3.5 Sustainable production | Focus on biodiversity and habitat capacity

There is a compelling need to demonstrate that food is being produced sustainably. However, determining this requires an understanding of a complex system. The theme of sustainable production takes a holistic approach and spans several Index indicators such as soil health, animal welfare, water systems (on farms and for fisheries), and biodiversity impacts. Given the global and national significance of biodiversity to the well-being of the planet and to food production systems, this paper addresses biodiversity with seven relevant metrics with a focus on habitats and land conversion. Results show a complex, changing landscape, revealing pressures on biodiversity as well as retention of farmland.

Results from the Index: Environment Indicators

This overview focuses on one element of sustainable production, biodiversity, with a focus on metrics related to habitat capacity (defined below) and land conversion. Agriculture and Agri-Food Canada (AAFC) compiles an index on wildlife habitat capacity, defined as the ability of the landscape to support breeding and feeding for wild terrestrial vertebrates.

- The Wildlife Habitat Capacity on Farms Index score for breeding ranged from 35.48 in 2000 to 34.27 in 2015, a small but incremental decline. A score of 100 means that all land is highly suitable for the reproduction of all potentially occurring land species.
- Farmland use for annual crops is on the rise, while perennial crops are decreasing. There is also a continued loss of farmland to urbanization and other non-agricultural uses.
- Within farmland, soil cover, which promotes biodiversity and soil health, is on the rise.
- 98% of Canada's commercial fisheries are harvested at approved levels of sustainability.
- Figure 1 represents the vibrancy of habitat capacity on farms with greener tones being healthier.

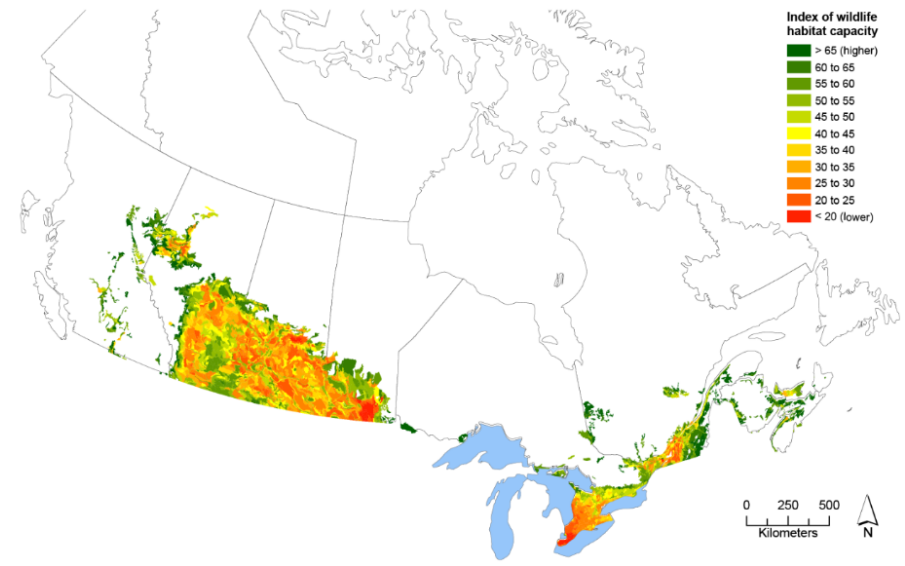

Figure 1: Wildlife habitat capacity on agricultural land, Canada 2017. (Agriculture and Agri-Food Canada).

Interpreting the results

Habitat capacity

Habitat capacity is the ability to support breeding and feeding for wild terrestrial vertebrates and can be a proxy for biodiversity. The ability of a landscape to support wildlife is difficult to capture in one metric; however, Agriculture and Agri-Food Canada's Wildlife Habitat Capacity on Farms provides an important metric, but due to data limitations, existing data may underrepresent habitat loss. Work is underway to enhance habitat capacity data and measurement of species populations. As finer-scale data becomes available, the Index could incorporate habitats that are not currently measured.

Land conversion

Agricultural land use can have a significant impact on biodiversity – for example, grasslands used for grazing provide important habitat for wildlife and sequester carbon – and the mix of land use is changing. From 2000 to 2015, annual cropland and fruit and berry cropland increased, but all other uses decreased, with grassland showing the largest decline.

CROPLAND			GRASSLAND		FOREST AND WETLAND		
Annual	Perennial	Fruit & berry	Managed	Unimproved pasture	Woodland	Wetland	Wooded wetland
+4.2%	-3.6%	+50.0%	-8.8%	-11.1%	-5.3%	-0.6%	-1.1%
+1,766,700	-824,600	+46,000	-778,800	-343,200	-2,995,700	-45,800	-100,500

Figure 2: Changes in landscapes within agricultural land, percent, and hectares (2000 to 2015)

Land use is currently measured at the field level and does not capture change within a field, nor does it include riparian areas; for these reasons, impact on habitat is likely understated. Ongoing work by AAFC such as including invertebrate species, fine-scale habitats (e.g., small wetlands), and difficult-to-decipher habitats (e.g., native grassland and smaller parcels), could be incorporated into the Index beyond the current Index pilot.

Additional context

Developing metrics that capture complex, dynamic indicators like biodiversity is a challenge. It can be further exacerbated by relying on national metrics as the Index does, which do not capture significant variability across Canada. Truly understanding biodiversity requires finer detail at local or regional levels.

Future versions of the Index may address such challenges by incorporating more detailed data and gleaning more and better information on outcomes to meet the information and benchmarking needs of the food system. The Index has also proposed a new indicator, a biodiversity ledger; with better data at hand, this would provide a composite view of biodiversity and metrics that would represent overall losses and gains.

Global indices tend to rely on measuring practices (rather than outcomes) to assess biodiversity change. For instance, they rely on counting protected areas and the prevalence of enabling policies to report on marine environments. Global schemes also typically include a greater emphasis on indicators related to species. However, species at risk are not included in this Index because factors affecting such species extend well beyond the farm landscape.

Measuring **biodiversity** is one component of a sustainable agri-food system.

The National Index on Agri-Food Performance is a first-of-its-kind Canadian initiative to define and report on a comprehensive and consolidated picture of sustainability from food production to retail.

Complete Index results along with references to global practices are available at **agrifoodindex.ca**. All information in this paper is sourced from the Index (Part 2) unless otherwise stated. This paper is one of seven published together as Part 3 of the Phase 3 Final Report, May 2023.