SLIVERS OF AN ANCIENT FOREST

The northwoods of the Upper Midwest were once covered in forests of fairytale proportion. Centuries-old pines towered a hundred feet above a biologically rich understory where little light penetrated. Reflecting on his first sight of the forest in 1890, Minnesota lumberman Richard Louis Griffin proclaimed, “I will never forget that sight or the impression it left upon my mind, as I stood there gazing upon this wonderful forest—inexhaustible, enough to last for ages as I thought at that time. Yet, within the course of a very few years not to exceed fifteen, this great forest was laid bare, leaving only a few scattering stands of pine in patches here and there.” By 1920, lumber companies had exhausted the northwoods and moved on to the Pacific Northwest. Only 1% of these original forests remain. However, the forest is growing back. Previously clear-cut land is now protected from logging, but threats from climate change and invasive species threaten the forest’s recovery.

Tamaracks in trouble

Mature tamaracks dominate the bogs of northern Minnesota. However, a warming climate has bolstered the native eastern larch beetle, which feeds on and lays eggs in the tree. Nearly half of the state’s tamaracks have been lost since 2001. State officials are trying to accelerate logging of the old trees in hopes of saving younger saplings.

The Lost 40

An old growth pine forest that owes its survival to a surveying error during the Public Land Survey in 1882. A surveyor identified the location as a lake. Believing the area was underwater, loggers passed the forest over. It’s now a Minnesota state preserve. The oldest trees are red pines estimated at 240 years old.

No shelter from the storm

Wilderness designations may protect forests from logging and development, but climate events don’t respect borders. A 1999 derecho brought 100 mph winds to the Boundary Waters, toppling an estimated 25 million trees. A record-setting drought in 2021 led to numerous wildfires and a complete closure of the wilderness to visitors.

Sylvania Wilderness

Nearly all of this 18,000-acre preserve is made up of primeval hardwood forest. A group of wealthy industrialists saved it from the saw. Beginning in 1897, the businessmen purchased the land for a private hunting and fishing retreat. The so-called “Sylvania Club” included executives from U.S. Steel, General Motors and, ironically, lumber companies. The U.S. Forest Service later purchased the land.

Hartwick Pines

Karen Hartwick purchased an 85-acre stand of old growth pine trees in 1927 from a lumber company that deemed the land unprofitable. The same year, she donated the land to the state of Michigan on the condition the forest become a state park with a building dedicated to her late husband Edward. A 1941 storm leveled half the trees. Today, the park contrasts with the surrounding forests, which are still heavily logged.

Itasca State Park

At the headwaters of the Mississippi River lives a nearly two-centuries-old community of pine trees. They remain standing due to the advocacy of Jacob Brower, who in the late 1800s traveled to the area to settle a dispute over the actual source of the river. Seeing the area rapidly transformed by logging, Brower lobbied the Minnesota Legislature to protect the forest around Lake Itasca. The legislature created the state’s first state park in 1891 by a margin of one vote.

Valley of the Giants

A fluke of nature saved the 600-year-old cedars of Sleeping Bear Dunes National Lakeshore’s South Manitou Island. Over the centuries, westerly winds embedded the trunks of the trees with sand from nearby dunes. Loggers who arrived on the island in the early 1800s would have used saws that needed to be sharpened by hand. It’s said the sand would have quickly dulled the blades. That, coupled with the distance of the trees from the dock, led the loggers to pass the cedars over while the rest of the island was logged.

Planning for future old growth

The Minnesota Department of Natural Resources is managing 44,000 acres of state forest to eventually transition to old growth. State officials have said they envision a network of old forests scattered across the state.

Zombie forests

Northern latitudes are warming at about twice the global average. Under more extreme warming scenarios, the northwoods could look more like Kansas in 2100. Boreal tree species like spruce and fir won’t fare so well in those climates. Already, oak, maple and invasive buckthorn dominate the brush under the taller pine trees in many areas. Foresters have dubbed the coniferous trees that are unlikely to be replaced by their own species ‘zombie’ trees.

Lumber industry in freefall

Contractions in the global lumber industry are causing Wisconsin mills to close or idle, with dire consequences for communities they support. Nine-hundred workers lost their jobs in 2020 with the closure of a Wisconsin Rapids mill that opened in 1904 to process the state’s giant trees and later specialized in glossy magazine paper. Another paper mill in Park Falls that opened in 1896 closed this year, laying off 180 workers.

Fewer deer, healthier forests

Tribal forests are older, healthier and more diverse than their state or national counterparts. One big factor is year-round hunting, which leaves fewer deer to eat fledgling trees. One study estimated tribal forests have 25-50% fewer deer per acre.

Cathedral Pines

Lucy Ramsey Holt saved this 40-acre grove of white pine, hemlock and red pine that took root before the founding of the United States. In the early 1900s, Holt held her Bible study under the giants. She petitioned her husband William, owner of the Holt Lumber Company, to spare the trees. The site is now a preserve owned by the U.S. Forest Service. Nestled in the safety of the massive conifers is a rookery for one of North America’s largest birds, the great blue heron.

Invasives on the march

Michigan has more acres of forest than any state east of the Mississippi. But its trees are at risk from invasives spreading westward. The invasive hemlock wooly adelgid became established in the state in 2016 after devastating Appalachian hemlocks.

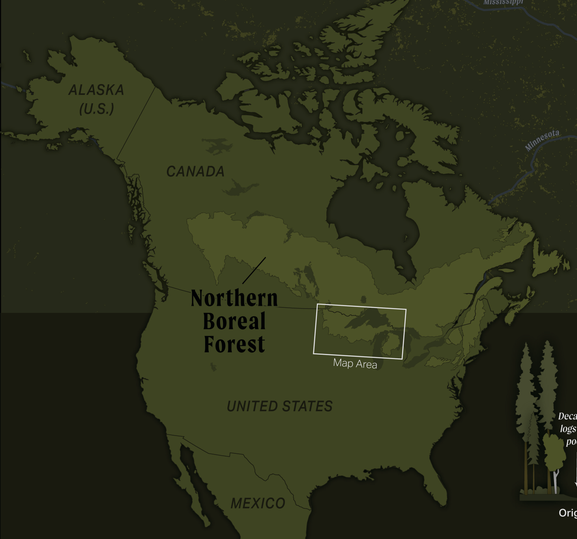
What’s so special about old growth?

While there’s grandeur in tall trees, old growth is valuable beyond aesthetics:

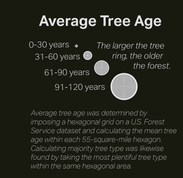
Carbon storage - Old trees sequester carbon dioxide more efficiently than young trees. Old growth forests are essentially sinks for decades, sometimes centuries, worth of carbon and could prove especially valuable in the fight against climate change.

Climate resilience - Tall trees block the sun’s light from reaching the forest floor, creating a cooler, damper microclimate where cold-adapted species can persist. Additionally, scientists are just beginning to understand the genetic heritage embodied in old trees. It’s believed they could contain genes that will enable them to persevere through climate change and new diseases better than young trees.

Greater biodiversity - When the forest structure varies, species of all kinds have a place. Old growth forests host more kinds of lichen, fungi, insects and songbirds than younger forests. Some species, like porcupine and flying squirrel prefer old growth. Others require it. Woodland caribou once thrived in the forests of the Upper Midwest where they fed on abundant lichen. As the old forests vanished, so too did the caribou.

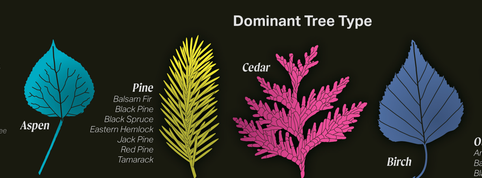


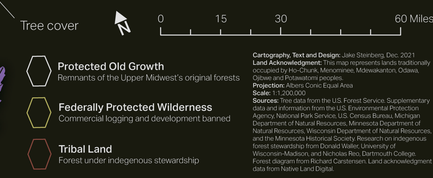
Average Tree Age



Average tree age was determined by imposing a hexagonal grid on a U.S. Forest Service dataset and calculating the mean tree age within each 55-square-mile hexagon. Calculating majority tree type was likewise found by taking the most plentiful tree type within the same hexagonal area.

Dominant Tree Type





Cartography, Text and Design: Jake Steinberg, Dec. 2021
Land Acknowledgment: This map represents lands traditionally occupied by Ho-Chunk, Menominee, Miskwaakiiwi, Odawa, Ojibwe and Potawatomi peoples.
Projection: Albers Conic Equal Area
Scale: 1:1,200,000
Sources: Tree data from the U.S. Forest Service. Supplementary data and information from the U.S. Environmental Protection Agency, National Park Service, U.S. Census Bureau, Michigan Department of Natural Resources, Minnesota Department of Natural Resources, Wisconsin Department of Natural Resources, and the Minnesota Historical Society. Research on indigenous forest stewardship from Donald Waller, University of Wisconsin-Madison, and Nicholas Reo, Dartmouth College. Forest diagram from Richard Carstensen. Land acknowledgment data from Native Land Digital.