Longleaf Pine Savannas in Louisiana and Mississippi

Longleaf pine flatwood savannas (pine savannas) are floristically rich, herb-dominated wetlands, that are naturally sparsely stocked with longleaf pine (*Pinus palustris*). They historically dominated the Gulf coastal plain flatwood regions of Louisiana and Mississippi. The term "savanna" is classically used to describe expansive herb-dominated areas with scattered trees.

Pine savannas are found naturally on broad "flats" in an interdigitated mosaic with mesic to dry-mesic (non-wetland) longleaf pine flatwoods, savannas occupying the poorly drained and seasonally saturated/flooded depressional areas and low flats, while the non-wetland flatwoods occupy the better drained slight rises and low ridges. Pine savannas are subject to a highly fluctuating water table, from surface saturation/shallow flooding in late fall/winter/early spring to growing-season droughtiness.

In relatively unaltered landscapes in southeast Louisiana and south Mississippi, pine savannas are commonly associated with mesic pine flatwoods intermingled on slight rises and low ridges, and typically grade gently down slope to slash pine-pond cypress woodlands, then bayhead swamps and/or small stream forests.

Low tree density in pine savannas is attributable to a number of site and soil characteristics, among them: 1) longleaf regeneration is impeded by frequent floods that preclude seedling establishment in low areas subject to regular flooding or long periods of standing water, 2) high water tables and heavy subsoils inhibit deep root development, thereby encouraging shallow rooting of longleaf, making it more prone to wind-throw, and 3) wet flatlands are not the ideal environment for longleaf and trees growing there are probably under stress, making them more susceptible to insect or disease attack.

While fire, soil conditions and a seasonally high water table worked in concert to control community structure in longleaf pine flatwood savannas, ***fire was arguably the most critical element in their maintenance***. All of the species indigenous to pine savannas evolved over millennia within a regime of frequent surface fires (once every 1 to 4 years, or so) and most depend of fire for perpetuation in their natural habitat. Among other things, fire stimulates flowering and fruit/seed production of savanna herbs and pyrophytic shrubs, deters invasion by fire-intolerant woody vegetation, and exposes mineral soil for seedlings of indigenous herbs and longleaf pine to become established. We know today that in the absence of frequent burning, pine savannas quickly succeed into shrub/tree thickets, and sun-loving herbs are reduced and most are eventually eliminated without fire.

For the most part, savanna remnants seen today are relatively limited in size compared to the broad expanses that once existed, and have undergone dramatic structural changes. Prior to alteration by human activities of the last 100 years or so, the original habitat was a very open "forest" (canopy cover averaged much less than 50%), with the scattered trees almost exclusively longleaf pine. Few shrubs and hardwoods were encountered, except in wetter depressional acid swamps (e.g., slash pine-pond cypress woodland and bayhead swamp) and along creek bottoms that bisected the flatwoods region. Today, most of the few remaining examples of pine savanna have been invaded to a greater or lesser degree by "off-site" shrubs, pines and hardwoods and have been burned insufficiently or out of season. Others are often poorly stocked with longleaf pine.

Pine savannas support a rich variety of plant species. The community is most often dominated by numerous types of grasses and sedges, but is noted by many for its interesting

collection of insectivorous plants and showy orchids, lilies and others, and for its very high floristic diversity. Many of the plants known from pine savannas are restricted to this habitat or closely-allied hillside bogs. ***Longleaf pine savannas in southeast Louisiana support more types of rare plant species than any other natural habitat in the state.***

Graminoids present typically includes Andropogon spp. (broomsedges), Schizachyrium scoparium and S. tenerum (little and slender bluestem), Panicum spp. (panic grasses), Aristida spp. (three-awn grasses), Ctenium aromaticum (toothache grass), Muhlenbergia capillaris (hairawn muhly), Erianthus spp. (plume-grasses), Coelorachis spp. (jointgrasses), Rhynchospora spp. (beak-rushes), Xyris spp. (yellow-eyed grasses), Fuirena spp. (umbrella grasses), Scleria spp. (nut-rushes), Dichromena latifolia (giant white top sedge), Eriocaulon spp. (pipeworts), Lachnocaulon spp. (bog buttons), and Fimbristylis spp. (fimbry-sedge). Some forbs common in the community include Sarracenia spp. (pitcher plants), Agalinis spp. (gerardias), Lobelia spp. (lobelias), Rhexia spp. (meadow beauties), Eryngium integrifolium (bog thistle), Oxypolis filiformis (narrow-leaved hog-fennel), Polygala spp. (milkworts), Liatris spp. (blazing-stars), Sabatia spp. (rose-gentians), Drosera spp. (sundews), Pinguicula spp. (butterworts), Utricularia spp. (bladderworts), and Platanthera spp. (fringed-orchids). Various additional species belonging to the lily family (Liliaceae), sunflower family (Asteraceae), and orchid family (Orchidaceae) are prominent. Lycopodium spp. (club-mosses) and sphagnum moss are often abundant. Fire frequency is a major factor controlling species occurrence and community structure. Without frequent fire, shrubs, and eventually trees, especially hardwoods, would gain dominance and eliminate most of the herbaceous flora.