White Pine Perils

Paul Hetzler

The tallest trees this side of the Rockies, our eastern white pine (*Pinus strobus*) is one of the most – if not the most – economically and culturally important species in southeastern Canada and the northeastern US. Though the current champion is a North Carolina giant measuring 189 feet (57.6 metres) tall, early loggers recorded white pines of up to 70 metres (230 feet). White pine is renowned for its exceptionally wide and clear (knot-free), light-coloured lumber used for flooring, paneling and sheathing as well as for structural members. New England was built on white pine, and in some old homes, original pine floorboards twenty or more inches wide can still be found.

The cathedral-like quality of a stand of mature white pines tends to inspire an appreciation of nature, if not a deep sense of awe and reverence. In terms of identification, white pine makes it easy. It's the only native pine out east that bears needles in bundles of five, one for each letter in "white." To be clear, the letters are not actually written on the needles. Its attractive, six-inch long cones with resin-tipped scales are perfect for fire-starting, and for wreaths and other holiday decorations.

Impressive as its material attributes are, white pine has given us less tangible, but more precious, gifts. With its five needles joined at the base, the white pine helped inspire five Native nation-states to lay down their arms a thousand years ago, and join together in a novel democratic confederation called the Haudenosaunee or Iroquois. With its fifty elected chiefs, two houses of legislature, and system of checks and balances, this complex and enduring structure became the blueprint for the US Constitution.

Many who supported American colonial independence wrote of their regard for the Haudenosaunee Confederacy. Ben Franklin and James Madison were particularly enthusiastic about it, and exhorted the thirteen colonies to adopt a similar union. Among the earliest Revolutionary flags was a series of Pine Tree Flags, and the eagle, though removed from its pine perch, has always sat on US currency.

The Haudenosaunee still depict the white pine, referred to as the tree of peace, with a bald eagle at its top. The eagle is there to watch for enemies such as greed and short-sightedness. In its talons, a bundle of five arrows are clenched to symbolize strength in unity. It is no coincidence that modern women's rights began in Seneca Falls, NY in the figurative shade of the white pine. Early suffragists like Matilda Jocelyn Gage wrote of their utter amazement that in Haudenosaunee villages, women were treated with equal respect as were men, and that violence in any form against women was not tolerated.

With so many reasons to love white pines, I was distraught when white pines began to show signs of distress in many parts of their range. Starting around 2009, needles began to turn yellow and drop early, and new growth was stunted. At first these symptoms were restricted to sites with shallow soil, and along highway corridors where trees were already stressed by deicing salt, which burns foliage as well as roots. The droughts of 2012 and 2016, unprecedented in terms of low soil moisture, set pines back even further. By 2018, even pines on better soils were looking sick.

As with many newly found disorders, this decline, dubbed white pine needle disease (WPND), is not fully understood. What is known is that a host of fungal pathogens are involved. Four diseases which affect needles have been identified, though typically only two or three are present in any given case. Even more confusing is the fact that a handful of other fungi have been found attacking white pine foliage, but each is geographically quite limited. A widespread root pathogen has been discovered, and another fungus which infects trunk tissue appears to be spread by a scale insect. Stressed pines may die in one to three years, but otherwise healthy trees are surviving, at a much-reduced rate of growth, for longer.

In the past, a sudden decline of a tree species was usually the result of a non-native pest or pathogen

like Dutch elm disease, chestnut blight, or the emerald ash borer. The odd thing about WPND, aside from the fact that between six and ten organisms may be at work, is that all of them are native to the affected areas. The New York State Department of Environmental Conservation (NYSDEC) has identified one which may have origins outside North America, but this has not been confirmed.

The University of Massachusetts Extension Landscape, Nursery and Urban Forestry website explains that "The lack of a non-native pathogen or insect leads researchers to investigate the role of environmental conditions, which have been altered by a changing climate. An increase in temperature and precipitation from May through July has helped to fuel the WPND epidemic. The issues facing eastern white pine will continue, but management options do exist to help improve health and vigor of white pines."

In home landscapes, the Bartlett Tree Research Laboratory suggests "Mulching around white pines and watering deeply once a week during hot spells is recommended. A fertilization program should also be established, and soil pH maintained between 5.2 and 5.6. Correct any micronutrient deficiencies (such as iron), and mitigate soil compaction with a variety of aeration procedures." White pines will not be happy for long on clay soils, or those with a pH above 7.0. Also, be sure to plant all pines out of range of road-salt spray, and give them ample space.

At the moment, WPND appears not to have found its way into Canada yet, but I see no reason to think it will magically stop at the border. Down in the US, large tracts of white pine have been ravaged by this epidemic, making blister rust seem tame by comparison. Forest managers should prepare for this decline by thinning overstocked white pine stands. Early evidence suggests that a light application of nitrogen may help infected pines. For more information, contact an ISA-Certified Arborist or a Registered Professional Forester. More in-depth reading can be found at https://www.sciencedirect.com/journal/forest-ecology-and-management/vol/423/suppl/C

White pine has done so much for us. Let's do what we can for this venerable tree.

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