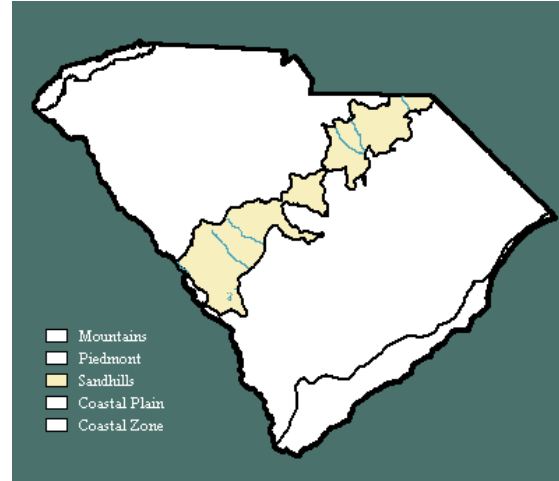


Sandhills Ecoregion Terrestrial Habitat

Description and Location

The Sandhills Ecoregion is the inland portion of the coastal plain that borders the fall line. This ecoregion is frequently recognized as a physiographic province distinct from the coastal plain, although some researchers incorporate the sandhills within a broader area known as the “inner coastal plain.” The sandhills form a discontinuous belt of varying width of deep sands across the middle of the state (Porcher and Rayner 2001).



Pliocene and Pleistocene sands deposited up to ten million years ago by strong southwest prevailing winds form the top layer of the sandhills (Murray 1995). These sands are a very pure and high quality source of silica; they are mined throughout the sandhills, especially in Lexington County (Murray 1995). These deep sands have created a xeric environment that supports a distinctive type of vegetation dominated by longleaf pines (*Pinus palustris*) and turkey oaks (*Quercus cerris*). This fire-adapted community burns with a frequency interval of 5 to 10 years and may be one of the oldest communities of this type in the southeast (Wharton 1978).

Major brownwater rivers that cut their way through the sandhills on their way from the mountains and piedmont to the sea include the Lynches, Wateree, Congaree and Savannah Rivers. The North and South Forks of the Edisto River are the only major rivers that originate in the sandhills.

Deep sand ridges ranging from 300 to over 600 feet above mean sea level are one of the most striking and dominant features of the Sandhills. Ridge tops of pure Lakeland and Kershaw Sands, some up to 30 feet deep (Wharton 1978), support the most extreme xeric scrub communities of longleaf pine and turkey oaks. The sandy soils on the ridges, excessively drained with low available water capacity, are low in fertility due to rapid leaching and possess little to no leaf litter (Lawrence 1976). The drier sand ridges are suitable for agriculture only when managed through fertilization and irrigation. These ridges can support timber production, particularly of longleaf pine, which is well adapted to deep, dry sandy soils.

Fire is a dominant factor in the ecology of this region. Sandhills pine forests are a fire climax community; as such, these forests are dependent on frequent ground fires to reduce hardwood competition and to perpetuate pines and grasses.

Sand ridges that have more clay and silt mixed with sand support subxeric sandhill scrub vegetation and mesic pine flatwoods. Increased plant diversity is a result of the more moderate growing conditions. Due to the increase in leaf litter, fire is an important factor in the maintenance of the subxeric scrub forest and woodlands. These subxeric to mesic communities

can grade into oak-hickory forests or, in the absence of fire, they may succeed to oak-hickory forests.

Rainwater rapidly percolates through the sand ridges until it reaches hardpan, at which point it moves laterally until emerging at the surface on side slopes or near the base of sand ridges. These natural seepage areas result in distinctive wetland habitats embedded within the xeric forests and woodlands. The community type that develops is determined by the amount of water, the position on the slope and, especially, by fire. In the absence of fire, this wetland habitat can be forested with longleaf or pond pines (*Pinus serotina*) growing over a dense evergreen pocosin-like shrub layer or, with frequent fire, it can be an open hillside herb bog. Seepage accumulating at the base of the sand ridges results in a saturated zone that supports a streamside pocosin forest.

Habitats and Priority Species

Although xeric sandy soils predominate, the rolling terrain and variations in soil and subsoil composition provide significant local variation in habitat composition. The principal habitat of the sandhills is sandhills pine woodland, with local structure and composition influenced mainly by fire history. The major sandhills habitat types are summarized below.

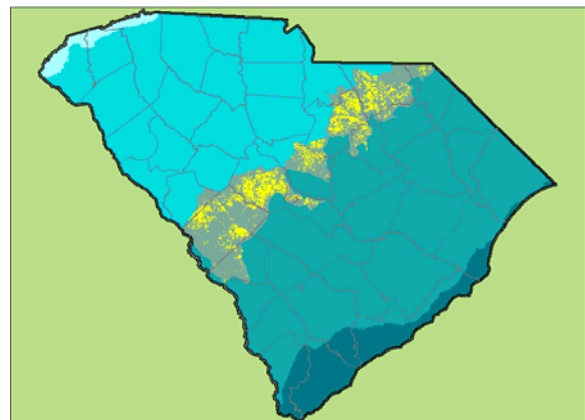
Sandhills Pine Woodland

General Description and Location

Pine woodland is the characteristic vegetation on the sandy soils that define the region. On deep, well-drained sands a longleaf pine (*Pinus palustris*) canopy with a subcanopy of turkey oak and other scrub oak species prevails. On lower or middle slopes, or on sites with relatively high amounts of organic matter, other pine species may share dominance with longleaf and a more diverse understory and herbaceous layer is present. On lower slopes sufficiently protected from fire, succession can proceed to oak-hickory forests similar to those of the piedmont

Several priority species favor the longleaf pine-wiregrass community, a canopy composed of longleaf pine, an open understory and a diverse herbaceous layer with extensive wiregrass (*Aristida* sp.) cover. The longleaf pine-wiregrass subtype is dependent on fire for maintenance. Wiregrass and leaf litter generally carry fire well and longleaf pine is very fire-adapted. Where fire is excluded, turkey oak and other scrub oak species increase.

Although accurate vegetation maps for pine woodland are not available, the extent of this habitat type can be gauged from soil maps showing the distribution of the sandy soils in the region with which pine woodland is strongly associated. Potential pine woodland habitat in the South Carolina sandhills is illustrated highlighted in yellow, as predicted by soil type.



Associated Species

Highest Priority: American Kestrel, Bachman's Sparrow, Brown-headed Nuthatch, Eastern Wood Pewee, Northern Bobwhite, Red-cockaded Woodpecker, Wood Thrush, Coral Snake, Gopher Tortoise, Pine Snake, Southern Hognose Snake
High Priority: Pine Woods Snake
Moderate Priority: Eastern woodrat, Eastern Fox Squirrel

Grassland and Early Successional Habitats

General Description and Location

As in other ecoregions, a variety of grassland and early successional habitats are present, either as transitional vegetation following forest disturbances or as managed areas. Habitat characteristics and wildlife species composition do not differ from that of the coastal plain. See the Coastal Plain Ecoregion account for a full description.

Associated Species

Highest Priority: Common Ground-dove, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Loggerhead Shrike, Northern Bobwhite, Painted Bunting
High Priority: Barn Owl
Moderate Priority: American Woodcock, Bewick's Wren, Meadow Vole, Eastern Woodrat

Seepage Slope

General Description and Location

Seepage slopes occur on sites having a hard clay moisture-confining layer underlying the sandy soil, such as iron-bearing sandstone or kaolin deposits. Water percolating downhill is forced to the surface, which results in seasonally or permanently saturated soils. Vegetation is variable, depending on position on the slope, the amount of peat accumulation and fire history. Dense shrubland composed of several fire-tolerant species, with an open canopy of pond pine (*Pinus serotina*) is representative. The shrubland community intergrades with open grass-sedge vegetation on wetter seeps that are regularly burned or maintained in an open condition by mechanical clearing or herbicide application. Steeper slopes support a mixture of pine species, including longleaf pine and Virginia pine and a characteristic shrub layer of titi (*Cyrilla racemiflora*), sand myrtle (*Leiophyllum buxifolium*), mountain laurel (*Kalmia latifolia*) and inkberry (*Ilex glabra*).

Associated Species

Highest Priority: Chamberlain's Dwarf Salamander, Pine Barrens Treefrog
High Priority: Southern Dusky Salamander

Ponds and Depressions

General Description and Location

Clay lenses and other confining layers support a variety of permanently and semi-permanently flooded isolated freshwater wetlands throughout the sandhills. Landforms include natural and

artificial ponds dominated by cypress and/or swamp tupelo. Varying amounts of peat accumulation and fire frequencies produce shrub-dominated pocosins or grass-sedge-herb-dominated depression meadows. Upslope from these lowland habitats, the transition to well-drained uplands supporting sandhills pine woodland is often abrupt.

Associated Species

Highest Priority: Little Blue Heron, Yellow-crowned Night Heron, Carolina Gopher Frog, Tiger Salamander
High Priority: Black Swamp Snake, Chicken Turtle, Florida Cooter, Yellowbelly Turtle, Mink, Southeastern Bat
Moderate Priority: Great Blue Heron, Great Egret, Spotted Turtle, Common Snapping Turtle

Blackwater Stream Systems

General Description and Location

Tributary streams rising in the sandhills and coastal plain are commonly known as “blackwater streams” for the color of tannins leaching from decaying vegetation. Forests on the narrow floodplains formed by these streams typically have a canopy dominated by swamp tupelo (*Nyssa biflora*) and red maple (*Acer rubrum*). On broader sites, bald cypress (*Taxodium distichum*) can become an important canopy species. Tulip poplar (*Liriodendron tulipifera*), sweet gum (*Liquidambar styraciflua*), pond pine (*Pinus serotina*), loblolly pine (*Pinus taeda*) and laurel oak (*Quercus laurifolia*) are important associates. The shrub layer is open in areas subjected to the most flooding, or it can be fairly dense and pocosin-like in areas subject to infrequent flooding. Headwaters and wet flats immediately above the floodplain can support dense, pocosin-like shrub thickets or, under suitable fire conditions, pure stands of Atlantic white cedar (*Chamaecyperus thyooides*).

Associated Species

Highest Priority: Kentucky Warbler, Eastern Wood Pewee, Rusty Blackbird, Swainson’s Warbler, Wood Thrush, Yellow-crowned Night Heron
High Priority: Acadian Flycatcher, Black Swamp Snake, Spiny Softshell Turtle, Mink, Rafinesque’s Big-eared Bat, Southeastern Bat
Moderate Priority: American Woodcock, Louisiana Waterthrush, Wood Duck, Spotted Turtle

River Bottoms

General Description and Location

The state’s major rivers transect the sandhills, forming broad floodplains similar to those in the coastal plain. Steep bluffs occur where rivers have cut into sandhill formations having an erosion-resistant iron-bearing sandstone layer. Hardwood-dominated woodlands form the characteristic vegetation. As in the coastal plain, characteristic trees include sweetgum, loblolly pine, water oak, willow oak, laurel oak, cherrybark oak and American holly. The Cypress-tupelo swamp subtype occurs on lower elevation sites as seasonally flooded swamps. Dominant trees are bald cypress and water tupelo swamp gum, water elm and red maple.

Associated Species

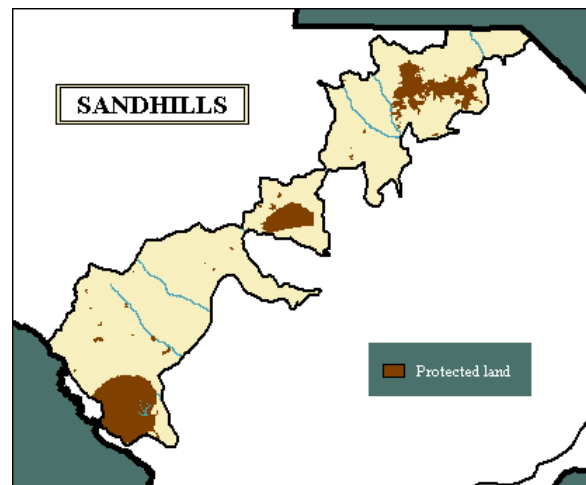
- Highest Priority: Black-throated Green Warbler, Kentucky Warbler, Little Blue Heron, Rusty Blackbird, Swainson’s Warbler, Yellow-crowned Night Heron, Black Bear, Northern Yellow Bat
- High Priority: Acadian Flycatcher, American Alligator, Black Swamp Snake, Gulf Coast Mud Salamander, River Cooter, Spiny Softshell Turtle, Striped Mud Turtle, Mink, Rafinesque’s Big-eared Bat, Southeastern Bat, Star-nosed Mole
- Moderate Priority: American Woodcock, Great Blue Heron, Great Egret, Louisiana Waterthrush, Wood Duck, Bird-voiced Treefrog, Common Snapping Turtle, Spotted Turtle, Eastern Woodrat, Eastern Fox Squirrel

General Condition of Habitats

Compared to the adjoining piedmont and upper coastal plain, upland forest cover in the sandhills is relatively unbroken. However, numerous cycles of pine removals and exclusion of fire have left a vast, rather monotonous forest cover on much of the landscape, consisting of small longleaf pines, turkey oak and other scrub oak species. Forest in this condition is not suitable habitat for South Carolina’s priority species. Indeed, the prevalence of forest in this condition is a primary source of concern for many of these species.

Considerable effort is being made by the forestry community to encourage production of saw timber-sized longleaf pines and more liberal application of fire. Encouraged by successful efforts to restore red-cockaded woodpecker (RCW) populations on public lands and extensive enrollment of private lands in the RCW Safe Harbor program, landowner interest in longleaf pine-wiregrass forest restoration seems to be increasing. Longleaf pine seedlings and technical guidance for establishing longleaf stands are also increasingly becoming more available.

Significant public land holdings in the sandhills include the US Army base Fort Jackson and the Army National Guard Leesburg Training Site; the Sandhills National Wildlife Refuge; Sandhills State Forest; major portions of the Savannah River Site; and Hitchcock Woods (operated by a private foundation). Although the impetus for conservation-oriented management on many of these facilities stems from the listing status of the RCW, the intended future condition of many forested tracts on these lands is a longleaf pine wiregrass community, with a significant portion of longleaf pine stands attaining older age classes.



Major public land holdings and private conservation lands in the Sandhills (acres)	
Aiken County Open Land Trust	58
South Carolina Department of Natural Resources	1,873
South Carolina Department of Parks, Recreation & Tourism	4,361
South Carolina Forestry Commission	18,997
The Hitchcock Foundation	791
The Nature Conservancy	141
United States Department of Energy	64,893
United States Department of the Army	21,251
United States Fish & Wildlife Service	18,118
Total	130,483

Impoundments have been constructed in sandhills streams for many centuries. In the 18th and 19th centuries they were built to provide power and water for gristmills; most of these old mill ponds are still in existence. As agriculture continued to expand in the sandhills region, farm ponds were constructed to provide irrigation for agricultural fields. The number of small impoundments in blackwater streams increased dramatically during the 1960's and 1970's (Melven pers. comm.) and this trend continued through the end of the century. There were about 1,100 farm ponds in Lexington County as of 1970 (Lawrence 1976) and there are now more than 4,000 farm ponds (Deaderick pers. comm.). In a study of the Edisto River basin, most of the wetland alterations documented in the North and South Forks of the Edisto River were found in the headwaters streams where the relatively steep and narrow valleys in the sandhills make good farm pond sites. Very few headwater streams in the Edisto Basin were found without impoundments (Marshall 1993).

Region-wide Challenges

The rate of urbanization has increased in the sandhills in the last two decades, primarily in the Aiken, Columbia, Camden and North Augusta areas. Tracts of land with existing ponds are especially sought after for residential development. Residential development is concentrated around the ponds and there is often very little buffer of natural vegetation remaining between the home sites, roads and ponds.

Although land management practices that favor restoration of the longleaf pine ecosystem are gaining wide acceptance, significant alterations continue to affect transition areas between uplands and wetlands. These alterations typically occur when access roads or firebreaks are placed at the upland-wetland boundary, which effectively excludes fire from the wetlands. The result is a closed canopy forest, rather than the complex of dense shrub (pocosin) and grass-sedge successional stages that would occur under a more natural fire regime.

The longleaf pine ecosystem, the dominant natural vegetation type in the sandhills, is one of the most imperiled in the country with only three percent of its original extent in a relatively natural condition (Frost 1993). Even in areas where longleaf pine remains, fire suppression has severely impacted the ecosystem. Fire suppression in the southeastern United States began to be institutionalized between 1910 and 1930 (Frost 1993; Ware et al.1993). This practice severely affected the remaining patches of the longleaf pine ecosystem, resulting in a change in species composition and forest structure. In recent years, some areas have been restored or are in the

process of being restored with the use of prescribed fire. This practice has been limited, however, because of the costs associated with prescribed fire and because of other risks associated with prescribed burning, including problems with smoke management.

Economic considerations have also affected timber management practices. Conversion of areas to tree species not usually associated with the sandhills have contributed to the decline of the longleaf pine ecosystem. Many land managers have planted pine species other than longleaf because they were less expensive to plant and produced a superior mid-term return on investment.