

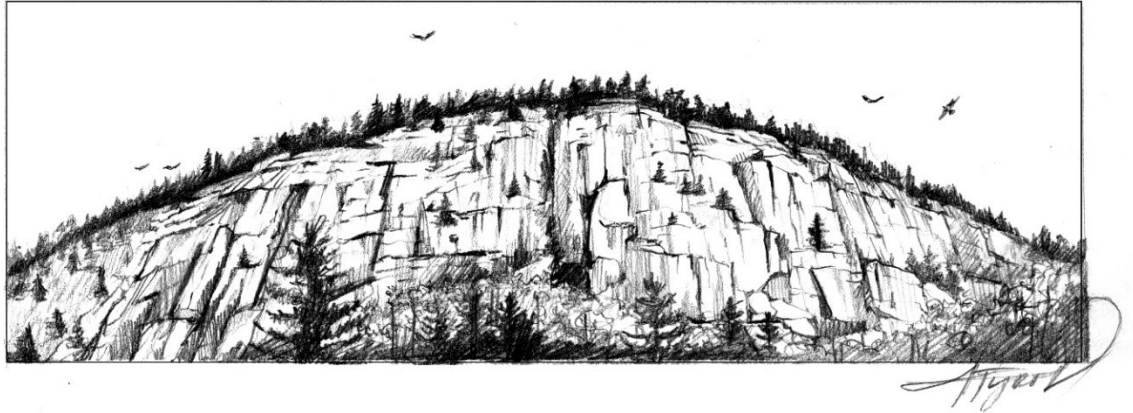
The Outside Story

Cliffs Host Varied Flora and Fauna

By Susan Shea

On a recent hike up Eagle Mountain in Milton, Vermont, we climbed to a ledge overlooking Lake Champlain. Turkey vultures soared overhead, tilting back

and forth on the breeze. A sheer cliff dropped to the forest below us, a lush variety of plants clinging to its face. Cliffs are defined as areas of exposed bedrock with a slope greater than 60 degrees. We tend to think of cliffs as solely geological features. But they also host distinct natural communities of plants and animals.



While lichens and mosses can grow on bare rock, many plants must find cliff shelves, cracks, and crevices where soil has accumulated to grow. Because soil is sparse, most cliff-dwelling plants are small. These include sedges, grasses, ferns, and wildflowers. On ledges or in cracks where there is more soil, shrubs and small trees may sprout.

Climate and type of bedrock are the most important factors that determine which species of plants inhabit specific cliffs. Sun exposure, slope, moisture availability, air currents, and the direction the cliff faces also influence the type of vegetation that can grow here.

Boreal cliffs, located in northern and cooler areas and at elevations higher than 2,000 feet, are associated with spruce-fir and northern hardwood forests. Temperate cliffs occur in warmer regions and at mid to low elevations near oak-pine or northern hardwood forests.

The chemical composition of a cliff's bedrock strongly influences the plant community. Calcareous bedrock, such as limestone, marble, and calcareous schist, releases calcium and magnesium, important plant nutrients, as it weathers. As a result, both boreal and temperate calcareous cliffs have a high diversity of plant species, some rare, and have long been a magnet for botanists.

The precipices of Vermont's Smugglers' Notch and Lake Willoughby are boreal calcareous cliffs and support some flora that normally grows on high alpine summits or farther north in Canada. Temperate calcareous cliffs provide habitat for interesting plants such as walking fern, which can sprout a new plant from a tip touching the ground; showy wild columbine, with its drooping red flowers; delicate maidenhair spleenwort fern; and stunted white cedar trees. This type of cliff can be found on Vermont's Mount Philo and Eagle Mountain and along the Connecticut River in New Hampshire.

Acidic bedrock, such as granite and sandstone, has little or no calcium. Acidic cliffs, such as the granite cliffs of Cannon Mountain in New Hampshire's Franconia Notch, also support plant life but do not have the number of species or the rare, specialized plants that calcareous cliffs do.

Cliffs also provide homes for birds and other wildlife. Peregrine falcons nest on ledges, scraping a small depression or laying their eggs on bare rock. Ravens build large stick nests on shelves. Turkey vultures hide their nests in crevices or rock caves. Eastern phoebes build moss-covered cup nests under cliff overhangs. Cracks provide summer roosting sites for the endangered eastern small-footed bat. Bobcats, which can easily spring from ledge to ledge, often den in cliffy habitat inaccessible to humans and predators.

Over time, erosion, freezing, and thawing can cause pieces of rock to break off a cliff and accumulate below its base. Known as talus, these rock piles form a unique natural community. The largest areas of talus occur where unstable rock or angular boulders prevent soil from collecting. Only lichens and moss can survive in the soilless, hot, dry environment of open talus. But beneath the rocks, deep caverns can form and provide insulated chambers for snakes to overwinter, including the state-endangered timber rattlesnake. Rock voles and long-tailed shrews also den in talus.

Extensive areas of a special type of talus called felsenmeer, a German word meaning "sea of rocks," exist above timberline in the Presidential Range of the White Mountains, where they cover hundreds of acres. These huge fields of angular, lichen-encrusted boulders were created from intense freezing and thawing after the glaciers retreated. Few plants grow here other than sedges and a few alpine species.

Cliffs and open talus are unique and relatively rare habitats in the Northeast. Their plant and animal communities can be disturbed by stone-quarrying and rock-climbing. Most known peregrine falcon nesting cliffs are closed to hikers and climbers during breeding season to protect this raptor, which has only recently recovered from near extinction. It is best, and safer, to enjoy the flora and fauna of cliffs by remaining at the base and using binoculars.

Susan Shea is a naturalist, writer, and conservationist based in Vermont. Illustration by Adelaide Murphy Tyrol. The Outside Story is assigned and edited by Northern Woodlands magazine and sponsored by the Wellborn Ecology Fund of the New Hampshire Charitable Foundation: www.nhcf.org.

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