Biodiversity & Me

Your guide to the biodiversity of the Bruce Trail and Niagara Escarpment

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You don’t need to travel to the far corners of the Earth to find an incredible assortment of creatures, ancient trees, and endangered species. A walk on the Bruce Trail, along the beautifully diverse Niagara Escarpment, can show the careful observer all these things and more.

The Niagara Escarpment is a massive forested ridge of ancient dolostone stretching through southern Ontario from Niagara to Tobermory. The Bruce Trail runs along its length for over 885 km, making it the oldest and longest public footpath in Canada and the best way to explore the Escarpment’s treasures.

This unique geological feature took millions of years to develop. Today it supports a wide variety of habitats that are home to:
• over 300 species of birds,
• 53 types of mammals,
• 36 species of reptiles and amphibians,
• 90 types of fish and
• over 1500 plants (including 50 ferns and 40 orchids).

Many of these species are unique to this area and some are found nowhere else in Canada.

There is no better place to explore biodiversity than the geological marvel we are lucky enough to have in our own backyards.

What is biodiversity?

Biodiversity – short for biological diversity – is the variety of life on Earth, from the variety of species, to the variety within species, to the variety of ecosystems. The more variety of species and ecosystems there are, the easier it is for our natural environment to recover from change.

Biodiversity is also about how everything interacts. A loss of one species through habitat destruction or pollution affects the lives of other species, including human beings who depend on a wide variety of species and the services they perform in our daily lives.

There are many reasons to preserve biodiversity – what are yours?

! Species at Risk

Keep your eyes out for species marked with this symbol (!). These are species-at-risk – plants or animals in danger of extinction or disappearing from an area. More than 190 of Ontario’s wild species are at risk and many of them find their home along the Niagara Escarpment.
Follow the path of the Niagara Escarpment and you’ll see that it runs like a giant green ribbon through southern Ontario – the most densely populated area of Canada.

The Bruce Trail Conservancy is working to secure a conservation corridor along the Niagara Escarpment in order to protect its natural ecosystems and to promote environmentally responsible public access to this UNESCO World Biosphere Reserve.

**Hunting for Habitats**

This green ribbon is actually made up of different habitats providing shelter, safety, food and water for a variety of associated species.

This map shows just a few of the many habitats you can explore on your next trip along the Bruce Trail.

Find out more about each of these habitats and the species that call them home in the pages to follow.

**Conservation Corridors**

Natural areas like the Niagara Escarpment are becoming more fragmented because of human activities. And yet, plants and animals need uninterrupted areas of natural environments to allow them easy access to food, shelter and breeding areas. This means core protected areas and corridors between them. These corridors are critical to biodiversity and ecosystem health.

**Did you know?**

The Niagara Escarpment is a UNESCO World Biosphere Reserve, designated for its unique landform characteristics and the presence of a provincial land use plan to guide development in this area. It is one of only 15 biosphere reserves in Canada.
My Bruce Trail Hike Log

Use this log to keep track of where you’ve been and what you’ve seen.

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My sketch, photo, collage or favorite memory from this hike

Four Seasons of Discovery

Try returning to the same place in multiple seasons and find out how it has changed.

Do you see or hear different species? Are familiar species in a different stage of their growth? Do you notice different sounds, colours or smells?
Wetlands: Not Quite Land, Not Quite Water

Get your feet wet in one of the most diverse habitats around – a wetland!

Wetlands are remarkable areas of land that are saturated with water and feature species adapted to life in a wet environment. They represent the meeting of land and water habitats, and so possess a unique mixture of species and conditions. This makes wetlands some of the most biodiverse habitats in the world.

Which wetlands have you seen?
Four types of wetland can be found on the Niagara Escarpment.

- **Marshes** are the most productive wetlands. Rich in nutrients, marshes are characterized by emergent vegetation of reeds, rushes, cattails and sedges surrounding an area of deeper water.

- **Swamps** are like wetlands within a forest. Dominated by shrubs or trees, they may be flooded seasonally or for long periods of time. Swamps are nutrient rich and productive.

- **Bogs** accumulate acidic peat – a black muck formed by generations of dead plant material, often sphagnum moss. With poor drainage and few nutrients, bogs are challenging places to grow.

- **Fens** are peat-forming wetlands with better drainage and less acidity than bogs. As a result they are more nutrient-rich and can support more species. They are often covered by grasses, sedges, rushes and wildflowers.

Sponges and Filters
Wetlands are crucial to biodiversity and human health. They act like sponges to hold water until it slowly seeps into the ground, controlling flooding and erosion. Wetlands filter chemicals & nutrients, maintaining and improving water quality. Wetlands are wild! They provide habitat for a wide variety of species.

What would we do without wetlands?

**Biodiversity Checklist for Wetlands**

- Cattails
- Dragonfly
- Leopard frog
- Sedges
- Sphagnum moss
- Floating vegetation
- Marsh Marigold
- Marsh
- Wood Duck
- () Black Tern

Wetlands on the Bruce Trail:

- Speyside Sanctuary
- Young Wetland
- Malcolm Bluff Wetland
- Beaver Springs
Forests: Wooded Wonderlands

Look up, down and all around

Walking under the cool shade of a hundred foot high forest canopy is one of the many delights of the Bruce Trail.

Each layer of the forest from the tallest tree to the soil beneath your feet is filled with life. All the layers work together in a balanced partnership between plants, animals and habitat.

Forests on the Bruce Trail:
- McNally Property
- McLeod
- Speyside Woods
- Hemlock Ridges

Least Diverse
This is a conifer tree plantation – an effort to reforest an area quickly. Biodiversity in these forests is low but can be improved by thinning the conifers and planting native deciduous trees and soft-stemmed plants.

Most Diverse
This is a mature forest, containing trees of all ages and sizes – providing a mosaic of habitats for a variety of creatures.

Canopy
The trees that form the uppermost layer of the forest capture most of the sunlight, provide nesting sites, and affect much of what goes on below. Common associated canopy trees: Oak/Hickory; Maple/Beech; Hemlock/Maple.

Understory & Shrubs
Here younger trees grow slowly and wait for an opening in the canopy to provide space and light. Shade-tolerant plants thrive in the darker, moister conditions. In a coniferous forest, where the dark shade and acidic soils create challenging growing conditions the understory is often missing.

Ground Layer & Soil
This layer is made up of wildflowers, grasses, ferns, mosses, lichen and fungi that grow close to the ground. Here you’ll also find the nuts, cones, seeds and berries of the plants above which provide a feast for ground-dwelling creatures. Peeking under logs and rocks will reveal a mini-universe of invertebrates, fungi and bacteria providing the vital service of decomposition.

Biodiversity Checklist for Forests
- (1) Red-headed woodpecker
- Porcupine
- Red-backed salamander
- Fungi and Moss
- Wood Lily
- Sassafras (or Mitten Tree)
- (1) Hart’s Tongue fern
- Red-shouldered Hawk
- (1) Butternut
Explore the beautifully diverse Niagara Escarpment
**Meadows: Pollinators’ Paradise**

You may think you are in just another open field, but look again. Meadows are abuzz with pollinating insects, foraging birds, and nesting mice. These open areas are dominated by grasses, sedges and non-woody plants, providing important habitat for many species year-round.

**More Nutrients, Less Diversity**

Strangely, meadows with soil that has a high nutrient level are less diverse than those with a lower nutrient level. This is because nutrient rich soils favor fast-growing, invasive plants – like the lawn favorite, Kentucky blue grass – that out-compete the slower, less aggressive species.

**Meadows on the Bruce Trail:**
- Thirty Mile Creek
- Russel
- White/Campbell
- Malcolm Bluff Wetland

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**Alvars: Globally rare habitats**

If it looks like you just stepped onto a mossy sidewalk, then you’re in an alvar.

Alvar is a Scandinavian word for flat, open areas of limestone or dolostone where the soil is either shallow or absent. Due to extreme environmental conditions such as alternating flood and drought, unique and often rare plant, insect and bird habitats are formed.

Lichens, mosses, and herbaceous plants cover the ground where the few trees that grow are severely stunted. Alvars support a wide array of rare plants (like Lakeside Daisy, Ram’s-head Lady’s-Slipper and Dwarf Lake Iris) and birds whose habitat is declining elsewhere (like Loggerheaded Shrikes, Eastern Meadowlarks, and Upland Sandpipers). You may also find rare butterflies and snails.

We are only beginning to realize the ecological importance of alvars - found only in Canada’s Great Lakes region, the Baltic region of Europe and the islands along the coast of Sweden.

**If you visit… please stay on the marked trail. Alvars are vulnerable to foot traffic.**
Cliffs & Crevices: Life on the Edge

A visit to the Niagara Escarpment wouldn’t be complete without exploring its rocky cliffs.

Despite drastic temperature fluctuations, high winds, and low nutrient and moisture levels, life clings to these rocky edges, including the beautiful Purple-Stemmed Cliffbrake. Turkey Vultures soar on the thermals created by the cliff wall. Peregrine Falcons, Cliff Swallows, and 4 bat species nest in the cracks of the cliff face.

Near the cliff edge, crevices form.
Joints or lines of weakness in the rock parallel to the edge of the Escarpment face become crevices through mass wasting (the downslope movement of soil and rock under the influence of gravity). In some cases, huge blocks of dolostone have fallen and landed in such a way that they cap the crevice, forming caves.

Foxes and coyotes make their homes in and around the crevice system. The walls and floors of the caves and crevices are typically lined with many species of ferns.

Living Rocks: Even the rocks themselves are full of life. Green algae and fungi actually grow within the dolostone rock of the cliff face. These remarkable lifeforms are “cryptoendolithic” meaning hidden-inside-rock.

Streams: Ribbons of life

Streams are vital freshwater links through the Niagara Escarpment. They are home to a vast array of plants, animals and insects including Snapping Turtles, Smallmouth Bass, Crayfish, Muskrats, Freshwater Shrimp and Water Lilies.

Rich around the edges.
Immediately surrounding a stream is a biologically rich area called a riparian zone. Here hydrophilic (water-loving) plants thrive, birds nest and feed on the insects emerging from the water, and animals move along the sheltered banks.

Grasses, shrubs and trees in this zone offer habitat for wildlife and stabilize creek banks even in floods. This buffer protects the stream from erosion, and the overhanging canopy can keep the water temperature at a suitable level. Riparian vegetation also filters pesticides and other chemical pollutants, preventing them from entering the stream.

Ecosystem Health: Streams can be amazing indicators of the ecosystem health. Look for clear water, a variety of plants along the banks, meandering routes, and aquatic invertebrates as good signs of a healthy stream.

Streams on the Bruce Trail:
- Grindstone Creek
- Thirty-Mile Creek

Biodiversity Checklist for Streams
- Crayfish
- Cardinal flower
- Belted Kingfisher
- (!) Spotted Turtle
Biodiversity on the Niagara Escarpment is threatened by the HIPPO dilemma.

Have you seen signs of any of these threats on your hike?

**Habitat loss**
Loss of habitat due to human development, forestry, agriculture and other activities is the primary cause of biodiversity loss in Canada and around the world. The Niagara Escarpment traverses the most heavily-developed and densely-populated region of Canada. This means natural areas are increasingly rare, degraded, and fragmented.

- The BTC’s mission is to secure a permanent conservation corridor along the Niagara Escarpment. Today almost 7,000 acres of Escarpment land are secured and managed by the BTC.
- This preserved land is cared for by Bruce Trail volunteers, with the support of a small BTC staff. Some of our stewardship efforts include reforesting abandoned fields, installing bird boxes for wood ducks, and regularly monitoring the ecological health of our properties.

**Invasive species**
Native to other continents such as Europe or Asia, exotic species are often imported by humans. Some of them are invasive and represent a real threat to indigenous species because they tend to replace them.

Have you seen these invaders on your hike?

- The BTC is addressing invasive plants on the Escarpment through education, volunteer-powered weed-pulls, and working with landowners along the trail.

**Pollution**
It’s easy to see how pollution of our air, water and soil is a big problem for biodiversity. Acid rain harms forests. Ground-level ozone affects human health and tree growth. Poisons wash into waterways. Plastic trash entangles wildlife. Scrap metal leaches iron, lead and other metals into the soil.

- The BTC has removed hundreds of tonnes of garbage from the Niagara Escarpment. We are also working with our neighbours to reduce runoff from their lands.

**Population Growth**
Most threats to biodiversity are caused by humans. Six million Ontarians live within a 90-minute drive of the Niagara Escarpment. This is the fastest growing region of the province and biodiversity will continue to be lost if current trends continue.

**Over-consumption / Unsustainable use**
Humans are demanding more from the Earth than it can provide. If everyone in the world lived like Ontarians we’d need the resources of 4 planets to sustain us (Ontario Biodiversity Council, 2010). People everywhere must learn to reduce, reuse, and recycle Earth’s resources.

(C) Climate change is the ‘silent C’ that is increasingly putting biodiversity at risk. Climate change affects many species who cannot adapt quickly enough to survive an increase in the average temperature and changes in their surrounding environment.
What You Can Do to Preserve Biodiversity

**On the Trail**
- Leave only your thanks and take nothing but photographs.
- Stay on the trail so as not to damage vegetation.
- Avoid picking plants and flowers, or peeling tree bark.
- Observe, sketch or photograph animals from a distance but do not chase, disturb or feed them.
- Keep pets on a leash.

**In Your Everyday life**
- **Explore** more natural spaces. The Bruce Trail has 885 km of main trail and over 400 km of side trails waiting for you.
- **Learn** more about the habitats and species of the Niagara Escarpment. Take a field trip with a naturalist club. Learn to identify invasive species. Record and report them, if possible.
- **Monitor** biodiversity in your own backyard through volunteer “citizen science” programs or as a Bruce Trail Land Steward volunteer.
- **Use less** energy and less water.
- **Plant** native species of plants in your garden and community.
- **Support** organizations that are working to preserve biodiversity.

**Support the Bruce Trail Conservancy by**

- Becoming a member
- Volunteering
- Donating

Help support our mission to secure a conservation corridor containing a public footpath along the Niagara Escarpment.
OGP Biodiversity is a series of conservation-focused, family-friendly events sponsored by Ontario Power Generation in partnership with Ontario Nature, the Bruce Trail Conservancy, Earth Rangers, LEAF (Local Enhancement and Appreciation of Forests), Rouge Park and Trees Ontario. Its goal is to spread the word about protecting and conserving biodiversity in our urban parklands and forest ecosystems, making it easy for people to get involved with the environment and help fight climate change. OGP Biodiversity is part of OGP’s commitment to conserve, sustain and protect nature. For further information on these and other upcoming events, visit opgbiodiversity.ca.