

# ANCIENT CEDARS

Some of the oldest trees in eastern North America are found along rocky canoe country shorelines, but they're not the ones you might expect.

By Michael Henry

As a boy, I sometimes paddled my canoe into the thick fog that formed over the lake where I lived to see if I could become temporarily lost. If I was successful, I eventually came to shore without a clue as to where I was. Other times, I instantly recognized familiar gnarled cedar trees clinging to the rocky lakeshore and knew precisely where I had landed. Without hesitation or doubt, I would paddle directly home as the rising sun cut the morning fog to shreds.

Stunted eastern white cedars growing along rocky shorelines are a familiar sight to canoeists in eastern Canada, but few realize that these diminutive trees, only a few meters tall, are several centuries old.

The phenomenon of ancient dwarfed cedars was discovered almost accidentally, less than an hour's drive from downtown Toronto. In the late 1980s, scientists from the University of Guelph were studying the impact of hiking trails along the limestone cliffs of the Niagara Escarpment. They counted the annual growth rings of some trailside cedars and were astonished to learn that they were hundreds of years old. The age of the oldest dated specimen was 1,890 years. At first the scientists suspected that these cliffs were unique in supporting such timeworn trees. Within a few years, however, similar ancients were found on small granite islands in northwestern Quebec, on cliffs in Bon Echo Park in northeastern Ontario, and within view of the Prime Minister's kitchen window in

downtown Ottawa. It soon became apparent that these venerable old trees are fairly common, even though their existence had been overlooked almost everywhere they grow.

In 1997 Doug Larson, a University of Guelph scientist who helped discover the Ontario cedars, traveled in the United States looking for more examples of these trees. "I went to 15 different states," he recalled, "and within a couple of days of sampling in each state, we'd found the most ancient forest known for those states—for every one of them."

Recently, encouraged by findings elsewhere, I looked for, and found, ancient cedars more than 500 years old growing in the heart of canoe country, in Temagami, Ontario. I also realized that most of the shoreline cedars there are older than anyone ever suspected. Stick-like trees no bigger around than my thumb are often 50 to 100 years old. Larson was not surprised. "When we sampled at Bon Echo, for example," he

said, "there were old trees right down to the lake level—you could run your canoe under 500- or 600-year-old trees." He explained that lakeshores are ideal places to look for ancient cedars because even very small rock ledges are exposed, and therefore are isolated from dangers such as forest fires that trees growing in a forest must face. Consider that a cliff emerging from the forest canopy must be very high to have the same kind of exposure that a small rock face on a lakeshore might have. However, for a health-conscious eastern white cedar tree, isolation is just one ingredient in the recipe for long life.

Both the small size of these trees and their incredible longevity are the result of their roots being confined to small cracks in rocks. This is a natural bonsai phenomenon. Indeed, it would come as no surprise to bonsai enthusiasts that these trees are very old. The art of bonsai, the story goes, was inspired by natural miniature trees growing on mountaintops in China. To create "artificial" bonsai, gardeners mimic the slow growth of natural mountaintop trees by gradually clipping back roots and branches.

The oldest human-engineered bonsai is about 600 years old and, because of the generations of effort that have gone into creating it, is worth about half a million dollars. In contrast, natural bonsai frequently far exceed 600 years, but usually go unnoticed.

One of the tricks to living a thousand years or more is not choosing to die. Most living things have a natural life span; for instance, humans rarely live much longer than 100 years. In the forests of Temagami you can still find white pines and red pines that have lived more than 400 years, but ones older than 700 years do not exist. Cedars, however, can live for 2,000 years and maybe more, precisely because they have no preprogrammed old age. In fact, it's common for three-quarters or more of a white cedar tree to die while the remainder continues to grow for centuries. As a result, the trunks of cedars tend to become less and less round as the trees age. Some become oblong and

others resemble cauliflowers in cross section as small strips of wood grow out from the main trunk. These strips start to form a new tree, while the remaining wood dies and eventually falls away with no harm to the tree. One of the few things that can kill an ancient cedar is the crumbling away of the rock from which it grows. Cedars can actually outlive the rocks that they grow upon.

Everything has its niche. Some organisms prefer change; others require stability. A rock face may seem like the harshest possible habitat, but there are a number of plants, insects, fungi, and algae that thrive in this very stable environment. These creatures form a community that lives on and around the ancient cedar "forest," and transform rock faces from simple geological features into ecosystems that persist undisturbed for thousands of years.

Not surprisingly, humans are probably the greatest threat to these stable ecosystems. Rock climbers cause incremental damage. One climber scrapes a little bark from a tree, the next dislodges some soil, another scuffs some lichen from the cliff face. No one person does much harm, but this is a forest that has existed for dozens of human generations, and will continue to if simply left alone. After just a couple of generations of rock climbers, scientists have recorded significant damage to some of these ancient forests, and some of the oldest trees have been killed.

Canoeists can also cause harm. Who among us has never collected dry shoreline driftwood for a campfire? Or without thinking, broken off some dead tree branches? By so doing, you could be disturbing an ecosystem that has persisted since long before your great-great-

The cross section of a  
300-year-old cedar fits easily in  
the palm of one's hand.

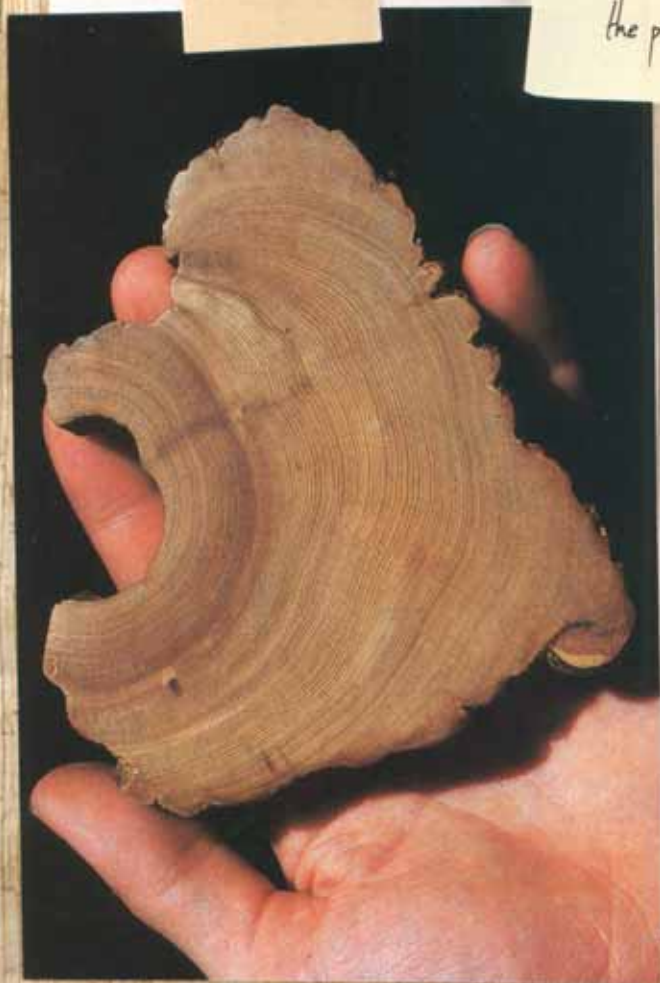


PHOTO: MICHEL HEARY

grandparents were conceived. Wardens at Ontario's Bruce Peninsula National Park have gone so far as ticketing people who collect and burn driftwood. Even after an ancient cedar dies, it may take hundreds, even thousands of years for its wood to rot away. "We've found pieces of wood at the base of the cliffs that started to grow before Tutankhamen was on the throne in Egypt," said Larson. "We're talking about 3,000- or 4,000-year-old woody debris at the bottom of the escarpment." He pointed out that even this dead wood can be valuable to scientists, who use it to reconstruct an area's climate history. Each growth ring reflects one year of growth for the tree. The width of the ring tells scientists how good the growth conditions were that year, whether it was a particularly cold or dry year. Dead cedars give reliable climate information over thousands of years.

Canoeists have a special connection to eastern white cedar, which is the traditional building material for wood-strip canoes. Now we know that the original canoe builders, centuries ago, might have admired the same individual shoreline trees that we see today.

The first European to appreciate the eastern white cedar was probably the French explorer Jacques Cartier. In the winter of 1535 it saved his life and the lives of many of his crewmen. They were suffering from scurvy, caused by a lack of vitamin C in their diet. More than a quarter of Cartier's crew had already died when the Huron people told him about a tree that would help them. The Indians prepared a tea from the leaves and bark of this tree. The tree contained natural vitamin C that cured the scurvy. "All the doctors in Europe," Cartier wrote, "could not have done as much in a year as this tree did in one week."

Cartier was so impressed that he took some of these small trees back to France, making it the first American tree species transplanted to Europe. Even though we know it as the eastern white cedar, the name that was given to the tree by King Francis I is still sometimes used. He called it arborvitae, the "tree of life." Only recently have we come to realize how appropriate his name really is.

*Michael Henry is an ecologist, writer, and lifelong canoeist. He is currently working on a book about Ontario's old-growth forests. □*



PHOTO: MICHAEL HENRY

## Have You Seen This Tree?

The next time you're paddling by a rocky shoreline, keep your eyes open for ancient cedars. Here's what to look for:

- **Trees isolated by lots of rock.** Anywhere you see a dwarf cedar totally exposed on a rocky outcrop or rock island, there's a good possibility that it's an ancient.

- **Trunks displaying uneven growth.** Over time, some parts of these ancient cedars die while others keep growing. Often only one side of a trunk, or just a portion of one side, continues growing in a strip. This type of growth happens very slowly, so an extremely uneven trunk often means an extremely old tree.

- **A stubby bonsai look.** Tightly packed branches, some of which might be dead, are another indication of very old age.