

# The Forgotten Pines

STORY AND PHOTOGRAPHS BY JARED BERNARD

**W**hite pines that dwell on the tranquil upper slopes of the Rocky Mountains are in peril owing to two troublemakers: white pine blister rust and mountain pine beetles. As cornerstones of their delicate ecosystems, these trees support everything from birds to bears. Yet the few economically valuable white pine species have already been so severely depleted that they're joining their less commercial relatives in vanishing without public attention.

Known for their soft wood, white pines belong to the subgenus *Strobus*, which has five needles per bundle, and include limber pine (*Pinus flexilis*), southwestern white pine (*P. strobiformis*), sugar pine (*P. lambertiana*), western white pine (*P. monticola*), and whitebark pine (*P. albicaulis*). Many of these species are adapted to the upper montane or subalpine zones, where they supply fatty, protein-rich seeds to grizzlies, black bears, squirrels, chipmunks, and birds. One bird species, the Clark's nutcracker, has evolved to become the prime disperser of the seeds, which it caches in the ground. Teresa J. Lorenz, a PhD student at the University of Idaho, and colleagues used radio telemetry to track Clark's nutcrackers. They revealed that nutcrackers only plant 16 percent of whitebark pine seeds in spots suitable for germination. Lorenz says this is ordinarily plenty—unless the trees are under siege.

One culprit is white pine blister rust, a peculiar Eurasian fungus that invaded North America in 1910. It moves across a tree's limbs like necrosis, prompting Diana F. Tomback, an ecologist at the University of Colorado Denver (UCD), to equate the slowly dying tree to a zombie. But one white

pine cannot infect another—the rust first needs to complete its complex reproductive cycle in gooseberry, lousewort, or Indian paintbrush.

Lauren E. Barringer investigated whitebark pine forest health and nutcracker activity in Montana's Glacier National Park, Alberta's Waterton Lakes National Park, and Wyoming's national parks for her master's dissertation with Tomback at UCD. The results of the survey, published last year, are startling: in Glacier and Waterton Lakes almost half of the whitebark pines were dead, and more than two-thirds of the rest were infected by rust.

**A**nother culprit is the mountain pine beetle [see "Distressed Woods," page 26]. Barringer, Tomback, and their colleagues show that in Yellowstone and Grand Teton national parks more than a third of the whitebark pines are dead and more than a third of the remainder are under attack by the beetles, which assail both healthy pines and those afflicted with rust.

Climate change augments both invasions. The beetles are normally restricted by severe winters, but since 1996, according to the United States Forest Service and Natural Resources Canada, they've destroyed well over 53 million acres of forest. That figure doesn't include all white pines, however: not being commercially important like lodgepole and ponderosa pines, some white pines have typically been beyond the scope of the U.S. Forest Service. Likewise, blister rust relishes the warmer climate and has now surrounded Rocky Mountain National Park in Colorado.

Both the International Union for Conservation of Nature and Canada's Species At Risk Act list the whitebark pine as endangered, yet the U.S. Fish and Wildlife Service



Clark's nutcracker, above, caches white pine seeds in the ground, where they may germinate. Far left: Whitebark pine needles turn brown on a branch infected by blister rust. Background: Limber pine grows in Alberta, Canada.

has not, calling it "warranted but precluded." Mark Sattelberg, the field supervisor handling the case, explains that lawsuits moved other species ahead in the queue, postponing the review of whitebark pine until 2016. Also required, Sattelberg says, is a recovery strategy.

The U.S. Forest Service's Robert E. Keane and others released such a strategy in June 2012. Their plan, which boldly proposes to recover the entire international range of the whitebark pine, includes planting seedlings that are resistant to rust. Keane says the plan's best quality is that it advocates partnership with Canada. To unite conservationists and researchers, Tomback founded the Whitebark Pine Ecosystem Foundation and a sister Canadian organization. In September 2012, the two groups met in Kimberley, British Columbia, where they found a whopping 74 percent of whitebark pines infected by blister rust. This underscores the need for international efforts to protect the white pines, and the community they uphold.

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