

NORTHERN WHITE-CEDAR

Laura Kenefic

Many of us have affection for a particular tree. This might be the heavy-limbed old-field pine that served as a childhood climbing tree or the red maple in the dooryard that heralds spring and fall with brilliant flowers and foliage. Northern white-cedars (*Thuja occidentalis*), slow-growing evergreen trees of medium stature, are usually unremarkable to the casual observer, though their scale-like leaves distinguish them from the more common needle-leaved conifers. Nevertheless, I have a personal connection with one of them, and as a species, they enrich both my life and yours in many ways. Though fourth-most abundant among trees in Maine, northern white-cedar remains one of the least-studied tree species in North America. There is much we don't know about this species, though what we do know is remarkable.

Northern white-cedar was dubbed *l'arbre de vie* (the tree of life, arborvitae) by the French after Indigenous people taught Jacques Cartier's crew to use its vitamin-C-rich foliage to treat scurvy in the year 1535. "Tree of life" is also an apt descriptor given its longevity; northern white-cedar is the longest-lived tree species in its range, capable of living hundreds of years in the forests of Maine and more than a thousand farther west on the Great Lakes' Niagara Escarpment. Though it is not a strong competitor for sunlight, northern white-cedar can persist where other trees cannot. Most Maine northern white-cedars begin their lives beneath a canopy, growing slowly as what foresters call advance regeneration. Over time, these trees experience many periods of suppression and release, exhibiting a patient growth strategy that positions them well to capture natural gaps as they ascend into the canopy over centuries.

Northern white-cedar trees are ecologically, culturally, and economically important in Maine and beyond. Their vitamin-rich evergreen foliage enriches the diets of white-tailed deer and snowshoe hare when



other food is scarce, and dense stands of northern white-cedar trees provide winter cover for deer, protecting them from cold temperatures, wind, and deep snow that sap their energy and limit their mobility. In fact, northern white-cedars provide habitat for Maine wildlife as diverse as the arborvitae leafminer larvae burrowing in their leaves and black bears stripping the soft, insect-repelling bark to use as bedding in their dens. Northern flying squirrels and red squirrels also collect the bark for nesting, likely a behavioral adaptation that evolved in response to northern white-cedar's anti-parasitic properties.

Northern white-cedar swamps—forested wetlands with a lush carpet of mosses and undulating forest floor where trees and other plants seek refuge from high water—are homes to rare orchids such as the showy lady's slipper, roundleaf orchid, and endangered white adder's mouth orchid. Microhabitats—small places where plants, animals, insects, and fungi live—abound in the loose bark, tangled branches, foliage, and cavities commonly found on the trees in these lowland forests. Culturally, northern white-cedar plays important roles in the spiritual and material lives of the Wabanaki people, who have long incorporated the bark, wood, and foliage into ceremonies and items for daily use such as baskets, snowshoe frames, and canoes. European colonial settlers used the wood for shingles and shakes, fence posts, poles, and other construction requiring rot-resistant wood. Those uses remain common today, with the largest producer of northern white-cedar shingles in Quebec naming a product line after the coastal Maine town of Bar Harbor. Homes along the Atlantic coast have traditionally been sheathed in cedar, and there are northern white-cedar shingles from thousands of trees sheathing the summer cottages of Mount Desert Island alone.

With so many values, and in so many places from swamps and seeps to abandoned pasturelands, mixed uplands, lakeshores, and rocky summits, it is hard to live in Maine and not know a northern white-cedar tree. The first with which I felt a connection is a midsized tree in a forested seep in central Maine. I carry this tree in my memory just as I carry the childhood friend who upon meeting me took my hand and said, "We are going to be best friends." Located in the heart of Maine, deep within the Penobscot Experimental Forest in Bradley, this tree lies in a low, wet area that foresters call a spruce-fir flat. The Penobscot Experimental Forest was created by the US Forest Service in 1950, with 20-acre research compartments where new approaches to forest management could be tested. In response to the region's economic engine of pulp and paper manufacture,

researchers turned their attention to maximizing red spruce and balsam fir pulpwood production. This included felling low-value stems that might compete with the trees designated for production. Many northern white-cedars were deemed undesirable because, with shallow roots and fragile branches, these trees are particularly susceptible to damage and decay.

When I started my career with the Forest Service in the 1990s, the old ways were holding fast, but new perspectives on forest management were on the horizon. The forester in charge at the Penobscot Experimental Forest began his career in the 1950s and oversaw my training with a close eye to traditional standards. On my belt, a holster for a quart-sized can of blue paint with metal trigger (called a marking gun) was on one hip and a leather sheath holding a hatchet was on the other. Northern white-cedar trees are often hollow in the center though outwardly sound with vigorous crowns; our job was to find these “defective trees.” At each one, we used our hatchets, turning them backward to strike the bole twice in rapid succession, listening to hear if the tree sounded hollow. Each hollow tree was painted with a large blue X on two sides using a long, slow squeeze of the trigger for each diagonal slash. Trees less than 10 inches in diameter were too small to be used for shingles and not suitable for posts and poles if hollow. These would be felled and left on the ground. Sometimes a younger northern white-cedar tree growing in the shade would be released, accelerating its growth to take advantage of the resources freed by the older tree’s demise. More often, faster growing fir or shrubs captured the newly available growing space.

I encountered the northern white-cedar tree that I so distinctly remember on a hot summer day. The blackflies were mercilessly biting the backs of our hands and around the cuffs and collars of our work shirts. I pulled a metal measuring tape around the tree, reading 8 inches in diameter. There was a small hole about 5 feet above the ground, an inch and a half across. I pulled out my hatchet and sounded the tree: two strikes and the hollow sound of a tree whose innards were gone. I considered the hole and paused. Calling over to the forester in charge, I said, “This tree has a cavity,” pointing to the opening. He was dismissive, barely glancing at the opening, “Nothing is going to use that. Paint it.” “Really?” I asked, not wanting to believe him. We stared at the tree together, the flies buzzing, the air warm and damp. And in that moment, a small gray tree frog poked his head out of the hole and looked at us. We stood there, stunned. The forester burst out laughing, his guffaw ringing through the trees. “You’ve

got me,” he said, “leave the tree.” It felt like a victory. The frog ducked his head back inside the tree, his work done for the day.

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Recommended Reading

Storm, G. L., & Kenefic, L. S. (2022). *Northern white-cedar: The tree of life*. Michigan State University Press.

