
FOREST
COVER
TYPES
of
United
and C
E H
of American Foresters
1980

swamp tupelo, pondcypress, pond pine, loblolly-bay, live oak, southern redcedar, cabbage palmetto, red maple, and less commonly sweetgum, water oak, and laurel oak. On better-drained sites, the type may be associated with a wide variety of species, including longleaf, loblolly, and sand pines, and post, blackjack, sand live, myrtle, blue-jack, and turkey oaks.

Geographic distribution.—The native range of the typical variety of slash pine extends from the southern tip of South Carolina south to central Florida and west along the Coastal Plain to southeast Louisiana. The western range of slash pine has been extended through central Louisiana to east Texas by planting, and it now reproduces naturally in those areas. Slash pine has been planted north of its native range, in Alabama, Mississippi, southern Arkansas, and parts of North and South Carolina, but performance has generally been unsatisfactory and natural regeneration is uncertain.

Ecological relationships.—Slash pine is subclimax and is replaced by a variety of hardwoods depending on soil moisture. Young saplings are easily killed by fire but older trees may survive burning. Largely because of its susceptibility to fire, slash pine was formerly confined to three kinds of habitats: bay swamps, boggy flatwoods, and coastal slash pine flatwoods (A.F. Clewell 1977, personal communication). These habitats will be discussed in turn. (1) Bay swamps are dominated by slash pine and sweetbay or loblolly-bay and sometimes by swampbay, pondcypress, and swamp tupelo, often with an understory of swamp cyrilla and buckwheat-tree. The undergrowth is essentially absent except for species of sphagnum. Bay swamps are highly acid, poorly drained, and usually occur as depressions in the flatwoods. Slash pines apparently seed in after fire and may form a pure overstory above the more slow growing hardwoods, which coppice from their undamaged root crowns. If a seed source is not available, though, slash pine may be rare or absent. Fires are expected on these sites only during severe droughts, perhaps one to three times a century. (2) Boggy flatwoods border acid depressions or creek swamps. Here slash pine is often mixed with longleaf pine. Pitcher plants are common in the undergrowth. (3) Coastal slash pine flatwoods occupy interdunal swales or flats near tidal marshes. The flatwoods also occur inland in penisular Florida. The undergrowth may be dominated by wiregrass, bluestems, saw-palmetto, inkberry (gallberry), and fetterbush lyonia.

Differences in elevation across the natural range of slash pine are small, but local change of less than 1 m (1 or 2 ft.) in topography can have a pronounced effect on soil conditions and site productivity (Cooper 1957). Slash pine has invaded vast areas originally covered by the longleaf pine type. Removal of the longleaf pines, coupled with fire suppression and a ready source of slash pine seed in adjacent bay swamps, allowed the extension of the slash pine (and longleaf–slash pine) type into former longleaf pine flatwoods. Slash pine has also invaded fallow agricultural fields and other disturbed areas. It has been planted extensively on old-field sites where it makes its best growth (Cooper 1957).

Variants and associated vegetation.—Variation in the slash pine type is attributable to differences in composition of associated tree species and undergrowth, which in turn reflect the several very different habitats in which slash pine occurs. On very wet sites such as bay swamps, little undergrowth exists except for sphagnum. On moist to wet sites such as the boggy flatwoods, undergrowth includes wax-myrtle (southern bayberry), gallberry (inkberry), buckwheat-tree, dahoon, yaupon, and pitcher plants. On better-drained soils, undergrowth consists mainly of pineland threeawn, saw-palmetto, gallberry, Curtis dropseed, dwarf huckleberry, ground blueberry, and (particularly in the western part of the range) yaupon and dahoon. On most upland sites, grasses such as broomsedge and creeping and chalky bluestems may be present if overstory density is not excessive.

When the slash pine type is associated with dunes, the undergrowth may consist of relatively few shrubs such as myrtle oak, Chapman oak, and rosemary. Such a forest is essentially a slash pine-scrub community. Along tidal marshes the coastal slash pine flatwoods often intergrade with the coastal hammocks of live oaks, southern redcedar, and cabbage palmetto.

JOHN D. HODGES
Mississippi State University

South Florida Slash Pine

111

Definition and composition.—The south Florida slash pine forest type is pure or comprises a majority of the stocking. In the central and southern parts of its range it occurs both in pure stands and in mixture with other species. On flatwoods sites it is pure, but on the more fertile soils it is associated with cabbage palmetto, water oak, and live oak; in the ecotones between cypress heads and flatwood sites, it grows with pondcypress. In the northern part of its range, south Florida slash pine and longleaf pine are associates, especially in the transition zones between dry and wet sites. South Florida slash and typical slash pine also occur together on the northern fringe of the type (Langdon 1963).

Geographic distribution.—The type occurs only

in Florida. It is found on eight lower Florida Keys in the vicinity of Big Pine Key, but not on other lower or any upper keys. In peninsular Florida, it occurs from the Everglades National Park northward in the southern Florida flatwoods to central Florida and then north along a narrow strip on both coasts to Volusia and Levy counties. The type occurs from near sea level to elevations of about 20 m (about 70 ft.) in five physiographic regions of Florida—flatwoods, big cypress, Miami rock ridge, Atlantic coast ridge, and the Florida Keys (Davis 1943), but not on the central Florida ridge. South Florida slash pine grows in a region with high annual temperatures, low winter rainfall, and high summer rainfall. The climate of the southern part of the range may be described as subtropical and that of the northern part as temperate.

Ecological relationships.—The soils of south Florida have subsurface strata mostly of limestones and calcareous sandstones overlain by marine sands, shells, and marl. The topography is very flat, which greatly affects surface drainage and water tables. When coupled with soil reaction and fertility, these factors result in a mosaic of sites and vegetation types—freshwater ponds, cypress heads, wet grassy prairies—that mingle with the south Florida slash pine type in relatively small areas.

Fire has also had a dominant influence. South Florida slash pine has been found to be more adaptable and resistant to fire than typical slash pine (Ketcham and Bethune 1963); moreover, stands in the southern part of the type range are more resistant than those in the northern fringe (McMinn 1967). The type may be both an edaphic and a fire climax on flatwood sites, but there is little indication that plant succession in south Florida will ever establish a uniform climatic climax vegetation (Robertson 1962). However, on the more fertile sites in the northern and southern parts of the range, temperate and subtropical hardwood hammocks, respectively, are probably the climax vegetation types (Davis 1943). The boundary between the temperate and subtropical hardwood hammocks is determined by winter temperatures, which fall below freezing at irregular intervals except in the extreme southern tip of peninsular Florida and in the Florida Keys.

Variants and associated vegetation.—A south Florida slash pine-cabbage palmetto variant occurs on calcareous soils in the flatwoods physiographic region. Cabbage palmetto may share dominance with the pine or may predominate in this variant. A second variant—called the subtropical pine forest by Küchler (1964) and the Rockland pine forest by Davis (1943)— is restricted to soils derived from or overlain by limestone or calcareous rock in the big cypress and Miami rock ridge physiographic regions. Although this variant has south Florida slash pine as ity dominant species, the unique feature is that its understory associates include many tropical species of hardwoods, shrubs, epiphytes, and palms.

The south Florida slash pine type serves as a link between temperate and subtropical communities; thus its associates (trees, shrubs, ferns, epiphytes, grasses, and grasslike plants) are many and varied. Most common over a major portion of the range are saw-palmetto, wiregrass, bluestems, southern bayberry (waxmyrtle), large gallberry, and runner oak; on calcareous soils cabbage palmetto should be added to the list.

O. GORDON LANGDON
USDA Forest Service
Southeastern Forest
Experiment Station

Pond Pine

98

Definition and composition.—Pond pine is pure or makes up a majority of the stocking. Slash pine, loblolly pine, pondcypress, baldcypress, swamp tupelo, red maple, sweetgum, sweetbay, loblolly-bay, and redbay are common associates. Since the type occurs in areas that have a history of wildfire, the composition of associates varies with intensity of the most recent fire, interval since it occurred, and rehabilitation measures that may have been taken.

Geographic distribution.—The type occurs over fairly extensive areas in the Coastal Plain from North Carolina to Florida, on flatwoods near the coast, or in bays and ponds. As a species, pond pine ranges northward to southern New Jersey and westward through northern Florida, and individuals have been identified in natural stands in the North Carolina Piedmont. But it does not occur as a forest cover type in these outlying parts of the species range. Nonetheless, more pond pine exists than has been commonly supposed because the species is regularly mistaken for loblolly pine by the casual observer, even though each species possesses distinct characteristics. Pond pine has in the past been most readily identified by its ability to exist under conditions that effectively eliminate other pines. Thus on better sites that have escaped destructive wildfires, pond pine often passes for loblolly pine and is harvested and used with no distinction made between the two.

Ecological relationships.—Pond pine seems to be able to endure poor aeration, high soil acidity, slow nitrogen fixation and nitrification, and wildfires—and still regenerate and grow. The type is found most extensively in the broad, poorly drained, interstream areas of peaty soils in the lower Coastal