ROYAL ONTARIO MUSEUM

GREEN BELT

Possibility grows here.

BIODIVERSITY IN A CHANGING CLIMATE

Go to the produce section of your grocery store and you'll find the fruits of biodiversity.

Biodiversity, loosely defined as the variety of life in a given ecosystem, is the reason we have mangos, apples, blueberries and bananas. These commonplace fruits were all born and bred from unassuming plants found in ecosystems around the world. Their existence to this day relies on a host of other life forms—pollinators, predatory insects, fungi—without which, our grocery store shelves would be much emptier.

Worryingly, scientific evidence suggests that biodiversity is in decline across the globe, and that one of the drivers of this phenomenon is climate change. As some regions become hotter and drier, and others wetter, species lose their ecological niches. One biological response to this is migration; species move into new territories where weather is more suitable. But this can have unexpected consequences for the environment and, more pointedly, you.

The Ontario Greenbelt is at the heart of Canada's most biodiverse region; the Carolinian Forest zone, stretching into the Mixed Forest zone to the north. This region is home to an incredible diversity of plant and animal life, including 78 endangered species. As Ontario's climate warms, many species in this region will disappear from certain areas.

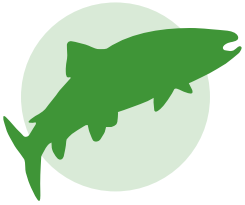
CLIMATE IMPACTS ON BIODIVERSITY

CLIMATE CHANGE IS ALREADY IMPACTING ONTARIO'S BIODIVERSITY—IF YOU'RE A FISHERMAN, BIRDER OR SOMEONE WHO SPENDS TIME AROUND WOODS, PONDS OR MEADOWS, YOU MAY HAVE ALREADY NOTICED.

Friends of the Greenbelt Foundation has partnered with scientists from The Royal Ontario Museum (ROM) to report on species currently affected by climate change. The Northern black widow spider, a shy native Ontario species, the Lake trout, a favourite of Great Lake anglers, and the Tree swallow, a fixture of roadside nest boxes province-wide, are good examples.

Northern black widow spider: Creeping north

Records show that this species has moved up to 94 km north since 1989. As a prey and habitat generalist, the Northern black widow will likely continue to expand its distribution. That means that Ontarians can expect to see this lesser-known species in areas like Niagara-on-the-Lake, Holland Marsh and Cottage Country. Although a timid species, its shifting distribution should be monitored, and people should be aware if they are present in their area. They should also know what to do in the very rare case of a bite.



Lake trout: Losing habitat

It has long been known that water temperature affects what species of fish you can catch. Lake trout, a cold-water species, prefers deep lakes that stay cooler than 19°C in the summer. As shallower lakes warm, Lake trout fail to thrive there; and where lakes have deeper water, a greater number of fish must now survive in a smaller aquatic habitat. This could mean a very different experience for anglers of the future, which could also have significant economic impacts on Ontario's $2.2 billion recreational fishing industry.

Tree swallows: Egg-laying out of sync

Tree swallows are one of the best known bird species in North America. They breed throughout much of Canada, and winter in the southern United States and Mexico. One citizen-science study found that Tree swallow egg-laying dates have advanced by at least nine days since 1959. This might not seem like a problem except that when eggs are laid earlier, young birds also need insects to eat earlier. If the insects aren't present in the ecosystem, the young are less likely to survive.

Ecosystem health relies on many species all being in sync with one another. When the climate changes, species are more likely to fall out of sync and the ecosystem can begin to fail or change. When species move, their absence is felt by other organisms that relied on them. Conversely, when species emerge into new ecosystems, they can threaten the balance of what was already there.

WHAT CAN YOU DO TO PROTECT BIODIVERSITY?

The good news is—you can be part of the solution. The effects of climate change on biodiversity may seem too complex and far-reaching to tackle but there are lots of things that the average person can do to help.

We need Ontarians to be interested in and engaged with the nature that surrounds them. So get out and explore natural areas like Ontario's Greenbelt! Most importantly, know the facts about climate change, and its impacts on nature, and get involved in community initiatives.

Join a citizen-science project

Interested in science but not a scientist? One of the most valuable contributions you can make is to join a citizen-science project that monitors and reports on biodiversity. Teams of scientists simply do not have the time to collect all the data they need. This is where you come in. Monitor and report on the species of birds that visit your backyard or report back on the fish you've caught on summer vacation. All of this data helps scientists to get a better sense of how Ontario species are responding to climate change. This, in turn, helps scientists advise policymakers on what decisions will protect biodiversity.

Support green infrastructure like Ontario's Greenbelt

The Ontario Greenbelt safeguards sensitive terrestrial (and aquatic) ecosystems like the Niagara Escarpment and Oak Ridges Moraine; sites that are not replicated anywhere else in Canada. The Greenbelt also acts as a crucial ecological corridor connecting southern Ontario to the East, West and North. These corridors are of great significance for species that need to migrate in order to survive changing climatic conditions.

Make your voice heard

If you know of an issue related to climate change or biodiversity in your area that is not being addressed, speak up! Write a letter to the editor of a newspaper you read, setup a meeting with your MPP or contact a local science organization to learn more. At the very least, if you're well informed you can help spread the word to other members of your community.

Photo: Lake trout

Photo: Tree swallow, © Mark Peck

ABOUT THIS SERIES:
The Greenbelt Foundation partnered with experts to understand how climate change is affecting our daily lives, and ways that we can individually and collectively respond to these challenges. For other installments in the series, visit www.greenbelt.ca/changing_climate