Big Bend Wildlife Management Area (Taylor County)
Photo by Ann F. Johnson

Hydric Hammock

Description: Hydric hammock is an evergreen hardwood and/or palm forest with a variable understory typically dominated by palms and ferns occurring on moist soils, often with limestone very near the surface. While species composition varies, the community generally has a closed canopy of oaks and palms, an open understory, and a sparse to a moderate groundcover of grasses and ferns. The canopy is dominated by swamp laurel oak (*Quercus laurifolia*) and/or live oak (*Q. virginiana*) with varying amounts of cabbage palm (*Sabal palmetto*), American elm (*Ulmus americana*), sweetbay (*Magnolia virginiana*), red cedar (*Juniperus virginiana*), red maple (*Acer rubrum*), sugarberry (*Celtis laevigata*), sweetgum (*Liquidambar styraciflua*), and water oak (*Q. nigra*). Cabbage palm is a common to dominant component of hydric hammock throughout most of Florida. Loblolly pine (*Pinus taeda*) may be frequent in some areas, but slash pine (*Pinus elliottii*) is less frequently encountered. In addition to saplings of canopy species, the understory may contain a number of small trees and shrubs. American hornbeam (*Carpinus caroliniana*) is often frequent, and various other woody species may be present including swamp dogwood (*Cornus foemina*), small-leaf

viburnum (*Viburnum obovatum*), common persimmon (*Diospyros virginiana*), swamp bay (*Persea palustris*), wax myrtle (*Myrica cerifera*), dwarf palmetto (*Sabal minor*), American beautyberry (*Callicarpa americana*), and needle palm (*Rhapidophyllum hystrix*). Vines may be frequent and diverse; common species are eastern poison ivy (*Toxicodendron radicans*), peppervine (*Ampelopsis arborea*), rattan vine (*Berchemia scandens*), trumpet creeper (*Campsis radicans*), climbing hydrangea (*Decumaria barbara*), yellow jessamine (*Gelsemium sempervirens*), greenbriers (*Smilax* spp.), summer grape (*Vitis aestivalis*), and muscadine (*Vitis rotundifolia*). Herb cover, when present includes mostly graminoids and ferns with the following species commonly encountered: sedges (*Carex* spp.), woodoats (*Chasmanthium* spp.), smooth elephantsfoot (*Elephantopus nudatus*), Carolina scalystem (*Elytraria caroliniensis*), woodsgrass (*Oplismenus hirtellus*), maiden ferns (*Thelypteris* spp.), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis* var. *spectabilis*), toothed midsorus fern (*Blechnum serrulatum*), netted chain fern (*Woodwardia areolata*), and Virginia chain fern (*Woodwardia virginica*). Epiphytes such as golden polypody (*Phlebodium aureum*), air-plants (*Tillandsia* spp.), and shoestring fern (*Vittaria lineata*) increase in frequency to the south along with other more subtropical shrubs such as myrsine (*Rapanea punctata*), and wild coffee (*Psychotria nervosa*; species list developed in part from Vince et al. 1989).

Species composition is mainly influenced by flooding patterns. In saturated and frequently flooded environments, hydrophytic trees such as swamp tupelo (*Nyssa sylvatica* var. *biflora*) become more abundant. Frequency and depth of inundation have a pronounced effect on oak canopy composition as well, with saturated soils supporting more swamp laurel oak, and areas of infrequent flooding supporting more live oak (Vince et al. 1989). Increased salinity is a factor often limiting certain species. Rises in terrain as well as ecotones to mesic hammock and upland hardwood forest induce a greater cover of upland species, specifically southern magnolia (*Magnolia grandiflora*), pignut hickory (*Carya glabra*), and saw palmetto (*Serenoa repens*).

Hydric hammock occurs on low, flat, wet sites where limestone may be near the surface and soil moisture is kept high mainly by rainfall accumulation on poorly drained soils. Periodic flooding from rivers, seepage, and spring discharge may also contribute to hydric conditions (Vince et al. 1989). Soils are variable, usually somewhat acidic to slightly alkaline with little organic matter, and in all cases, alkaline materials are available in the substrate (Vince et al. 1989). In the extensive Gulf Hammock region shallow loamy soils (Waccasassa series) formed by marine sediments overlie a layer of Oligocene limestone near the surface that frequently outcrops (Harper 1914; USDA 2007). Deeper soils over limestone (Aripeka series) and deep sands with calcium carbonate nodules and shell fragments underlie many hammocks in peninsular Florida (USDA 2007). These substrates are conducive for the growth of calciphiles characteristic of hydric hammock (red cedar, rattan vine, etc.). Hydric hammock is inundated only for short periods following heavy rains. The normal hydroperiod is seldom over 60 days per year. Fire may be rare or occasional depending on several factors including how often the surrounding community burns and hammock size.

Characteristic Set of Species: swamp laurel oak, live oak, cabbage palm, red cedar

Rare Species: Rare plants occurring in hydric hammock include auricled spleenwort (*Asplenium erosum*), Chapman's sedge (*Carex chapmanii*), hay scented fern (*Dennstaedtia bipinnata*), Tampa vervain (*Glandularia tampensis*), Florida hasteola (*Hasteola robertiorum*), star anise (*Illicium parviflorum*), hand fern (*Ophioglossum palmatum*), plume polypody (*Pecluma plumula*), terrestrial peperomia (*Peperomia humilis*), pinewoods dainties (*Phyllanthus liebmannianus* ssp. *platylepis*), and pinkroot (*Spigelia loganioides*). Hydric hammock is important habitat and foraging grounds for an array of rare animals including Gulf hammock dwarf siren (*Pseudobranchus striatus lustricolus)*, spotted turtle (*Clemmys guttata*), eastern indigo snake (*Drymarchon couperi*), limpkin (*Aramus guarauna*), short-tailed hawk (*Buteo brachyurus*), swallow-tailed kite (*Elanoides forficatus*), yellow-crowned night-heron (*Nyctanassa violacea),* black-crowned night-heron (*Nycticorax nycticorax),* Sherman's short-tailed shrew (*Blarina carolinensis shermani*), Homosassa shrew (*Sorex longirostris eionis),* Southeastern bat (*Myotis austroriparius*), Florida black bear (*Ursus americanus floridanus*), Florida long-tailed weasel (*Mustela frenata peninsulae),* and Gulf salt marsh mink (*Neovison vison halilimnetes*).

Range: Hydric hammock is restricted to Florida and coastal Georgia (Vince et al. 1989). It mainly occurs in the Florida peninsula north of the Everglades and is most extensive between Pasco and Wakulla counties, with only small occurrences further west immediately adjacent to salt marshes. Hydric hammock is less widespread on the east coast, but may be found on the St. John's River floodplain and just inland of salt marshes along the northeastern coast. Many other small hydric hammocks are scattered throughout the state, particularly along spring runs. The range of inland hammocks extends to approximately Alachua County.

Natural Processes: Fire is not considered an important component of hydric hammock dynamics; however, they do burn occasionally. Cabbage palms are fire tolerant and intense fires favor this species. Live oak can survive low intensity fires, but red cedar is highly susceptible to fire. Flooding duration and frequency are primary factors in species composition. While most hydric hammock trees are at least somewhat adapted to flooding, the ranges of tolerance vary according to timing and depth of inundation (Vince et al. 1989).

Community Variations: Along the Gulf coast where hammock and flatwoods vegetation grades into salt marshes, salinity levels allow the persistence of only a subset of the hydric hammock vegetation, particularly cabbage palm, live oak, and red cedar. These coastal hydric hammocks extend west along the Florida Panhandle at least to the Apalachicola basin and may be mixed stands of palms, oaks and loblolly pines (Platt and Schwartz 1990). Small stands of hammock that are surrounded by marsh or prairie are known as prairie hammocks, and are common along the St. John's River. Isolated stands of Atlantic white cedar (*Chamaecyparis thyoides*) are known to occur in at least a few hydric hammocks in Central Florida.

Two commonly occurring variants of hydric hammock are recognized here.

Variants: COASTAL HYDRIC HAMMOCK – Strips of hammock immediately bordering salt marsh or other coastal communities. Species

composition is limited by salinity to mostly cabbage palm, live oak, and red cedar.

PRAIRIE HYDRIC HAMMOCK – Isolated pods of trees occurring within a larger matrix of pyrogenic vegetation, usually floodplain marsh. Dominant trees are cabbage palm, live oak, and red cedar with an open sparse understory. Prairie hammock burns more frequently and is often completely dominated by cabbage palm. Also see Mesic Hammock in this guide for description of prairie mesic hammock.

Associated Communities: Hydric hammock often grades into, or may be difficult to differentiate from, mesic hammock, bottomland forest, alluvial forest, swamps, and baygall. Hydric hammock may be distinguished from mesic hammock by its species composition that is dependent on occasional flooding (Simons et al. 1989). Both are typically oak-dominated. However, since mesic hammock is less saturated and does not flood frequently, it supports a higher frequency of southern magnolia and pignut hickory, and often has a shrub layer of saw palmetto.

Alluvial forest, influenced primarily by periodic flooding from rivers, tends to have a greater abundance of trees characteristic of riverine habitats, particularly water hickory (*Carya aquatica*) and overcup oak (*Quercus lyrata*), although the transition may be gradual where hydric hammock and alluvial forest occur in the same floodplain (Wharton et al. 1977). Hydric hammock may occur finely intermixed with either basin or floodplain swamp. Although cypress and tupelo may be present in hydric hammock, they are not dominant trees.

Perhaps the most difficult distinction to draw is between hydric hammock and bottomland forest, a community usually found in broad floodplains or along primary streams. Both have a similar species composition and may be found in the same general situations, but bottomland forest generally lacks the cabbage palm and red cedar components found in most hydric hammocks. Baygall is maintained by continual seepage from surrounding uplands and is dominated by bay species – loblolly bay (*Gordonia lasianthus*), sweetbay, and red bay (*Persea borbonia*) – rather than an oak/cedar/cabbage palm assemblage. Soils are more acid with a higher organic matter than the slightly acidic to neutral soils of hydric hammock.

Management Considerations: Preservation of good quality hydric hammock is important for a variety of reasons. In addition to the aesthetic qualities of the community that promote outdoor tourism, these hammocks provide valuable habitat for game animals that rely on the large production of oak mast. The canopy and forest floor of hydric hammocks act to reduce soil erosion. During heavy rains, sheet flow is slowed across the forested floor of a hammock, allowing greater absorption into the soil. Hammocks adjacent to salt marshes function to protect inland areas from damaging hurricane winds (Wharton et al. 1977; Simons et al. 1989).

Selective logging of the natural canopy trees such as live oak and red cedar has been a continual disturbance to hydric hammock, and although forest structure may have been impacted by these activities, species composition does not seem to have been greatly

altered (Simons et al. 1989). A greater threat has come from the conversion of hydric hammock into pine plantation. Soil damage caused by site preparation and logging is particularly detrimental in hydric hammock, forming ruts and canals that increase surface water runoff and, consequentially, soil erosion. Once planted, the time required to return to a natural stand depends on the intensity of the site preparation prior to planting. Crowded thickets of weedy shrubs and vines generally dominate clearcut hammocks for many years; however, with the removal of the planted pine canopy, hammock trees may re-establish a natural stand by re-seeding or resprouting from remaining trees (Simons et al. 1989).

Projected rises in sea level over the next century threaten coastal hydric hammock. While adult cabbage palms may persist for years following increased saltwater flooding, regeneration of stands eventually halts and palm forests are replaced by salt marsh (Williams et al. 1999).

Effective conservation management of hydric hammock primarily consists of maintaining natural hydrology and controlling exotic plant invasion. Ditching and water control structures should be avoided and existing ones should be removed or filled. Any activity that requires the use of heavy machinery should be limited to dry periods when the soil is not saturated, thereby reducing rutting which can cause unnatural water channelization.

Exotic plants and animals pose significant problems in hydric hammock. This community may be the most preferred habitat of feral hogs (*Sus scrofa*; Simons et al. 1989). Control of this species is not only important in order to reduce competition with native wildlife, but also to minimize soil disturbance which decreases diversity of native ground cover within hydric hammock. Soil disturbance and canopy openings allow the spread of exotic invasive plants, particularly Brazilian pepper (*Schinus terebinthifolius*), skunk vine (*Paederia foetida*), camphor tree (*Cinnamomum camphora*), Japanese climbing fern (*Lygodium japonicum*), old world climbing fern (*L. microphyllum*), white-flowered wandering jew (*Tradescantia fluminensis*), sword fern (*Nephrolepis cordifolia*), Caesar's weed (*Urena lobata*), and cogon grass (*Imperata cylindrica*). Once established these species require costly efforts for control or removal.

Exemplary Sites: Waccasassa Bay Preserve State Park (Levy County), Chassahowitska Wildlife Management Area (Hernando County), Lower Hillsborough River Flood Detention Area (Hillsborough County), St. Marks National Wildlife Refuge (Jefferson County), Triple N Ranch Wildlife Management Area (Osceola County), Highlands Hammock State Park (Highlands County), Bulow Creek State Park (Volusia County)

Global and State Rank: G4/S4

Crosswalk and Synonyms:

Kuchler	113/Southern Floodplain Forest
Davis	8/Swamp Forests
	12/Hardwood Forests
SCS	12/Wetland Hardwood Hammocks
	13/Cabbage Palm Hammocks
Myers and Ewel	Hydric hammocks
SAF	73/Southern Red Cedar
	74/Cabbage Palmetto
FLUCCS	617/Mixed Wetland Hardwoods

Other synonyms: wet hammock, Gulf Hammock

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