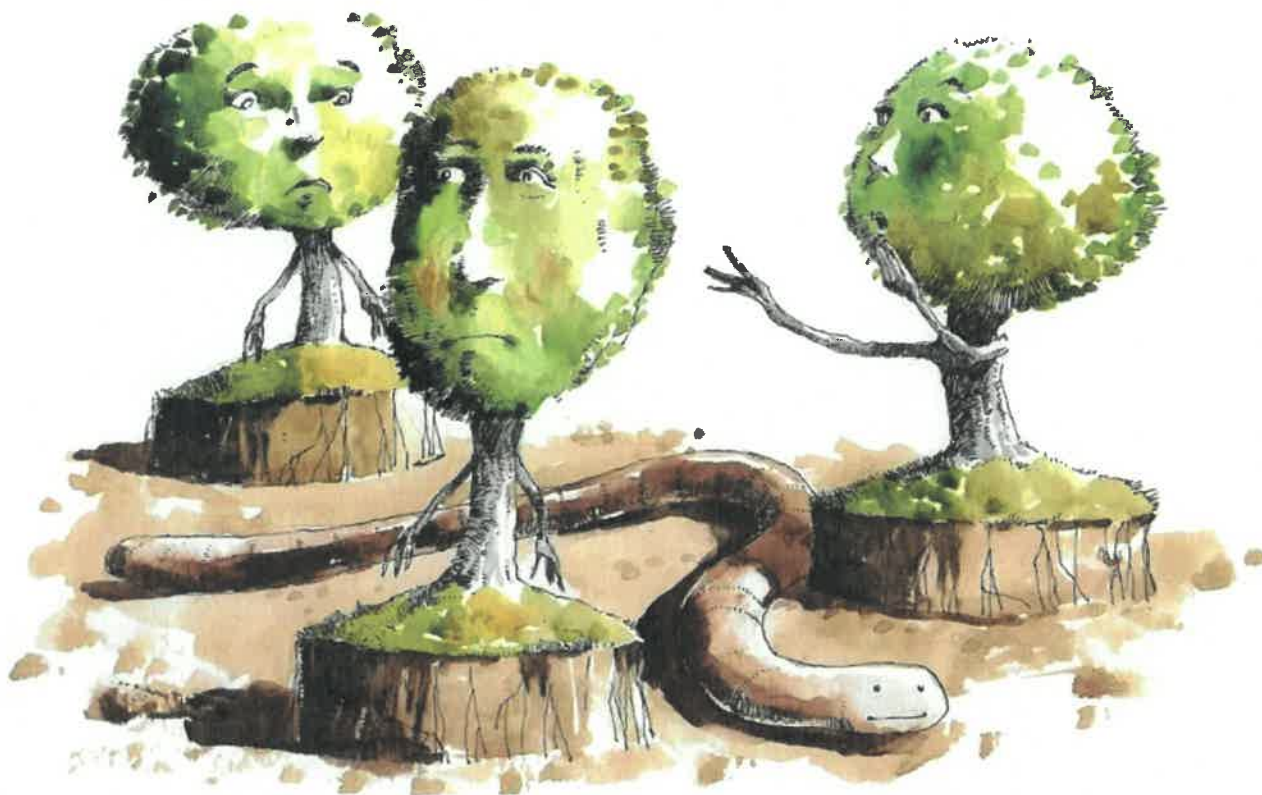




OPINION | LEILA PHILIP

# The social fabric of forest soil



STAN FELLOWS FOR THE BOSTON GLOBE

**By Leila Philip**

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“Stone walls are the Mass Pike of the New England forest,” says our guide from the [New Roxbury Land Trust](#), pointing to the long stone wall jutting into the woods. She explains how leaves collect along it and rot, creating habitat for all manner of bugs, beetles, and amphibians, which mammals eat. I am lost in thought, imagining the stone wall at midnight — a busy highway of foraging raccoons, skunks, opossums, coyotes, foxes, minks, bobcats, and fisher cats — when I jerk my head up, startled by her next sentence. “The problem is earthworms, they’ve invaded the forest — fungi are dying off.” She begins to describe the mysterious symbiotic relationship between fungi and the roots of trees.

Fungi in the soil invade tree roots for their own benefit and, in doing so, create miles of network that link the roots of forest trees; they are the fiber optics of the forest, miles of dense web that trees use to exchange nutrients and information. Trees survive better together than they can on their own; it takes a forest to create the micro-climate trees need to prosper. Thus, pines and other conifers use the network of thin filaments created by fungi to exchange nutrients with oaks and maples. Simply speaking, in a forest, mutual support is more beneficial to trees than competition, and it is largely accomplished through the complex symbiosis between fungi and the roots of trees. The problem is that *Lumbricus terrestris*, the common night crawler, brought to this continent by European settlers who used soil as ballast in ships, has begun to colonize northeastern forests, eating most of the organic matter that fungi need to survive. When fungi die off, trees lose their ability to communicate and are greatly weakened. Even the towering oaks cannot survive.

We tramp on, all 40 of us who have signed up for this morning's guided walk, titled "The Great Transition," and put on by the New Roxbury Land Trust, which is celebrating the opening of these 84 acres of woods — a new acquisition — to the public. Crows caw. I hear the wind, a great whoosh through the trees. Yellow leaves clatter down through sunlight.

Formed in 1999 by a group of volunteers, the New Roxbury Land Trust (named after the original settlers of Woodstock, Conn., who walked here in 1686 from Roxbury, Mass.), is still staffed by volunteers, although they now belong to the national Land Trust Alliance, which, since its founding in 1982, has conserved 56 million acres of land throughout the country. Each of us benefits from protected land, whether we live near the land kept in trust or far from it. Keeping land open filters air and water supplies, absorbs carbon emissions, and protects wildlife habitats as well as farmland, critical for our national food supply.

At the edge of a meadow, our guide stops with delight to show us a patch of lichen now growing on a stone wall. She explains how lichen can only grow in clean air — its hearty growth here demonstrates the impact of environmental regulation in the form of the Clean Air Act, which among other things, has dramatically reduced acid rain in the Northeast. We walk on, learning how to identify maples from oaks, shagbark from ash. We chew black birch twigs, which taste surprisingly like teaberry gum. But I'm no longer thinking about all that I see: I'm wondering about what lies beneath our tramping feet.

In fairy tales, the forest is a place of danger and transformation. For the first Puritans, it was the biblical wilderness — a place of darkness and evil, which they were meant to transform into a garden. For me in 2017, the woods are a place in which I seek solace. But ever since my walk with the land trust, I've become keenly aware of how the New England forests, including even the symbol of their strength — the mighty oak — are at risk. Something as seemingly inconsequential as the introduction of a new species of earthworm can eventually be devastating.

Scientists are only now beginning to fully understand the extent to which forest trees use webs of fungi — whose thin filaments can travel miles through the forest soil — to exchange nutrients and information. But one thing is clear: When trees lose their ability to communicate through these networks, the forest suffers.

Is the forest soil like the social fabric? We take it for granted, because we don't see it. We only know it's unhealthy when the institutions that rely on it begin to fail. As they are doing now.

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