IOWA DEPARTMENT OF NATURAL RESOURCES

FORESTRY SECTION

White Pine:

A Declining Species

Strategies to Keep White Pine Trees Healthy

Native eastern white pine trees in the Driftless Area are mostly large, mature trees growing within a hardwood forest. Surveys by the Iowa Department of Natural Resources (DNR) show a lack of white pine regeneration, primarily due to unhealthy understory conditions. Iowa DNR foresters and other landowners are working to conserve seed from these locally-adapted trees so they can be planted in additional areas.

Without active management of seed-bearing white pine stands, most seeds fall in areas that do not have enough light for white pine seedlings to grow. The small numbers and isolated areas of Iowa's white pine trees create difficult conditions for this species to regenerate itself. White pine trees growing in Driftless Area forests today are not being replaced with young trees, causing their overall population to decline.

Eastern white pine does not grow well beneath the canopy of other trees. In sunny openings, it can establish quickly, outcompete many other species, and eventually dominate a site. in closed-canopy forests, white pine seeds often fail to land on suitable seedbeds or receive enough light to germinate and grow. Historically, white pine like trees in oak-hickory forests relied on periodic disturbances like fire or regeneration harvests to reduce competition from shade-tolerant trees and maintain the open conditions needed for trees to regenerate. Eastern white pine trees likely became established in the Driftless Area because of indigenous land management practices, including the use of fire on a regular rotation. White pine seedlings need abundant light to reach the forest floor, followed by a fire-free period to allow them to grow bark thick enough to survive future burns.

Over the past 150–200 years, fire suppression and limited forest management have significantly altered Iowa's forest composition. Without regular disturbances from fire or regeneration harvests, the understory becomes denser, allowing shade-tolerant species to dominate while shade-intolerant species like eastern white pine fail to regenerate. When mature white pines die, their canopy gaps are typically filled by shade-tolerant species growing in the understory. This shift in forest composition can have important consequences for wildlife species that depend on white pine for nesting, perching, or foraging.

Maintaining eastern white pine on the landscape requires active management to keep mature trees healthy and support the survival of young seedlings on suitable sites. This species, often found along bluffs overlooking streams, thrives on well-drained soils with low organic content.

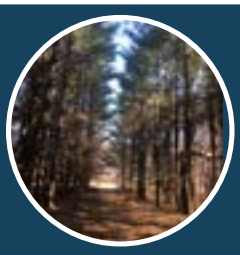
Preventing overcrowding among white pines reduces stress from competition for sunlight, water and soil nutrients and helps the trees resist environmental, insect and disease threats. Try techniques such as crop tree release or basal area thinning, based on stand composition and your woodland goals. Consult a local forester to determine the most beneficial management technique.

Prepare open areas downwind from mature trees to encourage natural regeneration. Ideal sites have non-aggressive grass cover and minimal erosion risk. Light disking before a strong seed year can expose soil and improve seedling growth. In northeast Iowa, white pine cones typically ripen around August 20.

QUICK FACTS ABOUT WHITE PINE:

- Excellent height and diameter growth when established
- Abundant seed production every 3-5 years
- Best rooting in deep sandy soils; competes well in Iowa when the soil is thin and the low organic soil content makes it difficult for other plants and trees to get established
- Once established, exhibits excellent height and diameter growth.
- Mature white pines in Iowa can live more than 150 years, grow nearly 3 feet in diameter, and reach up to 150 feet tall.

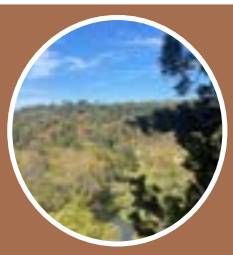
STRATEGIES TO PRESERVE WHITE PINE POPULATIONS IN IOWA



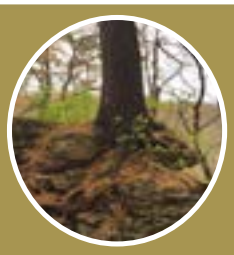
CONSERVE AND PROTECT REMAINING OLD STANDS OF WHITE PINE

COLLECT AND STORE SEEDS FOR FUTURE USE TO MAINTAIN GENETIC DIVERSITY

FACILITATE NATURAL REGENERATION TO PROMOTE GENE CONSERVATION AND NATURAL SELECTION



MANAGE EXISTING YOUNG FORESTS



CONTINUE GENETIC RESEARCH AND TREE IMPROVEMENT PROGRAMS

Eastern white pine can also be established artificially, but incorporating it into existing forests is labor-intensive. Success rates are typically higher in open or currently unwooded sites. After a bumper seed year, you may find small seedlings in the understory that can be transplanted to sunny, manageable areas to improve survival. Protect young trees with cages to prevent browsing by deer and rabbits. Consult your local forester for guidance on seedling protection, competition control, and proper spacing.

In the future, the Iowa DNR and its partners will establish seed orchards composed of native eastern white pines with diverse genetics from across the Driftless Area. These trees will cross-pollinate to produce resilient, locally adapted seed that can be easily collected and sown at the State Forest Nursery. Landowners will have access to a convenient and reliable source of high-quality white pine seedlings.

Keeping eastern white pine on the Driftless Area landscape is a legacy for future generations. Losing this species would further diminish the region's forest biodiversity, already impacted by the decline of ash, elm and butternut. White pine is valued not only for its striking beauty, but also for the vital wildlife habitat it provides.

While eastern white pine faces serious challenges in Iowa, collective action across state, county, and private lands can help conserve its genetic diversity, support forest structure and preserve the ecological and aesthetic richness of the Driftless Area.

IOWA Department of Natural Resources