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Santa Fe National Forest pine species under threat, but protections remain informal

When Sam Hitt first saw his favorite white pine in the Santa Fe National Forest about a decade ago, he stopped dead in his tracks.

He continued a bit down the trail, then returned. At the time, he didn't know the tree was a white pine, but he was struck by the bushy blue-green pine nonetheless.

"This tree talked to me," Hitt recalled Wednesday while walking the Black Canyon Trail.

Since then, he's learned that white pines are threatened by a disease known as white pine blister rust, which forms boils on the bark of trees and causes a high mortality rate among infected trees, and he's determined to help.

Hitt, the founder of WildEarth Guardians, formerly known as the Forest Guardians, and current president of the Santa Fe Forest Coalition, is urging the Forest Service to update the land management plan for the Santa Fe National Forest to protect it.

"The cure for anxiety is action," he said. "We can protect this beautiful tree from likely extinction."

While the nearby Cibola National Forest and Grassland's management plan specifically states that thinning and harvesting projects should avoid white pines to protect their genetic diversity and give the species a better chance at surviving the blister rust, the Santa Fe National Forest's plan has no such provision.

That's unlikely to change, despite Hitt's efforts. Forest Supervisor Shaun Sanchez says amending the land management plan is "not a priority."

But in a letter to people inquiring about the Southwestern white pine, the forest supervisor wrote that in practice, the national forest aims to protect the trees when possible, especially mature trees.

Some of the trees might be cut to ensure the safety of a fuel break during prescribed burns, he wrote, adding "our standing rule is to retain as many of these trees as possible," in order to retain genetic diversity and hopefully fend off white pine blister rust.

"We train our teams to view white pine as an ecologically vital species, ensuring it remains a priority in every field decision," Sanchez wrote.

Numbers, ecological role

The Western United States is home to six five-needle pine varieties. New Mexico has several of those species, including the Southwestern white pine, the Rocky Mountain bristlecone and the limber pine. In Northern New Mexico, the ranges of the Southwestern white pine and the limber pine overlap. Hitt, who refers to the two species collectively

as “white pines,” thinks hybridization in the area could be important for the species’ survival by diversifying and bolstering the gene pool.

All six of the varieties are facing a multitude of threats, including disease, insects and a Forest Service data analyzed by researchers in 2021 found that of the six species, five have seen more dead trees in two decade-long periods: 2000-2009 and 2010-2019. changing climate, said University of Colorado Denver professor Diana Tomback.

Two of those species are found in Northern New Mexico: the limber pine and the Southwestern white pine. Between the two decade-long periods, the number of Southwestern pines counted by the Forest Service dropped by 2.3 million over the landscape, from more than 19 million between 2000 and 2009 to more than 17 million in 2010 to 2019.

The number of limber pines fell by 8.4 million in that same period, from more than 160 million in 2000 to 2009 to 151 million in 2010 to 2019.

The Southwestern white pine provides special ecosystem services, Tomback said. Able to grow on steep, rocky slopes, the tree can hold in soil and prevent erosion, and may shade snowpack, prolonging the snowmelt. Its seeds are munched on by birds and small mammals — even the mighty black bear will sometimes dine on the seeds.

The limber pine has a mutualistic relationship with a bird species, the Clark’s nutcracker, which harvests the tree’s seeds and stashes them underground to serve as a winter and spring snack.

Deadly fungus

White pine blister rust, a fungus native to Asia, was first observed in the United States in the early 1900s. Since then, it has spread to dozens of states, including northern Colorado in 1998 and New Mexico in the mid-1970s, according to U.S. Forest Service reports, likely from aeciospores that drifted in the atmosphere from California.

The disease, which typically grows in cool, humid months, often takes two to three years before the tree shows the first signs of infection, Tomback said, although the fungus can quickly kill a sapling. In larger, older trees, the fungus may infect a twig or branch first, but it travels down the tree's vascular system. When the cankers reach the stem, they can kill a full-grown tree.

Trees in Europe and Asia are adapted to white pine blister rust, said Tomback, who teaches in the Department of Integrative Biology. But their counterparts in North America were vulnerable to the fungal disease. Just a small number — between 3% and 5%, Tomback said — have a natural resistance.

"Here are trees that are naive," Tomback said. "If they have resistance, it's just by chance that they happen to have the genetic diversity that included some genes that confer resistance."

While it might be the primary threat, the disease isn't the only risk facing the five-needle pines, Tomback said. Mountain pine beetle, increasingly large and severe wildfires and climate change are all impacting the trees. When winters don't get as cold, the beetle larva can survive the

chill. On top of that, the stress of drought can compromise trees' natural defenses against the mountain beetle, Tomback said.

New Mexico impact

Northern New Mexico has been largely spared by the white pine blister rust thus far. But the disease can spread: A 2023 report published by the U.S. Forest Service found new spots of infection near the New Mexico/Colorado border, confirming "that inoculum is present and disease spread is occurring."

The 2023 Forest Health Monitoring report said active management, including diversifying the ages of five-needle pine species, could improve resistance to the disease. Similarly, a 2025 study, published in peer-reviewed journal Scientific Data said proactive management would be suitable where there's currently low levels of the disease.

"Even though it may not be around Santa Fe in the national forest at a high level, the history of white pine blister rust is it slowly ramps up over time," Tomback said.

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