

HIGH POCOSIN (EVERGREEN SUBTYPE)

Concept: High Pocosins are shrub bog communities of intermediate-depth peats, with a prevailing shrub height greater than 1.5 meters but with a sparse, poorly-developed tree canopy. The Evergreen Subtype covers the typical examples dominated strongly by evergreen shrubs, generally *Lyonia lucida*, *Ilex glabra*, and *Cyrilla racemiflora*.

Distinguishing Features: High Pocosins are distinguished from other peatland pocosins by having dense shrub layers persistently greater than 1.5 meters tall (except immediately after fire) but lacking a well-developed tree canopy (cover less than 25 percent). Pond Pine Woodlands that have recently burned may have similar tree stature and cover, but generally will show evidence of having supported larger and denser trees before the fire. However, Pond Pine Woodland that has been logged may be difficult to distinguish, and other forests with evergreen shrubs may also come to deceptively resemble High Pocosin if clearcut.

High Pocosins are distinguished from Streamhead Pocosins by not occurring in seepage-fed drainages in sandhill terrain. They lack *Liriodendron tulipifera*, *Toxicodendron vernix*, and other characteristic streamhead species and may have *Gordonia lasianthus* as a component. They are distinguished from Small Depression Shrub Border by occurring on peats, not being associated with small depressions, and lacking other characteristic species such as *Ilex myrtifolia* and *Nyssa biflora*.

The Evergreen Subtype is distinguished from the Deciduous Subtype by having only a minor amount of deciduous shrubs such as *Zenobia pulverulenta* and *Vaccinium* spp. It is distinguished from Peatland Canebrake by having broadleaf shrubs dominant, though *Arundinaria tecta* may be present in small amounts.

Synonyms: *Pinus serotina* / *Lyonia lucida* - *Ilex glabra* - (*Cyrilla racemiflora*) Shrubland (CEGL003846).

Ecological Systems: Atlantic Coastal Plain Peatland Pocosin and Canebrake(CES203.267). Pine-Ericalean Pocosin (Kologiski 1977) (in part). Included in the Short Pocosin category of Snyder (1980). Shrub bog (general usage).

Sites: High Pocosins occur on peats that are typically about 1.5 meters deep, in the intermediate parts of the deeper domed peatlands, in centers of shallower peatlands, or in peat-filled Carolina bays and swales. Peat deposits may be deeper or shallower in other conditions that give similar nutrient levels.

Soils: Soils are usually Terric Haplipsaprists, most often mapped as Pamlico or Croatan. A few are mapped as Dare (Typic Haplipsaprists) and a few are mapped as deeper or shallower peats. Most soil maps do not distinguish different soils for High Pocosin and Low Pocosin.

Hydrology: Sites are saturated at the surface seasonally or all year. High Pocosins occurring in domed peatlands are slightly higher than the surrounding lands and the only surface or ground water that drains into them comes from other pocosins, making them largely ombrotrophic. High pocosins in Carolina bays and swales occupy low areas that lack mineral input, or occur in the

interior of peat-filled depressions where any nutrients in incoming water are filtered out by peat on the periphery. The peat is deep and saturated enough that plant roots can reach mineral soil only during droughts (Otte 1981). Small, permanently flooded depressions may occur, but are less common than in Low Pocosin.

Vegetation: The vegetation is a dense tall shrubland with stunted trees widespread but with less than 25% overall cover even with no recent fire. The shrub layer is 1.5 to 3 meters tall, except when recovering from fire. The open canopy consists almost exclusively of *Pinus serotina*, though *Gordonia lasianthus*, *Magnolia virginiana*, or *Persea palustris* may occur in small numbers. The shrub layer is dominated by *Lyonia lucida*, *Cyrilla racemiflora*, *Ilex glabra*, *Ilex coriacea*, and the hardwoods listed above. *Smilax laurifolia* is frequent and often forms large tangles. *Arundinaria tecta* may be present but does not dominate. Other shrub species, such as *Zenobia pulverulenta*, *Aronia arbutifolia*, *Vaccinium fuscum*, or *Vaccinium formosum*, may occur in small numbers. Herbs are sparse. *Anchistea virginica* is most frequent. In small openings created by peat consumption in fires or sometimes by mechanical disturbance, a few other herbs may be common: *Carex striata*, *Andropogon glomeratus*, and the rare *Peltandra sagittifolia*. *Sphagnum* spp. may occur in small amounts.

Range and Abundance: Ranked G3. Most High Pocosins are the Evergreen Subtype. They range throughout the outer terraces of the Coastal Plain, are present in all larger peatlands and many of the peat-filled Carolina bays. The equivalent association ranges southward to Florida, but North Carolina appears to have most of the occurrences.

Associations and Patterns: High Pocosins occur as large patch communities. They may dominate the center of a large peatland or Carolina bay, or they may be a broad to narrow intermediate zone outside of a Low Pocosin center. They almost always grade to Pond Pine Woodland on the outer edges with shallower organic deposits. Other Peatland Pocosin communities, such as Bay Forest or Peatland Canebrake, may also occur in the mosaic. The Deciduous Subtype usually is in different Carolina bays than the Evergreen Subtype, but they can cooccur.

Dynamics: High Pocosins are intermediate in nutrient levels and productivity, between Low Pocosins and Pond Pine Woodlands. Nutrient shortages limit the size and density of trees, which remain small and low in density even with the long absence of fire. Recovery from fire may be somewhat slower than in Low Pocosin because of the higher normal biomass, but productivity is also higher. Some species, such as *Zenobia* and various herbs, recover particularly quickly and dominate several years after a fire, until they are out-competed by *Cyrilla* and *Lyonia* (Christensen, et al. 1981). Species diversity is generally highest right after a fire, and declines gradually. Some species, such as *Peltandra sagittifolia*, appear to be exclusively associated with severely disturbed patches.

Tree regeneration is driven by fires, which create bare ground and release seeds from serotinous cones. Tree density and stature in the long term is driven by nutrient limitation. However, a fire can significantly change the tree density in either direction in a High Pocosin or Pond Pine Woodland, and this may lead to apparent changes in the boundary between the two in transitional areas.

The natural dynamic relationship of High Pocosin and Peatland Canebrake is not well known. It is reasonable, as suggested by Frost (2000), that canebrakes might be invaded by shrubs and come to resemble High Pocosin in the long absence of fire, though others are known to have been invaded by hardwood trees. Any High Pocosin that contains *Arundinaria* may have the potential to become dominated by it with frequent burning, and *Arundinaria* will support burning more frequently than shrubs will. However, it is unclear if these communities interchanged on a regular basis, or if they occurred as a stable mosaic in areas that promoted different fire behavior. Both shrubs and cane appear capable of promoting the fire regime that benefits them, so feedback between vegetation and fire may have stabilized both communities.

Variation: Stature of vegetation increases with decreasing peat depth. Dominance, stature, and diversity also vary due to fire cycles. Theoretically, differences in hydrology, fire regime, and other site factors between large peatlands and Carolina bays might create differences in pocosins in these settings, but such differences have not been documented.

Comments: Much of the literature on pocosin ecosystems is general and does not distinguish High Pocosins specifically. Their location relative to the terminology of tall and short pocosin is also sometimes unclear.

Similar vegetation occurs in southern Virginia on small peat bodies along tidal rivers. No similar vegetation is known in North Carolina in such a setting.

Rare species: *Kalmia cuneata*, *Lysimachia asperulifolia*, *Peltandra sagittifolia*.

References:

- Christensen, N.L., R. Burchell, A. Liggett, and E. Simms. 1981. The structure and development of pocosin vegetation. In C.J. Richardson (ed.): Pocosin wetlands: an integrated analysis of Coastal Plain freshwater bogs in North Carolina. Hutchinson Ross Publ. Co.
- Frost, C.C. (2000) Studies in landscape fire ecology and presettlement vegetation of the southeastern United States. PhD Dissertation, University of North Carolina, Chapel Hill, NC.

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Woodwell 1956