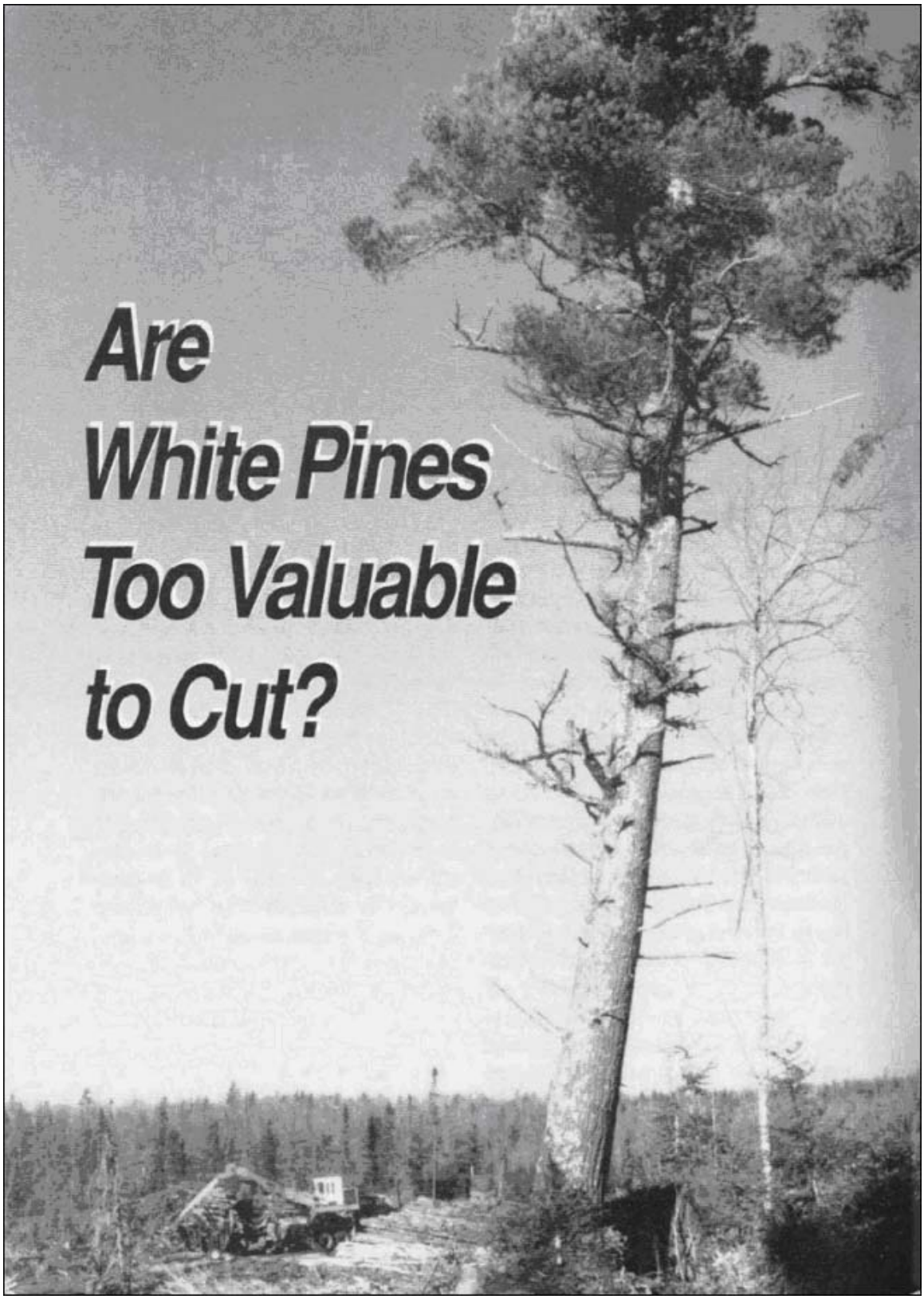

Are
White Pines
Too Valuable
to Cut?

To cut or not to cut? Here are some of the research findings foresters must weigh in managing Minnesota's old-growth white pines.

By Lynn L. Rogers

WHITE PINES were once the most valuable source of lumber in Minnesota. In the 1800s and early 1900s, lumbermen cut their way across North America's white pine range, from Maine to Minnesota, harvesting virgin pine to support America's westward expansion. Minnesota's first sawmill opened on the St. Croix River in 1839. By the 1930s the last large stands of white pines in northeastern Minnesota had been cut. Of the remaining smaller stands scattered in remote areas, many have been harvested in the last 65 years. We are now down to the last 1 percent or less of the old pines that once were widespread over northern and central forest regions of Minnesota.

Lone survivor of a clear-cut, a large white pine *(left) has* been spared because of its value to wildlife such as bald eagles *(above)* and black bears.

White Pine

I recently watched the clear-cutting of about 100 acres of mature aspen, birch, spruce, and fir forest— the common, easily renewable forest of northeastern Minnesota. Taken with them were a few scattered old white pines that had escaped harvest around the turn of the century. The largest was a 42-inch-diameter tree that was particularly familiar to me.

A year and a half earlier, I had spent the night nearby while a family of bears I was studying slept beside that large white pine. At dusk, the mother bear had ceased foraging and led her cubs directly to the pine from nearly a half-mile away. At the tree, the mother listened and sniffed the air a few moments, then sat back against the trunk and gathered her two cubs to nurse. She laid her head back against the trunk, shut her eyes, and seemed to relax. Eight minutes later, with nursing

"T
be
do
ne
th
th
ni

LYNN L ROGERS

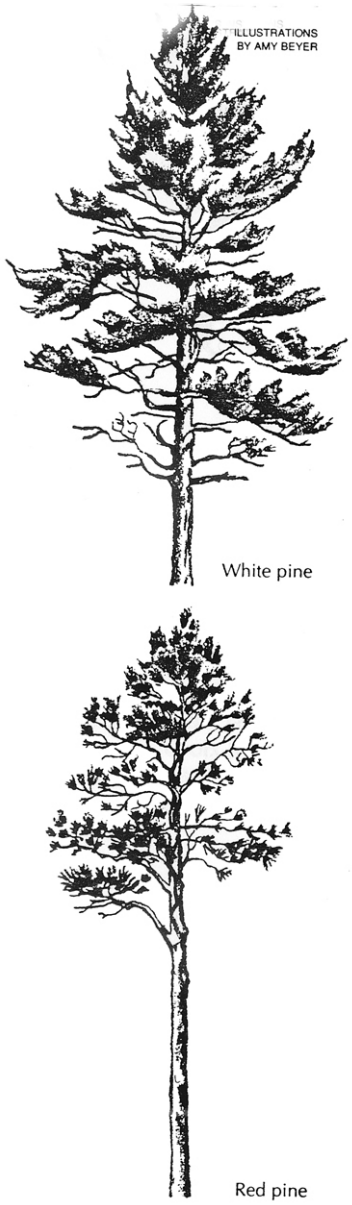
White pine's gnarly bark gives bear cubs a good grip when they climb. Its spreading branches *(top right)* make better nest sites for large birds than those of the red pine.

completed, the family snuggled down in the pine needles beside the trunk to sleep through the night.

As I looked at the stump of that tree, I realized there were few, if any, young white pines in the bear's territory to replace the ones being cut. I realized the same was true in other areas I had visited in my 22 years in northeastern Minnesota.

Isolated white pines are not only valuable to bears, but they also provide habitat for eagles, ospreys, and boreal owls. Further research could show that other species rely on them as well.

Other wildlife biologists, foresters, environmentalists, and recreationists are also concerned about the difficulty of replacing old-growth white pines and are examining the practice of cutting white pines in northeastern Minnesota. Here are some of the facts they are considering.



Limited Regeneration. Unlike other species cut in Minnesota, and unlike white pines elsewhere in the state, white pines in northeastern Minnesota seldom regenerate naturally. The regeneration problem began around the turn of the century when cutting and subsequent slash fires nearly eliminated white pine seed trees and seedlings in most areas from Maine to Minnesota. Aspen and birch trees filled the void. Even before the cutting of white pines was completed in Minnesota, people in eastern states where white pines were once common had realized the pines were not regenerating naturally as they should. Thus in the early 1900s began an era of white pine planting across the northeastern United States.

Lynn L. Rogers *is wildlife research biologist with the U.S. Forest Service, North Central Forest Experiment Station, Ely. He wrote "Foster Families Found for Deserted Cubs" in the July-August 1989* Volunteer.

White Pine

American tree nurseries could not keep up with the demand for seedlings, so they imported additional white pines from European nurseries.

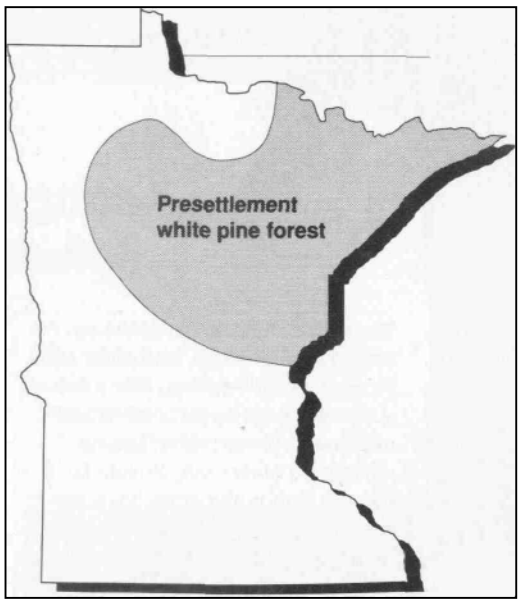
The imported seedlings did not do well. The millions of seedlings planted in open areas provided ideal conditions for outbreaks of white pine weevils—insects that attack the top branches of young white pines, deforming or killing them.

The seedlings were also deformed or killed by browsing deer, newcomers to the north woods. Deer had expanded their range northward when the old pine forests were cut and burned and replaced by lush, young aspen and birch forests.

But worst of all for the white pines was a new and fatal disease that was inadvertently imported with the white pine seedlings from European nurseries—white pine blister rust (*Cronartium ribicola*), a disease usually fatal to white pine seedlings and saplings. By 1919 this disease was detected in northeastern Minnesota, where favorable climatic

conditions helped it spread.

White pine blister rust completes its life cycle through an alternate host plant of the genus *Ribes,* which includes gooseberry and currant shrubs. Late summer breezes blow rust spores from the undersides of *Ribes* leaves to white pine needles—usually needles within 9 feet of the ground. The delicate spores survive to enter the needles only if the needles are covered with moisture for 48 hours at temperatures below 68. These late summer weather conditions seem to be more common in northeastern Minnesota than elsewhere in the North American white pine range.



Vast white pine stands once covered large areas of central and northern Minnesota. A century ago, loggers clear-cut the pine forests, sending the trees to mills in gigantic log drives, such as the one that jammed in the St. Croix River Dalles in 1886 *(left),* now the site of Interstate State Park.

Fungal Foe. The fungus causing this disease requires living tissue to survive. After infecting a needle, the fungus grows into surrounding tissues for years until the branch or trunk is girdled and dies. Growth along a branch seldom exceeds 18 inches before the branch dies. The branches of large mature white pines are long enough to keep infections from reaching the trunk. Mature trees may lose individual branches or the uppermost portions of their crown to blister rust, but they can survive with the disease for decades, perhaps centuries.

But seedlings and saplings have needle-covered stems and branches, allowing blister rust to quickly strike a fatal blow to the heartwood of the tree. Moist conditions near the ground also increase the chance of infection. Today, nearly all young white pines in northeastern Minnesota die from blister rust, deer browsing, or insect attack before reaching maturity.

In other parts of Minnesota and in other states where the climate is less favorable for blister rust, white pine is making a comeback of sorts. Second-growth white pines in

those areas are again providing the strong, lightweight, straight-grained wood that is so easily worked for cabinets, doors, and knotty pine walls. But in northeastern Minnesota, regrowth of white pines will depend on development of rust-resistant strains as well as management techniques for using currently available stock. Selectively breeding highly resistant stock may take decades. Despite diligent efforts, only limited numbers of seedlings with a small degree of resistance are available.

"Controversy over cutting white pines has increased as more people become aware of its values for wildlife, aesthetics, recreation, and biodiversity."

Meanwhile, controversy over cutting white pines in northeastern Minnesota has increased as more people have become aware of its values for wildlife, aesthetics, recreation, and biodiversity. To assess the status of old-growth white pines, Kurt Rusterholz, forest ecologist with the Department of Natural Resources Section of Wildlife, worked with a computer printout from the U.S. Forest Service inventory and compiled a list of white pine communities older than 120 years on state-owned land and in the Superior and Chippewa national forests. Additional stands remain within private and county lands, Indian reservations, and the Boundary Waters Canoe Area Wilderness. According to a rough estimate, the BWCAW may have 20,000 acres of white pine forest—a mixture of white pine, aspen, and birch—that are not subject to harvest.

Limited Acreage. Other ecosystems outside the BWCAW have less old white pine acreage. Although these areas once had large expanses of white pines, Rusterholz has found only about 3,000 acres of old white pines—less than 1 percent of the presettlement acreage. The total acreage would fit into a square about 2 ¼ miles on each side. A quarter of that acreage—773 acres—is in Itasca State Park.

"Large white pines held more than 80 percent of 239 bald eagle nests in Superior National Forest."

White Pine

Only 16 of the 135 old stands counted are larger than 40 acres. The DNR has developed guidelines for protecting old-growth stands. The guidelines do not include provisions for isolated old-growth pines.

In addition to old-growth white pine stands, individual white pine trees nearly 400 years old are scattered throughout northeastern Minnesota. These huge old monarchs escaped the ax because they were too scattered or malformed for profitable cutting around the turn of the century. They escaped death from blister rust because they were large enough to tolerate the disease when it was introduced. These scattered trees play a role different from old-growth white pine stands. In forests of aspen, birch, spruce, and fir, they tower above the surrounding forest, adding dimension and diversity and increasing nesting and foraging opportunities for native songbirds, birds of prey, and mammals.

Although red pines also stand above the surrounding forest, mature white pines with their spreading branches are the choice of nesting eagles and ospreys. White pines held more than 80 percent of 239 bald eagle nests and 80 percent of 285 osprey nests found in the Superior National Forest in the past 30 years, according to U.S. Forest Service biologist Ed Lindquist. Red pines, whose branches may be bunched too tightly for birds with 5- and 6-foot wingspans, held only 11 percent of the eagle nests and 5 percent of the osprey nests. Steve Wilson, forest ecologist with the DNR Scientific and Natural Areas Program, has discovered that boreal owls use large white pines as song perches.

Escape Trees. White pines are the preferred escape trees for black bears in northeastern Minnesota. In a detailed study of black bears by North Central Forest Experiment Station biologists, radio-collared mothers brought their spring cubs

to areas with scattered old white pines and made more than 95 percent of their beds next to the pines. White pine trunks have sturdy, creviced bark that cubs can easily climb to escape danger. Small cubs will climb other trees in emergencies, but they often fall from smooth-barked aspens and birches or from flaky-barked red pines, jack pines, and spruces. Frightened mothers frequently lead their cubs past dozens of these unsafe trees to reach mature white pines for their cubs to climb. As cubs' climbing skills improve in summer, mothers become less selective of escape trees and bedding locations.

The value of white pines to eagles, ospreys, and bears are known because these values are obvious. But the value of white pines to other species is not well-known. In view of the lack of research, it's important that forest managers ensure that no forest type is depleted. Now, protection of old white pines on federal and

DAN RUDA

Red pines are favored for replanting because white pines often succumb to blister rust.

"Protection alone will not be enough to restore our white pine heritage in the face of disease, insects, and deer."

state land consists primarily of saving eagle and osprey nest trees near water. U.S. Forest Service regulations under the Shipstead-Newton-Nolan Act prohibit most logging on federal land within 400 feet of navigable waterways. DNR Forestry-Wildlife Habitat Management Guidelines for bald eagle breeding areas suggest that four to six old-growth white pines be left per 320 acres within a quarter-mile of major rivers and lakes larger than 40 acres. These guidelines were developed 10 years ago, when eagle and osprey numbers were low and shoreline nest sites easily accommodated the few territorial birds. Now these birds are increasing in number and are spreading inland in search of nest sites, according to Jack Mooty, DNR nongame wildlife specialist. In my opinion, they may also be moving inland because the number of lakeshore retirement and vacation homes in northern Minnesota nearly doubled between 1967 and 1982. According to Glenn Radde of the DNR Bureau of Management Systems, shoreline development is likely to increase through the year 2030. The DNR is reviewing its guidelines.

Most Valuable Trees. Now, the cutting of isolated white pines on state and federal land more than a quarter mile from water is up to individual DNR and U.S. Forest Service foresters. There are no official state or federal guidelines for protecting scattered white pines in most such areas. Along public roads, white pines are usually left for their scenic value. In more remote areas, they are often cut.

Stumpage values of mature white pines range from $50 to $250 per tree, making them the most valuable trees in northern forests. Those who favor cutting say that this valuable timber will go to waste if not harvested at the proper time. Foresters arranging timber sales sometimes allow scattered white pines to be cut along with trees of marginal

value to ensure profits. In the long term, the cost of replacing these isolated pines in northeastern Minnesota exceeds their timber value, so they simply are not replaced. Replacing single trees would require prohibitively expensive special attention: temporarily leaving large shade trees to protect seedlings from weevils, inspecting and pruning trees to protect them from blister rust, and using other measures to protect pines from deer browsing. If the efforts were successful, a mature pine would again be available in a century or so.

Many people think the area's remaining old white pines should be saved for their beauty and value to wildlife, especially since the renewability of the resource is in question. As white pines are cut from private land, they argue, it becomes all the more important to keep them on public land.

White pines spared in clear-cutting may remain standing for more than a century while new forests grow up around them. If killed by lightning or other causes, white pines can stand for years as "snag" trees, providing homes and food for perhaps as many mammals and birds in death as they did in life. A healthy forest is not only solid trees; it is a functioning ecosystem with dead and dying trees to provide food for insects and homes for wildlife.

In northeastern Minnesota, protection alone won't restore our white pine heritage in the face of disease, insects, and deer. Restoration will be achieved only through determined efforts to aid natural regeneration, through large-scale planting of rust-resistant seedlings when they become available, and through artificial measures to protect seedlings from deer. Everyone concerned about the future of the white pines in northeastern Minnesota needs to work together to rebuild this resource for all its values—timber, wildlife, aesthetics, and biodiversity.

Once common throughout central, northern, and eastern Minnesota, giant pines like this 112-footer in Itasca State Park have become curiosities.