The Longleaf Pine Ecosystem

"We find ourselves on the entrance of a vast plain which extends west sixty or seventy miles...This plain is mostly a forest of the great long-leaved pine, the earth covered with grass, interspersed with an infinite variety of herbaceous plants, and embellished with extensive savannas, always green, sparkling with ponds of water..." (William Bartram’s Travels, 1791)

Introduction

The longleaf pine (Pinus palustris) forest was once the greatest forest on earth. In the 1700’s longleaf pines covered more than 90 million acres across the Southeast. Today, less than 3 percent of the forest remains and what’s left is disappearing at a rate of 100,000 acres a year. Losses of longleaf pine are staggering. In the last 30 years alone, longleaf pine acreage in northern Florida has decreased by 84 percent.

Prior to European settlement, longleaf pine forests dominated much of the southeastern United States. These forests, characterized by an open canopy of longleaf pine and a low, often species-rich understory, were found from southern Virginia to Florida to eastern Texas. The presettlement range of longleaf pine is estimated at 92.5 million acres.

Ecology

Longleaf pine forests are very diverse. Some longleaf pine savannas have over 40 plant species per square meter, among the highest values reported at this scale in the world. Longleaf pine-dominated vegetation occurs across a wide range of soil types and moisture regimes, and there is a corresponding diversity of longleaf pine community types. These range from droughty sandhills to rich rolling hills to wet flatwoods.

A common link between all these community types is fire. Lightning-caused fires burned through these forests approximately every 2 to 8 years depending on the community type. These fires naturally would have occurred most frequently from late April through July, and would have burned thousands of acres at a time. Today, in order to maintain the quality of longleaf pine forests, prescribed fire must be used as a management tool.

The plants and animals found in longleaf pine forests are adapted to these frequent fires. Longleaf pine is the most fire-resistant Southern pine, and will germinate only on bare mineral soil (a summer fire before the autumn seed fall burns accumulated litter to prepare the seed bed). Another adaptation is the characteristic “grass stage” of the seedling longleaf pine. In this stage, the needles burn away, but the growing bud is not killed by most fires (unlike the seedlings of other pines).

History

Today, less than 3 percent of the original 92.5 million acres of longleaf pine forests remains. In the 1700’s, land was cleared for settlement, and commercial logging was limited to coastal areas and to lands adjacent to streams and rivers. In 1834, the adaptation of the copper whiskey still to turpentine distillation led to an explosion in the naval stores industry (critical to the economy of the Southeast for many years). However, with the proliferation of logging railroads and steam-powered log skidders and sawmills, virtually all the remaining virgin timber across the Southeast was cut from 1870-1920. After this period of intensive logging, longleaf pine failed to regenerate over much of the Southeast due to a combination of factors, including a lack of seed source over large areas, free-ranging hogs that consumed seedlings, and fire...
suppression. Logging continued on the second growth stands, and intensive forestry practices have eliminated much of the remaining remnants of longleaf pine forests. Once destroyed, restoration of longleaf pine vegetation is difficult because the diverse understory vegetation appears to be incapable of recolonizing large areas from which it was removed.

Conservation Efforts

Recreating a longleaf pine forest – the kind that once dominated the southeastern United States at the time of European settlement – is more than a lifetime’s pursuit. However, protecting the remaining longleaf pine forests has been, and continues to be, a high priority for The Nature Conservancy of Georgia. In 1996, The Nature Conservancy conducted a two-year inventory to assess the extent and quality of the remaining longleaf pine forests in Georgia. We identified approximately 190,000-262,000 acres of naturally regenerated longleaf pine on public land, and approximately 136,500 acres on private land. We currently are working with landowners interested in protecting high-quality longleaf pine forests.

Longleaf Pine Facts

- By 1955, only 12.2 million acres of longleaf pine forests remained in the Southeast, and in 1985, only 3.8 million acres remained. A recent estimate calculated the remaining acreage of naturally regenerated longleaf pine forests at approximately 2.6 million. Less than 0.1% of this acreage is considered old-growth.
- The longleaf pine ecosystem supports more than 300 rare, threatened, or endangered species, including the red-cockaded woodpecker, the indigo snake, American chaffseed, and purple balduina.
- Impressive in their own right, a longleaf pine can reach over 120 feet with a trunk exceeding more than 3 feet in diameter and can live for 300-400 years.
- Longleaf pines have the longest needles and largest cones of the southern pines. Needles are 10-18” long, and cones are typically 6-10” long.
- Wiregrass, a dominant species in many longleaf pine community types, produces viable seeds only after a lightning-season fire (late April-July). Wiregrass and longleaf pine needles are the primary fuels for the frequent fires that burn through these fire-maintained natural communities.
- Military bases and quail-hunting plantations contain Georgia’s best remaining examples of longleaf pine forests. Longleaf pine forests can be observed at several of Georgia’s state parks, including Seminole State Park, General Coffee State Park, George L. Smith State Park, Crooked River State Park, and Franklin D. Roosevelt State Park.

The Nature Conservancy is an international, non-profit organization whose mission is to protect the plants, animals and natural communities that represent the diversity of life on earth by protecting the lands and waters they need to survive.