia Ministry of Environment, Lands and Parks
http://www.env.gov.bc.ca/

British Columbia Ministry of Forests
http://www.for.gov.bc.ca/

Alberta Department of Environmental Protection
http://www.gov.ab.ca/dept/env.htm

Alberta Department of Agriculture, Food and Rural Development
http://www.gov.ab.ca/dept/agric.htm

Saskatchewan Department of Agriculture and Food
http://www.gov.sk.ca/govt/agfood/

Saskatchewan Department of Environment and Resource Management
http://www.gov.sk.ca/govt/environ/

Manitoba Department of Agriculture
http://www.gov.mb.ca/agriculture/

Manitoba Department of Environment
http://www.gov.mb.ca/environ/

Manitoba Department of Natural Resources
http://www.gov.mb.ca/natres/

Ontario Ministry of Agriculture, Food and Rural Affairs
http://www.gov.on.ca/OMAFRA/

Ontario Ministry of Environment
http://www.ene.gov.on.ca/

Ontario Ministry of Natural Resources
http://www.mnr.gov.on.ca/MNR/

Quebec: Le ministère de l'Agriculture , des Pêcheries et de l'Alimentation
http://www.agr.gouv.qc.ca/

Quebec: Department de l’Environnement et de la Faune
http://www.mef.gouv.qc.ca/

Quebec: Department des Ressources naturelles
http://www.mrn.gouv.qc.ca/

New Brunswick Department of Agriculture and Rural Development

http://www.gov.nb.ca/agricult/

New Brunswick Department of Environment
http://www.gov.nb.ca/environm/

New Brunswick Department of Fisheries and Aquaculture
http://www.gov.nb.ca/dfa/

New Brunswick Department of Natural Resources and Energy
http://www.gov.nb.ca/dnre/

Nova Scotia Department of Environment
http://www.gov.ns.ca/envi/

Nova Scotia Department of Natural Resources
http://www.gov.ns.ca/natr/

Nova Scotia Department of Fisheries
http://www.gov.ns.ca/fish/

Prince Edward Island Department of Agriculture and Forestry
http://www.gov.pe.ca/af/

Prince Edward Island Department of Fisheries and Environment
http://www.gov.pe.ca/fe/

Newfoundland Department of Environment and Labour
http://www.gov.nf.ca/env/

Newfoundland Department of Fisheries and Aquaculture
http://www.gov.nf.ca/fishaq/

Newfoundland Department of Forest Resources and Agrifoods
http://www.gov.nf.ca/forest/

Non-Government

Canadian Pulp and Paper Association
http://www.open.doors.cppa.ca/

Canadian Botanical Conservation Network
http://www.rbg.ca/cbcn
International Development Research Centre
http://www.idrc.ca/

Sierra Club of Canada
http://www.sierraclub.ca/

CARING FOR CANADA'S BIODIVERSITY

Annex to Canada's First National Report to the Conference of the Parties to the Convention on Biological Diversity

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INVENTORY OF INITIATIVES:

Integrating Biodiversity into Sectoral and Cross-Sectoral Decision Making

TABLE OF CONTENTS

Purpose

This Annex is the companion document to Caring for Canada's Biodiversity: *Canada's First National Report to the Conference of the Parties to the Convention on Biological Diversity*. This document contains a wide inventory of initiatives which together illustrate the degree to which biodiversity conservation and sustainable use is being incorporated into policies, plans and programs at the local, regional and national levels. This inventory is not meant to be comprehensive, but rather illustrative. For cross-referencing purposes, examples are generally grouped according to the categories used in the body of the National Report. As such, they add substance and detail to the issues and points raised in the body of that report.

A. State of the Environment Reporting

Monitoring and Reporting on the State of Canada's Environment

National environmental reporting in Canada began several decades ago, and Canada's first national report was released in 1986. The ecosystem approach to organizing information is translated into a less technical presentation, built on providing answers to five basic questions:

- *What is happening in Canada's environment? (environmental conditions and trends)*
- *Why is it happening? (link to human activities)*
- *Why is it significant? (environmental, social, and economic consequences)*
- *What are Canadians doing about it? (management responses to environmental change)*
- *Is this sustainable? (are human actions depleting environmental capital?)*

A series of smaller reports focusing on specific sectors or ecosystems have also been produced. These include the State of Forests, State of the Oceans, State of the Great Lakes, the Northern River Basins Study and the State of the Parks Report. As well, Environment Canada's Environmental Assessment and Monitoring team produce regular State of the Environment Fact Sheets which are succinct reports on selected issues, such as Bringing the Bald Eagle Back to Lake Erie.

Canada Country Study: A Window on Climate Change in Canada (1997)

Environment Canada has produced the first-ever national assessment of the environmental, social, and economic impact of climate change in Canada. The country study includes two national summary reports, the National Summary for Policy Makers and Highlights for Canadians. The two reports identify gaps in scientific knowledge and recommend plans of action to improve our knowledge base.

The Study results identify what we currently know of possible impacts as a consequence of projected changes in climate and what we currently know of adaptive responses. The identified impacts should not be seen as predictions but, rather, as indications of sensitivities and vulnerabilities associated with the projected change in climate. The diversity of these impacts and viable adaptation options, in addition to reflecting projected change in climate, reflect the geographic breadth and the environmental, economic and social diversity of Canada.

State of the Parks Report

In 1997, the federal Department of Canadian Heritage prepared Canada's third State of the Parks Report to report on the state of the country's national parks and national historic sites. The report presented a methodology for measuring the ecological integrity of the national parks, and the results of the first, limited application of this methodology. Using this methodology in subsequent reports will allow the Canadian government to identify, monitor and evaluate trends in the ecological integrity of the national parks.

The State of the Canada's Forests, Learning from History 1967 - 1997

This report is the seventh report on the state of Canada's forests. These reports provide current information on the condition of Canada's forests and discuss a range of important forest-related issues.

Canada is moving rapidly into a new era in managing its forest heritage. Today, all orders of government are pursuing various initiatives with the forest community, which includes forest companies, Aboriginal peoples

and-conservation organizations, to measure our progress toward sustainable forest management: provincial forest legislation has been strengthened, codes of practice have been developed, and more forested areas are being protected.

State of the Great Lakes Report (1995)

This report summarizes the state of the Great Lakes as observed at the end of 1994 by the United States and Canada as Parties to the Great Lakes Water Quality Agreement.

The Laurentian Great Lakes basin is rich in biological resources. The Great Lakes contain one-fifth of all the fresh surface water on Earth. The basin is blessed with extensive forests and wilderness areas, rich agricultural land, hundreds of tributaries and thousands of smaller lakes, extensive mineral deposits, and abundant and diverse wildlife. There are 28 cities with populations of more than 50,000 in the region, and some 33.2 million people call it home. The basin remains one of North America's major industrial and agricultural regions and supports growing tourism.

However, the balance of the Great Lakes basin ecosystem is under tremendous stress from human activities. Vast improvements have been made over the last 25 years in controlling toxic contaminants, although much remains to be done. In contrast, although some progress is being made in protecting and restoring habitat, continuing losses far exceed gains. In the case of biological diversity, because each loss of genetic diversity is permanent, all losses are additive. The challenge facing Great Lakes rehabilitation, is to minimize or eliminate the loss of native species and to protect the genetic variation within those species. The goal for habitat is that preservation of habitat essential to high priority ecosystems will accelerate together with restoration successes.

Northern River Basins Study

This study was conducted by the federal government and the governments of Alberta and the Northwest Territories over four and a half years in order to examine the relationship between development and the Peace, Athabaska and Slave river basins. Areas of research included:

- *distribution and concentration of pulp-mill related and other contaminants in water, sediment and selected biota;*
- *fish distribution, abundance, movement and contaminant levels;*
- *food chain analysis;*
- *hydrologic data, especially under ice-flow patterns and sediment transport and disposition;*
- *potential linkages between nutrient loading, plant growth and oxygen levels, especially under low-flow and ice-covered conditions;*
- *drinking water quality, taste and odour;*
- *oxygen requirements of various fish species; and*
- *development and validation of various hydrologic, contaminant and oxygen models.*

Findings from this study will be used to direct and inform future development and environmental protection or conservation decisions in the basins.

Overview of Canadian Marine Fisheries Resources: Stock Status Reports

Stock status reporting covers all or most species subject to fishing and will be expanded to cover ecosystem issues. These status reports provide an essential scientific assessment of the decline in abundance and catch of marine fisheries resources in the Northwest Atlantic, Arctic and Northwest Pacific due to a variety of effects, including environmental variations, fishing pressure and predation. These assessments are key for making sustainable use decisions that affect marine biodiversity. The Canadian Stock Assessment Secretariat is currently organizing zonal and national workshops on the emerging ecosystems issues in stock assessments. Stock assessments now involve multi-disciplinary reviews encompassing an ecosystem approach.

Biodiversity in British Columbia: Our Changing Environment

This report identifies the large scale changes in biodiversity in British Columbia and emerging threats to it. The report also provides a discussion of the current state of biodiversity, primarily at the species and ecosystem levels, and the biophysical processes affecting its future.

Biodiversity of Freshwater Mussels in the Lower Great Lakes Drainage Basin

This project addressed the precarious conservation status of this group of aquatic organisms in Canada. The project generated a computerized GIS-linked database on the historical distributions (1860 - 1996) of freshwater mussels in the study area, using over 400 collection records obtained from numerous sources and examined together for the first time. The data revealed a pattern of species losses and changing community composition throughout the basin, and identified candidate species of mussels to be considered for national status designation by the Committee on the Status of Endangered Wildlife of Canada (COSEWIC).

Current Trends Along the Lower Fraser Valley

This report is based on four years of scientific studies conducted by the federal government and the University of British Columbia's Institute for Resources and the Environment. The report focuses on how population growth and development in the Lower Fraser Valley is degrading water quality and stream health within three watersheds. The Brunette River watershed is mainly urban, the Salmon River watershed is an urban-rural mix ad the Sumas River watershed is the heart of the most productive agricultural areas in B.C. The report demonstrates how individuals can take action to reduce human impacts on the environment, including changes in lifestyles and land-use practices.

National Urban Land Information Base

This project is a the result of a partnership between Statistics Canada and Environment Canada. The information base uses digital satellite imagery to measures changes in rural-to-urban land use, land cover (for example woodlots and grassland) and urban green space in Canadian cities. To date, information is available for 13 of Canada's largest urban areas over the 1986 - 1991 period, and links with earlier land-use change data. The next step of the project is to gather data on more urban centres and move to a continuous five-year cycle of reporting.

B. Monitoring our Performance

Commissioner of the Environment and Sustainable Development

The Commissioner of the Environment and Sustainable Development is a new position established in order to encourage stronger performance by the federal government in the areas of environment and sustainable development. A key role of the Commissioner is to monitor and evaluate the integration of cross-cutting issues, like biodiversity, into federal sustainable development strategies and their implementation.

The Ecological Monitoring and Assessment Network (EMAN)

The Ecological Monitoring and Assessment Network (EMAN) is comprised of approximately 100 research and monitoring sites in Canada and is organized into 14 terrestrial Ecological Science Cooperatives. EMAN provides:

- *a national perspective on how Canadian ecosystems are being affected;*
- *scientifically defensible rationales for control and management activities;*
- *an evaluation of the effectiveness of control programs;*
- *and identifies new environmental issues as they emerge.*

EMAN has partnerships at all government orders, with all levels of the educational communities and with industry and the non-governmental organizations. The work of EMAN, and its monitoring and assessment functions play an important role in understanding biodiversity change and assessing the impact of policies and programs on biodiversity as well as their effectiveness.

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.

OECD Environmental Performance Review: Canada

Released in November 1995, it noted that: the renewal of Canada's forests is secure as a result of policies that

have been in place for some time; private companies have made substantial progress in reducing pollution; and public participation in decision making is remarkable. The report also urged the continued development of alternative silviculture methods and the expansion of scientific knowledge of the biodiversity of Canada's forests.

Sierra Club of Canada Rio Report Card

The Sierra Club of Canada launched the Rio Watch project immediately after the Earth Summit in June 1992. The goal of the Report Card is to actively track and report on progress by governments. The Report Card has become a useful tool to identify barriers to progress such as budget constraints, a neo-conservative political agenda at a global level, trade liberalization and fluctuating levels of political will and of media coverage. The Report Card has also become useful for public education.

C. Improving Data Management

Environmental Valuation Reference Inventory (EVRI)

The EVRI is a storehouse of valuation studies that is capable of matching current policy requirements with previous studies. A well-defined protocol is embedded within the EVRI to facilitate access to those studies that best address current needs. The EVRI contains 5 main categories of information with over 30 fields.

Conservation Data Centres and Natural Heritage Information Centres

Many provinces have established Conservation Data Centres, such as British Columbia, Saskatchewan and Manitoba. The Centres are established through partnerships between the province and conservation organizations. The Centres gather and distribute information on local animals, plants and plant communities. Each of these is assigned a conservation status rank based on rarity and endangerment in an effort to better understand each province's biodiversity of and the impacts of human activity.

Many provinces have also established Natural Heritage Information Centres, such as Alberta, Ontario and Quebec. Again, these Centres are cooperative projects involving federal and provincial governments and conservation organizations, primarily the Nature Conservancy. The Centres provide a computer database for elements of the provinces' biodiversity and are invaluable for the proper management of species at risk, identifying and assessing candidate protected areas and for land use planning. Centres may also generate a permanent and dynamic atlas and data bank on the character, distribution and conservation status of natural areas, critical flora and fauna, communities and special features in a province. The Centres also support environmental education programs. In Quebec, the arrival of computer mapping meant the transfer of copies from the data base and mapping support to the 16 regional branches of the Quebec's Ministère de l'Environnement et de la faune, thus providing greater efficiency in the use of information on species which are threatened or vulnerable, and for activities in the territory. The limits of the 650 main protected territories were digitalized and integrated into the data base.

Resource Inventory Committee, British Columbia

This Committee is comprised of provincial and federal government agencies and Aboriginal peoples. The goal of the Committee is to to promote co-operation among many groups to develop a better biodiversity data and information system for the province.

Co-operative Resource Inventory, British Columbia

This program is jointly undertaken by several provincial agencies in order to conduct a biodiversity inventory and research. The Inventory is an important information resource for the B.C. Geographic Information System.

Catalogue of Protected Natural Areas in Quebec

Within the framework of the implementation of the Convention on Biological Diversity in Quebec, a catalogue of protected natural areas was drawn up according to the classification promoted by the World Conservation Union (IUCN, Categories I to VI). Over 700 protected natural areas were identified, totaling 52,578 km2 or 3.15% of the territory of Quebec.

Bowater Mersey Paper Company Limited and Avenor Inc.

Bowater Mersey Paper Company Limited (Nova Scotia) and Avenor Inc. (Ontario) are partnering with the Smithsonian Institution and UNESCO in inventorying and monitoring biological forest diversity on standardized plots.

D. Assessing and Building our Biological Inventories

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 systems 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.

Canada's Country Study, Canadian Museum of Nature

Canada supported the work of the United Nations Environment Program (UNEP) to define and carry out Country Studies on biodiversity in different nations. Canada, through the Canadian Museum of Nature (CMN). The results of this survey are contained in the publication called "Canada's Biodiversity: The Variety of Life, its Status, Economic Benefits, Conservation Costs and Unmet Needs." This document includes information on taxomonic census, habitat and ecosystem diversity and significant changes in populations of selected species.

A Conservation Assessment of the Terrestrial Ecoregions of North America, World Wildlife Fund (Canada and U.S.)

This study is a comprehensive analysis of biological richness of species habitat by habitat in Canada and the U.S. Rare ecosystems and those under severe threat are identified. The report concludes that North America harbours a far more critical share of the world's biodiversity than has been generally recognized.

E. Promoting the Use of Traditional Knowledge

Centre for Traditional Knowledge, Canadian Museum of Nature

The Canadian Museum of Nature (CMN) established a Chair of Traditional Knowledge in 1993. The Centre for Traditional Knowledge (CTK), based at the CMN, was incorporated as a not-for-profit non-governmental organization in 1994. The Centre evolved from a programme of activities carried out by the National Committee for UNESCO / Man and the Biosphere Programme (Canada/MAB). The CMN has provided continued support to the Centre since January 1994. The goal of the CTK is to promote and advance the recognition, understanding and use of traditional ecological knowledge around the world in policy and decision making for sustainable development.

There is widespread recognition in Canada that Aboriginal peoples possess a traditional knowledge of the environment that needs to be understood and recognized in its own right, and to have its place in the nation's institutions. The CMN, as a national institution for natural history in Canada, has the responsibility to represent all Canadians and to interpret the richness and complexity of Canada's natural environment.

Northern River Basins Study Traditional Knowledge Documentation Project

This documentation project was a first time experiment in applying the medicine wheel framework in Traditional Knowledge Research. Traditional knowledge encompasses acquired knowledge through life experience and its application to land use and leadership decision making by Aboriginal Peoples. Traditional Knowledge Research has become an important and valued component of Aboriginal peoples seeking self-determination. The documentation of land use, occupancy and historical natural resource management in the Northern River Basins has

provided insight into ways of managing natural resources with stewardship in mind and heart.

The documentation project was comprised of 246 interviews in ten Aboriginal communities. A video entitled "The Knowledge of Our Mother" was developed focusing in the main environmental issues and concerns raised by these ten communities. The environmental changes identified by the respondents were numerous and parallel to findings of other research components of the Northern River Basins Study.

Canadian Museum of Nature / Centre for Traditional Knowledge Partnership

The CMN worked closely with the CTK in the planning and organizing of a workshop on Arctic and traditional knowledge at the IUCN World Conservation Congress in October 1996.

The exhibit Arctic Forever, a multi-phase educational project to raise awareness and stimulate dialogue among Canadians about sustainable use of natural resources in the North was developed jointly between the Centre for Traditional Knowledge and the Canadian Museum of Nature. A preview of this exhibit was presented at the IUCN Congress in 1996, followed by the opening of the exhibit at the Museum, in June 1997. Achieved in partnership with northern Aboriginal peoples and communities, this project combines traditional knowledge, the Museum's scientific research in the North, its extensive collections of Arctic natural history, and production of educational material, and modern communications technologies.

F. Enhancing Local Community and Indigenous Peoples Involvement in the Conservation and Management of Biodiversity

Action 21

Action 21 is a program of Environment Canada that encourages Canadians to take action in their communities in support of healthy environments. The program has two components: a public awareness initiative to encourage all Canadians to become active participants in environmental solutions; and a community funding program that provides financial support to non-government, non-profit groups to carry out local environmental projects that support national priorities.

Action 21 encourages projects that protect, rehabilitate or enhance the natural environment, and build the capacity of communities to sustain activities into the future, for example, projects which protect wild animals and plants and prevent the loss of their habitats.

Co-management Guidelines, Saskatchewan

Saskatchewan has developed a set of guidelines to aid the establishment of co-management agreements. Co-management agreements are processes designed to increase public participation in the management of renewable resources and parks, and in environmental protection and conservation.

Aboriginal peoples in Saskatchewan are becoming increasingly involved with the management of the natural resources upon which they depend. Co-management agreements can provide an effective framework for them and other citizens to increase their role in decisions related to the management of natural resources.

Co-management agreements in Saskatchewan are based on the following five principles:

- *public ownership and government responsibility for resource management and environmental protection will be retained;*
- *co-operation among partners in the management of resources and in environmental protection will be based on mutual respect, trust, fairness and openness;*
- *stewardship of natural resources is key to sound management and must ensure the maintenance of healthy ecosystems and the sustainable use of renewable resource;*
- *integrated resource management and economic decision-making is essential to achieving sustainable development; and*
- *co-management processes need to be open to all stakeholders, and decisions must reflect existing uses and allocations.*

Northern Great Plains Native Plant Committee, Saskatchewan

This Committee was formed in 1995 in order to stimulate and support growing interest in conserving

and reintroducing native plant species to the northern Great Plains. The Committee's work is in response to the altered landscape of Saskatchewan's prairies and parklands, particularly the loss of a diversity of native plant species. As part of their work, the Committee hosted their third annual Native Plant Summit in October 1997.

Themes covered at the summit were: revegetation techniques for highway right-of-ways, oil and gas industry sites and parks and pastures; schoolyard revegetation; native plant nurseries; large-scale revegetation planting; and reclamation sites.

Round Tables on the Environment and Economy

In 1988 New Brunswick was among the first jurisdictions to form a Round Table with 13 members, which represent all of the province's major sectors. They report to the Premier and are mandated to formulate a strategy for sustainable development.

The National Round Table on the Environment and Economy (NRTEE)

The NRTEE was formed to act an independent federal agency that seeks to provide objective views and information regarding the state of the debate on the relationship between the environment and the economy. Biodiversity considerations are regularly included in many of the NRTEE's programs, such as Measuring Eco-efficiency, Private Woodlot Management, Foreign Policy, Ocean Environment and Resources and Sustainable Development and Education. The NRTEE's contribution to the 1998 International Year of the Oceans is the development of the guide: Sustainable Strategies for Oceans: A Co-Management Guide .

Ontario Green Communities Initiative

This initiative is a program delivery model which builds the capacity of community-based partners to conceive and deliver conservation and prevention projects. The communities build strong partnerships encompassing the public, private and voluntary sectors. Some of the environmental results of the program include: energy and water savings; waste reduction, improved air and water quality, increased greenspaces to support biodiversity and pollution prevention. There are over 20 communities participating in the program.

G. Education, Guides and Information

International Summer School on Biodiversity and Systematics, Canadian Museum of Nature and Queen's University

This month-long course provides participants from professional and academic sectors with an introduction to the key issues and concepts of biodiversity and systematics. It is not only limited to the biological sciences but also explores the interaction between academic inquiry in these areas and the wide variety of human endeavour and values.

The course provides participants from government, the private sector, academia, conservation groups or interested individuals with an overview of the diversity of life on earth; its form, function, classification, study, and the ways in which human's concerns impinge upon it. More detailed content is provided on biodiversity and systematics.

The Alberta Riparian Habitat Management Project

A publication called "Caring for the Green Zone", was developed to assist ranchers and livestock operators to adopt measures to protect riparian areas. Demonstration sites were also established. Since the program began, project partners have provided information to 4500 ranchers and land managers, 1800 people have visited the demonstration sites and 13,000 copies of Caring for the Green Zone have been distributed.

Centre for Aboriginal Environmental Resources, Manitoba

The Centre was founded in 1994 by a board of 10 Aboriginal leaders from across Canada. Together they created a mandate aimed at increasing Aboriginal people's participation in environmental decision making.

The Centre is committed to increased environmental management capacity within Aboriginal communities, which is necessary to enhance local capacity to address a wide range of environmental issues. Environmental capacity building will also help communities to become more self-sufficient, and ensure the appropriate design of solutions to community environmental problems.

Guide for the Management of Threatened and Vulnerable Species, Quebec

Hydro-Quebec has contributed, with the Ministère de l'Environnement et de la Faune and the firm of Tecsult-Dryade, to the establishment of a software package with information on the presence of species in Quebec which are threatened or vulnerable. The guide also provides a preliminary evaluation of predictable impacts of the various types of activities in the environment. This easy-to-use software will also allow users such as organizations or municipalities, to consider the problem of sensitive fauna and flora species within the context of a given development project.

Invasive Plants of Canada Project

This project was created in partnership by three federal departments, Environment Canada, Canadian Heritage and Natural Resources Canada, in an effort to raise Canadian awareness and action on invasive exotic plants. This project consists mainly of a Guide to Monitoring Exotic and Invasive Plants and Fact Sheets on the Invasive Exotic Plants of Canada. The Fact Sheets provide useful information to the public (history, impact, characteristics, extent of the problem, habitat) on these plants as well as some guidance on how to address them with control measures and monitoring. The Guide provides an in-depth discussion on the role of monitoring, its project design and value.

Wildlife Habitat Canada Forest Biodiversity Program

The forest industry is increasingly required to demonstrate sustainable forest management that embraces the conservation of biodiversity. This has left many forest companies in a position of needing to develop a strategy to conserve biodiversity but without the necessary information and expertise to do so. Wildlife Habitat Canada (WHC), a national non-profit conservation organization, recognized this deficiency, and responded by seizing the opportunity to advance biodiversity and wildlife habitat conservation by taking a proactive approach and helping forest companies deal with this very important issue by creating the WHC Forest Biodiversity Program. Although the program is in its pilot stage, six major Canadian forest companies are participating in five provinces.

Creating a Biodiversity Management Procedures Guide for Your Organization

Environment Canada and Parks Canada collaborated to create a guide to assist companies to produce biodiversity guidelines or policies for their organization. This manual offers a step-by-step process for the development of a Biodiversity Management Procedures Guide tailored to the needs of an individual organization. The manual was developed specifically for organizations whose operations have a direct or indirect impact on biodiversity, such as those with "on the ground" field operations - forestry, mining, oil and gas extraction, pipeline construction, real estate development, large-scale agriculture and infrastructure development. The manual instructs on how to develop a procedures guide, reviews the fundamental concepts of biodiversity in order to understand the inter-relationships and consequences of good and bad management practices and introduces a range of conservation tools available to industry.

MacMillan Bloedel Ltd

MacMillan Bloedel Ltd (British Columbia) provides ongoing support for W.R. Campbell in the preparation of "A Field Guide to the Birds of BC". The expected publication is in late 1998. Additional books will subsequently include "Birds of Vancouver Island", "Birds of the Queen Charlotte Islands" and "Birds of Prey of BC".

Nin.Da.Waab.Jig Heritage Centre, Walpole Island, Ontario

The general mandate for the Centre is to protect, preserve, interpret and promote the natural and cultural heritage of the Walpole Island Aboriginal peoples. In its promotion of biodiversity conservation the Centre has several functions:

- ***Education****: household tips for protecting the environ ment; education materials for the Island's agriculture sector on the environmental effects of pesticides; local newsletter on environmental activities and progress; and, publications on waste management based on native values and practices.*

- ***Capacity building****: examples include: the Walpole Island Sustainable Development Strategy and Implementation Plan; research stations for monitoring water, air quality, sediment, wildlife, fish and human health; a comprehensive environmental audit program; and, education outreach to other Aboriginal communities*

H. Biodiversity Conservation and Rehabilitation Projects

The Alberta Riparian Habitat Management Project

The Alberta Riparian Habitat Management Project, also known as the Cows and Fish project, is a partnership project involving the Alberta Cattle Commission, Trout Unlimited, the Canadian Cattleman's Association, Alberta Environmental Protection, Alberta Agriculture, Food and Rural Development, and Fisheries and Oceans Canada.

Project partners work with ranchers to foster an understanding of how changes in grazing management on riparian areas can improve landscape health and productivity. These changes benefit ranchers and others who use and value riparian areas. A publication called "Caring for the Green Zone", was developed to assist ranchers and livestock operators to adopt measure to protect riparian areas. Demonstration sites were also established.

Since the program began, project partners have provided information to 4500 ranchers and land managers, 1800 people have visited the demonstration sites and 13,000 copies of Caring for the Green Zone have been distributed.

Carolinian Canada, Lambton Wildlife Inc.

The Carolinian Canada zone, which lies south of an imaginary line between Toronto and Grand Bend on Lake Huron, contains about 40 percent of Canada's endangered species. A coalition of environmental organizations and relevant government agencies first came together about 10 years ago to address this problem of list species and habitats in Southern Ontario. The original mandate of the Carolinian Canada program was to acquire land that is biologically sensitive; later, a private stewardship program was introduced. In the next phase of the program, conservation of significant properties will continue, but emphasis will be placed on creating corridors or connections between the protected areas and buffer zones. Local demonstration projects will also be developed.

Clean Annapolis River Project, Nova Scotia

The Annapolis River watershed is 1500 km2 and is located in southwestern Nova Scotia, and drains into the Bay of Fundy. The watershed supports about 35,000 human inhabitants and numerous wildlife species. The local economy is resource based, primarily agriculture and fisheries. Tourism and forest harvesting are also important to the region.

Responding to public awareness of the need to conserve and restore the Annapolis River watershed, a non-governmental organization called the Clean Annapolis River Project (CARP) was formed. CARP recommends that the best way to achieve community action to restore and protect the watershed is to:

- *initiate projects that are aimed at participants in achieving immediate environmental improvements such as stream bank restoration and protection of wetlands on private land;*
- *generate a high level of public awareness using reports, newsletters and other means, to ensure informed decision making;*
- *ensure that public awareness programs are based on the best available information; and*
- *develop community-based conservation and remedial action plans.*

Conservation Agreements, Nature Conservancy of Canada

Using conservation agreements between private landowners and conservation groups is quite new to Canada. The Nature Conservancy of Canada, a national organization that protects biodiversity by saving habitat, holds agreements on thousands of acres of land. In addition, many other conservation groups also accept such agreements.

The "conservation agreement'' is a powerful and simple way to protect all kinds of wildlife habitat. The agreement hands a portion of a willing landowner's property rights over to a conservation group, giving it the right

to restrict development according to the terms of the agreement. The owner continues to own and use the land and can still sell or pass on the land. But the conservation group holds its property right forever. If a future owner violates the conservation agreement by developing the land, the conservation group can legally stop the development - even if many owners, and decades, have passed since the agreement was made. If the conservation agreement causes a drop in the value of the land because it cannot be developed, the owner can receive a charitable tax deduction equal to the drop.

As a result, private conservation land trusts have saved another 1.637 million acres. The Nature Conservancy of Canada has saved 1.2 million acres through the use of conservation agreements.

Career and Technologies Studies, Government of Alberta and Amoco Canada Petroleum Company Ltd.

Alberta and Amoco Canada Petroleum Company Ltd., have demonstrated the power of partnerships in developing three nature videos and teachers Resource Guides. These materials are being used in a unique program that is called Career and Technologies Studies, which is aimed to help Alberta students develop skills, assist them in making career choices and prepare them to enter the workforce.

Each video offers important lessons for students. Alberta's Grasslands and Parkland describes and compares the natural history of the two most populated natural regions of the province and explores how ecosystems develop. Wildlife at Risk highlights five species that are under threat because of the impact of people on the environment and illustrates the importance of preserving wildlife. The third video entitled Prairie Wildlife: A Complex Web, follows the life of a Richardson's Ground Squirrel to demonstrate the interdependency of prairie species. Copies of these videos have been sent to approximately 1900 schools in Alberta.

I. Biodiversity and Sustainable Development Strategies

Quebec's Biodiversity Implementation Strategy and Action Plan

Quebec has developed, in concert with 9 provincial ministries and some non-governmental organizations, through broad public consultation, an implementation strategy for the Convention on Biological Diversity. The Strategy describes the nature and value of Quebec's biodiversity and contains management objectives and aims. The Action Plan consists of 429 courses of action which are related to the 189 measures that were identified in the Implementation Strategy. The Action Plan includes a 4-year implementation schedule, assigns agency responsibility for each action and sets out an evaluation process after 4 years, in addition to an annual monitoring report.

Some actions already completed include:

- *development of a guide for the restoration of shorelines, particularly along the St. Lawrence seaway;*
- *completion of a comprehensive study on the impact of logging with regeneration protection concerning various anima species;*
- *enactment of legislation to preserve agricultural land and activities; and*
- *Quebec municipalities have invested more in the construction of wastewater purification plants.*

Quebec's Biodiversity Implementation Strategy and Action Plan provide excellent models for other jurisdictions that are responding to the Convention. Development of the Strategy resulted in a collective vision for conserving biodiversity, using biological resources in a sustainable manner and sharing equitably the benefit arising from the use of genetic resources.

Initiatives for the Conservation of Biodiversity in British Columbia

This document provides a progress report on initiatives in British Columbia related to the goals of the Canadian Biodiversity Strategy (CBS). It also outlines the range of provincial sustainability strategies, which integrate biodiversity concerns into decision-making:

- ***essential needs*** *- agricultural enhancement; Stewardship of the Water of BC; Clean Air Program; growth strategies; waste management and pollution prevention;*

- ***resource strategies*** *- Forest Practices Code; Timber Supply Review; Clayoquot Sound Scientific Panel; Forest Renewal BC; Forest Land reserve; Mineral Strategy; and Energy Strategy;*

- ***conservation strategies*** *- Protected Areas Strategy; Wildlife Strategy; BC Salmon Habitat Conservation Plan; Conservation on Private Lands; and BC Heritage Rivers System;*

- ***integration strategies*** *- Commission on Resources and Environment; Land Use Coordination Office; inter-agency management committees; community resource boards; Fraser Basin Management Program; Georgia Basin Initiative; strategic land use plans; Environmental Assessment Act; Coastal Zone Strategy; and sustainable reporting; and*

- ***First Nations*** *- First Nations initiatives and treaty negotiations.*

The Province is more than three-quarters of the way to achieving its goal of protecting 12 percent of the land base by the Year 2000. Implementation of the Forest Practices Code is continuing, and more work is planned on the conservation and protection of endangered species and ecosystems. The Province is committed to work with its citizens and stakeholders to achieve the conservation of biodiversity and the sustainable use if resources.

Manitoba Sustainable Development Strategy

The main goals of the Strategy seek to protect the environment and provide jobs for present and future generations. The Strategy emphasizes environmental clean-up, the prevention of environmental and economic mistakes and enhancing its natural resources.

To help achieve these goals Manitoba is currently proposing new legislation, the Sustainable Development Act, in order to:

- *create an institutional, legal and administrative frame work for sustainable development;*
- *implement sustainable development in the provincial public sector; and*
- *provide financial support for innovative projects related to sustainable development.*

The Act also proposes the establishment of a Commission for Sustainable Development.

Stewardship and Sustainability: A Renewed Conservation Strategy for Prince Edward Island

This strategy is the result of discussions with a broad range of interested citizens and groups, and provides a framework to guide management of the province's renewable resources. The strategy identifies five fundamental elements that Prince Edward Island will undertake in order to improve policies and decision-making:

- *focusing on the management of ecosystems by integrating the management of all natural resources, rather than focusing on single-species;*
- *increasing governmental environmental accountability by designating the Department of Environmental Resources as responsible for the Province's responses to environmental issues;*
- *improving environmental and economic integrated decision-making using instruments such as environmental impact assessments;*
- *exploring the use of new policy instruments to ensure local solutions to local issues; and*
- *enhancing information flow to better inform and encourage participation of citizens and groups in environmental protection.*

City of Red Deer, Alberta

On August 25, 1994, the Council of the City of Red Deer agreed that having considered the Canadian Biodiversity Strategy, it would incorporate components of the Strategy into their Environmental Action Plan for the development and improvement of municipal bylaws and legislation that will help identify and preserve unique natural areas, lead to a Sustainable Development Strategy and result in biodiversity conservation in Red Deer.

In addition, the City of Red Deer has a Biological Service in program, along with other environment

related activities, all of which are oriented to habitat preservation and biodiversity conservation.

Shell Canada, "Progress Toward Sustainable Development: 1996 Report "

Shell Canada is one of the largest integrated petroleum and petrochemical companies in Canada. In 1990, the company developed a policy, which incorporates the concepts of sustainable development into its business activities. Shell has initiated several actions that are assisting Canada to meet its obligations under the Convention on Biological Diversity, including:

- *development of standards and guidelines with objectives and targets for sustainable development;*
- *upgrading facilities and equipment to increase protection of water resources by improving wastewater treatment and preventing the release of oil;*
- *reducing waste disposal by 50 per cent over 1998 levels by the year 2000;*
- *protecting wilderness and wildlife by adopting new procedures and supporting wildlife research; and*
- *providing funding for individuals, groups, and schools for innovative projects that protect or improve the environment.*

J. Integrated Planning Approaches

UNESCO: Man and Biosphere Programme

Canada is an active participant in the UNESCO Man and Biosphere Programme which establishes selected areas as biosphere reserves as part of the worldwide system. With their core protected areas surrounded by buffer or transition zones, biosphere reserves are action-oriented, living laboratories that demonstrate the value of integrated resource management and consensus decision making. They provide the physical parameters to measure the success of locally defined and implemented solutions needed to build in notions of integration land use planning and community involvement in decision making, integrating environmental, economic and social objectives.

Canada currently has six biosphere reserves: Charlevoix Biosphere Reserve, Mont Saint-Hilaire Biosphere Reserve, Niagara Escarpment Biosphere Reserve, Long Point Biosphere Reserve, Riding Mountain Biosphere Reserve and Waterton Biosphere Reserve.

North American Waterfowl Management Plan (NAWMP)

The NAWMP is a major conservation initiative involving Canada, the United States and Mexico. The goal is to conserve and enhance waterfowl habitat in order to increase populations of waterfowl. Conservation of waterfowl habitat will provide benefits to numerous species, including birds, mammals, amphibians, reptiles and many insect species.

The Saskatchewan Wetlands Conservation Corporation (SWCC), a provincial agency, initiated the Prairie Shores program as part of the NAWMP in 1991. The Prairie Shores program has targeted wetland and adjacent upland habitats which are critically important breeding habitat for shorebirds such as the endangered Piping Plover, important shorebird migration sights and important habitat for ducks and geese. An example of the work conducted is at Big Quill Lake, one of the most important breeding areas in the world for the endangered Piping Plover and a major shorebird migratory stopping point. Here a mixture of land securement, habitat enhancement and partnerships with 4 grazing cooperatives have protected and improved much of the shoreline. Habitat protection work has included fencing and provision of water sites to keep cattle away from sensitive shoreline areas.

Other programs for which the SWCC is responsible include: Prairie CARE, Waterfowl Crop Damage Prevention and Compensation and Large Marsh. These programs all share the common feature of private landowners working with conservation agencies to protect and enhance wildlife habitat.

Fraser River Action Plan

The Fraser River Action Plan (FRAP), announced by the federal government in June 1991, is jointly run and funded by Environment Canada and Fisheries and Oceans. The Action Plan has three key goals:

- *to clean up pollution,*
- *to restore fish and wildlife productivity and habitat, and*

- *to develop a management strategy to ensure that the river basin stays healthy in the future.*

The FRAP is an attempt to integrate environmental, economic and social decision-making, and to move away from the sectoral decision-making that has often created unintended negative impacts and increased the costs in other sectors. As well as potential negative impacts in other sectors, the inability of sectoral decision-making to deal with the interaction among economic, environmental and social sectors can result in failure to achieve the desired result even in the sector of interest. This means that resources and effort directed at one sector may end up being wasted in terms of the desired results.

British Columbia's Land Use Charter

The Land Use Charter establishes a set of principles for sustainability to guide government policy development. Many of the principles were borrowed from or reflect elements of the Convention on Biological Diversity. The Charter encourages the Province to:

- *maintain, enhance and restore life support systems;*
- *conserve biological diversity;*
- *anticipate and prevent adverse environmental impacts;*
- *acknowledge our incomplete understanding of natural systems;*
- *account for environmental and social costs in all decisions;*
- *recognise global responsibility;*
- *respect the intrinsic value of nature;*
- *ensure the sustainable use of renewable resources;*
- *respect the concerns of individual and communities; and*
- *recognise the rights of Aboriginal peoples.*

Urban - Human Population and Settlement, British Columbia

Recognizing that unplanned growth in urban areas in British Columbia has put severe pressures on species and ecosystems, several human settlement activities have been initiated. These include:

- *In 1995, a Growth Strategies Act was introduced to provide a new planning tool for local government to enable them to address the challenges of human population growth. The Act is intended to support development of sustainable communities and support efforts to adopt municipal and regional planning approaches that respect the need to conserve the natural environment.*
- *The **Fraser Basin Management Program**. This program is intended to develop a strategic plan for the Fraser River basin which is home to one-quarter of the provinces human population, and is also an extremely important salmon fishery resource.*

David Thompson Corridor Local Integrated Resource Plan, Alberta

This Plan is in response to Alberta's Eastern Slopes Policy. The David Thompson Corridor includes a major transportation route and is developed for its oil, gas and forest resources. The corridor includes two of Alberta's three designated wilderness areas and is therefore is rich in biodiversity and provides numerous outdoor recreation opportunities. The area also border in the south and west with Banff National Park.

This Plan is aimed at sustainable resource management within the planning area and sets broad resource use objectives and guidelines. There are five sub-planning areas, each with specific complementary management objectives and British Columbia's Land Use Charter.

A Policy for Resource Management of the Eastern Slopes, Alberta

This policy affirms Alberta's commitment to the wise use and conservation of the province's natural resources. The policy identifies integrated resource planning in a comprehensive inter-agency approach as the most effective means for management of the Eastern Slopes region. This approach is based on a planning process, which requires stated resource management approaches and zoning of sub-regions based upon eight regional land-use zone categories.

Cold Lake Sub-Regional Integrated Resource Plan, Alberta

The purpose of the Plan is to promote the coordinated management of public land and resources within the Cold Lake planning area to achieve maximum economic, environmental and social benefits. The Plan includes management objectives and guidelines for the entire area. The study area is divided into nine

resource management areas based on their natural features, their capability for current and future uses and demands. Integrated resource planning mechanisms are important for optimizing natural resource use and preventing or addressing resource use disputes as well as ensuring biodiversity conservation.

Alberta Prairie Conservation Action Plan

This Plan, developed by agricultural producers, conservation groups, government, business and industry groups, and education and research institutions, provides a blueprint for the development and use of prairie resources and to ensure the long-term conservation of prairie biodiversity. The Plan is an example of the value of bio-regional planning and the need to adopt a multi-stakeholder process to develop goals.

Lands for Life, Ontario

Lands for Life is a comprehensive integrated planning process that will determine long-term protection and use of Ontario's natural resources. The program includes environmentalists, tourist operators, Aboriginal peoples, the mining industry, recreational users, the forest industry and the provincial government in a round table process that gives the people most affected a say in how Crown lands are used.

The first phase of the process will be completed by mid-1998 and result in recommendations on land-use and the sustainable use and protection of natural resources for three ecological regions, the Boreal West, the Boreal East, and the Great Lakes St. Lawrence. A Regional Round Table has been established for each ecological region as the key decision-making forum.

Lake Ontario Greenway Strategy

This Strategy was developed in response to recommendations made by a Royal Commission's examination of the environmental degradation of Lake Ontario, oss of cultural heritage resources and inappropriate development along the lakeshore. The Strategy's goal is to foster commitment to action that will regenerate a healthy and sustainable waterfront that is clean, green, accessible, diverse, attractive, affordable, open, useable and connected. In support of this goal, the following five objectives are defined:

- *to protect the physical, natural and cultural attributes associated with the Lake Ontario Greenway through cooperative actions;*
- *to identify restoration needs and methods and encourages landowners, communities and agencies to undertake regeneration activities;*
- *to promote greater awareness, understanding and recreational use of the waterfront and encourages community participation in its regeneration;*
- *to promote economic activities on the waterfront that are compatible with the other Greenway objectives; and*
- *to facilitate cost-effective public and private initiatives by reducing jurisdictional gridlock, sharing resources, and coordinating waterfront activities.*

Long Point Biosphere Reserve, Ontario

The Long Point Biosphere Reserve is a 26,250 hectare site in southern Ontario. It is a 32 kilometre long sandpit and dune formation that supports a rich mixture of habitats including an open lake, shallow bays, sand bars, beaches, dunes, forest and scrub lands, ponds and marches. Twenty distinct biotic communities have been described supporting inter alia about 700 species of vascular plants, 300,000 birds of 273 different species, 25 species of fish which contribute to a thriving sports fishery, and five species of hertofauna which are either rare or endangered in Canada.

Great Lakes 2000

The Great Lakes 2000 is a seven-year program and represents the second phase of the Great Lakes Action Plan (GLAP). Great Lakes 2000 renews the federal government's commitment and actions until the year 2001 to restore, protect and sustain the Great Lakes. Great Lakes 2000 uses an ecosystem approach and focuses on three main objectives:

- *restoration and remediation of degraded sites;*
- *prevention and control of pollution, including the virtual elimination of persistent, bioaccumulative and toxic substances; and*
- *conservation and protection of human and ecosystem health.*

The third goal, which relates most directly to biodiversity includes: protection of wetlands; restoration of

habitat; securing a network of protected areas; development of recovery plans for species; development of Lake-wide Management Plans; develop ecosystem objectives and indicators; development of ecosystem-based planning processes to integrate land use and water management; control of undesirable non-indigenous species; identifying impacts of climate change and promote response strategies; and developing partnerships in health and ecosystem issues.

St. Lawrence Vision 2000

This initiative is the result of a joint effort by the governments of Canada and Quebec to coordinate and harmonize their actions to protect and conserve the St. Lawrence River and its tributaries in order to return their use to the public with a view to sustainable development. Key areas of the program include the reduction of toxic discharges into the river, wildlife habitat conservation, and citizens assuming the responsibility for the river.

Accomplishments include the:

- *protection of 4,600 hectares of wildlife habitat, or nearly 65% of the overall target (7,000 hectares);*
- *identification of five degraded marine habitats that need to be restored;*
- *rehabilitation work begun in the Bonaventure barachois;*
- *development of 28 farm plans for the protection of the environment which will contribute to rebuilding the rainbow smelt population in the Boyer River;*
- *setting up of a multidisciplinary team to develop a recovery plan for the St. Lawrence beluga; and*
- *continued implementation of the recovery plans for six bird species.*

COBARIC II, Quebec

The Chaudière River Basin Committee (COBARIC II), is a non-profit corporation made up of municipal and local industrial and agricultural representatives. COBARIC II was mandated by the Quebec Ministère de l'Environnement et de la Faune and other local partners to develop a model for integrated water management of the by Chaudière River drainage basin, particularly a water master plan and an implementation plan which address the economic, administrative and legal issues.

In addition, a Committee of provincial ministers responsible for municipal affairs, agriculture, fisheries and food, industry, commerce, science and technology, natural resources, and the environment and wildlife are developing guidelines by the spring of 1998 for the removal of pollutants and toxic substances from waterways. A pilot project will be implemented on the Chaudière River in association with COBARIC II.

Planning Integrated Resource Management, Quebec

In 1997, the ministère des Ressources naturelles du Québec published a document entitled, Planning Integrated Resource Management - An Approach. This guide is specifically designed for Quebec's forest resource users. It presents integrated resource management as a participatory management method involving all users in the planning of activities to be carried out in the forest environment. The guide also provides a detailed approach and contains several examples of integrated resource management projects currently underway in Quebec.

The Contribution of Aboriginal Communities to Integrated Planning and Decision Making

Aboriginal peoples have accumulated, through generations of experience, traditional knowledge, which provides an excellent basis for developing plans, program and projects for the conservation and sustainable use of biological resources. There are a plethora of such initiatives, which are designed and implemented at the Aboriginal community level, a few of which are listed below.

Management for a Living Hesquiaht Harbour, Vancouver Island

This management strategy provides for the determination of sustainable harvest levels of biological resources on Hesquiaht First Nations land in order to meet food, ceremonial and economic needs (based on species biodiversity and market values of these species) and in order to restore the area's watersheds. Partners include the Hesquiaht community, local logging industry, British Columbia (kelp monitoring program) and other local industry.

Canadian Housing and Mortgage Corporation: Guide to Planning Sustainable Communities

The Canadian Housing and Mortgage Corporation is currently developing this guide and drawing from experiences, such as Environment Canada's the Atlantic Coastal Action Plan (described above) which provide a model for planning and implementing sustainable development at the watershed scale and the need to include sustainable commercial sector planning.

MacMillan Bloedel Ltd

MacMillan Bloedel Ltd (BC) is in the process of mapping ecosystems (site series) at 1:20 000 scale for all its tenures to provide data for use in strategic and operational planning. This will provide essential information on the location and extent of forest ecosystems for landscape-level planning, including design of Forest Ecosystem Networks for representation of biological diversity and protection of critical wildlife habitat. It will also confer the ability to use GIS-based computer models to assess the impacts of forest practices on wildlife habitat and populations. Other benefits are: a tool for site productivity estimation for old-growth stands; an aid for silviculture prescription mapping and extrapolation of experience from similar ecosystems; and a framework for predicting silvicultural treatment benefits on a forest-wide basis for economic models and cut-level determination.

Tolko Manitoba and Pine Falls Paper Company Limited

Tolko Manitoba and Pine Falls Paper Company Limited (MA) are developing a system which quantifies wildlife habitat values in the forest management process. Through the development of wildlife Habitat Suitability Index (HSI) models, habitat quality is predicted using a Geographic Information System (GIS). Eighteen (18) species were selected as surrogates to represent the diversity of habitats utilized by the myriad of wildlife found in the boreal forest landscape of Manitoba.

K. Protected Areas Plans and Strategies

New National Parks and National Marine Conservation Areas

Canada, in partnership with the provinces, established several new national parks in 1996: Tuktut Nogait, near Paulatuk, Northwest Territories (NWT); and, land has been withdrawn for 2 more national parks at Wager Bay, NWT and Northern Bathurst Island, NWT. In 1996, Wapusk National Park, near Churchill, Manitoba, was also created as a result of a joint federal and provincial effort and consists of 11,475 square kilometres protecting a large area of the Hudson Plains Ecozone. The establishment of Wapusk National Park has secured habitat for many species, including polar bears, caribou, approximately 200 bird species and an array of arctic and sub-arctic plants. The federal government is also working with Quebec to establish the Saguenay-St. Lawrence Marine Park.

In addition, an innovative Canada - British Columbia program called the Pacific Marine Heritage Legacy (PMHL) has been established for new protected areas in the Gulf Islands of the province. With respect to marine protected areas, projects are underway to assess the feasibility of establishing national marine conservation areas in Western Lake Superior, the Gulf Islands, and Bonavista and Notre Dame Bays, Newfoundland.

British Columbia Protected Areas Strategy

The Protected Areas Strategy aims at coordinating and integrating the protected area programs and increasing the size of the protected areas system to include 12% of the province by the year 2000.

Protected areas in British Columbia are defined as: land, freshwater or marine areas set aside to protect the province's diverse natural and cultural heritage. They are areas in which no industrial resource extraction or development is permitted. Between 1992 and 1996, over 200 new parks and protected areas comprising 2.7 million hectares were established.

Ecological Reserves Program, British Columbia

Ecological Reserves were established primarily to preserve genetic diversity, to facilitate scientific

research and provide opportunities for environmental education. Since 1996, British Columbia has created 139 Ecological Reserves encompassing 159,477 hectares.

Muskwa - Kechika Park

On October 11, 1997, the Government of British Columbia announced its plans to create a special wilderness area in the northern Rockies in order to conserve 4.4 million hectares of habitat which is populated by a wide range of wildlife, including thousands of moose, elk, wolves and bears. The Muskwa - Kechika are has been widely compared to such unique global areas as Africa's Serengetti plains. The size of the wilderness area will be larger than Switzerland. A total of 1.17 million hectares will be completely off limits to any development or tourism. The remaining space will be open to some resource development under tight rules.

Northwest Territories Protected Areas Strategy

In 1996, the Northwest Territories (NWT) and the federal government committed to develop a protected areas strategy by the end of 1998. The NWT features the most extensive area of healthy boreal and arctic ecosystems in the world and supports a unique cultural heritage. The NWT also contains valuable mineral, oil and gas resources that are being developed.

The NWT Protected Areas Strategy is currently being developed with the aim of providing all residents and stakeholders with opportunities for involvement in the establishment of protected areas. The Strategy is also intended to help clarify the status of land vis-à-vis Aboriginal peoples.

The preliminary objectives for the Strategy are:

- *to provide a clear and common vision of protected areas goals, principles and criteria;*
- *to be used as a tool to inform or guide regional planning not supersede it;*
- *to identify candidate protected areas based upon community consultation, traditional knowledge, scientific research and other appropriate means;*
- *to develop and make publicly available, a database and map recording the location of existing protected areas across the NWT and identify gaps;*
- *to ensure the careful consideration of environmental, social and economic effects before designation decisions are made;*
- *to integrate and coordinate the protected area programs already in place, including those set out under land claims;*
- *to gather and publicly share information on the range of ownership and management options currently available or that could be developed for a system of protected areas; and*
- *to link local and global efforts so that a system of protected areas respects local needs with particular emphasis on Aboriginal priorities and interests, while making a global contribution to environmental conservation.*

Protected Areas Strategy, Yukon

The Yukon is currently developing a Protected Areas Strategy. A public consultation process has been developed in order that residents participate in developing the Strategy. In addition, a Public Advisory group has been established to guide overall development of the Strategy.

Recently, four new ecological areas were established under agreement made by the federal and territorial governments in the Yukon. Several other activities are also resulting in increased protection for biodiversity in the Yukon, including:

- *two new land claims agreements were established in 1997, which contain commitments whereby the federal and territorial governments, and Aboriginal people agree to establish and integrate management of three new protected areas;*
- *financial resources have been provided for habitat enhancement projects and to increase capital funding for Parks System Planning; and*
- *several fish and wildlife management plans are under development to support the conservation and sustainable use of these resources.*

Special Places Program, Alberta

The Special Places Program was created in 1995 in order to complete a network of protected areas, which represent the province's six natural regions and 20 sub-regions by the end of 1998. The priority of the

Program is to fill the under-represented landscapes or gaps in the existing protected areas system. In two years, 37 new sites, totaling approximately 500,00 acres, have been protected. Many other candidate sites are currently being reviewed. In addition, industrial development has been prohibited in the Willmore Wilderness Park.

Final Action Plan for Saskatchewan's Representative Areas Network

The goal of the Action Plan is to conserve Saskatchewan's native biological diversity and natural resources by protecting and managing a system of areas which represent the full range of native ecological systems by the year 2000. The Plan will be implemented based on the following five objectives:

- *preservation and management of adequate examples of Saskatchewan's natural landscapes, based on enduring features, in all ecoregions;*
- *preservation of natural areas relatively undisturbed by human activities and maintenance of their ecological integrity so that they can serve as reservoirs of biological diversity;*
- *protection of areas known to contain species at risk;*
- *preservation of areas of high scenic value and unique physical features, such as waterfalls, badlands and sand dunes; and*
- *provision of appropriate recreational, educational and research opportunities.*

An Action Plan for Manitoba's Network of Protected Areas

Through this Plan, Manitoba is committed establishing a network of protected areas that are representative of their natural regions, and particularly to managing and protecting the province's natural lands and special places. The Plan outlines steps to assemble protected lands and identifies selection criteria. The goal is increase the number of protected areas, thereby improving representation of the province's natural regions.

Ecological Reserves and Wildlife Management, Manitoba

In 1997, Manitoba established two ecological reserves and excluded 10 wildlife management areas from industrial resource extraction activities. Wildlife management areas are established to maintain biodiversity and biological integrity, and are used by subsistence and recreational hunters, trappers and for eco-tourism. Manitoba has currently about two million hectares of land in the wildlife management area system.

Ontario Parks Legacy 2000 - A Partnership to Secure Natural Areas in Ontario

Ontario Parks Legacy 2000 is a program based on a new and innovative partnership using public and private funds to help complete a system of provincial parks and other protected areas by the year 2000. With this partnership, the government will make progress to secure significant natural areas for the protection and enjoyment of future generations. This land acquisition will also assist in research and education efforts to develop a better understanding of Ontario's natural environment.

Through the Ontario Parks Legacy 2000 program, and with a higher level of support from private sources, the Nature Conservancy looks forward to securing new park lands for the benefit of wildlife and as a continuing legacy for the people of Ontario.

Ontario's Parks and Protected Areas: Framework and Action Plan

The 1997 Framework and Action Plan proposes a series of actions which will lead to a comprehensive system of parks and protected areas. This system will represent the full range of the province's biological diversity and protect other special natural heritage values important to society for their intrinsic worth. The Action Plan includes measures to establish a system of natural heritage areas and acknowledges the importance of managing the intervening landscape in an ecologically sustainable way.

The Action Plan is organized around a number of themes:

- *a policy framework which identifies a goal and objectives for the natural heritage areas program;*
- *the science and methodologies needed to identify significant areas;*
- *the planning processes required to determine whether and how to protect areas;*

- *a range of tools to protect representative and special natural heritage values;*
- *management of a system of parks and protected areas; and,*
- *a summary of priority actions which will guide implementation, leading to a comprehensive systems of parks and protected areas.*

Network of Ecological Reserves, Quebec

The five-year program (1996-2001), aimed at establishing ecological reserves, will create 14 reserves and identify and reserve twenty new territories. As of December 4, 1997, the Quebec network of ecological reserves numbered 57, totaling 69,280 ha (692.8 km2). These sites are designated undeveloped nature reserves by the World Conservation Union (IUCN). The Quebec Ministère de l'Environnement et de la Faune signed joint management agreements with the Montagnais communities of Uashat Mak Mani Utenam and of Betsiamites for the ecological reserves of Matamec and Louis-Babel on the North Shore. These agreements are examples to bring to the fore the traditional knowledge, technical capacity and skillfulness of indigenous communities to manage biodiversity.

Network of Parks, Quebec

In September 1996, the Quebec government established Monts-Valin Park under the provisions of the Quebec Parks Act. This park, covering an area of 154 km2, is situated in the Saguenay-Lac-Saint-Jean region. The Quebec network now has eighteen parks, covering a total area of 4,402 km2. In addition, Quebec and the federal government are currently establishing the Saguenay-St. Lawrence Marine Park, covering an area of 1,138 km2.

Repap New Brunswick, Steve Creighton Nature Trust of New Brunswick Inc. and the Province of New Brunswick

Repap New Brunswick (NB) in cooperation with Steve Creighton Nature Trust of New Brunswick Inc. and the Department of Natural Resources and Energy - N.B. inventoried twenty-seven different sites representing a wide variety of ecosystem types that should be protected as Unique Areas or Environmentally Significant Areas.

Chrysler Canada Greenway

Chrysler Canada has donated $250,000 toward the preservation of a 44-km stretch of old railway property, named the Chrysler Canada Greenway. The Greenway will become part of the Trans Canada Trail, which when completed, will be a shared use recreation trail stretching across 15,000 kilometres of Canada. The Greenway is home to unusual tree species, about 75 species of prairie grass, rare flowering plants, Carolinian forest, 38 species of native trees and 40 species of shrubs, rare and protected flora and fauna and endangered reptiles.

L. Forest Management

Model Forest Network

Model forest areas have been established throughout Canada to establish working models of sustainable forest management. The Network has been designed to promote the creation of local partnerships to establish local visions and mechanisms for sustainable forest management.

This initiative builds local, national and international partnerships to generate ideas and solutions to achieve sustainable forest management practices. This network has been expanded to Russia, Mexico, Malaysia and the U.S. Partners commit themselves to a set of objectives, that reflect their local environmental, socio-economic, cultural and political contexts, and set long and short term sustainable forest management.

The Network meets Canada's commitments to the Convention on Biological Diversity by;

- *enhancing the integration of sectoral and cross-sectoral policies and plans;*
- *increasing local and Aboriginal peoples' involvement in decision-making;*
- *by fostering interdisciplinary research related to sustainable forest management;*
- *increasing communication and partnerships among governments and the private sector;*
- *facilitating the identification and establishment of protected areas;*
- *enhancing inventory and monitoring of forest biodiversity;*

- *coordinating and facilitating the conservation of threatened forest species; and*
- *providing resources for capacity building to assist*
- *developing countries to achieve the sustainable management of their forests.*

Fundy Model Forest, New Brunswick

The Fundy Model Forest is 420 000 hectares in size, includes a national park and has a population of approximately 35 000. The Fundy Model Forest demonstrates the success of partnerships. The program began with twenty partners and has expanded to involve nearly 100 individuals in technical working groups. New partners continue to join, and many more individuals and groups have become involved through implementation of about 50 specific projects. The Fundy Model Forest demonstrates the power of local involvement and the need for local communities to work together to create a vision for the landscape in which they make their living.

The Model Forest recently released its first report, Hayward Brook Project: A General Description, which is the first report in the series, Fundy Model Forest Technical Notes. This first report is a compilation of ecosystem research conducted in the Hayward Brook Watershed Study.

Eastern Ontario Model Forest

Ontario is a key partner in Canada's Model Forest network as the Province has two of the countries 10 model forests. The Eastern Ontario Model Forest is the largest model forest in Canada, encompassing 1 534 115 hectares of the Great Lakes-St. Lawrence forest region. This area is approximately 88% privately owned and has several important uses to local and Aboriginal people. For example, the region is an important maple syrup production area and contains trees and other resources that are required to make Aboriginal traditional crafts and tools. The model forest process has brought together more than 50 partners in the region to develop a common goal of using forest resources in a sustainable manner.

Lake Abitibi Model Forest

The Lake Abitibi Model Forest is located in northeastern Ontario in the boreal forest region. This model area is 1 094 690 hectares in size and is characterized by flat lowland peat sites that mainly support black spruce. The 13 partners involved with this model area have initiated several projects including:

- *testing different equipment to determine the environmental impacts of different management practices;*
- *research projects to study how small mammals are affected by logging activities; and*
- *initiation of an inventory and database of Aboriginal historic sites, and development of a model to predict the location of other sites.*

Western Newfoundland Model Forest

The Western Newfoundland Model Forest initiative promotes broad-based community involvement in resource use and conservation. Cooperative decision-making and co-management of resources is essential to preventing conflicts among resource uses, and to maintaining the region biodiversity. The Model Forest program provides a framework for shared decision-making and facilitates data and information sharing, and promotes stewardship among all participants.

Forest Policy, Northwest Territories (NWT)

A Forest Policy has been developed to ensure that the 614 000 km2, or 18% of the NWT which is forested land is managed sustainably. NWT supports a commercial forest industry, fuelwood and provides habitat for many wildlife species, which are used for subsistence foods, recreational and commercial hunting and fishing, and trapping.

Management of forests is shared among the NWT, the federal government, Aboriginal peoples, local communities, private sector interests, conservation organizations and research institutions. Their management strategy includes the following objectives:

- *to ensure that the harvest of forest products is sustainable;*
- *to minimize the impact of timber harvesting on the environment and traditional resource uses;*
- *to complete forest inventories;*
  to prepare integrated resource management plans with
- *full community participation;*
  to ensure forest renewal on all harvested areas;

- *to increase local involvement in forest management through the development of community forests and co-management agreements;*
- *to increase opportunities for residents of the Northwest Territories to be involved in the forest sector;*
- *to provide education and training programs; and to increase opportunities for northern lumber and value-added production.*

The Forest Code of Practices, British Columbia

This new Act was passed to ensure that the province's forests are managed to meet current needs without compromising the ability of future generations to meet their needs.

The Code applies to approximately 85% of the province. It was introduced to consolidate previous guidelines, give government new powers of enforcement and bring in an independent auditing and review process. The Code specifies the operational requirements for harvesting, silviculture, road construction and associated forestry activities, as well as forest recreation and livestock grazing requirements. In addition, over 40 associated guidebooks have been developed which recommend best management practices.

Forest Renewal Plan, British Columbia

The Forest Renewal Plan derives from a partnership among the Province, forest workers, forest companies, environmental organizations, communities and Aboriginal peoples. The Plan was created to assist communities whose economy is linked or dependent on forest industries to adjust to new forest management rules and changes to harvesting.

Biodiversity conservation is a key element of the Plan, with funds being provided for research on alternatives to clearcutting, species and habitat inventories, watershed restoration as well as a variety of other projects. The Plan has invested over $10 million towards biodiversity research, including:

- *distribution and nesting of Marbled Murrelets in coastal forests;*
- *nest-site selection by Northern Goshawk; the effect of forest harvesting on Tailed Frogs in the Coastal Hemlock Zone;*
- *managing forests to maintain Bald Eagles; effects of thinning on forest bird communities in interior Douglas-fir forests;*
- *the importance of riparian habitats for terrestrial amphibians in natural and altered landscapes; and natural disturbance regimes in various ecological zones.*

Clayoquot Sound Scientific Panel

Clayoquot Sound is over 2,600 km2 of magnificent inlets and rainforests located on the west coast of Vancouver Island, British Columbia. A scientific panel was established and charged with developing world-class forestry standards suitable to the unique ecological conditions and values in the Sound, based on traditional aboriginal knowledge of resource management as well as best available scientific knowledge. The Panel recommended an ecosystem-based approach to forest management in which long-term forest health is paramount. The Province is developing a long-term plan to implement the Panel's recommendations in cooperation with representatives of the Panel, Aboriginal Peoples, forest companies and local communities.

Biodiversity Research Council, British Columbia

The goal of the Biodiversity Research Council is to recommend and promote a provincial research and development effort that supports achievement of the goals of the Canadian Biodiversity Strategy (CBS). Among other activities, the Council makes recommendations on strategic directions for biodiversity research, means to encourage collaboration and interdisciplinary approaches, and monitor and evaluate British Columbia's performance in implementing the CBS. In addition, the Council addresses a full range of biodiversity issues, including measuring impacts, monitoring trends and training taxonomists. Although the mandate of the Council includes the full range of biodiversity issues, forest-related research issues are the initial focus of the Council.

Forest Conservation Strategy, Alberta

This Strategy was developed through a multi-stakeholder process involving representatives from forest and other natural resource industries, environmental

groups, Aboriginal groups the Province. In addition, 800 individuals from 95 communities participated in reviewing drafts of the Strategy and providing their advice. The Strategy is organized around five directions:

- ***Ecological Management****: using the resource in a manner that resembles the scale and effects of natural disturbance;*
- ***Sustainable Forest Economy****: examining ways to extract economic benefits from forests while maintaining ecological functions, and re-evaluating how benefits and impacts of human activities are measured;*
- ***Protected Areas****: networks of protected areas are necessary in order to provide benchmarks and support activities such as recreation while conserving natural resources and wildlife habitat;*
- ***Range of Management Intensities****: which refers to four possible management intensities: extensive management, intensive management, facility and protection, in the context of ecological management over a landscape area; and,*
- ***Participation and Partnerships****: essential elements of the ecological management approach.*

Operation Burrowing Owl

The Burrowing Owl is an endangered species native to the Canadian Prairies. Much of its habitat occurs on private farmland. Operation Burrowing Owl is sponsored by the Governments of Saskatchewan and Alberta, Nature Saskatchewan, Alberta Fish and Game Association, Wildlife Habitat Canada and World Wildlife Fund to encourage private land owner participation in conservation efforts. The program uses voluntary agreements to protect vital nesting areas. Operation Burrowing Owl also informs land owners about the risks to Burrowing owls of pesticide use and, by collecting data from land owners, provides a low cost method of monitoring the Burrowing owl population.

Long-Term Integrated Forest Resource Management Plan, Saskatchewan

The goal of the Plan, which was developed through an open and transparent planning process, is to maintain and enhance the long-term health of forest ecosystems, for the benefit of all living things both nationally and globally, while providing environmental, economic, social and cultural opportunities for the benefit of present and future generations. The Plan also includes resource management issues that need to be addressed, strategies, objectives and examples of the actions that will support achievement of the Plan's overall goal.

Manitoba's Forest Plan -- Towards Ecosystems Based Management, Canada-Manitoba Partnership Agreement in Forestry

This Plan is the result of public consultations with many individuals and organizations, and provides a framework for the management of the province's forest into the next century.

The Plan identifies several recommendations, including the need to:

- *adopt an ecosystem approach to forest management;*
- *adopt maintenance of ecosystem diversity as the single most important forest management objective at a provincial scale;*
- *adopt historical variability considering current and historic fire history, age distribution and inventory information, as a first approximation of a forest state that is representative of ecosystem diversity;*
- *use the ecoregion or land resource area as the basic management unit;*
- *encourage stronger community involvement in forest management activities; and*
- *establish benchmarking standards and performance indicators that allow for tracking forest management programs.*

Review of Biodiversity in Quebec's Forests

In 1996, Quebec produced the report, Review of Biodiversity in Quebec's Forests, an essential planning tool to support all individual and organizations working in the forest sector who are concerned with the conservation and sustainable use of forest resources. The review is based on nine studies conducted by the Province, universities and the private sector. These studies include information on rare forest species, ancient forests, fragmentation, the importance of damp environments and waterside sites and the impact of silviculture on biological diversity in stands. The

review also identifies areas requiring action, such as the need to:

- *improve knowledge;*
- *develop a preventative approach focused on protecting the forest species and ecosystems that appear to face the greatest threat of extinction in the short and medium terms;*
- *assess forestry practices in order to adapt methods according to the results observed (adaptive management); and*
- *design and test an approach for the management of the forest mosaic as part of the landscape.*

The Forest Resources of Ontario

This report, the most recent in a series that began in 1922, provides a comprehensive snapshot of the state of Ontario's forests at regional and provincial levels, including statistics such as the area within various forest types and the distribution of tree species across the province. Also included are provincial and regional summaries of forest areas and timber growing stock volumes, maps of tree species distribution, a time series comparison with the previous reports and greater depth than previous issues of the report on current geographical distribution of forest features.

This report is based upon the most up to date forest inventory ever available for a report in this series. Since 1990, over 30 million hectares over forested land have been updated in the Forest Resources Inventory (FRI). Still, much of Ontario's northern forest has not yet been inventoried.

The Crown Forest Sustainability Act, Ontario

The purpose of this Act, which came into effect in 1994, is to provide for the sustainability of Ontario Crown forests and, in accordance with that objective, to manage Crown forests to meet social, economic and environmental needs of present and future generations. The determination of sustainability is done in a manner consistent with the following principles:

large, healthy, diverse and productive Crown forests and their associated ecological processes and biological diversity should be conserved; and the long term health and vigour of Crown forests should be provided for by using forest practices that, within the limits of silvicultural requirements, emulate natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air and social and economic values, including recreational values and heritage values.

Forest Biodiversity, Ministry of Natural Resources, Quebec

Quebec has stated its commitment to conserve and use sustainably its forestry resources in an action plan, which draws on a range of legislative, performance indicators and research tools. Quebec's commitment to addressing biodiversity loss also includes pursuing preventative measures and a management framework, which adapts to the changing needs of its forest biodiversity.

Forest Act, Quebec

The Forest Act, which forms the cornerstone of Quebec's forest policy, was amended in 1996 to include the notions of sustainable forest development and conservation of biological diversity. A preliminary provision was added to the Act:

The purpose of this Act is to foster recognition of the forest as a common heritage and promote sustainable forest development in order to meet the economic, environmental and social needs of present and future generations while giving proper consideration to other potential uses of the territory.

This provision clearly defines sustainable forest development as being especially conducive to the preservation of biological diversity.

The Black Ash Project, Akwesasne, Ontario and Quebec

The result of this Project, created by the Mohawk Council of Akwesasne, was the replanting of 10 000 black ash trees in an effort to restore the population from decline due to agricultural expansion and draining of areas for land development and irrigation as well as species inventories of many of the islands within its territory.

Eel Ground Forestry Management Plan, New Brunswick

This forestry management plan developed by the Micmac Aboriginal community, mainly resulted in local capacity building (forest managers; woodcutters; educators; and the acquisition of a sawmill, dry kiln and planner facility and training of local operators) in the effort to maintain and enhance wildlife and species diversity, protect traditional medicinal plants, create opportunities for recreational and spiritual activities and increase economic benefits and employment.

"Conserving Biological Diversity in Canada's Forests", the Canadian Pulp and Paper Association

Recognizing the importance of biodiversity conservation, the Canadian Pulp and Paper Association (CPPA) member companies supported in 1996 the development of a CPPA Biodiversity Program. The objective of this program is to help the industry become a leader and partner in biodiversity conservation and sustainable use. Efforts are presently under way to develop CPPA's Biodiversity Strategy. Partnerships have been established with other industrial sectors, ENGOs and others. CPPA and Wildlife Habitat Canada are launching a national joint venture recognition program "The Forest Stewardship Recognition Award Program". This program aims to stimulate forest biodiversity conservation efforts and practices by the forestry sector and other stakeholders, and to foster public appreciation for these efforts. In early 1998, the biodiversity components of the CPPA web site will be redesigned in order to introduce the newly created "Internet Biodiversity Database" which showcases more than 150 biodiversity programs and activities involving member companies.

Some examples of member companies' programs include:

- ***Repap New Brunswick (NB), J.D. Irving Ltd. (NB), Fraser Paper Inc. (NB)*** *are jointly studying buffers along water bodies to determine the: effectiveness in mitigating potentially adverse effects from harvesting activities; the feasibility of intervention into buffers for silvicultural manipulation and recovery of timber; and the short and long-term responses of the forest in the riparian and adjacent zones to tree removal by selection cutting.*

- *In Nova Scotia,* ***Stora Forest Industries, Ltd****. works with experts to devise a forest ecosystem design with a management plan to conserve wetlands, old growth areas and areas with high potential recreation potential.*

- *In Quebec,* ***Domtar*** *incorporates consideration of plant and animal life and succession of native species into its forest management plan. Measure to conserve species include allowing natural regeneration and establishing protected areas.*

- *For the* ***Gordon Cosens Forest*** *timber management plan (1995-2000), Spruce Falls Inc, Ontario adopted a holistic or ecosystem approach for managing the forest by mimicking the natural forest disturbance pattern and regime through harvesting and silviculture. Single species, unique habitat and plant communities were also considered where special conservation measures were required. Components of diversity are considered at the landscape and disturbance patch scales.*

- *In Alberta,* ***Weldwood of Canada Ltd.****, in collaboration with Foothills Model Forest and Alberta Fish and Wildlife, has developed and implemented a decision support system for forest managers that combines timber supply and wildlife habitat analyses. This tool will be applied to a wide range of problems such as the effects of cutblock layout and limiting access on wildlife habitat. It will provide predictive scenarios on the effects of multipass logging and the length of greenup, logging practices such as the protection of understory and snag retention, habitat genetic improvement and other silvicultural enhancement, disturbances due to resource extraction, grazing and fire both on Annual Allowable Cut and wildlife.*

- ***Alberta-Pacific Forest Industries Ltd****, Alberta has prepared training and operating guidelines for machinery operators such as videos and colored guidebooks presenting appropriate operating procedures. Each operator carries a plasticized card highlighting the most important elements of the Stand Structure Guidelines such as the number of trees per hectare that should be left, types of trees, size and shape of tree clumps and location, and forested corridors .*

- ***Weyerhaeuser Canada*** *is using an ecologically-based approach to forest management to maintain a variety of stand sizes, seral stages and stand attributes and structures across landscapes and within the range of natural variation in the system (i.e. a forest management approach that*

mimics natural disturbances). More specifically, the Alberta operation has developed a set of guidelines to manage landscape level issues such as age structure and serial stages; patch size, shape and distribution; and connectivity. Over the past years, Weyerhaeuser has worked to address maintenance of viable caribou habitat, an endangered species in Alberta. The company has developed a specific caribou habitat management policy with long-term principles for the integration of forest management activities with caribou habitat winter ranges needs.

- *In British Columbia, **Timberwest Forest Ltd**. is determining the ranges of amphibian species - including the long-toed salamanders, boreal toads and the wood frog - on lands leased by the company. These populations are monitored to determine densities and to detect changes.*

- *The **Forest Alliance of British Columbia and the Nature Conservancy of Canada** have committed $2 million to conserve the wintering habitat of one of the world's largest concentration of bald eagles.*

Seed Certification, Centre for Land and Water Stewardship (CLAWS), University of Guelph

The Forest Gene Conservation Association, not-for-profit organization dedicated to maintaining and restoring genetic diversity in Ontario's forests, and CLAWS are developing and marketing a seed certification program for Southern Ontario. The program involved certifying all steps of the operation: collection of seeds; the seed processing plant; the growers; and the distributors. To ensure that genetically appropriate stock will be available in privately run nurseries, it will be necessary to educate consumers to make these demands on growers and distributors. A variety of information materials, demonstration sites, a suppliers directory and workshops for nursery professionals are also a part of the program.

Private Woodlot Management in the Maritimes

This initiative, developed by the National Round Table on the Environment and Economy, was created to examine issues regarding the sustainability of the present levels of harvesting on private lands in New Brunswick, Nova Scotia, and Prince Edward Island. Through stakeholder workshops, the program examined areas such as incentives, tax reform, training. Licensing and certification initiatives, as well as industry and community leadership.

M. Agriculture and Biodiversity

Alberta Environmentally Sustainable Agriculture Agreement (AESA)

In 1992, Canada and Alberta established the five year, $36 million AESA program which has several biodiversity elements:

- *the retention of wetlands and wetland habitats which provide economic returns to farmers;*
- *constructing wetlands to treat wastes from agricultural activities;*
- *inventories of forest resources on private lands to assist landowners to benefit economically from woodlots without reduced agricultural or environmental benefits; and*
- *adjusting grassland insect control practices to reduce impacts to grasslands songbirds.*

Agricultural Waste Management, Fullarton Township, Ontario

This program is resulting in the creation of valuable wetland areas and the construction of wetlands to treat runoff on a dairy farm in Fullarton Township. Originally developed in 1992, this was the first wetland constructed in Ontario designed specifically to manage agricultural wastes. The constructed wetlands have proved to be effective in managing wastes and providing wildlife habitat.

As a result, several other wetlands to treat agricultural wastes are now being constructed. A similar program has been initiated in Quebec. A farmer in the Sainte-Marie-de-Beauce region is participating in a demonstration project that will illustrate the use of an artificial wetland to treat dairy wastewater and liquid manure. The wetland will also be constructed in order to support wildlife.

Basin Drainage Water Management Program, Canada-Quebec Subsidiary Agreement on Sustainable Agriculture

Quebec farmers in agricultural basins contribute to the development of expertise in the area of integrated water management. By their involvement, they are helping to increase knowledge and to develop planning tools to improve the quality of water and of the

environment. Financial help is provided for ecological advisors and other needs which allow farmers to put into practice the concept of sustainable agriculture. By controlling soil erosion and non-point source pollution, farmers contribute to the preservation of biodiversity.

Specific projects include:

- ***Turmel Creek Drainage Basin Project*** *: The farmers in the Turmel Creek secondary basin, Sainte-Marie-de-Beauce, are improving the quality of the surface water of the basin and have developed a plan for the re-establishment of wildlife along the Turmel Creek. The farmers improving their skills in the management effluent from livestock production, soil management, fertilizer use, buffer strip layouts and the protection of waterways.*

- ***Upper Saint-Esprit Creek Drainage Basin, Montcalm County****. Some thirty farmers are improving the quality of the drainage basin by reducing erosion and streamlining their use of pesticides and fertilizer. The farmers have also participated in the evaluation of the overall impact of the changes in their farming techniques on the quality of the environment.*

Conservation Club Program of Quebec, Canada-Quebec Subsidiary Agreement on Sustainable Agriculture

The Conservation Club Program of Quebec consists of twelve consultant clubs, each made up of between 20 and 30 farming enterprises (totaling 290 farms and a managed area of some 30,000 hectares) which receive specialist assistance with their conservation projects. As a result, farmers develop a holistic approach to resource management, thus promoting sustainable agriculture. Financial assistance is provided to pay the salaries of the environmental consultants. The main problem areas addressed include: improvement of water quality and a decrease of non-point source pollution, resource conservation and integrated fertilizing at their best, and the development of an integrated crop protection initiative.

Boyer River, Quebec

Within the framework of the St. Lawrence Vision 2000 Action Plan, over 200 farmers from the Quebec region are cooperating in an arterial drainage and resource conservation project. These farmers conduct an agri-ecological diagnosis of their farms which serve as a customized management tool to develop action plans and support methods aimed at sustainable agriculture and the preservation of biological resource diversity in the Boyer River drainage basin. The limited access of cattle to the waterways, the establishment of watering areas, the installation of windbreaks, bank stabilization by means of buffer strips and integrated fertilization are all initiatives helping to control water erosion, improve water quality and restore the rainbow smelt breeding site, situated at the mouth of the Boyer River.

Ontario Land CARE

In this program, Ducks Unlimited Canada works with farmers and landowners to identify and develop management plans for areas surrounding critical wetlands across the province. The program's goals are to ensure adequate wetlands and upland forage area near wetlands for waterfowl. Financial and technical assistance is provided to landowners for the following activities: planned grazing systems; forage management; permanent cover; buffer management; water management; and on-farm demonstrations.

Round Table on Resource Land Use and Stewardship, Prince Edward Island

The report of the Round Table on Resource Land Use and Stewardship was released to the public on September 3, 1997. One area of discussion includes biodiversity in agriculture. Despite the trend toward monoculture and a general lack of local knowledge about the benefits of biodiversity, the Round Table recommends the following five initiatives will help reverse the trend:

- *establishing organic matter as the primary indicator of soil quality;*
- *establishing mandatory riparian (buffer) zones along watercourses;*
- *encouraging the maintenance of diverse hedgerows and the establishment of new ones;*
- *encouraging better soil conservation through strip cropping, terracing, and grassed waterways; and*
- *educating farmers about the benefits of biodiversity through the Environmental Farm Plan initiative.*

"Agricultural Biodiversity Initiatives"

This document, sponsored by national Agriculture Environment Committee, the Canadian Cattlemen's Association and the federal department Agriculture Canada, is an inventory of agricultural biodiversity initiatives conducted by Canada agricultural producers. Although the document does not provide a comprehensive listing of projects, 42 are classified according to whether they are ecosystem-based, species-based or focused on the conservation of genetic diversity. Some project examples are:

- *Restoration of Native Grasses in Riparian Zones, Saskatchewan;*
- *Burrowing Owls and Loggerhead Shrikes, Alberta; and*
- *Conserving Endangered and Heirloom Food Crops.*

Co-Management of Antelope Creek Ranch

In 1986, Alberta and non-governmental organizations, such as Ducks Unlimited Canada and Wildlife Habitat Canada, established co-management of a 225 hectare ranch in a mixed grass prairie ecosystem in southern Alberta. The ranch is used as a venue to demonstrate the best sound land management practices and how agricultural activities can be integrated with conservation of prairie biodiversity.

N. Aquatic Biodiversity Conservation

The Oceans Act

A new federal Oceans Act came into force in January 1997, representing a significant step towards establishing Canadian oceans jurisdiction and consolidating federal management of oceans and coasts. The Act entrenches an ecosystem approach to oceans management based on the principles of integrated resource management, sustainable development and the precautionary principle. Key is the development of the Oceans Management Strategy (OMS) which sets the stage for many ocean activities.
The first step of the OMS is the establishment of a national policy and framework for Integrated Coastal Zone Management, based on the premise of collaborative effort among stakeholders and governments. The Strategy also calls for a system of marine environmental quality standards to judge performance in achieving effective ecosystem-based integrated management. The OMS aims to replace the current fragmented approach to oceans responsibilities and management to find better ways to integrate the various management objectives.

Under the Oceans Act, and as called for in the Strategy, marine protected areas may be created for the conservation of living marine resources, specifically:

- *commercial and non-commercial fishery resources, including marine mammals, and their habitats;*
- *endangered or threatened marine species and their habitats;*
- *unique habitats;*
- *marine areas of high biodiversity or biological productivity; and*
- *Any other marine resource or habitat as is necessary to fulfill the mandate of the Minister of the federal department of Fisheries and Oceans.*

Canadian Code of Conduct for Responsible Fishing Operations

In response to declining fish stocks around the world, the result of ineffective and unsustainable fisheries management practices, the federal government has consulted industry representatives in all regions of Canada and collectively they have drafted principles and guidelines for the Canadian Code of Conduct for Responsible Fishing Operations. Once there is national agreement, the Code of Conduct will become part of co-management arrangements and integrated management plans, and would become binding on harvesters through the annual Conservation Harvesting Plans.

The rationale for the Code is that fishers must assume greater responsibility for the conservation of the fisheries resources on which they depend. The Code will provide a conservation and sustainable use framework which fishers develop themselves and agree to follow, particularly in the areas of: environmental and resource protection; fishing gear; vessels; access and enforcement; cooperation and partnerships; education and research; and, public awareness.

National Programme of Action for the Protection of the Marine Environment from Land-based Activities

In November 1995, Canada, with 109 other countries, adopted the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA). Parties to the GPA are responsible for the prevention of degradation of the marine environment from land-based activities by preserving the marine environment. Achievement of the aims of the GPA will help maintain and restore the productive capacity and biodiversity of the marine environment.

Subsequent to its adoption of the GPA, Canada is developing a National Programme of Action (NPA), with a focus on regional implementation, to be developed and implemented as a partnership between federal and provincial and territorial governments, in consultation with relevant stakeholders. Canada plans to complete development of the NPA by 1998, which is the International Year of the Oceans.

The NPA will be based on existing federal commitments to prevent and control pollution and habitat degradation under our existing laws and policies and will reflect Canada's commitment to an integrated management approach in coastal areas, as provided for under the Oceans Act. The NPA will help focus and coordinate the involved marine programs in a more cost-effective and efficient manner.

The priority areas of concern with regard to physical alteration and destruction of habitats include: critical habitats, habitat of endangered species, ecosystem components, shorelines, coastal watersheds, estuaries, marine protected areas and small islands.

Responsible Fishing Technology Network

In September, 1997, the federal Minister of Fisheries and Oceans signed a Memorandum of Understanding (MOU) between the Department of Fisheries and Oceans and the Fisheries and Marine Institute, Memorial University, Newfoundland to establish the Responsible Fishing Technology Network. This knowledge-based industry network in conservation harvesting technology is intended to solve problems in responsible fishing technology and bring together expertise and facilities for problem solving and technology transfer.

Aboriginal Fishing Strategy

On both east and west coasts, Aboriginal peoples have been involved in the salmon stock assessment process. Funding through the federal Aboriginal Fishing Strategy has resulted in Aboriginal peoples being directly involved in the collection of statistics and stock assessment data used by the Department of Fisheries and Oceans in their reviews of stock status. On the Miramichi River, local native bands operate the mark-and-recapture trap nets to develop estimates of total run size to the river. These data are presented to a workshop of user groups for input of commentary on the results. Such meetings also provide the forum for the input of local and traditional knowledge. Aboriginal peoples have provided traditional knowledge in the management of Arctic marine mammals, in particular the provision of advice for the harvesting of eastern Arctic bowhead whales.

National Policy on Introductions and Transfers of Aquatic Organisms

The Department of Fisheries and Oceans is currently developing a National Policy on Introductions and Transfers of Aquatic Organisms. The purpose of the policy will be to provide national guidelines for minimizing the impacts of intentional introductions and transfers of aquatic organisms. Types of impacts include introduction of disease, genetic changes, and ecological disturbance. The guidelines will help to ensure that assessment of proposals to introduce and transfer aquatic organisms is consistent in all provinces and territories.

The Fish Protection Act, British Columbia

British Columbia is introducing new legislation, The Fish Protection Act, to protect fish by ensuring healthy fish bearing streams and plentiful stock. Highlights of the Act include:

- *no new bank-to-bank dams on provincially significant rivers;*
- *better protection of water flows for all fish in British Columbia by improving the water licensing process;*
- *designation of "sensitive streams" where fish are endanger;*
- *improved riparian protection for urban streams;*

- *tax incentives for landowners to use conservation covenants to protect fish habitat; and*
- *strengthening the power of local governments to protect fish habitat.*

British Columbia Salmon Habitat Conservation Plan

This plan is a comprehensive approach to address problems caused by past practices and prevent further loss of salon habitat. The two major components of the plan are:

- *supporting community stewardship projects which protect and restore salmon streams threatened by urban development in the Georgia Basin;*
- *coordinating existing initiatives that benefit salmon habitat, for example the Forest Practices Code which provides for the protection of wetlands, rivers, stream and lakes on Crown forest land.*

Alberta Fish Conservation Strategy

This Strategy serves as a plan for the sustainable management of Alberta's fish resources until the year 2005. The Strategy is consistent with fisheries legislation and other wildlife policies and is intended to ensure the maintenance of the province's fish biodiversity.

Wetlands Policy, Saskatchewan

This Policy is aimed at conserving the province's valuable wetlands. Since European settlement, approximately 40% of the wetlands have been lost, and half of the remaining wetlands are threatened by human activities. The objectives of the Wetlands Policy are:

- *to encourage sustainable management of wetlands on public and private lands to maintain there functions and benefits;*
- *to conserve wetlands that are essential to maintain critical wetland species or wetland functions; and*
- *to restore or rehabilitate degraded wetland ecosystems where destruction or alteration has resulted in a significant loss of wetland function or benefits.*

Implementation of the Wetlands Policy is achieved by several key activities, including:

- *increasing public awareness of the benefits of wetlands; increasing monitoring of wetlands to improve decision-making;*
- *integrating government policies that affect the management of wetlands, and coordinating interagency management activities;*
- *developing land-use planning guidelines for wetlands; and*
- *implementing government policies and program to encourage landowners to maintain their wetlands.*

Sustainable Water Use, Manitoba

Manitoba has developed several water policies to ensure sustainable use of this essential resource. Wise management of water is an essential component of Manitoba's sustainable development approach. The Province has identified the following water management goals:

- *to protect and enhance aquatic ecosystems;*
- *to conserve and manage the lakes, rivers and wetlands of Manitoba;*
- *to ensure the long-term sustainability of the province's surface water and groundwater;*
- *to develop and manage the province's water resources to ensure that water is available to meet priority needs*
- *and to support sustainable economic development and environmental quality;*
- *to alleviate human suffering and minimize the economic costs of damages caused by flooding;*
- *to enhance the economic viability of Manitoba's agricultural community through the provision of a comprehensively planned drainage infrastructure; and*
- *to enhance awareness and knowledge of Manitoba's water resources.*

Risk Assessment Protocol For Introduction of Non-Native Species of Fish, Manitoba

Manitoba is responding to increasing concerns regarding the introduction of exotic fish species and other aquatic organisms into the province's aquatic ecosystems. Regulations have been adopted which prohibit the importation, possession or release of any fish eggs or live fish of any species, which could potentially negatively impact Manitoba's fishery resources. Manitoba is also working with Saskatchewan, Alberta and the federal Department of Fisheries and Oceans to prevent the inappropriate introduction of harmful fish into the region. A committee of experts has been formed and a draft Risk Assessment Protocol For Introduction of Non-Native Species of Fish is currently

under review. The Protocol will provide a basis to assess risks of fish introduction to downstream jurisdictions.

Grand Codroy Estuary Wetlands Conservation Program, Newfoundland

While the land surrounding the Grand Codroy estuary is among Newfoundland's most fertile, the estuary itself is one of the Atlantic coast's most important waterfowl habitats for thousands of migrating waterfowl. The estuary was designated a Wetlands of International Importance under the 1971 Ramsar Convention.

The 700 households in the area are involved mainly in cattle farming, commercial fishing and selective forestry, and they contribute to the region's conservation efforts. Several activities which are harmful to the habitat are actively discouraged through the program and by the residents: hunting, cottage development, improper use of pesticides, illegal dumping and the burning of fields for agricultural purposes. As a result, farmers are seeing a greater crop returns and healthier herds because of improved water quality, better soil and less-worn pastures.

River Classification Program, New Brunswick

New Brunswick is famous for its rich tapestry of rives and lakes. These resources have played a essential role in the settlement and development of the province. Provincial rivers and lakes are economic, environmental and cultural resources. New Brunswick has initiated a River Classification Program as part of the New Brunswick Clean Water Act. The river classification system will help to:

- *provide a consistent approach to the management of the provincial river system;*
- *ensure the sustainable use of water resources; and*
- *promote active, public stewardship of lakes and rivers.*

The Program is being established in phases. The first phase of the program is called Outstanding Lakes and Rivers. Lakes and rivers, which receive the Outstanding designation, will be managed to protect natural quality of the water, and plant and animal life.

Sustainable Strategies for Oceans: A Co-Management Guide

This guide, developed by the National Round Table on the Environment and Economy, explains the characteristics of successful co-management regimes, addresses questions related to the application of co-management and provides a check list for evaluating co-management regimes. Case studies are provided on fisheries, coastal zone management, marine protected areas and watershed management.

This guide will be release in 1998 to coincide with International Year of the Oceans.

O. Mining and Biodiversity

Mining activities in Canada involve many land use decisions that have an impact on habitat conservation and environmental quality. Below are two examples of the incorporation sustainable practices into mining decisions which has become a concern by both government and industry.

The Minerals and Metals Policy of the Government of Canada: Partnerships for Sustainable Development

This Policy represents and important source of guidance for federal decisions on minerals and metals in the context of sustainable development. The Policy supports the protection of certain marine and terrestrial areas from development as essential contributions to Canada's environmental health, diversity and ecological processes.

Whitehorse Mining Initiative

This initiative includes an Accord among government, the mining industry, labour unions, Aboriginal peoples and environmental organizations which presents a vision for ensuring a healthy mining industry in the context of maintaining healthy and diverse ecosystems in Canada. The Accord assists in meeting Canada's commitments to the Convention on Biological Diversity in various ways, including:

- *calling for environmentally responsible mining activities;*

- *requiring comprehensive reclamation plans that return viable and self-sustaining ecosystems;*
- *identifying responsible parties to undertake reclamation of old mine sites that pose a health, safety or environmental hazard, and to establish a fund where responsibility for reclamation can not be assigned;*
- *recommending that project-specific environmental assessments are effective and well defined, and are conducted in the broader context of land-use planning; and*
- *recognizing the need for protected areas as part of Canada's approach to conserving biodiversity.*

West Kitikmeot Slave Area Study Society, Northwest Territories (NWT)

The West Kitikmeot Slave Area Study Society is a partnership formed in 1995 of Aboriginal and environmental organizations, the federal government and the NWT Chamber of Mines. This partnership ensures that development which occurs in the region respects Aboriginal cultural values, encourages community self-reliance and respects the environment. Funding for the Society is made jointly by mining companies and the federal and territorial governments.

All partners are committed to increasing understanding of the changes caused by development in order to improve management of land and resources. The partnership demonstrates how Aboriginal peoples, governments, environment groups and industry must work together to anticipate, prevent and resolve land and resource use conflicts.

Mining Site Rehabilitation Program, Quebec

In order that mining sites might be re-colonized by the various animal or vegetable species, the Quebec Ministère des Ressources naturelles instituted a rehabilitation program for mining sites retroceded to the Crown. So far, 325 hectares out of a total of 498 (65%) have already been rehabilitated. The program to encourage the rehabilitation of abandoned mining sites has already led to the rehabilitation of an additional 100 hectares on six sites. Since 1996, all mining companies have submitted plans for the rehabilitation of their sites, aimed at cleaning up the site after its use, thus allowing a more rapid recolonization of the area and the restoration of biodiversity.

P. Wildlife Conservation

Saving the Right Whale

On October 21, 1997, Canada, the U.S. and the World Wildlife Fund agreed to work together to develop a recovery plan to save the endangered North American right whale. The recovery plan will include participation of shipping interests, fishers, whale-watching groups on how to save the right whale.

Once hunted for their baleen plates and oil, the right whale has been protected from international whaling since 1935. Current estimates of the population indicate that there are no more than 500 individuals, with 295 found in the North Atlantic Ocean and 200 in the North Pacific Ocean. The principal reasons for the decline of the right whale are ship collisions, entanglement in certain types of fishing gear, degradation of habitat (especially areas where they feed) and disturbance.

In 1993, Canada's Department of Fisheries and Oceans established right whale conservation zones in the Bay of Fundy and off the southern tip of Nova Scotia in the Roseway Basin area. Possible recovery measures might include types of fishing gear used in areas where the whales swim to altering shipping lanes to how many whale watching boats can observe the right whales.

Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act

In 1996 Canada put in place a new legislative tool the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act. The overall purpose of the law is to protect wild species, especially those at risk from over-exploitation caused by poaching and illegal trade, and to safeguard our ecosystems from the introduction of harmful wild species.

British Columbia Wildlife Strategy

This provincial strategy provides a vision and framework to ensure the province's wildlife heritage remains for future generations, by identifying priorities, developing partnerships and mobilizing action. The Strategy illustrates the importance of creating strategic plans, as prescribe in Article 6(a) of the Convention.

Restoration and Rehabilitation, British Columbia

British Columbia is committed to the obligations contained in the Convention on Biological Diversity and the Canadian Biodiversity Diversity, including a commitment to restore degraded ecosystem and restore threatened wildlife populations where feasible. Many activities are being initiated at both the species and ecosystem levels, including:

- *The development of recovery plans for several species designated most at risk: Marbled Murrelet, Spotted Owl, Sage Thrasher, White-headed Woodpecker, Peregrine Falcon and Wood Bison. In addition, a re-introduction program for the endangered Vancouver Island Marmot (Canada's only endemic mammal species), was initiated in 1996.*

- *Several ecosystem restoration projects have been initiated under the Watershed Restoration Program of Forest Renewal. Over 240 projects are currently underway with about $90 million be allocated thus far.*

Grizzly Bear Conservation Strategy, British Columbia

Over half of Canada's grizzly bears live in British Columbia, and this population is threatened. The Strategy was created to provide a basis for ensuring the long-term survival of the grizzly bear. Since 1995 the several actions have been taken, including:

- *increased fines for illegal harvesting of grizzly bears; new hunting restrictions, including banning of hunting in some areas;*
- *providing fund to bear-proof garbage dumps;*
- *new regulations to ban the trade or possession of bear parts including gallbladders, paws and genitalia;*
- *the creation of Grizzly Bear Conservation Areas such as the Khutzeymateen; and*
- *the establishment of a Grizzly Bear Scientific Advisory Committee.*

Provincial Wildlife Act, Saskatchewan

In 1997 Saskatchewan amended the Provincial Wildlife Act to better protect the province's biodiversity. One of the key amendments of the Act expanded the Province's mandate to protect and manage all wild plants and animals in the province. The legislation also ensures a high level of protection for species that are designated at risk.

Control of Alien Species, Alberta

The Government of Alberta has taken action to address the negative impacts to the environment and economy of unwanted exotic species. The Wildlife Act allows the Minister to evaluate and forbids, where warranted, the importation or release of exotic species being considered for agricultural or other uses in order that they not pose a threat to Alberta's wildlife. The Agricultural Pests Act and the Weed Control Act provide controls over introduced species that are considered to be pests or weeds.

Endangered Species Recovery Program, Alberta

This Program's aim is restore all species classified as threatened or endangered in Alberta to viable population levels. This Program is integrated with the national initiatives of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Recovery of Nationally Endangered Wildlife (RENEW). Recovery plans have been developed for the woodland caribou, swift fox, peregrine falcon, burrowing owl, trumpeter swan, white pelican, whopping crane, ferruginous hawk, piping plover, loggerhead strike, northern leopard frog, bull trout, golden trout, lake sturgeon, St. Mary sculpin and the western blue frog.

Wildlife Co-management Agreement, Northwest Territories and Aboriginal Peoples

The Inuit people of the Nunavut region in northern Canada have entered into an agreement with the Government of Canada to co-manage wildlife. The Nunavut Wildlife Management Board has been established by the Nunavut Land Claims Agreement and includes both government and Inuit members. The Board's primary task is to act as an institution of government. It is responsible for wildlife management within the Nunavut region, including developing wildlife policies, establishing harvesting guidelines, initiating research activities, and overseeing a variety of management activities that ensure sustainable use of wildlife resources.

The establishment of the Nunavut Wildlife Management Board signals recognition of the need for an effective management system that complements Inuit harvesting rights and priorities, and recognizes Inuit systems of wildlife management as contributing to the conservation of wildlife and their habitat.

Slave River Lowlands Wood Buffalo Recovery Plan, Northwest Territories (NWT)

The Deninu Kue' First Nation have initiated a recovery plan for the Hook Lake bison herd. Bison are extremely important for ecological, economic and cultural reasons to many Aboriginal communities in the NWT. The Hook Lake bison herd is located in the Slave River Lowlands near Wood Buffalo National Park, and once number 1700 individuals. The population declined rapidly in the 1970s and 1980s, and in 1995 the approximate herd size was 200.

Unfortunately, two diseases have been introduced to bison herds in northern Canada. Bacteria causing bovine brucellosis and tuberculosis were introduced to the region with imported bison from the south. Controlling the spread of the disease will help to ensure the long-term conservation of the Hook Lake bison herd.

The goals of the recovery plan are:

- *to restore a healthy herd of bison to the Hook Lake area that is free of the diseases bovine tuberculosis and brucellosis;*
- *to preserve the genetic diversity of the Hook Lake Bison Herd'*
- *to salvage healthy bison from the Hook Lake area; to preserve and enhance the Hook Lake ecosystem; and*
- *to develop economic opportunities from the Hook Lake Bison Herd.*

St. Lawrence River Region, Quebec

The federal government is collaborating with several farmers and non-government researchers from Ducks Unlimited Canada and the l'Université du Québec to examine different farming techniques to promote waterfowl nesting in areas along the St. Lawrence River. The aim of the research is to demonstrate, how biodiversity conservation can be integrated with sustainable agricultural practices.

Inland Fish and Wildlife Advisory Council, Newfoundland

In 1997, the government of Newfoundland formed the Inland Fish and Wildlife Advisory Council which operates at arms length. The Council includes members from the public, resource users and other stakeholders in the decision-making process. The Council's primary mandate is to develop recommendations and provide advice to the Province on inland fish and wildlife management issues.

One of the most pressing projects of the Council is the development of the Conservation Stamp Program. This program will create a fund administered by the Council, and allow hunters, anglers and others who appreciate wildlife to make a direct contribution to the maintenance and enhancement of wildlife and fish habitats. Funding will be obtained by the purchase of a conservation stamp which will be mandatory to validate any provincial fish and wildlife licence. Funds will be directed at new fish, wildlife and conservation programs.

Recovery Plan for Newfoundland Marten

The Newfoundland population of the American Marten (martes americana atrata) was designated as threatened in 1986 and subsequently revised to endangered in 1996. Many factors contributed to its decline, including habitat loss due to logging, forest fires and insect infestations as well as mortality due to accidental trapping, predation and disease.

The recovery goal for this population is to enhance current population numbers, eventually establishing two discrete populations with at least 350 -400 members in each population. This will be accomplished by protecting and enhancing habitat, introducing martens from captive breeding programs and reducing accidental trapping mortality. Research and monitoring are key elements of the overall strategy.

Newfoundland and Labrador Conservation Corps

The Newfoundland and Labrador Conservation Corps is a highly successful, non-profit conservation initiative launched in 1993 by the Economic Recovery Commission and the Province. The program is designed to integrate education, training and work

experience for young people aged 16 to 27, in the areas of environmental enhancement and conservation. These youth are organized as "Green Teams" throughout the province and provide advice, assistance and human resources to community groups and organizations interested in protecting or enhancing their natural resources and heightening environmental awareness.

Reintroduction of the Eastern Bluebird, Hydro Quebec

Since 1979, this Hydro-Quebec program has aimed at reintroducing the Eastern Bluebird into Quebec. Already over 500 nesting boxes have been installed on power line towers and the rate of occupation is approximately 25%. Other Hydro-Quebec programs have resulted in the installation of an additional 220 nesting boxes, both on power line towers and distribution poles, and the use of wetlands and small ponds to reintroduce the Western Chorus Frog into southern Quebec where it was once found in large numbers.

Shell Canada

Shell Canada, through its contribution to the World Wildlife Fund Canada, supports the ongoing study of grizzly bears in the Bow River Watershed, Alberta. This study is aimed at determining the impact of land use on grizzly bear habitat. The results of the study will be used to reduce the impact of Shell's activities on this habitat.

Canadian Forest Products Ltd.

Since 1990, Canadian Forest Products Ltd., British Columbia is following eighty-seven Bald Eagle nests (nest location and characteristics, success of reproduction) to ensure the protection of nesting habitat in the long-term. It also conducts surveys of rare and socially important species such as bald eagles, marbled murrelets, owls, northern goshawk, and deer. It undertook habitat research studies of breeding birds, small mammals, bats and bears, monitored plants and vertebrates in forest fragments of varying size, studied fish and stream invertebrates.

Ainsworth Lumber Co., Canadian Forest Products and Weyerhaeuser Canada

A preliminary list of potential rare and endangered plants in the Grande Prairie Forest Region in northern Alberta has been developed for three partners: Ainsworth Lumber Co., Canadian Forest Products and Weyerhaeuser Canada. The list also provides ecosite and community type information on the plants.

Wildlife Tomorrow, Saskatchewan

Wildlife Tomorrow is an example of a voluntary landowner conservation program. Since its creation in 1974, it has included over 1400 participant landowners. Voluntary agreements are negotiated between the Saskatchewan Federation and local landowners whereby the landowner retains title of the land but pledges to conserve its wildlife habitat. Landowners receive recognition for their efforts, but no financial compensation. Currently the Federation has obtained agreement to conserve over 16,000 hectares of wildlife habitat on private lands.

Q. International Cooperation - Sharing our Experience

Canada is in engaged in a number of partnerships with other countries to support the conservation and sustainable use of biodiversity. Some examples include:

The Arctic Council

The Arctic Council was established in 1996 by the Arctic Declaration to act as a circumpolar forum for cooperation interaction and coordination among Canada, Denmark, Finland, Iceland, Norway Sweden, the United States and the Russian federation, on sustainable development and environmental protection in the Arctic. The Arctic Declaration, signed by these nations, includes the Inuit Circumpolar Conference, the Saami Council (Scandinavia, Finland and Russia) and the Association of Indigenous Minorities of the North, Siberia and the Far East if the Russian Federation.

Several Arctic Environmental Protection Strategy programs continue under the Arctic Council:

- *Arctic Monitoring and Assessment Program;*
- *Protection of the Marine Environment in the Arctic;*
- *Emergency, Prevention, Preparedness and Response; and*
- *Conservation of Arctic Flora and Fauna.*

Program for the Conservation of Arctic Flora and Fauna (CAFF)

Canada is an active participant in the CAFF Program which was established to address the needs of arctic species and their habitat in the rapidly developing arctic region. CAFF is one of four programs funded by the Arctic Environmental Protection Strategy which was adopted by Canada, Norway, Denmark / Greenland, Iceland, Russia, Finland and the U.S. in 1991. The main goals of CAFF are to:

- *conserve arctic flora and fauna and their diversity of habitats;*
- *protect the arctic ecosystem from threats;*
- *improve conservation management laws, regulations and practices in the arctic; and*
- *integrate Arctic interests in the global conservation fora.*

Elements of the Program include:

the Co-operative Strategy for the Conservation of Biological Diversity in the Arctic Region which includes strategic directions relating to the Convention on Biological Diversity and a framework to guide conservation and sustainable use of arctic biodiversity; the Circumpolar Protected Areas Plan - Strategy and Action Plan signed by the eight circumpolar nations provides an overall arctic habitat conservation strategy. Between 1996 and 1997 nine new protected areas totaling 104,702 square kilometres were added to the existing network of arctic protected areas; and the Circumpolar Eider Conservation Strategy and Action Plan aims at the sustainable use of eider ducks.

Ecological Regions of North America: Toward A Common Perspective

The Commission for Environmental Cooperation (CEC), created under the terms of the North American Agreement on Environmental Cooperation, has developed a framework for the study of North America ecological regions. The study also includes a discussion on case studies throughout North America, including one on biodiversity conservation in North America's Arctic region. This study is the result of international cooperation by the Trilateral Committee on Environmental Information, the CEC Working group and the Canadian Council on Ecological Areas.

Sustainable Use of Biodiversity (SUB), International Development Research Centre

This program aims to enhance the capacity of local and indigenous peoples to protect, access and sustainably use biodiversity and knowledge of biodiversity, and undertakes the following:

- *support of local and indigenous peoples and institutions in Africa, Asia, and Latin America in undertaking research either independently or in collaboration with relevant formal-sector institutions;*
- *support of research at the local, national, and international levels that focuses on enhancing the sustainable use of biodiversity by local communities;*
- *support the development of appropriate and equitable policies governing biodiversity;*
- *promotion of new methodologies for enhancing, monitoring, and evaluating the sustainable use of biodiversity; and*
- *enhancement of communication between the local caretakers and the beneficiaries of biodiversity.*

The initiative supports research that concentrates on:

- *developing models for intellectual property and traditional resource rights to ensure equitable sharing of the benefits of biodiversity;*
- *promoting indigenous and local knowledge of biodiversity and the institutions needed to protect and use this knowledge;*
- *involving communities in the development and conservation of agricultural and aquatic biodiversity and supporting the development of incentives, methods and policy options for in situ or on-farm conservation; and*
- *supporting income-generating strategies and incentives for the sustainable use of the products of biodiversity, especially medicinal plants and non-timber forest products.*

Research projects funded by SUB include:

1. The Community Biodiversity Conservation and Development Program (CBDC)

This program has been initiated in 11 countries wherein global partners and local and national institutions whose activities promote the role of farmers as community innovators in the development, conservation, and utilization of plant genetic resources are brought together. The aim is to document and validate farmers' knowledge and systems of innovation. The program's activities focus on participatory research, which involve farmers and scientists working together in the field to increase productivity, improve farmers' livelihood, and maintain genetic diversity. The CBDC program is expected to have an impact on the generation, conservation, maintenance, and sustainable use of genetic resources at all levels - from farmers' fields to international institutions.

2. Medicinal Plant Regional Networks: Africa

An alliance of projects and network activities has aimed to respond to the regional research priorities of medicinal plants and traditional medicine in Africa. Research partners include universities, NGOs, government organizations such as botanical gardens and ministries of health. Individual projects or mini-networks have organized regional workshops, produced publications, and developed linkages among researchers. SUB is supporting a series of three regional workshops (Francophone, Anglophone, Bilingual) in order to facilitate discussion and information exchange of methodological and logistical approaches to addressing locally identified research priorities, to explore networking possibilities, and to continue dialogue with research partners to inform IDRC's support of medicinal plants activities in the region.

3. Traditional Medicine for the Islands (TRAMIL)

This Program is a multi-disciplinary research network promoting the popular use of medicinal plants through applied scientific research. The TRAMIL network of projects aims to assist communities to develop gender-sensitive strategies to meet health care needs through the scientific validation (safety and efficacy) of popular plant-based remedies and the development of community-based conservation programmes. Dissemination and application of research results are key aspects of the TRAMIL program at the community and the national level. SUB plans to expand its support to other countries in South America, and to facilitate linkages and communication among researchers in the region.

4. The South Asia-based IDRC Medicinal Plants Network (IMPN)

The IMPN program has assisted researchers to respond to regional needs, particularly in India, Bangladesh, Nepal and Sri Lanka. Three regional landmark meetings organized by IMPN have mobilized expertise, increased information exchange, and helped promote regional cooperation, particularly among NGOs, academic institutions, government organizations, the private sector, and donor agencies. Notably, a Code of Conduct for Research on Medicinal Plants was established to support biodiversity conservation, and the program has recently prioritized threatened and vulnerable medicinal plant species which required sustainable production efforts for the region. In December 1998, IMPN will be hosting a workshop on industry collaboration in medicinal plants research activities. IMPN will expand to other countries in South and Southeast Asia, including Pakistan in 1998-1999, in order to foster regional cooperation, and will place greater emphasis on community-based research.

5. Policy Initiatives in Zimbabwe and the SADDC Region

In March 1997, SUB funded a workshop in Zimbabwe on plant intellectual property rights, which involved government and civil society representatives. The workshop produced a review of Zimbabwean intellectual property law and the identification of various policy interests that could be addressed through intellectual property policy reform. The workshop identified areas for further research: the need for intellectual property-style right for indigenous "know-how" contributions to plant-related innovations in the formal sector; plant intellectual property rights that the

Zimbabwean government could implement; the need to implement regulations for foreign access to Zimbabwean biodiversity; and, the need to investigate the possibility of regional agreements regarding these research issues.

SUB is currently funding a proposal for a follow-up workshop, the objective of which is to discuss policy alternatives in more detail; and ultimately, to draft legislation for the advancement of local knowledge recognition, equitable sharing in the benefits of the use of that knowledge and the promotion of local, national and regional policy priorities.

6. World Fisheries Trust: Stimulating Canadian Partnerships in Aquatic Biodiversity Conservation and Use

Canadian First Nations have raised concerns about threatened and vulnerable fish stocks. In 1979, a group of cryopreservation researchers at the University of Victoria began applying their technologies to conserve threatened stocks of North American and tropical fish (eg. milkfish, tilapia, Colossoma). This provided the beginnings of a genetic conservation movement in which Canada has become a world leader. From these initial technological beginnings sprang a variety of organizations ultimately coalescing in the formation of an non-governmental organization, the World Fisheries Trust. This formation has spun-off a variety of other partnerships both in the technology as well as the policy spheres bringing in the Shuswap Nation, the Musqueam Indian Band, Carrier-Sekani Tribal Council, Nuu-chah-nulth First Nation and provincial and federal agencies. Overseas, partnerships have been developed with universities and hydroelectric companies in several Latin American countries.

7. The Indigenous Knowledge Programme (IKP)

The IKP program is a global initiative of the Indigenous Peoples' Biodiversity Network, international institutions and national agencies. The IKP's mission is to support indigenous peoples' activities that help to preserve and protect local knowledge and garner recognition and compensation for their innovations and intellectual contributions. The IKP focuses on indigenous knowledge systems and the impact they have on the conservation of biological diversity; the continuation and revitalization of indigenous cultures; and the reduction of poverty among indigenous communities and laying the foundation for sustainable livelihoods.

The IKP supports:

- *concrete activities at the community level that aim at the sustainable development of indigenous communities,*
- *research by and for indigenous peoples, and capacity building to establish priority research topics and to direct research activities, and*
- *activities of indigenous peoples at the policy level to ensure that their concerns with regard to the conservation and protection of indigenous knowledge will be included in the decision-making processes at the international level and national level.*

The IKP has facilitated discussions on traditional resource rights with national governments and become the Convention on Biological Diversity Secretariat partner responsible for the Expert Group preparing material for intersessional meetings on indigenous knowledge and Article 8j of the Convention. The Small Grants Programme of the IKP has attracted applications by many indigenous researchers worldwide and the program in general has acquired significant support from other donors.

Working in Francophone Africa, Canadian Museum of Nature

Following the Summit and Canada's commitment to comply with the Convention on Biological Diversity, the Canadian Museum of Nature signed a memorandum of understanding with some twenty countries, mainly Francophone countries in Africa, for activity development linked to the commitment of those countries within the framework of the Convention. The countries are bound by the provisions of the Convention, including the requirement to develop a national strategy on biodiversity.

The Canadian Museum of Nature, because of its scientific and technical expertise, offers all the services necessary to help countries conform to the provisions of the Convention, to ensure the preservation of

biodiversity, the sustainable use of biological resources and a fair and equitable sharing of the benefits derived from the use of genetic resources.

Within the framework of the Convention, the Canadian Museum of Nature has helped Guinea, Burkina Faso and the Ivory Coast for the last two years. Soon, Mali, Togo, Benin, Guinea-Bissau, Madagascar, along with other countries of Africa, the West Indies and many more will join the group working in this area.

Community Environmental Conservation Program in China and Vietnam, University of New Brunswick

Canada's support to the people of China and Vietnam through this unique community environmental conservation program, led by the University of New Brunswick, was announced on October 24, 1997.

Rural areas in Vietnam and China especially communities living near mangrove and tropical forests are threatened by starvation due to degradation of the ecosystem caused by overexploitation of natural resources, use of new technologies, rapid population growth and economic expansion.

Participants in the five-year program will implement community-oriented field training in habitat protection and species conservation in China and Vietnam. The program includes pilot projects to train officials and academics in techniques in conserving natural ecosystems, promoting sustainable use of natural resources in targeted communities and establishing a network to monitor results.

Other partners are Canadian International Development Agency, Saint Mary's University, Nova Scotia Agriculture College, DalTech, Vietnam National University and China's Xiamen University and Fujian Agricultural University.

The Western Hemisphere Shorebird Reserve Network (WHSRN), Saskatchewan

The WHSRN is an international conservation initiative designed to protect key habitats and resources used by shorebirds throughout their migration ranges. Many species of shorebirds depend on a chain of critically important sites to complete their annual migrations, and for their conservation to be successful, all links in the chain must be protected. As of February 1995, the Network consisted of 31 officially recognized sites in 7 countries, stretching from Tierra del Fuego in Argentina to Alaska, protecting approximately 10 million hectares of habitat and 30 million shorebirds.

Canada is an active partner in the WHSRN. The Bay of Fundy became Canada's first WHSRN reserve. In 1994, two more areas, Quill Lakes and Last Mountain Lake, both located in Saskatchewan, were added to the Network. The Quill Lakes area is a complex of fresh and saline lakes, marshes, potholes and associated native prairie which provides exceptional habitat for many species. Nearly 1 million birds use the area, including some endangered or threatened species. In 1997, Chaplin and Old Wives Lakes were designated as Canada's fourth and fifth WHSRN reserves.

International Plant Genetics Research Institute (IPGRI)

Canada is an active participant in the IPGRI. Specifically, Canada gives financial support to the Consultative Group on International Agricultural Research, the mandate of which is to advance the conservation and use of plant genetic resources for the benefits of present and future generations.