

# UNDER *Our* FEET

## ***Talus, Keystone to Biodiversity***

WRITTEN & PHOTOGRAPHED BY BRUCE MACKENZIE EXCEPT WHERE NOTED

**T**he Niagara Escarpment's talus slope is the keystone to its biodiversity. The soils and stable subterranean habitats found in the talus provide the medium for the abundance and diversity of its life. The talus slope is the sloped area along the face of the Escarpment where eroded rocks and materials have fallen and collected since the end of the last glacial period.





Along the northern sections of the Bruce Peninsula, especially where eroded rocks can fall directly into the deep waters of Georgian Bay, the talus is in its most rugged form.





▲ A mature section of the talus in the Dundas Valley, where the well-developed soils have covered all the cast-away rocks.

**W**hen the glaciers melted away, the Escarpment would have looked very different. Vertical cliff faces, the height of the Escarpment, would have prevailed along its length with almost no accumulated talus. Over time, with the constant workings of gravity and weathering, the Escarpment face began eroding, leaving an almost continuous pile of broken rock. The talus slope has grown in depth to where in places today, the Escarpment face is completely buried. In other areas portions of the Escarpment face are still seen as the talus slope is still forming.

### **Talus Changes Constantly**

The Escarpment may be made up of rocks up to 400 million years of age, but the talus is young, still developing in places and no matter where you are, it is constantly changing. Gravity is constantly pulling

new rocks down from the brow and rearranging the fallen rock and debris.

The materials in the talus are always being dissolved whether they be rock or organic materials. Rainwater is slightly acidic and the calcium-rich rocks are slowly dissolving in the talus slope. Organic materials are constantly being reduced to their nutrient components. All of these actions act to move the talus in a downward direction. Even the layer of moss on an exposed rock is creating an acidic environment on the top of the rock causing chemical weathering, slowly but surely.

The talus started out as an unorganized pile of rocks and in many ways still is. The raw rock pile over time has been infiltrated with other products of erosion, whether they be gravel, sand or silt and thousands of years of organic materials. All of this has made for layers or pockets of loose, well-drained



▲ The Bruce Trail constantly criss-crosses the talus slope on its journey along the Niagara Escarpment. Each metre seems to show a difference in how time has molded the slope.





This large rock has broken off from the shelf of rock protruding from the scree above, as the underlying rock of the shelf has eroded away, leaving a failing support for the shelf of harder limestone. This is the beginning of the gravitational journey for this rock down the talus slope by Beamer Falls.



soils that support the forests of today. This long line of forests provides for a ribbon of green for life to move through.

The eroding face of the Escarpment is a function of the differential erosion of the alternating layers of rock of different hardnesses. As the rock layering is not consistent along the Escarpment's length, the makeup of the talus slopes varies as the rocks do. In some places the slope is gentle with few rocks showing, and in other areas, like Lion's Head, it is a jumbled mess of gigantic rocks.

### Rare Habitats

The talus slope houses a rare and interesting life zone of which we seldom think. It provides subterranean habitats with stable moisture levels and generally cool temperatures. When soil temperatures change here, they do so slowly and do not vary widely. It is a habitat where darkness prevails. Precipitation and meltwaters percolate down through the talus. Waters emerge from the base of the talus as springs, or they can drain even further and replenish groundwaters. Living conditions in the talus slope are resistant to quick changes and seldom-seen extremes. This makes life easier for the flora and fauna.

The Escarpment generally faces an easterly or northerly direction. This orientation acts to keep the talus on the shady side of the Escarpment, leading to a cooler environment. Add this to the shade provided by trees, and some spots on the ground almost never see direct sunlight.

### Salamanders

The Red-backed Salamander, a common inhabitant of the talus, finds the habitat a perfect place to live. This species is in the family *Plethodontidae*, the lungless salamanders. To breathe they absorb oxygen through their skin. To do this, their skin must be constantly moist. Remaining almost always under leaf litter, they are provided the requisite moist regime by logs and rocks.

Red-backs of course share the talus with other salamander species, Spotted, Jefferson's and Blue Spotted, depending upon where you look along the Escarpment. These other salamanders require ponds for breeding. A lack of ponds can be a limiting factor to their existence. The Red-backed does not require water bodies to breed in. The female lays its eggs in a sheltered moist place, and she stays with the eggs for about six weeks until they hatch. The emerging young look just like an adult red-backed but very small. They go through the larvae stage in the egg. This allows the species to thrive in areas without ponds, allowing for widespread



The talus slope supports a forest of diverse life forms stretching along the length of the Niagara Escarpment.  
PHOTO BY BRUCE HARSCHNITZ.



▲ Each tree plays a role in maintaining the talus slope within its own lifetime. Should a wind topple this mighty Sugar Maple, the rocks entrapped in its roots will be free as they will be in the eventual death and decay of the tree.





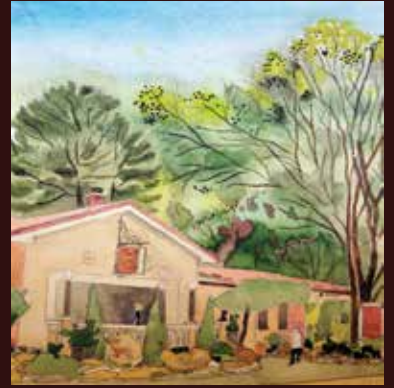
▲ The distance between the base of the tree and the rock shows how the rock has shifted downwards as the talus continues to settle over the life of the tree.

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The Red-backed can be found in two colour morphs, one with the dominant red stripe along its back, and the other, the “Lead-backed” morph, with miniscule silver dots on solid grey. The Red-backed in both morphs are long and slender, distinguishing them from the heavier and longer Jefferson’s or Blue-spotted Salamanders.

The loose soils and frequent voids between rocks allow for the easy horizontal and vertical travel of the talus’s subterranean animals. Animals living in the talus slope do not have to worry about being flooded out, for the talus drains well. Animals of all sizes that hibernate can find winter hibernaculums or den sites in the talus.

Invertebrates, bacteria, fungi and other lower lifeforms do well in the stable talus environments. They are constantly nourished by organic debris falling from the forest onto the talus slope where gravity and

water force the materials to penetrate into the talus to the waiting decomposers.

The spring wildflowers of the talus slope are often far more abundant and diverse than in wooded areas away from the Escarpment. The talus provides incredible microclimates and a wide variety of soil conditions compared to what one would find in a neighbouring wooded area.

Disruptions to talus slopes have a profound effect on the Niagara Escarpment’s biodiversity. Breaks in the talus, like roads and developments, prevent life from using the talus life zone as a travel way, creating isolated gene pools. They are like dams to rivers.

The importance of keeping these talus slopes intact is incalculable to our biosphere’s biodiversity. **NEV**

*Bruce Mackenzie’s last feature for this magazine was “Grimsby Beach: Noah Phelps’ Legacy in Gingerbread,” Summer 2021.*



▲ Herb Robert, a member of the Geranium family, is a limestone-loving plant seen growing here in the moss layer on a rock that has fallen from the Escarpment face.





◀ Red-backed Salamander, the most common salamander along the length of the Escarpment.  
PHOTO BY BOB CURRY.



▲ Bloodroot has large roots and requires deeper soils. It is one of the earliest of the spring ephemerals to bloom.



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