



INDICATOR: Percentage of land cover types in Ontario

Strategic Direction: Reduce Threats

Target: N/A

Theme: Pressures on Ontario's Biodiversity — Habitat Loss

Previous version: [Percentage of land cover types in Ontario 2015](#)

Background Information

Changes in land cover can provide critical information on broad-scale ecosystem changes and the causes and impacts of these changes. By using land cover mapping developed from satellite imagery, it is possible to track changes in land cover through time over broad areas. For this indicator, individual land cover classes were aggregated into five broader land cover types with relevance to biodiversity: anthropogenic cover, aquatic cover, disturbance cover, natural disturbance cover and natural terrestrial cover. At the ecozone scale, anthropogenic cover reflects threats to biodiversity, under the assumption that human-modified landscapes experience greater habitat loss and fragmentation than more natural landscapes. While some disturbances are caused by human activities (e.g. forestry), it's important to note that other disturbance types are a natural part of any ecosystem (e.g. insect outbreaks) and are necessary to maintain biodiversity.

This indicator shows trends in the proportion of broad land cover types in each of Ontario's terrestrial ecozones over the period 2000–2011, as well as the changes of the land cover types between 2011–2015 in the Mixedwood Plains Ecozone in the southern portion of the province.

Data Analysis

Classes of land cover from digital provincial data sets for the years 2000, 2011, and, 2015 were aggregated into five broad land cover categories (Table 1). In the Mixedwood Plains Ecozone of southern Ontario (with the exception of Manitoulin Island), land cover information from the Southern Ontario Land Resource Information System was used (SOLRIS; OMNRF 2019). SOLRIS version 1.2 (2000) was originally developed by integrating orthophoto based interpreted mapping and elevation model/satellite image based geospatial modelling. Each new version of SOLRIS is updated using automated Landsat satellite image change over time analysis of a previous version. In this way, SOLRIS version 3 (2015) is an update of SOLRIS 2.1 (2010). The change analysis process provides both an updated spatial inventory and summaries of mapping class change (e.g. area of change from forest to urban impervious). The extent of SOLRIS 3.0 is shown in Figure 1 and covers the Mixedwood Plains (except Manitoulin Island) and some southern portions of the Ontario Shield Ecozones.



Figure 1. Map showing SOLRIS extent (MNR 2019)

The remainder of the province was not analysed for this update as neither the Far North Land Cover 1.4 (FNL 2014; OMNRF 2014) nor the Provincial Land Cover 2000 (PLC2000; Spectranalysis Inc. 2004) have been updated since the last SOBR indicator report in 2015. Data from PLC2000 were used to assess land cover in the year 2000. The 2011 information for this large part of the province was assessed using two sources; the Far North Land Cover 1.4 which includes the entire Hudson Bay Lowlands Ecozone and the northern portion of the Ontario Shield Ecozone and an update to the rest of the PLC2000 that was incorporated spatial information maintained by the OMNRF on forest harvest, forest regeneration and burns. Among the various land cover products, the information for southern Ontario (SOLRIS) has the highest resolution and was developed using a more accurate classification method than the PLC2000, so distinguishing between real and methodological changes in this area is more problematic (OMNRF 2014); the PLC2000 land cover classes consist of vegetation types (such as forest, wetlands and agricultural crops or pasture) and categories of non-vegetated surface (such as water bodies, bedrock outcrops or settlements). These classes reflect the nature of the land surface rather than actual or potential land use (Ontario 2002).

Table 1. Broad land cover types used in analysis.

Broad land cover type	Land cover classes included
Anthropogenic cover	Built-up/settlement areas, roads, agriculture, and extraction (stone, sand and gravel, mines)
Aquatic cover	Open water of lakes and streams
Disturbance cover	Forest harvested within the previous 5-year period
Natural disturbance cover	Forest with recent burns, insect damage or blowdown
Natural terrestrial cover	Alvars, mudflats, prairies, savannahs, meadows, wetlands, forests, rock, open bedrock, marsh and other open country habitat

The trends in the proportion of broad land cover types in each of Ontario’s terrestrial ecozones over the period 2000–2015 are compared to assess for changes (Figure 2), as well as the changes of the land cover types between 2011–2015 in the Mixedwood Plains and Ontario Shield ecozones in the southern portion of the province (Figure 3).

Comparing land cover information through time using different datasets presents challenges. It may be difficult to determine if observed changes are related to real changes on the landscape or are related to differences in the accuracy and classification methods used. The use of broad land cover categories in this indicator addresses this concern to some extent. For example, the same area might be assigned to a forest class or a treed wetland class using different classification methods – these two classifications would be considered natural terrestrial cover in this analysis.



Results

Trend: Improvement Data Confidence: High Geographic Extent: Provincial

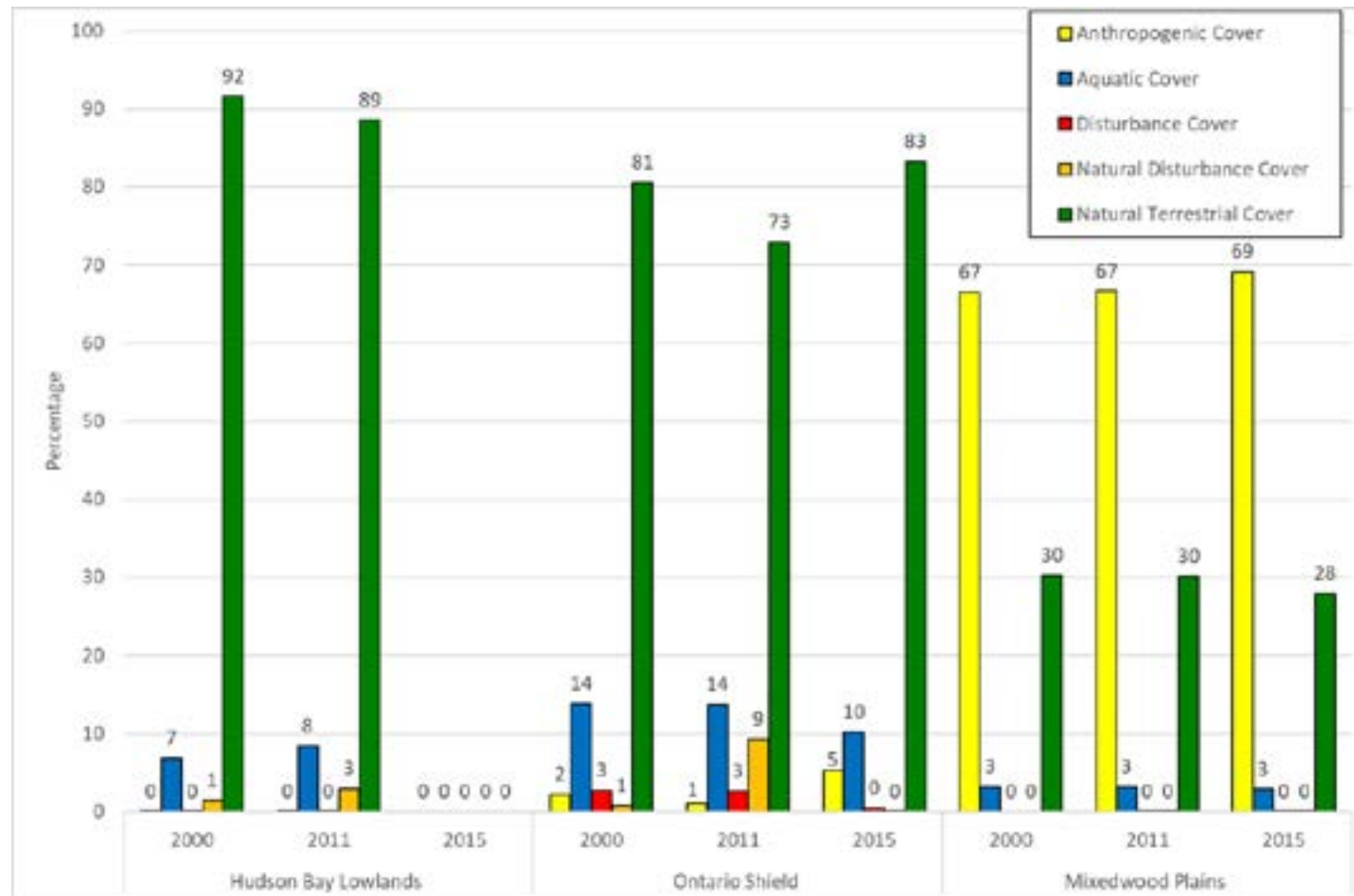


Figure 2. Comparison of percentage land cover composition for Ontario's ecozones (based on land cover current to 2000, 2011 and 2015, note: totals may not sum to 100% because of areas not classified due to cloud cover).

Note: The SOLRIS update for this review covers southern Ontario and therefore only the Southern part of the Ontario Shield was updated while the Hudson Bay Lowlands were not updated.

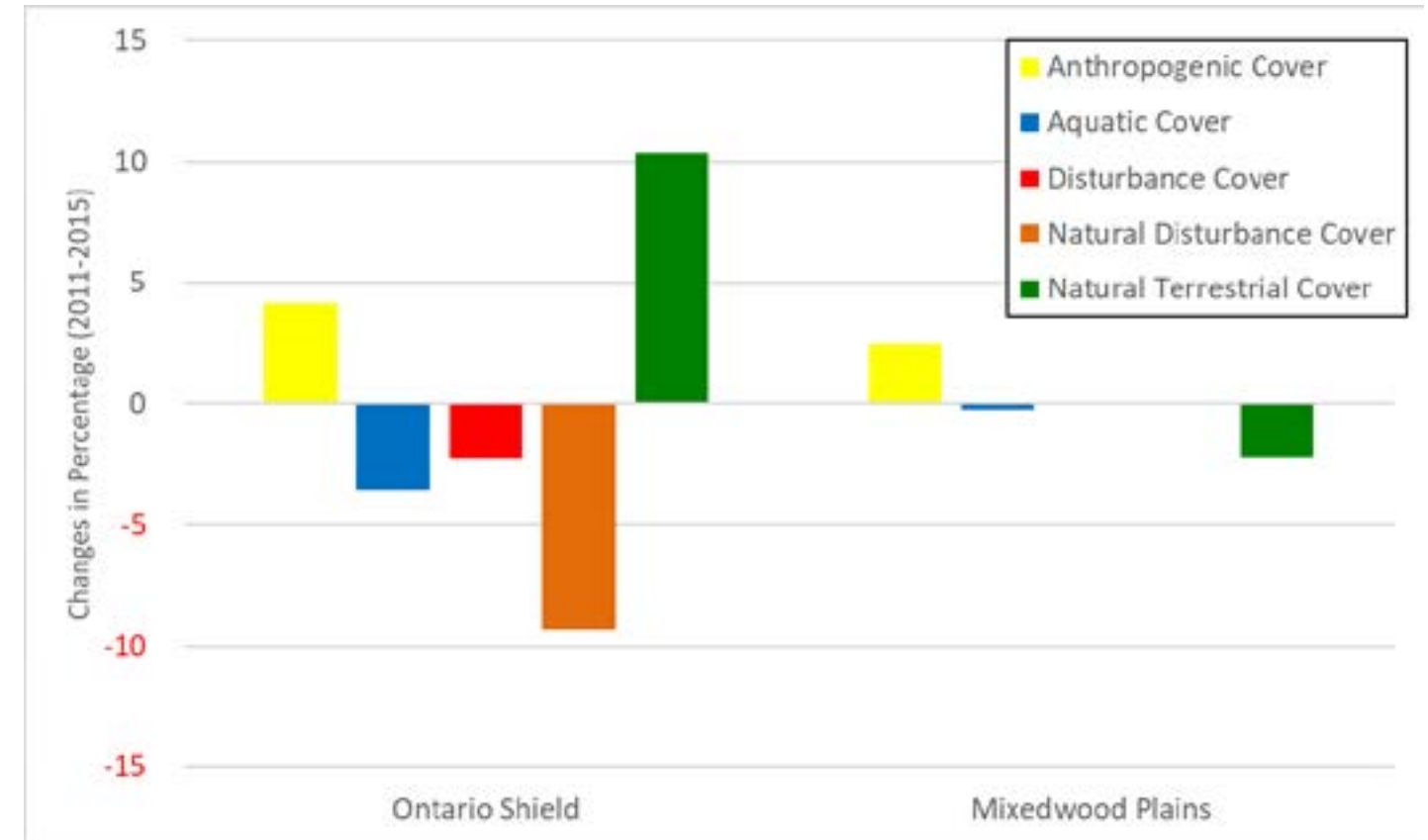


Figure 3. Changes in the percentage of land cover composition for Ontario ecozones between 2011–2015.

Note: The SOLRIS update for this review covers southern Ontario and therefore only the Southern part of the Ontario Shield was updated.

Status

- Anthropogenic cover remains highest in the Mixedwood Plains at 69%, up from 67% in 2011, and remains low in the in the Ontario Shield 5% (1% in 2011). Agriculture accounts for the majority of the anthropogenic cover in the Mixedwood Plains. These agricultural landscapes are an important source of food for Ontarians and provide food, fuel, and fibre to consumers beyond Ontario. In the MixedWood Plains urban development also plays a role in anthropogenic cover as the population grows and people choose to live within southern Ontario.
- In the Mixedwood Plains of southern Ontario, there was an increase in anthropogenic cover (2.49%) with a corresponding loss of natural terrestrial cover (-2.19%) between 2011 and 2015. This is a similar trend to that reported in SOBR 2015 which saw a very small increase of 0.14% to anthropogenic cover and a decrease of natural terrestrial cover by -0.12%. The amount of natural disturbance (burns) and disturbance from forest harvest remained extremely low in this ecozone.



- In 2019, the SOLRIS 3.0 boundary was expanded to cover a small portion of the Ontario Shield. In these areas an increase of 4% in anthropogenic cover, as well as a decrease of 9% in natural disturbance cover (e.g. blowdown, fire, insect and disease) and an increase in natural terrestrial cover by 10% (e.g. regeneration and plantation efforts) was observed.

Links

Related Targets: N/A

Related Themes: N/A

References

Ontario Ministry of Natural Resources and Forestry (OMNRF). 2019. Southern Ontario Land Resource Information System (SOLRIS) 3.0 – Ontario Ministry of Natural Resources and Forestry, Peterborough, ON.

Ontario Biodiversity Council. 2015. State of Ontario's Biodiversity. Ontario Biodiversity Council, Peterborough, Ontario [Available at: www.sobr.ca].

Ontario Ministry of Finance. 2018. Ontario population projections update. Queen's Printer for Ontario, Toronto.

Ontario Ministry of Natural Resources and Forestry (OMNRF). 2014. Far North Land Cover – Data Specifications Version 1.4. Ontario Ministry of Natural Resources and Forestry, Peterborough, ON.

Spectranalysis Inc. 2004. Introduction to the Ontario land cover data base, second edition (2000): outline of production methodology and description of 27 land cover classes. Inventory, Monitoring and Assessment Section, Science and Information Branch, Ontario Ministry of Natural Resources, Peterborough, ON.

Citation

Ontario Biodiversity Council. 2021. State of Ontario's Biodiversity [web application]. Ontario Biodiversity Council, Peterborough, Ontario. [Available at: <http://ontariobiodiversitycouncil.ca/sobr> (Updated: August 16, 2021)]