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Sustaining Alberta's Biodiversity

An Overview of Government of Alberta Initiatives
Supporting the Canadian Biodiversity Strategy

Lorna Bennett

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Alberta
ENVIRONMENTAL PROTECTION

Sustaining Alberta's Biodiversity

An Overview of Government of Alberta Initiatives
Supporting the Canadian Biodiversity Strategy

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Sustaining Alberta's Biodiversity – Minister's Message

I am pleased to present the report *Sustaining Alberta's Biodiversity: An Overview of Government of Alberta Initiatives Supporting the Canadian Biodiversity Strategy*. The report is the Government of Alberta's first on its progress under the Canadian Biodiversity Strategy.

Biological diversity is an important component of our environment. Unfortunately, biological diversity around the globe is under threat and declining. The Canadian Biodiversity Strategy was developed to sustain and promote biological diversity in Canada to help combat this decline. Alberta signed a statement of commitment, along with the federal government and all other provinces and territories, to use the strategy as a guide for actions to conserve biological diversity.

Alberta is blessed with a diverse and healthy environment composed of many types of ecosystems. As well as supporting a wide array of plant and animal species which provide a wide range of benefits for all Albertans, these ecosystems provide benefits such as clean air and water. Preserving these ecosystems is therefore a special responsibility.

The Government of Alberta, in keeping with our commitment to People, Prosperity and Preservation, continues to meet the challenge of that special responsibility through a variety of initiatives. As this report details, many such initiatives and programs have been undertaken and are ongoing. Some help conserve biological diversity by ensuring the viability of species and preserving natural habitat. Others involve studies that will improve our understanding of ecosystems and enable us to better manage natural resources on a sustainable basis. And still others involve conserving biological diversity through legislation, and through partnerships with other governments and organizations both nationally and internationally.

This report is not a complete list of government biological diversity initiatives. Nor does it list all the important efforts and activities undertaken by individuals, other non-governmental organizations and groups, industry and other levels of government in Alberta who are helping achieve the Canadian Biodiversity Strategy's goals. Nevertheless, I trust this report will serve as a useful reference and educational tool for all those who care about our environment and the preservation of biological diversity in our province.

A reader's survey can be found at the end of this report. I encourage you to complete and return it to the address given. Your responses and comments are welcome and important.

A handwritten signature in dark ink, reading "Ty Lund". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Honourable Ty Lund
Minister of Environmental Protection

Highlights

In late 1995 the Government of Alberta, along with the governments of other provinces, territories and Canada, committed to using the Canadian Biodiversity Strategy as a guide for conserving biodiversity and ensuring the sustainable use of biological resources.

The Government of Alberta has established and implemented many programs over the years that benefit biodiversity in a variety of ways. Many activities carried out as part of these programs are done in partnership with individuals, organizations, the private sector and other governments. As well, many individuals, organizations, private industry and municipal governments have undertaken important activities on their own initiative.

This report highlights major recent and ongoing Government of Alberta policies and programs conserving biodiversity and ensuring sustainable development within the goals of the Canadian Biodiversity Strategy.

Goal 1. To conserve biodiversity and use biological resources in a sustainable manner.

By creating new parks, ecological reserves and lands under other designations, the *Special Places* initiative will complete Alberta's network of protected areas in 1999. Special Places will represent environmental diversity throughout the province's six natural regions and 20 subregions. This program is a cornerstone of Alberta's efforts to conserve biodiversity.

Working with many partners, the government is preparing or has prepared conservation strategies, such as the **Alberta Forest Conservation Strategy**, **Prairie Conservation Action Plan** and **Fish Conservation Strategy** for Alberta, which focus on important landscapes and biological groups. Preparation of a strategy to protect the aquatic environment, including matters relating to the conservation of biodiversity, is also a requirement of the new *Water Act*.

In addition to habitat protection and conservation strategies, **species management plans** are prepared for individual threatened or endangered species.

Goal 2. To improve our understanding of ecosystems and increase our resource management capability.

Successful conservation programs require information on plant and animal populations, their habitat and distribution. Several monitoring and inventory programs are underway, and contribute to databases such as the **Alberta Natural Heritage Information Centre** and the **Biological Species/Observation Database**. **Status of Wildlife** reports assess the population status of non-fish vertebrates. The Government of Alberta also supports important ecosystem research through the **Sustainable Forest Management Network of Centres of Excellence** at the University of Alberta and the **Foothills Model Forest**.

Public lands are managed through an integrated resource management process. It recognizes the diversity of biological resources and the need to protect them, while allowing a variety of sustainable land uses.

Goal 3. To promote an understanding of the need to conserve biodiversity and use biological resources in a sustainable manner.

Albertans have a keen interest in their province's biological resources and want to be informed about resource conditions. Annual **State of the Environment reports** and Fact Sheets provide Albertans with basic information about environmental conditions and trends, including data on biodiversity. The Department of Environmental Protection also produces **educational materials** about Alberta's plants and animals for teachers and students interested in biodiversity.

Goal 4. To maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources.

Several acts and regulations govern the protection and use of Alberta's biological resources. These laws include special provisions aimed at the protection of endangered species and their associated habitats. The **Wildlife Act** and regulations establish laws related to hunting, trapping and other activities, and include protection of plants, fish and insects. Alberta's **Water Act** and regulations conserve water and protect aquatic habitats.

Habitat on public lands can be legally protected as **parks, ecological reserves, wilderness areas**, and other designations. Recent legislative changes allow landowners to establish conservation easements on private lands.

Goal 5. To work 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.

Alberta's prairie and parkland wetlands are the breeding grounds and staging areas for large numbers of North America's ducks and geese. Alberta is an important partner in the **North American Waterfowl Management Plan**, a multi-million dollar agreement between Canada, the United States and Mexico to conserve North America's migratory waterfowl. Four internationally important wetlands, known as **Ramsar** sites, are located in Alberta.

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Background

Biological diversity, or biodiversity, refers to the variety of species and ecosystems and the ecological processes of which they are a part. The management of biodiversity is an issue that affects the quality of life of all Canadians and human societies on a global basis. The biodiversity of ecosystems is a source of food, clothing and shelter yet its importance is largely unappreciated and poorly understood. Human economies are tied to the sustainable development of biodiversity resources. Shifts in biodiversity caused by natural processes, like fire, flooding, and changes in ocean temperature, or by human activities, can alter the resource base of regional economies, sometimes to the detriment of human populations.

Mounting global concern over the decline of biodiversity led to the negotiation of the United Nations Convention on Biological Diversity (also known as the Rio Convention) in 1992. In December 1992, with the support of the provinces and territories, Canada became the first industrialized country to ratify the Convention. As required by the Convention, Canada developed the Canadian Biodiversity Strategy (CBS) to guide the conservation of Canada's biodiversity and sustainable use of biological resources. The Alberta government actively participated in the development of the CBS and signed a Statement of Commitment supporting the strategy in November 1995.

Biodiversity

Biodiversity is the variability among living organisms and the ecological complexes of which they are part. It includes within species, between species and diversity of ecosystems.

Conservation of biodiversity means managing human uses of resources to maintain ecosystem, species and genetic diversity and the evolutionary and other processes that shaped them.

- Canadian Biodiversity Strategy, 1995

The Canadian Biodiversity Strategy contains five goals and numerous strategic directions.

The five goals are:

- To conserve biodiversity and use biological resources in a sustainable manner.
- To improve our understanding of ecosystems and increase our resource management capability.
- To promote an understanding of the need to conserve biodiversity and use biological resources in a sustainable manner.
- To maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources.
- To work 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.

The CBS stresses the need to understand the current status of species and their populations, population trends, and the causes of population and species changes in order to develop sound biodiversity conservation and sustainable use strategies. The strategy recognizes existing constitutional and legislative responsibilities for biodiversity, and emphasizes the need for inter-governmental cooperation between the provincial, territorial, and federal governments. The governments have committed to pursuing the directions of the CBS—in cooperation with the public and stakeholders—according to their policies, plans, priorities and fiscal capabilities. In committing to the CBS, governments are also responsible for reporting periodically on actions, underway or planned, to implement the strategy. This document reports on the activities the Alberta government has undertaken to help achieve the goals of the CBS.

Overview of Alberta

Physical Geography: Alberta is a land-locked province with a temperate continental climate and a landbase of 661 185 km², of which 16 800 km² are covered in fresh water. Sixty-two percent of the land is owned by the provincial government, including parks and wilderness areas, forested lands subject to multiple use management, and land under disposition. Twenty-eight percent is privately owned. Ten percent is under federal tenure, mostly in national parks.

The landscape is diverse, with the rugged Rocky Mountains in the western parts, and generally flatter landscapes shaped by glaciers and glacial lake deposits elsewhere in the province. In southern Alberta the land slopes from west to east; in northern Alberta the slope is from southwest to northeast. Elevations range from 3747 metres above sea level (Mount Columbia) to 215 metres in northeast Alberta.

Human Population: There are 2.7 million people in Alberta, 65 percent of whom live in incorporated cities. Most Albertans live in the two largest urban centres of Edmonton or Calgary and the corridor between them. In 1996, Edmonton's population was 616 000 and Calgary's was 790 000. Twenty percent of Albertans live in rural areas, but less than 10 percent farm for a living.

Economy: Natural resources are the keystone of Alberta's economy, but they also generate demand for manufacturing and service industries. In 1995, the total value of goods and services produced in Alberta – its Gross Domestic Product (GDP) – was \$78 billion. Manufacturing and service industries accounted for 70 percent of this total.

Energy industries contributed approximately \$10 billion to the GDP. Agriculture and its associated food and beverage industries contributed over \$4 billion, with wheat and livestock being major export products. Recently, forestry has been responsible for large percentage increases in the province's economic activity. Forestry and its related wood and paper manufacturing industries contribute about \$1.8 billion. Tourism is a fourth cornerstone of the Alberta economy and makes a contribution to the GDP similar in size to forestry. The latter three sectors are directly tied to the sustainable use of biological resources.

Biodiversity: Alberta has six distinct natural regions: Grassland, Parkland, Foothills, Boreal, Rocky Mountain, and Canadian Shield (*see map this page*). Within each natural region, the climate and vegetation characteristics are similar. Each region can be further subdivided into subregions, of which there are 20 in the province.

Alberta's Natural Regions

1. Boreal Forest Natural Region
2. Rocky Mountain Natural Region
3. Foothills Natural Region
4. Canadian Shield Natural Region
5. Parkland Natural Region
6. Grassland Natural Region

Within Alberta's natural regions, there are 91 species of resident mammals, 250 of resident breeding birds, 60 of fish, 10 of amphibians, and eight of reptiles. Over 90 percent of Alberta's populations of mammals, birds, fish, reptiles and amphibians are considered secure. Preliminary work has identified 36 species that are at risk, or may be at risk of extirpation (local extinction) in Alberta. An estimated 20 000 insect species exist in Alberta, although there are thousands of insect and invertebrate species not classified and catalogued. Alberta is also home to about 1650 species of flowering plants, 650 species of moss, a similar number of lichens, and 450 fungi species. About one-quarter of Alberta's native plant species are considered rare.

morels

Introduction

Alberta's natural regions and the biodiversity they contain are affected by human activities and natural influences, including urban growth, agriculture, large-scale industrial activities such as forestry and petroleum extraction, and climate change. Environmental pressures in Alberta have changed in intensity and nature in the past, as they will in the future.

The Government of Alberta keeps abreast of environmental issues and needs, and makes changes or undertakes new actions to address them as the need arises. *Sustaining Alberta's Biodiversity* describes current Government of Alberta policies, activities, and plans that meet the goals of the Canadian Biodiversity Strategy. The related work of non-government organizations and industry is identified where it is done in partnership with government.

This report does not attempt to catalogue all the many efforts of individuals, groups, and industry; nor is it a complete compendium of government initiatives that address biodiversity needs. Instead, it focuses on initiatives with a strong connection to the goals of the national strategy. Furthermore, the report does *not* evaluate individual or collective successes of the initiatives. These will be considered in follow-up reports.

Sustaining Alberta's Biodiversity begins with a broad overview of the legislative and policy basis for conservation and sustainable use of biological resources in Alberta, and key directions being pursued. To facilitate comparison, the remainder of the report is organized around the goals and directions of the Canadian Biodiversity Strategy. Although many initiatives described here address several strategy goals, each is listed under the goal with which it is most strongly connected. Detailed information can be obtained by contacting the sources listed at the end of the report.

A Framework for Conservation of Biodiversity in Alberta

Within the Government of Alberta, the responsibility for the conservation of biodiversity and the sustainable use of biological resources is shared by a number of Ministries and agencies. The Ministry of Environmental Protection, which consists of the Department of Environmental Protection, the Natural Resources Conservation Board, and the Environmental Appeal Board, plays a central role through its mandate to manage renewable natural resources (air, water, land, timber, fish and wildlife) and the systems in which they occur (airsheds, watersheds, parks, forests and ecosystems). Other Ministries and agencies, such as Agriculture, Food and Rural Development; Community Development; Economic Development; Energy; and the Alberta Energy and Utilities Board also play important roles in conserving biodiversity.

The mandates and responsibilities of government agencies regarding conservation of biodiversity and the sustainable use of biological resources are defined at the broad level by a provincial legislative and policy framework. While the Canadian Biodiversity Strategy serves as a guide for conserving biodiversity, Alberta's legislation and policies provide broad level mechanisms to implement the strategy's directions.

The basis for Alberta's biodiversity legislative and policy framework is found in the Vision of Sustainable Development in Alberta. The vision, created by the Alberta Round Table on Environment and Economy, was unanimously adopted by the Legislative Assembly in June 1993. The vision has nine elements, including one which specifically calls for the preservation of Alberta's biological diversity.

The Government of Alberta, with input from the public, has also put considerable effort into upgrading and refining its environmental and natural resources management legislation over the past decade. Recently the *Environmental Protection and Enhancement Act* was proclaimed to more effectively protect air and water quality, and the conservation and reclamation of land and soil. The *Water Resources Act*, which originally came into effect in 1931, will be replaced shortly by the *Water Act*, which provides a broad legislative basis for management and protection

of Alberta's water. The new Act will enable effective conservation of aquatic biodiversity by specifically calling for development of a provincial water management framework and a strategy for protecting the aquatic environment. Significant water management policies providing for the conservation of aquatic biodiversity include the South Saskatchewan River Basin Policy and the Wetland Policy.

Other provincial legislation such as the *Public Lands Act*; *Forests Act*; *Forest Reserves Act*; *Wildlife Act*; the *Wilderness Areas*, *Ecological Reserves and Natural Areas Act*; *Willmore Wilderness Park Act*; and the *Provincial Parks Act*; provide a statutory framework for managing public lands and natural resources for a wide variety of purposes, including the conservation of biodiversity. Policies developed to support these statutes include A Policy for Resource Management of the Eastern Slopes, Timber Harvest Planning and Operating Ground Rules, Fish and Wildlife Policy for Alberta, Special Places, numerous integrated resource management plans, and policy defining the Green Area and White Area (see map p.12) of the province. An interdepartmental land use referral system is a key mechanism for implementing policies, and for ensuring that biodiversity values and habitat protection are factored from the beginning into land use decisions and activities.

A number of federal statutes also form part of Alberta's statutory framework. The federal *Fisheries Act* governs all fisheries, both commercial and recreational, in the province. The act is supported by the Federal Policy for the Management of Fish Habitat and provincial policy in the form of the Fish and Wildlife Policy for Alberta, the Commercial Fishing Licensing Policy and the Fish Conservation Strategy for Alberta. Other federal statutes affecting conservation of biodiversity in Alberta are the *Migratory Birds Convention Act* and the *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act*.

Vision of Sustainable Development in Alberta

In May 1990, the Government of Alberta appointed the Alberta Round Table on Environment and Economy to provide advice and leadership on achieving sustainable development. The Round Table created a vision of sustainable development in Alberta, which was unanimously adopted by the Legislative Assembly in June 1993. The Vision has nine elements, including one on biological diversity.

Vision Statement

Alberta, a member of the global community, is a leader in sustainable development, ensuring a healthy environment, a healthy economy, and a high quality of life in the present and the future.

Vision Elements:

- The quality of air, water, and land is assured.
 - Alberta's biological diversity is preserved.
 - Biogeographical areas, habitat, and wildlife are protected. Aesthetically attractive areas are set aside for recreational, cultural, and spiritual needs.
 - We live within Alberta's natural carrying capacity.
 - The economy is healthy.
 - Market forces and regulatory systems work for sustainable development.
 - Urban and rural communities offer a healthy environment for living.
 - Albertans are educated and informed about the economy and the environment.
 - Albertans are responsible global citizens.
 - Albertans are stewards of the environment and the economy.
-

New Directions in Conserving Alberta's Biodiversity

Pressures on the environment have changed in intensity and nature with time. The measures adopted at one time to address issues of the day may not be sufficient to address current and future ones. Although biodiversity initiatives and research are being carried out on a number of fronts, ecosystem management and the development of sustainable forest management approaches (as highlighted in the Alberta Forest Conservation Strategy) have recently become a significant focus for the Government of Alberta, industry, academia and non-government organizations.

Ecosystem management holds particular promise as a way of sustaining ecosystems and the flow of benefits derived from them over the long term. Conversely, ecosystem management is also seen as an approach that will minimize the loss of biodiversity or collapse of sustainability. A central concept of ecosystem management is to view ecosystems at a broad landscape level, or "coarse filter approach." A key assumption of ecosystem management is that carrying out land use activities and water management in ways that approximate the effects of natural disturbances, and that maintain the natural variability of ecosystem conditions, will in turn ensure ecosystem sustainability and conserve biodiversity. Ecosystem management concepts are now being incorporated into the latest generation of forest management plans and being tested by the forest industry.

Although our understanding of the environment and ways of interacting with it continues to improve through research, our understanding of ecosystem sustainability is still limited. Applied research is being undertaken to better understand ecosystem functioning, natural processes and the role of natural disturbances. Natural disturbances, particularly fire, have played a critical role in the creation of Alberta's forests. Through initiatives like the Sustainable Forest Management Network of Centres of Excellence, Foothills Model Forest, Southern Rockies Landscape Planning Project, and the Forest Management Science Council, partnerships have formed to carry out research on forest ecosystems and to transfer new knowledge into practical and sustainable forest management approaches.

The Alberta government also recognizes that continued and specific actions will be required to meet the needs of certain species or to address specific biodiversity issues. This "fine filter approach" will be continued as a supplement to the "coarse filter" or ecosystem management approach over the long term.

Many of the above actions and programs are described in further detail under the following goals of the Canadian Biodiversity Strategy.

balsam fir cones

Implementing the Goals of the Canadian Biodiversity Strategy in Alberta

Goal 1. To conserve biodiversity and use biological resources in a sustainable manner.

Goal One initiatives address efforts to conserve species, and the habitats and resources upon which they depend for survival. The actions range from plans and strategies that guide human use of ecosystems and biological resources, to specific activities to reduce threats to species and habitats.

Government of Alberta initiatives under this goal include the cornerstone Special Places policy, the Alberta Forest Conservation Strategy, the Prairie Conservation Action Plan, the Fish Conservation Strategy and a variety of species management plans for threatened or endangered species.

A. Wild Flora and Fauna and Other Wild Organisms

Conservation of Species and Habitats

Fish and Wildlife Policy for Alberta

Through the Fish and Wildlife Management Program of Environmental Protection, the Government of Alberta has established a range of policies, strategies and programs directed specifically at conserving species and habitats. At a strategic level, the Fish and Wildlife Policy for Alberta establishes policy goals for the management of sport fish and wildlife (game bird and mammal) species in the province. The policy sets out 26 goals to

ensure that fish and wildlife populations are protected from severe decline and remain viable.

Fish Conservation Strategy for Alberta

A Fish Conservation Strategy for Alberta, extending to the year 2005, was completed in 1997. The strategy's goals and objectives will guide the management of Alberta's fish in a manner consistent with Canada's *Fisheries Act*, the Fish and Wildlife Policy for Alberta, and business plans of Alberta Environmental Protection. A key guiding principle of the strategy is that the biological diversity of Alberta's fish be maintained, and depletions or extirpation of species, populations, sub-populations or unique strains of fish are to be avoided.

The **Alberta Conservation Association**, established under the *Wildlife Act*, distributes funding to protect or enhance fish and wildlife populations and their habitat. Programs are financed by fees from hunting and fishing licence sales and tax deductible donations, and include the following:

- The **Buck for Wildlife Program**, which retains, enhances or creates fish and wildlife habitat on public and private land. The program supports fisheries habitat projects, such as streambank and shoreline fencing, stream enhancement, lake aeration, and riparian management. The program also supports wildlife projects such as wetlands enhancement, and browse and nesting cover enhancement.

In 1996, the program supported 35 wildlife projects that protected 24 000 hectares of habitat, and 104 fisheries projects. In 1994-95, the last full year for which data are presently available,

fisheries development included the enhancement of 6400 hectares of lake habitat, and lake aeration of 530 hectares. Also included were 100 kilometres of streambank stabilization and instream enhancement, 25 kilometres of streambank fencing, and the protection of 2000 hectares of riparian habitat.

- The **Fisheries Management Enhancement Program**, which enhances fish production and protection to meet the demands of recreational fishing. The program is funded by a levy on sport fishing licences. In 1996-97, 66 programs were funded with \$1.5 million, including fish population inventories and assessment, user monitoring, habitat evaluation, education, and fish stocking. A similar initiative, called the **Wildlife Management Enhancement Program**, funds programs and projects to maintain wildlife populations. In 1996-97, \$2.2 million was allocated to this program.

B. Protected Areas

Establishing protected areas is an effective and practical measure to conserve ecosystems and species. Protected areas perpetuate intact ecosystems and healthy populations of native species, and thus constitute storehouses of irreplaceable genetic information. While by no means a 'cure all', such areas can buy precious time during which research can be conducted and ecosystem-based management practices developed for the rest of the landbase. When integrated with other areas managed for different intensities of use, protected areas help us meet both environmental and economic needs. Related information on planning and ecosystem management is described on pages 23 and 24.

Alberta's Protected Areas System

Alberta's protected areas system consists of public lands in Alberta that are legally designated for preservation purposes. The system also meets societal demands for tourism and economic development. Each individual site within the system contributes in varying degrees to the overall objectives of preservation, outdoor recreation, heritage appreciation and tourism.

Within Alberta's protected areas system there are wilderness parks, wilderness areas, ecological reserves, natural areas, and provincial parks. Wilderness areas and ecological reserves are managed to ensure the environment remains in as natural a condition as possible. Other lands in the spectrum, such as natural areas and provincial parks, are managed with preservation as a priority, while providing compatible types and levels of outdoor recreation and tourism. The status of Alberta's protected areas system, as of February 1998, is summarized below:

<i>Type of Site</i>	<i>Number of Sites</i>	<i>Area (km²)</i>
Wilderness Parks	1	4597
Wilderness Areas	3	1010
Ecological Reserves	15	294
Natural Areas	154	849
Provincial Parks	68	3015

In addition, there are five national parks (54 084 km²) and four national wildlife areas (424 km²) administered by the Government of Canada. Currently, not all natural regions of the province are adequately represented within these two systems of protected areas. The Special Places program aims to complete the system and ensure adequate coverage of Alberta's natural regions.

Special Places

The Special Places initiative is a made-in-Alberta response to World Wildlife Fund Canada's (WWF) national Endangered Spaces campaign. Special Places also helps Alberta fulfill commitments under the Canadian Biodiversity Strategy. The initiative was announced in March 1995 by the Ministers of Environmental Protection and Economic Development and Tourism.

The vision of Special Places is to complete a network of protected areas by the end of 1999 that represents the environmental diversity of the province's six Natural Regions and 20 Subregions. The network will account for important landscape, ecosystem and biodiversity elements in Alberta, and will

range from significant and highly visible landform/ecosystem associations to micro-habitats and species. Although maintaining biodiversity is the focus, three additional goals of outdoor recreation, heritage appreciation and tourism/economic development are also to be achieved within designated protected areas where possible.

Scientific methods that maximize the chances of maintaining the ecological integrity of the networks over the long term are used to select and design protected areas.

Albertans play an important role in the implementation of Special Places by nominating sites in each of the province's natural regions to fill gaps in the protected areas network. Local committees representing broad interests provide recommendations on

site boundaries, uses, and management principles. Committees forward their recommendations to the Minister of Environmental Protection and to a multi-stakeholder Provincial Coordinating Committee that provides overall direction and awareness for the Special Places program.

Since the Special Places initiative was announced in March 1995, 37 sites covering approximately 202 500 hectares have been added to Alberta's protected areas network. In addition, an amendment to the *Willmore Wilderness Park Act* affirmed the Government's commitment to no new industrial development within the 400 000 hectare park.

History of Special Places

March 28, 1995	Minister of Environmental Protection announces Alberta's Natural Heritage Policy and Implementation Plan called Special Places.
August 3, 1995	Twenty-six new Natural Areas and the expansion of Cold Lake Provincial Park are designated under the program, adding approximately 32 400 hectares to Alberta's network of protected lands.
November 7, 1995	Amendments to the <i>Willmore Wilderness Park Act</i> are announced prohibiting industrial development in the 400 000 hectare Willmore Wilderness Park.
January 19, 1996	Elbow-Sheep and Kakwa are formally established as Wildland Provincial Parks under the Special Places program.
October 3, 1996	Ross Lake and Rumsey South are designated as Natural Areas under the Special Places program.
October 28, 1996	The <i>Provincial Parks Act</i> is amended to preclude new industrial development within the boundaries of all Wildland Provincial Parks such as Elbow-Sheep and Kakwa.
January 28, 1997	Prairie Coulees and Vega are designated as Natural Areas and Fort Assiniboine Sandhills is designated as a Wildland Provincial Park.
May 12, 1997	Holmes Crossing Sandhills is designated as a new Ecological Reserve, and Yamnuska is designated as a Natural Area.
-

C. Restoration and Rehabilitation

The restoration and rehabilitation of species and ecosystems includes the development and implementation of species recovery plans and ecosystem restoration programs.

Species Recovery

Endangered Species Recovery Program

The Endangered Species Recovery Program aims to restore all species classified as threatened or endangered in Alberta to viable population levels. The program is fully integrated with national initiatives under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and Recovery of Nationally Endangered Wildlife (RENEW) processes.

Recovery plans are prepared for Alberta species thought to be at risk, including rare species with low reproductive rates, species dependent on a vulnerable habitat type, or species that are particularly sensitive to human activities. Plans have been prepared for woodland caribou, swift fox, peregrine falcon, burrowing owl, whooping crane, ferruginous hawk, piping plover, loggerhead shrike, bull trout, golden trout, lake sturgeon, and St. Mary's sculpin. (Additional related information is on pages 25 and 26 under "Determining the Status of Alberta Wildlife").

burrowing owl

Regional Caribou Standing Committees

Woodland caribou are listed as an endangered species in Alberta because of habitat loss and declining populations at the southern fringes of the boreal forest and in west central Alberta. As early as 1990, provincial land use guidelines—designed to minimize habitat change or loss and reduce caribou exposure to disturbance—resulted in resource management conflicts on caribou ranges. In partnership with industry, the Government of Alberta established regional committees to resolve the conflicts and address concerns regarding industrial activity in caribou habitat.

Initial research studies have addressed basic caribou biology, documented caribou numbers, distribution and seasonal habitat use, and mapped caribou ranges. Further research will discover the effects of industrial operations on caribou and predator/prey interactions.

Supported by research, Regional Caribou Standing Committees develop operating guidelines to integrate industrial objectives with caribou conservation needs. Industrial operations within caribou ranges are approved and guided by land-use policies, planning and access management mechanisms, and regulations.

Ecosystem Restoration and Rehabilitation

Conservation and Reclamation of Disturbed Land

Alberta's *Environmental Protection and Enhancement Act* requires companies to reclaim industrial disturbances such as mines, quarries, pipelines, wellsites and pits. The objective of reclamation is to return disturbed land to "equivalent capability"—the land should be able to sustain the same range of uses that it could before the disturbance. By conserving and replacing topsoil, and by selecting appropriate land uses and revegetation mixes, sustainable and diverse ecosystems can be re-established in reclaimed landscapes.

On Alberta's public lands, companies must develop revegetation plans that use native species, or that will allow native species re-invasion. This reduces the loss of native flora, particularly native prairie, and reduces the chance of seeded non-native plants invading undisturbed land. As a side benefit, revegetation programs have encouraged the development of Alberta's fledgling native plant industry.

D. Sustainable Use of Biological Resources

The production and sustainable use of natural resources has been a central element of Alberta's development. Agriculture has played, and continues to play, a key role in shaping Alberta's landscape, economy and culture. Forestry has more recently become a significant sector in Alberta's economy, along with tourism and recreation. Aquatic environments in turn have been affected by the activities generated by these sectors. There are many actions underway to address biodiversity issues in the province's agricultural and forested areas and aquatic environments. Described below are some broad scale initiatives focused on sustainable use of natural and biological resources.

Agricultural Areas

Canada/Alberta Environmentally Sustainable Agriculture (CAESA) Agreement–Alberta Environmentally Sustainable Agriculture (AESA) Program

The CAESA was a five year, \$36 million program that expired at the end of March, 1997. The aim of the agreement was to support activities minimizing the impact of food production and processing on the environment.

Several initiatives undertaken as part of the CAESA Agreement had a positive effect on maintaining biodiversity. Examples include:

- **Retention of Wetlands and Wetland Habitat**, which involved the developing of alternative uses of natural wetlands, such as enhanced fish production, thus reducing incentives for wetland drainage.
- **Constructed Wetlands for Treatment of Agricultural Runoff**, in which wetlands were built to reduce runoff from feedlots and cow-calf winter feeding sites.
- **Inventory of Private Land Forest Resource and Development of the Farm Woodlot Initiative**. Inventories of forest resources on private land helped landowners benefit economically from woodlots without eliminating environmental and agricultural benefits.
- **Adjusting Grassland Insect Control Practices to Allow Survival of Grassland Songbirds**.

The CAESA Agreement has been followed by an Alberta Environmentally Sustainable Agriculture (AESA) program. The objective is continued development and adoption of management practices and technologies that make agricultural production and processing industries environmentally sustainable. Under AESA's Farm Based component, projects eligible for funding assistance will include those promoting the reduction of the impact of agricultural production practices on soil, water, air, and biodiversity. AESA's Research component will emphasize multidisciplinary and integrated studies on how to mitigate the effects of agricultural production and processing on soil, water, air, and biodiversity resources, and how to reduce waste.

Antelope Creek Habitat Development Area

The Antelope Creek Ranch is a 2225 hectare ranch in dry, mixed grass prairie, located west of Brooks, Alberta. It was purchased in 1986, and is managed cooperatively by the Province of Alberta, Ducks Unlimited, and Wildlife Habitat Canada.

Since its purchase, the Antelope Creek Ranch has been a venue for demonstrating sound land management practices. It integrates diverse land uses within a long term vision of sustaining agriculture and prairie ecosystems.

Aquatic Areas

Recommended Wetland Policy for Alberta

Wetlands offer Albertans numerous ecological, economic and social benefits. In June 1990, Cabinet approved Wetlands Management in the Settled Area of Alberta, an interim wetlands policy for settled areas of the province. Non-settled lands are addressed in the Recommended Wetland Policy for Alberta that includes the entire province.

Alberta: Settled and Non-settled Areas

The wetland policies will provide consistent direction to resource managers and industry. By streamlining decision processes, the wetland policy will also help the government achieve its objectives at reduced cost. For slough/marsh wetlands, the objectives are to maintain existing wetlands in a natural state, minimize negative effects, and mitigate degradation or

loss. The objectives for peatlands are to formally designate peatland ecosystems for preservation, allow activities and development on peatlands within acceptable limits, and minimize and mitigate, where necessary, the effects of peatland development on surrounding land and water.

South Saskatchewan River Basin Policy

In 1990 the Government of Alberta announced a water management policy for the South Saskatchewan River Basin. The policy was developed to address a range of water management issues within the basin including water allocation for irrigation purposes, apportionment commitments and water conservation. The policy addresses the protection of aquatic ecosystems by prescribing minimum flows for the Waterton, Belly and St. Mary Rivers, by allowing the setting of minimum flows for other water-courses within the basin as required, and by limiting the total amount of water available to the basin's irrigation users.

Peace Athabasca Delta Technical Studies

The Peace Athabasca Delta is the largest freshwater delta in the world, covering about 23 000 km². It provides many valuable environmental benefits, and economic benefits such as trapping for local indigenous peoples. The delta and Wood Buffalo National Park are home to remnant populations of bison, and are the summer breeding grounds of the whooping crane. The security of this valuable ecosystem is sensitive to changes, such as changes in upstream uses. The construction of the Bennett hydro-electric dam in British Columbia, for example, has regulated the water flow and thus reduced the variability that historically sustained the delta's ecosystem diversity.

A Memorandum of Understanding between the governments of Alberta and Canada, aboriginal peoples, and BC Hydro was completed in 1996 to study changes in water flows and determine their effect on the delta ecosystem. Vegetation studies will also yield information on biodiversity, and on trends in changes to the delta's ecosystems.

Recommendations from the technical studies were coordinated with another major water-related study, the Northern River Basins Study, and will be considered by appropriate departments and agencies. Negotiations will begin shortly on an Ecosystem Management Memorandum of Understanding to implement the recommendations.

Northern River Basins Study

The Northern River Basins Study (NRBS) began in 1991 to provide basic information on the impact of human activities and development in the Peace, Athabasca, and Slave River basins. This four and one-half year study was precipitated largely by public concern over the rapid expansion of the pulp and paper industry in northern Alberta.

The NRBS was a cooperative partnership of the governments of Alberta, Northwest Territories and Canada. Concerns addressed in the study included the accumulation of contaminants, the effect of contaminants and nutrients on aquatic ecosystems, and the combined effects of environmental stresses on the quantity and quality of water, invertebrates and fish. The NRBS addressed these and other related concerns with a view to promoting wise management of the basins' resources.

The NRBS included approximately 150 project reports and a final report that used the project reports to make recommendations for future management of the basins. Results of these studies were combined with extensive traditional knowledge, research, public input, and intensive analysis by some of Canada's most reputable scientists. The project studies contributed to our basic understanding of the ecology in these aquatic ecosystems.

NRBS reports are a benchmark statement of the present state of the rivers and what steps should be taken to preserve their value as ecological resources. Many of the final report's recommendations call for periodic monitoring of the effects of development on these rivers to ensure continued health and biodiversity in the basins.

Forested Areas

Alberta Forest Conservation Strategy—Alberta Forest Legacy

Alberta's forests are valuable natural assets. Forest ecosystems cover over 50 percent of the province's landbase, and contribute significantly to the provincial economy. They also confer environmental benefits by cleaning the air of pollutants and storing atmospheric carbon, filtering and regulating water supplies, and harbouring a diversity of biological species. Dollar values often are not assigned to these benefits because they are difficult to quantify. The benefits are, however, worth a great deal in avoided costs and are sustainable as long as forest ecosystems are healthy.

With so much activity on forested lands and the potentially conflicting nature of resource management objectives, forest users and stakeholders saw a need for a shared vision of the forests and ways of achieving it. The Alberta Forest Conservation Strategy (AFCS) was a policy initiative driven by stakeholders representing environment, industry, recreation and government interests. The strategy set out directions to conserve Alberta's forest ecosystems for generations to come. In February 1998, the Government of Alberta prepared an implementation framework for sustainable forest management, the Alberta Forest Legacy, that drew heavily upon the AFCS and other reference sources.

The Alberta Forest Legacy advocates several changes. The fundamental change is from sustained timber yield management to ecological management. Sustained yield management secures a wood supply for the forest industry based on yearly incremental

Forest Care

Forest Care is an initiative developed by member companies of the Alberta Forest Products Association. It consists of guiding principles and codes of practice that direct company decision-making and set standards of performance. The primary goals of Forest Care are to improve the industry's performance in six target areas and to communicate these improvements both locally and provincially. Three of the six target areas support the sustainable use of forest resources, including the conservation of biodiversity.

tree growth. Ecological management will consider a variety of forest values in addition to wood supply, including the long-term health of the whole forest ecosystem.

Historically, Alberta's forest ecosystems have been shaped by natural disturbances such as fire, insects and wind. The Alberta Forest Legacy aims to conserve the biodiversity within Alberta's forest ecosystems by recommending that timber harvesting and other human activities be conducted in ways that approximate natural processes that have shaped forest evolution.

Forest structures on which biodiversity depends will be maintained by human activities where possible. The strategy will be linked with other initiatives to manage Alberta's lands and other resources in Alberta through an Integrated Resource Management process (see page 23).

trembling aspen

Prairie and Parkland Areas

Alberta Prairie Conservation Action Plan

In 1989, the World Wildlife Fund and the governments of Alberta, Saskatchewan and Manitoba released the Prairie Conservation Action Plan (PCAP). It was a blueprint for the conservation of native prairie ecosystems in western Canada. In Alberta, the Prairie Conservation Forum, representing over 30 government, private sector, and non-government organizations, implemented the PCAP. The original PCAP covered the period from 1989 to 1994. It received wide support and over \$1 million was spent on 90 projects throughout the prairies. To extend prairie conservation initiatives in Alberta to the year 2000, a new Alberta PCAP was prepared in 1996. The Alberta PCAP continues the directions of the original plan:

Prairie Conservation Action Plan - Alberta Vision 1996 - 2000

Vision:

The biological diversity of native prairie ecosystems in Alberta is conserved for the benefit of current and future generations.

Alberta Goals

1. Advance the identification, understanding and use of information about Alberta's prairie ecosystems.
2. Ensure governments at all levels have in place policies, programs and regulations that favour the conservation of Alberta's native prairie ecosystems.
3. Adopt land use management practices and protective strategies across the whole prairie landscape that sustain diverse ecosystems.
4. Increase awareness of the values and importance of Alberta's native prairie ecosystem.

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- Conservation of native prairie species, communities and habitats.
 - A prairie-wide vision.
 - Encouragement of multi-party partnerships.

Key new emphases of the 1996–2000 plan include expanding the base of support in the agricultural community, increased emphasis on “bottom-up” involvement and initiatives, and ecosystem management and sustainable development, rather than species by species management approaches.

Similar plans are being prepared in Saskatchewan and Manitoba. When working documents have been prepared for those provinces, a new statement of prairie-wide conservation principles will be submitted for government approval.

E. Biosafety: Harmful Alien Organisms and Living Modified Organisms

The Canadian Biodiversity Strategy provides direction for controlling, eradicating and preventing the introduction of alien species that threaten other species and ecosystems.

Controls on the Introduction of Unwanted Species

Alberta's *Wildlife Act* forbids the importation or release of exotic species unless authorized by the Department of Environmental Protection. This allows wildlife officials to prevent the deliberate introduction of exotic species that may threaten native wildlife. Certain exotic animals, such as llamas and ostriches, are imported for agricultural production, but this activity is closely regulated.

Non-native species that are considered pests or weeds can be controlled under the *Agricultural Pests Act* and *Weed Control Act*. Perhaps the best known example is the province's control efforts along the Alberta-Saskatchewan border to prevent the dispersal of the Norwegian rat into Alberta.

Several education programs are in place to prevent accidental introductions. For example, boaters entering the province are warned to clean their trailer, boat and motor to ensure that Eurasian water milfoil, an aquatic weed, is not spread to Alberta lakes. A program to control purple loosestrife is outlined below.

Purple Loosestrife Management Program

Purple loosestrife is a one to two metre tall plant, with attractive pink/purple flowered spikes. It is a wetland perennial introduced into North America from Europe in the early 1800s. The first official report in Alberta was recorded in 1990 at Medicine Hat. Since then, many other sites have been confirmed throughout the province.

Purple loosestrife invades native wetland communities. It reproduces quickly (mature plants produce up to 2.5 million seeds each year), is not used as food by wetlands animals, and is a strong competitor. Consequently, loosestrife soon forms dense brush-like stands, which drastically reduce the number of native plants and the animals that depend on them.

The Purple Loosestrife Management Program was developed to identify sites and coordinate efforts to eradicate purple loosestrife in Alberta. The project involves all levels of government, industry, non-profit organizations, and private individuals.

purple loosestrife

Site inventories have been developed together with a strategy to control infestations. Control strategies have included hand pulling, herbicide applications, burning and clipping. Where control measures have been initiated, there has been a noticeable reduction in the number of purple loosestrife plants.

An associated public awareness campaign is continuing. Elements of the campaign include media coverage, conferences and brochure distribution.

F. Atmosphere

The Earth's climate and atmospheric conditions directly affect all ecosystems and biodiversity. Future long term changes in climate may have the most significant influence on biodiversity throughout the world. Although the overall effect of human activities on climate is not well understood, there is increasing concern that measures need to be taken to reduce human-caused impacts on the atmosphere. The Government of Alberta is working with other levels of government and stakeholders to address atmosphere and air quality issues.

bohemian waxwing

Clean Air Strategic Alliance

The Clean Air Strategic Alliance (CASA) is a coalition comprising the Government of Alberta, the Government of Canada, municipal governments, industry, and environmental and health non-governmental organizations. The Government of Alberta is represented on CASA by the Departments of Environmental Protection, Energy, and Health. Through CASA, several initiatives have been

undertaken to manage air quality, protect the environment and human health from harmful air emissions, and to address climate change issues.

The following are three major initiatives undertaken through CASA:

- **Climate Change Action Plan**—In 1994, CASA stakeholders developed Principles and Recommendations for the Alberta Climate Change Action Plan, which were subsequently adopted by the Government of Alberta. One component was participation by government and industry in the national Voluntary Challenge and Registry program. One-quarter of the more than 600 organizations participating in the Voluntary Challenge and Registry program are from Alberta. The Government of Alberta and participating industrial organizations have prepared and implemented comprehensive, registered plans to reduce greenhouse gas (primarily CO₂) emissions. Under the program the government has committed to reduce emissions associated with its own operations by 14 percent below 1990 levels by the year 2000.
- **Sulphur Dioxide Management**—CASA reviewed the provincial sulphur dioxide management system and recommended modifications and improvements to the existing regulatory framework that the Government of Alberta has agreed to implement. As a result of one of the recommendations, deposition guidelines will be established in the province using a multi-stakeholder process.
- **Regional Airshed Monitoring**—Many of Alberta's air quality issues are local, both in their cause and the solutions required. CASA has developed the Comprehensive Air Quality Management System through which zones can be established to help address air quality issues in specific regions. Air quality management zones provide an approach for local stakeholders to design local solutions to their concerns. Zones are defined on the basis of emission

sources and volumes, dispersion characteristics, impacts, and administrative characteristics. To date three zones have been established—Southern Wood Buffalo Air Monitoring Zone, West Central Airshed Management Zone, and Parkland Airshed Management Zone.

CASA recognizes the vital importance of understanding the nature, quality and potential effects of emissions in the province. There are hundreds of monitoring stations operated by industry and government. Three projects are underway to improve and make better use of information from them. One project involves implementing a management system to enable data from continuous and passive monitoring stations to be merged. The other two projects will examine relationships between monitoring station data, human health, and ecosystem effects.

G. Human Population and Settlement

Alberta's human population is now largely urban-based and the trend to urban living is likely to continue as the population increases. New and improved policies, planning and approaches are required to reduce the impact of urbanization on natural ecosystems.

Land Use Policies

In November 1996, Land Use Policies pursuant to Alberta's new *Municipal Government Act* were approved by the Government of Alberta. All municipal plans, land use bylaws, and planning decisions and actions are to be consistent with the Land Use Policies. Municipalities can interpret and elaborate on the policies to make them locally meaningful and appropriate.

The Land Use Policies contain 10 goals. Some policies within the goals assist with biodiversity. For example, one policy under a goal relating to land use patterns addresses biodiversity by aiming to meet the principles of sustainable development. Another goal

aims "to contribute to the maintenance and enhancement of a healthy natural environment" and has two policies aimed specifically at habitat retention.

Municipal Land Use Policies Respecting the Natural Environment

Goal: To contribute to the maintenance and enhancement of a healthy natural environment.

Policy 5

Municipalities are encouraged to identify, in consultation with Alberta Environmental Protection, areas of significant fish, wildlife and plant habitat and to establish appropriate land use patterns designed to minimize the loss of valued habitat within and adjacent to these areas.

Policy 6

If subdivision and development is to be approved in the areas identified in accordance with Policy 5 municipalities are encouraged to, within the scope of their jurisdiction, utilize mitigative measures to minimize the loss of habitat.

Sustainable Communities Initiative

The Sustainable Communities Initiative (SCI) helps Alberta communities to design and implement a plan of action to achieve sustainability, using sustainability indicators developed by the Alberta Round Table on Environment and Economy. The SCI supports community efforts to become healthy and sustainable through public education, participation and communication.

The SCI is supported by a partnership between the Department of Environmental Protection; TransAlta Utilities; and FEESA, An Environmental Education Society. Currently, there are eight communities actively involved in the SCI. The largest is Red Deer, an urban centre of 60 000 people. Four other communities are likely to enroll in the program in 1997.

Goal 2. To improve our understanding of ecosystems and increase our resource management capability.

Goal Two of the Canadian Biodiversity Strategy addresses research and information gathering to improve both our understanding of ecosystems, and the development of integrative approaches to ecosystem management.

Initiatives under this goal include research through the University of Alberta's Sustainable Forest Management Network of Centres of Excellence and the Foothills Model Forest, monitoring and inventory programs which contribute to databases such as the Alberta Natural Heritage Information Centre and the Biological Species/Observation Database, Status of Wildlife reports, and a variety of integrated resource management processes.

Ecosystem Management

Ecosystem management is the management of human activities so that ecosystems, their structure, composition and function, and the processes that shaped them, continue at appropriate time and space scales.

- adapted from the *Canadian Biodiversity Strategy*, 1995

A. Improving our Ecosystem Management Capability

In order to develop ecosystem management approaches, a broad range of research focused on ecosystem functioning and structure, and the effects of human activities on them, is underway. In addition to ongoing aquatic and vegetation inventories, significant efforts are underway to study and inventory forest ecosystems in Alberta.

Research

Network of Centres of Excellence

In 1995, the University of Alberta became home to the Sustainable Forest Management Network of Centres of Excellence (NCE). The NCE is a network of research in sustainable forest management that has the following three aims regarding Canada's boreal forests:

- Effective management.
- Preservation of biodiversity.
- Sustained forest resources for future generations.

The Government of Alberta is a major NCE sponsor. In 1996-97 it contributed about \$800,000 of a total NCE budget of nearly \$5 million.

The NCE has four research themes, two of them closely related to biodiversity. The first, on the ecological basis of sustainable forestry, examines natural ecosystem processes and how human activities affect them. The goal is

ruffed grouse

to develop forest management that allows an optimum flow of renewable resource products while maintaining biodiversity, soil, and water systems. A comprehensive database of ecological information will be central to research on the ecological basis of sustainable forestry.

The second theme relates to planning and practices for sustainable forest management, where biodiversity objectives are put into practice. Work under this theme will design and evaluate sustainable forest planning tools and practices.

The NCE project offers interdisciplinary research and training opportunities for graduate and undergraduate university students. Outreach programs will bring research findings back to communities, increasing the public's understanding and awareness of forest biodiversity.

Foothills Model Forest

Model forests are a broad based partnership to find practical solutions for the stewardship and sustainability of forest ecosystems. The Foothills Model Forest in west-central Alberta has a landbase of 2.8 million hectares, which is subjected to various levels of protection and land use. It is composed of land managed by Weldwood of Canada Limited, Alberta Crown forest management units, all of Jasper National Park, and for phase II of the model forest initiative, all of Willmore Wilderness Park. The Government of Alberta has contributed over \$1 million over the past five years to the Foothills Model Forest.

Research programs currently underway address species, ecosystem, and landscape diversity. They include studies on natural disturbances within forests, the environmental effects of various forest management practices, the role of protected areas in landscape management, and rare plant and animal species. Future studies will identify indicators of sustainability relevant to the area and assess the cumulative environmental effects of a range of activities.

Alberta Forest Management Science Council

A nine-member Alberta Forest Management Science Council advises the Department of Environmental Protection on the science required for forest management in Alberta. The Science Council provides advice on sustaining forest ecosystems and the forest economy, for both of which maintenance of biodiversity is an important element. The Alberta Forest Science Management Council has a two-year mandate that extends to 1998.

In 1997 the Science Council prepared a timber supply protocol that addresses sustainable forest management. "Sustainable Forest Management—Advice on Timber Supply Protocols to the Land and Forest Service" links social, economic and ecosystem elements of sustainable forest management. To develop the protocol the Science Council used an innovative peer review process to expose their ideas to senior scientists in North America. The protocol is the first of its kind in Canada and is currently under review by the Government of Alberta.

Southern Rockies Landscape Planning Pilot Project

The aim of the pilot project is to develop computer models and resource evaluation procedures that integrate ecological and non-timber values into forest management plans. Models based on principles of sustainable ecosystem management and landscape ecology may be used for land and planning activities by government and the forest industry throughout Alberta. Species richness and landscape pattern analysis will be used to evaluate the potential effects of alternative development scenarios on biodiversity. The project is scheduled for completion in June 1998.

Instream Flow Needs Studies

The Government of Alberta has initiated Instream Flow Needs (IFN) studies to identify river ecosystem components and characteristics that require protection, including fisheries, riparian vegetation, water quality, recreation and aesthetics. Through these studies, requirements for flow, flood frequency and timing are determined.

bull trout

IFN studies adopt an ecosystem management approach. Rather than focus on an individual species, the studies now recommend habitat maintenance for all species that need rivers for their development during at least some phase of their life cycle. Maintaining native habitats will, in turn, conserve and protect aquatic and riparian biodiversity.

Currently, IFN studies are underway on the Bow and the South Saskatchewan rivers. This work will also include determining how best to accommodate conflicting uses and needs while protecting the river ecosystem. An IFN study on the Red Deer River will begin soon.

Challenge Grants in Biodiversity

The Challenge Grants in Biodiversity is a funding program supporting outstanding graduate students and postdoctoral fellows doing basic research to improve our understanding of plants, animals, habitats and ecosystems in Alberta. Another goal is to develop a core of highly qualified, Alberta-based environmental biologists. The program is funded largely from hunter licence revenues through the Alberta Conservation Association, and from a contribution from the Rocky Mountain Elk Foundation. The program is coordinated and administered by the University of Alberta's Department of Biological Sciences.

Inventories and Land Classification

Inventories increase our understanding of ecosystems, providing data to support ecosystem management and maintain biodiversity. A wide range of inventories at the species, community and landscape levels have been conducted or are underway in Alberta. Many are completed as part of ongoing resource management

programs. A number of inventories are also carried out by volunteers and non-government organizations. The Alberta Bird Atlas and the Spring Plant Count are excellent examples of these non-government efforts.

The following are examples of broad scale inventories being conducted by the Government of Alberta:

- **Alberta Vegetation Inventory**—The Alberta Vegetation Inventory (AVI) is a basic data set that will support decision-making systems for ecosystem management and landscape planning. As the government implements ecosystem management, forest management plans will be based on forest inventory information that can address a broader spectrum of forest management issues than was possible with earlier timber inventories. Specifications for the government's 1:20 000 AVI were developed jointly between government foresters, wildlife biologists, grazing land managers and inventory specialists, and representatives of the forest industry. The AVI to date covers about half of Alberta's forested lands.
- **Reconnaissance Inventory**—Data from LANDSAT satellites are used by the Department of Environmental Protection for producing maps that cover large areas of the province. These maps are used for regional planning, assessing the habitat of wide-ranging wildlife species, and as part of an inventory of woodlots within the agricultural area of the province. Such maps are available for most of Alberta's forested areas.
- **Native Prairie Inventory**—In Alberta, it is estimated that more than 80 percent of the native prairie landscape has been transformed by agriculture, industry and urbanization. The intent of this inventory is to determine the amount and location of remaining native prairie – defined as grasslands that have not been disturbed for at least 30 to 60 years. The inventory is being carried out on a quarter section by quarter section basis over the entire

Grassland Natural Region in southern Alberta. To date, inventories have been completed on nearly 600 townships. About one third of the quarter sections inventoried have been found to be more than 75 per cent covered by native prairie.

Ecosite Classification Of Forested Lands

Through the analysis of vegetation, soil, site and forest productivity information, an ecological site classification system has been completed for forested lands in Alberta. This classification differs from earlier efforts by including grasslands, meadows and wetlands as well as forest types. This comprehensive landscape picture has been especially useful in forest management planning by helping resource managers meet various sustainability, multiple resource development, and preservation objectives.

Peat Management Task Force

Peatlands exist over large areas of flat, slow draining land in northern Alberta. The Peat Management Task Force was organized at the request of the horticultural peat industry, and consists of members from the peat industry, government, and academia. The task force was formed to provide information to resource managers that will contribute to the orderly development and conservation of peatland ecosystems.

With the assistance of the University of Alberta, the task force has produced an overview of Alberta's peat resources – *Peatland Inventory of Alberta, Phase 1: Overview of Peatland Resources in the Natural Regions and Subregions of the Province*. This inventory identifies sites suitable for conservation and development, and includes measures of site biodiversity.

The University of Alberta also has been contracted to produce a detailed inventory of peat resources identified by the Peat Industry Association as potential development locations. The university is establishing a Peatland Information Centre as a source for research and inventory results.

Detailed inventories on potential development areas continued in 1997, and included measurements of relative biodiversity. A study to consider the effects of peat-harvested areas on water quality began in 1997.

Rangeland Benchmark Programs

Benchmark programs to monitor the effects of various land uses on vegetation and plant species have been in place for several decades. Some examples include:

- **Benchmark Program**—Administered by the Alberta Department of Agriculture, Food and Rural Development, this program collects environmental and vegetation data on native rangelands. Livestock producers and resource managers use the data to make informed decisions about sustainable forage production and livestock grazing. With the results available to date, resource managers can promote the need to conserve the diversity and sustainable use of rangeland plant species. The program was initiated in the mixed-grass prairie in the late 1960s, extended into the Foothills fescue and parkland subregions during the 1970s and 1980s, and into other natural regions in the 1990s.
- **Rangeland Reference Area Program**—Administered by Alberta Environmental Protection, this program is similar in intent to the Benchmark Program and collects data on native rangelands located in the Rocky Mountain Forest Reserve. Several sites under this program have been monitored since the 1950s.

marsh marigold

- **Permanent Sample Plot Program**—Under this program over 7000 permanent sample plots have been set out, by forest companies and Alberta Environmental Protection, in the forested area of the province to measure timber growth and yield and plant species composition over time. This program provides a major source of data for calculating timber supply and timber sustainability.

Alberta Natural Heritage Information Centre

The Alberta Natural Heritage Information Centre (ANHIC) is a cooperative project between Alberta Environmental Protection, Canadian Heritage – Parks, and the Nature Conservancy. It is part of an international network of Conservation Data Centres encompassing most of the western hemisphere.

The ANHIC is a computer database on elements of biodiversity found within the province. It includes information on locations of species, ecological communities, and landscapes. The database is a valuable information source in land use and management planning.

The educational value of the ANHIC is enhanced by an information bulletin called the *Biodiversity Connector*. In addition, the Department of Environmental Protection has created an Internet home page (<http://www.gov.ab.ca/~env/>) that provides access to selected ANHIC information.

Provincial Museum of Alberta

The Provincial Museum of Alberta is the only institution in Alberta with the legislated mandate to document the province's natural history. It holds the largest specimen-based collection in western Canada, comprising a half million specimens, which enables it to be one of the few institutions that can provide verification of the existence of species in Alberta and demonstrate that existence over time. The specimens also form a significant part of the National Biodiversity Database held by museums across Canada. The Museum supports and is involved with work being undertaken through the Ecological Monitoring and Assessment Network (EMAN). EMAN is a comprehensive national network of ecological monitoring and research sites where long term, multi-disciplinary studies are carried out. Closely associated with this is the Museum's work on developing biodiversity monitoring protocols and transfer of that technology to developing countries.

The Provincial Museum of Alberta is an important focal point for public education about biodiversity and natural history within the province. In addition to viewing gallery presentations, students, researchers and the general public have access to the Museum's biodiversity database. The Museum's natural history programs are also developing interactive databases that will bring the specimen-based collections to Alberta schools and homes with access to computers and the Internet. A forthcoming Aboriginal Gallery will also serve to document traditional values and knowledge and provide an important public education function.

B. Increasing Resource Management Capability

Data and Information Management

Government of Alberta efforts to increase resource management capability include improved information storage and management, improved integration of land use and resource management planning processes, and environmental assessment processes.

Biological/Species Observation Database (BSOD)

The Department of Environmental Protection constructed a biological/species observation database in September 1996. It allows the department to monitor and periodically report on the status of wildlife in Alberta, and to effectively manage species that may be at risk. The database helps track rare species needing protection at the site level and assists with public reporting on wildlife status. Environmental Protection plans to integrate the database with biodiversity monitoring initiatives being undertaken by other jurisdictions, government agencies, non-government organizations, and the private sector.

Integrated Planning and Ecosystem Management

Integrated Resource Management

Integrated Resource Management (IRM) is a comprehensive, interdisciplinary approach to decision-making for the sustainable use of natural resources and protecting the environment. It integrates land use and natural resource policies, programs, and activities to optimize long term benefits to society and to minimize conflicts.

Integrated resource planning has been one of the primary mechanisms by which the Government of Alberta has applied IRM. Existing integrated resource plans are coordinated with other types of land and resource planning at the municipal, provincial and federal government levels, such as municipal development planning, forest management planning, river basin planning and planning for provincial and national parks.

Integrated resource plans have been completed at the regional, subregional, and local levels in many areas of the province. A Policy for Resource Management of the Eastern Slopes is an example of provincial level policy applied to a regional area—it consists of both a resource management policy and elements of a regional plan. The plan elements help address biodiversity issues within the region by delineating prime protection and critical wildlife zones. The intent of the prime protection zone is “to preserve environmentally sensitive terrain and valuable ecological and aesthetic resources.” The intent of the critical wildlife zone is “to protect ranges or terrestrial and aquatic habitats that are crucial to the maintenance of specific fish and wildlife populations.”

A Policy for Resource Management of the Eastern Slopes has also provided a framework for integrated resource planning elsewhere in the province. Some examples of other completed integrated resource plans include the Sturgeon Lake–Puskwaskau East and Lakeland subregional plans, and the Athabasca River Sandhills local plan.

The Government of Alberta is currently refocusing its commitment to IRM and sustainable development to better integrate natural resource management decision making across government. This will be an important prerequisite for balancing the protection of the province’s diverse and healthy natural environment with future economic development.

Land Use Guidelines

The Government of Alberta uses a wide range of legislative tools and guidelines to protect the environment within the context of land use objectives and plans. An interdepartmental land use referral system has been established to ensure appropriate land use policies, plans, and guidelines are considered in the approval of land use activities. The policies, plans, and guidelines are implemented through conditions (or restrictions) placed on the specific activity. For example, the Alberta Timber Harvest Planning and Operating Ground Rules, and Fisheries Habitat Protection Guidelines help protect the biodiversity of ecosystems in Alberta’s non-settled areas where forestry is a major activity. Among other things, these ground rules and guidelines call for “buffer strips” or vegetated reserves along watercourses to protect water quality and minimize sedimentation. They also call for the exclusion of timber harvesting from slopes in excess of 45 percent to minimize the potential for erosion, and timing constraints for construction and activities in and around watercourses to protect fisheries.

In combination with resource management policies and integrated resource management planning, ground rules and guidelines are valuable tools for protecting ecosystems and maintaining biodiversity.

Public Lands Reservations/Notations Program

The Public Lands Reservations/Notations Program identifies, records and monitors decisions made on the suitability of public land for various uses. The program affects several million hectares identified by over a dozen land resource management agencies.

Widely used by provincial resource management agencies and other levels of government, the program reflects the success of cooperative or integrated land use decision-making. Reservations under the program do not have legal status, but represent the commitment of agencies with legislative authority to manage provincial land and resources effectively.

The program provides several levels of protection for public land, from complete protection to allowing agricultural, commercial or other uses with conditions attached. Mostly, the program protects native vegetation, wildlife, soil, water, or landscape features from incompatible uses.

Environmental Assessments

Alberta's Environmental Assessment Process

Alberta's environmental assessment process is set out in the *Environmental Protection and Enhancement Act*, and provides the means for reviewing industrial projects and activities that may significantly affect the environment. The process assesses the environmental, economic, social, and cultural consequences of projects, allows for public input, and integrates environmental protection and economic decisions during the early stages of the planning process.

The assessment process is applied to "mandatory" projects, such as pulp mills, oil refineries, and large dams. For non-mandatory projects, the Act sets out steps to determine if the assessment process should be applied. For an assessment, the proponent is required to prepare an Environmental Impact Assessment (EIA) report according to specific terms of reference. A review of the EIA report is conducted by Alberta government departments, in particular the Department of Environmental Protection. This review includes an assessment of how the project could affect biodiversity and whether the mitigation measures proposed are adequate to sustain it. Depending on the nature of the project, quasi-judicial tribunals may also review the EIA and public hearings may be part of the review.

Quasi-Judicial Tribunals

The Natural Resources Conservation Board (NRCB) is a quasi-judicial tribunal established by the Government of Alberta to provide an impartial review of non-energy projects affecting the environment. The Board determines whether the social, economic, and environmental effects of development projects are in the public interest. The NRCB operates under the *Natural Resources Conservation Board Act*.

The NRCB considers projects related to the forest industry, recreation and tourism, metallic mineral or quarriable minerals, and water management projects. An environmental impact assessment directed by Alberta Environmental Protection triggers the

NRCB's involvement in such projects. Cabinet may refer other projects to the NRCB for review.

Similarly, the Alberta Energy and Utilities Board (EUB) is a quasi-judicial tribunal of the Government of Alberta that considers energy-related matters affecting the environment. The EUB operates under the *Alberta Energy and Utilities Board Act* and a number of other specific acts and regulations.

EUB Policy Directives

The EUB issues policy directives that affect biodiversity.

Interim Directive 96-1 *Hay Zama Lake Complex - Special Requirements* protects this important wetlands site for waterfowl and ecosystem values while allowing limited petroleum and natural gas activity. Under the directive, no surface access will be allowed for new oil and gas leases in offshore areas. To reduce environmental risk to the wetlands, the directive encourages shorter utilization periods for existing leases and wells, and phasing out activity altogether.

Although biodiversity is not a main focus of the EUB, the board contributes to the goals of the Canadian Biodiversity Strategy in various ways. These include:

- Development of policies for energy industry operations.
- Decision reports dealing with specific development applications.
- Changes in legislation and regulation.
- Participation in committees and activities related to biodiversity issues.

NRCB and EUB decisions consider Integrated Resource Management plans and other government environmental policies. However, board decisions also may influence policy and planning decisions about criteria for determining whether or not a project is in the public interest. Board decisions are binding, but can be appealed to the Alberta Court of Appeal.

C. Monitoring and Reporting

Monitoring provides a means of assessing the effectiveness of conservation policies, plans and programs.

Determining the Status of Alberta Wildlife

The ongoing process of determining the relative status of wildlife species in Alberta began in 1991 with the publication of the first *Status of Alberta Wildlife* report. A second edition was completed in 1996, with updates to be published every five years. The Status reports rank the relative status of non-fish vertebrates in the province and rates them as follows:

- At risk of extirpation in Alberta (RED).
- May be at risk (BLUE).
- Sensitive and may need special management (YELLOW).
- Not at risk (GREEN).
- Not enough information to determine a status (status undetermined).

The RED and BLUE lists include species that are, or will be considered for, formal designation as endangered species in Alberta. The YELLOW list is a focus for pro-active management to prevent these species from declining to potentially non-viable levels.

The lists are used by government and non-government agencies and organizations to set priorities for decisions about management, conservation, impact assessment, mitigation, research, and data collection. Industry and government regulators use the lists to prepare Environmental Impact Assessments. The Department of Environmental Protection evaluates the proportion of species in the at-risk category, and the decrease of species whose status is undetermined, as measures of success in its business plan.

In 1997, detailed status reports were prepared for species listed as RED or BLUE. The reports provide in-depth assessments of the biology, population size and trend, limiting factors, and risks faced by each species. They also provide the detailed information necessary to determine if these species are in danger of extirpation in Alberta and require legal designation as endangered species.

Alberta Species at Risk (RED and BLUE)

Birds

burrowing owl
peregrine falcon
pipit
whooping crane
bay-breasted warbler
black-throated green warbler
Cape May warbler
ferruginous hawk
long-billed curlew
sage grouse
short-eared owl
Sprague's pipit
trumpeter swan

Mammals

swift fox
wood bison
grizzly bear
northern long-eared bat
Ord's kangaroo rat
red-tailed chipmunk
woodland caribou
wolverine

Reptiles

prairie rattlesnake
short-horned lizard
western hognose snake

Fish

shortjaw cisco
St. Mary's sculpin
deepwater sculpin

Amphibians

northern leopard frog
great plains toad
Canadian toad
spotted frog
plains spadefoot toad

Although fish are included in the list of Alberta Species at Risk the system for rating wildlife status is not applied to fish. Of the 60 fish species in Alberta, none are “endangered”. Three are threatened and eight are vulnerable (roughly equivalent to the BLUE and YELLOW categories). The Department of Environmental Protection has completed management plans for five of the threatened and vulnerable fish species. Work is underway to develop plans for the remaining six species.

northern leopard frog

Performance Measures—Ministry of Environmental Protection

As part of the Government of Alberta’s overall business planning process, the Ministry of Environmental Protection has established seven performance measures that focus on progress and results in key areas. The measures provide a test of the Ministry’s effectiveness in fulfilling its mandate and in achieving its business planning goals, as well as the government’s overall performance. All of the seven measures support the goals of the Canadian Biodiversity Strategy and are summarized as follows:

- **Air Quality Index**—This measure shows the quality of air in Alberta throughout the year at selected locations in the province (including urban centres). The target is to maintain air quality at levels considered “good” or “fair” at all times.
- **Surface Water Quality Index**—This measure focuses on river water quality since the effects of human activity are generally more evident in rivers than in lakes. Several variables (for

example, coliform bacteria, nutrient, pH, oxygen, metals) are routinely tested and evaluated against acceptable levels identified in the Alberta Ambient Surface Water Quality Interim Guidelines. The suitability of water quality for different purposes (such as recreation, agriculture and sustainability of aquatic life) is also evaluated. The target is to improve river water quality downstream of developed areas to levels similar to upstream conditions.

- **Reduction of Municipal Solid Waste to Landfills**—Reduction of waste sent to landfills indicates the success of efforts to encourage Albertans to produce less waste. The target is to reduce the amount of municipal waste sent to landfills by 50 percent by the year 2000.
- **Timber Sustainability**—This measure compares the actual timber harvest to the approved annual allowable cut (AAC) of timber set by the province. The approved AAC is the maximum amount of timber that can be harvested each year. The target is for Alberta’s annual timber harvest to be no greater than the AAC established by the government, thereby ensuring a timber supply for the future.
- **Species at Risk**—This measure is based on a survey of the population status of fish and wildlife species in Alberta, conducted every five years. The target is to keep the percentage of species at serious risk below 5 percent.
- **Area of Parks and Natural Reserves in Alberta**—This measure includes a wide spectrum of legislative and policy instruments for protecting lands. It includes national and provincial parks, natural reserves and related sites, Forest Land Use Zones, and areas identified within Integrated Resource Plans as prime protection areas. The target is to have 81 000 km² of Alberta designated by the year 2000.

- **Pulp Production versus Amount of Substance Discharged**—The breakdown of pulp mill wastewater consumes water-borne oxygen and reduces the amount available to organisms in aquatic ecosystems. The target is to continue reducing the biochemical oxygen demand of pulp mill wastewater.

Canadian tiger swallowtail

Goal 3: To promote an understanding of the need to conserve biodiversity and use biological resources in a sustainable manner.

Goal Three initiatives look to increase public awareness and understanding of biodiversity issues, so that Albertans can effectively become involved in solutions.

Government of Alberta initiatives under this goal include educational programs and activities for teachers, students, ranchers, farmers and land managers; annual State of the Environment reports; and Fact Sheets.

Preparation of Educational Materials

Alberta Environmental Protection develops and delivers educational materials for school and other youth audiences. The materials include educational posters, fact sheets, teacher manuals, and guides that deal with conservation and the sustainable use of biological resources. Topics on which materials have been prepared include threatened wildlife, forests, and land conservation. Some program materials will soon be offered to educators through the department's Internet website.

Special Weeks and Public Awareness

Special Weeks (for example, Wildlife Week, Forestry Week) are hosted to raise public awareness of conservation issues, resource management practices, and government initiatives that address such concerns. The programs include seminars, public exhibits, environmental fairs, local community events, and interpretive walks. These events are popular and well-attended by youth, adults, and families.

Professional Development for Teachers

Alberta Environmental Protection provides teachers with the background knowledge and skills to deal with biodiversity, conservation, and ecosystem management issues in the classroom. The department offers professional development sessions at teachers

peregrine falcon

conventions and conferences, and a variety of other forums, often in partnership with other organizations. Each year more than 2500 teachers participate in these sessions.

In recent years, the department has also offered sessions to pre-service teachers at the university level as part of an environmental studies program. Alberta Environmental Protection also participates in and supports summer institutes for teachers, such as the Forest Education Leadership Institute, and the Spaces and Species Education Institute.

FEESA, An Environmental Education Society

The society offers Fellowships in Environmental Education to Alberta educators as well as a limited number of educators from outside the province. Through a fellowship, educators have the opportunity to participate in several summer Institutes dealing with issues concerning the *Boreal Forest* as well as *Spaces and Species*. These professional development experiences give educators first-hand field opportunities to learn about biodiversity in the province's six natural regions. Educators are also introduced to a variety of perspectives in dealing with issues of land use and protecting biodiversity.

Biodiversity and the School Curricula

The current science curriculum in Alberta addresses the following environmental topics or themes: diversity in forests, wetland conservation, needs of plants and animals, environmental quality, forest conservation, water quality and relationship to watersheds, and sustainable development. The secondary science program has a mandatory requirement for terrestrial and aquatic field studies for students enrolled in biology and general science.

Alberta Education has formally adopted an integrated approach for all science programs—one that involves science, technology, and societal (STS) concerns. The STS approach will provide further opportunities to continue the development of environmental themes in the science curricula.

Project Wild

This is an educational program that was delivered for many years by Alberta Environmental Protection's Fish and Wildlife Officers. The program is now delivered by the W.I.S.E. Foundation, a private conservation education organization, and focuses on conservation of wildlife and personal action. The W.I.S.E. Foundation offers training workshops for teachers and youth leaders. All workshop participants receive a copy of the Project Wild manual.

Range Management by Distance Education Initiative

This course was developed for distance education by Lethbridge Community College, the Public Lands Branch of Alberta Agriculture, Food and Rural Development, and the Research Branch of Agriculture and AgriFood Canada. The course emphasizes practical knowledge about rangeland ecosystems and range management practices.

The Range Management course emerged from the Stockmen's Range Management Course Series, operated in southern Alberta since 1990. The course features 14 modules

developed by 15 resource specialists from various agencies and institutions and is available through Lethbridge Community College.

Course objectives include promoting range management principles and practices, which encourage an ecologically based and sustainable ranching industry, improving ecological literacy among livestock producers and land managers, maintaining the biodiversity of rangeland ecosystems, and resolving range resource conflicts through interdisciplinary approaches.

Shoreline Habitat Conservation

Within the Northeast Boreal and Parkland Regions, Alberta Environmental Protection is using a public awareness and information program to help maintain and rehabilitate shoreline habitats. The program is aimed at cottage and resort owners, anglers, boaters, and local municipal officials, and emphasizes the importance of shoreline habitats to fish production and ecological integrity. Program topics include minimizing human disturbance of shoreline habitats, and rehabilitating disturbed shoreline habitats through changes in management.

Alberta Agriculture, Food and Rural Development (AFRD) conducts a similar program called the Shoreland Management Program. Through this program, AFRD strives to maintain the integrity of provincial water bodies so that their resource values and public benefits are sustained. AFRD and Alberta Environmental Protection work in close cooperation to ensure that their two respective programs complement one another in protecting Alberta's water bodies. The Shoreland Management Program works on policy issues, and continues to develop education and extension materials and approaches, so that users become effective stewards of shoreline areas.

The Alberta Riparian Habitat Management Project

Also known as "Cows and Fish", this project was established in 1992 as a partnership between the Alberta Cattle Commission; Trout Unlimited Canada; the Canadian Cattlemen'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 management changes benefit ranchers and others who use and value riparian areas, while protecting streams, their associated habitats, and the biodiversity they support. In 1996, the program was expanded beyond the Prairie Region to the provincial level.

To date, the program partners have provided information to 4500 ranchers and land managers. Over 1800 people have visited the demonstration sites and 13 000 copies of an awareness package called *Caring for the Green Zone* have been distributed throughout Canada and the western United States. With recurring feedback from rancher participants, the current focus has turned to community-level action.

State of the Environment Reporting

The *Environmental Protection and Enhancement Act* requires the Minister of Environmental Protection to report annually on the state of the environment in Alberta. To meet this obligation, Environmental Protection annually publishes a State of the Environment Report and several shorter fact sheets developed with the involvement of other government

departments and agencies. The purpose is to provide accurate information about ecosystem conditions and trends, the stresses on these ecosystems, and responses to environmental problems.

The 1994 State of the Environment report was a comprehensive overview of the state of the environment. The 1996 and 1997 reports respectively focus on aquatic and terrestrial ecosystems. Biodiversity is an important feature of these reports. In addition, Environmental Protection published a biodiversity fact sheet in 1995.

Goal 4: To maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources.

Goal Four highlights the importance of effective incentives and legislation for addressing biodiversity concerns and maintaining ecosystem sustainability.

Legislation

The Government of Alberta is committed to establishing an effective legislative framework that supports this goal. Recent government initiatives under this goal, which include consolidation and revision of existing legislation and the creation of new legislation are summarized here.

Enhanced Legislation for Endangered Species

The *Wildlife Act* and its regulations provide legal protection for endangered species. These species are protected from being hunted or harassed, and their nests or dens are also protected from disturbance. Currently, the Act provides for penalties of up to \$100,000 in fines and six months in prison.

In 1996, Alberta's *Wildlife Act* was amended to provide increased protection for endangered species in Alberta. Regulations supporting the legislation are expected in 1997. The legislation is consistent with the National Accord for the Protection of Species at Risk, agreed to by all provincial and territorial Wildlife Ministers in October 1996.

The amendment broadens the *Wildlife Act* to include provisions to protect plants, fish and insects so that all wild flora and fauna can be protected under this statute. The Act

establishes an Endangered Species Conservation Committee to advise the Minister of Environmental Protection about the designation of endangered species, the preparation of recovery plans, and endangered species and biodiversity conservation. It also provides for the assessment of endangered species by an independent scientific committee.

Alberta's New Water Policy and Legislation

The Government of Alberta recently completed a review of Alberta's water management policy and legislation. This review began in 1991 to update policy and legislation to ensure that Alberta's water is managed and conserved for today and the future. The new *Water Act* received Royal Assent in September 1996 and will be proclaimed into effect when its accompanying regulations are finalized.

Whereas the old *Water Resources Act* focused primarily on water allocation, the new *Water Act* adopts a broader perspective of sustainable water management. The Act's purpose clause states that the new *Water Act* is to: support and promote water conservation and management, sustain the environment, and ensure a healthy environment and high quality of life in the present and future.

The new legislation requires a provincial planning framework for water to be established within three years of the new legislation coming into effect. The framework will include a strategy to protect the aquatic environment and its related biological diversity. Biological diversity is defined within the *Water Act* as "the variability among living organisms and the ecological complexes of which they are a part, and includes diversity within and between species and ecosystems."

The legislation also supports the conservation of biodiversity by recognizing the importance of integrating water quality and water quantity, and by prohibiting new interbasin transfers of water.

Environmental Protection and Enhancement Act

The *Environmental Protection and Enhancement Act* (EPEA) came into force in September 1993. EPEA strengthened and clarified Alberta's previous environmental laws and consolidated them into one streamlined, comprehensive piece of legislation. EPEA takes an integrated approach to the protection of air, land and water.

EPEA recognizes the importance of the conservation of biodiversity and the sustainable use of biological resources in many different ways.

- The definition of environment is defined very broadly under the Act to mean "the components of the earth and includes:
 - (i) air, land and water,
 - (ii) all layers of the atmosphere,
 - (iii) all organic and inorganic matter and living organisms, and
 - (iv) the interacting natural systems that include components referred to in subclauses (i) to (iii)."
- The purpose clause under EPEA refers specifically to the protection of the environment being essential to the integrity of ecosystems and human health and to the well-being of society; and to the principle of sustainable development.
- EPEA includes a legislated environmental assessment process, which allows the impact of proposed developments on biodiversity to be considered.
- EPEA regulates the release of substances into the environment, the conservation and reclamation of land, and addresses waste minimization and recycling.

Protected Areas Legislation

The current legislation for managing Alberta's system of recreational and protected areas was created over a period of 20 years. Wilderness areas, ecological reserves and natural areas are administered under the *Wilderness Areas, Ecological Reserves and Natural Areas Act*. Provincial parks and recreation areas are administered under the *Provincial Parks Act*. The Willmore Wilderness Park is administered under its own legislation, the *Willmore Wilderness Park Act*.

The Government of Alberta plans to update, streamline and consolidate its protected areas legislation into a single act in 1998. This will update the legislation to a contemporary standard clarifying the purpose and intent of various classes of protected areas and how they are to be managed.

Conservation Easements

EPEA amendments to enable the registration of conservation easements in Alberta were proclaimed in September 1996. Conservation easements are legal agreements, registered against the land title of private property, that protect natural features of the property in perpetuity. Conservation easements provide another way for landowners to work with conservation groups, the provincial government, or local municipalities to protect important habitat.

Goal 5: To work 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.

Because some biodiversity issues transcend provincial and national boundaries, especially those issues concerning migratory animals, Goal 5 addresses the need for partnerships at strategic levels to conserve biodiversity.

Government of Alberta initiatives under this goal include partnership in the North American Waterfowl Management Plan—a multi-million dollar agreement to conserve North America's migratory waterfowl—and protection of four internationally important wetlands (known as Ramsar sites) in the province.

North American Waterfowl Management Plan

The North American Waterfowl Management Plan (NAWMP) is the largest habitat conservation initiative in North America. NAWMP programs are designed to restore waterfowl populations to 1970s levels by enhancing or restoring wetland habitats and surrounding habitat. This landscape management approach also benefits other species of wildlife.

The NAWMP is a joint effort among various levels of government in Canada, the United States, and Mexico; and private wildlife organizations. Within Alberta, NAWMP partners include Alberta Environmental Protection; Ducks Unlimited Canada; Environment Canada; and Alberta Agriculture, Food and Rural Development. On behalf of the Alberta partners, Ducks

Unlimited works with organized groups and individual farmers and ranchers to identify and implement sustainable agriculture options that also benefit wetland ecosystems.

Over the scheduled 15 years of work in Alberta, about 1.2 million hectares are projected for habitat conservation work. Currently, over 220 000 hectares are covered by agreements for enhancement or management. In 1996, \$9.8 million was spent on the NAWMP in Alberta. Ten percent of the plan's yearly costs are funded by the Government of Alberta.

North American Agreement for Environmental Cooperation

The North American Agreement for Environmental Cooperation (NAAEC) is the environmental side agreement to the North American Free Trade Agreement between Canada, Mexico, and the United States. Alberta has agreed to be covered by the NAAEC.

Several projects under the auspices of NAAEC relate to the conservation of biodiversity. Some examples include:

- **Cooperation in the Conservation of North American Birds**—This project aims to identify important bird areas, prepare an inventory of policies and programs for bird conservation, and develop a conservation strategy.

common goldeneye

- **Plant Biodiversity Inventory and Information Network for North American Forest Ecosystems**—This project will develop pilot inventories of plant biodiversity for two forest ecosystems, build partnerships between museums and institutions that hold plant inventory data, and create an on-line database of known vascular plants in North America.

- **Non-governmental Participation in the Conservation of Protected Areas and Adjacent Land Holdings**—Based on a pilot project in Mexico, this project will identify opportunities and challenges for conservation of protected areas and adjacent lands by non-governmental organizations. The work is founded on an awareness that protected areas and adjacent land holdings survive best when they are seen to be valuable to the jurisdiction and local surrounding communities.

Ramsar Sites

In 1971, Canada was one of 18 countries that signed the Convention on the Conservation of Wetlands of International Importance. The Convention was signed in Ramsar, Iran, and wetlands designated under the convention are known as Ramsar sites.

Sites are designated as Ramsar sites if they are particularly good examples of a specific type of wetland in the region, are important for the maintenance of biological diversity, or regularly support large numbers of waterfowl or aquatic birds. Designation supports national or provincial legislation protecting wetlands by drawing international attention to threats of deterioration or damage.

There are four Ramsar sites in Alberta. They are:

- **Beaverhill Lake**—Located in central Alberta, the lake is a significant feeding and resting site for migrating waterfowl and shorebirds that nest in more northerly areas, and is an important habitat for locally nesting waterfowl and shorebirds.
- **Whooping Crane Summer Range**—Locations in Wood Buffalo National Park provide the only nesting sites for wild whooping cranes.
- **Hay-Zama Lakes**—Located in northwestern Alberta, the lakes are an important waterfowl habitat area.
- **Peace-Athabasca Delta**—Located in northeastern Alberta, the delta is the world's largest freshwater delta and provides rich habitat for waterfowl and aquatic mammals.

Species Relocation

The Government of Alberta has cooperated with other jurisdictions to relocate species. This has resulted in species being re-introduced to former ranges, or increasing their populations to viable levels. In 1917 and 1920, elk were relocated to Banff and Jasper National Parks from Wyoming. Recently, wolves were relocated from Alberta to the United States.

In January 1995, 29 Alberta wolves from the Hinton area near Jasper National Park were captured and released in Yellowstone National Park and central Idaho in the American west. (The following year, another 36 wolves from British Columbia were relocated to the same area). The re-introduction of wolves to areas where they have not existed for most of this century, was the culmination of years of recovery planning by the United States Fish and Wildlife Service, in consultation with wildlife managers in Alberta. Active relocation of wolves from similar habitats, and having similar prey, was chosen over the slower alternative of waiting for natural repopulation. Study results suggest that the wolf populations are increasing, and that the relocation program has been successful.

gray wolf

Conclusion

In 1995, the Government of Alberta, along with the other provincial and territorial governments and the federal government, signed the statement of commitment supporting the Canadian Biodiversity Strategy. In signing the statement of commitment jurisdictions recognized the valuable benefits conferred by a rich diversity of species and biological resources, and the urgent need to protect them. The preceding report fulfils one obligation of signing the statement of commitment—to file a jurisdictional report on policies, activities, and plans that implement the Canadian Biodiversity Strategy.

On behalf of Albertans, the Government of Alberta manages natural resources in accordance with accepted conservation principles. *Sustaining Alberta's Biodiversity* highlights over 50 initiatives that help maintain the province's rich natural environment but it is not a complete listing. Some initiatives have been the work of the provincial government alone, and are leading-edge in concept and application. Others have been undertaken in partnership with non-government organizations and individuals, who have also done much good work on their own.

The promise and successful application of new environmental management approaches, such as ecosystem management, will largely depend on better understanding, insights and other benefits gained through research, cooperation and collaboration. This will require stronger linkages across and between disciplines and sectors such as forestry, agriculture, fish and wildlife management, academia, the public and Aboriginal peoples. At the same time broad-scale approaches, like ecosystem management, will need to be complemented by specific, or fine filter, initiatives.

The future holds new changes and challenges. The environmental conditions that existed in the province in its early history cannot be re-created. However, the Government of Alberta will continue to take the necessary steps to achieve its vision of sustainable development, including the maintenance of biodiversity, to ensure that Albertans' environmental and economic needs are realized.

pileated woodpecker

Appendix: Contacts for More Information

Agency

Irrigation and Resource Management Division
Alberta Agriculture, Food and Rural Development
206, J.G. O'Donoghue Building
7000 – 113 Street
Edmonton, AB T6H 5T6
phone: (403) 422-4596 fax: (403) 422-0474

Plant Industry Division
Alberta Agriculture, Food and Rural Development
304, J.G. O'Donoghue Building
7000 – 113 Street
Edmonton, AB T6H 5T6
phone: (403) 427-5341 fax: (403) 422-0783

Public Land Management Branch
Alberta Agriculture, Food and Rural Development
200, J.G. O'Donoghue Building
7000 – 113 Street
Edmonton, AB T6H 5T6
phone: (403) 427-3595 fax: (403) 422-4244

Environmental Assessment Division
Alberta Environmental Protection
6th Floor, Oxbridge Place
9820 – 106 Street
Edmonton, AB T5K 2J6
phone: (403) 427-6270 fax: (403) 422-9714

Prairie Region
Environmental Service
Alberta Environmental Protection
3rd Floor, YPM Place
530 – 8th Street South
Lethbridge, AB T1J 2J8
phone: (403) 381-5430 fax: (403) 382-4109

Fisheries Management Division
Alberta Environmental Protection
2nd Floor, Great West Life Building
9920 – 108 Street
Edmonton, AB T5K 2M4
phone: (403) 427-6730 fax: (403) 422-9559

Topic

- Canada/Alberta Environmentally Sustainable Agriculture (CAESA) Agreement
- Alberta Environmentally Sustainable Agriculture (AESA) Program
- Purple Loosestrife Management Program
- Conservation and Reclamation of Land Disturbances
- Land Use Policies
- Benchmark Program
- Public Lands Reservations/Notations Program
- Shoreline Habitat Conservation (Shoreland Management Program)
- Alberta Riparian Habitat Management Project
- Range Management by Distance Education Initiative
- Purple Loosestrife Management Program

- Alberta's Environmental Assessment Process

- Alberta Prairie Conservation Action Plan

- Fish and Wildlife
- Fish Conservation Strategy for Alberta
- Shoreline Habitat Conservation
- Alberta Riparian Habitat Management Project

Forest Management Division
Alberta Environmental Protection
9th Floor, Great West Life Building
9920 – 108 Street
Edmonton, AB T5K 2M4
phone: (403) 422-4566 fax: (403) 427-0085

- Alberta Forest Conservation Strategy
- Alberta Forest Management Science Council
- Southern Rockies Landscape Planning Pilot Project

Land Reclamation Division
Alberta Environmental Protection
3rd Floor, Oxbridge Place
9820 – 106 Street
Edmonton, AB T5K 2J6
phone: (403) 427-6202 fax: (403) 422-0080

- Conservation and Reclamation of Land Disturbances

Natural Heritage Planning and Evaluation Branch
Alberta Environmental Protection
2nd Floor, 9820 – 106 Street
Edmonton, AB T5K 2J6
phone: (403) 427-6639 fax: (403) 427-5980

- Alberta Natural Heritage Information Centre
- Ramsar Sites

Recreation and Protected Areas Division
Alberta Environmental Protection
2nd Floor, Oxbridge Place
9820 – 106 Street
Edmonton, AB T5K 2J6
phone: (403) 427-8441 fax: (403) 427-5980

- Alberta's Protected Areas System
- Special Places
- Protected Areas Legislation

Resource Data Division
Alberta Environmental Protection
14th Floor, Oxbridge Place
9820 – 106 Street
Edmonton, AB T5K 2J6
phone: (403) 427-7222 fax: (403) 422-0712

- Vegetation Inventories

Strategic and Regional Support Division
Alberta Environmental Protection
11th Floor, Petroleum Plaza - South Tower
9915 – 108 Street
Edmonton, AB T5K 2G8
phone: (403) 427-0047 fax: (403) 422-5136

- Provincial Wetland Policy
- Peat Management Task Force
- Peace Athabasca Delta Technical Studies
- Northern River Basins Study
- Sustainable Communities Initiative
- Instream Flow Needs Studies
- Integrated Resource Management
- Educational Activities
- State of the Environment Reporting
- Environmental Protection and Enhancement Act
- Conservation Easements
- Performance Measures–Ministry of Environmental Protection

Water Management Division
Alberta Environmental Protection
9th Floor, Oxbridge Place
9820 – 106 Street
Edmonton, AB T5K 2J6
phone: (403) 427-6168 fax: (403) 422-0262

- Water Policy and Legislation
- South Saskatchewan River Basin Policy

Wildlife Management Division
Alberta Environmental Protection
4th Floor, Great West Life Building
9920 – 108 Street
Edmonton, AB T5K 2M4
phone: (403) 427-6750 fax: (403) 422-9557

- Fish and Wildlife Policy
- Conservation of Species and Habitats
- Endangered Species Recovery Program
- Regional Caribou Standing Committees
- Status of Alberta Wildlife
- Biological/Species Observation Database
- Enhanced Legislation for Endangered Species
- Species Relocation

Alberta Intergovernmental and Aboriginal Affairs
12th Floor, Commerce Place
10155 – 102 Street
Edmonton, AB T5J 4G8
phone: (403) 427-6543 fax: (403) 427-0699

- North American Agreement for Environmental Cooperation

Local Government Services Division
Alberta Municipal Affairs
17th Floor, Commerce Place
10155 – 102 Street
Edmonton, AB T5J 4L4
phone: (403) 427-2523 fax: (403) 420-1016

- Land Use Policies

Environmental Protection Department
Alberta Energy and Utilities Board
640 – 5 Avenue SW
Calgary, AB T2P 3G4
phone: (403) 297-3187 fax: (403) 297-3520

- Quasi-Judicial Tribunals

Natural Resources Conservation Board
4th Floor, Sterling Place
9940 – 106 Street
Edmonton, AB T5K 2N2
phone: (403) 422-1977 fax: (403) 427-0607

- Quasi-Judicial Tribunals

Alberta Forest Products Association
200, 11738 Kingsway Avenue
Edmonton, AB T5G 0X5
phone: (403) 452-2841 fax: (403) 455-0505
Home page: <http://www.abforestprod.org>

- Forest Care

Department of Biological Sciences • Challenge Grants in Biodiversity
CW405, Biological Sciences Centre
University of Alberta
Edmonton, AB T6G 2E9
phone: (403) 492-1257 fax: (403) 492-9234

Clean Air Strategic Alliance • Clean Air Strategic Alliance
9th Floor, Sterling Place
9940 – 106 Street
Edmonton, AB T5K 2N2
phone: (403) 427-9793 fax: (403) 422-3127

Ducks Unlimited Canada • North American Waterfowl Management Plan
202, 10470 – 176 Street
Edmonton, AB T5S 1L3
phone: (403) 489-2002 fax: (403) 489-1856

FEESA, An Environmental Education Society • Fellowships in Environmental Education
601, 10179 – 105 Street
Edmonton, AB T5J 3N1
phone: (403) 421-1497 fax: (403) 425-4506

Provincial Museum of Alberta • Provincial Museum of Alberta
12845 – 102 Avenue
Edmonton, AB T5N 0M6
phone: (403) 453-9174 fax: (403) 454-6629

Ramsar Convention Bureau • Ramsar Sites
Rue Mauverney 28, CH-1196
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Reader Survey

Sustaining Alberta's Biodiversity—An Overview of Government of Alberta Initiatives Supporting the Canadian Biodiversity Strategy

Your response to this survey will help us improve the quality of future reports!

Please complete the following Reader Survey and return it to:

Alberta Environmental Protection
Strategic and Regional Support Division
11th Floor, Petroleum Plaza, South Tower
9915 – 108 Street
Edmonton, AB T5K 2G8
Phone: (403) 427-0047 Fax: (403) 422-5136

1. Your affiliation? Please check (✓) the most appropriate category.

- ☐ Education—Student
- ☐ Education—Teacher/Professor
- ☐ Government
- ☐ Industry (Please specify: _____)
- ☐ Private business
- ☐ Environmental organization
- ☐ Other organization (Please specify: _____)
- ☐ Unaffiliated (individual)
- ☐ Other (Please specify: _____)

2. For what purpose(s) will you use this report?

- ☐ To learn about biodiversity in general
- ☐ To learn about biodiversity in Alberta
- ☐ To assess the state of biodiversity in Alberta
- ☐ To extract specific environmental data
- ☐ Other (Please specify: _____)

3. Overall, do you find this report to be:

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not very useful

Comments:

4. In your opinion, were there any topics that were missing or inadequately covered?

☐ Yes ☐ No

Please specify:

5. In your opinion, how well is this report organized and written?

A) This report is:

☐ Very well organized
☐ Fairly well organized
☐ Not well organized

B) The information is:

☐ Very interesting
☐ Fairly interesting
☐ Boring

C) The content is:

☐ Comprehensive
☐ Adequate
☐ Lacking in certain areas

D) The report is:

☐ Very well written
☐ Fairly well written
☐ Not well written

E) The tables and figures in the report are:

☐ Very good
☐ Adequate
☐ Not very good

Comments:

6. What did you most like and dislike about this report?

Liked:

Disliked:

7. Any other comments or suggestions for improving future reports?

Thank you for your time and cooperation!