Possibility grows here.

POLLINATORS IN A CHANGING CLIMATE

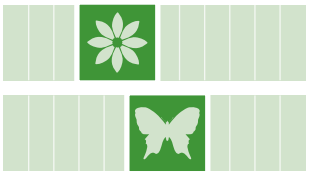
Wild Pollinator Biodiversity and Climate Resilience

Our rich and abundant wild pollinator communities in southern Ontario include over 350 different bee species, as well as wasps, butterflies, beetles, flies, moths, and hummingbirds. These pollinators are providing pollination services to urban and community gardens, crops in intensive agricultural systems, native plants in green spaces, and our residential flower gardens. It's been estimated that over 3/4 of wild plant and crop species are dependent on or benefit from insect pollination, and approximately 1/3 of the food we eat needs insect pollination.

Pollinator biodiversity is an important part of our ability to adapt to and mitigate climate change. By having many different species of pollinators in various habitats, we are ensuring species adapted to different flowers and weather tolerances are available to pollinate food crops and wildflowers. The redundancy of many species available to provide the ecosystem services we need buffers us against stressors like new diseases and extreme weather events. In other words, the more species that are lost, the more worrisome it becomes for our food security and sustainability of natural ecosystems.

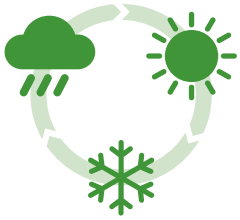
CLIMATE CHANGE IMPACTS ON POLLINATORS

Flower/Pollinator Mismatches



Flowers are blooming earlier and some pollinators are emerging earlier now than they did decades ago. This could lead to something called a "phenological mismatch," where the timing of the pollinator and the flower no longer match up, despite having evolved together over thousands of years. Mismatches can lead to pollinators not having the right type or amount of pollen and nectar when they need it. It could also result in a given species of plant not being properly pollinated. This is particularly worrisome for pollinators specialized on certain plant species.

Extreme Weather Events



Climate change is expected to increase the number and intensity of spring storms and summer droughts. These extreme weather events can directly harm pollinators or decimate the food plants they rely on. Winters may have less snowfall, which could mean pollinators overwintering underground may have less insulation from snow to protect them from frigid temperatures. Gradually warming temperatures, particularly in cities where there is a heat island effect, may make nesting habitat for pollinators less suitable due to heat exposure. We also see the southern portions of bumblebee ranges shrinking as temperatures increase with no sign of the bees moving northward, leaving them squeezed in a smaller amount of suitable habitat.

Invasive Species

Climate change can also facilitate the spread of invasive species, which can negatively impact pollinators. These invasive species can include other insects, which may compete for forage or nesting resources, animal species, which may be predators of pollinators, and plant species, which may outcompete important food sources (e.g. garlic mustard competing with native wildflowers). Climate change is also changing microbiota like viruses, fungi, bacteria, and other pathogens in ways we still need to learn much more about but which pose risks to the health of pollinators.

WHAT YOU CAN DO

Luckily there are quite a few ways you can help to conserve our wild pollinators in light of climate change.

Here are some actions for you, your friends and family:

Get involved in Community Science

You can submit photos to community science projects like BumbleBeeWatch or EButterfly to help scientists locate unknown populations of rare species, record important habitat requirements, and track range shifts. Long-term scientific data is critical to conservation planning and management of endangered pollinator species.

Create pollinator-friendly habitat

- Plant native plants. They provide pollen and nectar, are host plants for caterpillars, and in the cases of stem-nesting bees, are nest sites, as well.
- Plant gardens with something in bloom from early spring to late fall. Having nectar and pollen early in the season is critical for pollinators to be able to find a nest site and lay eggs.
- Plant frost-tolerant species in areas with late frost, and drought-tolerant species in areas with hot, dry summers.
- Plant food and herbs. Plant veggies like tomatoes and see which bees come to buzz-pollinate them. The bonus is you will have some fresh local herbs, fruits, and veggies too!
- Keep your garden messy. In the spring, delay cleaning up your garden as long as possible to allow insects overwintering in mulch, leaf litter, loose soil, and last year's stems to emerge naturally.
- Check out guides by Credit Valley Conservation, Toronto and Region Conservation Authority, and Wildlife Preservation Canada for recommendations on what to plant and how to maintain your pollinator habitat.

Spread the word about native bees

Sharing what you learn about the beauty and diversity of southern Ontario's native bees will help people make different choices and protect what they know and care about. Resources like the City of Toronto's 'Bees of Toronto' Guide or BumbleBeeWatch.org can help you learn about all the different bees that are native to this region.

Get involved in your local stewardship and volunteer programs

Conservation Authorities (CAs), city parks departments, local naturalist groups, and business improvement associations (BIAs) often provide opportunities for you to help create or provide quality habitat for pollinators either directly through plantings or indirectly by influencing policy. Contact your local CA, municipality, and community organizations to find out what programs they offer to support pollinator habitat.

Minimize insecticide use

For farmers, using Integrated Pest Management schemes (i.e. using pest-reduction tools and management practices that consider environmental impacts) could help make farmlands more supportive for wild pollinator communities. Many Conservation Authorities offer agricultural stewardship programs to help restore natural habitat on farmland. For homeowners, consider allowing insects in your yards and gardens instead of reaching for that can of Raid. While insecticides may seem like they are targeting pests, many of them harm a wide variety of beneficial insects, as well.

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

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