

## Kneeling Before the Ground Pine

Ambling along the Cabin John Creek trail in the middle of January, I pause for a spray of green wherever I can find it. In the winter months the 1,800 or so native plants species in our local flora shed their leaves, and when they do, our spirits tend to drop with the fallen foliage. A plant physiology text provides a rational explanation

for deciduousness: Leaf fall is a coping mechanism allowing our trees and shrubs to survive the chilly, dry wintry air when water is scarce. In winter, the tree cannot absorb enough water to replace what would escape through leaf pores if the green leaves remained on the branches. Further, if the plant did not “cement over” the spots, known as “leaf scars,” where the leaves had been attached, the tree or shrub would die. That makes sense for the plant, but what then can brighten our own moods along the trail during this photosynthetic time-out? Fortunately, throughout the leafless winter months we have the tiny but majestic ground pine, a study in green-needled finery.

You must drop to your knees to appreciate its subtle beauty, though. Don't be embarrassed: supplication before the ground pine, also known as clubmoss, is perfectly respectable behavior for winter naturalists. The name clubmoss comes from the shape of the club-like reproductive cone that sits atop the plant. That moniker is better than creeping woody wolf's foot, the direct translation of the Latin name for the species depicted here, known to botanists as *Dendrolycopodium obscurum*, a name that does not roll easily off the tongue.

But I prefer the name ground pine, which is more poetic and one that best captures for the layperson the image of what one looks like. Imagine that

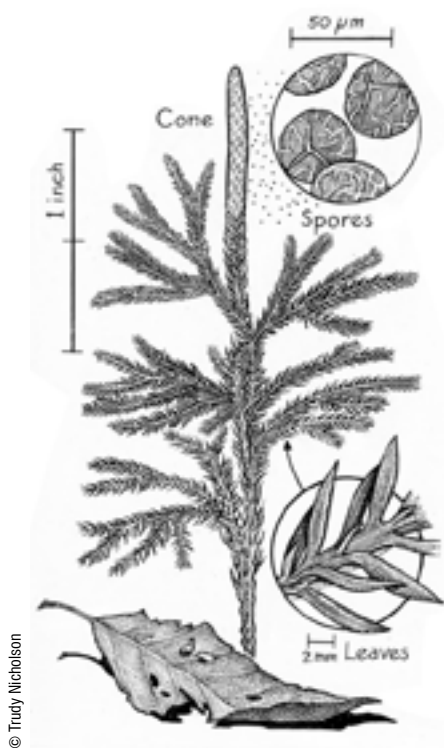
some forest spirit had cast a spell on a Norfolk Pine and turned it into a mini-bonsai or a seedling of a giant evergreen tree. Then you have a sense of what you are hunting for.

Even though it resembles a shrunken conifer, the ground pine is not actually a conifer at all but one of the more primitive vascular plants on Earth, first appearing about 410 million years ago. For those counting, that makes ground pines far more ancient than dinosaurs. Ground pines have changed remarkably little since they first appeared on the scene. They are not flowering plants, and they flash no showy structures of petals and stigmas and anthers. Rather, theirs is a more austere way of breeding, either reproducing by tiny spores emitted from the club at the tip, or by underground spreading roots called rhizomes.

It was not always a lifestyle in miniature for the ground pine family. Around 300 or so million years ago, there were tree forms of clubmosses that exceeded 100 feet in height. As that was the Carboniferous era, they made excellent fossils—a characteristic that earns high compliments among paleobotanists—their signature woody tissues and impressions preserved for millennia, yielding evidence of their great age.

Even today, branching out by rhizome is an ancient way for plant species to spread, and for an individual to turn into a giant colony. There is one such healthy cluster along the Cabin John Creek Trail on a bluff overlooking the stream. A tree must have fallen there, leaving a mound of earth and a bare spot to colonize. I spent some time with this colony two days after torrential rains had transformed our tranquil stream into a roaring river, more violent than I had seen in 23 years of walking this trail. High above the raging torrent, the ground pines stood, unbowed, unchanged, steadfast on a gloomy January day.

Clubmosses take the long view of life on Earth, and stay fixed in form from year to year, having been present on time scales that are geological in extent. Our species, in contrast, has been here for but a fraction of the 410 million years clubmosses have been around. And only 10,000 years ago, the



Clubmoss, also known as ground pine

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blink of an eye in geological time, we stopped hunting and gathering in the Cabin John Creek forests, and elsewhere in North America, to take up a more agrarian life.

The woody clubmoss may well be here still millions of years hence, but will we, the descendants of hairy, ape-like creatures who have yet to come to terms with the threats to our sustainable existence posed by climate change and habitat degradation? This is perhaps the genius of this species, in its simple message, just persevere—through tempests, floods, and challenging conditions, like humans face today in our clear and present danger—just persevere. —