



Lake Wales Ridge State Forest (Polk County)

Photo by Gary E. Schultz

Xeric Hammock

Description: Xeric hammock is an evergreen forest on excessively well-drained sandy soils. The low canopy is more or less closed and dominated by sand live oak (*Quercus geminata*), although Chapman's oak (*Q. chapmanii*), turkey oak (*Q. laevis*), bluejack oak (*Q. incana*), sand post oak (*Q. margaretta*), and laurel oak (*Q. hemisphaerica*) may also be common. An emergent canopy of pine, either sand pine (*Pinus clausa*), slash pine (*P. elliottii*), or longleaf pine (*P. palustris*), may be present. Hammocks that are intermediate with mesic hammock may have some live oak (*Q. virginiana*) in the canopy.

The understory is usually open and consists of shrubs characteristic of either sandhill or scrub, depending on the origin of the hammock. Common understory plants include saw palmetto (*Serenoa repens*), myrtle oak (*Q. myrtifolia*), rusty staggerbush (*Lyonia ferruginea*), fetterbush (*L. lucida*), sparkleberry (*Vaccinium arboreum*), deerberry (*V. stamineum*), black cherry (*Prunus serotina*), American beautyberry (*Callicarpa americana*), common persimmon (*Diospyros virginiana*), scrub palmetto (*Sabal etonia*), Hercules' club (*Zanthoxylum clava-herculis*), wild olive (*Osmanthus americanus*) or scrub wild olive (*O. megacarpus*), garberia (*Garberia heterophylla*), Florida rosemary (*Ceratiola ericoides*), and yaupon (*Ilex vomitoria*). The herb layer is generally very sparse or absent, but may contain some scattered wiregrass (*Aristida stricta* var. *beyrichiana*), sandyfield beaksedge (*Rhynchospora megalocarpa*), witchgrass (*Dichanthelium* spp.), or forbs such as sweet goldenrod (*Solidago odora*). Muscadine

(*Vitis rotundifolia*) and earleaf greenbrier (*Smilax auriculata*) are common vines. The epiphytes Spanish moss (*Tillandsia usneoides*) and ballmoss (*T. recurvata*) are often abundant.

Xeric hammock typically develops on excessively drained sands where fire-exclusion allows for the establishment of an oak canopy. This may occur naturally, when the area has significant barriers to fire, or more commonly, as the result of human intervention. In these areas, xeric hammock is found as small patches within or near sandhill or scrub. Xeric hammock can also occur on high islands within flatwoods or even on a high, well-drained ridge within a floodplain. Xeric hammock can occur on barrier islands and in other coastal situations, as an advanced successional stage of coastal scrub.

Characteristic Set of Species: sand live oak

Rare Species: Xeric hammock is not considered to be critical habitat for any rare plants tracked by FNAI, although some species adapted to scrub or sandhill communities may persist in hammocks.

Several rare animals commonly utilize xeric hammocks for nesting or foraging. These include gopher frog (*Rana capito*), gopher tortoise (*Gopherus polyphemus*), eastern diamondback rattlesnake (*Crotalus adamanteus*), Florida pine snake (*Pituophis melanoleucus mugitus*), short-tailed snake (*Stilosoma extenuatum*), Cooper's hawk (*Accipiter cooperii*), short-tailed hawk (*Buteo brachyurus*), and Florida black bear (*Ursus americanus floridanus*).

Range: Xeric hammock in Florida is most common in the central peninsula and its range generally corresponds to the ranges of scrub and sandhill. It is less common north of the Cody Scarp where clayey soils create mesic conditions that instead support upland mixed woodland or mesic hammock in the absence of fire. Xeric hammock probably extends into the coastal Carolinas and Mississippi, roughly equaling the extent of sand live oak.

Natural Processes: Sand live oak and myrtle oak are both clonal species which establish large rhizome systems capable of quickly re-sprouting following injury. Sandhills in which fire has been excluded for 7-16 years can establish clones of these oak species that may then persist even after fire is re-introduced into the community. The thick bark of sand live oak makes the trees somewhat resistant to fire, particularly after the clone exceeds 2 meters in height. These oaks may increase carbohydrates in roots in the fall, making them more capable of re-sprouting after winter burns than summer burns (Guerin 1993). Thus, cool season burns, especially, are not adequate to kill back these clones, and the establishment of an "oak dome" may then allow expansion to a patch of xeric hammock within the sandhill. The resulting shaded habitat of xeric hammocks can allow more fire-intolerant species such as southern magnolia (*Magnolia grandiflora*) to establish (Daubenmire 1990).

Xeric hammocks also form from long unburned oak scrub (Laessle 1958). Sand live oak and other scrub oaks, in the long-term absence of fire, grow upward to eventually form a canopy that shades the understory and creates a layer of leaf litter, covering open patches of sand and leading to more shaded, mesic ground conditions.

Community Variations: Xeric hammocks derived from scrub typically contain Chapman's oak, myrtle oak, and saw palmetto. In hammocks derived from scrubby flatwoods, saw palmetto may form a dense monospecific shrub layer. If derived from sand pine scrub, emergent sand pine often persists above the oak canopy. Xeric hammock derived from sandhill will often contain turkey oak, bluejack oak, sparkleberry, and remnant wiregrass. Xeric hammocks that develop from coastal scrub, particularly in the Florida Panhandle, often have some slash pine and southern magnolia in the canopy. Younger hammocks may have a remnant, emergent pine canopy, but the shaded oak habitat is not conducive to pine recruitment.

Associated Communities: Xeric hammock may be distinguished from scrub, scrubby flatwoods, or sandhill by the closed or nearly closed canopy of evergreen oaks. Xeric hammock should not be confused with a dense, impenetrable thicket of shrubby oaks (in the case of oak scrub), or a scattered canopy of oaks with a low ground cover still receiving abundant light (in the case of oak-invaded sandhill or scrubby flatwoods). There can be considerable overlap particularly between xeric hammock and oak scrub or scrubby flatwoods that have been protected from fire, allowing the sand live oaks to attain tree size and begin to form a low canopy. Mesic hammock and maritime hammock are also evergreen oak-dominated forests, but they occur on mesic soils and are dominated by live oak rather than sand live oak. Upland mixed woodland is dominated by an open mixture of pine and deciduous oaks, e.g., southern red oak (*Quercus falcata*) and post oak (*Q. stellata*), along with mockernut hickory (*Carya alba*). Cultural forests, which may also develop in fire-excluded areas, are generally dominated by laurel oak or water oak (*Q. nigra*), rather than sand live oak.

Management Considerations: The spreading oak canopy of xeric hammock provides a shady refuge in otherwise open, sunny areas. As a result, hammocks have long been utilized (and disturbed) by humans seeking comfortable homesites or camping and recreation areas. Feral hog rooting and livestock grazing are sources of soil disturbance.

Xeric hammocks, whether natural or anthropogenic, result from years of fire exclusion, further enhanced by incombustible oak litter and a sparsity of herbs. Once sand live oaks form a canopy greater than 2 meters high, even hot summer burns may not be sufficient to kill the dome, which can become established after only 7-16 years of fire exclusion (Guerin 1993). At that stage, oaks would only be killed through a catastrophic burn during dry conditions. Otherwise, the spread of oaks could be halted through mechanical removal or the use of herbicides if the management intent is the re-establishment of the fire-maintained community that was replaced by the xeric hammock.

Reference Sites: Eglin Air Force Base (Walton, Okaloosa, and Santa Rosa Counties), Troy Springs Conservation Area (Lafayette Counties), Cedar Keys National Wildlife Refuge – Atsena Otie Key (Levy County), Avon Park Air Force Range (Polk and Highlands Counties), Lake Wales Ridge State Forest (Polk County), Welaka State Forest (Putnam County)

Global and State Rank: G3/S3

Crosswalk and Synonyms:

Kuchler 112/Southern Mixed Forest

Davis	12/Hardwood Forests
SCS	3/Sand Pine Scrub
	15/Oak Hammocks
Myers and Ewel	Temperate Hardwood Forests
SAF	72/Southern Scrub Oak
FLUCCS	421/Xeric Oak
	425/Temperate Hardwood
	432/Sand Live Oak

Other synonyms: dry woods

References:

Daubenmire, R. 1990. The *Magnolia grandiflora-Quercus virginiana* forest of Florida. American Midland Naturalist 123:331-347.

Guerin, D.N. 1993. Oak dome clonal structure and fire ecology in a Florida longleaf pine dominated community. Bulletin of the Torrey Botanical Club 120:107-114.

Laessle, A.M. 1958. The origin and successional relationship of sandhill vegetation and sand-pine scrub. Ecological Monographs 28:361-387.