

PROFILE FOR  
COMMUNITY  
ACTION  
SERIES



# Biodiversity: A Profile for Community Action

A Companion to Harmony Foundation of Canada's  
Community Action Workshop Manual



**PROFILE FOR COMMUNITY ACTION SERIES**

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Community Action Workshop Manual**





# **Serving Communities Across Canada and Around the World**

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Achievement

Since 1985, Harmony Foundation has served community groups and educators from every Canadian province and 31 countries around the world. Our goal is to build the skills of individuals, schools, communities and other organizations so that they are prepared to deal with the challenges facing them. As a result of our training, many people have developed school and community projects that have helped raise environmental awareness and contributed to local environmental improvement. Our approach is characterized by:

## **Self-Sufficiency**

Our programs and publications provide the skills and tools that communities, organizations and educators need to deliver their projects self-sufficiently and to organize independently.

## **Capacity Building**

Our programs assist individual action, community initiatives and the development of educational programs and resources. Most importantly, we build the capacity of individuals and organizations so that they can respond positively to the environmental problems they face.

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Environmental education and community initiatives must be understood within their regional, national and global context in order to be truly supported by and integrated into society. Our programs encourage cooperative action on environment and development issues and active Canadian leadership and participation in the global campaign.

### **National Unity**

Through our Institute for Environmental Values Education and other programs Harmony Foundation continues to bring Canadians together around common concerns leading to an increased sense of national unity and pride.

### **Efficient Use of Resources**

By providing our programs and resources to organizations across Canada we avoid duplication of effort and encourage efficient use of resources. Through our partnerships with other organizations we respond to the needs of the public in a cost-effective way.

### **Leveraged Support**

We have maximized our support by using it to persuade other corporations, foundations and government agencies to join our efforts – thus leading to more extensive results. This approach has helped us attract a broad base of support and cooperation from corporations, foundations, federal and provincial governments and international agencies.





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## **Foreword**

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For over 15 years, Harmony Foundation has created and delivered education programs for individuals, communities, educators and workplaces working towards positive solutions to environmental problems and their underlying causes. During that time it has become increasingly clear that the most effective solution to environmental problems is prevention, based on the knowledge, skills and cooperation we need to make sound decisions in our own lives and work together internationally, regionally and in the communities where we live. Education will be a central part of any successful strategy.

There is a wide array of environment and community development training and education programs based on single themes such as nature appreciation, resource management or applied science and technology. These approaches, while having their place, have been too limited to deal with the complexity of most community, environmental and social issues.

At the root of global crises such as loss of biodiversity are the values that cause us to behave in environmentally destructive and selfish ways. The role of education must be to develop values and skills that lead to environmentally sound and humanitarian decisions and, ultimately, to positive action. Such education must be widely accessible, with a multi-disciplinary focus. It must help people of all ages and backgrounds to understand the interrelationships between values and behaviour and environmental quality, social justice and equity, and it must provide the tools to act on this knowledge. Links between local, national and global concerns must also be stressed. As environmental and community development issues increase in number, importance and complexity, we will be forced to rethink our goals and values to ensure they lead to environmentally sound and just behaviour in communities worldwide, contributing to national efforts and global cooperation.

Our challenge is to provide education and training programs that are comprehensive, integrative, positive and responsive to changing

environmental, social and economic realities. We must also counter the stumbling blocks to positive action, including disempowerment, cynicism, lack of knowledge or skills and inadequate leadership. Education, at its best, must develop a population that is aware of the world and concerned about it, and has the knowledge, skills, goals and commitment to work together toward solutions of current problems and the prevention of new ones.

The need for environmental scientists, regulators and advocates is clear. However, to successfully meet our environment and community development challenges we must promote a massive program of training and education that will help individuals develop goals and values that respect others, are compatible with a healthy environment, promote progressive social and economic decisions and lead to positive action for the benefit of people around the world, as well as other species and future generations. We know the problems, we have the means to deal with them, and future generations will judge us harshly if we fail to act.

**Michael Bloomfield**  
*Founder and Executive Director,*  
*Harmony Foundation*





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none of us has the right to drill a hole under our  
own seat'**

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## Introduction

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Congratulations on taking an important step towards protecting biodiversity. Knowledge is power, and by understanding what biodiversity is all about and why we're losing it, you can decide how your community can best add its efforts to the initiatives taking place across Canada and around the world.

In this Profile you'll find facts, resources, inspiration and a wealth of ideas on how to protect biodiversity in your community. You'll find this Profile tells you what you need to know about biodiversity in clear, accessible language. The **Overview** explains what biodiversity is, why it's important, what's causing the loss of biodiversity in Canada and around the world, and what can be done to protect it. At the back of the Profile, the **Biodiversity Fast Facts** summarizes everything in a handy three-page format.

You'll also find inspiration in the pages that follow. The **Success Stories** provide a wealth of ideas on how communities can take action to protect biodiversity. Read about what groups across Canada and internationally have done to conserve genetic diversity, monitor species, protect and rehabilitate habitat, and manage resources in a sustainable manner. You'll also discover lots of resources for further information in each of these areas.

The **Personal Action Checklist** at the back of this publication has some excellent suggestions on changes you can make in your own life to protect the diversity of life on this planet.

If this Profile motivates you to action, you may want to consider some of the other publications and programs that Harmony Foundation offers. *Biodiversity: Profile for Community Action* is only the tip of the iceberg – there is an array of tools available to you through Harmony's **Building Sustainable Societies** program, outlined below.

## **The Program**

As the diagram on page 3 illustrates, *Building Sustainable Societies* is a three- tiered program composed of training sessions, community action workshops, and local initiatives. The goal of the program is to provide community groups with the necessary knowledge and project planning skills to launch local biodiversity projects.

## **The Training Session**

In our Training Sessions, we prepare community group representatives to run Community Action Workshops, by familiarizing you with the activities and facilitation techniques in our *Community Action Workshop Manual*. Call us to find out if we'll be offering one in your region in the near future.

## **The Community Action Workshop**

The Workshop provides your group with an opportunity to work together to learn more about a selected environmental issue, identify community assets and needs, articulate a vision to solve a particular problem of your choice, and develop an action strategy. Above all, it is an opportunity for your group to work as a team. You'll find a more detailed description and agenda for the Workshop on page 4.

## **The *Community Action Workshop Manual***

This *Manual* is an ideal companion to the Profile you are now holding. While the Profile provides you with a clear understanding of biodiversity loss, the *Community Action Workshop Manual* shows you how to take effective local action through a simple and tested project planning framework. Together, the *Community Action Workshop Manual* and *Biodiversity: Profile for Community Action* provide you with everything you need to tackle the threats to biodiversity.

We hope you'll find a wealth of ideas and information in *Biodiversity: Profile for Community Action* and that you are inspired to act on the knowledge you will gain. Good luck in all your present and future endeavours, and remember that education is the starting point for global change.

As Margaret Mead famously remarked, never doubt that a small group of committed people can change the world – in fact it's the only thing that ever has.





## **Community Action Workshop Agenda**

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Put your biodiversity ideas into action! The Community Action Workshop is designed to guide community groups through the process of planning a local initiative. It takes a funnelling approach: beginning with the "big picture" of biodiversity loss and the global scope of the issue, the focus then narrows to an examination of biodiversity within the community and the selection of a specific local problem to tackle. The workshop culminates in the development of a detailed action plan to address the selected problem.

The Workshop is broken into five modules, for maximum flexibility, and takes approximately 11 hours in total to run. Please see Harmony Foundation's **Community Action Workshop Manual** for full details.

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## **Guiding Principles**

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The design and content of Harmony Foundation's Training Sessions and Community Action Workshops are based on the following educational principles:

### **Values-Based**

An examination of values provides the foundation required to effectively understand one's own and other's world views. From this understanding participants can consciously and conscientiously benefit from various perspectives and actions to generate innovative solutions.

### **Experiential**

Experience is at the base of learning. The experiential learning cycle involves concrete experience, reflection on the experience, concept building and application, and it challenges people to rise beyond their current level of thinking and acting.

### **Holistic and Multi-disciplinary**

Holistic education involves the whole person. It appeals to all dimensions of an individual (i.e., emotional, spiritual, intellectual, physical). A multi-disciplinary approach promotes learning through the integration of subjects. Effective social change education programs examine the interrelationships amongst many fields of study and amongst the various elements of societies.

### **Systemic**

Understanding the systemic relationships between individuals, societies and the environment contributes to an integrated approach to problem solving. Everything we do affects something or someone else.

### **Cooperative**

Cooperative learning is interdependent; we learn with each other and from each other. Both the facilitator and the participants contribute to the educational process.

### **Based on Critical Thinking**

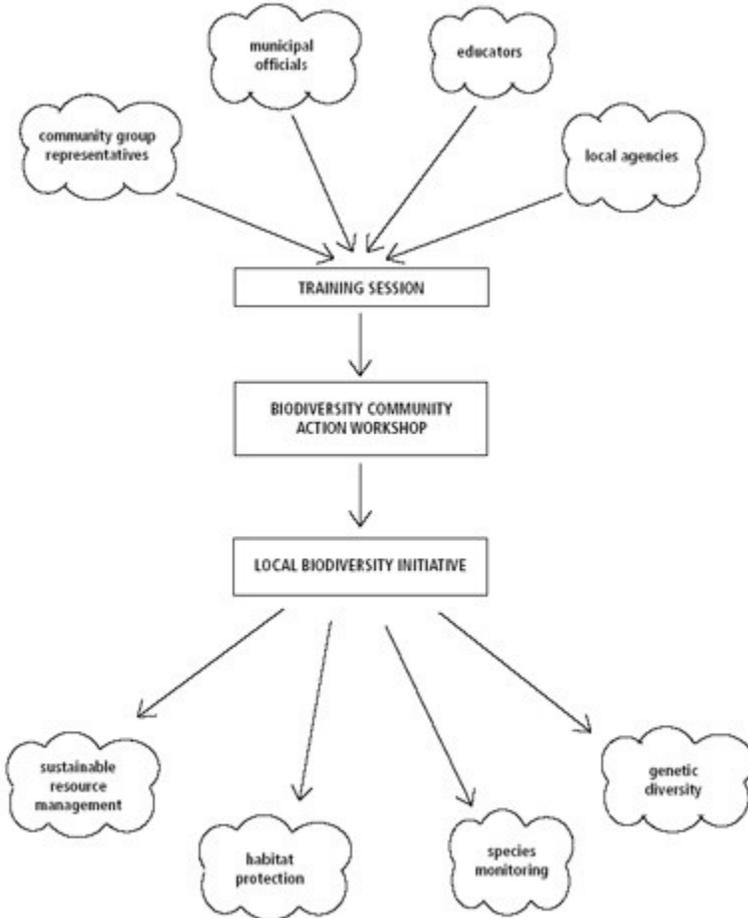
Critical thinking is a process, not a result. Critical thinkers aim to identify and challenge their own assumptions and knowledge about a particular topic or issue, along with information presented to them. They are open to forming new ways of viewing an issue and generating innovative solutions.

### **Situated within a Global Context**

Community-based initiatives are central to effective environmental and social action, yet they must be understood within regional, national and global contexts in order to effectively bring about long-term change. Societal change must happen at all levels in order for initiatives to be truly supported by and integrated into societies.



## **Building Sustainable Societies Project Structure**





## **An Overview of Biodiversity**

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### **Purpose**

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This section provides an introduction to biodiversity: what it is, why we need it, and its current state, both in Canada and internationally. It also looks at the reasons there is a worldwide decline in biodiversity, and what we can do to halt this disturbing trend.

The better we understand the issue, the more effectively we can take action.

### **Introduction**

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Throughout the world, a diversity of life – often referred to as biodiversity – exists. Most often, we hear about the importance of protecting tropical rainforests, which contain approximately half of the world's species. We also hear how compelling species such as the giant panda or the African elephant are in danger of extinction. Indeed, these ecosystems and species are very precious to this planet. Yet, there are many other types of ecosystems and species, even in our own provinces and territories, which are just as important, and just as worthy of protection. Think of how different Canada would be, for example, without its temperate rainforests of British Columbia or arctic regions of the Northwest Territories, Nunavut and the Yukon, and the species within them.

The biodiversity of ecosystems, species, and their genetic makeup are vital components of this planet. Increasingly, however, a multitude of combined pressures, including population explosion, over-exploitation of natural resources, pollution, climate change, urbanization and industrialization,



are threatening the world's biodiversity and, in turn, the overall quality of life on this planet. Currently, more than 11,000 species of plants and animals alone are facing a high risk of extinction in the near future, largely because of human activities (IUCN, 2000a).

Humans are clearly the driving force behind the current losses of biodiversity at local, national and global levels, and it is our responsibility to stop and prevent these losses. There are many ways to get involved, through changing our day-to-day choices, supporting organizations involved with protecting biodiversity, advocating for stronger legislation, or working towards a fundamental change in our society's perception of biodiversity so it becomes a higher priority for communities, government and the private sector.

## **What is biodiversity?**

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What is biodiversity? The word itself is an abbreviation of "biological diversity", but simply speaking, it is the variety of life on Earth and the processes and relationships that sustain it (Chadwick, 1993). Biodiversity exists at different levels, from genes, to species, to entire ecosystems, and is linked to human cultures as well.

### **Genetic diversity**

Genetic diversity is the hereditary variation – all the different possible combinations of genes – that exists within a species or population. It's what makes individuals within a species slightly different from one another, and it's what enables a species to adapt to changes in the environment.

### **Species diversity**

Species diversity or "species richness" is the most tangible and well-understood level of biodiversity. It refers to the number of different kinds of living creatures, or species, in a particular area, whether it be a small pond, for example, or a vast desert, or the entire earth (Duffield *et al.*, 1995).

We know very little about all the species that exist on earth. Worldwide, approximately 1.7 million species have been identified and described, but scientists estimate the total number of species that actually exist could be anywhere from 5 million to 100 million. It is generally agreed that at least 10 million species exist, and that most of them are insects and microorganisms (WCMC, 1995).

A **species** is a collection of organisms that can, in theory, interbreed with each other, whereas a **population** is a group of individuals of the same species that live in the same geographical area at the same time. The grizzly bear, for example, is a species, and different populations of grizzly bears inhabit different parts of North America.

(Source: Moran et al., 1986)

### **Ecosystem diversity**

A single species cannot exist in isolation – it depends on other species and the physical environment around it. So when we talk about biodiversity, it's important to consider "ecosystems", which are units of the natural environment that consist of the complex and dynamic interactions between all living and non- living components within a given area (Moran *et al.*, 1986).

Different ecosystems can contain very distinct species and patterns of interactions between these species – think of the differences between coral reefs, tallgrass prairies, coastal wetlands and old-growth forests, for example. Ecosystem diversity refers to the variety of ecological units and habitats and the ecological processes within them (DEST, 1993).

### **Cultural diversity**

Humans can cause both increases and decreases in local biodiversity, depending on how we use and manage the environment around us. Over thousands of years, various communities around the world have created a

diversity of knowledge, values and cultural practices in partnership with nature (Shand, 1997). Many indigenous societies have developed management practices that have allowed them to live sustainably within an area for thousands of years and maintain high levels of biodiversity.

## **Why is it important?**

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What do we lose when a local forest is destroyed, or a particular type of bird becomes extinct? There are many different reasons why biodiversity is valuable to the quality of life on earth. Overall, biodiversity is important for the maintenance of ecological, economic and socio-cultural systems. And fundamentally, nature has an intrinsic value beyond that defined by humans, and as humans, we have an obligation to respect life on this planet, as well the systems that support it.

### **Natural insurance policy**

According to Dr. Roy Crawford of Rare Breeds International, "maintenance of biological diversity, in all its many aspects, is essentially an insurance policy for future needs" (Chiperzak, 1999). Ecosystems that are genetically and species diverse have a greater resilience to factors such as pests, disease, floods and droughts, and are quicker to recover when disturbed (Janetos, 1997). Therefore, loss of biodiversity reduces the ability of nature to respond to these changes. As well, from a purely selfish perspective, the ability of humans to adapt to changing conditions is dependent on biodiversity.

### **Ecological value**

All species have an ecological value. Some species play vital roles in the flow of energy within an ecosystem – if you remove them from an ecosystem, you risk disturbing a complex balance. Ten to twenty species of animals, for example, can be dependent on one particular plant species at some time during their life span, either for food or for shelter (Moran *et al.*, 1986). Other species have equally important roles. In a forest or wetland, for example, natural vegetation helps maintain hydrological cycles by regulating water runoff. Meanwhile, plant root systems help

keep soil in place, thereby preventing erosion. Soil contains the nutrients needed by plants, while the nutrients are created by decomposing bacteria. The decayed matter can in turn feed earthworms, which mix and aerate the soil and make nutrients more accessible (DEST, 1993).

### **Economic value**

Biodiversity has long provided humans with basic materials for survival, particularly for food, healing remedies, clean air and water, shelter, clothing and income. It is estimated that over 7,000 plant species are cultivated and gathered by humans for food (UN FAO, 1996), and between 25,000 to 30,000 plant species are used for traditional medicinal purposes worldwide (Heywood *et al.*, 1995).

The use of natural resources for agricultural, forestry, fishery, pharmaceutical, oil and mining industries has created larger-scale economic values of biodiversity. Lumber and wood by-products generated some \$7.5 billion in Canada in 1990. Plants are just as important today for modern pharmaceutical developments as they have been for traditional medicinal practices. Take taxol, which was discovered in the 1990s in the bark of western yew (*Taxus brevifolia*). Clinical testing of taxol has shown that it has properties that can fight breast, ovarian and lung cancers, and therefore has the potential to produce a drug worth millions of dollars (Whiting, 2000).

Biodiversity also provides employment opportunities – millions of people work in agriculture, fishing, forestry and pharmaceutical industries around the world, which rely directly on natural resources (BCO, 1995). Biodiversity is crucial to eco-tourism, an increasingly popular activity driven by our desire to experience nature. Think of whale watching along Canada's west coast, safaris in Kenya's Amboseli Park, tours through a Costa Rican forest, or wilderness canoeing trips (Myers, 1997).

### **Intrinsic and spiritual values**

For many people from all walks of life, biodiversity is an important source of emotional, artistic and spiritual inspiration and cultural identity. Many indigenous communities have developed important cultural relationships with nature that are dependent on the local biodiversity. As well, the diversity of the natural landscape, including the coast of Newfoundland,

the Great Lakes, prairie grasslands, west coast forests and the Arctic, have helped create a uniquely Canadian character (BCO, 1995).

And many people recognize that fundamentally, all life forms have a right to exist. It is important that we respect the integrity of nature and act on our ethical obligation towards other species – recognizing that we share this planet with all life forms and should live in balance with them. Although these values of biodiversity might not hold as much weight in political or economic decision-making situations, fundamental beliefs and values can be quite powerful in mobilizing individual and community efforts to conserve biodiversity.

## **What is the current state of biodiversity?**

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### **Globally**

Though we know that no species or ecosystem can last forever, scientists believe that current extinction rates – the number of extinctions per species per year – and the rate of habitat destruction are among the highest known in geological history (Sepkoski, 1995). One estimate indicates that mammals are becoming extinct at a rate 100 times higher than the **background extinction rate**. The **background extinction rate** is the number of species, over a certain timeframe, that have become extinct due to natural causes, rather than as a result of large-scale human pressures. Another estimate indicates that over the next 20 years, one to ten percent of tropical forest species will become extinct, a rate 1,000 to 100,000 times the average background extinction rate (Clobert *et al*, 1995).

At a global level, the IUCN (World Conservation Union) identifies species that are threatened, or at risk. IUCN currently lists 11,046 plant and animal species at high risk of extinction in the near future, which includes 24 percent of mammal species and 12 percent of bird species. These include the Iberia lynx, the most threatened wild cat known worldwide; the Chinese alligator; the Tibetan antelope; the sea otter; eight species of South Asian box turtle (mainly due to harvest demands from the Asian

food and medicine market); and the Alabama canebrakepitcher plant, threatened by wetland destruction (IUCN, 2000b).

Indonesia, India, Brazil and China are among the countries with the most threatened mammals and birds, while plant species are declining rapidly in South and Central America, Central and West Africa, and Southeast Asia. In almost all cases these species are at risk due to human activities (IUCN, 2000a).

Ecosystems, too, are under stress. It is estimated that half the world's wetlands have been lost in the 20<sup>th</sup> century. As well, forests have been reduced by over 20 percent worldwide and over 90 percent of grasslands have been lost (UNDP, 2000).

Agriculture has become increasingly vulnerable to pests, disease and weather, thanks to a reduction in crop and livestock diversity. Over thousands of years, farming communities carefully developed crops with distinct characteristics suited to different conditions (Heywood *et al.*, 1996). During the Green Revolution of the 1950s, much of this crop diversity was replaced by genetically similar high-yielding varieties requiring intensive pesticide, fertilizer and irrigation inputs (Shand, 1997). In Sri Lanka, for example, 2,000 varieties of rice were grown by farmers in 1959, but by 1991 only five varieties were being cultivated (Rhoades, 1991). Since the beginning of the 20<sup>th</sup> century, 75% of the world's genetic diversity of crops has been lost (UN FAO, 1996).

Globally, there have been a number of areas that have been identified as 'hot spots,' or areas of abundant biodiversity. Hot spots are found largely in tropical regions, and contain relatively high concentrations of species that are not found anywhere else in the world. At least 25 hot spots have been identified, and it is believed that by safeguarding the majority of them, we could significantly reduce the current rates of extinction. At the same time, pressures for agricultural lands and other developments make hot spots challenging targets for conservation (Powledge, 1998).

### **In Canada**

While Canada does not contain any 'hot spots' of biodiversity, it is one of the world's largest countries, home to almost 24 percent of the planet's

wetlands, 20 percent of its freshwater and 10 percent of its forests. Our seasons and climate have forced many species to be highly adaptive, developing special insulation traits, dietary characteristics, or life cycle activities such as hibernation and migration (BCO, 1995). Polar bears, for example, are well equipped with thick layers of fur and fat to protect them against the cold. Their white colour helps camouflage them from their prey, while the soles of their feet have small bumps and hollows that act like suction cups to keep them from sliding on the ice (CWS, 2000b).

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses how many of the country's species are at risk of extinction and, where possible, evaluates the level of risk they face. COSEWIC uses the following categories to describe risk of extinction. **Extirpated** refers to wildlife species that once existed in Canada, but are no longer found in the country's wild, while **endangered** species are facing imminent extirpation or extinction. **Threatened species** are those that are likely to become endangered if limiting factors are not reversed, while **special concern** refers to species whose characteristics make them particularly sensitive to human activities or natural events.

As of November 2000, COSEWIC categorized 364 species as either at risk or extinct, but there are many more Canadian species currently at risk that are awaiting assessment (Mosquin, 2000). Those that have been formally listed as at risk by COSEWIC include a number of whale species: the Northern Pacific populations of killer and humpback whales, as well as three beluga whale populations — those of the St. Lawrence, Ungava Bay and Baffin Island/ Cumberland Sound regions.

Ecosystem biodiversity is also at risk in Canada. The Carolinian Forest zone of Southwestern Ontario, for example, is one of Canada's most diverse ecological zones. Though it makes up only one percent of the country's entire landmass, it contains 40 percent of the wildlife considered threatened, endangered or of special concern in the entire country, while also supporting 25 percent of Canada's human population (van Hemessen, 1997). Over 90 percent of the land has been converted since European settlement, leaving many of the original plant species vulnerable to extinction (van Hemessen, 1997; Mosquin, 2000). Similarly, only one percent of Alberta, Saskatchewan and Manitoba tallgrass prairie remains –

the loss due mainly to large-scale crop and livestock agricultural practices (Mosquin, 2000; McNeely, 1995).

## **What causes biodiversity loss?**

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<b>THREATENED SPECIES WORLDWIDE</b>		
<b>Categories</b>	<b>1996</b>	<b>2000</b>
Plants	n/a	7,022
Invertebrates	2,434	3,277
Mammals	2,067	2,133
Birds	2,167	2,123
Fish	922	1,028
Reptiles	428	454
Amphibians	138	231

(Source: IUCN, 1996, 2000)

While natural causes account for the background extinction rate, they cannot account for the tremendous increase in the rate of species extinction seen in the past century. For this, humans must take the blame. The biggest underlying problem is that our economic and political systems fail to recognise the true ecological value of biodiversity for current and future life on this planet.

### **Unsustainable resource use**

The over-exploitation of specific resources for industries, particularly forestry, fishery and mining, has caused significant changes of habitats and entire ecosystems (Heywood *et al.*, 1995). As well, certain species have become extinct as a result of over-hunting for food, such as the passenger pigeon, great auk and bison (Bocking, 2000). Along the east coast of Canada, Atlantic cod – an important fisheries species once

abundant in those parts – are currently listed as endangered due to over-exploitation. Many animals are at risk of extinction because they are over-exploited for their furs, hides, tusks, horns or feathers. The pet trade is another pressure on species: every year, millions of mammals, birds, reptiles, amphibians and fish are imported into various countries, including Canada, for commercial sale (Moran *et al.*, 1986).

Globally, population growth and increased consumption have also contributed to the unsustainable exploitation of our natural resources, particularly over the last 50 years. In 1950, the world's population was 2.4 billion, in 2000 it reached 6 billion, and the projection for 2025 is 7.7 billion (UNPD, 2001). Increasing demands for water, as well as resources for food, shelter and other materials, have created serious strains on the earth's biodiversity. In many rural areas of developing countries, wood is the major source of fuel for cooking. However, fuelwood is being consumed faster than it can be replenished.

Industrialization is a key driver of resource consumption. Global oil consumption has been staggering; we have consumed 820 billion barrels of oil since it was first discovered in 1859 (Rauch, 2001). It is estimated that if all people on this planet had a North American standard of living, the earth would only be able to support one-sixth of its current population (McNeely, 1995).

### **Habitat fragmentation & changes to landscape**

On a global scale, habitat loss and degradation are the most pervasive threats to biodiversity, affecting 89 percent of threatened bird species, 83 percent of threatened mammals, and 91 percent of the threatened plants (IUCN, 2000a). Without suitable habitat, species cannot survive.

Deforestation is a major cause of habitat destruction. Clearcutting creates fragmented habitats, which are more vulnerable to winds, humans and exotic species, and limits the opportunities for pollination and breeding. The large-scale harvesting of trees for industry also directly destroys food sources, habitats and specific micro-climates for many species (McNeely, 1995). At the same time, forests are being cleared for other purposes, such as subsistence agriculture in many developing countries. In Rwanda, for example – a country that has been through devastating experiences of

genocide and poverty – almost all of the country's forested land has been cleared for agriculture and fuelwood. Deforestation, in this case, is a response to desperate situations, as it is in many other developing countries (Mugarura, 1999).

Dams are another serious threat. When a dam is built, a reservoir is created, flooding the surrounding landscape. Habitats such as wetlands, waterfalls, rapids or flood plains may be destroyed, which in turn affects populations. Plant, animal and other types of species become fragmented and extirpated over large areas (McNeely, 1995).

With almost half of the world's population living in urban environments (McNeely, 1995), urban sprawl and the construction of highways are putting increasing pressure on biodiversity. The construction of buildings and roads have destroyed and fragmented ecosystems by filling in marshes and clearing forests (Moran *et al.*, 1986).

In ecological terms, a **habitat island** is any restricted habitat area surrounded by different habitats. A lake without in or out flow is considered an aquatic island. Natural habitats divided by highways, cities or farmland are patches of land that have become isolated, and are also considered habitat islands. All of these types of island ecosystems are similarly vulnerable to the introduction of exotic species.

(Source: Moran *et al.*, 1986)

### **Exotic species**

Exotic species are organisms that have been introduced by humans to new geographic areas, whether accidentally or deliberately. Sometimes this is beneficial to humans: in many parts of the world, a large portion of human dietary needs have been met by crop species introduced from elsewhere. However, the introduction of exotic species can cause severe disruptions of habitats and ecosystems because natural predators, pests and diseases

are often not present to keep them in check, and the exotic species can compete with native species for resources.

In Canada, zebra mussels are a serious problem in the Great Lakes, clogging water intake pipes, while purple loosestrife has invaded wetlands from New Brunswick to British Columbia (McAllister, 2000). Elsewhere, one of the most devastating impacts of exotic species occurred beginning in the late 1950s when Nile perch were introduced as a sport fish into Kenya's Lake Victoria – the world's second largest lake. This resulted in the loss of an estimated 200-300 fish species, the majority of which were **endemic** (Bartley, 1997; Lowe-McConnell, 1993; Wilson, 1992). **Endemic** species are only found in, or restricted to, certain regions or localities. Islands, for example, might contain high numbers of endemic species relative to their surrounding habitats.

Islands are particularly vulnerable to exotic species. An island might not be large enough for native prey species to avoid new non-native predators. The state of Hawaii, for example, which only accounts for 0.2 percent of the United States' land area, contains 31 percent of the country's endangered species, threatened primarily by exotic species (Allison and Miller, 1997).

### **Pollution**

Industrial wastes have caused considerable stress to species and habitats, in some cases destroying them entirely. In parts of North America and Europe, acid rain, created mainly by the burning of coal, has caused the death of aquatic organisms and the acidification of lakes and streams. Heavy metals (such as arsenic, cadmium, mercury, nickel, copper, silver and zinc) from industrial plant effluents and sewage sludge are also extremely harmful, and because they cannot be broken down into non-toxic forms, they remain a threat for many years (Moran *et al.*, 1986).

Meanwhile, a number of organic chemicals are persistent because they bioaccumulate through food webs. This means that as one organism feeds on another, the organic chemical passes up the food chain, becoming more concentrated at each level. As a result, organisms at the top of the food chain are exposed to the highest levels of toxins. These persistent organic

pollutants include many pesticides, PCBs, effluent from pulp and paper mills, and industrial by-products (Moran *et al.*, 1986).

For example, pollution is a major cause of extinction for beluga whales, particularly in the St. Lawrence (CWS, 2001). Due to prevailing wind patterns, persistent organic pollutants are particularly pervasive in Arctic regions, where top predators such as polar bears have accumulated significant concentrations.

### **Climate change**

As humans release more and more greenhouse gases into the atmosphere by burning fossil fuels, through cars, power plants, industry, and other sources, global temperatures have begun to increase. The effects are potentially devastating for many species. Already, we are feeling the impacts of climate change: the shrinkage of glaciers, thawing of permafrost, and declines in some plant and animal populations (IPCC, 2001).

Estimates predict that the increase in global temperature by 1.4 to 5.8 °C over the next century could cause sea levels to rise by 0.09 to 0.88 metres compared to 1990 levels (IPCC, 2001). Furthermore, every increase of 1°C will mean that land species need to relocate some 125 kilometres towards the poles or 150 metres vertically up mountainsides. Many species or complex ecosystems will not be able to redistribute fast enough to keep up with these projected changes. Agricultural systems will also be affected by increased drought, too much rain, or more pests and weeds (McNeely, 1995).

In Canada, Arctic sea ice has already decreased by 14 percent between 1978 and 1994 (Bocking, 2000). This has serious consequences: sea ice is one of the country's largest marine ecosystems. According to a Canadian Wildlife Service biologist, melting of sea ice has led to longer ice-free summers, which has in turn made it difficult for polar bears to find seals for food. As a result, they are suffering from weight loss and a decline in birth rates (Source: McAllister, 2000; COSEWIC, 2000).

## **How can we protect it?**

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Biodiversity can be protected in many different ways and at many levels, from individual decisions to buy organic food, to community efforts to restore a local marsh, to national endangered species legislation, to international efforts to protect tropical rainforests.

### **Genetic preservation and recovery efforts**

One way to preserve the genetic resources of plants and resources is through ex-situ preservation, which means maintaining resources outside of natural habitats. Plant genetic resources are being conserved, to a certain extent, by botanical gardens and arboretums worldwide, while zoos, to a lesser extent, help conserve the genetic and species biodiversity of certain animals. Genebanks can also be used to conserve plant seeds and animal tissue (Jeffries, 1997).

Some recovery programs for specific species have proved successful. In Canada, whooping cranes have increased in number as a result of efforts by wildlife experts to protect the species during migration, as well as in their winter and summer habitats. These birds have also been bred in captivity, and eventually released into the wild (CWS, 2000a).

Recovery programs and ex-situ conservation, however, represent only a small portion of conservation needs. Conserving genetic biodiversity requires conserving the integrity of species, which requires multiple population approaches within natural environments. This need is addressed through the protection and rehabilitation of habitats.

### **Habitat protection and restoration**

In Canada, most protected areas are found within national, provincial and territorial parks, as well as ecological reserves, and wilderness and wildlife areas (Attridge, 2000). However, as demonstrated with such plans as the Ontario's Lands for Life/Living Legacy and British Columbia's Forest Practices Code, protected areas are not always safe from over-exploitation, or habitat destruction and fragmentation. Establishing protected areas could mean little unless harmful activities and development are strictly prohibited and specific management plans are required.

At the federal level, the *Canada National Parks Act* is considered one of the strongest legal wildlife protection measures in the country. Under the Act, the first priority for park management is the "maintenance or restoration of ecological integrity, through the protection of natural resources and natural processes". The Act also requires all parks to have a management plan that is reviewed regularly and incorporates public input (*Canada National Parks Act*, 2000; Attridge, 2000).

Increasing pressures from development in and around national parks mean that habitat fragmentation is becoming a serious problem. Banff National Park, in particular, has experienced significant impacts over the past 50 years, from such activities as increased use of the Canadian Pacific Railway, expansion of the Trans Canada Highway, and development of hotels, golf courses and hydroelectric facilities (Page, 2000).

Habitat preservation is not only a matter of conserving "wilderness" areas – people in cities and suburbs worldwide are increasingly creating and/or maintaining valuable habitats such as urban parks, urban forests, urban wetlands and roadside plantings (Johnson and Jonsson, 1995).

Habitat restoration and rehabilitation are two of the most recent and challenging areas of ecology. Rehabilitation refers to the repair of damaged ecosystems, while restoration is the reconstruction of a natural or semi-natural ecosystem on degraded or modified land. Both practices involve addressing the causes of degradation such as an exotic plant species or environmental pollution. Then the affected species and/or ecological processes need to be restored, often beginning with the restoration of soil and the re-establishment of plant communities (Hobbs and Lleras, 1995).

In Sudbury, Ontario, for example, an alliance of citizens and groups has had remarkable success restoring soil, water and vegetation damaged by nickel smelting operations. Once considered a virtual moonscape, today the hills are covered with trees, and insect, bird and mammal populations have increased. The region's lakes and rivers have decreased in acidity, and the process has generated employment for over 3,000 people (Havinga, 1999).

### **Government involvement – national and international legislation**

At the international level, the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) and the Convention on Biological Diversity (CBD) are the two key agreements on biodiversity. CITES, to which 122 countries are party, aims to protect endangered species from trade across national borders (Johnson and Jonsson, 1995). The CBD, which came out of the United Nations Convention on Environment and Development in 1992, aims for the conservation and sustainable use of biodiversity at the genetic, species and ecosystem levels. Currently 180 countries are party to the Convention, including Canada. Although these agreements may have increased awareness in the international community, they have been less effective in creating strong legal commitments within participating countries.

In Canada, the main response to the CBD has been the Canadian Biodiversity Strategy, established in 1995. According to a number of Canadian environmental law centres, the Strategy is not specific, nor does it include any strong commitments (Attridge, 2000). Responsibility for implementing the CBD lies with federal departments such as Environment, Natural Resources, Agriculture and Agri-Food, Fisheries and Oceans, and each of the provinces. Yet, as a result of cutbacks to federal and provincial departments responsible for protecting wildlife, implementation has been held back. Most of these bodies have stronger commitments to the advancement of industry than to protection of biodiversity (Mosquin, 2000).

Other programs also have serious limitations. Canadian Wildlife Service's Recovery of Nationally Endangered Wildlife (RENEW) program has approved recovery programs for only 19 species at risk (Mosquin, 2000). RENEW, as well as COSEWIC, face problems of limited funding and lack of legal power (DeMarco and Bell, 2000).

Although many citizens and over 100 organizations have expressed support for strong federal endangered species legislation, no such legal force currently exists (DeMarco *et al.*, 1997). In April 2000, the Species at Risk Act (SARA) was proposed by the federal government, but died when the fall election was called. The Liberal government reintroduced SARA to the House of Commons in 2001, and it is currently under review by the

House Standing Committee on the Environment and Sustainable Development (CPAWS Saskatchewan, 2001a). The Act would prohibit killing of endangered species on federal lands and waters, as well as migratory birds, and would protect their nests or dens (SLDF, 2001).

However, according to critics such as the Canadian Parks and Wilderness Society and the Sierra Legal Defense Fund, SARA has serious weaknesses. Under the Act, habitat protection is not mandatory – instead, it is left to the discretion of Cabinet. Another problem with SARA is that it gives power to the federal Cabinet, not COSEWIC, to decide whether or not a species is listed as endangered, creating the risk that listings could be based on political factors rather than science (CPAWS Saskatchewan, 2001b; SLDF, 2001).

At the provincial level, legislation for the protection of species is not universal. And, even when legislation exists, provinces are reluctant to identify more than a few species at risk (Attridge, 2000). The more species listed at risk, the more restrictions for development. A strong federal act could address these problems.

<b>PROTECTED LAND IN CANADA</b>	
<b>Jurisdiction</b>	<b>% protected</b>
Yukon	9.0
Northwest Territories	4.6
British Columbia	11.2
Alberta	9.8
Saskatchewan	6.0
Manitoba	8.1
Ontario	8.8
Quebec	4.2
New Brunswick	1.3
Nova Scotia	8.2
Prince Edward Island	4.1
Newfoundland/Labrador	1.8

(Source: Based on WWF, 1999)

### **Sustainable resource management**

While regulation is an essential tool to ensure sustainable resource extraction activities, various certification programs for processing and labeling are proving very effective at mobilizing consumer pressure. One of the best-known certification processes is for organic foods. Over the past several years ecologically sound forest certification bodies have also emerged. The Silva Foundation of British Columbia, for example, has been involved with forest certification since the early 1990s, and in 1993 became a founding member of the internationally-based Forest Stewardship Council (Silva Foundation, 2001).

### **Conclusion**

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There is no question that biodiversity is an urgent issue. At the same time, we can draw inspiration from the thousands of successful projects that have protected or restored biodiversity at a local level across Canada and around the world. Whatever approach is taken, conservation programs are most likely to succeed if local peoples benefit culturally and economically and all stakeholders have access to information and decision-making processes (Hobbs and Lleras, 1995). More fundamentally though, if we are to effectively reverse the trends, we need to change our attitudes to the environment around us. We should respect the inherent right of all species to exist, and we must re-examine our view of the world as a vast storehouse of "natural resources" for us to exploit.

Protecting biodiversity is about more than piecemeal efforts at the genetic, species or ecosystem levels – it must involve a fundamental shift in how modern societies perceive and live in landscapes. In summary, we must re-invent our relationship with the world around us, becoming better environmental stewards. We all have a role to play in this: as consumers, voters, citizens, parents of succeeding generations, and, above all, as one species among millions inhabiting our planet.

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## **Community Success Stories**

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### **Purpose**

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In the following pages, you'll find lots of inspiring "success stories" – descriptions of projects that community groups across Canada and around the world have undertaken to conserve biodiversity. We've chosen examples of projects on genetic biodiversity, species monitoring, habitat protection and sustainable resource management; and everything from small-scale, inexpensive initiatives to quite ambitious undertakings. Read on!



### **Introduction**

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We hope you'll find the success stories that follow provide you with inspiration, coupled with plenty of practical, nitty-gritty detail. Each of the profiles outlines the project, who was involved, what it cost, how long it took, what made it successful, what problems the organizers encountered ... all the information you'll need to determine whether your group could undertake something similar.

You'll also find a selection of excellent resources to turn to for more information at the beginning of each section. Below, you'll find some general resources on biodiversity. In addition, there is a Naturalists' Society or Federation of Naturalists in most provinces. You can find a list at the Federation of Alberta Naturalists website ([www.fan.ca](http://www.fan.ca)) by checking their links page. The provincial environmental networks are another excellent resource. You can find the contact information for the network in

your province by contacting the Canadian Environmental Network, listed below.

## **General Biodiversity Resources**

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### **Canadian Biodiversity Information Network**

Biodiversity Convention Office, World Trade Centre  
393 St. Jacques Street, Office 300  
Montreal, Quebec H2Y 1N9  
tel: 514-288-2220  
fax: 514-288-6588  
e-mail: [bcoweb@ec.gc.ca](mailto:bcoweb@ec.gc.ca)  
[www.cbin.ec.gc.ca](http://www.cbin.ec.gc.ca)

### **Canadian Environmental Network**

300-945 Wellington Street  
Ottawa, Ontario K1Y 2X5  
tel: 613-728-9810  
fax: 613-728-2963  
email: [info@cen-rce.org](mailto:info@cen-rce.org)  
[www.cen-rce.org](http://www.cen-rce.org)

### **Canadian Wildlife Service**

Environment Canada  
Ottawa, Ontario K1A 0H3  
tel: 819-997-1095  
fax: 819-997-2756  
[www.cws-scf.ec.gc.ca](http://www.cws-scf.ec.gc.ca)

### **Conservation International**

1919 M Street NW, Suite 600  
Washington, DC 20036  
tel: 202-912-1000  
[www.conservation.org](http://www.conservation.org)

**Ocean Voice International**

PO Box 37026, 3332 McCarthy Road  
Ottawa, Ontario K1V 0W0  
tel: 613-721-4541  
fax: 613-721-4562  
e-mail: [oceans@superaje.com](mailto:oceans@superaje.com)  
[www.ovi.ca](http://www.ovi.ca)

**Sierra Club of Canada**

412 – 1 Nicholas Street  
Ottawa, Ontario K1N 7B7  
tel: 613-241-4611  
fax: 613-241-2292  
e-mail: [sierra@web.ca](mailto:sierra@web.ca)  
[www.sierraclub.ca](http://www.sierraclub.ca)

**Sierra Legal Defence Fund**

214-131 Water Street  
Vancouver, British Columbia V6B 4M3  
V6B 4M3  
tel: 800-926-7744  
fax: 604-685-7813  
email: [sldf@sierralegal.org](mailto:sldf@sierralegal.org)  
[www.sierralegal.org](http://www.sierralegal.org)

**World Wildlife Fund – Canada**

245 Eglinton Avenue East, Suite 410  
Toronto, Ontario M4P 3J1  
tel: 800-26-PANDA  
fax: 416-489-8055  
email: [panda@wwfcanada.org](mailto:panda@wwfcanada.org)  
[www.wwfcanada.org](http://www.wwfcanada.org)

**Publications:**

Binder, Deanna, Stewart Guy and Briony Penn. *Backyard Biodiversity & Beyond: A Handbook for Students and Teachers*. Victoria: Province of British Columbia, 1994.

World Wildlife Fund. *Biodiversity Basics: An Educator's Guide to Exploring the Web of Life*. WWF, 2000. *A comprehensive module on biodiversity for middle school classes, available from Acorn Naturalists ([www.acornnaturalists.com](http://www.acornnaturalists.com))*.

**Web Sites:**

NatureServe – An Online Encyclopedia of Life ([www.natureserve.org](http://www.natureserve.org)). *A source for authoritative conservation information on more than 50,000 plants, animals and ecological communities of the United States and Canada.*





## **Conserving Genetic Biodiversity**

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### **Introduction**

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Gene diversity is critical for the survival of a species. Some deer in a herd may be particularly resistant to disease, for example, or some types of corn may be better suited to particular conditions than others. When there's not enough genetic diversity in a population, it becomes more vulnerable to disease, pests or changes in the environment.



The following profiles offer some examples of how people are conserving genetic biodiversity.

In Halifax, people are saving and swapping seeds; in Kenya, people are recording and preserving medicinal plants; on the Prairies, people are working to ensure the survival of the Ferruginous Hawk; in Ontario, people are bringing elk back to the province; and across the country, people are working to save rare farmyard animals.

### **Resources**

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#### **Canadian Botanical Conservation Network**

c/o Royal Botanical Gardens

PO Box 399

Hamilton, Ontario L8N 3H9

[www.rbg.ca/cbcn/en/index/html](http://www.rbg.ca/cbcn/en/index/html)

**Canadian Foundation for the Conservation of Farm Animal Genetic Resources**

e-mail: [cfcfagr@magi.com](mailto:cfcfagr@magi.com)

[www.magi.com/~cfcfagr/homepage.html](http://www.magi.com/~cfcfagr/homepage.html)

**Canadian Peregrine Foundation**

250 Merton Street, Suite 404

Toronto, Ontario M4S 1B1

tel: 416-481-1233

[www.peregrine-foundation.ca](http://www.peregrine-foundation.ca)

**Food and Agriculture Organization of the United Nations**

[www.fao.org/biodiversity](http://www.fao.org/biodiversity)

**Genetic Resources Action International (GRAIN)**

Girona 25, pral.

E-08010 Barcelona

Spain

tel: +34-93- 301-13-81

fax: +34-93-301-16-27

e-mail: [grain@retemail.es](mailto:grain@retemail.es)

[www.grain.org](http://www.grain.org)

**Operation Burrowing Owl**

Nature Saskatchewan

206-1860 Lorne Street

Regina, Saskatchewan S4P 2L7

tel: 306-780-9273

fax: 306-780-9263

email: [nature.sask@unibase.com](mailto:nature.sask@unibase.com)

[www.unibase.com/~naturesk/obo.htm](http://www.unibase.com/~naturesk/obo.htm)

**Seeds of Survival**

Unitarian Service Committee of Canada

56 Sparks Street, Suite 705

Ottawa, Ontario K1P 5B1

tel: 613-234-6827

*Biodiversity: A Profile for Community Action*

fax: 613-234-6842

email: [uscanada@usc.canada.org](mailto:uscanada@usc.canada.org)

[www.usc-canada.org](http://www.usc-canada.org)





## **Seedy Saturday**

**The Urban Farm Museum Society, Halifax**

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**Goal of Project:**

To offer a forum where people can buy, sell and trade open-pollinated seeds and learn about saving seeds.

**Number of People-hours Involved:**

"A few hours here and there over three months."

**Length of Project:**

One-day event.

**Budget:**

No budget; costs were minimal.

**Partnerships Involved:**

Nova Scotia Organic Growers Association helped by associating its name with the event; many people have heard of the Association, but the Museum Society is less well known. Seeds of Diversity helped by advertising the event and offering advice and services. The Captain William Spry Community Centre let the group use its fax machine and office supplies.

**Major Funders:**

None.

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Marjorie Willison has been a gardener for years and works as a gardening consultant, but right now she's more interested in planting ideas than turnips. Willison is part of the Urban Farm Museum Society, a group in Spryfield, Nova Scotia, just on the outskirts of Halifax. As part of their efforts to celebrate Spryfield's agricultural history, the group of 15 locals organized its first Seedy Saturday last year.

Seedy Saturday is an annual event in cities across Canada where people buy and sell open-pollinated varieties of vegetable, fruit, flower, grain and herb seeds. Most seed companies now sell hybrid seeds. Hybrids are created by crossing parent plants that are not the same variety. This can create a desirable combination of characteristics, but the seeds produced from hybrids are not viable, forcing gardeners to buy new seeds each year. In contrast, open-pollinated varieties produce viable seed. Heirloom varieties, which are open-pollinated, often are more flavorful, and more beautiful (or at least unique-looking). These seeds have been saved and have stood the test of time because of their desirable traits – taste, pest resistance, or frost hardiness, for example – not because they pack well and can survive a trip of several hundred kilometres to the grocery store. No square, tasteless tomatoes here!

Willison and the other members of the group were attracted to the project as soon as they heard about it: "We liked the idea of being dependent on each other and coming together for a social event to talk about seeds, trade seeds and buy and sell them. And, it reminds people that we should be growing more of our own food." This project is helping people to do just that.

The group held their free event in a seniors centre in 2000. The venue was "packed to the gills," says Willison, and people had a lot of fun buying, selling and trading vegetable, flower, and herb seeds. The society sold seeds from members' gardens, mostly common flowers, vegetables such as baking beans and a few herbs. There were a dozen sellers and about 90 buyers. Willison was able to do most of the organizing work herself for that first event, though it was a bit much at times. She secured a site, contacted seed sellers through lists from Seeds of Diversity and the Nova Scotia Organic Growers Association, sent out public service announcements advertising the event and handed out flyers to shoppers at Halifax's farmers market.

In 2001, the event took place in a larger space in a more central and commercial area of town, and the gardening answer booth, as well as the day's demonstrations (on how to graft apples, how to start seeds and how to save seeds) were held in a room separate from the buying and selling, so they wouldn't get lost among the seed sellers. Most of the shoppers

were from Halifax; Willison is making an extra effort to try to get more people out from Spryfield. The sellers in both years have been people who are already saving their seeds; Willison would like to see more people begin to start saving their seeds now that there's a venue for selling and trading them.

"It's a lot of fun and there's rich potential. People like the idea of saving seeds and trading them around, but they need encouragement and an environment that will support that. We're helping to provide the environment by organizing this event."

Seedy Saturday events are sponsored by Seeds of Diversity, a charitable organization dedicated to conserving, documenting and using public-domain non-hybrid plants. Seeds of Diversity helps groups put on events by putting new organizers in touch with experienced organizers, by co-sponsoring events and by advertising them. The group has developed a handbook for new Seedy Saturday organizers, available on its website.

### **Contact Information**

The Urban Farm Museum Society, c/o 10 Kidston Road  
Halifax, Nova Scotia B3R 2J7  
tel: 902-477-7896

Seeds of Diversity Canada  
PO Box 36, Station Q  
Toronto, Ontario M4T 2L7  
tel: 905-623-0353  
email: [office@seeds.ca](mailto:office@seeds.ca) web: [www.seeds.ca](http://www.seeds.ca)





## **Documenting Kenya's Medicinal Plants**

**International Centre for Research in Agroforestry, Kenya**

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### **Goal of Project:**

To document and preserve the medicinal plants of Kenya; to screen the plants for their potential medicinal properties; to record the knowledge of the indigenous herbalists.

### **Number of People-hours Involved:**

Dozens of hours each by several people in Kenya to organize the trips. There are three trips a year. On each one, about 10 people volunteer for two weeks. A staff person at Earthwatch Institute is in charge of all the trips the Institute helps to organize, of which this is one.

### **Length of Project:**

Ongoing. The project began two years ago.

### **Budget:**

Varies. About \$150,000 a year.

### **Partnerships Involved:**

Earthwatch Institute helps recruit volunteers for the trips and helps to advertise the project; the University of Nairobi screens the plants in its lab.

### **Major Funders:**

The volunteers' fees to go on the trip cover about half the project cost; the International Centre for Research in Agroforestry is funded by many government agencies and foundations around the world.

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In Kenya, it's not only plants and animals that are endangered. Knowledge is, too. Traditional knowledge of the healing powers of medicinal plants is in danger of dying out, because the holders of that knowledge are passing away, without passing on what they've learned. A Kenyan group is

working to make sure that knowledge is preserved along with the plants used for the medicinal practices. In doing so, they've created a once-in-a-lifetime vacation opportunity for those wishing to incorporate education into their holidays.

With only one university-trained doctor for every 30,000 to 40,000 Kenyans, most people rely on medicinal plants to cure their ailments. But traditional healers aren't passing on their knowledge, and deforestation, due mostly to agricultural practices and population pressures, is threatening the plants.

Bethwell Owour is an ethnobotanist with the International Centre for Research in Agroforestry, a non-profit research body that conducts research on sustainable and productive land use methods and policies. He and Hellen Oketch, from the department of Pharmacology and Pharmacognosy and the University of Nairobi, were very worried about the loss of indigenous knowledge, the decline of natural vegetation and the loss of genetic resources. They organized a community meeting to discuss the trends with others who shared their concern and a desire to do something about it. That "something" is a project to record indigenous knowledge and preserve medicinal plants.

The group is working with Earthwatch Institute, who organizes summer trips where volunteers pay to travel to Kenya for two weeks to help with the project. Organizers decided to work with a group outside Kenya in order to get things done more quickly, recalls Owour. The group chose Earthwatch because the group respects intellectual property rights.

Volunteers get cultural training and are taught how to interview herbalists and gather plant samples. They work with translators, taxonomists and ethnobotanists to interview herbalists about the plants they use, how they administer them and where they find them. They then collect samples in the lush, hilly areas near Lake Victoria. Samples of rare and endangered plants are transferred to a medicinal plant garden that has been set up to help ensure their continued survival. Plant samples are dried, pressed, labelled and screened at the University of Nairobi for their potential therapeutic properties and recorded in a specimen database. The

knowledge gained from this project will be shared in village workshops, seminars and publications.

It's important to the organizers that Kenyans benefit from any commercial drug applications that may be discovered, so organizers are working with a lawyer on a contract with potential drug companies to ensure a percentage of profits remains in the country.

Today, plants in the project's garden are "chest-high," says Owour, motivating people to join the preservation effort. The project has been a success because it's been based on trust, he says. From the beginning, the community has led the project. "If we don't involve the stakeholders in this, then, I think, we're not going anywhere. And if we don't have their trust, we're not going anywhere. This is about the livelihood of people: nobody does give up that information very easily. They really have to know the benefits that come out of it." The trust is nurtured between the scientists and the communities through a committee of elders, who talk to people about the project, and is reflected in the strong support from local governments and associations. Thanks to this strong cooperative focus, this project is helping to preserve not only plants and knowledge in Kenya, but culture as well.

**Contact Information:**

Bethwell Owour, Database Consultant  
Tree Domestication Program  
International Centre for Research in Agroforestry  
First United Nations Avenue  
PO Box 30677, Nairobi, Kenya  
tel: (US)650-833-6645 / fax: (US) 650-833-6646  
email: [icraf@cgiar.org](mailto:icraf@cgiar.org)  
[www.icraf.cgiar.org](http://www.icraf.cgiar.org)

Earthwatch Institute  
3 Clock Tower Place, Ste 100  
Box 75, Maynard, MA USA 01754  
tel: 800-776-0188 / fax: 978-461-2332

email: [info@earthwatch.org](mailto:info@earthwatch.org)  
[www.earthwatch.org](http://www.earthwatch.org)





## **Conserving Genetic Biodiversity**

### **Honourable Mentions**

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#### **Ferruginous Hawk**

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The strategy was to convince ranchers and farmers that the Ferruginous Hawk was their ally, recalls Steve Brechtel, who headed up efforts to preserve the hawk population on the Prairies. He did this by reminding them that a hawk eats hundreds of prairie gophers a year, ridding them of the rodent they view as an enemy. "It was a really easy sell," says the biologist.

In 1980, the rust-colored hawk, the largest in the world, was listed as threatened by the Committee on the Status of Endangered Wildlife (COSEWIC) in Canada. The hawk is found only on the plains of North America. Scientists speculated the decline was connected to a loss of nesting sites, primarily trees and shrubs. They gave hundreds of nesting poles to ranchers and farmers, who often used them as corner fence posts. Through the program, ranchers also planted trees and protected the ones they already had.

Thanks to the success of efforts such as this, Ferruginous hawk populations have increased and COSEWIC has downlisted its status from "threatened" to "special concern".

#### **Contact Information:**

Steve Brechtel, Non-game Biologist  
Alberta Wildlife, Department of Environmental Protection  
OS Longman Building, 6909-116 Street  
Edmonton, Alberta T6H 4P2  
tel: 780-422-9535

## **Elk Restoration**

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The Bancroft-North Hastings Elk Restoration Project Committee is helping to return elk to Ontario.

These impressive mammals – the adult bulls are about 1.5 m tall, weigh 300 kg and have antlers that are 1.2 m long – are indigenous to Ontario, but died out in the late 1800s due to overhunting and a loss of habitat. In January 2000, committee members transported 70 elk from Elk Island National Park near Edmonton to Bancroft, 110 km northeast of Peterborough. In January 2001, the group trucked in another 48. The goal is to have a herd of between 100 and 200 animals, which is what the Ministry of Natural Resources (MNR) has deemed to be a sustainable number.

"I thought, this is a neat opportunity to put back into the ecology something that was once here," says John O'Donnell, a hunter and the committee co-chair. "Doing something that will impact generations from now, that's the great feeling I get out of it."

The committee equipped the elk with radio collars in order to track their movements, reproductive success and causes of death. Most elk have stayed within 50 km of where they were released and many are within ten. They like to walk the paths under hydro lines, where they can eat young plants and grasses, yet remain close to wooded areas.

While some people are concerned the elk may hurt the deer population by eating the food deer would eat and may destroy farmers' crops, the project has generally met with positive response, says O'Donnell.

The group's work is part of a larger initiative by the MNR, which is working with 11 partner organizations and a host of sponsors to restore elk to parts of their former range in Ontario.

### **Contact Information:**

John O'Donnell, Co-Chair  
Bancroft-North Hastings Elk Restoration Project Committee  
PO Box 177  
Bancroft, Ontario K0L 1C0  
tel: 613-332-4128

## **Heritage Breeds**

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Farming specialization and industrialization has reduced farmyard diversity. For example, 98% of dairy herds in Canada are Holsteins, and 75% of those are sired by only 12 bulls. But breeding societies, farmers and Rare Breeds Canada are preserving rare and endangered animals, and the genetic diversity they represent.

Rare Breeds Canada runs a Host Farm program, in which it provides a farm with a breeding pair of animals. After three years, the farmer gets to keep half the offspring. The group also buys rare animals and finds farmers who will raise them. The group saves older breeds because they have many good qualities: the Chantecler Chicken, without a comb, is immune to frostbite damage, for example, and the Canadienne Cow is a hardy animal providing both good milk and a good carcass. "We're trying to keep them until their commercial potential is realized again," says Tom Hutchinson, who runs the group's office.

### **Contact Information:**

Rare Breeds

c/o Environmental and Resource Studies Program,

Trent University

1600 West Bank Drive,

Peterborough, Ontario K9J 7B8

tel: 705-748-1011 x1634 / fax: 705-748-1634

email: [rarebreedscanada@trentu.ca](mailto:rarebreedscanada@trentu.ca)

[www.trentu.ca/rarebreedscanada](http://www.trentu.ca/rarebreedscanada)





## Species Monitoring

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### Introduction

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Scientists have identified and described 1.7 million species to date. But this is only a fraction of the species living on this planet – there are millions more that haven't been described. Clearly we need to learn more! Just as importantly, we need to keep tabs on key species we do know about, so we can identify biodiversity loss before it becomes critical and evaluate the success or failure of conservation programs.



Thanks to some dedicated people, we're slowly beginning to do just that. In this section, you'll read about people monitoring birds and fish in marshes, watching salmon grow in their classroom, assessing riparian habitat around their lake and keeping a close watch over a coral reef.

And that's just the beginning! There is a wide range of biological surveys in progress around the world, in cities and in rural areas. monitoring everything from loons to frogs to wildflowers. Many welcome volunteers who'd like to get involved.

The Canadian Wildlife Federation and the Ecological Monitoring Assessment Network maintain directories of current surveys in Canada, while the Cornell Lab of Ornithology lists several continent-wide bird surveys. You can also contact one of the other organizations in the resource list that follows for details on particular projects.

### Resources

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#### **Canadian Nature Federation**

Suite 606, 1 Nicholas Street

Ottawa, Ontario K1N 7B7  
tel: 800-267-4088  
fax: 613-562-3371  
e-mail: [cnf@cnf.ca](mailto:cnf@cnf.ca)  
[www.cnf.ca](http://www.cnf.ca)

**Canadian Biodiversity Institute**  
Suite 322, 99 Fifth Avenue  
Ottawa, Ontario K1S 5P5  
e-mail: [admin@eobm.ca](mailto:admin@eobm.ca)  
[www.biodiversityonline.ca](http://www.biodiversityonline.ca)

**Canadian Wildlife Federation**  
350 Michael Cowpland Drive  
Kanata, Ontario K2M 2W1  
tel: 800-563-9453  
fax: 613-599-4428  
e-mail: [info@cwf-fcf.org](mailto:info@cwf-fcf.org) web: [www.cwf-fcf.org](http://www.cwf-fcf.org)

**Citizens' Environment Watch**  
2 Sussex Avenue  
Toronto, Ontario M5S 1J5  
tel: 416-978-4144  
fax: 416-971-2078  
email: [env.watch@utoronto.ca](mailto:env.watch@utoronto.ca)  
[www.utoronto.ca/envstudy/cew/cew.htm](http://www.utoronto.ca/envstudy/cew/cew.htm)

**Cornell Lab of Ornithology**  
tel: 800-843-2473  
email: [cornellbirds@cornell.edu](mailto:cornellbirds@cornell.edu)  
[http://birds.cornell.edu/whatwedo\\_citizenscience.html](http://birds.cornell.edu/whatwedo_citizenscience.html)

**Ecological Monitoring and Assessment Network**  
Environment Canada, Canada Centre for Inland Waters  
867 Lakeshore Road  
Burlington, Ontario L7R 4A6  
tel: 905-336-4414  
fax: 905-336-4989

email: [eman@cciw.ca](mailto:eman@cciw.ca)  
<http://eqb-dqe.cciw.ca/eman/emanhome.html>

### **Monarch Watch**

University of Kansas, Entomology Program  
1200 Sunnyside Avenue  
Lawrence, Kansas 66045-7534  
tel: 888-824-4464  
fax: 785-864-5321  
email: [monarch@ku.edu](mailto:monarch@ku.edu)  
[www.monarchwatch.org](http://www.monarchwatch.org)

### **World Conservation Monitoring Centre**

Information Office, UNEP-WCMC  
219 Huntington Road  
Cambridge CB3 0DL England  
tel: +44-1223-277-314  
fax: +44-1223-277-136  
e-mail: [info@unep-wcmc.org](mailto:info@unep-wcmc.org)  
[www.unep-wcmc.org](http://www.unep-wcmc.org)

### **Wormwatch**

c/o AAFC  
PO Box 3000  
Lethbridge, Alberta T1J 4B1  
tel: 403-317-2294  
fax: 403-317-2187  
email: [wormwatch@em.agr.ca](mailto:wormwatch@em.agr.ca)  
web: <http://eqb-dqe/partners/wormwatch/intro.html>





## **Marsh Monitoring Program**

### **Bird Studies Canada, Port Rowan ON**

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#### **Goal of Project:**

To monitor marsh birds and amphibians in the Great Lakes basin; to investigate their habitat associations; to increase awareness of conservation issues.

#### **Number of People-hours Involved:**

At Bird Studies Canada, two people spend about eight months of the year working on the project; two other staff are involved for briefer periods. In addition, volunteers survey 300 routes a year, at about nine hours per route.

#### **Length of Project:**

Ongoing. Project launched in both Canada and the US in 1995. Organizers hope to be able to run the program for at least 11 years.

#### **Budget:**

In 2000/2001, the group's budget was \$150,427 – higher than average because the group is revising materials and conducting a larger recruitment drive, and because it published a five-year report.

#### **Partnerships Involved:**

Great Lakes United, a US group, helps with recruitment and training sessions in the United States; Environment Canada's Canadian Wildlife Service provides technical advice; the Federation of Ontario Naturalists and the National Audubon Society have helped with recruitment; and the Brant Waterways Foundation helped the group develop surveys. As well, many government agencies and regional conversation groups provide expertise.

#### **Major Funders:**

Environment Canada, US Environmental Protection Agency, the Great Lakes Sustainability Fund (Canada), and the Great Lakes Protection Fund (US).

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It's not a very popular destination, admits Peter Satterly. "I don't really know too many people who are interested in going into a mosquito-infested marsh at night." But that's where he hangs out. Satterly is a volunteer with the Marsh Monitoring Program, organized by Bird Studies Canada. A few times every summer, Satterly heads out after work to four marshes in Frontenac County, Ontario and two marshes near his home in Manotick to conduct bird surveys, amphibian surveys and a habitat assessment.

The Marsh Monitoring Program is carried out along the 760,000 km<sup>2</sup> Great Lakes Basin, in both Canada and the United States. Wetlands are critical to the health of the Basin's ecosystem and home to dozens of species of birds and amphibians. Unfortunately, many of these wetlands have been lost due to draining and filling, and many that remain have been damaged by contaminants, excessive nutrients and alien plants and animals.

The program was initiated by Bird Studies Canada, a non-profit organization dedicated to the conservation of wild birds, and launched in the two countries in 1995. Six years later, the program is running smoothly, says Kathy Jones, the organization's aquatic survey officer. Funding organizations are beginning to commit to multi-year grants and the only trouble the volunteers seem to have is sometimes being questioned by the police, who wonder why someone's standing in the middle of a marsh at night.

Jones provides volunteers with a detailed instructional booklet, data forms, an instructional cassette tape containing examples of bird and amphibians sounds they are likely to hear, and a broadcast tape they can play in the field to elicit response sounds from animals. The program focuses its efforts around 43 "areas of concern", largely in urban areas, that have been identified by the International Joint Commission as being in particularly poor shape.

The amphibian studies are conducted after sunset, when male amphibians are more vocal and announce their presence to females. With both bird and amphibian studies, volunteers try to count the number of individuals in their monitoring area. Once a year, they assess habitat: noting the

floating plants, open water, exposed mud, rock or sand, trees and shrubs in the wetland, the size of the wetland, and how the adjacent land is being used.

Many of the volunteers have been with the project since it began. Satterly has, and hasn't yet grown tired of the task. He appreciates that he's surveying for a concrete reason; it makes the effort seem worthwhile. And, while he's been a birder his whole life, he hadn't monitored amphibians before getting involved with this project, so he's learned a great deal though this work.

To date, volunteers have recorded 13 species of calling amphibians and 53 species of birds that use the wetlands for nesting or feeding or both. Results suggest a decline in the Chorus Frog, American Toad, Pied-billed Grebe, Blue-winged Teal, American Coot, Black Tern, Tree Swallow, and Red-winged Blackbird, and an increase in the Bullfrog, Canada Goose, Mallard, Chimney Swift, Northern Rough-winged Swallow, Common Yellowthroat and Common Grackle. This knowledge, the group hopes, can guide conservation projects and management plans, help assess cleanup and restoration efforts and assist in the protection and management of existing wetlands.

Organizers hope to get enough funding to continue this project for at least a decade. "The Great Lakes are going to always be here. And the need to know what is happening with them is going to always exist," says Jones.

**Contact Information:**

Bird Studies Canada

PO Box 160, Port Rowan, Ontario N0E 1M0

tel: 888-448-BIRD / fax: 519-586-3532

email: [aqsurvey@bsc-eoc.org](mailto:aqsurvey@bsc-eoc.org)

[www.bsc-eoc.org](http://www.bsc-eoc.org)





## **Volunteer Watershed Monitoring Program Partners for the Saskatchewan River Basin, Saskatoon**

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**Goal of Project:**

To help people better understand water management issues.

**Number of People-hours Involved:**

The organization has one staff person who works half-time on this project, and a staff person at the Saskatchewan Wetland Conservation Corporation spends 10% of his time on this project. A dozen volunteer groups survey their area once a month when the water is running, and once after freeze-up.

**Length of Project:**

Ongoing. Began in 1998.

**Budget:**

About \$75,000 a year.

**Partnerships Involved:**

Saskatchewan Wetland Conservation Corporation trains the volunteers; Saskatchewan Environmental Research Management conducts the fecal coliform tests for free.

**Major Funders:**

Environment Canada, Canadian Tourism Commission, Meewasin Valley Authority, Saskatchewan Environmental Resource Management, Tourism Alliance of Western and Northern Canada, Tourism Saskatoon, Tourism Saskatchewan, SaskWater, Saskatoon Catholic Board of Education, City of Calgary, Parks Canada, Department of Canadian Heritage, River Network, The EJLB Foundation, Water Survey of Canada, Edmonton Tourism, Battlefords Tourism, Town of Nipawin, Dr. Ray Fast, Prairie Chem Inc.

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For the past 25 years, Ray Riesz has enjoyed vacationing at his cottage on Good Spirit Lake, a shallow 12-km-long lake in southern Saskatchewan,

30 km northwest of Yorkton that is home to a number of species including walleye, northern pike, sharp-tailed grouse, grosbeaks and waxwings. When Riesz retired a few years ago, he decided to help make sure the lake would be in good condition so that others will be able to enjoy it as much as he has.

Riesz and a few other lake users formed the group Friends of Good Spirit Lake because they were worried about the increase in algae and turbidity in the lake. Many agriculture operations border tributaries of the lake, and nutrients from farming operations are leading to algae growth, which can affect water quality and habitat quality.

The group monitors the lake through the Volunteer Watershed Monitoring Program developed by Partners for the Saskatchewan River Basin in conjunction with the Saskatchewan Wetland Conservation Corporation. Through the program, 13 groups – school classes, community groups and naturalist groups from both urban and rural areas – monitor creeks, rivers and lakes that are part of the watershed. Volunteers learn about the importance of maintaining the health, native biodiversity and ecological integrity of watersheds, and are trained to monitor shoreline health, water quality and aquatic life.

Teams, which make a two-year commitment to the project, receive water-testing kits, supplementary equipment, an information guide and a reference package. They test for eight water quality parameters at three different locations along the waterway every month during the growing season and once after freeze-up. They monitor aquatic invertebrates by dipping a screen in the water, and they also assess riparian habitat once a year. "It's not difficult at all," says Riesz, who has no biology background.

The program was started because people like Riesz want to know more about their watershed, says Richter. "There's a real hunger for the information. They want to know what the real facts are. The program is a way to connect the research community to the general public."

When the program was getting started, some community members viewed it with suspicion, worried the group was out to lay blame. The group has worked to overcome this perception, says Richter, by clearly explaining

their goal is to connect people to water management issues, not to pit one neighbour against another.

Before launching the project, Richter's group pulled together a technical committee to develop objectives and parameters and choose equipment that would be easy to use, relatively inexpensive and would give volunteers results right in the field. This technical backing was crucial, says Richter, to ensure the volunteers ended up with quality results.

Right now, groups are collecting information in order to create baseline data. The next step will be to analyze the data. Results from the schools have not been as consistent as those from other groups, probably because there are new classes every year and the schools aren't able to monitor as often. But, the project is still a great hands-on learning experience, says Richter.

Volunteers have come to better understand the impact of human activities on water, say both Richter and Riesz. Riesz's group has found that Good Spirit Lake is in pretty good shape, except for the algae. Riesz has also learned to appreciate the lake at a deeper level: "I just find it so interesting that the lake can change so much," say Riesz. "It's pretty fulfilling. And enlightening."

**Contact Information:**

Partners for the Saskatchewan River Basin,  
c/o Meewasin Valley Authority  
402 Third Avenue South,  
Saskatoon, Saskatchewan S7K 3G5  
tel: 306-665-6887 / fax: 306-665-6117  
email: [partners@saskriverbasin.ca](mailto:partners@saskriverbasin.ca)  
[www.saskriverbasin.ca](http://www.saskriverbasin.ca)



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## **Species Monitoring**

### **Honourable Mentions**

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#### **Fish Friends**

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Students at New Brunswick's Pennfield Elementary made 200 new friends last year. And then they let them go. Pennfield Elementary is just one of 600 schools participating in the Fish Friends program, developed by the Atlantic Salmon Federation for grades 4, 5 and 6. Through this program, children hatch and grow wild Atlantic salmon eggs in their classroom and then release them into nearby waterways.

The Federation provides schools with a closed system that replicates what happens in nature. Schools get 200 to 300 eggs, a 30-gallon aquarium, a chilling unit and a biological filter. The program is subsidized through local school boards and fish and game clubs.

This project probably won't increase the number of salmon in the rivers, since in the wild only one egg in 8,000 actually survives to the salmon stage. However, it is an excellent way for children to better appreciate salmon and the environment, says Anne Fanjoy, Pennfield Elementary's principal and grade 4 teacher. "They are far more conscious and aware of the things that can affect habitat now," she says.

#### **Contact Information:**

Danny Bird, Regional Director, New Brunswick  
Atlantic Salmon Federation  
PO Box 5200  
St Andrews, New Brunswick E5B 3S8  
tel: 506-529-1072 / fax: 506-529-4985  
email: [dbird@nbnet.nb.ca](mailto:dbird@nbnet.nb.ca)  
[www.fishfriends.net](http://www.fishfriends.net)

## **Coral Reefs**

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The Philippines has one of the world's most threatened coral reef systems. Each year, an estimated 330,000 pounds of cyanide is sprayed on Philippine coral reefs, and between 1966 and 1986 the productivity of the reefs dropped by one-third, according to the International Coral Reef Initiative.

But the Philippines is also home to one of the most successful examples of a community coral reef restoration and monitoring program.

In the late 1970s, a local university started a coral reef conservation program on Apo Island, about five kilometres off the southeast coast of Negros Island in the Philippines. The reef was being overfished and destructive dynamite and cyanide techniques were being used. As fish stocks began to decline, fishermen realized they had to do something to stop the situation or else they'd lose their livelihoods. So in 1985, the entire Apo Island coral reef was made a marine reserve with a fish sanctuary, providing a refuge for fish to feed and reproduce. Only traditional fishing is allowed within the reserve, and only in the non-sanctuary area.

The reef is monitored and managed by a community group, the Apo Island Marine Management Committee, which enforces the restricted fishing methods. The Committee has support from local and national governments and Silliman University. Since the sanctuary was set up, Apo's fisheries have thrived, with fish catches tripling over the past five years.

### **Contact Information:**

International Coral Reef Initiative Secretariat  
c/o the Department of Environment and Natural Resources  
2nd floor, FASPO Building  
DENR Compound, Visayas Avenue  
Diliman, Quezon City  
Philippines

## **Lady Beetle Survey**

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Human impacts on biodiversity extends to even the smallest things. Like lady beetles.

Over 170 species of the familiar polka-dotted insects have been brought into North America since the 1880s. In 1995, the Canadian Nature Federation started a survey to discover what impact these foreign beetles have had on the native population.

Almost 3,000 people participated in the survey, which wrapped up last year. The Federation received over 32,000 reports of individual beetle sightings in parks, on clothing and, of course, in gardens eating aphids.

To keep the project manageable, the Federation asked volunteers to look for 10 particular types of beetles, three of those alien species. The study results suggest alien lady beetle species are expanding while native populations may be declining. The Seven-spotted and Southern lady beetles alone made up 60 percent of sightings. They are both alien species.

Although the lady beetle survey is now complete, anyone interested in the Federation's monitoring programs can join Frogwatch, which tracks frog and toad mating calls.

### **Contact Information:**

The Canadian Nature Federation

1 Nicholas Street, Suite 606

Ottawa, Ontario K1N 7B7

tel: 800-267-4088 / fax: 613-562-3371

email: [ladybeetle@cnf.ca](mailto:ladybeetle@cnf.ca)

[www.schoolnet.ca/vp-pv/ladybug/e/ladybug/index.htm](http://www.schoolnet.ca/vp-pv/ladybug/e/ladybug/index.htm)

## **World Wildlife Fund's Endangered Space Campaign**

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The World Wildlife Fund's Endangered Space Campaign, launched in 1989 and ending in 1999, was a major nongovernmental initiative to

establish a complete system of protected areas representing the full range of Canada's natural diversity. Initially, it set out to protect a minimum of 12 percent of Canada's lands and waters from industrial activities, but as the effort progressed WWF deemphasized the 12 percent figure – often criticized for being a scientifically unsound figure – in favour of the more defensible objective of completing a representative protected areas network. Though the Campaign served as an effective watch-dog by assigning 'report cards' to areas under both federal and provincial jurisdiction, it did not achieve its goal of a completed representative protected areas system. Nevertheless it helped create 1,000 new or expanded protected areas covering 38 million hectares of wilderness (Source: DeMarco and Bell, 2000; WWF, 2000).

**Contact information:**

245 Eglinton Ave. East, Suite 410

Toronto, Ontario M4P 3J1

tel: 1-800-26-PANDA

tel: 416-489-8800

fax: 416-489-3611

email: [ca-panda@wwfcanada.org](mailto:ca-panda@wwfcanada.org)

[www.wwf.ca](http://www.wwf.ca)





## **Habitat Protection and Rehabilitation**

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### **Introduction**

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Biodiversity refers to the number and variety of species, ecosystems and genetic variation contained within species. When we lose habitat, we lose all of these things. Cutting down a local forest to make room for development threatens the songbirds that lived there, for example, and polluting a northern lake with acid rain reduces the fish population.



The following stories tell about the work groups are doing to protect and rehabilitate habitat. A group in New Brunswick has restored an urban stream; villagers in Papua New Guinea have protected their forest; a group in Alberta is trying to create a continent-long wildlife corridor; Manitoba naturalists are conserving ancient Prairie grass; 10-year-old children went to city council to save rare, tailed frogs; and a Quebec group is preserving its delicate sand dunes.

There are many projects you could undertake to protect habitat, such as stopping pollutants from entering a local waterway, naturalizing a schoolyard, or working to create regional parks. The following resource list should give you some ideas for further activity, or contact your provincial nature trust or land conservancy organization.

### **Resources**

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#### **Canadian Parks and Wilderness Society**

880 Wellington Street  
Suite 506  
Ottawa, Ontario K1R 6K7

tel: 800-333-9453  
fax: 613-569-7098  
email: [info@cpaws.org](mailto:info@cpaws.org)  
[www.cpaws.org](http://www.cpaws.org)

**Conservation Information Cooperative**

University of Guelph  
Guelph, Ontario N1G 2W1  
email: [cic@uoguelph.ca](mailto:cic@uoguelph.ca)  
[www.cic.envsci.uoguelph.ca](http://www.cic.envsci.uoguelph.ca)

**Ecogifts**

Habitat Conservation Division  
Canadian Wildlife Service  
Ottawa, Ontario K1A 0H3  
fax: 819-953-3575  
email: [ecogifts@ec.gc.ca](mailto:ecogifts@ec.gc.ca)  
[www.cws-scf.ec.gc.ca/ecogifts](http://www.cws-scf.ec.gc.ca/ecogifts)

**Evergreen Foundation**

355 Adelaide Street West, 5th Floor  
Toronto, Ontario M5V 1S2  
tel: 416-596-1495  
fax: 416-596-1443  
email: [info@evergreen.ca](mailto:info@evergreen.ca)  
[www.evergreen.ca/index.html](http://www.evergreen.ca/index.html)

**The Land Stewardship Centre of Canada**

17503-45th Avenue (Imrie House)  
Edmonton, Alberta T6M 2N3  
tel: 780-483-1885  
fax: 780-486-9599  
email: [lsc@compusmart.ab.ca](mailto:lsc@compusmart.ab.ca)  
[www.landstewardship.org](http://www.landstewardship.org)

**The Nature Conservancy of Canada**

110 Eglinton Avenue West  
Suite 400

Toronto, Ontario M4R 1A3  
tel: 800-465-0029  
fax: 416-932-3208  
email: [nature@natureconservancy.ca](mailto:nature@natureconservancy.ca)  
[www.natureconservancy.ca](http://www.natureconservancy.ca)

**Parks Canada National Office**

25 Eddy Street  
Hull, Quebec K1A 0M5  
tel: 888-773-8888  
e-mail: [parkswebmaster@pch.gc.ca](mailto:parkswebmaster@pch.gc.ca)  
[www.parkscanada.gc.ca](http://www.parkscanada.gc.ca)

**Wildlife Habitat Canada**

7 Hinton Avenue North, Suite 200  
Ottawa, Ontario K1Y 4P1  
tel: 613-722-2090  
fax: 613-722-3318  
email: [reception@whc.org](mailto:reception@whc.org)  
[www.whc.or](http://www.whc.or)

**Publications:**

*Greening School Grounds: Creating Habitats for Learning*. Toronto:  
Green Teacher Books, 2001.





## **Omani Paimanda Project**

### **Niugini Wildlife Society, Papua New Guinea**

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#### **Goal of Project:**

To conserve the Engae Dendrobium, an orchid, and two species of bird, known as the Miok in the local vernacular.

#### **Number of People-hours Involved:**

Unknown.

#### **Length of Project:**

Ongoing. The United Nations Development Programme began funding the project in 1997. Funding stopped in 1999, but the project continues.

#### **Budget:**

K30,000 (approx. \$14,500 Cdn), plus K50,000 (\$24,200 Cdn) for a feasibility study. The co-ordinating group is looking for new funding so it can continue the work.

#### **Partnerships Involved:**

Partnerships with local clans, who hold land through traditional land tenure.

#### **Major Funders:**

The United Nations Development Programme and Pogera Joint Venture, a joint mining venture between Placer Dome Inc., Goldfields Porgera Limited, Orogen Minerals (Porgera) Limited, and Yuwai No. 65 Ltd.

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Some students from the University of Papua New Guinea didn't forget their lessons once the school term had ended. In the classroom, they were heavily exposed to environmental issues. Back in their own village, they saw the impacts of logging, and they started to think about what could happen to their forests if environmental factors were not taken into account. They decided to apply their lessons to real life.

Papua New Guinea is thought to have between five and seven percent of the world's species, many of which aren't found elsewhere. Over the past ten years, the area has seen the slow but steady increase in unsustainable land use practices. Although communities have been receptive to the forestry industry because of the money it brings to the local economy, the ecosystem was beginning to suffer from logging, population pressure, subsistence agriculture and portable sawmills.

The area the students were concerned about is the Paimanda Range, in the central province of Enga. The area is rich in biodiversity, lushly forested with oak and beech, and contains sacred ceremonial sites. It is also home to the *Engae Dendrobium*, an orchid, and two bird species, the *Astrapia Nigral* and *Astrapia Rothschildi*. The birds, locally known as "Miok", have long black tail feathers that are prized by men who use them in their traditional headdress. The area used to boast the country's largest supply of Miok, until hunters and loggers reduced their numbers and the natural habitat dramatically.

The students chose to focus on a 65-km<sup>2</sup> site at the top of the Paimanda Range, 3,000 m above sea level. Though intact to some degree, the area is threatened by domesticated pigs who forage and by humans who clear the forest for gardening, causing habitat destruction and soil erosion.

Working with the Niugini Wildlife Society, the students secured funds from a mining company operating in the province to conduct a feasibility study on protecting this site. They then took their idea to the people, hosting a community-wide forum and getting the message out.

There was widespread support for action, and community representatives were appointed to the management committee of the project. The group got funding from the United Nations Development Programme (UNDP) Small Grants Programme, which it used to reforest the scars in the site, to develop a nursery of endemic orchid species, and to protect the habitat of the Miok and other endemic flora and fauna. Even a number of local landowners came on-side, declaring their forests off limits to loggers and to uncontrolled hunting.

Although the land is not legally protected, conservation rules have been set and the area is monitored by the management committee, who charge those breaking the rules.

This was a big project to undertake, remembers Thomas Paka, the national coordinator of the UNDP's granting program in Papua New Guinea. The project involved about 13 tribes and took about three years to set up. "The major challenge was to really get the different tribes involved in the project," he recalls, "Basically, to make them understand what conservation is and how important it was to them and their children in the long run." Paka has learned that involving all the stakeholders at all stages, from planning to implementation, is fundamental. And also that budgets and work plans must be realistic.

But it was worth it, he says: "The major impact was the general awareness the project had on the lives of the people at the community level and even at the policy level about conservation and its importance. The provincial government is now fully supportive of the idea and is encouraging other districts to start projects like this."

Although UNDP funding ended in 1999, the project continues, and its impacts continue to be felt.

**Contact Information:**

United Nations Development Programme  
3rd Floor ADF House, Musgrave Street, PO Box 1041  
Port Moresby, Papua New Guinea  
tel: +675 321 2877 / fax: +675 321 1224





## **Cold Brook Restoration Project**

### **Atlantic Coastal Action Program – Saint John**

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#### **Goal of Project:**

To restore the habitat of Cold Brook.

#### **Number of People-hours Involved:**

A co-ordinator worked full-time for the project's six-month duration, overseeing the project; two university biology students conducted a biological survey; volunteers reviewed potential plans and continue to keep an eye on the ongoing state of the stream.

#### **Length of Project:**

Six months in total; most of the construction work was done in two months.

#### **Budget:**

About \$20,000, the majority of which was used to build and install deflectors.

#### **Partnerships Involved:**

No formal partnerships. The group secured the co-operation of the stream bank's landowners (the City of Saint John, McAllister Place shopping mall, Irving Oil Ltd. and private individuals), so that it could access the site.

#### **Major Funders:**

The federal government (through EcoAction 2000) and the provincial government (through the New Brunswick Environmental Trust Fund).

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Everyone wants a comfortable, relaxing home. Even fish.

With this in mind, a group in Saint John, New Brunswick set out to restore a half-kilometre stretch of Cold Brook, a stream that runs through the city.

The City of Saint John had channelized the shallow, slow-flowing stream to reduce the risk of flooding. But channeling left the stream in a very

unnatural state – it was the same depth all along its course, its bottom didn't change, the water flowed in a straight line, and there was little overgrowth along the banks.

All in all, not a good home for fish. Fish want a stream with variety – a stream with fast riffles that mix oxygen with the water, and cooler, deeper pools where they can rest and feed. There were only a few fish in the channelized Cold Brook: some dace, sucker and eel.

So late in the summer of 1999, the Atlantic Coast Action Program-Saint John decided to make the stream a little more welcoming. In consultation with the Department of Fisheries and Oceans it designed and paid for the installation of log crib wing deflectors – triangular piles of rocks in the stream held in place by logs – which reshaped the stream and restored its natural winding, meandering nature. Deflectors constrict the water, and in doing so, increase the flow of water, which increases scouring on the stream bottom. This causes variations in bottom depth, encouraging the formation of these deep, cool pools that are so attractive to fish.

In addition, the group planted 15 native trees and about 30 berry bushes along the stream banks. The water-tolerant willow and red spruce shade the water and keep it cool for the fish. The bushes, with their fruit, attract wildlife. To create habitat for birds and bats, the group also installed nesting boxes.

At the beginning of the project, two biology students from the University of New Brunswick conducted a biological survey and took water quality samples. The group will use this baseline to monitor the impact of the project over the next few years. "Improving the habitat of a stream will improve the number and diversity of fish and insects, will attract mammals and birds and so on. The whole system benefits from an improved habitat," explains Sean Brilliant, the group's executive director. Brilliant feels an increase in species abundance is very likely to happen over time, and an increase in species diversity is a good possibility, though more difficult to foresee.

The group chose Cold Brook because it was in a residential area, where people would actually see the project and its impact. The group wanted to

demonstrate that urban streams can be diverse and ecologically significant. Saint John residents too often view them as ditches, dumping tons of garbage into them every year, says Brilliant.

The group made a point of meeting with local residents and landowners who might be impacted by the project and educating them about their plans for the brook. People reacted positively, recalls Brilliant, although many were surprised the waterway was anything more than a ditch.

Securing community support is critical with projects like this, he says. "And you have to recognize everybody in the community. You have to recognize that the local oil refinery is a part of your community and that the local services group is a part of your community." And that fish are as well.

Atlantic Coastal Action Program – Saint John works to improve the environmental health and integrity of the Saint John River Estuary. The non-profit group takes on 12 to 20 projects a year, through two full-time staff, contract workers and hundreds of volunteers.

**Contact Information:**

Atlantic Coastal Action Program – Saint John  
76 Germain Street, PO Box 6878, Station A  
Saint John, New Brunswick E2L 4S3  
tel: 506-652-2227 / fax: 506-633-2184  
email: [acapsj@fundy.net](mailto:acapsj@fundy.net)  
<http://user.fundy.net/acapsj/>





## **Yellowstone to Yukon Conservation Initiative**

### **Yellowstone to Yukon Conservation Initiative, Canmore AB**

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#### **Goal of Project:**

To establish a connected network of protected areas and corridors from the Greater Yellowstone ecosystem to Yukon's Mackenzie Mountains.

#### **Number of People-hours Involved:**

Six full-time staff, plus the efforts of hundreds of groups and individuals.

#### **Length of Project:**

Ongoing. The initiative began in 1995, and an office was opened in Alberta in January 1997. The group has called the project "a 100-year vision".

#### **Budget:**

2001 budget: \$1.5 million.

#### **Partnerships Involved:**

The group partners with the Sonoran Institute on conservation publications and economic analyses. It has partnered with the Sierra Club, Training Resources for the Environmental Community, and the Wilderness Society on capacity-building workshops for member groups.

#### **Major Funders:**

About 20 foundations, both Canadian and American, such as the Henry P. Kendall Foundation, the LaSalle Adams Foundation, Kahnoff Foundation, and Wilburforce Foundation.

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Big animals need big spaces. Over the past decade, more and more biologists have become convinced that our habitat protection efforts aren't expansive enough and that many animals are under threat because they don't have enough habitat. Male grizzly bears, for example, need up to 2,300 km<sup>2</sup> of roaming room. Animals don't just need parks, they need huge areas of connecting land; land that crosses provincial and national

borders, private and public property, protected and unprotected areas. Scientists began to see that we have to change the way we think about habitat protection. So they formed the binational Yellowstone to Yukon Conservation Initiative (Y2Y).

"What Y2Y is advocating, in a nutshell, is a paradigm shift in terms of how we approach land use planning and wildlife management in the Rocky and the Columbia mountains," says Peter Aengst, the initiative's outreach co-ordinator. The Canadian-US project is challenging people to see the region from Yellowstone National Park to the Yukon as one interconnected area, and to manage the area and create land use plans with that perspective in mind. After all, that's the way the animals view it.

Aengst emphasizes the group isn't suggesting the area be turned into one giant park without economic activity. Instead, Y2Y is working to establish a connected network of protected areas and wildlife movement corridors so that wide-roaming animals such as grizzly bears, wolves, caribou, salmon, wolverine and bald eagles have enough space to live.

It's a large, complex undertaking; there is no one correct size for connecting corridors, for example. But the project's complexity hasn't hurt its appeal. So far, over 120 organizations and 100 individuals have joined the network, ranging from conservative fishing and hunting groups to grassroots environmental groups, to politicians, scientists, economists and First Nations groups.

"It's only going to happen through the efforts of all of these groups working in those local areas," says Aengst. His group plays a co-ordinating role, providing resources and offering capacity-building workshops to its member groups. Y2Y reminds people of the larger context, he says, so that the local groups can do their work in a way that also advocates the Y2Y vision.

Aengst has been busy fighting misconceptions about the economic impact of the project. Some resource lobby groups have tried to make people think Y2Y wants to stop all development. In fact, the initiative has been able to show that preserving these areas is good for the local economy, as well as local wildlife. People move to the area, set up businesses and visit the area because of its wilderness. If that economic driver is gone, the area could falter.

Since the initiative started in 1993, it's had a considerable impact. In November, the BC government approved the Mackenzie Land and Resource Management Plan. The plan, developed over seven years with the help of local residents and industries, recognizes the need for more than just parkland. In 1997, the BC government created almost four million acres of protected area surrounded by a seven-million acre special management area that permits some mining and forestry, again addressing landscape connectivity and the need to buffer core areas. A few BC cities have created community plans with a Y2Y planning perspective. And in 1998, the US and Canadian parks services formally agreed to make Y2Y a joint priority in their planning.

A lot of the land in the Y2Y corridor, especially in the US, is privately held. Land trust groups in the US, committed to the Y2Y vision, are now operating with the bigger context in mind, thinking strategically about what land they want to buy and being pro-active about approaching landowners.

It's an ambitious project, and a lot remains to be accomplished, but Aengst is confident that given time, and space, they'll be successful.

**Contact Information:**

Yellowstone to Yukon Conservation Initiative

710 9th Street, Studio B

Canmore, Alberta T1W 2V7

tel: 403-609-2666 / fax: 403-609-2667

email: [hub@y2y.net](mailto:hub@y2y.net)

[www.rockies.ca/y2y/](http://www.rockies.ca/y2y/)





## **Habitat Protection and Rehabilitation**

### **Honourable Mentions**

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#### **Manitoba Tall Grass Prairie**

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It used to spread across this continent, from southern Manitoba to Texas, but the Manitoba Tall Grass Prairie is almost gone now, plowed up by early settlers wanting farmland. Today, less than 0.02% of the province's prairie remains. Thanks to concerned naturalists, at least some of it has now been preserved.

A powerful coalition of groups, including the Manitoba Naturalists Society, the World Wildlife Fund, Wildlife Habitat Canada, Environment Canada, Manitoba Conservation (a provincial government department) and the Nature Conservancy of Canada, has worked together to secure over 5,000 acres of prairie 115 km southeast of Winnipeg.

Gene Fortney, the director of land protection for the Manitoba office of the Nature Conservancy, is working to secure adjacent areas and create a larger preserve. "You have to be opportunistic," he says. "When you find an agreeable person you can work with, then you go ahead, using either conservation agreements, lease agreements or straight purchase."

The group is able to get help from people because in most cases the land it wants isn't suitable for agriculture. People understand that while the land isn't good for farming, it's important ecologically, says Fortney. And they understand that the preserve needs contiguous parcels of land.

The preserve is home to over 270 plant species, including the endangered Western Prairie Fringed Orchid and the endangered Small White Lady's Slipper, 155 bird species, 35 mammal species and 48 different types of butterflies.

**Contact Information:**

Nature Conservancy of Canada, Manitoba Region  
298 Garry Street  
Winnipeg, Manitoba R3C 1H3  
tel: 204-942-6156  
fax: 204-947-2591

**West Vancouver Frogs**

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A little discovery can have a big impact, grade 5 students at West Vancouver's Gleneagles Elementary School learned in October 1997.

The children discovered frogs in nearby McDonald Creek during a science lesson. It turned out the thumb-sized amphibians were tailed frogs, listed as threatened in BC. Several of the children brought their findings to West Vancouver city council, which was in the process of approving a housing development by the creek that the children feared would destroy the frog's habitat and push the frog toward extinction. Until that point, no one had realized the frogs were there.

In the end, months of lobbying by the children – and biologists -convinced council to increase buffer zones along the mountain creek and put in restrictive tree covenants. As well, the developers were made to pay for a five-year scientific study to monitor the impact of its development on the stream.

**Contact Information:**

Gleneagles Elementary School  
6350 Marine Drive  
Vancouver, British Columbia V7W 2S5  
tel: 604-981-1360  
fax: 604-981-1361

## **Dune Protection**

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Before Attention Fragîles got involved, the dunes on the Magdelean Islands in the Gulf of St. Lawrence were considered one giant playground for all-terrain vehicles. They criss-crossed the dunes, destroying beach grass and killing endangered piping plovers and their eggs.

The non-profit group, working with the Canadian Wildlife Service, educates residents and tourists to change their behaviour. With a population density of 70 inhabitants per square kilometre, conservation is a big challenge. But since the dunes are the only home in Quebec to piping plovers, the group feels it's one that must be tackled.

In 1995, Attention Fragîles convinced some island municipalities to ban motorized traffic on dunes, beaches and wetlands. A year later it created a parking lot by the beach and built a raised wooden footpath so people don't drive or walk on the delicate dunes. It replants beach grass, builds fences around dune "holes," so the dune can regenerate itself, and puts wire mesh around piping plover nests to protect them.

### **Contact Information:**

Attention Fragîles  
30 ch. Principal CP 369  
Cap-Aux-Meules, Quebec G0B 1B0  
tel: 418-986-6644





## **Sustainable Resource Management**

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### **Introduction**

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Human beings depend on nature's resources for food, shelter and well-being. We grow and harvest crops, cut down trees for lumber or fuel, and extract minerals from the earth's crust. But some ways of using resources are less destructive than others. Managing resources wisely helps to conserve an area's biodiversity.



We can all help to support sustainable resource management. On a community level, we can encourage our governments to enact legislation that ensures responsible resource extraction practices, for example. Individually, we can buy goods that have been produced in an environmentally sustainable way. We can also simply take care of the things we have, so that they last.

The following profiles describe how communities in BC are managing their own forests, how shoppers in Quebec are sharing in the food-growing process, and how coffee growers are helping the environment as they help themselves.

There are many organizations involved in developing sustainable management practices and ecolabelling initiatives in different sectors. The Office of Energy Efficiency has developed "Energuides" labels for household appliances, for example, while the Environmental Choice Program applies to a number of different consumer products. The resource list below provides a starting point for contacting sustainable resource organizations.

## **Resources**

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### **Canadian Organic Growers**

PO Box 6408, Station J  
Ottawa, Ontario K2A 3Y6  
tel: 613-231-9047  
email: [info@cog.ca](mailto:info@cog.ca)  
[www.cog.ca](http://www.cog.ca)

### **Environmental Choice Program**

c/o TerraChoice Environmental Services Inc.  
2781 Lancaster Road, Suite 400  
Ottawa, Ontario K1B 1A7  
tel: 800-478-0399 / fax: 613-247-2228  
email: [ecoinfo@terrachoice.ca](mailto:ecoinfo@terrachoice.ca)  
[www.environmentalchoice.com](http://www.environmentalchoice.com)

### **EthicScan Canada**

Lawrence Plaza Postal Outlet, PO Box 54034  
Toronto, Ontario M6A 3B7  
tel: 416-783-6776 / fax: 416-783-7386  
email: [ethic@look.ca](mailto:ethic@look.ca)  
[www.ethicscan.on.ca](http://www.ethicscan.on.ca)

### **FarmFolk/CityFolk**

103, 131 Water Street  
Vancouver, BC V6B 4M3  
tel: 604-730-0450  
fax: 604-730-0451  
email: [office@ffcf.bc.ca](mailto:office@ffcf.bc.ca)  
[www.ffcf.bc.ca](http://www.ffcf.bc.ca)

### **Forest Stewardship Council**

National Working Group  
100 Broadview Avenue, Suite 421  
Toronto, Ontario M4M 3H3  
tel: 416-778-5568

fax: 416-778-0044  
email: [fscga@web.net](mailto:fscga@web.net)  
[www.fscganada.org](http://www.fscganada.org)

**Marine Stewardship Council**

4005 20th Avenue West, #221  
Fishermen's Terminal, West Wall Building  
Seattle, Washington 98199  
tel: 206-691-0188  
fax: 206-691-0190  
email: [infor@msc.org](mailto:infor@msc.org)  
[www.msc.org](http://www.msc.org)

**Office of Energy Efficiency**

Energy Publications, c/o DLS  
Ottawa, Ontario K1A 0S7  
tel: 800-387-2000  
fax: 819-994-1498  
<http://energy-publications.nrcan.gc.ca>

**Silva Forest Foundation**

PO Box 9  
Slocan Park, BC V0G 2E0  
tel: 250-226-7222  
fax: 250-226-7446  
[www.silvafor.org](http://www.silvafor.org)

**Publications**

Rosalyn Will *et al.* *Shopping for a Better World*, 2000 ed. New York:  
Council on Economic Priorities, 2000. Available from [www.cepnyc.org](http://www.cepnyc.org).





## **Community Forest Licence**

**Harrop-Procter Watershed Protection Society, Procter BC**

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**Goal of Project:**

To harvest timber using an ecosystem-based approach.

**Number of People-hours Involved:**

Thousands of hours to prepare the community licence application. Now, 12 board members each commit 10 hours a month to the project and one person works full-time managing the project.

**Length of Project:**

Ongoing. The group began research and outreach a few years ago and received its licence in August 2000.

**Budget:**

Varies with the amount of timber harvested.

**Partnerships Involved:**

The Silva Forest Foundation helped the group to write its forest plan.

**Major Funders:**

Equity investment and loan financing. For the community outreach and enhancement projects, the group has used private foundation funds and government employment grants.

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Sometimes, to make sure things are done properly, you have to do them yourself. A group of community members and environmentalists in Procter, BC were worried that if their nearby forests were extensively logged, the creeks and watersheds in the forests, which provide the town's drinking water, would be harmed. So the group got a forestry licence for itself, gaining control over cutting rights in the area.

The Harrop-Procter Watershed Protection Society signed a community forest pilot project agreement with the provincial government in August

2000. The pilot licence lasts five years, and is one of ten the government has allotted in an attempt to increase the participation of communities and First Nations in managing local forests.

The Society will operate the almost 11,000-hectare community forest in Procter, about 30 km north of Nelson in the interior of BC, using an ecosystem-based forest management philosophy. The group plans to sell eco-certified timber, create a value-added manufacturing plant, harvest botanical forest products such as mushrooms, and encourage environmentally low-impact tourism. The group wants the forests to create higher-than-average revenues, lessening the need to cut great numbers of trees. It plans to start harvesting in July 2001.

Superficially, the sustainable forestry operation may seem the same as a traditional, commercial one, but it differs in several important ways. Firstly, the licence is based on area, not on volume, which switches the focus to an ecosystem style of resource management and allows the group to be more flexible and responsive to change than it would be if it were committed to harvest a specific volume each year. Secondly, the group's goals are not just economic, but are social and environmental.

Local control often means local jobs. For example, about 150 km north of Procter, the Revelstoke Community Forest Corporation has managed a tree farm licence since 1993. The corporation, owned by the City of Revelstoke and three local forest industry partners, tries to hire locally, process locally and purchase locally. Today, close to 75 percent of the timber that is felled in its tree farm licence is processed in town, up from only four percent in 1986. The community forest employs 50 to 60 local people and generates \$8 to \$10 million of economic activity each year, the bulk of which stays in town.

Thirdly, and probably most importantly, the community licence requires community involvement. The group had to demonstrate local support before it could get the licence. Through a door-to-door campaign, 60 percent of the adult community joined the group as members. As well, the group held meetings to get the community's support for its forestry plans and got input from First Nations in the area and from local resource companies that held resource rights. Now that it has the licence, the

community involvement continues. The group hires local people, and the society is made up of long-term residents, committed to the area.

This community requirement meant some difficult times for the Harrop-Procter Watershed Protection Society. It involved working with the provincial Ministry of Forests district manager, whom members had had trouble with in the past over environmental issues. "To his credit, he made it work. He didn't keep that as an obstacle," says Ramona Faust, a director with the society. The district manager did ask the group to meet with local forestry companies to get their support for the initiative, though – another stressful task for group members.

In the end, people learned to deal with each other in a fair way and with respect, remembers Faust. "I think you can work solutions out with your neighbour. It may be really ugly in the middle, but in the end, they're going to be more responsive than shareholders in North Carolina or some other far-off place."

**Contact Information:**

Harrop-Procter Watershed Protection Society  
PO Box 5, Procter, British Columbia V0G 1V0  
tel: 250-229-2221  
fax: 250-229-2332  
email: [hpwater@netidea.com](mailto:hpwater@netidea.com)





## **QuÉbec Community Supported Agriculture Équiterre, Montreal**

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### **Goal of Project:**

To link people with the farmers and growers who supply their food; to give organic farmers a venue for their produce; to offer people an alternative to the grocery store; to give farmers a stable source of income.

### **Number of People-hours Involved:**

Équiterre has one staff person dedicated to the project full-time, plus one or two people who spend about half their time working on the project. Also, ten volunteers each give about 200 hours a year to help with the project. There are 55 farms in the CSA program and about 3,000 shareholders.

### **Length of Project:**

Ongoing. The project began in 1996, and each "season" usually lasts about 20 weeks, from about the end of June to the end of October, although a few farms produce winter baskets.

### **Budget:**

Between \$100,000 and \$200,000: it varies annually, depending on activities.

### **Partnerships Involved:**

Partnerships with the farmers, who help run the network. As well, the shareholders are often invited to help on the farms and some farms have a core group of people who help the farm in its organization and projects.

### **Major Funders:**

Family foundations, government grants and farmers' contributions.

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When Allison Hackney inherited family property in Senneville, on the island of Montreal, she wanted to maintain it as an active, productive farm. But, without much farming experience, she wasn't sure how she

could afford to do that. By joining Équiterre's community-supported agriculture (CSA) program, she got the financial stability she needed to make that dream possible. Hackney now produces about 30 types of organic fruits and vegetables, from cabbages to kiwi to corn, for 45 shareholders who buy shares in the harvest each year. Urbanites get great food and Hackney gets to be a farmer.

Équiterre – French for equality and earth – is a not-for-profit organization promoting ecological, socially just choices. It has lived up to its name with its CSA program, creating economic, environmental and social sustainability.

Economic stability is a large benefit of the program for farmers. In a CSA scheme, shareholders invest their money at the beginning of the season, providing farmers with cash to buy seeds and guaranteeing a market for the produce that results. "Farms have a secure revenue, instead of only getting the money once the produce is sold. They know that they have this income, good year, bad year," says Isabelle Joncas, the information agent at Équiterre.

The shareholders benefit economically, as well. In return for their shares payment, they receive a weekly box of fruits and vegetables off the farm, at prices that are about 10 to 50 percent cheaper than they'd be at a store.

Environmental stability is another plus in the case of organic CSAs. Organic farming is a sustainable approach that doesn't involve chemical pesticides and fertilizers. More and more people are becoming interested in buying organic food, and Équiterre started the province's CSA network in 1996 to answer the demand for organic food at reasonable prices, says Joncas. People join for other reasons as well, such as to get really fresh vegetables or to support Quebec farmers. The program's wide appeal results in a wide impact. The group estimates that in 2000, 4,700 people in Quebec enjoyed CSA produce.

Some city people have been surprised there are so many farmers near Montreal. "That's why Équiterre is really a wonderful thing for us, because it matches those people up with a farm, which otherwise might not happen," says Hackney. At the beginning of the season, meetings are held so people can meet the farmers, find out what they offer and what they charge.

Hackney's farm is typical of the 55 farms involved in the network. Most are small to medium-sized operations, offering great diversity in produce to an average of 50 to 70 shareholders. Farmers pay \$35 a year to be a part of the network and two percent of sales they've made through Équiterre (up to a maximum of \$350). As well, each shareholder pays \$5 a year to Équiterre.

This program isn't just about economics and environment. It's about people, bringing them together and involving the farmers and the shareholders in the whole process. While Équiterre co-ordinates the network, each farm sets its own product line, drop-off time and place, and share prices (Hackney, for example, charged \$325 last year). Most farmers drive into Montreal or to small cities or villages where their groups are, but Hackney has her shareholders pick up the produce at her farm. Last year she spread the produce on some tables under the tree and posted a shopping list. People went around and packed their own boxes. "Sharers got to know each other that way. It was a meeting place, it became a very social thing." People would linger, ask questions and exchange recipes while picking up their produce.

Thousands of shoppers in Quebec are now able to say not just where their food has come from, but whom it has come from.

**Contact Information:**

Équiterre

2177 Masson Street, Suite 317

Montreal, Quebec H2H 1B1

tel: 514-522-2000 / fax: 514-522-1227

email: [info@equiterre.qc.ca](mailto:info@equiterre.qc.ca)

[www.equiterre.qc.ca](http://www.equiterre.qc.ca)





## **Sustainable Resource Management Honourable Mentions**

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### **Shade-Grown Coffee**

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Since 1996, Conservation International has worked with four co-operatives in the state of Chiapas, Mexico to bring organic, shade-grown coffee to international markets. The farms are just outside the El Triunfo Biosphere Reserve, so they help to create a buffer zone between the reserve and full-scale development, offering migratory birds a place to rest and farmers a way to make a living in an ecologically responsible way.

In recent years, coffee producers have been under pressure to cut down forests to create monoculture plantations and to use chemical fertilizers and pesticides to ensure high yields. But increasing demand from concerned consumers and support from environmental groups are making shade-grown coffee a real viable alternative for producers. Shade-grown coffee is cultivated under the existing (or slightly modified) forest canopy, which shields coffee plants from rain and direct sun. This technique retains soil moisture, suppresses weed growth and provides soil nutrients through leaf litter. Shade trees also give birds somewhere to nest. Shade-grown coffee thus has a lower impact on its surrounding environment than high-yield "sun" coffee.

Conservation International knew farmers couldn't afford to grow shade-grown coffee unless they could find buyers for the coffee, so it established partnerships with Rapunzel, a major European distributor of organic food, and the Starbucks chain of coffeehouses. Today the co-operatives have obtained organic certification, negotiated coffee contracts for harvests, developed new markets and arranged financing to export coffee shipments. Producers' average earnings have increased 40 percent since Conservation International began working with them, demonstrating that profit and sustainability do not have to be mutually exclusive.

**Contact Information:**

Conservation International  
1919 M Street, NW Suite 600  
Washington, DC 20036  
tel: 202-912-1000  
[www.conservation.org](http://www.conservation.org)





## **Biodiversity Fast Facts**

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### **Purpose**

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The following "Fast Facts" provides a snapshot of biodiversity: what it is, why we're losing it, and why we need to protect it. The information is presented in graphical form and in bullet points for quick reference. Some of the information you'll have seen in Biodiversity Overview, but Fast Facts provides additional facts and figures that drive home the reality of biodiversity loss.



If you are using this *Biodiversity: Profile for Community Action* in conjunction with our *Community Action Workshop Manual*, Fast Facts is an excellent handout to provide participants in Module 2, Activity 2: Analysing Our Issue. Consider it a part of the Participant's Workbook that you distribute to participants in advance of the Workshop.

### **WHAT IS IT?**

- Biodiversity is an abbreviation of 'biological diversity'.
- Simply speaking, it is the variety of life on Earth and the processes and relationships that sustain it.

There are three different levels of biodiversity:

- **Ecosystems:** Examples include marshes, coral reefs, prairies, deserts, and even backyards.
- **Species:** Each species is a group of living creatures with unique characteristics. There



are millions of species on Earth, from microscopic bugs to killer whales.

- **Genes:** Genetic diversity refers to the different combination of genes within species. Gene variety allows organisms to adapt to a wide variety of conditions.

<b>NUMBER OF SPECIES WORLDWIDE</b>		
	known # of species (thousands)	estimated total # of species (thousands)
Insects	950	8
Fungi	70	1
Arachnids	75	750
Nematodes	15	500
Viruses	5	500
Bacteria	4	400
Plants	250	300
Protozoans	40	200
Algae	40	200
Molluscs	70	200
Crustaceans	40	150
Vertebrates	45	50
Total	1,700	12,500

(Source: WCMC, 1992)

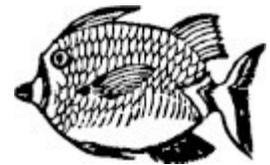
## WHY SHOULD WE PROTECT IT?



- Humans depend on it – plants and animals provide us with food, and plants are still the primary source of medicine for many people, as well as the basis for many modern pharmaceuticals.
  - All life depends upon it – ecosystems provide essential services such as pollination, air and water purification and climate regulation.
  - It's good insurance – ecosystems that contain a diversity of genes and species are much more resilient and able to adapt to pests, disease and changing climate.
  - Biodiversity means jobs and money – millions of people work in agriculture, fishing, forestry, pharmaceuticals and ecotourism industries.
  - It's spiritually important – many species are part of our cultural heritage, and nature is important to spiritual beliefs and psychological well-being.
  - It's an ethical obligation – all species have a right to exist, regardless of their usefulness to human life.
- 

## WHY ARE WE LOSING IT?

- deforestation, dams and urban sprawl which all destroy habitat
- habitat fragmentation, which causes large populations to be broken into smaller ones as well as altering conditions such as light, wind and temperature
- exotic or invasive species which compete with native species
- over-harvesting of resources either for industry or for human use (water, firewood)
- unsustainable harvesting of endangered species for furs, hides, tusks, horns or feathers



- pollution such as acid rain, heavy metals, and hormone-mimicking chemicals which can kill or weaken organisms
- climate change, which may alter environmental conditions faster than species can adapt

## **FAST FACTS**

- Since 1900, 75 percent of the worldwide genetic diversity of agricultural crops has been lost<sup>1</sup>
- A total of 11,046 species of plants and animals are threatened around the world, in almost all cases as a result of human activities. This includes 24 percent of mammal species and 12 percent of bird species.<sup>2</sup>
- In the last 500 years, human activity has forced 816 species to extinction (or extinction in the wild). Many species are lost before they are even discovered.<sup>3</sup>
- The rainforests of Central and South America, equatorial Africa, and Southeast Asia may house at least half of the world's species!<sup>4</sup>
- Madagascar has more Critically Endangered and Endangered species than anywhere in the world, because many of its species exist nowhere else in the world, and more than 90% of its original vegetation has already been lost.<sup>5</sup>



- COSEWIC is the Committee on the Status of Endangered Wildlife in Canada. It was established in 1977 to develop a national listing of species at risk, based on scientific evidence. COSEWIC has no legislative or management power – it can only make recommendations to provincial and territorial governments.
- According to COSEWIC, there are 364 endangered species in Canada.<sup>6</sup>

- There is a dangerous lack of diversity in livestock: 98 percent of dairy herds in Canada are Holsteins.<sup>7</sup>
- Several North American ecosystems are threatened including the St. Lawrence river, North American tallgrass prairie, Midwest oak savanna, and many wetlands.<sup>8</sup> The main culprits are pollution, urban sprawl, and conversion to agriculture.

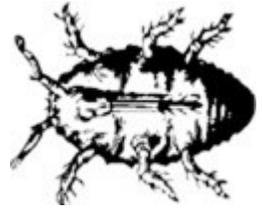
<b>CANADIAN SPECIES AT RISK</b>		
<b>Category</b>	<b>Extinct</b>	<b>At Risk<sup>1</sup></b>
Amphibians	—	16
Birds	3	50
Fish	6	68
Lepidopterans	—	10
Lichens	—	4
Mammals	2	56
Molluscs	1	8
Mosses	—	1
Vascular Plants	—	120
Reptiles	—	19
<b>TOTALS</b>	<b>12</b>	<b>352</b>

<sup>1</sup>Includes species that are considered 'endangered', 'threatened', and 'of special concern'.

(Source: COSEWIC, 2000)

## **WE ALL NEED A PLACE TO LIVE!**

- 80% of the species designated by COSEWIC as at risk of extinction are threatened by loss of habitat.<sup>9</sup> For example: A grizzly bear needs a lot of space to live comfortably – 200-600 km<sup>2</sup> for females and 900-1800 km<sup>2</sup> for males. Grizzlies can only survive in relatively undisturbed areas, and are threatened by continual erosion of their habitat by humans.<sup>10</sup>
- The marbled murrelet is an endangered bird found mainly on the west coast. Only fairly old Douglas fir and Sitka spruce trees have branches thick enough for murrelet nests, so deforestation has a devastating impact.<sup>11</sup>
- Bald eagles prefer solitude when breeding, and often abandon their nests when human disturbance comes too close. Most bald eagles choose sea coasts and lakeshores, where suitable nest trees are available, so development by humans as well as deforestation threaten their populations.<sup>12</sup>
- Salmon need pure, well-oxygenated cold water and are one of the first species to suffer when water quality is degraded by pollution or riverbank erosion. Hydroelectric dams are another threat – if they cannot get back to their spawning grounds, their populations cannot survive!<sup>13</sup>
- Giant pandas live in dense bamboo and coniferous forests at altitudes of 5,000 to 10,000 feet in China. Due to the great demand for land and natural resources in this heavily populated country, their habitat has been greatly reduced, and there are probably less than 1,000 giant pandas left in the wild.<sup>14</sup>



## SOME ENDANGERED SPECIES AROUND THE WORLD



Sources:

Endangered Life. 'Endangered Life from Around the World'. 2001.  
<<http://endangeredlife.org>>. World Conservation Union (IUCN). 'Species Profiles.' 2000. <[www.iucn.org/redlist/2000/species.html](http://www.iucn.org/redlist/2000/species.html)>. WWF. Threatened Species Accounts. <[www.panda.org/resources/publications/species/threatened](http://www.panda.org/resources/publications/species/threatened)>.

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- 1 United Nations Food and Agriculture Organization. State of the World's Plant Gene Resources for Food and Agriculture. Rome: FAO, 1996.
- 2 World Conservation Union (IUCN). 'Confirming the Global Extinction Crisis.' Press release, 28 September 2000. <[www.iucn.org/redlist/2000/news.html](http://www.iucn.org/redlist/2000/news.html)>.
- 3 Ibid.
- 4 Alonso, A., F. Dallmeier, E. Granek and P. Raven. Biodiversity: Connecting with the Tapestry of Life. Smithsonian Institution: Washington DC, 2001.

- 5 World Conservation Union (IUCN). 'Where are the Threatened Species?' 2000. <<http://iucn.org/redlist/2000/where.html>>.
- 6 Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Canadian Species at Risk; November 2000. Ottawa: Environment Canada, 2000. <[www.cosewic.gc.ca/COSEWIC/2000\\_list.pdf](http://www.cosewic.gc.ca/COSEWIC/2000_list.pdf)>.
- 7 Carr, Adriane. 'Canada's Farm and Garden Biodiversity in Peril.' Vancouver: Western Canada Wilderness Committee, 1995. <[www.wildernesscommittee.org/cesl/farms.htm](http://www.wildernesscommittee.org/cesl/farms.htm)>.
- 8 Alonso, A., F. Dallmeier, E. Granek and P. Raven. Biodiversity: Connecting with the Tapestry of Life. Washington DC: Smithsonian Institution, 2001.
- 9 Canadian Wildlife Service. Hinterland Who's Who. 2001. <[www.cws-scf.ec.gc.ca/hww-fap/eng-ind.html](http://www.cws-scf.ec.gc.ca/hww-fap/eng-ind.html)>.
- 10 Ibid.
- 11 Ibid.
- 12 Ibid.
- 13 US Fish and Wildlife Service. Wildlife Fact Sheets. 1998. <<http://species.fws.gov>>.
- 14 Ibid.





## Personal Action Checklist

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### Purpose

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If you're serious about protecting the diversity of life on this planet, there are some very tangible actions you can commit to today. The following "Personal Action Checklist" gives you an excellent starting point for living lightly on the earth. Look over the ideas and decide what changes you can make in your own behaviour. Never underestimate the difference that one person can make!



### In the home:

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- Buy recycled paper and you'll save forests – look for the 'EcoLogo' indicating the paper is at least 50% recycled with 10% post-consumer content. A higher post-consumer content is even better!
- Recycle whatever products your blue box program will accept.
- Don't pour used motor oil or chemicals down storm drains – you're polluting local waterways!
- Use biodegradable cleaners – help prevent toxic build-up in lakes, rivers and oceans.

### On the table:

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- Purchase less common fruits and vegetables to encourage farmers to grow a diversity of foods (make an effort to support local farmers at the same time!).
- Buy shade-grown coffee to help protect bird habitat.

- Choose organically grown fruits and veggies – if you currently don't buy anything organic, then start small, by making perhaps 20% of your produce organic, and work up from there.
- Don't buy seafood or fish that comes from depleted stocks or has been harvested by bottom trawling. This includes Atlantic cod, BC shrimp, tiger prawns, Canadian lobster, farmed salmon, bluefin tuna, scallops, and sole.
- Avoid genetically modified foods (GMOs) – they are a threat to biodiversity.

### **In the garden:**

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- Plant some heritage seeds in your garden so that older varieties of plants are not lost.
- Make some room for native species in your backyard.
- Make your garden pesticide free – its healthier for your family and pets, as well as other species.
- Encourage wildlife to make your garden their home or place of refuge – plant thickets and hedges, leave a brush pile, include mossy logs, and create a diverse landscape with varying heights of vegetation. Bird feeders and bird baths are good too!
- Join in the effort to control invasive species – do not plant them in your garden and support efforts to remove them. To find out what the main invasive species in your region are, check out Environment Canada's list at <<http://eqb-dqe.cciw.ca/eman/ecotools/protocols/terrestrial/exotics/append1.htm>>.
- Preserve any wetlands that exist on your property or in your community, because they are a habitat that is quickly disappearing across North America.

### **In your community:**

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- Volunteer for a local habitat restoration program – perhaps reclaiming a marsh or a stream.
- Get involved in a local wildlife monitoring program.

- Support groups that are working to protect endangered species and ecosystems.

**At the political level:**

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- Write a letter to your MP, stating your concern about the loss of biodiversity and asking for stronger legislation for endangered species and protected areas.
- Fight urban sprawl by writing a letter to your local councillor describing the damage that low-density suburbs inflict on the environment.





Once while the sage Choni was walking along a road, he saw a man planting a (carob) tree. Choni asked him, "How many years will it require for this tree to give fruit?" The man answered, "It will require 70 years." Choni asked, "Are you so healthy a man that you expect to live that length of time and eat its fruit?" The man answered, "I found a fruitful world because my ancestors planted for me. So will I do for generations to come."

**Harmony Foundation of Canada** is a charitable organization dedicated to achieving environmental progress through cooperation and education. Harmony's education activities provide the knowledge and skills needed to help people and organizations achieve their environmental goals and improve their practices.

Harmony's innovative programs have been recognized with a **Global 500 Award** (1992) from the United Nations Environment Programme, a **Commonwealth Foundation Fellowship** (1994), and an **Ethics in Action Award** (1998).

Since 1985, Harmony Foundation has:

- Established the *Institute for Environmental Values Education*, which creates educational publications and provides training for educators and community leaders from around the world.
- Developed *Building Sustainable Societies* to encourage, support and promote cooperative community action for the environment. Combining leadership training, the *Community Action Workshop Manual* and a series of issue specific profiles, the program offers the process and content needed to create practical community and school projects.
- Created a series of *Youth Vision* projects providing young people with life and work skills through community service.
- Developed *Green Works*, a ground-breaking training program to assist organizations and communities to develop workplace environmental programs.
- Designed *ECOMMUNITY*, a multi-stakeholder training program to assist communities in the development of a sustainable community plan.
- Provided many learning resources for schools, workplaces, community groups and individuals to encourage improved environmental practices.



Harmony Foundation has created a variety educational publications for educators, youth, home and family, the workplace, and communities, including;

### **ACTION IN YOUR HOME**

**Home & Family Guide: Practical Action for the Environment\***. Practical, room-by-room action tips to protect the environment in home and family activities. 80 pages. 1989.

**Robert Bateman's ecoTIPS**. A booklet on priority environmental issues with renowned naturalist Robert Bateman providing practical tips for home, work, school and in your community. 13 pages. 1996.

**Green Garden Project: Guide to Organic Gardening**. A booklet on organic methods of lawn and garden care. 13 pages. 1998.

### **ACTION IN YOUR WORKPLACE**

**Workplace Guide: Practical Action for the Environment\***. Workbook including 500 specific actions and 24 pages of worksheets to improve workplace environmental practices on energy, hazardous materials, waste, water, transportation, purchasing, property management, education and community relations. Foreword by Hon. Maurice Strong, 176 pages. 1992.

### **ACTION IN YOUR COMMUNITY**

**Community Action Workshop Manual**. An indispensable tool for planning environment and development projects in your community. Provides step-by-step instructions for leading the workshop, analysing issues, identifying local assets and needs, developing an action plan, and more! 132 pages. 2001.

**Green Cities: a Guide for Sustainable Community Development**. A comprehensive guide to sustainable community development with a clear overview, profiles of successful community initiatives and many helpful resources. (in press). Foreword by Hon. Maurice Strong. 2005.

**Climate Change: a Profile for Community Action**. Examines climate change through a clear overview and profiles successful community

initiatives from around the world. Includes many helpful resources. 77 pages. 2001.

**Climate Change: Global Issue/Northern Issue.** A supplement to the Climate Change profile, examines how climate change is affecting the north and successful Northern community initiatives. 12 pages. 2001

**Biodiversity: a Profile for Community Action.** Examines bio-diversity and its decline through a clear overview and profiles successful community initiatives. Includes many helpful resources. 71 pages. 2001.

**Troubled Waters: a Profile for Community Action.** Examines freshwater issues through a clear overview and profiles successful community initiatives. Includes many helpful resources. 78 pages. 2003.

**Strengthening Our Communities: A Guidebook for Community Youth Programs.** Provides practical information on how to organize and coordinate community youth programs, including project partnerships, mentoring programs and community service projects. 48 pages. 1997.

**Discovering Your Community: A Cooperative Process for Planning Sustainability\*.** A comprehensive workbook to help community groups research and plan successful sustainable community development projects. It includes success stories from other communities and worksheets. 58 pages 1994.

**Community Workshops for the Environment\*.** Manual to organize and lead practical environmental action workshops. No waiting around for the environmental "experts" to get your group started on community education and other projects. 60 pages. 1991.

**Climate Change Community Action Workshop Manual.** Comprehensive manual provides information to lead a Community Action Workshop on climate change. Includes clear background information, inspiring community success stories and step-by- step instructions for leading the workshop . 162 pages. 2000.

\*Cette publication est aussi disponible en français.

For an order form and more information please visit  
[www.harmonyfdn.ca](http://www.harmonyfdn.ca)



## **Major Accomplishments of Harmony Foundation**

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### **Environmental Education in Action!**

Harmony Foundation is dedicated to achieving progress through cooperation and education. Harmony's training programs and educational resources encompass environmental values and practical skills for positive action on environment and development issues.

### **PUBLICATIONS AND RESOURCE MATERIALS**

- Home & Family Guide: Practical Action for the Environment / Guide pour la famille et la maison: la protection de l'environnement au quotidien, 1989
- Community Workshops for the Environment / Ateliers communautaires au sujet de l'environnement, 1992
- Positive Action for the Environment & Community Action Projects – video kit, 1992
- Workplace Guide: Practical Action for the Environment / Guide pour le milieu de travail: vers la santé environnementale, 1991
- Discovering Your Community: A Cooperative Process for Planning Sustainability / A la découverte de votre collectivité: un processus coopératif de planification de la pérennité; a step-by-step workbook to help individuals and groups in the research and development of a sustainable plan for their area, 1994
- Strengthening Our Communities: A guidebook for Community Youth Programs, 1997
- Guide to Organic Gardening, 1998
- Climate Change Community Action Workshop Manual, 2000
- Community Action Workshop Manual, 2001

- Climate Change: A Profile for Community Action, 2001
- Biodiversity: A Profile for Community Action, *Autumn 2001*
- Green Cities: a Guide for Sustainable Community Development 2005
- Troubled Waters: A Profile for Community Action, 2002

## **INSTITUTE FOR ENVIRONMENTAL VALUES EDUCATION**

- professional development, education and curriculum resources for school and community educators

## **BUILDING SUSTAINABLE SOCIETIES PROGRAM**

- leadership building programs for educators and community leaders
- tools for community action: Leadership Training Sessions, the *Community Action Workshop Manual* and the Profiles for Action: Water, Climate Change, Bio-diversity and Green Cities

## **YOUTH VISION**

- Innovative Youth Vision community Programs provide young people with job and life skills through community service projects, career development training and a mentorship program

## **GROWING UP GREEN – RESOURCES FOR CHILDREN**

- Growing Up Green: Environmental Action Wheel / La Roue d'action <La croissance verte>, 1993
- Earthworms – Nature's Recyclers: An Integrated Unit for Primary and Junior Students, 1992

## **GREENWORKS**

- training and demonstration programs to improve workplace and community environmental practices
- GreenWorks: Building on success/Pour aller de success, 1993

## **NATIONAL AND INTERNATIONAL COOPERATION**

- Cooperative efforts involving participants from Harmony Foundation's Programs

- Exchange programs involving educators and community leaders from Canada and around the world

## **ENVIRONMENTAL LEADERSHIP**

- We encourage progressive leadership and work to bring together diverse professionals to find cooperative ways to respond to environment and development issues.
- We advise a number of organizations and encourage the efforts of others while promoting Canadian leadership in the global campaign for environmental progress.

## **MAJOR AWARDS**

- Ethics in Action Award, 1998
- United Nations Environment Programme's Global 500 Award for outstanding achievement in environmental protection, 1992 Earth Summit
- Commonwealth Foundation Fellowship, 1994

## **EARTH COUNCIL ALLIANCE**

- Harmony Foundation is a founding member of the Earth Council Alliance, representing like-minded organizations from around the world. [www.earthcouncilalliance.com](http://www.earthcouncilalliance.com)





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