

# ONTARIO'S BIODIVERSITY STRATEGY, 2011

Renewing Our Commitment to *Protecting What Sustains Us*

**DRAFT COPY FOR PUBLIC REVIEW**

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## 1.0 A Message from the Ontario Biodiversity Council

### An invitation from the Ontario Biodiversity Council to review and comment on the draft Ontario's Biodiversity Strategy, 2011: Renewing our Commitment to *Protecting What Sustains Us*

Ontario's Biodiversity Strategy belongs to the people of Ontario, our children, and our grandchildren.

*"Protecting the diversity of life on Earth – of which we humans are an integral part – requires broad societal consensus and participation. It is a challenge not for some of us, but for all of us (OBS, 2005)." [highlight or feature text]*

This Draft Strategy was developed through an inclusive process that invited a wide range of partners and the public to participate. In January 2011, the Ontario Biodiversity Council brought together a diverse group, including environmental, conservation, industry and Aboriginal organizations, as well as government agencies, to discuss how Ontario will build upon and renew Ontario's Biodiversity Strategy, 2005. With their enthusiastic support, Council launched the process of developing the renewed strategy.

Ontario's Biodiversity Strategy belongs to all of us, and the process of renewing it has been open to all. In January 2011, Council posted on its website some early thoughts on what the new OBS should contain, and then invited feedback on those ideas through an online Biodiversity Workbook ([www.ontariobiodiversitycouncil.ca](http://www.ontariobiodiversitycouncil.ca) and <http://obsrenewal.cenet.ca>). The web material included information about the renewal process, comment forms, and biodiversity reference documents from provincial, national and international sources. The many comments received through these sites provided important guidance for Council in drafting a renewed Strategy.

Through January, February and March 2011, Council members also met with a variety of groups that allowed Council to gain a better understanding of specific concepts and issues relevant to biodiversity conservation. Council would like to thank everyone who has participated in this process. Your input has been very constructive and has helped shape this draft OBS, 2011.

Council now invites your feedback on the draft Strategy through this public review and comment period. Your comments will help us in preparing the final document. **Please submit comments by June 1, 2011.** The final version of Ontario's Biodiversity Strategy, 2011 will then be published to the Council website and printed copies will be available.

Developing a renewed biodiversity strategy is, of course, just the beginning. It is our hope that this document will stimulate your interest and engagement in biodiversity conservation. Ontario's Biodiversity Strategy will achieve its goals and realize its vision only if all Ontarians and all sectors of society take responsibility for protecting what sustains us.

50 **Text Box:** Ontario Biodiversity Council

51  
52 The Ontario Biodiversity Council (OBC) is a group of 22 volunteers from  
53 environmental and conservation groups, government, academia, Aboriginal  
54 organizations, and industry. It was formed in 2005 to guide the implementation  
55 of Ontario's first biodiversity strategy.

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57 The Ontario Biodiversity Science Forum (OBSF), Biodiversity Education and  
58 Awareness Network (BEAN), and Stewardship Network of Ontario (SNO) all work  
59 alongside the OBC to implement Ontario's Biodiversity Strategy.  
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62 **2.0 Introduction**

63 Biodiversity is the variety of life on Earth. It includes all living things and the ways they  
64 interact with each other and their environment. All species, including humans, rely on  
65 biodiversity to survive, so it is in our best interest to conserve the abundant variety of  
66 plants and animals, and the ecosystems they inhabit.  
67

68 Biodiversity is the variability among living organisms from all sources, including among  
69 other things, terrestrial, marine and other aquatic ecosystems, and the ecological  
70 complexes of which they are a part; this includes diversity within species, between  
71 species, and of ecosystems (*Convention on Biological Diversity, 1992*).  
72

73 **Text Box:** Biodiversity = Biological Diversity

74 There are different levels of biodiversity: genetic, species, and ecosystem. Each  
75 level is important in its own way. **Genetic diversity** is the variety within the  
76 same species; for example, in humans, our genes determine characteristics like  
77 hair and skin colour. Genetic diversity improves a species' ability to cope with  
78 stresses such as climate change. **Species diversity** refers to all the different  
79 types of species in a region or habitat. There are more than 30,000 species in  
80 Ontario. **Ecosystem diversity** is the variety of different habitats and  
81 communities of plants and animals found in a certain area. Our province has  
82 many different ecosystems, such as tundra, prairies, wetlands, and forests.  
83

84 **2.1 The importance of biodiversity**

85  
86 We depend on biodiversity for the necessities of life. For example, biodiversity provides  
87 us with clean air and water, and with fertile soil to grow the food we eat. Wood, fibre,  
88 and food all come from the natural world. Conserving Ontario's biodiversity is key to  
89 achieving a healthy environment, strong communities and a thriving economy.  
90

The benefits people obtain from biodiversity are called ecosystem services. These benefits can come from species, such as bees that pollinate crops, or from a complex ecosystem, such as a wetland that absorbs carbon and cleans water. Ecosystem services can be provisioning, regulating, supporting, or social/cultural.



## Ecosystem Services

**Text Box:** “Ecosystems provide goods and services that sustain all life on this planet, including human life. If damaged, we cannot fully restore them, no matter how much money we spend”. (Chivian and Bernstein 2008, ‘Sustaining Life - How human health depends on biodiversity’)

Along with providing us with the necessities of life like food and water, biodiversity also fuels our economy. Tourism, fishing, agriculture, forestry and many other industries rely on biodiversity. Ontario’s agricultural sector employs more than 164,000 people; our farm outputs contributed \$22 billion in gross economic stimulus to Ontario in 2009 alone<sup>1</sup>. Ontario’s forestry sector employs more than 200,000 people across the province, with the value of forestry sector products estimated at \$14 billion in 2008<sup>2</sup>.

In the past, nature was not assigned an economic value unless it produced a commodity that was bought and sold in the marketplace. We now have tools to help us understand the value of the additional priceless benefits from nature – its “ecosystem services”. A recent report estimated that Southern Ontario’s ecosystem services provide billions of dollars<sup>3</sup> worth of economic benefits related to water and air purification, storm water

<sup>1</sup> Ontario Federation of Agriculture <http://www.ofa.on.ca/index.php?p=238&a=2321>

<sup>2</sup> [http://www.mndmf.gov.on.ca/forestry/forest\\_industry\\_e.asp](http://www.mndmf.gov.on.ca/forestry/forest_industry_e.asp)

<sup>3</sup> Troy, A. and K. Bagstad. 2009. Estimating Ecosystem Services in Southern Ontario. Ontario Ministry of Natural Resources, Peterborough, ON.

management, and many more. Taking into account the true value of biodiversity in every form will improve our ability to make sound conservation and development decisions that protect these precious services.

Textbox:: *“Our personal health, and the health of our economy and human society, depends on the continuous supply of various ecological services that would be extremely costly or impossible to replace.” (CBD website, 2010)<sup>4</sup>*

Nature also keeps us healthy. Biodiversity promotes good health by breaking down and recycling wastes, providing clean air and water, and creating opportunities for outdoor recreation and exercise. Biodiversity acts as a buffer to protect humans from disease. Changes in biodiversity can affect the risk of infectious disease in plants and animals, including humans. For example, when forests become fragmented into smaller patches, the diversity of forest-dwelling species decreases, allowing populations of the White-footed Mouse to thrive. The White-footed Mouse is a main host for the bacteria that causes Lyme disease, so an increase in White-footed Mouse also increases the chances of humans contracting Lyme disease. This buffering effect provided by biodiversity may also apply to other diseases that can infect humans, such as West Nile disease.

Medical research relies on biodiversity to answer many important questions. For example, the Polar Bear’s unique physiology may hold clues for preventing and treating diseases like osteoporosis, kidney failure, and type II diabetes. Over half of our most commonly prescribed drugs are derived from natural sources, including medicines used to treat infections and cancer. Scientists estimate that we have identified no more than one in ten of all species on Earth<sup>5</sup>. As biodiversity is lost, so is the potential for new discoveries that could save or improve the lives of millions.

**Text Box:** Canada Yew is a coniferous shrub that grows in mature forests around the Great Lakes and in the northeast and central parts of the province. Canada Yew is important for wildlife. White-tailed Deer and Moose eat yew, and songbirds feed on its red false-fruits.

Although highly toxic if eaten by humans, Canada Yew has become highly valued by the pharmaceutical industry for its medicinal qualities. It is currently

<sup>4</sup> <http://www.cbd.int/2010/biodiversity/>

<sup>5</sup> Chivian & Bernstein, ‘Sustaining Life - How human health depends on biodiversity’

being used to produce drugs that fight ovarian, breast, and non-small cell lung cancers.

Biodiversity also feeds our spirits and minds by providing amazing outdoor experiences. With more than 400 Conservation Areas<sup>6</sup> and 330 Provincial Parks, the opportunities to explore and enjoy the wealth of Ontario's nature are immense. It would be almost impossible to put a price on the value of these outdoor experiences. Canoeing in Quetico Provincial Park, fishing and boating on the Great Lakes, or taking a walk along a Greenbelt trail are just a few of the ways we enjoy the natural world that surrounds us.

*The beauty of nature is something many people are enthralled by. There is something within the natural environment which people really connect to, and gives them an immense sense of satisfaction when they experience nature. For some there are cultural or spiritual meanings attached to the landscape, whereas for others it is simply the aesthetic quality of the natural environment which they enjoy so much. (DEFRA – Valuing the benefits of biodiversity 2007)*<sup>7</sup>

Biodiversity also defines who we are as a province and a people. Ontario's residents are and have always been shaped by our natural environment. Think about the iconic images of Ontario such as paintings by the Group of Seven, which capture the stark beauty of our wilderness. First Nations art and culture, such as the Petroglyphs, are defined by a strong connection to nature and Ontario's plants, animals, and environment. Our literature is also influenced by nature. The writings of many early settlers like Susanna Moodie, and modern authors such as Margaret Atwood, draw inspiration and meaning from the environment and the cities, forests, fields, and lakes that make up Ontario.

*"Writing about the natural world around us helps us to better understand how we can take an active role in conserving our precious natural resources, from the water we drink to the plants and animals in our local environments. By going outside and developing a basic knowledge of biodiversity, we can all respond creatively to the need for change in the way we live, work, learn, and grow — especially in relation to our neighbours of other species."*

- Margaret Atwood, on the Get to Know program [www.gettoknow.ca](http://www.gettoknow.ca)

Aside from all of the benefits it brings to our lives, biodiversity deserves to be recognized, appreciated and protected in its own right. Ontario's 30,000 known species live in interconnected ecosystems that have evolved over thousands of years. This is a

<sup>6</sup> Conservation Ontario Fact Sheet ([http://conservation-ontario.on.ca/resources/Fact\\_sheets/CO\\_Fact\\_Sheet\\_Feb\\_2010.pdf](http://conservation-ontario.on.ca/resources/Fact_sheets/CO_Fact_Sheet_Feb_2010.pdf))

<sup>7</sup> <http://www.defra.gov.uk/environment/biodiversity/documents/econ-bene-biodiversity.pdf>



truly amazing wealth of life, from tiny fungi to vast northern forests, and from Piping Plovers to Polar Bears. It's our responsibility, as citizens of usOntario, to conserve the species and spaces that are found in our province, for their own sake, for biodiversity's sake, and for the benefit of future generations.

## **2.2 The global context**

Ontario's Biodiversity Strategy, 2005 complements international and national agreements and initiatives focussed on maintaining the diversity and well-being of life and ecosystems on Earth. Our renewed Strategy continues the linkage to national and international efforts, and aligns with new and emerging biodiversity initiatives within Ontario, elsewhere in Canada and in the global community.

At the national level, Ontario's activities support the Canadian Biodiversity Strategy, developed through the collaboration of federal, provincial and territorial governments in 1995. At the international level, Ontario's activities advance the 1992 UN Convention on Biological Diversity.

In renewing Ontario's Biodiversity Strategy in 2011, effort has been made to align with new and emerging biodiversity initiatives within Ontario, Canada and the global community.

The increasing attention to biodiversity conservation across the world gives us reason to celebrate and remain hopeful that our efforts will achieve results. In 2010, The United Nations recognized the importance of biodiversity by declaring 2010 the International Year of Biodiversity and 2011-2020 the Decade on Biodiversity, raising global awareness and understanding of biodiversity and its connection to human health and well-being. World leaders, G8 ministers and civic officials are recognizing that business as usual is not in the interests of the planet or the species that reside here. Banks, insurance companies, industries and many other sectors are joining the conservation community in identifying biodiversity as the foundation upon which we live healthy, vibrant and secure lives.



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**TIMELINE GRAPHIC** inserted here incorporating key dates:

### **Milestones for Biodiversity Conservation**

1980 *World Conservation Strategy* created

1987 *Our Common Future* report by the World Commission on Environment and Development created (known as the Brundtland Commission)

1991 the World Conservation Union (IUCN), the United Nations Environment Program (UNEP) and the World Wildlife Fund update the 1980 World Conservation Strategy with *Caring for the Earth: a Strategy for Sustainable Living*.

1992 The United Nations (UN) Convention on Biological Diversity was completed at the Earth Summit in Rio de Janeiro, Brazil, in 1992. International agreement commits nations to achieve a significant reduction in the current rate of biodiversity loss by 2010

1992 The World Resources Institute, the IUCN and UNEP sponsored the *Global Diversity Strategy: Guidelines for Action to Save, Study and Use Earth's Biotic Wealth Sustainably and Equitably*, which complements the UN Convention.

1992 Canada was the first industrialized nation to ratify the convention

1995 Canada published the *Canadian Biodiversity Strategy*. Its vision is “a society that lives and develops as part of nature, values the diversity of life, takes no more than can be replenished and leaves to future generations a nurturing and dynamic world, rich in its biodiversity.”

2005 *Protecting what sustains us - Ontario's Biodiversity Strategy, 2005* is released

2008 *Interim Report on Ontario's Biodiversity 2008* is released

2010 United Nations declares International Year of Biodiversity to raise global awareness and understanding of biodiversity.

2010 Canadian Biodiversity: Ecosystems Status and Trends 2010 report released by the Canadian Council of Resource Ministers

2010 The United Nations Convention on Biological Diversity Conference of the Parties agrees on a new global biodiversity strategy for 2011-2020 at Nagoya meeting in Japan (Aichi Targets).

2010 *State of Ontario's Biodiversity 2010* report and *Ontario's Biodiversity Strategy Progress Report 2005 - 2010* released

2011 *Ontario's Biodiversity Strategy, 2011* released

**Text Box:** New international commitment to biodiversity conservation

Under the 1992 Convention on Biological Diversity (CBD), 193 countries work to sustain the diversity and well-being of life and ecosystems on Earth. In 2002, parties to the Convention set a target to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth. In 2010, countries reported that this goal had not been achieved and a new approach was required. At the most recent meeting of the parties to the Convention in October 2010, a new global strategy was established for 2011-2020. This new plan will be the overarching framework on biodiversity under the CBD and also biodiversity-related conventions dealing with wetlands (Ramsar Convention), migratory species, endangered species (Convention on International Trade in Endangered Species, or CITES) and natural and cultural heritage (UNESCO-Man and the Biosphere). This new strategic plan includes the Aichi Biodiversity Targets, which establishes five global strategic goals and 20 biodiversity targets to be achieved by 2015 or 2020.

### **2.3 Renewing the OBS**

Ontario's Biodiversity Strategy, 2011 builds on the positive achievements of Ontario's 2005 strategy and sets out new and updated direction for the next 10 years. The Ontario Biodiversity Council led the renewal process, with support provided by the Ontario Ministry of Natural Resources.

Over the last 6 years, conservation and environmental groups, government departments and agencies, educators and academics, industry associations, landowners, and other parties have worked to implement Ontario's Biodiversity Strategy and achieve its goals. Many of those efforts are documented in the Ontario Biodiversity Council's report *Ontario's Biodiversity Strategy Progress Report, 2005-2010*.

We are also working to improve our knowledge of biodiversity. Council's report, *The State of Ontario's Biodiversity 2010 report*, provides an assessment of the health of biodiversity and conservation efforts in our province. Similar to other reports from around the world, Ontario's report shows that biodiversity is under threat despite increasing conservation efforts.

In Ontario, many people marked the International Year of Biodiversity by getting involved in stewardship activities, sharing their passion of natural history with others, and taking steps to reduce their ecological footprint. The renewed Ontario's Biodiversity Strategy, 2011 confirms Ontario's commitment to maintain course and accelerate our

309 efforts to protect what sustains us. It represents Ontario's response to the new global  
310 strategic plan under the United Nations Convention on Biological Diversity and to  
311 provincial and national reports that show we must do more to conserve biodiversity.

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### 3.0 Ontario's Biodiversity

Ontarians are stewards of more than one million square kilometres of land and water. Our province supports a wide range of ecosystems, from the Carolinian forests in the southernmost part of the province, to the tundra of the Hudson Bay Lowlands in the far north. More than half of the province is forested. There are more than 250,000 lakes, 500,000 kilometres of streams, and large portions of the Great Lakes, representing a significant proportion of the world's freshwater resources.

Our landscape is home to a rich diversity of life. This biodiversity exists at three levels. **Genetic** diversity is the variety of genetic information contained within individuals of a particular species. **Species** diversity is the variety of species. **Ecosystem** diversity is the variety of habitats, ecological communities, and associated ecological processes. The variety at each level (e.g., number of species), the distribution of diversity on the landscape (e.g., corridors connecting habitats) and the interactions between genes, species and ecosystems and their environment are very important.

Genetic diversity is the foundation that underpins biodiversity. Individual genes (segments of DNA molecules) provide the code that enables individual organisms to survive, grow and reproduce. Genes are also the basis for traits that offspring inherit from their parents. Diversity at the genetic level allows species to adapt to environmental stressors such as habitat change, new diseases, and climate change, and persist through time. Populations of most species are genetically adapted to local conditions and climate. Recent Ontario research has shown that using locally-adapted genetic strains in the management of species such as Eastern White Pine and Lake Trout is important. It also shows the importance of maintaining genetically diverse populations of common and widespread species. When a species' genetic diversity is reduced through population declines, isolation from other populations and inbreeding, reduced survival and reproduction can lead to the loss of populations. In some cases, unique genetic resources may be lost forever. Monitoring the genetic diversity of Ontario's species is a huge task, but essential for effective biodiversity conservation. Our knowledge of Ontario's genetic diversity continues to improve, through collaborative research and

monitoring by government agencies, scientists, non-government organizations,  
businesses, and members of the public.

**Text Box: Ontario's Biodiversity – Ours to Discover**

A lot is known about many Ontario species, especially mammals, birds, reptiles, amphibians, fishes, and vascular plants (plants with roots, stems, and leaves). Yet, we still have lots to learn about the majority of species found here, such as beetles, moths and other insects, spiders, and fungi. And new species are still waiting to be discovered, not only in the tropics and oceans, but also here in Ontario. Ecologists and naturalists regularly discover native species that have not been previously documented in Ontario. Recent field work documented several insect and lichen species new to the province and one undescribed species of lichen that is new to science.

Ontario is among the provinces with the highest diversity of species in Canada. There are more than 30,000 species in the province. More than two thirds of these are insects. There are also more than 800 vertebrate species (mammals, birds, reptiles, amphibians, and fishes) and over 5,500 species of plants. New species are discovered each year. Our knowledge of some groups, especially naturally occurring fungi and micro-organisms, is far from complete. Although most of Ontario's native species are secure, some are of conservation concern due to their rarity, or because their populations have declined in response to various threats. Some Ontario species such as Juniper Sedge and Northern Madtom (a small catfish) are globally at risk, so Ontarians have a responsibility to the rest of the world for their conservation. For other, more secure, species such as Muskellunge, Ontario has the majority of the world's populations, so we also have a global conservation responsibility for those species. Most Ontario species consist of many different populations. Breeding between members of adjacent populations can be important to their persistence. Maintaining a healthy distribution of species depends on the existence of healthy local populations.

Ecosystem diversity is the third level of biodiversity. Ecosystems can be very small, like a pond, or very large, like the Hudson Bay Lowlands, which make up about one quarter of Ontario. Ecosystems are characterized by what grows, lives and dies in that space and the interactions of air, water, soil, rock and living organisms. These interactions create important ecosystem processes such as production, decomposition and the cycling of nutrients and energy. Ontario's rich diversity of ecosystems includes a significant portion of the global boreal forest, an expansive forested ecosystem that crosses Canada. Other, smaller ecosystem types are equally important, for example,

tallgrass prairie and savannah habitats in southern and northwestern Ontario, which support unique communities of plants and animals. Impressive coastal dune ecosystems are found on the shores of the Great Lakes, and alvars (flat open limestone barrens with thin soil) occur on Manitoulin Island and several other locations in southern Ontario. Ecosystems are dynamic – constantly changing in response to the interactions of living organisms and the effects of natural forces such as wildfire and flooding.

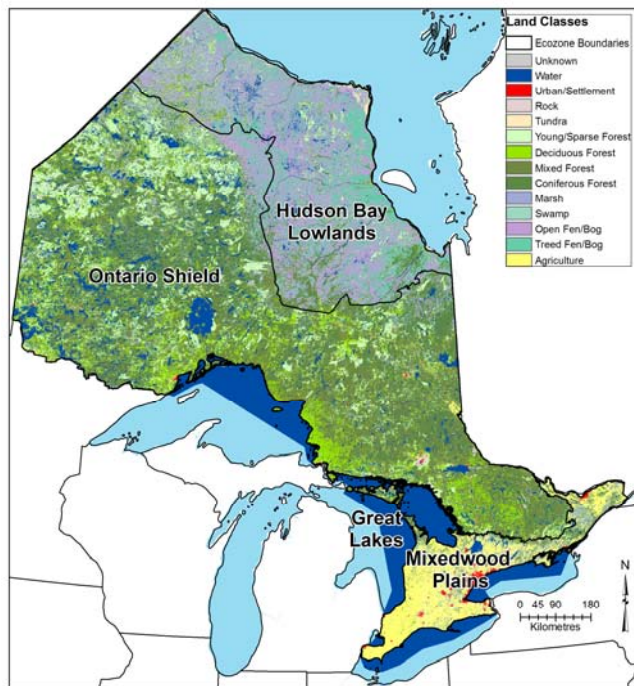
#### **Text Box: Reservoir for the future**

Just over 14,000 years ago, Ontario was deeply buried by glacial ice. As glaciers retreated northward, over time plants and animals colonized from the south. The genetic, species and ecosystem diversity found in Ontario today is the result of this colonization. Loss of biodiversity in regions south of Ontario affects the potential for future colonists. Ontario's rich array of biodiversity provides resilience and is an important reservoir for coping with future stresses such as climate change.

### **3.1 Ontario's Ecozones**

Ontario can be divided into four ecozones, based on ecology, climate, and topography, and each is shared with other provinces and U.S. states. The following broad overview of each of Ontario's four ecozones is summarized from information contained in the State of Ontario's Biodiversity 2010 report (OBC 2010).

**Text Box:** What is an ecozone? It is an area of the Earth's surface that represents a large ecological zone with characteristic landforms and climate. Ecozones can be distinguished from one another by their plant and animal species, climate, landforms, and human activities.



## Ontario's Ecozones

The **Hudson Bay Lowlands** is the northernmost ecozone in Ontario and covers 23% of the province. The area is mostly wetlands, but also supports boreal and sub-arctic forests, tundra, tidal marshes and numerous rivers and lakes. Its extensive wetlands provide essential migratory and breeding habitats for birds such as Snow Geese. Along with providing valuable habitat, the wetlands act as carbon 'sinks', storing large amounts of carbon. Polar Bear, Lake Sturgeon, Gray Wolf, Woodland Caribou, and Wolverine all live in the Hudson Bay Lowlands. Only about 0.03% of Ontario's population (4,275 people in 2006) live in this ecozone and most of the landscape is undeveloped. Major human activities in this region include fishing, hunting and trapping. Mining, forestry, and hydroelectric development also occur in this ecozone and could increase in the future.

The **Ontario Shield** is Ontario's largest ecozone and covers 61% of the province. About 68% of the ecozone is forested. Lakes, ponds, and wetlands cover almost 23% of this area. This ecozone's varied topography supports a large variety of ecosystems and species, including Moose, American Black Bear, Beaver, and Ring-necked Duck. Coniferous forests composed of Black Spruce, Balsam Fir, Jack Pine, and Tamarack



dominate in the north. In the south, mixed forests and deciduous forests of tolerant hardwoods (e.g., Sugar Maple and American Beech) are more frequent. About 8% of Ontario's population (943,313 people in 2006) live in this region. Mining, logging, fishing, trapping, hunting and camping are major activities in this region.

The **Mixedwood Plains** is Ontario's smallest ecozone. It makes up 8% of the province but is home to about 35% of Canada's population and 92% of Ontario's population. Its rich soils, moderate climate, and central location made this area ideal for settlement. In the past few hundred years, the Mixedwood Plains Ecozone has been changed from forests, wetlands, prairies, and alvars to a landscape dominated by agriculture and settlement. Despite these changes, this ecozone is still Canada's most biologically diverse area with species such as Sugar Maple, Fowler's Toad, Fisher, and White-tailed Deer. The Carolinian Zone (the most southerly portion of this ecozone) has many species found nowhere else in Canada. In addition to high population density, the Mixedwood Plains has a high concentration of industry agriculture, and generates more than 25% of Canada's agricultural production including many fruits, vegetables and products not grown elsewhere in Canada.

The **Great Lakes** Ecozone contains 18% of the world's supply of surface freshwater and is made up of five large lakes and their connecting waterways. Parts of four of these lakes are in Ontario and are shared with the United States; the exception is Lake Michigan, which is wholly contained within the United States. The Great Lakes region was shaped by glaciers more than 10,000 years ago. Each lake reflects that history differently, with coastal areas that are variously composed of bedrock, cobble beaches, sand dunes, or alvars. The Ontario portion of the Great Lakes makes up 8% of the province. This ecozone supplies 85% of Ontario's drinking water, and includes cold deepwater habitats, shallower nearshore habitats, islands, and coastal wetlands. Transportation, fishing and cottaging are major human activities on the Great Lakes, and most of the province's major industries are located on or near their shores. There are 49 ports on the Ontario portion of the Great Lakes shoreline, through which millions of tonnes of cargo are shipped each year. The Great Lakes are one of the most ecologically diverse regions in North America, but the biodiversity of this ecozone has been adversely affected by the area's high population and associated industries.

**Text Box: Urban Biodiversity**

Ontario's cities, towns, and other urban areas are important but often overlooked for their biodiversity. Many cities contain a richness of habitat types and support a wide diversity of resident species. They are also important stopover places for migratory songbirds and butterflies. In addition, urban biodiversity provides important ecosystem services: For example, our city trees act as natural air conditioners, helping to cool our neighbourhoods in the summer; urban creeks and rivers absorb heavy rains and prevent flooding; and, parks and other natural habitats provide recreational spaces that improve our physical and emotional health and well-being. Many cities now view biodiversity as an essential element of community infrastructure and are taking action to ensure that urban biodiversity is protected and maintained.

## 4.0 Threats

Natural ecosystems are dynamic and resilient, continually evolving in response to a variety of forces and factors. But they are limited in their ability to adapt to rapid change, such as that introduced through human activities. Humans disrupt and degrade biodiversity in six basic ways: habitat loss, introduction of invasive species, population growth, pollution, overharvesting, and climate change. Our growing population and our increasing levels of resource consumption drive these threats to biodiversity. Recently, an assessment of pressures on Ontario's biodiversity showed that many threats are increasing (OBC 2010).

### 4.1 Habitat Loss

Species are greatly affected by habitat loss, alteration and fragmentation. Genetic diversity can be lost as populations are isolated from each other by habitat fragmentation, which occurs when a continuous area of habitat is split into smaller disconnected patches. Habitat loss is serious in southern Ontario, where urbanization, agriculture and road density are greatest, and yet where some of the province's rarest biodiversity is also found, such as alvars and tallgrass prairies. Resource extraction (e.g., forestry and mining), hydro-electric power development, and roads and bridges can impact biodiversity through habitat changes and degradation of local water bodies. In addition, intensive recreational activities can destroy local vegetation, pollute waterways, and disturb wildlife. The cumulative impact of a series of seemingly small habitat losses can be significant.

The degradation and loss of habitat is currently the greatest threat to Ontario's species and ecosystems.

#### **Text Box:** Pollinators

Most of the world's flowering plants require pollination - when an animal transfers pollen from one plant to another. Bees, wasps, butterflies, moths,

birds and bats are all pollinators. About 35% of the world's food supply is made up of crops that require pollination. Scientists have noticed that pollinating species are in decline around the world. For example, in North America, the Honey Bee is in decline because of parasitic mites and colony collapse disorder – a poorly understood occurrence when an entire colony of bees is lost. Other causes of pollinator decline in Ontario could be the result of habitat loss and fragmentation, introduced pathogens and parasites, pesticides, and climate change (NRC 2007).

## **4.2 Invasive Alien Species**

Alien species are plants, animals, and micro-organisms that have been accidentally or deliberately introduced into habitats outside their normal range. Invasive species are harmful alien species whose introduction or spread threatens the environment, the economy, and society, including human health. Invasive species originate from other continents, adjacent countries or from other ecosystems within Ontario and Canada.

Without the predators and competition found in their natural habitats, invasive species can quickly reproduce and spread. They can infest, damage, displace or destroy native species and ecosystems (e.g., Emerald Ash Borer), agricultural crops (e.g., Plum Pox Virus), wetlands (e.g., Purple Loosestrife) and lakes and rivers (e.g., Zebra Mussel), inflicting significant ecological and economic damage. Once established, they are extremely difficult and expensive to control, and usually impossible to eradicate.

There are more than 1,000 alien plant species in Ontario. In 2009, there were 186 aquatic alien species present in the Great Lakes. Although the rate of Great Lakes invasions increased from the 1940s to 2000, the invasion rate appears to have declined over the last decade (OBC 2010).

## **4.3 Population Growth**

Our growing human population is one of the main pressures on Ontario's biodiversity. Ontario's population (estimated at 13.1 million in July 2009) is expected to increase by 4.8 million between 2009 and 2036 (OMOF 2010). Most of this population growth will occur in southern Ontario increasing pressures on ,

where the biodiversity of the Mixedwood Plains Ecozone is already under significant stress. As the population grows, more prime agricultural land and natural habitats will be converted to urban areas along . Poorly planned development can result in urban sprawl, and with it a continually increasing network of roads and the destruction or fragmentation of natural habitat. Population growth increases our total emissions of greenhouse gases and pollutants, and our consumption of natural resources. Ontario's residents are placing high demands on our natural resources. Without hard work to reduce pressures, both individually and collectively, Ontario's growing population will continue to erode the province's biodiversity.

#### **4.4 Pollution**

We contaminate ecosystems with chemicals extracted from the Earth's crust (such as heavy metals and fossil fuels) and with manufactured compounds, including chemicals such as hormone disrupting substances, polychlorinated biphenyls (PCBs), dioxins, ozone depleting chemicals, and many more not naturally found in nature.

Pollution is emitted to air (e.g., sulphur and nitrogen oxides, particulate matter), soil (e.g., pesticides and heavy metals), and water (e.g., nitrates and phosphates). There are tens of thousands of pollutants circulating through the Earth's ecosystems, and many of them causing significant, large-scale impacts, such as those caused by acid rain on boreal and deciduous forests and associated aquatic ecosystems.

Pollution can also disrupt ecological processes. Manufactured chemicals and other pollutants contribute to a variety of health issues in people and wildlife, including cancer, birth defects, behavioural changes, and chronic illness. Synthetic chemicals that block, mimic or interfere with natural hormone production (known as endocrine disruptors) can cause abnormalities in reproduction, growth, and development, particularly in fish and amphibians. Some chemicals deplete the ozone layer, which allows increased ultraviolet (UV) radiation to reach the Earth. UV rays can be especially damaging to ecosystems

in the early spring, when vegetation is young and fish and frogs lay their eggs in shallow water. Human health (e.g., skin cancer) and some food crops are also vulnerable to increased UV radiation. Our urban and industrial development has also increased the amount of light falling on ecosystems, even at night. There is also a growing concern about this light pollution and its impacts on biodiversity, for instance through disorientation of migrating birds, changes in amphibian behaviour, and disruptions in plant dormancy.

While the levels of many contaminants have decreased in Ontario, the deposition of nutrients, metals and other substances remains a concern for many of the province's ecosystems. Ground-level ozone levels in the southern portion of the province continue to rise, posing a risk to human health and vegetation communities that are fundamental to the province's biodiversity (OBC 2010).

#### **4.5 Overharvesting**

Overharvesting occurs when we use natural resources at a rate that cannot be sustained over the long term. Such unsustainable use can affect genetic diversity, local populations and ecosystems, and, in turn, our economy and society. Unregulated and widespread overharvest was historically a major threat to several species in Ontario. Today, the development of management programs, the regulation of harvests through education and effective enforcement, and a commitment to conservation among fishing, hunting and trapping communities, have led to a more sustainable harvest of fish and wildlife species. The legislative and policy framework for the management of Crown forests also ensures the sustainable harvest of Crown forest resources.

Despite the success of programs to manage harvest, the unregulated, unsustainable, and/or illegal harvest of some species remains a concern. Outside of protected areas, the harvest of most Ontario plant species is not regulated. Overharvest of American Ginseng, a plant used for medicinal purposes, is identified as one of the main threats to this endangered species. American Ginseng is now protected under Ontario's *Endangered Species Act, 2007*. Several of Ontario's protected reptile species are harvested illegally for the pet trade. Although this may not be a widespread problem, the combined

effects of illegal harvest and other stressors (e.g., habitat loss, road mortality) take their toll on these species.

## **4.6 Climate Change**

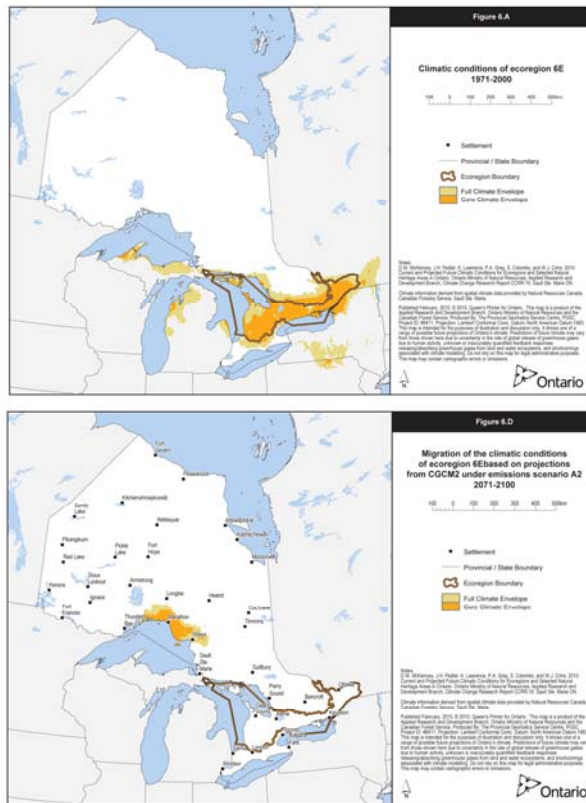
Climate change is an increasingly important factor in biodiversity conservation. It threatens the ecosystem compositions we associate with Ontario land and waterscapes, because individual species vary in their ability to disperse or adapt to a changing climate. Climate change may also increase the viability of certain pest species, and increase the spread of invasive species. It will also affect the way species interact. For example, earlier flowering times could mean that flowers bloom before pollinating insects have emerged. As a result, ecosystem functions may be impaired, and threats to the survival of certain species may emerge.

Recent work by the Canadian Forest Service and MNR (McKenney et al. 2010) illustrates the strong likelihood that climate conditions associated with each ecoregion will move northward faster than species and ecosystems can cope. Because these changes are happening faster than species can migrate (particularly trees and other plants), and the added complication of natural barriers to dispersal, there is an uncertain future for the province's biodiversity.

Climate-related changes have already been seen in the distributions of many Ontario species, and ice cover has been reduced on the Great Lakes and some inland waterbodies. Declining body condition and survival of Ontario's Polar Bear population have been associated with reduced ice cover in Hudson and James Bays.

Climate change models based on moderate greenhouse gas reductions suggest that Ontario's average annual air temperature will increase by 2.5 to 3.7 degrees Celsius by 2050 over 1961-1990 levels. Increases will be greatest in the north.





Projected changes in climatic conditions found in ecoregion 6E (top – climatic conditions 1971 - 2000, bottom – movement of climatic conditions projected for 2071 – 2100).

### **Text Box:** Climate Change and Biodiversity

The relationship between biodiversity and climate change runs in two directions. While climate change is a serious threat to Ontario's biodiversity, conservation of biodiversity can play an important role in mitigating climate change (reducing greenhouse gas concentrations) and in adapting to climate change (tolerating or coping with impacts). For example, ecosystems such as forest and wetlands are important carbon sinks that help reduce greenhouse gas concentrations. The maintenance or restoration of corridors and intact natural habitats, as well as the maintenance of genetically diverse populations, will provide the opportunity for some native species to adjust their distribution as the climate conditions of ecoregions move northward. The conservation of protected areas and other natural habitats that favour high biodiversity is especially important in this regard. Although efforts are required for climate change mitigation and adaptation, adaptation efforts probably have a stronger relevance to biodiversity conservation as the impacts of climate change are already being seen.

## **4.7 Cumulative Impacts of Threats**

Pressures on Ontario's biodiversity are often treated as if they act in isolation. In reality, Ontario's species and ecosystems usually face several threats at the same time. This can include multiple instances of the same type of threat (e.g., numerous water withdrawals over a watershed), or different threats acting on the same system (e.g., fragmentation of forest habitat combined with the invasion of alien plant species). When combined, these threats to biodiversity have a much greater negative affect than they do on their own. Multiple threats impact both aquatic and terrestrial ecosystems and can result in a slower recovery time following disturbance.

The broad range of threats to biodiversity requires an integrated, adaptive conservation approach that involves all sectors of society. The loss or degradation of biodiversity not only affects ecosystem function, but also damages society's ability to generate wealth and support livelihoods. Each Ontarian, each business, and each agency therefore has a role to play in biodiversity conservation.

## 5.0 Challenges to Conserving Ontario's Biodiversity

There are several challenges to conserving Ontario's biodiversity. These challenges are not specifically identified as threats in the previous section, but to a large extent they are the overarching drivers that erode Ontario's biodiversity. By confronting these challenges head on, opportunities will be created to conserve the natural capital that sustains us.

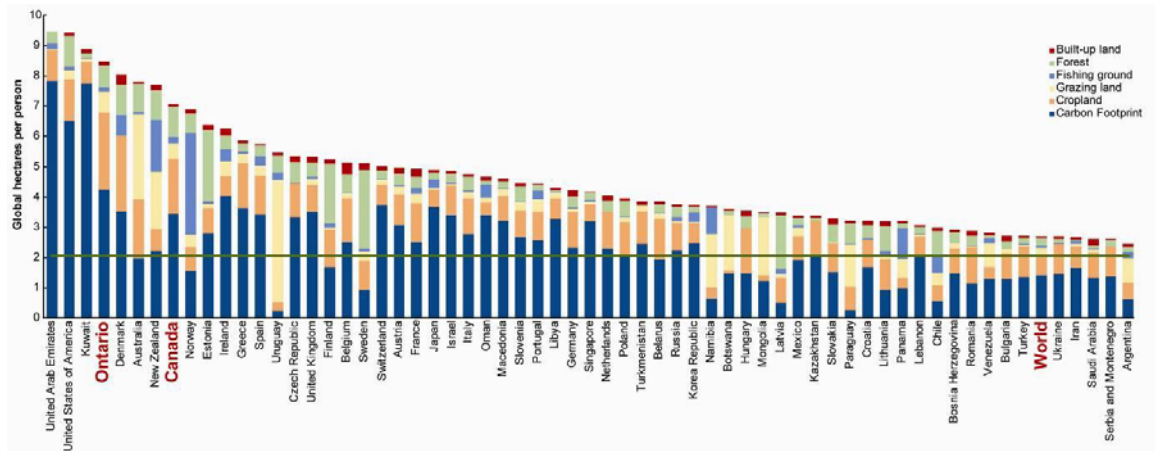
### 5.1 Consumption Patterns

Ontario residents place very high demands on the planet's resources. A recent analysis showed that the average per person consumption of natural resources (as measured by the Ecological Footprint) in Ontario is very high. We currently consume natural resources at a rate four times higher than the global average and are at the limit of our province's biocapacity. Ontario's large and growing human population coupled with a high Ecological Footprint is a major impediment to the conservation of Ontario's biodiversity. To reduce negative impacts on biodiversity, we need to individually and collectively limit our Ecological Footprint through reducing consumption and waste generation.

#### **Text Box:** Ontario's Ecological Footprint

The Ecological Footprint is a way to measure humanity's demand for natural resources, and reveals whether our collective consumption levels are approaching or exceeding the Earth's ecological limits. It is divided into two parts. The Ecological Footprint of consumption measures human demand for resources based on a given population's total consumption of goods and services (e.g., food, housing, transportation). It is measured in standard units of productive land known as global hectares (gha). The Ecological Footprint is directly compared to a region's biocapacity, which captures the extent and productivity of key ecosystems that support human populations, in terms of the products these ecosystems provide on a sustainable basis, including food, fibre, timber and the capacity to absorb carbon dioxide emissions.

On a per person basis, Ontario residents are among the global populations placing the highest demand on the planet's resources. In 2005, the average Ecological Footprint in Ontario was 8.5 gha per person. Ontario's Ecological Footprint is exceeded only by the United Arab Emirates, the United States, and Kuwait. It is also considerably higher than the average Canadian Ecological Footprint of 7.1 gha.



Ontario's Ecological Footprint compared to the Ecological Footprints of a selection of countries with available data, 2005 (source: Stechbart and Wilson 2010)

## 5.2 Valuing Biodiversity

Development in Ontario has been largely based on a model of economic growth, without consideration of the accompanying ecological costs. We measure our collective success primarily by economic indicators such as the Gross Domestic Product (GDP). Although a strong business case can be made to live within the means of nature – because healthy ecosystems sustain healthy people and a healthy economy – as a society we do not incorporate nature into the balance sheet of countries, companies and/or communities. Our economic measures focus on income without consideration of the state of the natural capital that supports our communities and economy. As a result, biodiversity losses are not accounted for as a decrease in economic wealth. Many countries, companies and communities are now realizing the value of the ecosystem services that are provided by healthy natural systems. For example, research has shown that the ecosystems services arising from biodiversity (such as pollination, water storage and purification) in southern Ontario alone are worth many billions of dollars that are otherwise missing from the balance sheets that inform our decisions. The conservation of biodiversity in the province will be greatly strengthened when these true values are incorporated into everyday decision-making by governments, business and communities. Incentive programs that reward biodiversity conservation efforts will also be helpful in this regard.

### **5.3 Investment of Resources and Funding**

Efforts to protect and restore Ontario's biodiversity have increased over the last decade. This is due to the greater involvement of citizens in private-land stewardship programs, as well as some small increases in government funding. Unfortunately, this increase in conservation efforts has not been sufficient to prevent the continued loss of the province's biodiversity (OBC 2010). Currently, funding of the three provincial ministries with biodiversity as part of their mandates is about 2% of the provincial budget – less than 0.5% of the provincial GDP. Given the economic value of biodiversity and its importance in supporting the health of Ontario's communities and economy, government and non-government sectors need to allocate greater resources to protect, maintain, restore, and monitor biodiversity. It is in our own best interest.

### **5.4 Understanding**

Most citizens agree that protecting the environment and conserving natural resources are good things to do. Why, then, do our actions continue to impact biodiversity and the life support systems it provides? We need to understand the linkage between our everyday actions and decisions, their collective impacts on our natural world, and how these affect our health, our communities and our economy. We need to realize that biodiversity conservation is in our own best interest – and that of our children and grandchildren.

Our knowledge of the state of genetic, species, and ecosystem diversity, and the complex interactions and processes they embody, is far from complete. A recent assessment of the state of Ontario's biodiversity (OBC 2010) identified several important knowledge gaps that need to be addressed. These include the need for new monitoring programs, updating of stale information, analysis of existing data sets, and research programs to address important biodiversity questions. We must improve our understanding of the factors that motivate individuals and organizations to positively contribute to biodiversity conservation. Our efforts to conserve biodiversity require this important information. Expanding our knowledge base will require additional investment and collaboration. Sharing and improving access to this information is equally important. At the same time,

the precautionary approach needs to be incorporated into decision making when there are threats to biodiversity, but a lack of scientific certainty.

## **5.5 Collaboration**

Many Ontario public and private agencies, organizations, and institutions are involved in biodiversity conservation. While the overall goals of these groups may be similar, they do not always work in concert. Increased collaboration ensures that the limited resources available for biodiversity conservation are used most effectively. In some cases, the activities, policies and programs of certain sectors may inadvertently be harmful to biodiversity. This Strategy encourages all sectors to examine their own activities and build implementation plans to reduce the ecological impacts of their operations. It also encourages cooperation across agencies, sectors and jurisdictions, including the identification of new opportunities and new partners for collaboration. Biodiversity is not only an environmental issue – it also relates directly to human health and the health of our communities and economy.

## 6.0 Opportunities

While there are serious threats and challenges to biodiversity conservation in Ontario, there are also opportunities to identify and implement solutions. Efforts to reduce risks and conserve biodiversity have increased since the original OBS was prepared in 2005. The opportunities described below are presented as starting points or foundational elements for achieving the goals of this Strategy and, in particular, placing biodiversity on the public agenda. They are not a comprehensive listing, but include some examples of important actions or achievements on which we can build.

### 6.1 Ontarians care

Ontarians care about the environment, and many participate in efforts to conserve biodiversity. Biodiversity may not be a household term, but we know that people care about clean air and water, wildlife and parks. People are concerned about the smog that blankets not only our large cities, but also blows northward, affecting lands, waters and communities far from the sources of pollution. There is a growing appreciation of the importance of protecting our water supply. Ontario households participate actively in 3Rs (reduce, reuse and recycle) programs to try to control our production of garbage. Issues like climate change have captured considerable public attention in recent years. There is a growing appetite among consumers to purchase locally grown Ontario agricultural products. We can build on this environmental concern and commitment to support biodiversity conservation and the goals of this Strategy. Ontario has many organizations dedicated to environmental and conservation issues, and there is also a strong network of individuals and organizations implementing stewardship projects to conserve Ontario's biodiversity.

#### **Text Box:** Stewardship

Ontarians have shown a strong commitment to conserving biodiversity by participating in a variety of stewardship activities. Between 2006 and 2008 more than 33,000 Ontarians volunteered each year on biodiversity conservation projects. Activities range from protecting bird habitat to supporting on-farm environmental projects through the Canada-Ontario Environmental Farm Plan. Landowners actively participate in government programs such as the *Managed Forest Tax Incentive Program (MFTIP)*, which by 2008 had over 11,000 participating properties covering 728,434 hectares. Stewardship is a growing trend in Ontario, as more and more people take an interest in the environment



and protecting Ontario's biodiversity. Engagement through stewardship remains critical in ensuring the success of Ontario's Biodiversity Strategy.

## **6.2 A Solid Foundation**

Ontario has a strong foundation of legislation and policy on which to build actions to protect biodiversity and sustainably use biological assets. Ontario's current legislative and policy framework supports biodiversity conservation on numerous fronts, including sustainable forest management on Crown lands, clean air and water, local planning, private land stewardship, and environmental assessment.

This framework has been strengthened considerably since the 2005 OBS through a number of new laws and policies, including the *Endangered Species Act, 2007*, the *Provincial Parks and Conservation Reserves Act*, the *Greenbelt Act*, the *Clean Water Act*, the *Places to Grow Act*, and Ontario's Action Plan on Climate Change. This is a powerful foundation on which Ontarians can build as we move forward with the implementation of this Strategy.

## **6.3 The Ontario Biodiversity Council**

The formation of the Ontario Biodiversity Council and its working groups was a major step in coordinating our efforts to conserve biodiversity in Ontario. In addition to guiding implementation activities for the OBS, Council has produced reports on the state of Ontario's biodiversity (interim report in 2008, full report in 2010) and on progress in implementing the OBS (2010). Council continues to provide an established forum in which a wide range of stakeholders can come together to discuss biodiversity conservation strategies – an important advantage in implementing a renewed OBS. In future, changes to Council and its working groups may occur to maximize effectiveness in guiding implementation of the renewed Strategy.

## **6.4 A Legacy for the Future**

Ontario has a wealth of natural capital. Despite documented biodiversity losses, particularly in southern Ontario, more than 90% of the province has natural cover in the form of forests, wetlands, lakes and streams, and there are still intact, self-sustaining ecosystems populated with a variety of native species. Compared to many other places

Ontario's Biodiversity Strategy, 2011 – May 4 – Draft for Public Review

on Earth, we are fortunate to have so much natural capital remaining. It provides a strong basis for ecosystem restoration and reconnecting habitats that have been fragmented by human activity. Globally, the cumulative and increasing impacts of multiple threats, including climate change, have made biodiversity conservation an urgent priority. We are at a critical point in Ontario if we are going to keep what we have. But this challenge is also an opportunity – to take action now and over the near term to make sure that we will be able to pass Ontario’s immense natural wealth on to our children and grandchildren.

## **7.0 Ontario’s Biodiversity Strategy**

### **7.1 Vision**

*Our vision is a future where biodiversity loss is halted and recovery is advanced. People value, protect and enhance biodiversity and the ecosystem services essential for human health and well-being.*

We seek a future where:

- Together, we have halted biodiversity loss and advanced recovery. In key areas under threat from human development, we have restored ecological integrity and brought endangered species back to self-sustaining levels.
- All Ontarians recognize that we must live within nature’s means – that the Earth does not have an endless capacity to tolerate and absorb the impacts of human activity. We place a high value on our natural heritage and the many benefits that it provides. We are determined to pass our rich natural heritage on to future generations.
- Sustainable living is a priority and regarded as a responsibility by all sectors of society – government, business and industry, communities, institutions and organizations, and individual Ontarians.

- Ontario has a sustainable economy in which human needs are met, but human consumption and production do not deplete biodiversity. Ecological assets are included in our indicators of environmental, social, cultural and economic well-being.
- The health of species, including humans, and ecosystems has improved. We have removed some of the most harmful substances that were systematically accumulating in nature, and we have reduced pollutants in our water, air and land.
- Urban sprawl has been contained, farmland is no longer being lost in southern Ontario, and our communities are healthy.
- Ontario's successful biodiversity strategy is part of a strong global effort to protect biodiversity and ensure sustainable use of biological assets.

This kind of fundamental change will not happen unless we can capture the imagination and inspire the commitment of all people. Attitudes and behaviours over must change if Ontario's biodiversity is to be conserved. This Strategy is meant to continue to stimulate interest, involvement, and action.

## 7.2 Goals

Three goals define the conservation path proposed in this Strategy:

Goal 1: Mainstream biodiversity – incorporate biodiversity considerations into decision-making across the province, in different sectors, and in our homes, workplaces, and schools.

Goal 2: Protect, restore and recover Ontario's genetic, species, and ecosystem diversity and related ecosystem functions and processes.

Goal 3: Use Ontario's biological assets sustainably.

Our goals will not be achieved quickly or easily. There are many threats and obstacles in our path, as well as opportunities. This Strategy sets out long-term direction and practical steps that can be achieved, measured, and reported on in the next 5-10 years. Where possible, it identifies groups who can lead the effort to develop solutions.

**Text Box:** What is 'Mainstreaming'?

'Mainstreaming' biodiversity means that the word biodiversity is a household term and we all talk about it. Mainstreaming means that we instinctively consider impacts on biodiversity in everything we do, from the purchases we make in the grocery store to the flowers we plant in our gardens and the decisions made in managing our businesses or providing services in our communities. The consideration of biodiversity needs to be part of our decision-making in all of our activities and throughout society. Biodiversity is life and deserves to be considered and protected in everything we do and every decision we make.

### 7.3 Principles

This Strategy is guided by core principles that build on the Canadian Biodiversity Strategy (1995) and Ontario's Biodiversity Strategy, 2005. They establish important concepts, values and approaches, and form the basis for the Strategy and its implementation.

Ecological Principles - To protect biodiversity we must understand and apply key ecological concepts such as:

- All life forms, including humans, are connected
- Maintaining the integrity, dynamics and resiliency of natural systems is critical to their functioning
- Habitat connectivity is essential at local, regional and wider scales
- Biodiversity is best conserved in natural habitats at all levels: genetic, species, and ecosystem

Societal Principles – To help mainstream biodiversity, people must understand and believe that:

- Biodiversity has ecological, economic, social, cultural and intrinsic value
- We each depend on biodiversity and have a responsibility to contribute to its stewardship
- We must understand and appreciate the value of biodiversity and get involved in making decisions about the use of our air, water, land, and other resources

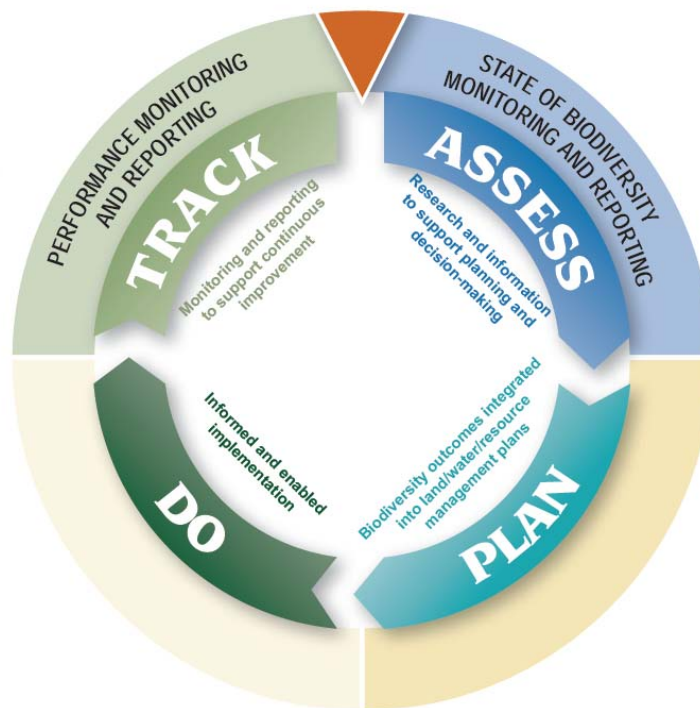
Management Principles – The conservation and sustainable use of biodiversity requires:

- An ecosystem approach for the integrated management of land, water, and living resources
- Maintenance of biodiversity as the first priority in conservation initiatives, because it is much more cost effective and less risky than recovery and restoration activities
- A risk-based approach, adaptive management and long-term monitoring of ecosystem health and function, given the complex and dynamic nature of ecosystems and the uncertainty about future climate

- Support, involvement, knowledge, innovations and practices of Aboriginal and local communities
- Development decisions that integrate ecological, economic, social, and cultural values, within the broader context of conserving biological diversity
- Cooperation and sharing of knowledge among governments and organizations at all levels
- Applying the 'precautionary approach'

**Text Box: Adaptive Management**

Adaptive management focuses on learning and adapting as our knowledge base improves, through partnerships of managers, scientists and other stakeholders who learn together how to maintain and enhance sustainable ecosystems. Adaptive management helps to maintain flexibility in decisions, so that we can respond appropriately to continuously changing environmental conditions and human systems. Adaptive management helps to improve our understanding of ecological systems, social factors and management tools to achieve our goals.



Adaptive Management Framework (CBS)

## 7.4 A Framework for Action

Ontario's Biodiversity Strategy is based on working together – within and across communities, organizations, and sectors – to achieve mutually beneficial goals and outcomes for biodiversity. The challenge is to coordinate our efforts so that we can achieve greater success in a more efficient and effective manner.

The purpose of this Strategy is to provide guidance and a common focus for biodiversity conservation in Ontario. It aims to build on the good work already occurring, raise awareness of biodiversity values, facilitate the coordination of effort through synergies and partnerships, and support and encourage the efforts of communities and individuals to conserve Ontario's biodiversity.

This framework has four strategic directions that reflect the critical components required to conserve Ontario's biodiversity:

- Engage People
- Reduce Threats
- Enhance Resilience
- Improve Knowledge

Each of the strategic directions is supported by long-term objectives and outcomes, to focus for our efforts, provide aspirations for achievement, and establish a flexible framework through which all sectors can plan their biodiversity conservation activities.

This Strategy also identifies the key actions needed to conserve Ontario's biodiversity. Each action relates to one or more specific objectives and outcomes and contributes to achieving the Strategy's vision and goals. This is not an exhaustive list; the actions that are taken will depend on provincial, regional and local priorities, availability of funding, and opportunities to build on local experience and capacity. Council acknowledges that more specific actions may be required to address local or regional conservation priorities.



This Strategy also identifies broad roles and responsibilities for groups involved in implementing the Strategy. These groups include all levels of government (federal, provincial, municipal, agencies), non-government organizations, sectors including business, health, education and science, the public, and the Ontario Biodiversity Council and its three working groups ( Biodiversity Education and Awareness Network, Stewardship Network of Ontario and Ontario Biodiversity Science Forum).

The success of this Strategy will be tracked through 15 specific targets representing key areas of focus for biodiversity conservation in Ontario. We have chosen to monitor and assess progress over a 10-year timeframe to encourage ambitious actions that are planned and coordinated across sectors – actions that ultimately will lead to significant improvements in the state of Ontario's biodiversity.

## **7.5 Engage People**

Individually and collectively, our decisions and actions are crucial to the conservation of biodiversity in Ontario. We are not currently doing enough to halt the decline of Ontario's biodiversity. To succeed in this Strategy, our attitudes and behaviours must change, so that we value biodiversity appropriately and include it in our everyday decision-making. This strategic direction therefore includes ways to improve biodiversity education active participation in biodiversity conservation through volunteerism and stewardship activities, and the integration of biodiversity values into all sectors through effective policies, programs, and legislation.

### **Objective: Inspire and empower people to value and protect biodiversity**

#### **Outcomes: What do we want to achieve?**

- All people learn about biodiversity through integrated and experiential education approaches
- People value biodiversity and understand its importance to human health and well-being
- The capacity of the public, voluntary sector and landowners to contribute to biodiversity conservation through stewardship is enhanced

- People, individually and collaboratively, are investing and actively participating in biodiversity conservation and stewardship

**Objective: Mainstream biodiversity across all sectors**

**Outcomes: What do we want to achieve?**

- Ontario has a strong foundation of policy and legislation to conserve biodiversity
- Responsibility for the conservation of biodiversity is fully recognized and accepted by all

Key Actions	Lead Responsibility	Support
1. Continue to integrate biodiversity education into all levels and all types of curriculum	Provincial government; education sector	Biodiversity Education and Awareness Network, non-government organizations
2. Develop and implement a Children's Outdoor Bill of Rights	Provincial government	All sectors
3. Employ strategies to effectively communicate the relevance of biodiversity to the public	All sectors	Ontario Biodiversity Council and working groups
4. Develop a strong network of partners engaged in further understanding the linkages between biodiversity and human health and well-being	All governments, health sector	Non-government organizations
5. Develop and provide decision-making tools for effective biodiversity conservation	All governments, Canadian Business and Biodiversity Council	Ontario Biodiversity Council and working groups
6. Develop implementation plans to incorporate biodiversity values in the government and businesses sectors	All governments, business sector	Ontario Biodiversity Council, Canadian Business and Biodiversity Council
7. Review and enhance the legislative framework for biodiversity conservation and sustainability in Ontario	Provincial government	All sectors
8. Integrate the economic value of biodiversity and ecosystem services into decision-making	All sectors	
9. Investigate economic tools that encourage biodiversity conservation (e.g., incentives, removal of disincentives, markets)	All governments, business sector	

10. Encourage the involvement of Aboriginal communities in shared stewardship for biodiversity conservation	All sectors	
11. Support and enhance biodiversity stewardship activities and partnerships with local communities and landowners	All sectors	
12. Provide opportunities for all people to become involved in biodiversity conservation, with a focus on youth and new Canadians	All sectors	
13. Recognize achievement and innovation in biodiversity conservation	All sectors	Ontario Biodiversity Council and working groups

### **Targets: How will we measure our progress?**

- By 2015, biodiversity is integrated into the primary, secondary, and postsecondary school curriculum including schools of business
- By 2015, 50% of Ontarians understand biodiversity and its role in maintaining their health and well-being
- By 2015, the number of Ontarians who participate in biodiversity conservation activities is increased by 25%
- By 2015, all sectors have initiated the development of implementation plans in support of Ontario's Biodiversity Strategy and by 2020 those plans are implemented
- By 2020, all relevant policies and programs integrate biodiversity values

## **7.6 Reduce Threats**

The management and reduction of threats to biodiversity is an essential part of conserving Ontario's biodiversity. We can improve the condition of species and ecosystems, and help us to prevent further biodiversity loss, by reducing the extent of significant threats to biodiversity, and by reducing the impacts of existing threats. Reducing threats will also help to enhance the resilience of our ecosystems and protect the services they provide that are so vital to our health and well-being. Critical components of this strategic direction include reduction of both direct and indirect pressures on Ontario's biodiversity and the sustainable use of our natural assets.

### **Objective: Reduce pressures on biodiversity**

**Outcomes: What do we want to achieve?**

- The loss and degradation of natural habitats in Ontario is decreased
- The growth of Ontario's Ecological Footprint is halted and reversed
- Plans for climate change mitigation to reduce greenhouse gas emissions are developed and implemented

**Objective: Promote sustainable use of natural assets**

**Outcomes: What do we want to achieve?**

- Our use of Ontario's natural assets is sustainable

Key Actions	Lead Responsibility	Support
14. Develop and implement growth plans to reduce urban sprawl	Provincial, municipal governments	Business sector
15. Place priority on efficient transportation and encourage growth and redevelopment along selected corridors and centres that are well served by transit	All sectors, including individuals	Business sector
16. Develop and implement policies and programs to reduce greenhouse gas emissions and energy consumption by promoting energy conservation, efficiency strategies and sustainable energy supplies	All governments	All sectors, including individuals
17. Develop and implement strategies to mitigate against the effects of climate change by sequestering and storing carbon in ecosystems	All governments	Public, science and business sectors, non-governmental organizations
18. Develop and implement policies and programs to reduce water use and promote water conservation and efficiency strategies	All sectors, including individuals	
19. Promote the adoption of environmental management systems in the public, private and voluntary sectors	All governments, business sector	
20. Continue and enhance measures for prevention, early detection, rapid response, and effective management of invasive species	Federal, provincial governments	Individuals, science sector, non-government organizations
21. Continue and enhance strategies to reduce the release of pollutants harmful to biodiversity including air, water, soil	All sectors, including individuals	Science and health sectors, non-governmental

and light pollution		organizations
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1109

1110 **Targets: How will we measure success?**

- 1111       ➤ By 2015, plans for climate change mitigation are developed and implemented  
1112           and contribute to Ontario's target to reduce greenhouse gas emissions by 6%  
1113           below 1990 levels  
1114       ➤ By 2015, strategic plans are in place to reduce the threats posed to biodiversity  
1115           by invasive species  
1116       ➤ By 2015, the release of pollutants harmful to biodiversity is reduced  
1117       ➤ By 2020, the growth of Ontario's per capita resource consumption and waste  
1118           generation is halted and reversed

1119 **7.7 Enhance Resilience**

1120 Complementing our efforts to reduce threats to biodiversity, enhancing the resilience of  
1121 our ecosystems is another important part of the Strategy. Enhancing resilience means  
1122 enhancing the capacity of our ecosystems to cope with change. A resilient ecosystem is  
1123 more able to withstand and recover from stresses such as climate change, invasive  
1124 species, and pollution.

1125

1126 To effectively enhance resilience and achieve the other strategic directions, we need to  
1127 invest strategically. Resources for biodiversity conservation are finite, so focusing  
1128 resources and investments to yield the greatest benefits to biodiversity is essential. The  
1129 costs and benefits of biodiversity conservation should be distributed equitably across  
1130 relevant sectors.

1131

1132 Strategic investments, partnerships and stewardship are also an increasingly important  
1133 way of identifying, prioritizing and achieving biodiversity conservation goals. For  
1134 example, cooperation between the Ontario government, non-government organizations  
1135 and the private sector has resulted in an increase in lands managed for biodiversity  
1136 values (e.g. sustainable forest management).

1137

1138 **Objective: Maintain, restore, and recover ecosystem function**

1139

**Outcomes: What do we want to achieve?**

- The connectivity of fragmented landscapes in Ontario is increased and currently intact landscapes are maintained
- Adaptation plans to cope with the effects of climate change are developed and implemented
- Ecosystem services are maintained and have been restored or enhanced in previously degraded habitats

**Objective: Protect Ontario's genetic, species and ecosystem diversity**

**Outcomes: What do we want to achieve?**

- The protected area system is representative of Ontario's terrestrial and aquatic ecosystems
- Fewer species and ecosystems are of conservation concern in Ontario, and their status is improved
- A proactive approach focused on keeping common species and ecosystems common is adopted

**Objectives: Invest resources and funds strategically**

**Outcomes: What do we want to achieve?**

- Critical priorities, partnerships, and actions to conserve biodiversity are identified and acted upon
- Cities and towns invest in the management and restoration of urban habitats for biodiversity
- There is sustainable long-term investment and other resources for biodiversity conservation in Ontario

Key Actions	Lead Responsibility	Support
22. Set targets for natural cover with respect to ecosystem type and geographic location throughout the province	All governments	Science sector, non-government organizations
23. Expand the protected areas system of ecologically representative and ecologically significant areas in Ontario	All governments	Non-government organizations, individuals

24. Integrate biodiversity values into growth management plans	Provincial, municipal governments	
25. Adopt landscape conservation planning and comprehensive land use planning approaches at all scales	All governments	Non-government organizations
26. Increase the proportion of private lands that are managed for biodiversity	All sectors, including individuals	
27. Develop and implement urban biodiversity and green infrastructure strategies for Ontario's cities and towns	Municipal governments, non-government organizations, public sector	
28. Develop and implement a genetic resource management strategy for wild species in Ontario	All governments, science sector	
29. Assess species and ecosystem vulnerability to climate change and implement adaptation plans	All governments, science sector	
30. Implement recovery strategies for species and ecosystems of conservation concern	All governments	Science and business sector, individuals
31. Continually improve sustainable management of harvested species	Federal, provincial governments	Individuals, science sector, non-government organizations
32. Establish sustainable funding mechanisms to support biodiversity conservation in Ontario	All sectors	Ontario Biodiversity Council and working groups

#### **Targets: How will we measure success?**

- By 2015, the status of species and ecosystems of conservation concern in Ontario is improved
- By 2015, the proportion of private lands in Ontario that are managed for biodiversity is increased
- By 2015 natural heritage systems plans and biodiversity conservation strategies are developed and implemented at the municipal and landscape levels
- By 2020, at least 17% of terrestrial and inland water systems are conserved through well-connected systems of protected areas and other effective area-based conservation measures
- By 2020, programs and policies are in place to maintain and enhance ecosystem services

1182

## 1183 **7.8 Improve Knowledge**

1184 Decades of scientific inquiry and study contribute to our understanding of Ontario's  
1185 biodiversity, but there is still much to learn. In particular, we need to build our  
1186 understanding of how the Ontario's many plants, animals and micro-organisms contribute  
1187 to broader ecological functions and to the health of our environment. We also need to  
1188 understand what motivates individuals and sectors to begin working toward biodiversity  
1189 conservation. Long-term investment in research and monitoring, and the establishment  
1190 of strategic partnerships to address these knowledge gaps is essential to achieving our  
1191 biodiversity goals.

1192

1193 In addition to filling our knowledge gaps, biodiversity information also needs to be  
1194 interpreted for wider audiences and communicated clearly so that it can be used in  
1195 decision-making. Everyone, at all levels of society, must understand how their actions  
1196 and choices can have a positive impact on biodiversity.

1197

### 1198 **Objective: Improve and share biodiversity knowledge**

1199

#### 1200 **Outcomes: What do we want to achieve?**

- 1201 • Essential knowledge for conserving biodiversity is accessible to a wide  
1202 audience, and used to make good decisions

1203

### 1204 **Objective: Implement biodiversity monitoring, reporting, and evaluation**

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#### 1206 **Outcomes: What do we want to achieve?**

- 1207 • The ability to assess and report on the state of Ontario's biodiversity is improved

1208

Key Actions	Lead Responsibility	Support
33. Establish long-term investment in science-based biodiversity programs, including priority inventories and integrated ecosystem monitoring	All governments, non-government organizations, science sector	
34. Regularly review the status of knowledge about Ontario's biodiversity, including revision of research questions, identification of knowledge gaps,	Federal, provincial governments, science sector	Ontario Biodiversity Science Forum, science sector

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revision of research strategies, and development of strategic partnerships		
35. Establish an information system to collect, assemble, manage, and share data	Federal, provincial governments, science sector	
36. Review and refine a suite of indicators for measuring the state of Ontario's biodiversity, including Ontario's Ecological Footprint and Living Planet Index	Provincial government, Ontario Biodiversity Council	Ontario Biodiversity Council working groups, science sector
37. Report on the state of Ontario's biodiversity at 5 year intervals, using best available science and information	Ontario Biodiversity Council	Ontario Biodiversity Council working groups
38. Review and report on targets established in Ontario's Biodiversity Strategy at 5 year intervals	Ontario Biodiversity Council	Ontario Biodiversity Council working groups

#### Target: How will we measure success?

- By 2015, a long-term monitoring and reporting system for assessing the state of Ontario's biodiversity is established and operating

## 8.0 Implementing Ontario's Biodiversity Strategy

Everyone has a role to play if we are to succeed in conserving Ontario's wealth of biodiversity, both now and in the future. The objectives, outcomes, actions, and targets contained in Ontario's Biodiversity Strategy, 2011 provide a framework for coordinating biodiversity conservation across the province, but much more is possible. We hope this document will inspire Ontario's sectors and groups to think creatively about biodiversity, and take responsibility for creating their own implementation plans for biodiversity conservation.

### **Text Box:** Implementation Plans

Implementation plans are roadmaps for action created by industry, government, business, organizations, community groups, municipalities, educational institutions and others. These plans adopt the priorities and actions from the OBS 2011 and create their own measures to help achieve them.

The creators of Ontario's Biodiversity Strategy, 2005 understood that the successful implementation of the Strategy required that people work together. Through specific actions in the OBS, organizations and individuals were asked to come together and champion the OBS, and advance biodiversity education and biodiversity science.

The resulting cooperation and collaboration resulted in the Ontario Biodiversity Council, the Biodiversity Education and Awareness Network (BEAN) and the Ontario Biodiversity Science Forum (OBSF). Additionally, the Stewardship Network of Ontario (SNO), already active within Ontario, took on a new role to foster biodiversity stewardship, another action recommended in the OBS, 2005. Ontario's Biodiversity Strategy Progress Report 2005-2010 documents the achievements of each of these organizations.

This OBS, 2011 identifies major roles and responsibilities for biodiversity conservation actions, but much more is possible. Council will continue to guide the implementation of the Strategy and encourage all sectors to help achieve the outcomes and goals. We hope that this renewed OBS will also spur additional collaboration and partnerships focussing on particular actions or opportunities.

Aboriginal peoples have depended on Ontario's biodiversity for food, shelter, cultural and spiritual purposes for thousands of years. Aboriginal communities continue their relationship with the land and its resources today, and their involvement is critical to the successful implementation of the Strategy. The 1987 World Commission on Environment and Development emphasized the importance of preserving traditional knowledge, while the *Convention on Biological Diversity* and the *Canadian Biodiversity Strategy* reinforce the need to respect, preserve, and maintain the knowledge, innovations and practices of Aboriginal communities and to seek community-based, local responses to the Strategy. The existing Aboriginal and treaty rights of Aboriginal peoples are recognized by the Constitution, affirmed by the Supreme Court, and must be respected in implementing this Strategy.

## **9.0 Monitoring and Reporting Progress**

For the OBS 2011 to succeed, we need to be able to track progress toward meeting the Strategy's goals and outcomes through regular monitoring. When we find that current approaches are not working, we must revise them. The Ontario Biodiversity Council commits to monitoring and reporting progress on the Strategy's 15 biodiversity targets at 5-year intervals.

From an ecological perspective, 10 years is a very short timeframe, and few of the issues identified in this Strategy can be fully addressed in that time. New issues will emerge, and priorities will change, over the next 10 years. Outcomes and targets will be refined, and new actions will be identified, as we learn more about Ontario's biodiversity and society's ability to conserve it. It is essential that we all have access to consistent and reliable information as that process unfolds. The Ontario Biodiversity Council commits to providing that information through its website, including access to this Strategy, implementation plans, reports, and opportunities for involvement.

## **10.0 Glossary**

**Adaptive Management** – a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs and incorporating new information (Millennium Ecosystem Assessment).

**Alien Species** – plants, animals and micro-organisms that have been accidentally or deliberately introduced into areas beyond their normal range. Synonyms may include introduced, non-native and exotic (OBS 2005).

**Biodiversity or Biological Diversity** – the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (CBD modified).

**Biocapacity** – the capacity of ecosystems to produce useful biological materials and to absorb waste materials generated by humans, using current management regimes and extraction technologies. Biocapacity is usually measured in global hectares (GFN).

**Conservation** – the maintenance of the Earth's resources in a manner that maintains ecosystem, species and genetic diversity and the evolutionary and other processes that shaped them. Conservation may or may not involve the use of resources; that is, certain areas, species or populations may be excluded from human use as part of an overall landscape/waterscape conservation approach, while in other areas the sustainable use of biological resources is permitted (CBS modified).

**Climate Change** – any change in climate over time, whether due to natural variability or as a result of human activity (Adapting to Climate Change in Ontario).

**Climate Change Adaptation** – the ability to respond and adjust to actual or potential impacts of changing climate conditions in ways that moderate harm or take advantage of any positive opportunities that the climate may afford (AFDB et al. 2033).

**Climate Change Mitigation** – an intervention intended to reduce adverse human influence on the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks (IPCC).

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**Ecological Footprint** - a metric that assesses humanity's demand for certain natural resources and identifies whether our collective consumption levels are approaching or exceeding the Earth's ecological limits. The ecological footprint provides an indicator of the pressure on biodiversity by measuring the competing level of ecological demand that humans place on the biosphere (SOBR, GFN).

**Ecological Integrity** – the quality of a natural, unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species, and ecosystem diversity assured for the future (DNRM).

**Ecological Processes** – the interactions and connections between living and non-living systems including movements of energy, nutrients and species (Victoria's Biodiversity Strategy 2010-2015).

**Ecosystem** - a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit (CBD).

**Ecosystem Diversity** – the variety of ecosystems and their biological communities that interact with one another and their non-living physical environments (Victoria's Biodiversity Strategy 2010-2015).

**Ecosystem Approach** – resource planning and management activities that assure consideration of the relationships among and between all organisms, including humans, and their environment (DNRM).

**Ecosystem Resilience** – the capacity of an ecosystem to adapt to changes and disturbances, yet retain its basic functions and structures (Australian Biodiversity Strategy 2010-2020).

**Ecosystem Services** – services that humans derive from ecological functions such as photosynthesis, oxygen production, water purification and so on (CBS modified).

**Ecosystem diversity** – the variety of habitats, ecological communities and ecological processes (Australian Biodiversity Strategy 2010-2020).

**Ecosystem Health** – the condition of an ecosystem, through its structure and functions, that permits the maintenance of biological diversity, biotic integrity and biological processes over time (DNRM modified).

**Ecozone**– an area of the earth's surface that represents a large ecological zone and has characteristic landforms and climate. Each ecozone is distinguished from others by its unique mosaic of plants, wildlife, climate, landforms, and human activities. In this Strategy we briefly describe the three ecozones and the Great Lakes as the four "ecological regions" that comprise Ontario (OBS 2005).

**Education** - the guiding of learning processes in the form of instruction, experiencing or setting examples. Formal education is the hierarchically structured, chronologically graded educational system running from primary through the tertiary institutions. Non formal education are organized educational activities outside the established formal system, intended to serve an identifiable learning clientele with identifiable objectives. Informal education is the process whereby every individual acquires attitudes, values,

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skills and knowledge from daily experience, such as family, friends, peers and media. Education is a set of processes that can inform, motivate and empower people to support biodiversity conservation, not only by making lifestyle changes, but also through promoting change in the way that institutions, business, and governments operate (CBD).

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

**Genetic Diversity** – the variety of genetic information contained in individual plants, animals and micro-organisms (Australian Biodiversity Strategy 2010-2020).

**Genetic Resources** – genetic material of actual or potential value (CBS).

**Habitat** – the place or type of site where an organism or population naturally occurs. Species may require different habitats for different uses throughout their lifecycle (CBS).

**Intrinsic Value** – valued for its own sake, not for what they lead to or produce (DNRM modified).

**Invasive Species** – alien species whose introduction or spread threatens the environment, the economy, and/or society, including human health (OBS 2005).

**Landscapes** – complexes of ecosystems in geographically defined areas (CBS).

**Mainstreaming** – the informed inclusion of relevant environmental concerns into the decisions of individuals and institutions (CBD modified).

**Precautionary approach** – A way of making decisions about the environment when risks are suspected but not known with certainty. The 1992 Declaration on Environment and Development states: “In order to protect the environment, the precautionary approach shall be widely applied by States [i.e. jurisdictions] according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.” (1992 UNEP *Rio Declaration on Environment and Development*).

**Protected Area** – a clearly defined geographic space, recognized, dedicated and managed through legal or effective means to achieve the long-term conservation of nature with associated ecosystem services and cultural values (IUCN).

**Protection** – a commitment to protect individuals, a subpopulation or a population, or ecosystems (or parts thereof) from adverse impacts that may result in their loss (OBS 2005).

**Rare Species** – small populations of species that are not currently endangered, threatened or of special concern, but may be at risk. These species are usually localized within restricted geographical areas or habitats, or are thinly scattered over a more

extensive range. Rarity can be defined locally, regionally, provincially/territorially, nationally or globally (CBS modified).

**Recovery** – an action that is necessary to reduce or eliminate the threats that causes a species to be listed as threatened, endangered or extirpated (DNRM modified).

**Rehabilitation** – the return of a species, population or ecosystem to a healthy, functioning state (CBS).

**Resilience** – see ecosystem resilience

**Restoration** – the return of a species, population or ecosystem to its state prior to disturbance (CBS).

**Species at Risk** – any wild plant or animal threatened by, or vulnerable to extirpation in Ontario or extinction. Species at Risk are assigned a designation (i.e., Special Concern, Threatened, Endangered or Extirpated) to represent the degree of imperilment. Note: Six species (i.e., Macoun's Shining Moss, Blackfin Cisco, Blue Pike, Deepwater Cisco, Passenger Pigeon, Eastern Elk), formerly found in Ontario, are now extinct (i.e. no longer exist anywhere).

**Species diversity** – the variety of species found in a given area (CBD).

**Species or Ecosystem of Conservation Concern** – a species or ecosystem that is in decline, rare, or scarce in the wild (Nature Serve).

**Stewardship** - an ethic that embodies cooperative planning and management of environmental resources in which organizations, communities and other groups actively engage both in the prevention of habitat loss and as well the facilitation of resource recovery and/or replenishment, usually with a focus on long-term sustainability. (Fisheries and Oceans Canada - 'Stewardship in Action' program).

**Sustainable** – the potential for long-term maintenance of well-being, which has environmental, economic, and social dimensions (UN).

**Sustainable Development** – development that meets the needs of the present without compromising the ability of future generations to meet their own needs (CBS).

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

**Threatened Species** – species that are likely to become endangered if the natural and/or human pressures limiting them are not reversed (CBS modified).

**Traditional Knowledge** – knowledge gained from generations of living and working within a family, community or culture (CBS).

1460 **Urban biodiversity** - the variety and richness of living things, including genetic, species  
1461 and habitat diversity found in and around towns, cities and other currently or previously  
1462 developed areas (Muller 2008).

1463  
1464 **Watershed** – the area of land that drains into a river, lake, or other water body  
1465 (Conservation Ontario).

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