



INDICATOR: ONTARIO'S ECOLOGICAL FOOTPRINT AND BIOCAPACITY

STRATEGIC DIRECTION: Reduce Threats

TARGET: 9. By 2020, the growth of Ontario's per-capita resource consumption and waste generation is halted and reversed.

THEME: Pressures on Biodiversity – Consumption

Background Information:

Human activities affect biodiversity directly through habitat loss, introduction of invasive species, pollution, unsustainable use and climate change. The growing population combined with increasing levels of consumption drive these threats and often compromise the ability of our ecosystems to produce natural resources and to absorb waste (i.e., biological capacity or biocapacity). To manage biological capacity sustainably, resources must not be used more quickly than ecosystems can regenerate them.

Since the 1970s, humanity has been in ecological overshoot with annual demand on resources exceeding what Earth can regenerate each year. Recent analyses show that resource consumption levels have doubled over the last 50 years and currently exceed the Earth's regenerative capacity by 51% (WWF 2014, Zokai et al. 2015). Global overshoot can have major environmental implications, including degradation of ecological assets, depletion of natural reserves, biodiversity loss, and ecosystem collapse. While discrete threats to biodiversity can be identified (e.g., the loss of forest habitat to urban development), the overall unsustainable use of biological resources – driven by human consumption patterns, technology and population levels - represents a suite of cumulative stresses on biodiversity and is a major factor driving biodiversity loss.

The Ecological Footprint is a metric that assesses humanity's demand for natural resources and identifies whether our collective consumption levels are approaching or exceeding the Earth's ecological limits. The Ecological Footprint is widely recognized as a strong measure of environmental sustainability and is used by governments and institutes worldwide. The Ecological Footprint has been used as an indicator at the global level to assess progress on the Aichi Biodiversity Targets (Secretariat of the Convention on Biological Diversity 2014). While the Footprint does not measure biodiversity loss directly, it tracks global pressures on biodiversity and can be used to complement other measures of ecosystem-specific impacts on biodiversity (Galli et al. 2014). The strength of the Ecological Footprint is that it makes a direct comparison between resource availability and resource consumption and looks at total human demand on global ecosystems rather than giving a limited view of the sustainable use of a single commodity or industry.

This metric 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). This is directly compared to biocapacity and captures the extent and productivity of key ecosystems that support human populations, in terms of the products these ecosystems provide (including food, fibre and timber, and capacity to absorb carbon dioxide emissions).



These measures are human-centred and only include products provided by ecosystems that can be directly harvested for human use (food, fibre and timber).

This indicator examines trends in Ontario's Ecological Footprint and Biocapacity for the years 2005 and 2010 based on analysis completed by the [Global Footprint Network](#).

Data Analysis:

The Ecological Footprint is measured in global hectares, or actual hectares of land weighted according to the bioproductive capacity of each type of land. An Ecological Footprint of 5 global hectares per person means that it takes 5 hectares of world average productive land and water to support human consumption and waste assimilation. This provides a holistic picture of all resource demand regardless of where it takes place or what type of land is utilized.

The Ecological Footprint is calculated by taking the total mass of each product consumed (tonnes of wood, for example), dividing by yield for that product (in tonnes per hectare), then multiplying by the yield factor and equivalence factor. The yield factor accounts for differences between provincial and world yields for the land-use type in question. The equivalence factor takes into account differences in world average productivity between the various land-use types (e.g., cropland, forest land, fishing grounds). Biocapacity is calculated by multiplying the area devoted to each land-use type (e.g., forest land) by the respective yield and equivalence factors for that land-use type.

National Footprint Accounts developed by the [Global Footprint Network](#) are the basis for all Ecological Footprint analysis. The current analyses for this indicator are based on the 2014 edition of the National Footprint Accounts for the data years 2005 and 2010. Results reported for 2005 in the State of Ontario's Biodiversity 2010 (OBC 2010; Stechbart and Wilson 2010) were based on the 2008 edition of the National Footprint Accounts. The results from 2005 were reanalysed using the 2014 edition to ensure that the two time periods were directly comparable.

Source data for Ontario's Ecological Footprint and Biocapacity come from a number of international organizations, including the United Nations Food and Agriculture Organization and the International Energy Agency, as well as Statistics Canada, the Ontario Ministry of Agriculture, Food and Rural Affairs, and the Ontario Ministry of Natural Resources and Forestry. The Ecological Footprint and Biocapacity for Ontario in 2010 were compared to values from 2005 to assess trends (Figure 1). Trends in the Ecological Footprints of Canada and Ontario were also compared over this period (Figure 2). Ontario's Ecological Footprint was also compared to 2010 levels for other countries with available data (Figure 3).

The information presented in this indicator represents a summary of a technical report prepared by the Global Footprint Network (Zokai et al. 2015).

- [View Ecological Footprint and Biocapacity trends for individual nations](#)



Results:

Trend: Mixed Data Confidence: Medium Geographic Extent: Provincial

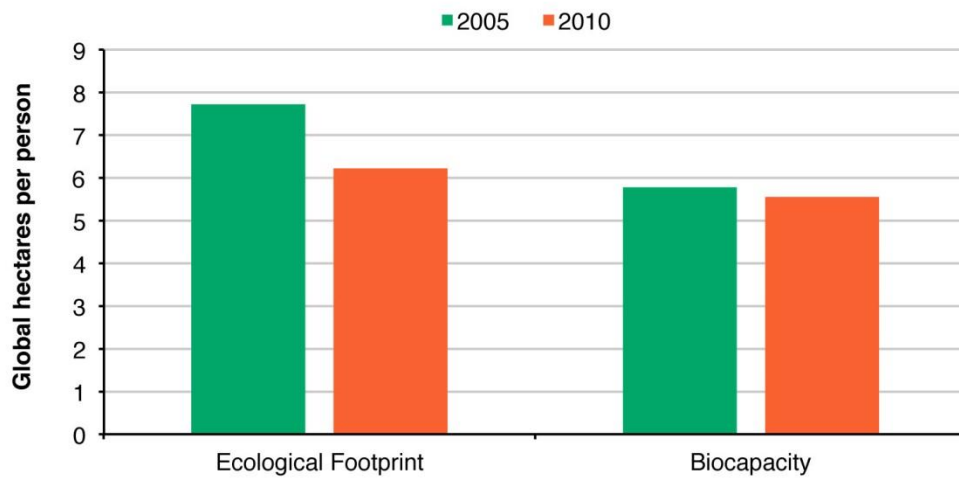


Figure 1. Comparison of trends in Ontario’s Ecological Footprint and Biocapacity per person, 2005-2010.

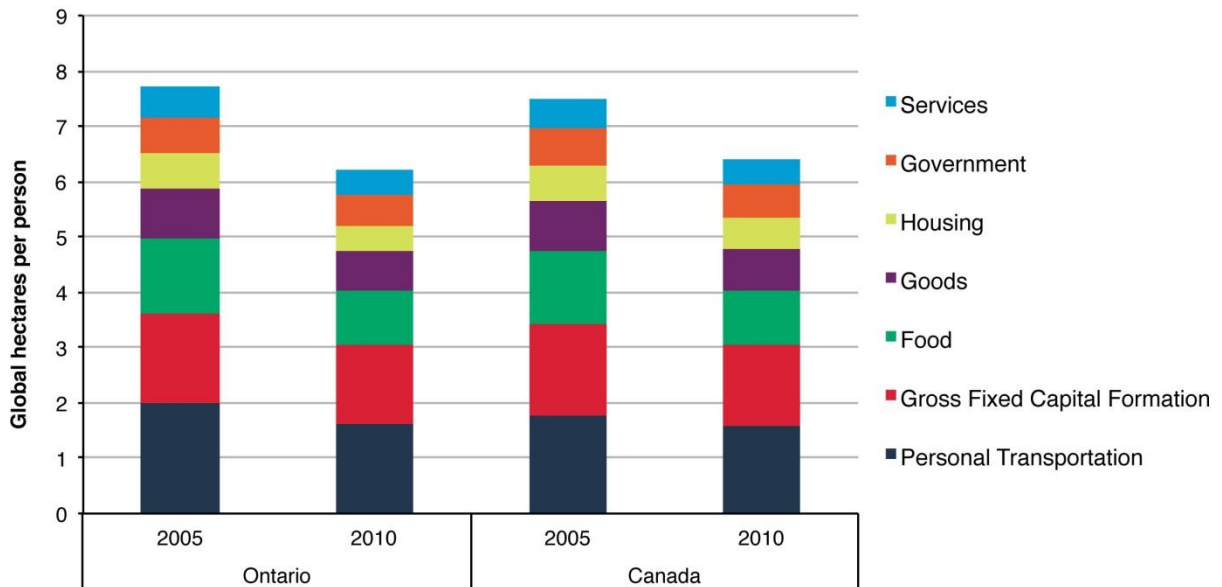


Figure 2. Comparison of trends in the Ecological Footprints per person of Ontario and Canada based on consumption category, 2005-2010.

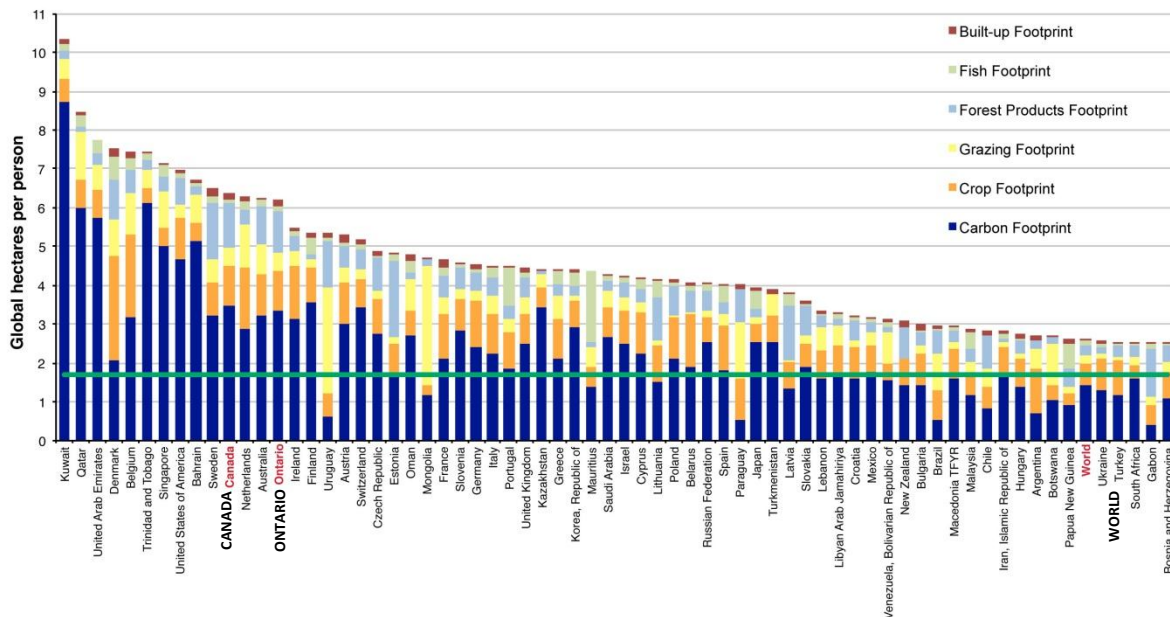


Figure 3. 2010 Ecological Footprint per capita for 66 countries with the highest Ecological Footprint, compared with Ontario (Horizontal green line represents average world biocapacity of 1.7 gha per person).

Status:

- Ontario’s per capita Ecological Footprint decreased by almost 20% between 2005 and 2010 (from 7.71 to 6.21 global hectares per person), while Canada’s decreased by about 15% over the same period. The overall Ecological Footprint of the Ontario population decreased by 15%. The decrease in Ontario’s Ecological Footprint is largely due to decreased energy intensity and is related to reduced greenhouse gas emissions.
- Despite this reduction, Ontario’s demands for resources in 2010 remained relatively high with only 13 nations having a higher per capita Ecological Footprint. In 2005, only eight nations were higher than Ontario. If everyone in the world live comparable lifestyles to the residents of Ontario based on the 2010 Footprint results, Humanity would require the resources of 3.7 planet Earths to support itself.
- In 2010, the Carbon Footprint was the largest element of Ontario’s Ecological Footprint by demand type. Personal transportation was the most significant component of Ontario’s Footprint by consumption type.
- The capacity of the province’s biological resources to support these demands is limited. Ontario’s per capita biocapacity in 2010 was reduced from 2005 (from 5.8 to 5.6 global hectares per person due to increasing population size), and was about 10% lower than the per capita Ecological Footprint. Overshooting Ontario’s biocapacity can cause the loss of biodiversity and ecosystem services that provide benefits to people.

**Links:**

Related Targets: N/A

Related Themes: N/A

Web Links:

Global Footprint Network <http://www.footprintnetwork.org/>

References:

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WWF. 2014. Living planet report 2014: species and spaces, people and places. McLellan, R., Iyengar, L., Jeffries, B. and N. Oerlemans (Eds). WWF, Gland, Switzerland.

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Citation

Ontario Biodiversity Council. 2015. State of Ontario's Biodiversity [web application]. Ontario Biodiversity Council, Peterborough, Ontario. [Available at: <http://ontariobiodiversitycouncil.ca/sobr> (Date Accessed: May 19, 2015)].