



# State of Ontario's Biodiversity 2010 Highlights Report

A Report of the Ontario  
Biodiversity Council





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# Message from the Ontario Biodiversity Council

Biodiversity needs to be conserved for its own sake. We also need to conserve it for our sake—for clean air and water, productive soils, and for healthy food and renewable resources that help to sustain us and our economy.

Ontario is part of a worldwide effort to protect biodiversity. This effort requires government, industry, non-governmental organizations and the general public to work together to halt biodiversity loss.

In 2005, the province released Ontario's Biodiversity Strategy to help conserve the province's biodiversity and to "protect what sustains us." One of the recommendations in the strategy was that the state of Ontario's biodiversity should be reported on every 5 years. The Ontario Biodiversity Council is pleased to release the first State of Ontario's Biodiversity report and the 'Highlights' document which summarizes the full report. The full document can be found online at [www.ontariobiodiversitycouncil.ca](http://www.ontariobiodiversitycouncil.ca).

The release of the report coincides with the International Year of Biodiversity. It is a time to celebrate the variety of life on Earth and the value of biodiversity in our lives. It is also a time to take action to conserve what is so important to us.

## WHAT IS THE OBC?

The Ontario Biodiversity Council (OBC) was formed to guide the implementation of Ontario's Biodiversity Strategy.

The group's 22 members come from a variety of organizations and share a commitment to biodiversity conservation.

To learn more about the OBC please visit:  
[www.ontariobiodiversitycouncil.ca](http://www.ontariobiodiversitycouncil.ca)

We encourage everyone to appreciate and protect biodiversity. Every effort to live in a sustainable way, whether big or small, will contribute to the recovery of biodiversity. We each have a role to play and invite you to join our efforts to protect what sustains us.

*Wild Lupines*



Photo: OMNR

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# Introduction

Biodiversity is the variety of life on Earth expressed through genes, species and ecosystems. Humans are part of nature and biodiversity helps to maintain our health and well-being. We depend on it for food, fresh water, clean air and medicines. It also provides fibre, wood, and other raw materials that we rely on. In short, without biodiversity we wouldn't survive.

There are many different threats to biodiversity. Habitat loss, invasive alien species, pollution, overharvesting and climate change affect biodiversity. Most of the threats are caused by humans. Ontarians are placing large demands on the province's resources and biodiversity is being lost, especially in southern Ontario. Ontario's population is growing and biodiversity will continue to be lost if current trends continue.

In order to protect biodiversity we have to understand it. This report is one of a number of tools to help us learn about and appreciate biodiversity in Ontario. The 29 indicators assessed provide a snapshot of the status of biodiversity across the province and help pinpoint areas where more protection or research is needed. This report also shows where progress in protecting and conserving biodiversity has been made and should be celebrated.

This report highlights many areas where Ontario's biodiversity is threatened. Rather than being discouraged, Ontarians should use the knowledge this report provides to make change in their lives—to step lightly on the Earth, and to find ways to help protect and conserve biodiversity in their own backyards and across the province.

*Nelly Lake*

**Habitat loss, invasive alien species, pollution, overharvesting and climate change affect biodiversity.**

# About This Report

This report presents the highlights of a more detailed technical report that is available from the Ontario Biodiversity Council’s web site ([www.ontariobiodiversitycouncil.ca](http://www.ontariobiodiversitycouncil.ca)).

This report assesses the health of Ontario’s biodiversity using 29 different indicators. The indicators address three different themes: pressures on Ontario’s biodiversity, the state of Ontario’s biodiversity, and the conservation and sustainable use of Ontario’s biodiversity.

Rating indicators and how they change over time gives us a picture of how biodiversity is threatened and where we need to work harder to protect it.

Each indicator is rated for status, trend and data confidence.

**Status:** Summarizes the condition of biodiversity for that particular indicator—presented as a series of bullets for each indicator.

**Trend:** Rates whether things are getting better or worse, or staying the same for each indicator. For some indicators, there isn’t enough historical or recent information to tell if conditions are improving or getting worse. For each indicator, the trend is identified in one of the following categories:

TREND		
Improvement		The state of biodiversity related to this indicator has improved
No change		Things have stayed the same
Mixed		Some aspects have improved, some have gotten worse
Deterioration		The state of biodiversity related to this indicator has gotten worse
Baseline		Not enough historical or recent information available to judge the trend
Undetermined		Not enough information was available to determine a baseline



Photo: Ontario Tourism

*Point Pelee*

This report presents the highlights of a more detailed technical report that is available from the Ontario Biodiversity Council's web site ([www.ontariobiodiversitycouncil.ca](http://www.ontariobiodiversitycouncil.ca)).

### WHAT'S AN INDICATOR?

The indicators in this report are summaries of monitoring programs and other sources of existing data.

They can help show us the threats and pressures to biodiversity. Rating indicators helps us to see how our actions positively or negatively affect biodiversity.

**Data confidence:** Measures the amount and quality of the information that was used to rate each indicator. For each indicator, the data confidence is identified in one of the following categories:

High



A large amount of recent data was available

Medium



A fair amount of recent or relatively recent data was available

Low



Limited or outdated information was available

# Ontario's Ecozones

Ontario is divided into four ecozones, each with its own ecological, climatic and topographic characteristics. Information on indicators is presented based on these ecozones.

- **Hudson Bay Lowlands**—This is the northernmost ecozone in Ontario and covers 23% of the province. The area is dominated by wetlands and also supports boreal and subarctic forests, tundra, and numerous rivers and lakes.
- **Ontario Shield**—This 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 the ecozone.

## WHAT'S AN ECOZONE?

An ecozone 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.

- **Mixedwood Plains**—This is Ontario's smallest and most southerly terrestrial ecozone. It makes up 8% of the province but is home to about 35% of Canada's population. The landscape is dominated by agriculture and settlement.
- **Great Lakes**—The Great Lakes hold 18% of the world's supply of surface freshwater. The Ontario portion of the Great Lakes makes up 8% of the province. This ecozone includes cold deepwater habitats, shallower nearshore habitats, islands, and coastal wetlands.



Ecozones of Ontario



# Pressures on Ontario's Biodiversity

Human actions are responsible for the four main threats to biodiversity: habitat loss, invasive species, pollution, and overharvesting. Climate change and the combined effects of these threats also place biodiversity at risk. This section examines the impact of these pressures on biodiversity.



**The Ecological Footprint measures human demand for resources based on the amount of resources we use and wastes we produce.**



# 1 Ecological Footprint

How much of the Earth's resources are humans using? The Ecological Footprint measures human demand for resources based on the amount of resources we use and wastes we produce. Biocapacity measures the amount and productivity of agricultural land, waters and forests available to supply resources for human demand. The Ecological Footprint and biocapacity are measured in terms of bioproductive global average hectares, or global hectares (gha).

The global Ecological Footprint in 2005 was 2.7 gha per person, or 17.4 billion gha in total. The world's biocapacity (or total supply of productive land) was only 13.6 billion gha, or 2.1 gha per person. We are in a state of "ecological overshoot"—we are using more of the planet's natural capital than is being replenished each year.

## STATUS

- In 2005, Ontario's Ecological Footprint was 8.4 gha per person. This is one of largest Ecological Footprints in the world (on a

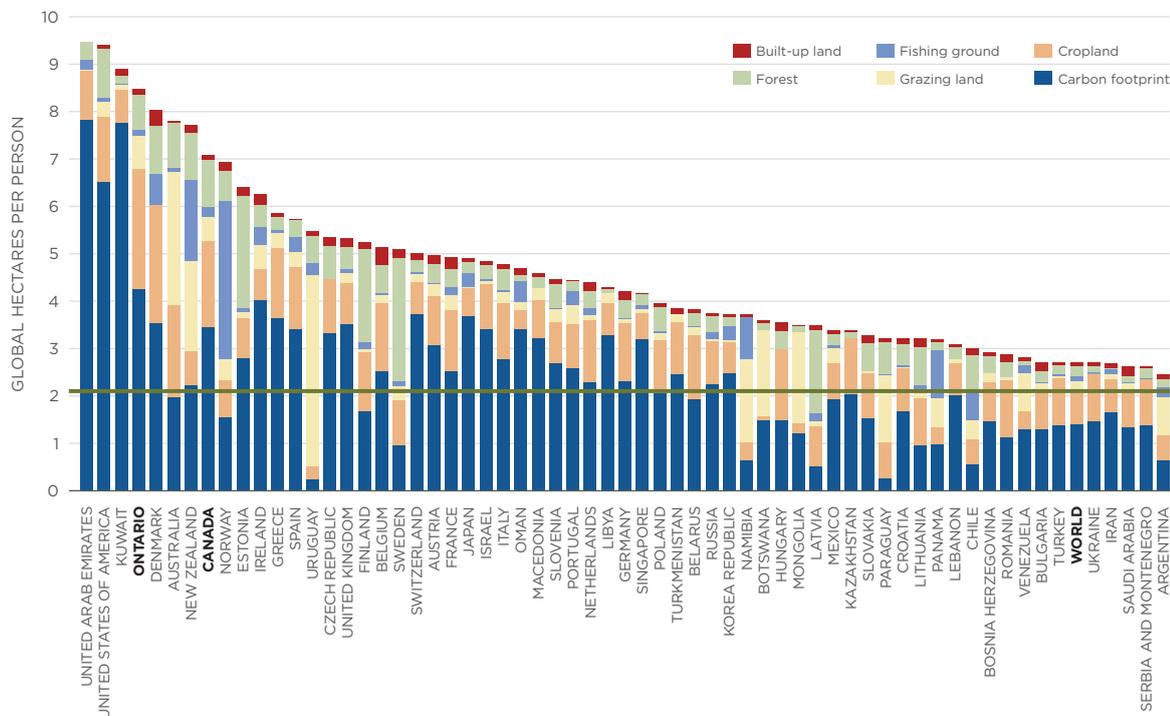
per person basis) and is higher than the Canadian average.

- The ability of Ontario's biological resources to support these demands is limited. On a per capita basis, Ontario has much less biocapacity available than Canada overall. Ontario's biocapacity in 2005 was roughly equivalent to the Ecological Footprint (8.5 gha per person).
- If everyone in the world lived like Ontarians, we'd need the resources of four planets to sustain us. Humans are demanding more from the Earth than it can provide.

**TREND**  
BASELINE



**DATA CONFIDENCE**  
MEDIUM



Ontario's Ecological Footprint compared to the Ecological Footprints of a selection of countries with available data, 2005. Green line is the world average biocapacity of 2.1 gha per person (source: Stechbart and Wilson 2010).



## 2 Habitat Loss—Percentage of Land Cover Types

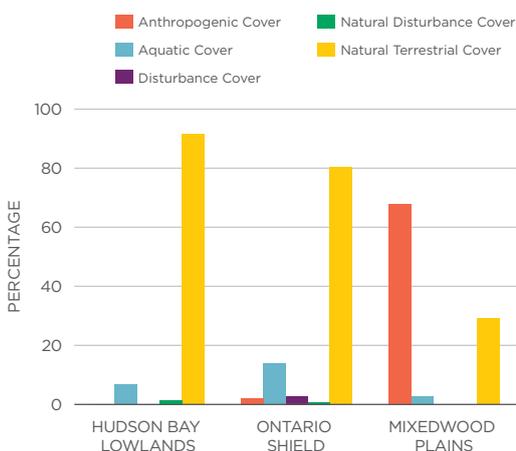
Changes in the ways land is used and changes in types of land cover can cause habitat loss and affect biodiversity.

This indicator looks at the amount of different land cover in each of Ontario's terrestrial ecozones. Different land cover types are:

- anthropogenic cover—built-up areas, agricultural areas, roads, and gravel pits;
- aquatic cover—inland lakes, rivers and streams;
- disturbance cover—forests harvested between 2001 and 2005;
- natural disturbance cover—forests where there have recently been fires; and,
- natural terrestrial cover—forests, wetlands, alvars, mudflats, prairies, savannahs, rock and tundra.



Photo: Ontario Tourism



Percentage land cover composition for the Hudson Bay Lowlands, Ontario Shield and Mixedwood Plains ecozones (adapted from Ontario Parks 2009).

### STATUS

- The Mixedwood Plains has the highest amount of anthropogenic cover (68%) followed by the Ontario Shield, (2%) and the Hudson Bay Lowlands (less than 1%). Most of the anthropogenic cover in the Mixedwood Plains is agricultural and provides important food, fuel and fibre.
- The Hudson Bay Lowlands and the Ontario Shield are dominated by natural cover types.
- There is very high habitat loss and fragmentation in Ontario's south and very little in the north.

**TREND**  
BASELINE



**DATA CONFIDENCE**  
MEDIUM

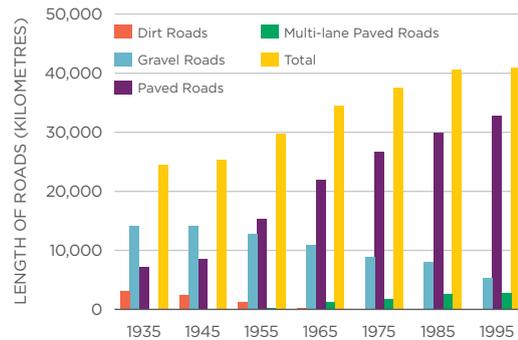




### 3 Habitat Loss—Road Density in Southern Ontario

Southern Ontario has more roads than any other part of Canada. When roads are built, a small amount of habitat is directly lost. Roads can act as barriers to movement for some species, splitting up populations and preventing animals from accessing important habitats. Many species are killed in vehicle collisions, and noise and pollution from roads can also negatively affect biodiversity.

This indicator looks at changes in the length and types of roads in Southern Ontario.



Major road changes in southern Ontario, 1935 to 1995 (source: Fenech et al. 2000).

#### STATUS

- The total length of roads in southern Ontario increased from 24,445 km in 1935 to 40,909 km in 1995.
- Paved roads increased from 7,133 km in 1935 to 32,857 km in 1995.
- There were no multi-lane paved roads in southern Ontario in 1935. By 1995 there were 2,780 km of multi-lane paved roads in the region.

**TREND**  
DETERIORATION



**DATA CONFIDENCE**  
MEDIUM

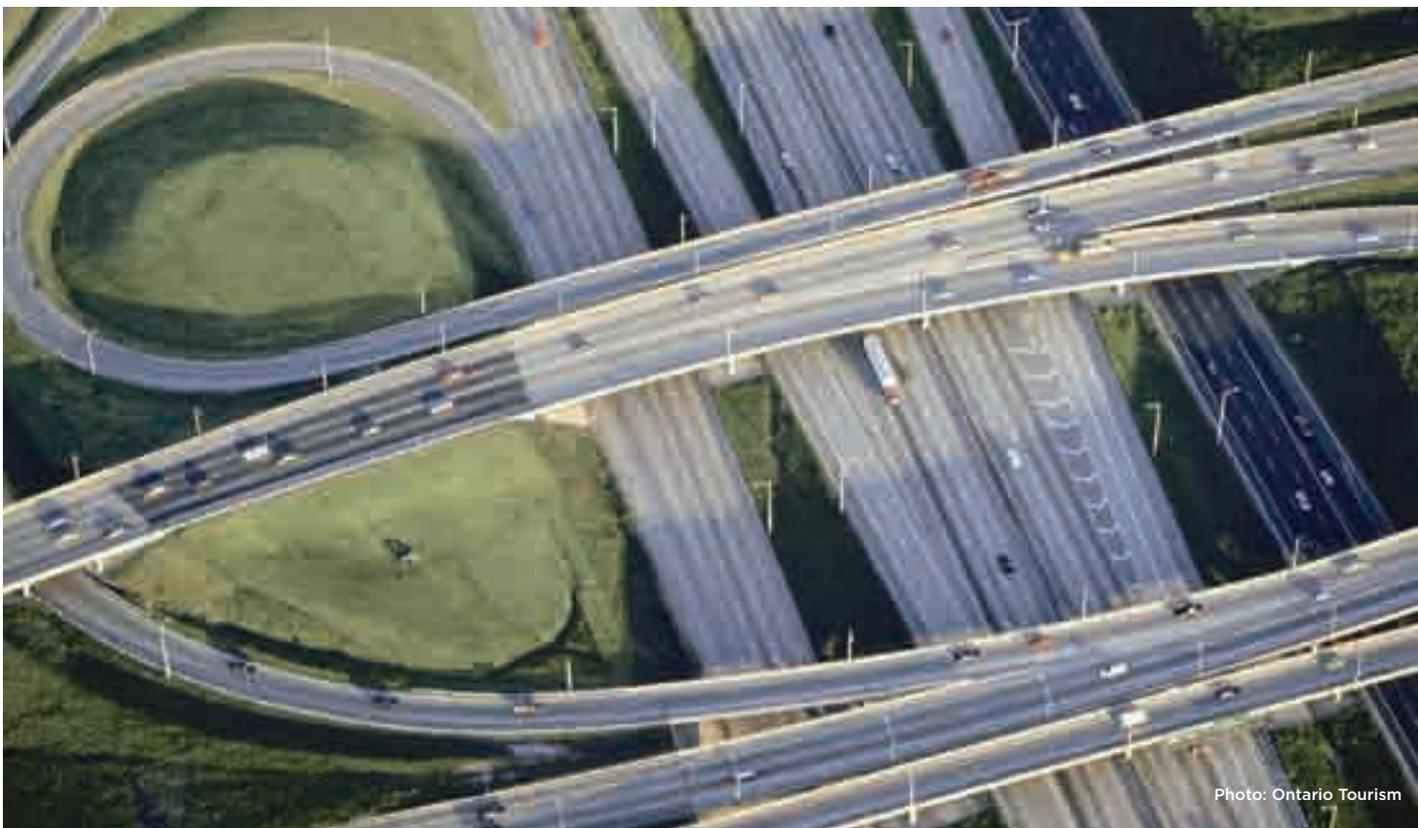


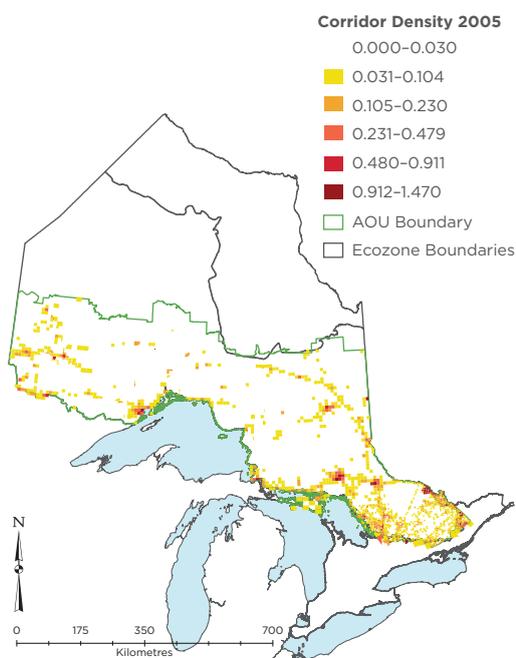
Photo: Ontario Tourism



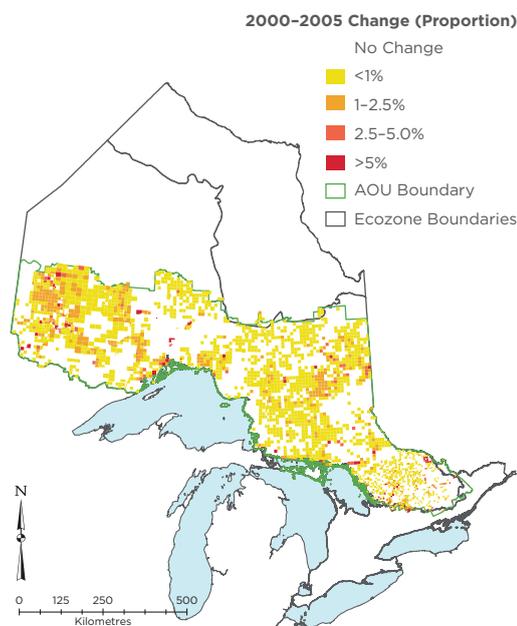
# 4 Habitat Loss—Extent of Anthropogenic Corridors in the Ontario Shield

Road density in most of the Ontario Shield Ecozone is much lower than in southern Ontario. Effects on biodiversity depend on the location of roads, the density of road corridors and their level of use. In addition to the impacts listed in the previous indicator, the increased access provided by new roads in forested habitats can lead to increased harvest of wildlife species, easier access by predators such as wolves, and facilitate invasions by alien species.

This indicator looks at changes in the density of anthropogenic corridors (roads, landings, gravel pits, railways, utility corridors, airports, built-up lands) within the area of the Ontario Shield where commercial forestry takes place (Area of the Undertaking). In forested areas, the majority of anthropogenic corridors are associated with forest access roads.



Density of anthropogenic corridors (% of landscape) within the Area of the Undertaking (AOU) in the Ontario Shield Ecozone, 2005 (adapted from OMNR 2007).



Proportional increase in the density of anthropogenic corridors in the Area of the Undertaking (AOU) in the Ontario Shield Ecozone, 2001-2005 (source: OMNR 2007).

## STATUS

- Road densities are highest in the south-eastern part of the Ontario Shield and around urban centres.
- Between 2001 and 2005, the area of anthropogenic corridors increased by 0.02%. This is mostly due to the construction of new forest access roads.

**TREND**  
BASELINE



**DATA CONFIDENCE**  
MEDIUM

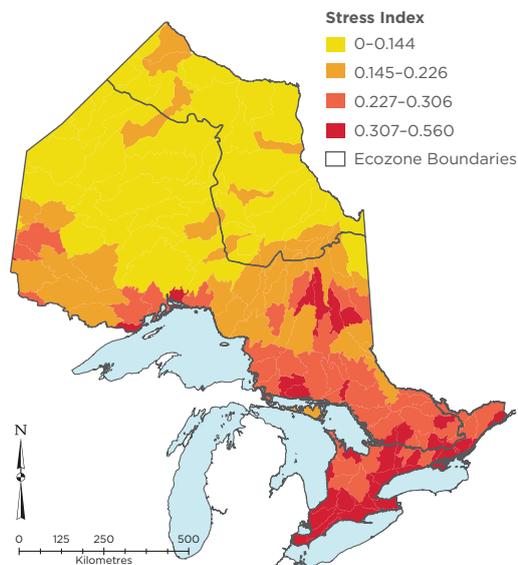




## 5 Habitat Loss—Aquatic Stress Index

Habitat loss is a major threat to freshwater species and ecosystems around the world. Aquatic habitats can be affected by human activities such as dredging (removing portions of the lake or river bottom), constructing dams, changing shorelines, and large-scale developments of the landscape. Despite the well-known impacts of habitat loss and alterations on aquatic biodiversity, the actual amount of

aquatic habitat that has been impacted has not been assessed at a broad level in Ontario. Therefore, this indicator uses the Aquatic Stress Index to represent the relative intensity and distribution of threats to aquatic habitats in Ontario. The Aquatic Stress Index rates the intensity of human stressors on watersheds and includes census information on agriculture, industry, roads and human populations.



Stress Index for watersheds in Ontario (source: Chu et al. 2003). Higher Stress Index scores represent a higher level of stress to aquatic ecosystems. (© 2003 NRC Canada or its licensors—reproduced with permission)

### STATUS

- Watersheds in the Mixedwood Plains Ecozone have the highest Stress Index values. Aquatic habitat loss and degradation is highest in this part of the province.
- Watersheds in the southern part of the Ontario Shield Ecozone and those close to urban centres have high Stress Index values. The northwestern portion of the ecozone and watersheds in the Hudson Bay Lowlands Ecozone have low Stress Index values.

**TREND**  
BASELINE



**DATA CONFIDENCE**  
MEDIUM

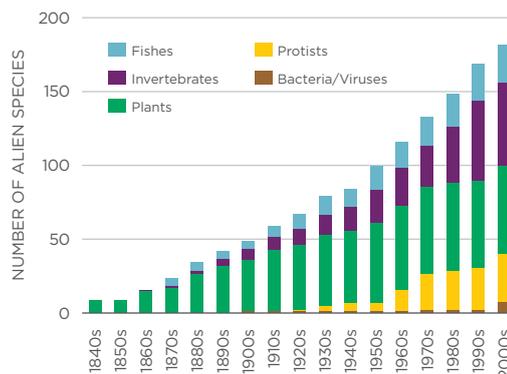




# 6 Invasive Alien Species—Aquatic Alien Species in the Great Lakes

Invasive alien species are one of the main threats to biodiversity world wide. Alien species are plants, animals, and micro-organisms from other regions or countries that are introduced by humans. *Invasive* alien species are harmful and threaten the environment, economy or society, including human health. Zebra Mussel, Emerald Ash Borer, Dutch Elm Disease, and Purple Loosestrife, are well-known examples of invasive alien species. It is difficult to limit their numbers and spread. Invasive alien species can devastate native species and ecosystems and cause millions of dollars in damages and control costs. There are far more alien species within Ontario than in other Canadian provinces and territories.

This indicator summarizes the cumulative number of alien species in the Great Lakes and the rate at which introductions have occurred.



Cumulative number of aquatic alien species in the Great Lakes by decade (note: protists includes algae, diatoms and protozoans) (source: Mills et. al. 1993; Ricciardi 2006; A. Ricciardi, McGill University, unpublished data).

## STATUS

- The number of aquatic alien species in the Great Lakes basin has steadily increased since the first species was documented in the 1840s. As of 2009 there were 186 species present.
- The rate of new introductions has increased. Between 1840 and 1950, there were 7.8 new species discovered per decade. Since 1950, this has increased to 16.8 new species per decade.



Photo: OMNR

Above: Spiny Water Flea; Below: Zebra Mussels



Photo: Heather Bickle, OMNR

TREND  
DETERIORATION



DATA CONFIDENCE  
HIGH

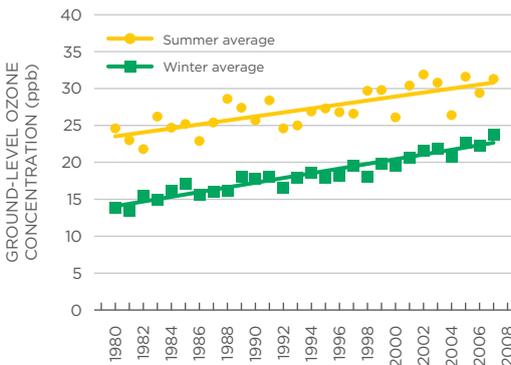




## 7 Pollution—Ground-level Ozone

Ground-level ozone is one of the most significant air pollutants in terms of impacts to biodiversity and human health. It can irritate eyes and cause respiratory problems in humans and affects crop production, tree growth, plant species composition and carbon sequestration. Harm occurs when levels go above 40 parts per billion (ppb), which commonly occurs in southern and eastern Ontario in the summer. In Ontario, the highest concentrations of ground-level ozone occur in southwestern areas of the province on hot and sunny summer days.

This indicator looks at seasonal averages of ground-level ozone at sites across Ontario and the highest 8-hour daily average concentrations during summer at sites in southern and eastern Ontario.



Seasonal averages of ground-level ozone at sites across Ontario (1980–2007). (source: Ontario Ministry of the Environment 2008).

### STRATOSPHERIC OZONE VS. GROUND-LEVEL OZONE: WHAT'S THE DIFFERENCE?

Stratospheric ozone is formed in the upper atmosphere and is the “ozone layer” that protects life on Earth from the sun’s damaging ultraviolet rays.

Ground-level ozone is formed by chemical reactions near the surface of the Earth and is harmful to people, plants, and animals.

### STATUS

- From 1980 to 2007 ground-level ozone increased across the province by 30% in the summer and 60% in the winter.
- From 1990 to 2006, the highest 8-hour daily average concentration of ground-level ozone in southern and eastern Ontario increased by approximately 15%. Human and environmental health risks from exposure to ground-level ozone increased over this period.
- Most values were above the ground-level ozone threshold of 40 ppb at which impacts to biodiversity can occur. Some areas had readings over 100 ppb.

**TREND**  
DETERIORATION



**DATA CONFIDENCE**  
HIGH





## 8 Pollution—Freshwater Quality Index

Lakes and streams play a very important role in sustaining biodiversity. Pollution from industry and urban areas and runoff from agricultural lands can affect freshwater quality and its ability to support aquatic life.

This indicator uses the Water Quality Index (WQI) to measure the health of 80 monitoring sites in Ontario. The Freshwater Quality Index combines multiple measurements of nutrient and metal pollutants and rates sites as poor, marginal, fair, or excellent/good based on their ability to support aquatic life.

### STATUS:

- 58% of assessed aquatic monitoring sites in Ontario were considered good or excellent, while 33% were considered fair, 8% were considered marginal, and 1% were considered poor.
- All of the sites with marginal and poor ratings were in the southwestern portion of the Mixedwood Plains Ecozone.



Status of freshwater quality for protection of aquatic life at monitoring sites in Ontario, 2004–2006; WQI—Water Quality Index (source: Environment Canada 2008).

TREND  
BASELINE



DATA CONFIDENCE  
HIGH



*Small stream near London*



Photo: OMNR

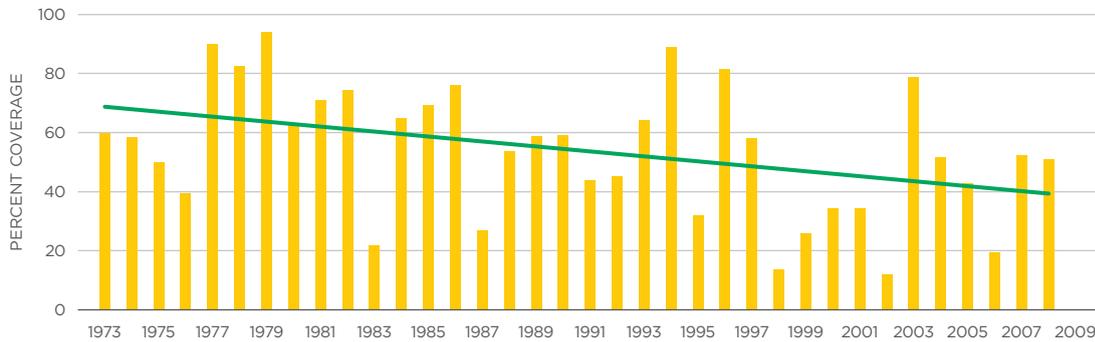


## 9 Climate Change—Ice Cover on the Great Lakes

Changes in ice cover on northern hemisphere lakes are a strong signal of global climate change. Changes in freeze-up and break-up times can affect the food supply for aquatic life, alter fish spawning, and cause birds to change their migration patterns. Less ice means more

water may evaporate and turn into snow which will fall across the area.

This indicator assesses changes in the amount of ice formed on the Great Lakes each year over the last 40 years.

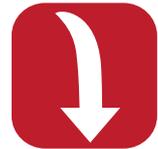


Observed changes in seasonal maximum ice cover on the Great Lakes 1973–2008 (source: Karl et al. 2009).

### STATUS

- Between 1970 and 2008, a decrease in the maximum amount of ice that formed each year was observed on all the Great Lakes. There was at least a 17% decline in the percentage of each lake that was covered in ice annually. On Lakes Michigan and Ontario the decline in ice cover was about 40%.
- Between 1970 and 2008, the maximum amount of ice that formed annually declined the most on Lake Michigan, followed by Lakes Ontario, Superior, Erie and Huron.

**TREND**  
DETERIORATION



**DATA CONFIDENCE**  
MEDIUM



Lake Superior



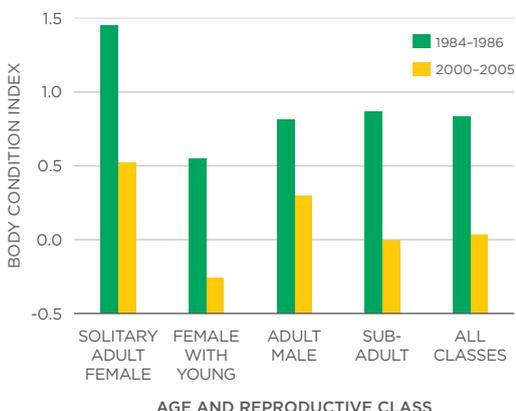
Photo: Ontario Tourism



# 10 Climate Change—Body Condition and Survival of Polar Bears

Polar Bears are threatened by climate change because they rely on sea ice for feeding, mating and resting. The period of ice cover in southern Hudson Bay and James Bay has decreased by 3 weeks since the mid 1970's, giving Polar Bears less time to hunt and build up their fat stores.

This indicator measures the health (body condition) and annual survival rates of Polar Bears in southern Hudson Bay.



### STATUS:

- Significant declines in body condition are apparent for Polar Bears. Pregnant females and juvenile bears have been the most affected.
- Declines in survival are apparent for male and female Polar Bears of all ages in the Southern Hudson Bay subpopulation.
- This suggests that less sea ice caused by climate change is negatively affecting the body condition and overall survival of Ontario's Polar Bears.

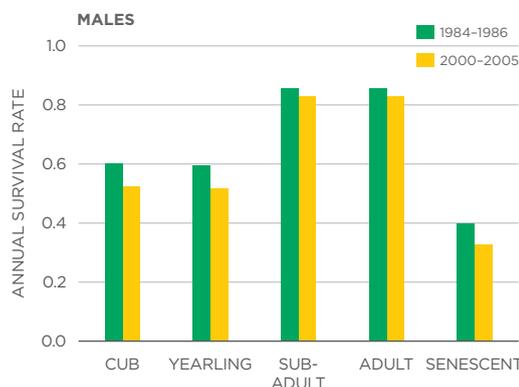
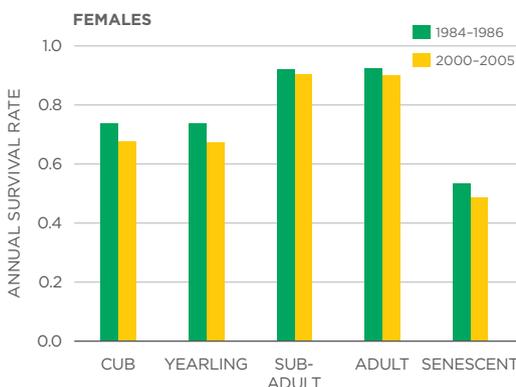
**TREND**  
DETERIORATION



**DATA CONFIDENCE**  
HIGH



Changes in average body condition index values for Southern Hudson Bay Polar Bears captured in Ontario between 1984-1986 and 2000-2005 (adapted from Obbard et al. 2006).



Comparison of annual survival rates of Polar Bears in the Southern Hudson Bay subpopulation between 1984-86 and 2003-05 (adapted from Obbard et al (2007)).

# State of Ontario's Biodiversity



Despite Ontario's growing human population, most of the province remains covered by natural systems like forests, wetlands, lakes and streams that sustain biodiversity. This section of the report looks at the state of these natural systems and the species that inhabit them.

*Atikokan*



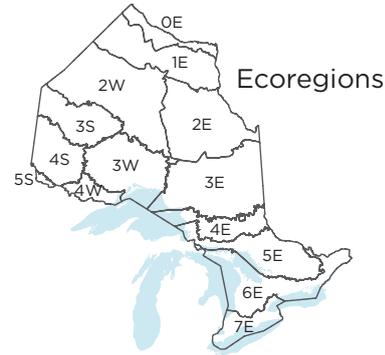
Photo: Ontario Tourism



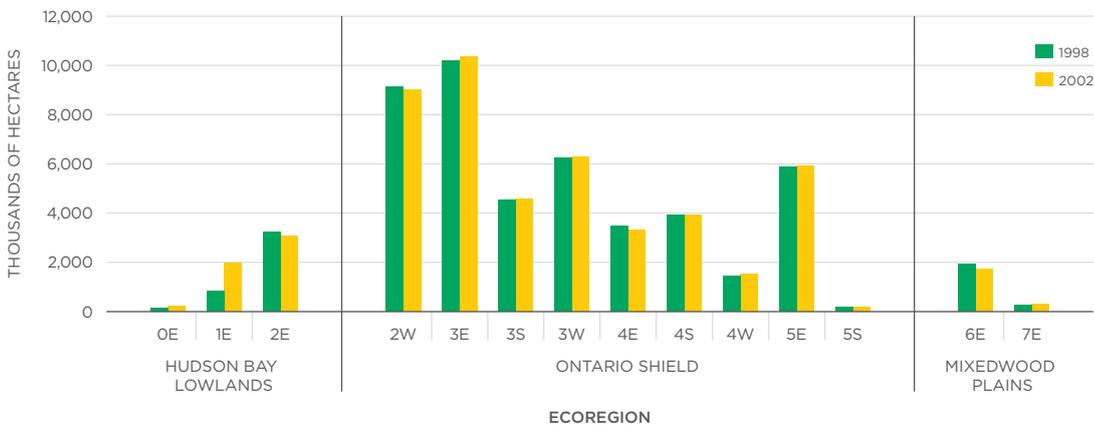
# 11 Forests—Forest Cover and Disturbance

More than one half of Ontario’s land base is forested (52%). Permanent loss of forest cover due to development has negative impacts on forest-dependent species. Disturbances like fire, insects, and timber harvest can change the composition of forests, but the forest cover on the landscape is maintained through regeneration. These disturbances may negatively impact some species and favour others.

based on geology, climate, vegetation, soil, and landform features. The amount of forest disturbed by fire and harvest was also evaluated.



This indicator examines the total area of forest in ecoregions within each ecozone in 1998 and 2002. Ecoregions are subdivisions of ecozones



Total area of forested land by ecoregion in each ecozone in 1998 and 2002 (source: OMNR 2006). Map shows ecoregions within each ecozone.

## STATUS:

- The total amount of Ontario’s forested land remains relatively stable. The slight increase between 1998 and 2002 (especially in the Hudson Bay Lowlands) is mostly due to using higher resolution images in 2002.
- More than one half of Ontario’s land base is forested, and 87% of the forested land is found in the Ontario Shield Ecozone.
- The amount of land harvested and burned annually are similar and together represent about 1% of the forested area on Ontario’s Crown lands.

**TREND**  
NO CHANGE



**DATA CONFIDENCE**  
MEDIUM





# 12 Forests—Forest Fragmentation in the Mixedwood Plains Ecozone

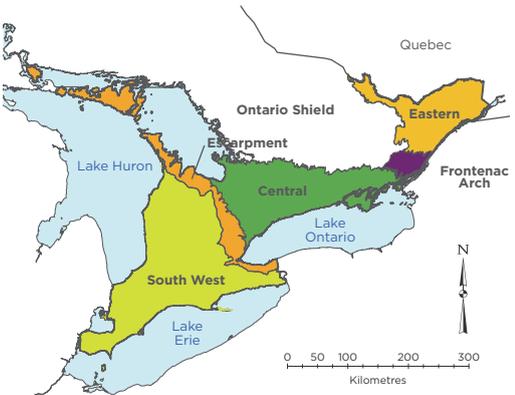
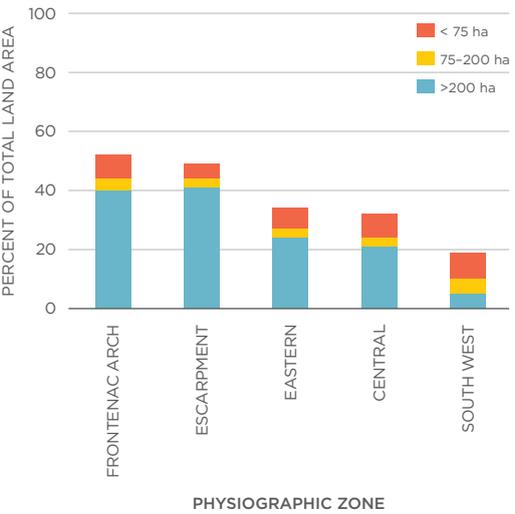
Many species rely on large areas of habitat to live, mate, grow, and find food. When habitat is broken down into small pieces—called fragmentation—biodiversity can be negatively affected. For example, many forest interior birds can't live in an area if it is less than 30% forested or only consists of small forest patches less than 75 ha.

This indicator assesses the amount of forest cover and the size of forest patches in five different physiographic zones (see map below) of the Mixedwood Plains Ecozone.



Photo: John Butterill

Northumberland County



Percent forest cover and size of forest patches by physiographic zone in the Mixedwood Plains Ecozone (source: OMNR 2009).

**STATUS:**

- With only 17% forest cover, forest fragmentation may be affecting bird species diversity and biodiversity in the South West zone.
- The Escarpment and Frontenac Arch zones, with 41% and 40% land area in forest patches greater than 200 ha, respectively, have extensive forest habitat compared to other areas in the ecozone.

- The Southwest Zone has only 5% of its land area in forest patches greater than 200 ha. This zone represents 44% of the area of the Mixedwood Plains Ecozone.

**TREND**  
BASELINE



**DATA CONFIDENCE**  
MEDIUM





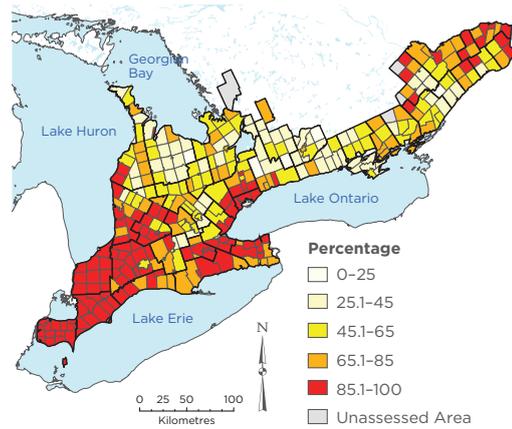
# 13 Wetlands—Wetland Losses in Southern Ontario

Wetlands are one of the most important ecosystems on the planet. Wetlands benefit both people and the environment. Wetlands stabilize shorelines, purify water, store water, help with flood control and stabilize climate by acting as carbon sinks. Many plants and animals also depend on wetlands as habitat for all or part of their lives.

Despite their importance, wetlands continue to be lost or destroyed due to development. Those that remain are under threat. This indicator measures the loss of wetlands in the Mixedwood Plains Ecozone between 1800 and 2002.

### STATUS:

- Historically the Mixedwood Plains had about 2 million ha of wetland representing 25% of the ecozone.
- By 1982, 69% or 1.4 million ha of wetlands had been lost to other uses.
- An additional 70,854 ha (3.5%) of wetlands were lost by 2002, representing a continuing loss of 0.17% per year.



Loss of original wetland area by township, from 1800 to 2002 (source: Ducks Unlimited Canada 2010).

**TREND**  
DETERIORATION



**DATA CONFIDENCE**  
MEDIUM



*Point Pelee*



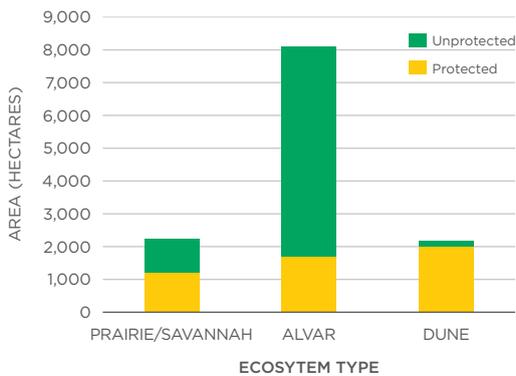
Photo: Ontario Tourism



# 14 Rare Ecosystems—Extent and Protection of Rare Ecosystems

Ontario's rare ecosystems like prairies, savannahs, alvars and freshwater coastal dunes are home to many rare species not found elsewhere and are important to biodiversity. There are 403 of these rare ecosystems that have been documented in Ontario; 75% of these occur in the Mixedwood Plains Ecozone. Some of these rare ecosystems are legally protected in provincial and national parks, national wildlife areas, and conservation reserves.

This indicator compares the total area of rare ecosystems in Ontario with the area of rare ecosystems that is legally protected in the province.



Total area of prairie/savannah, alvar and dune ecosystems in Ontario showing amount of each type that is legally protected (source: NHIC database).



Photo: Wasył D. Bakowsky, NHIC Archives

*Alvar pavement in Misery Bay*

## STATUS:

- Alvar ecosystems cover more area than the other rare ecosystem types, but only 21% of their total area is legally protected.
- Just over half (54%) of the prairie/savannah area is legally protected.
- Ninety-two percent of the area of dune ecosystems is legally protected.

**TREND**  
BASELINE



**DATA CONFIDENCE**  
MEDIUM

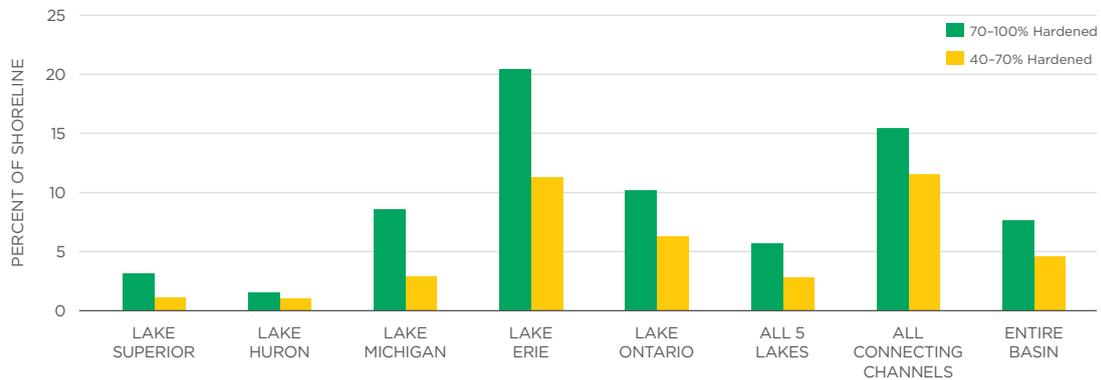




# 15 Aquatic Ecosystems—Extent of Shoreline Hardening in the Great Lakes

Much of the shoreline of the Great Lakes has been replaced with concrete or rock (shoreline hardening) to prevent erosion and reduce flood risks. This interferes with natural coastal process and can result in the loss of habitat and biodiversity—dunes disappear,

beaches are reduced, and coastal wetlands are affected. Shoreline hardening is very hard to reverse. This indicator assesses the amount of shoreline hardening along the Great Lakes and their connecting channels.



Extent of shoreline hardening within the Great Lakes and connecting channels. Connecting channels include: St. Mary’s River, St. Clair River, Lake St. Clair, Detroit River, Niagara River and St. Lawrence Seaway (source: SOLEC 2009).

### STATUS:

- Of the five Great Lakes, Lake Erie has the highest percentage of hardened shoreline, and lakes Huron and Superior have the lowest.
- More than one fifth of Lake Erie’s shoreline is 70-100% hardened.
- The connecting channels have experienced a higher percentage of shoreline hardening than all of the Great Lakes except Lake Erie.

**TREND**  
DETERIORATION



**DATA CONFIDENCE**  
MEDIUM



*Great Lakes shoreline hardening*



Photo: OMNR



# 16 Aquatic Ecosystems—*Diporeia* spp. in the Great Lakes

*Diporeia* spp. are species of small crustaceans that live at the bottom of deep cold lakes. They play a key role in the food web as many smaller fish eat *Diporeia*, and these fish are then eaten by larger fish like Lake Trout and salmon.

*Diporeia* used to be the most abundant bottom-dwelling organism in the deep, offshore areas of the Great Lakes but populations have been declining since the 1990s.

Because they are such an important part of the food chain in the Great Lakes, the health of *Diporeia* populations is representative of the

health of the deep coldwater communities of the Great Lakes. This indicator measures the distribution and abundance of *Diporeia* found in the Great Lakes over the last 10–20 years.

## STATUS

- *Diporeia* has declined drastically over the last 10–20 years in all of the Great Lakes except Lake Superior.
- *Diporeia* declines have coincided with the establishment of invasive Zebra Mussels and Quagga Mussels in each lake, however, the reasons for the declines are not well understood.

*Diporeia* sp.

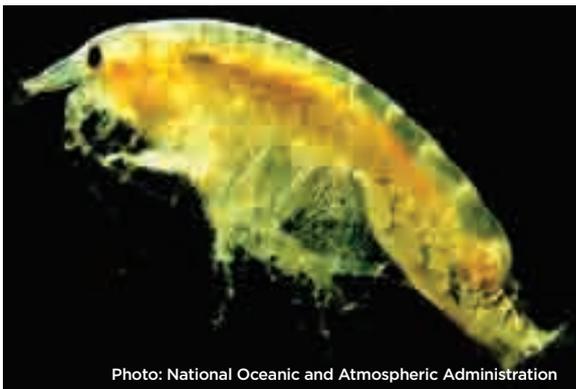
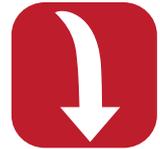
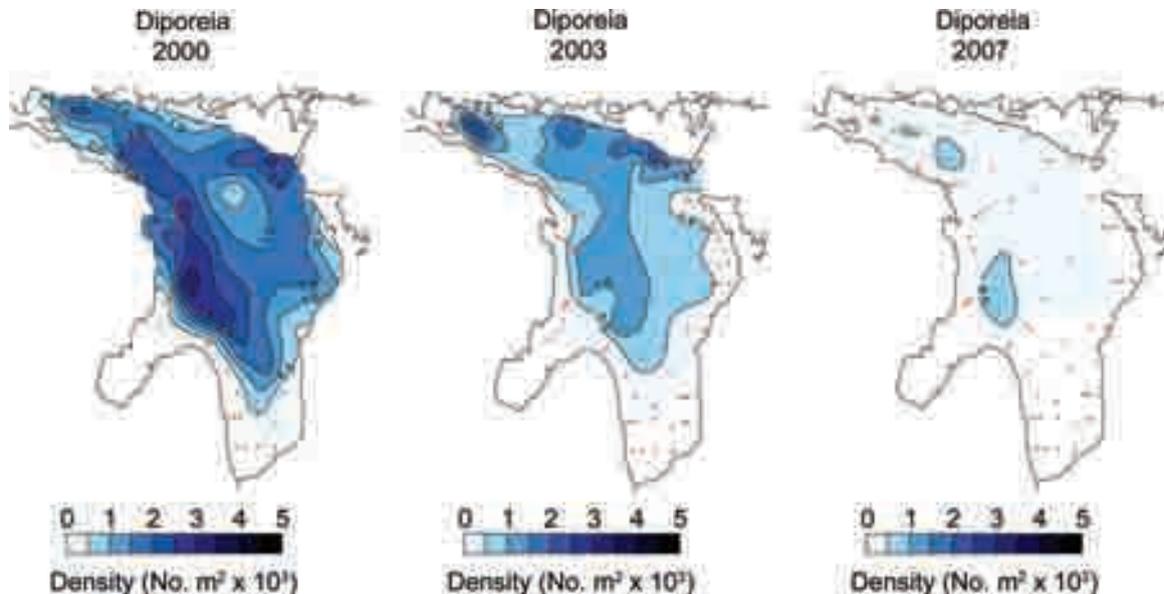


Photo: National Oceanic and Atmospheric Administration

**TREND**  
DETERIORATION



**DATA CONFIDENCE**  
MEDIUM



Distribution and abundance (number per square metre) of *Diporeia* spp. in Lake Huron in 2000, 2003, and 2007 (small crosses indicate sampling locations) (source: SOLEC 2009).



# 17 Aquatic Ecosystems—Alterations to Stream Flow

The amount of water flowing in a stream is determined by climate, the geology of the surrounding area, and the size and shape of its watershed. Stream flow is important in shaping the stream channel, creating habitat in the stream and in the adjacent riparian lands and floodplains. These habitats are important in determining the different species that can live in a given stream. The life cycles of aquatic species living in streams are based around predictable seasonal changes in stream flow.

Biodiversity can be harmed when the timing and amount of stream flow changes due to impoundments, urbanization of the surrounding area, and climate change.

Stream flow data from across the country have shown that annual and late summer flows tend to be decreasing in southern Canada and that

the spring melt is occurring earlier in the year. Although there are suitable data available from streams across Ontario, the detailed analyses of these long-term data sets could not be completed for this report. Therefore, the stream flow indicator is included in this report as 'not assessed'. It will be assessed in future reports.

**TREND**  
UNDETERMINED



**DATA CONFIDENCE**  
N/A



*Harris Creek*

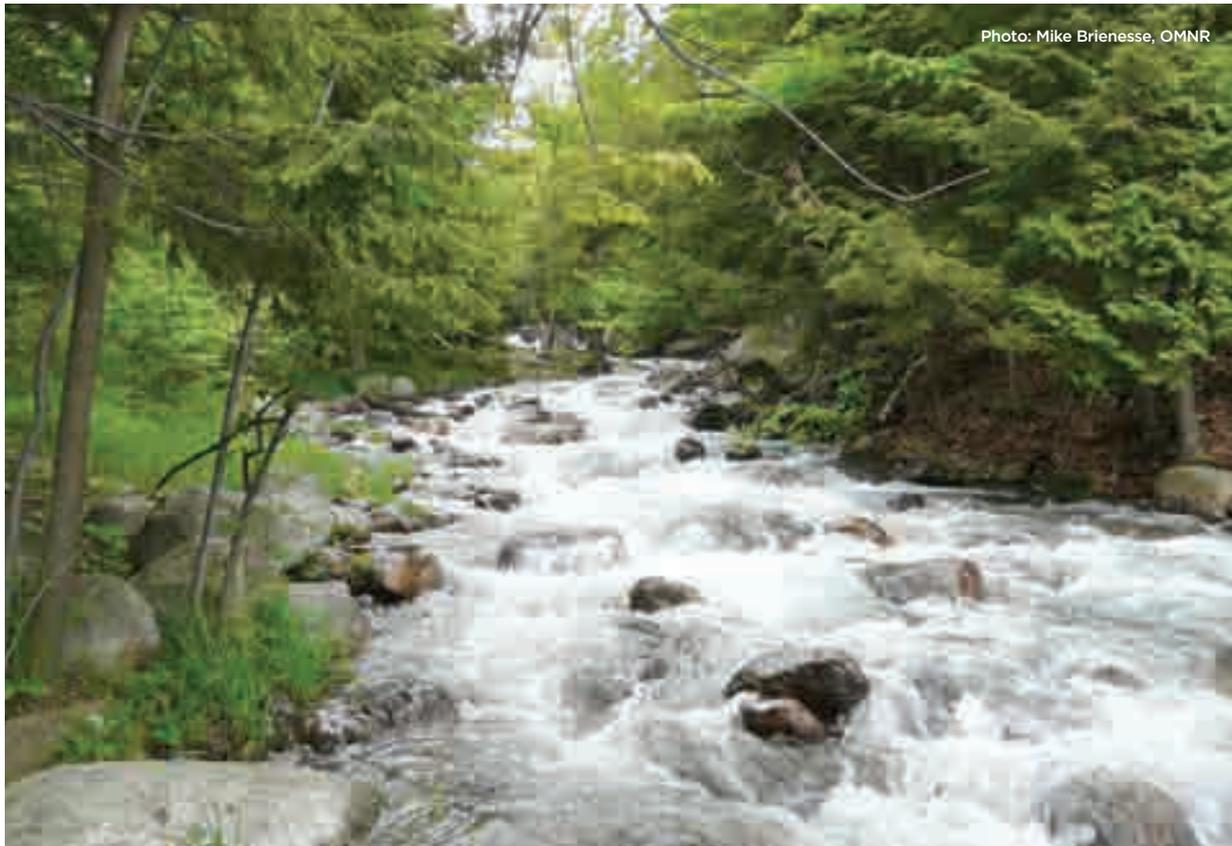


Photo: Mike Brienesse, OMNR



# 18 Aquatic Ecosystems—Stream Fragmentation and Flow Regulation by Dams

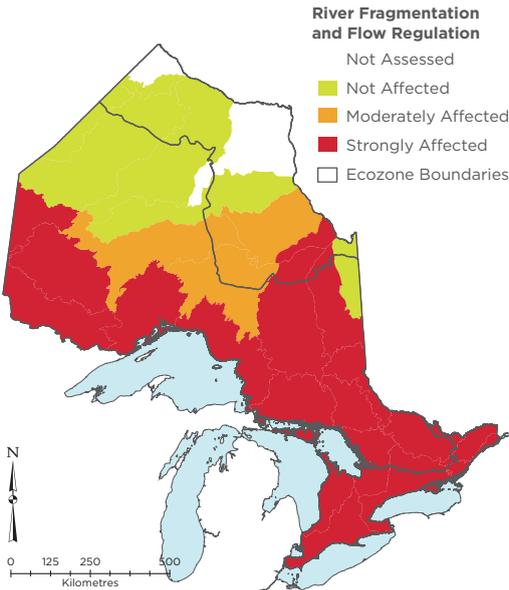
Dams impact aquatic biodiversity in many ways. They interrupt the flow of streams and change the amount and timing of flows. Upstream areas are often flooded, creating warmer lake-like conditions, and habitat downstream is often degraded. Dams can also break up aquatic habitats, splitting up populations and preventing migratory species from reaching spawning habitats.

A recent assessment of dam-based impacts on the world's large river systems (by Nilsson et al. 2005) that included Ontario showed that all of the watersheds in the southern half of the province are greatly affected by dams. Watersheds in the northwestern portion of the Ontario Shield and the northern portion of the Hudson Bay Lowlands are unaffected by dams.



Photo: Erika Thimm, OMNR

*Long-Sault Dam, St. Lawrence River*



The information for this assessment was too broad to determine more detailed status and trends for river systems in Ontario. Therefore, the stream fragmentation indicator is included in this report as 'not assessed'. It will be assessed in future reports.

**TREND**  
UNDETERMINED



**DATA CONFIDENCE**  
N/A



Impact classification of Ontario's large river systems based on river channel fragmentation and water flow regulation by dams (based on data from Nilsson et al. 2005).



# 19 Species Diversity—Status of Native Species in Ontario

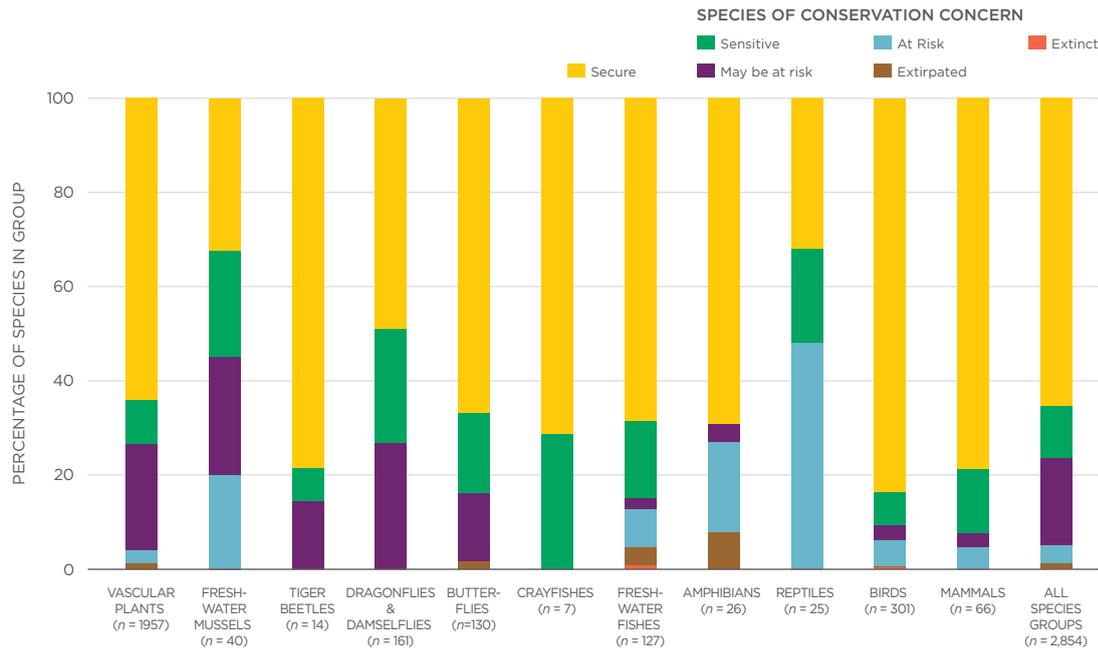
It is estimated that there are more than 30,000 species in Ontario. Most of these species are insects. Although many Ontario species are managed to provide sustainable harvests, numerous species are at risk of disappearing from the province due to threats such as habitat loss and invasive alien species. The General Status of Wild Species in Canada is assessed every 5 years ([www.wildspecies.ca](http://www.wildspecies.ca)). In 2005, the General Status program assessed 4,217 Ontario species.

This indicator looks at the proportion of species of conservation concern in each species group in 2005 and changes in the General Status ranks between 2000 and 2005.



Photo: Rob Tervo

*Spring Salamander—Extirpated from Ontario*



Proportion of Ontario native species in secure and conservation concern General Status rank categories, 2005 (n = number of secure species and species of conservation concern in group) (source: CESSC 2006).



Summary of changes in General Status rank of Ontario Species between 2000 and 2005.

DIRECTION OF GENERAL STATUS RANK CHANGE	REASON FOR GENERAL STATUS RANK CHANGE			TOTAL CHANGES	NO CHANGE
	Better information	Increasing risk	Decreasing risk		
into higher risk category	21	10	n/a	144	919
into lower risk category	54	n/a	0		
into Accidental or Exotic categories	5	n/a	0		
into Undetermined category	6	n/a	n/a		
out of Undetermined category	43	n/a	n/a		
taxonomic change, no rank in 2000	5	n/a	n/a		
<b>Total number of changes in rank</b>	<b>134</b>	<b>10</b>	<b>0</b>	<b>144</b>	
<b>Number of species with no change in rank</b>					<b>919</b>

Note: information in table represents changes in General Status ranks to ferns, orchids, butterflies, freshwater fishes, amphibians, reptiles, birds, and mammals that were assessed in 2000 and 2005. (source: NHIC, unpublished data).

*Narrow-leaved Spring Beauty—Secure in Ontario*



Photo: Sam Brinker, OMNR



### STATUS:

- The 2005 ranks show that 987 Ontario species are of conservation concern (i.e., Extinct, Extirpated, At Risk, May Be At Risk, or Sensitive), while 1,867 Ontario species are Secure, representing 23% and 44% of all assessed wild species in the province, respectively.
- Of the assessed groups, vascular plants account for the majority (72% or 3,055 species) of species. Similarly, most of the species of conservation concern (71% or 702 species) are vascular plants.
- Seventy-three percent of species of conservation concern (572 species) and 71% of the 13,402 occurrence records are within the Mixedwood Plains Ecozone.
- Birds have the highest proportion of secure species (84% of 301 species) of the groups assessed. Reptiles have the highest proportion of species of conservation concern (68% of 25 species), followed closely by freshwater mussels, and dragonflies and damselflies.
- Between 2000 and 2005, the General Status rank did not change for 919 of 1,063 species (86%) assessed, but 144 species changed status rank.

- Thirty-one species were ranked in a higher risk category in 2005. Twenty-one species were changed to a higher risk category as a result of a detailed assessment by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or the Committee on the Status of Species at Risk in Ontario (COSSARO). Ten species (nine birds and one fish) moved to a higher risk category due to increasing risks to these species.
- Fifty-four species were moved to a lower risk category. All of these changes were due to better information being available to assess the status of the species.

**TREND**  
MIXED



**DATA CONFIDENCE**  
HIGH



*Iowa Darter—Secure in Ontario*



Photo: Alan Dextrase, OMNR



# 20 Species Diversity—Trends in Ontario's Breeding Birds

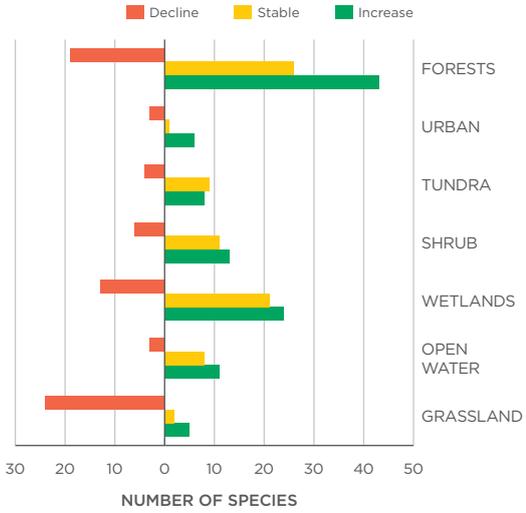
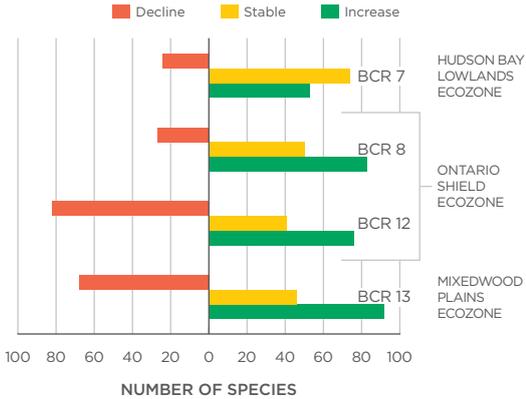
Birds are found throughout Ontario, in our backyards, parks, wetlands, and forests. Birds play an important role as seed dispersers, predators and scavengers and are an essential part of the province's biodiversity. We know a lot about Ontario's birds due in part to keen birdwatchers and volunteer-based surveys by "Citizen Scientists". This information makes it possible to do a detailed assessment of population trends for Ontario birds.

This indicator looks at long-term trends in the number and distribution of Ontario's breeding bird species in different regions and different habitats. Each species is categorized as declining, stable, or increasing.

*Cedar Waxwings*



Photo: Simon Dodsworth



Number of bird species showing long-term declining, stable or increasing trends in Ontario by Bird Conservation Region (top) and by habitat type (bottom).



## STATUS:

- Overall, the majority of birds that regularly breed in Ontario have either increasing or stable long-term population trends. Forest birds in particular seem to be doing well.
- Although birds in the north seem to be doing much better than birds in the more developed areas of southern Ontario, the state of our knowledge of northern breeding birds remains relatively poor.
- The guild of aerial insectivores (Whip-poor-will, Chimney Swift, swallows, Common Nighthawk and flycatchers) is declining at an alarming rate (>50% decline) for unknown reasons.

- Birds that rely on grassland and agricultural habitats in southern Ontario are also showing steep population declines (>50% decline).

**TREND**  
MIXED



**DATA CONFIDENCE**  
HIGH



*Northern Hawk Owl*



Photo: Simon Dodsworth

# Conservation and Sustainable Use



The establishment of protected areas and conservation lands is an essential component of biodiversity conservation programs. The effective management of the intervening landscape is also essential to the maintenance of biodiversity over a large scale. This section examines the extent of Ontario's protected areas and conservation lands, participation in sustainable management systems and stewardship programs, the extent of stewardship activities, and the financing of biodiversity conservation programs.

*Woodland Caribou Provincial Park*



Photo: OMNR



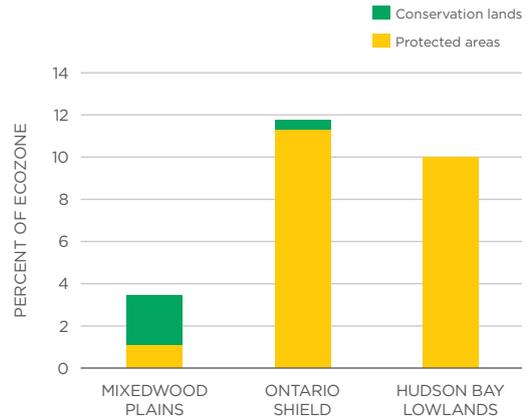
# 21 Protected Areas and Conservation Lands— Protected Areas and Conservation Lands by Ecozone

Ontario has 650 regulated protected areas (provincial parks, conservation reserves, wilderness areas, and national parks) as well as numerous conservation lands including lands and easements held by the Nature Conservancy of Canada (15,588 ha), Ontario Nature (2,437 ha), and Ducks Unlimited Canada (368,054 ha), and Ontario’s 36 conservation authorities (141,838 ha).

This indicator looks at the amount of protected areas and conservation lands within each of Ontario’s terrestrial ecozones.

### STATUS:

- 9.1% of Ontario’s land base is protected within provincial and national parks, conservation reserves and wilderness areas. This is slightly lower than the national average of 9.9%.
- Seventy-four percent of Ontario’s protected areas occur within the Ontario Shield Ecozone.
- The proportion of ecozone area in protected areas and conservation lands is highest in the Ontario Shield Ecozone (11.8%), followed by the Hudson Bay Lowlands Ecozone (10.0%), and the Mixedwood Plains Ecozone (3.5%).



Percentage of protected areas and conservation lands in each terrestrial ecozone (adapted from OMNR 2008).

*Killarney Provincial Park*

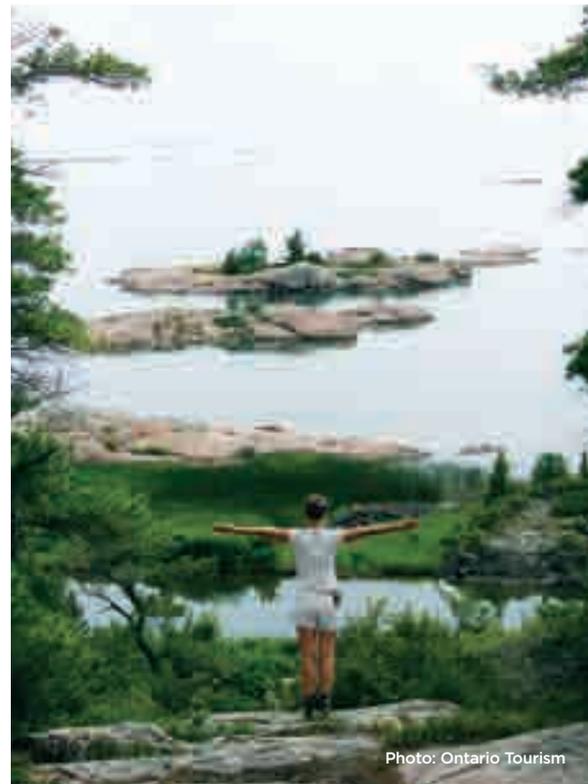


Photo: Ontario Tourism

**TREND**  
BASELINE



**DATA CONFIDENCE**  
MEDIUM



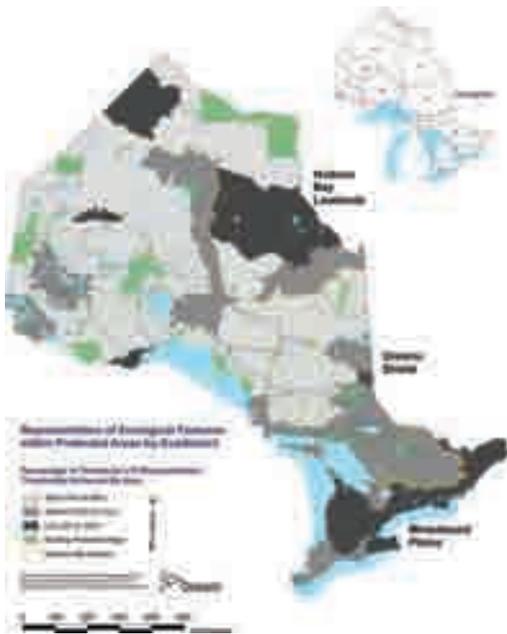
(medium to low for conservation lands)



## 22 Protected Areas and Conservation Lands—Ecological Representation in Ontario’s Protected Areas

Ecological representation is one of the ecological criteria used when creating a protected area such as a park. It’s a way of ensuring that the full range of Ontario’s diversity is identified and protected.

This indicator assesses how well protected areas represent Ontario’s landforms and vegetation. As a minimum, 1% (or 50 ha, whichever is greater) of each landform/vegetation type should be represented in protected areas of each ecoregion. Ecoregions are subdivisions of ecoregions that are characterized by distinctive groupings of landform, relief, geology, soil, waterbodies, and vegetation.



Representation of terrestrial life science features by ecoregion in Ontario’s protected area system (adapted from OMNR 2010).

### STATUS:

- Protected areas are best distributed among natural features in the Ontario Shield.
- Nearly all of the protected area in the Hudson Bay Lowlands is within Polar Bear Provincial Park. The identification of additional protected areas in this ecozone (and the northern portion of the Ontario Shield) will be done through community-led land use planning for traditional territories as part of the Far North Land Use Planning Initiative.
- Nearly all natural features in the Mixedwood Plains are underrepresented.
- Minimum ecological representation thresholds have not been achieved for any ecoregion in the province. However, in many ecoregions and ecoregions, Ontario has met its park class targets, which help to ensure that appropriate sizes and classes of parks are distributed throughout the province.

**TREND**  
BASELINE



**DATA CONFIDENCE**  
HIGH

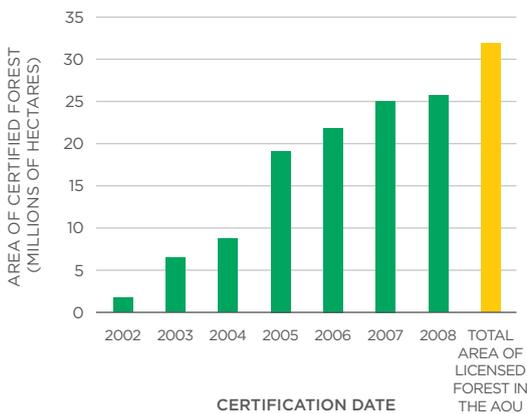




# 23 Sustainable Management—Sustainable Forest Management and Certification

Over half of Ontario’s forests are in an area known as the Area of the Undertaking (AOU) which covers most of the Ontario Shield Ecozone. Most forests in the AOU are publicly owned. Forest companies hold Sustainable Forest Licenses and manage Forest Management Units in the AOU. Under the *Crown Forest Sustainability Act* and related regulations and policies, these forests must be managed sustainably and biodiversity must be maintained in the short term and the long term. Properly-managed forests conserve biodiversity, maintain wildlife habitat and species diversity, protect special biological and cultural sites, maintain soil and water resources, and are protected from deforestation. Forest certification provides independent ‘third Party’ verification that a forest is well-managed, as defined by a particular standard.

This indicator reports on the area of management unit forest in the AOU certified under a sustainable forest management standard from 2002–2008.



Area of management unit forest in the AOU under forest certification (2002-2008) compared with total area of licensed forest in the AOU. (source: Annual reports on Forest Management, OMNR [www.mnr.gov.on.ca/en/Business/Forests/Publication/MNR\_E000163P.html])



Photo: © Eric Goethals, FSC

FSC Certified log with stamp of approval

## STATUS

- In 2009, Ontario had 31.9 million ha of management unit forest under Sustainable Forest Licence.
- The amount of independently certified forest grew from about 8 million ha in 2004 to over 25 million ha in 2008 (about 80% of the licensed area).
- Because most of the land south of the AOU is privately owned, sustainable management of southern Ontario forests often occurs on a voluntary basis. Almost 82,000 ha of privately owned forest have been certified since 2004.

TREND  
IMPROVEMENT



DATA CONFIDENCE  
HIGH

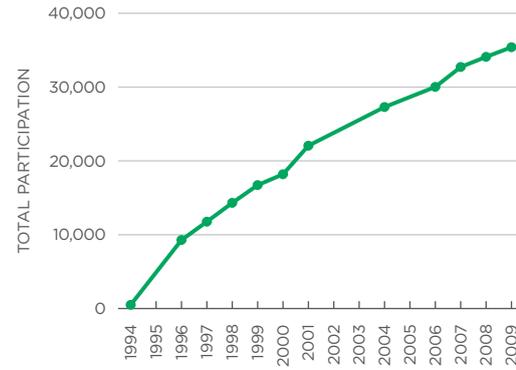




# 24 Sustainable Management—Environmentally Sustainable Agriculture Program

Ontario has about 57,000 farms and over 5 million ha of farmland. The Canada-Ontario Environmental Farm Plan (EFP) program encourages farmers to use sustainable farming practices. Runoff control, improved manure storage, and nutrient management planning, restricting livestock access to waterways, establishing buffers, restoring wetlands, and controlling invasive plant species provide direct benefits to biodiversity.

This indicator reports on the number of participants preparing EFPs and the implementation of best management practices.



Number of participants in Ontario's Environmental Farm Plan program, 1994-2009 (source: OMAFRA).

Algoma



Photo: Ontario Tourism

## STATUS

- A total of over 35,000 farms (~65% of farms in Ontario) have participated in the Environmental Farm Plan program since 1992. Participation rates have risen substantially since 2005. This is largely due to Ontario's new agricultural policy framework and increased financial incentives to implement best management practices.
- Between April 2005 and November 2009, 17,515 environmental farm projects were implemented. About 25% of these projects relate directly to biodiversity.

**TREND**  
IMPROVEMENT



**DATA CONFIDENCE**  
HIGH





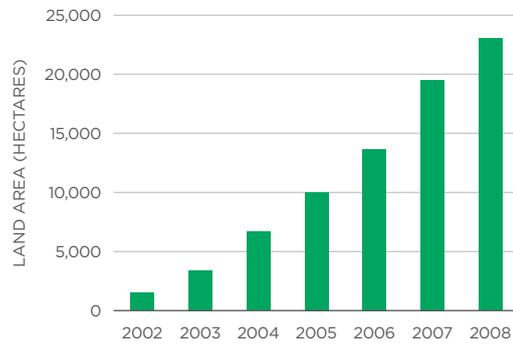
## 25 Biodiversity Stewardship—Area with Stewardship Activities

Stewardship activities are defined as actions that lead to responsible land care and sustainable resource use. Stewardship activities include planting trees, improving wetlands and riparian areas, and removing invasive species. Most stewardship activities are organized by non-profit groups and take place on privately owned land. Stewardship is important to maintaining Ontario’s biodiversity.



Photo: Brianne Fennema

This indicator reports on trends in the area of Ontario in which stewardship activities have taken place. Information from 2002–2008 to support this indicator was collected from selected conservation organizations who maintain databases on stewardship activities.



Cumulative area with stewardship activities in Ontario, 2002–2008 (source: Ducks Unlimited Canada, Conservation Ontario, and the Ontario Ministry of Natural Resources’ Ontario Stewardship Program).

### STATUS:

- Since 2002, stewardship activities have occurred on 23,399 ha of habitat.
- Stewardship activities take place on an average of 3,343 ha of habitat each year.

**TREND**  
IMPROVEMENT



**DATA CONFIDENCE**  
MEDIUM





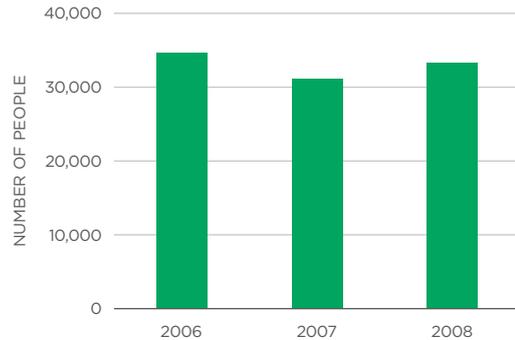
## 26 Biodiversity Stewardship—Number of Individuals Volunteering to Conserve Biodiversity

People can make a positive impact on biodiversity. Groups such as school children and private landowners volunteer to plant trees, rehabilitate barren lands, carry out restoration activities or fundraising campaigns, and donate their time or act as good stewards of their land.

This indicator reports on trends in the number of people in Ontario who volunteer their time to protect and enhance biodiversity. Data to support this indicator was collected from selected conservation organizations that maintain databases on stewardship activities.

### STATUS:

- Between 2006 and 2008, an average of 33,000 Ontarians volunteered annually on biodiversity conservation projects or initiatives surveyed for this report. This represents about 0.3% of Ontario's population.



Number of people volunteering to conserve biodiversity in Ontario, 2006–2008 (source: Conservation Ontario, Ducks Unlimited Canada, Ontario Nature, the Nature Conservancy of Canada, and the Ontario Ministry of Natural Resources' Ontario Stewardship Program).

**TREND**  
BASELINE



**DATA CONFIDENCE**  
MEDIUM



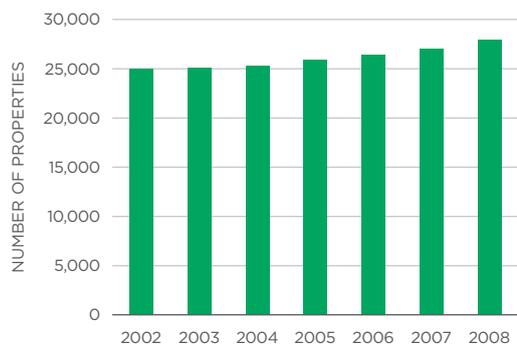
Photo: Heather Bickle, OMNR



## 27 Biodiversity Stewardship—Participation in Provincial Tax Incentive Programs

Ontario has two tax incentive programs that encourage biodiversity conservation and stewardship. The Conservation Land Tax Incentive Program (CLTIP) supports private stewardship of Ontario’s provincially significant conservation lands. It provides property tax relief to landowners who agree to protect the natural heritage values of their properties. The Managed Forest Tax Incentive Program (MFTIP) promotes forest stewardship and minimizes the long-term decline of forest cover. Eligible landowners receive a tax reduction for preparing and following Managed Forest Plans. Both programs are voluntary.

This indicator reports on the number of properties with landowners enrolled under these two tax incentive programs.



Number of Ontario properties with landowners enrolled in the Conservation Land Tax Incentive Program or Managed Forest Tax Incentive Program, 2002–2008 (source: OMNR).



Photo: Larry Watkins, OMNR

### STATUS:

- Participation in biodiversity tax incentive programs in Ontario has increased. Between 2002 and 2008, participation rates for the two programs combined have increased by 11%.

**TREND**  
IMPROVEMENT



**DATA CONFIDENCE**  
HIGH





# 28 Urban Biodiversity—Wooded Area within Urban Landscapes in the Mixedwood Plains Ecozone

Urban biodiversity is important in connecting people with nature in cities. For many people, experience with nature is largely limited to their backyard or a local park. Buildings, roads and parking lots fragment and degrade natural habitats, reduce the variety of plant and animal species, and disrupt natural ecosystems. The amount of wooded area in urban environments reflects how much disruption these ecosystems are facing.

This indicator assesses the amount of wooded areas in urban landscapes of the Mixedwood Plains Ecozone.

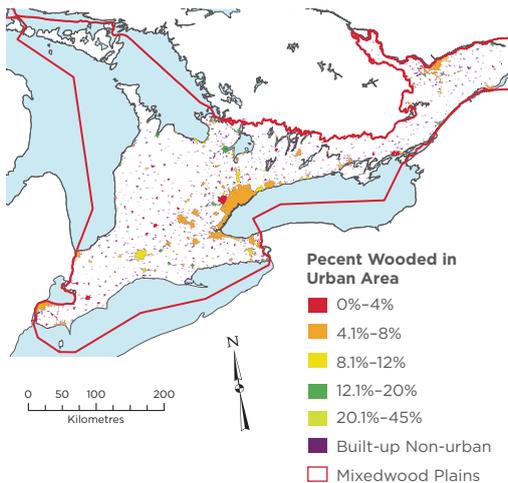
### STATUS:

- The total area of urban land in the Mixedwood Plains Ecozone is estimated at 4,765 km<sup>2</sup>. Wooded areas make up approximately 7.8% of this urban landscape.

**TREND**  
BASELINE



**DATA CONFIDENCE**  
MEDIUM



Percentage of wooded area within urban areas in the Mixedwood Plains Ecozone in 2006 (excluding Manitoulin and St. Joseph Islands) (adapted from OMNR 2009).

*Peterborough*



Photo: OMNR



# 29 Financing Biodiversity Management—Provincial Expenditure and Charitable Giving

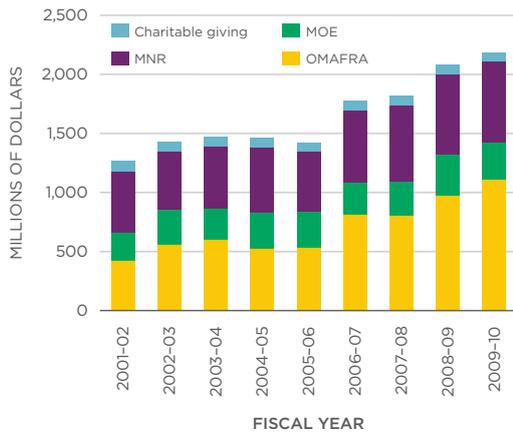
Biodiversity management and conservation is supported through public spending, charitable giving by individuals, and donations and management activities of business and industry, Aboriginal communities and conservation groups.

This indicator assesses money spent on biodiversity conservation over the past decade from the provincial public sector and charitable giving of individuals. For the public sector, the provincial Ministries of Natural Resources (MNR), Environment (MOE), and Agriculture, Food and Rural Affairs (OMAFRA) are included because the majority of their programs align

with activities relevant to biodiversity. It should be noted that not all of the expenditures related to these ministries and charitable giving provide direct benefits to biodiversity.

### STATUS:

- From 2001-02 to 2009-10, expenditures of the biodiversity-related provincial ministries increased by 79%. Over the same period, the provincial budget increased by 42% and the Gross Domestic Product (GDP) increased by 15% (all values indexed for inflation).
- Between 2001-02 and 2009-10, the three provincial ministries most directly involved in conservation and environmental management were given 1.8-2.4% of the total provincial budget. The percentage has increased slightly since 2005-06.
- Allocation of resources to biodiversity management and conservation from the provincial public sector and charitable giving represented 0.4% of Ontario's GDP in 2008.



Provincial spending by biodiversity-related provincial ministries and charitable giving to the environment. (source: Ministry of Finance—Expenditure Estimates of the Province of Ontario, and Hall et al. 2006, 2009).

**TREND**  
IMPROVEMENT



**DATA CONFIDENCE**  
MEDIUM



# Summary

Ontarians are placing large demands on the province's biological resources. Biodiversity losses are occurring, particularly in southern Ontario. Ontario's population is growing and the province's biodiversity will continue to be lost if current trends continue. Although efforts and spending to protect and conserve biodiversity have increased over the last decade, these have not been enough to stop losses of the province's biodiversity.

Hudson Bay Lowlands biodiversity has been the least affected by human activity. Almost all of the ecozone consists of natural land cover and this area contains some of the few large river systems in the world that are unaffected by dams. Climate change is expected to have a large impact on this ecozone.

The Ontario Shield is the largest ecozone in the province. Two thirds of the Ontario Shield's landscape is forested with limited loss of forest habitat. There has been a steady increase in the certification of forest harvest. Humans have impacted biodiversity mostly in the southern part of the region.

Most of Ontario's population lives in the Mixedwood Plains Ecozone and biodiversity has been greatly affected there. The landscape has been highly altered with 68% of the ecozone made up of built-up areas, agriculture, roads and other anthropogenic cover. Despite the altered landscape, the Mixedwood Plains is still home to the highest diversity of species in Ontario. More species of conservation concern and rare ecosystems are found in this ecozone than in other parts of Ontario.

The biodiversity of the Great Lakes Ecozone has been impacted by a long history of human use. Invasive alien species have been a particular problem for Great Lakes biodiversity. There are now at least 186 aquatic alien species and the rate of new invasions has increased. Nearshore habitat loss, changes in species and climate change all affect Great Lakes biodiversity.

Information gaps that became apparent during the selection, development and assessment of biodiversity indicators include the lack of standardized, broad-scale monitoring for many aspects of biodiversity, the lack of comprehensive analysis of some existing data sets, the age of existing data, and the identification of suitable indicators to assess some aspects of Ontario's biodiversity.

## *Kawartha Highlands*



Photo: Wasył D. Bakowsky, NHIC Archives

# Looking Ahead

Ontario's Biodiversity Strategy recommends reporting on the state of Ontario's biodiversity every 5 years. The next report is scheduled for 2015. The 2010 report will be used as a baseline for future reporting, but it is likely that some new indicators will be developed to address

gaps in the current report. The Ontario Biodiversity Council intends to update the content of the 2010 report on the Council's web site ([www.ontariobiodiversitycouncil.ca](http://www.ontariobiodiversitycouncil.ca)) with new information and as indicators are developed.

## Summary of status, trends, and data confidence for each indicator used in the State of Ontario's Biodiversity 2010 report.

INDICATOR	STATUS	TREND	DATA
Ecological Footprint	high per capita footprint and limited biocapacity		
Habitat Loss—land cover	significant habitat loss in Mixedwood Plains, but limited habitat loss in the Ontario Shield and Hudson Bay Lowlands		
Habitat Loss—road density in southern Ontario	67% increase in total length of road from 1935-1995, length of paved road increased almost 5-fold over this period		
Habitat Loss—corridors in the Ontario Shield	low road densities except southern portion and near urban centres, small increase in road area 2001-2005 (0.02%)		
Habitat Loss—aquatic stress index	high stress index values in Mixedwood Plains and southern Ontario Shield, low values in Hudson Bay Lowlands		
Invasive Alien Species—Great Lakes	large number of alien species present in Great Lakes (186) and invasion rate has increased		
Pollution—ground-level ozone	increasing background levels and increasing 8-hour peak levels during the summer		
Pollution—freshwater quality index	58% of sites with good or excellent ratings, but 41% with fair, marginal or poor ratings mostly in southwestern Ontario		
Climate Change—Great Lakes ice cover	decline in percentage of ice cover on all five Great Lakes between 1970-2008		
Climate Change—condition and survival of Polar Bears	reduced condition and survival rates for male and female Polar Bears in all age classes		

TREND: Improvement Deterioration No Change Mixed Baseline Undetermined

DATA CONFIDENCE: High Medium Low N/A

**Summary of status, trends, and data confidence for each indicator used in the State of Ontario's Biodiversity 2010 report** (continued).

	INDICATOR	STATUS	TREND	DATA
State of Ontario's Biodiversity	Forests—extent of forest cover and disturbance	amount of forested land remained stable between 1998 and 2002		
	Forests—fragmentation in Mixedwood Plains Ecozone	4 of 5 zones have >30% forest cover, but largest zone (SW) has only 17% with limited habitat for forest-interior birds		
	Wetlands—losses in southern Ontario	from 1982–2002, wetland losses continued in the Mixedwood Plains at a rate of 0.17% per year.		
	Rare Ecosystems—extent and protection	54% of prairie/savannah habitat legally protected, 92% of dune habitat protected, only 21% of alvar protected		
	Great Lakes—Great Lakes shoreline hardening	> 30% of Lake Erie shoreline and 25% of GL connecting channels have high proportion of hardened shoreline		
	Great Lakes— <i>Diporeia</i> abundance in Great Lakes	drastic declines in abundance in all Great Lakes except Lake Superior over the last 10–20 years		
	Inland Waters—alterations to stream flow	not assessed		
	Inland Waters—fragmentation by dams	not assessed		
	Species Diversity—changes in General Status rankings	919 of 1,063 species had same ranks in 2000 and 2005. 10 species moved to higher ranks because of increased risks		
	Species Diversity—trends in Ontario's breeding birds	most species increasing or stable (especially forest birds and northern birds), aerial foragers and grassland birds declining		
Conservation and Sustainable Use	Protected Areas—protected areas and conservation lands	11.3% of Ontario Shield, 10.0% of Hudson Bay Lowlands, and 3.5% of Mixedwood Plains protected		
	Protected Areas—ecological representation	minimum representation thresholds have not been achieved for any ecodistrict, Ontario Shield has best representation		
	Sustainable Management—forest certification	area under forest certification increased dramatically since 2002, 80% of licenced land base certified in 2008		
	Sustainable Management—agriculture	65% of Ontario farms (35,000) have participated in environmental farm plans since 1992		
	Stewardship—area enhanced for biodiversity	cumulative and annual area enhanced for biodiversity continued to increase from 2002 to 2008		
	Stewardship—volunteer efforts to conserve biodiversity	between 2006 and 2008, 33,000 Ontarians volunteered annually on biodiversity conservation initiatives		
	Stewardship—participation in tax incentive programs	participation rate in conservation tax incentive programs (CLTIP and MFTIP) increased 11% between 2002 and 2008		
	Urban Biodiversity—wooded area in urban landscapes	wooded areas account for 7.8% of the 4,765 km <sup>2</sup> of urban landscape within the Mixedwood Plains Ecozone		
	Financing—expenditures and charitable giving	since 2001, spending by biodiversity-related ministries has increased significantly		

TREND: Improvement Deterioration No Change Mixed Baseline Undetermined

DATA CONFIDENCE: High Medium Low N/A

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# Sources of Information for Indicators

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Stechbart, M., and J. Wilson. 2010. Province of Ontario ecological footprint and biocapacity analysis. Copyright by Global Footprint Network, Oakland, CA.

### 2 *Habitat Loss—Percentage of Land Cover Types*

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Ducks Unlimited Canada. 2010. Southern Ontario wetland conversion analysis: Final Report. Ducks Unlimited Canada, Barrie, ON.

**14 Rare Ecosystems—Extent and Protection of Rare Ecosystems**

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**15 Great Lakes—Extent of Shoreline Hardening in the Great Lakes**

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**16 Great Lakes—Diporeia spp. in the Great Lakes**

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**20 Species Diversity—Trends in Ontario's Breeding Birds**

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**23 Area Under Sustainable Management Systems—Sustainable Forest Management and Certification**

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Conservation Ontario, Newmarket, ON.

Ducks Unlimited Canada, Barrie, ON.

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**26 Biodiversity Stewardship—Number of Individuals Volunteering to Conserve Biodiversity**

Conservation Ontario, Newmarket, ON.

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**27 Biodiversity Stewardship—Participation in Provincial Tax Incentive Programs**

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**28 Urban Biodiversity—Wooded Area Within Urban Landscapes in the Mixedwood Plains Ecozone**

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Ontario Ministry of Finance, Toronto, ON.



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