Office of the Auditor General of Ontario
Bureau de la vérificatrice générale de l'Ontario

Report on the State of the Environment in Ontario

May 2023

Why we prepared this report

- Our Office's 2021 audit, Reporting on Ontario's Environment, found that the Ministries of the Environment, Conservation and Parks, Natural Resources and Forestry and Agriculture, Food and Rural Affairs are not providing consolidated information to give the public, stakeholders and decision-makers an assessment of the overall condition of Ontario's environment and natural resources.
- Consolidated reporting can provide government decision-makers, businesses and citizen groups with a clearer picture about whether our air, water, soil and wildlife populations are getting better or worse.

Why it matters

- Ontarians rely on the natural environment for water, food, energy and resources. Fresh air and access to clean water, beaches, parks, conservation areas and other green spaces are vital for our health and well-being. However, pollution, development, a changing climate and other pressures can negatively affect our environment, natural resources and agricultural sustainability. Left unchecked, degradation and damage of ecosystems can harm Ontario's economy and Ontarians' health and quality of life. Ontarians have a right to know how decisions and actions of the past have an impact on the environment.

What we found

The State of Air in Ontario

- Overall, Ontario's air quality has improved dramatically over the past several decades. Various factors have contributed to this, including improved pollution-control equipment for vehicles and industry, fewer industrial sources of air pollution, and the phase-out of coal-fired electricity between 2005 and 2014.
- Concentrations in the air of many contaminants, including fine particulate matter, sulphur dioxide and nitrogen dioxide, have all decreased over the last three decades.
- There are some exceptions to these positive trends. For example, air concentrations of ground-level ozone, which can trigger asthma and other breathing problems, have been increasing. Also, some urban and industrial areas in Ontario have poorer air quality than the rest of the province.

SEE SECTION 2.0

The State of Water in Ontario

- Water quality in the Great Lakes has improved in many ways over the past half-century. However, nearshore algae blooms have been increasing in parts of Lake Erie and Lake Ontario over the past decade, and microplastics are a growing concern in Lake Ontario, and to a lesser extent, Lake Erie. Microplastics are plastic particles less than five millimeters in size that can carry toxins and cause intestinal and other damage if consumed.
- In inland lakes, levels of phosphorus (which contribute to algae blooms), and acidity (which can threaten sensitive aquatic plants and animals) are generally improving, though some lakes continue to have excess phosphorus and acidity.
- In overall water quality for rivers and streams, 60% of monitored rivers and streams in Ontario are rated "fairly poor" to "very poor" based on biological health, and 41% are rated "marginal" to "poor" based on water chemistry.
- Groundwater quality and trends vary. About 11% of groundwater monitoring wells sampled between 2002 and 2019 had chloride levels that exceeded the Ontario Drinking Water Aesthetic Objective—meaning it can affect taste and sodium intake for people who drink the water—and 3% of the monitored wells had chloride concentrations high enough to cause more severe impacts.

SEE SECTION 3.0

The State of Land and Waste in Ontario

- Cropland, which comprises 4% of Ontario's total land area, has experienced declines in soil quality. Agriculture and Agri-Food Canada's census data in 2016 (the most recent year available) showed that 58% of the province's cropland is at moderate to very high risk of soil erosion, which can reduce long-term crop productivity and yields. The 2016 data also shows that 87% of cropland is losing soil carbon annually, which can contribute to climate change.
- Through reuse, recycling and composting, Ontario increased the percentage of waste diverted from landfill from 19% in 2002 to 29% in 2020. However, because the total volume of generated waste remains high, the amount of waste sent to landfills has remained at over 8 million tonnes per year and, despite a longer-term declining trend, increased by 7% between 2016 and 2020. Assuming current waste generation, diversion and export levels, the province's current landfill capacity is capable of accepting only up to 10 to 13 more years of waste.

SEE SECTION 4.0

The State of the Climate in Ontario

- In 2020, the province's greenhouse gas emissions were 27% lower than in 2005. Ontario's emissions peaked in 2000 and have gradually fallen since then, partly due to phasing out Ontario's coal-fired electricity generation.
- However, increased levels of global greenhouse gas emissions are altering both global and local climate conditions in many ways. For example:
  - The annual number of weather-related disasters, such as severe rain or ice storms, has increased over the past 100 years, from at most one per year in the early 1900s to an average of about three per year since 2000.
  - The long-term trend shows a clear gradual increase in Ontario's surface air temperature. From 1948 to 2020, the average annual air temperature in Ontario increased by approximately 0.02°C per year (about 1.5°C over the 73-year record). The increase in surface temperature is most evident during the winter months, with an average increase for the winter season of 0.03°C per year (about 2.0°C over the 73-year record).
  - Increased temperatures can affect many aspects of Ontario's environment, including algae and plant growth, and the average maximum ice cover across all of the Great Lakes, which is 26% lower than it was almost 50 years ago. Changes in ice cover can affect the life cycles of fish and other organisms in lakes, as well as shipping in the Great Lakes.

SEE SECTION 5.0

The State of Nature and Wildlife in Ontario

- More than two-thirds of southern Ontario has been converted to agricultural land and urban areas since European settlement in the early 1800s, resulting in the loss and degradation of natural ecosystems, such as wetlands and forests. Between 2000 and 2015, approximately 13,455 hectares (1.3%) of wetland cover in southern Ontario—were lost. Although the Ministry of Natural Resources and Forestry set targets in 2017 to halt and reverse the net loss of wetlands in southern Ontario, these targets are no longer in effect.
- Forests cover nearly two-thirds of Ontario, and overall, a diversity of forest types continues to be maintained. However, the number of hectares lost to deforestation each year is almost four times greater on average than the number of hectares established as new forests. Deforestation in southern Ontario more than doubled from 2009 to 2018, with agricultural development accounting for most of the increase.
- While the Province does not collect comprehensive, long-term data on wild pollinators, some species, like the rusty patched bumble bee, have declined dramatically. For managed honey bees, the percentage of colonies that fail to survive each winter has ranged from a low of 11% in 2005/06 to a high of 58% in 2013/14, with 15% overwinter mortality considered the maximum acceptable level for populations to be sustainable.

- Invasive species, which are alien (non-native) species that can disrupt ecosystems, continue to spread in Ontario. For example, the number of alien aquatic species in the Great Lakes has increased steadily at an average rate of 10 new species per decade since the first one was observed in the 1830s.
- As of January 2022, 2,763 (or 28%) of categorized species in Ontario were of conservation concern (have a higher likelihood of being or becoming extinct or locally extinct). Reptiles, mosses and freshwater mussels are the most vulnerable to extinction, with 73%, 69% and 49% of those species, respectively, considered species of conservation concern in Ontario. Southern Ontario has one of the highest concentrations of species at risk of extinction in Canada, primarily due to the loss and degradation of habitat from human activities.

SEE SECTION 6.0

Read the report at www.auditor.on.ca