

FNAI defined natural communities that are found on the UNF Campus

XERIC UPLANDS - very dry, deep, well-drained hills of sand with xeric-adapted vegetation.

Sandhill - (synonyms: longleaf pine - turkey oak, longleaf pine - xerophytic oak, longleaf pine - deciduous oak, high pine). Sandhills are characterized as a forest of widely spaced pine trees with a sparse understory of deciduous oaks and a fairly dense ground cover of grasses and herbs on rolling hills of sand. The most typical associations are dominated by longleaf pine, turkey oak, and wiregrass. Other typical plants include sparkleberry, persimmon, winged sumac, pinewoods dropseed, Indian grass, wild buckwheat, queen's delight, yellow foxglove, bracken fern, runner oak, goats rue, partridge pea, milk pea, dollarweeds, wild indigo, gopher apple, and golden-aster. Typical animals include tiger salamander, barking treefrog, spadefoot toad, gopher frog, gopher tortoise, worm lizard, fence lizard, mole skink, indigo snake, coachwhip snake, pine snake, short-tailed snake, crowned snake, eastern diamondback rattlesnake, bobwhite, ground dove, red-headed woodpecker, rufous-sided towhee, fox squirrel and pocket gopher. Sandhills occur on hilltops and slopes of gently rolling hills. Their soils are composed of deep, marine-deposited, yellowish sands that are well-drained and relatively sterile. The easily leached soil nutrients are brought back to the surface by the burrowing habits of some sandhill animals. Sandhills are important aquifer recharge areas because the porous sands allow water to move rapidly through with little runoff and minimal evaporation. The deep sandy soils help create a xeric environment that is accentuated by the scattered overstory, which allows more sunlight to penetrate and warm the ground. The absence of a closed canopy also allows Sandhills to cool more rapidly at night and to retain less air moisture. Thus, temperature and humidity fluctuations are generally greater in Sandhills than in nearby closed canopy forests. Fire is a dominant factor in the ecology of this community. Sandhills are a fire climax community, being dependent on frequent ground fires to reduce hardwood competition and to perpetuate pines and grasses. The natural fire frequency appears to be every 2 to 5 years. Without frequent fires, Sandhills may eventually succeed to Xeric Hammock. Unburned or cutover Sandhills may be dominated by turkey oak. Sandhills are often associated with and grade into Scrub, Scrubby Flatwoods, Mesic Flatwoods, Upland Pine Forest, or Xeric Hammock. Sandhills were widespread throughout the Coastal Plain, but most have been degraded by timbering, overgrazing, plowing, fire exclusion, and other disturbances. Much of Florida's Sandhill communities have been converted to citrus groves, pastures, pine plantations, or residential and commercial developments. Thus, the importance of properly managing the remaining tracts is accentuated.

MESIC FLATLANDS - flat, moderately well-drained sandy substrates with admixture of organic material, often with a hard pan.

Mesic Flatwoods - (synonyms: pine flatwoods, pine savannahs, pine barrens). Mesic Flatwoods are characterized as an open canopy forest of widely spaced pine trees with little or no understory but a dense ground cover of herbs and shrubs. Several variations of

Mesic Flatwoods are recognized, the most common associations being longleaf pine - wiregrass - runner oak and slash pine - gallberry - saw palmetto. Other typical plants include: St. Johns-wort, dwarf huckleberry, fetterbush, dwarf wax myrtle, stagger bush, blueberry, gopher apple, tar flower, bog buttons, blackroot, false foxglove, white-topped aster, yellow-eyed grass, and cutthroat grass. Typical animals of Mesic Flatwoods include: oak toad, little grass frog, narrowmouth toad, black racer, red rat snake, southeastern kestrel, brown-headed nuthatch, pine warbler, Bachman's sparrow, cotton rat, cotton mouse, black bear, raccoon, gray fox, bobcat, and white-tailed deer.

Mesic Flatwoods occur on relatively flat, moderately to poorly drained terrain. The soils typically consist of 1-3 feet of acidic sands generally overlying an organic hardpan or clayey subsoil. The hardpan substantially reduces the percolation of water below and above its surface. During the rainy seasons, water frequently stands on the hardpan's surface and briefly inundates much of the flatwoods; while during the drier seasons, ground water is unobtainable for many plants whose roots fail to penetrate the hardpan. Thus, many plants are under the stress of water saturation during the wet seasons and under the stress of dehydration during the dry seasons. Another important physical factor in Mesic Flatwoods is fire, which probably occurred every 1 to 8 years during pre-Columbian times. Nearly all plants and animals inhabiting this community are adapted to periodic fires; several species depend on fire for their continued existence. Without relatively frequent fires, Mesic Flatwoods succeed into hardwood-dominated forests whose closed canopy can essentially eliminate the ground cover herbs and shrubs. Additionally, the dense layer of litter that accumulates on unburned sites can eliminate the reproduction of pines which require a mineral soil substrate for proper germination. Thus, the integrity of the Mesic Flatwoods community is dependent on periodic fires. However, fires that are too frequent or too hot would eliminate pine recruitment and eventually transform Mesic Flatwoods into Dry Prairie.

Mesic Flatwoods are closely associated with and often grade into Wet Flatwoods, Dry Prairie, or Scrubby Flatwoods. The differences between these communities are generally related to minor topographic changes. Wet Flatwoods occupy the lower wetter areas, while Scrubby Flatwoods occupy the higher drier areas. Mesic Flatwoods are the most widespread biological community in Florida, occupying an estimated 30 to 50% of the state's uplands. However, very few undisturbed areas of Mesic Flatwoods exist because of habitat mismanagement and silvicultural, agricultural, or residential development. Mesic Flatwoods are often fairly resilient, and with proper management they can generally be restored.

WET FLATLANDS - flat, poorly drained sand, marl or limestone substrates.

Wet Prairie

Description: Wet prairie is an herbaceous community found on continuously wet, but not inundated, soils on somewhat flat or gentle slopes between lower lying depression marshes, shrub bogs, or dome swamps and slightly higher wet or mesic flatwoods, or dry prairie. It is typically dominated by dense wiregrass (*Aristida stricta* var. *beyrichiana*) in the drier portions, along with foxtail club-moss (*Lycopodiella alopecuroides*), cutover muhly (*Muhlenbergia expansa*), yellow butterwort (*Pinguicula lutea*), and savannah

meadowbeauty (*Rhexia alifanus*). In the wetter portions, wiregrass may occur with, or be replaced by, species in the sedge family, such as plumed beaksedge (*Rhynchospora plumosa*), featherbristle beaksedge (*R. oligantha*), Baldwin's nutrush (*Scleria baldwinii*), or slenderfruit nutrush (*S. georgiana*), plus longleaved threeawn (*Aristida palustris*). Also common in wetter areas are carnivorous species, such as pitcher plants (*Sarracenia* spp.), sundews (*Drosera* spp.), butterworts (*Pinguicula* spp), and bladderworts (*Utricularia* spp.). Other characteristic species in this community include toothache grass (*Ctenium aromaticum*), pineland rayless goldenrod (*Bigelovia nudata*), flattened pipewort (*Eriocaulon compressum*), water cowbane (*Oxypolis filifolia*), and coastalplain yellow-eyed grass (*Xyris ambigua*).

Wet prairies in northern Florida and the calcareous variant in south-central Florida are some of the most diverse communities in the United States, with an average of over 20 species per square meter in some places and over 100

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Wet Prairie

total species in any given stand.46,208,294,307,426 Factors contributing to this diversity include subtle spatial differences in moisture conditions across the wet prairie and temporal differences in fire and flooding regime from year to year, which favor different species and prevent any one species from excluding the others.

Wet prairie is noted for its many showy flowering herbs including false foxgloves (*Agalinis* spp.), grass pinks (*Calopogon* spp.), pipeworts (*Eriocaulon* spp.), rein orchids (*Platanthera* spp.), milkworts (*Polygala* spp.), meadowbeauties (*Rhexia* spp.), rosegentians (*Sabatia* spp.), yellow-eyed-grasses (*Xyris* spp.), white-top sedge (*Rhynchospora latifolia*), and composites in the genera *Balduina*, *Carphephorus*, *Coreopsis*, *Eupatorium*, *Eurybia*, *Helenium*, *Helianthus*, *Rudbeckia*, *Solidago*, and *Symphotrichum*. Re-sprouting short shrubs that grow intermixed with the grasses, include two species of St. John's wort (*Hypericum brachyphyllum*, *H. myrtifolium*), evergreen bayberry (*Myrica caroliniensis*) and, in Panhandle Florida, bog tupelo (*Nyssa ursina*). A few stunted trees of slash pine (*Pinus elliotii*), pond cypress (*Taxodium ascendens*), or swamp tupelo (*Nyssa sylvatica* var. *biflora*) may be present. In northern Florida clumps of wetland shrubs such as titi (*Cyrilla racemiflora*), coastal sweet pepperbush (*Clethra alnifolia*), myrtle-leaved holly (*Ilex cassine* var. *myrtifolia*), and large gallberry (*Ilex coriacea*) are also seen.

FLOODPLAIN WETLANDS - flat, alluvial sand or peat substrates associated with riverine Natural Communities and subjected to flooding but not permanent inundation.

Bottomland Forest - (synonyms: bottomland hardwoods, river bottom, stream bottom, lowland hardwood forest, mesic hammock). Bottomland Forest is characterized as a low-lying, closed-canopy forest of tall, straight trees with either a dense shrubby understory and little ground cover, or an open understory and ground cover of ferns, herbs, and grasses. Typical plants include water oak, live oak, red maple, sweetgum, loblolly pine, white cedar, cabbage palm, diamond-leaf oak, southern magnolia, loblolly bay, swamp tupelo, spruce pine, American beech, dahoon holly, wax myrtle, swamp dogwood, Florida elm, stiffcornel dogwood, and American hornbeam. Typical animals include

marbled salamander, mole salamander, threelined salamander, slimy salamander, five-lined skink, ringneck snake, gray rat snake, eastern king snake, cottonmouth, wood duck, red-tailed hawk, turkey, yellow-billed cuckoo, screechowl, great-horned owl, ruby-throated hummingbird, acadian flycatcher, pileated woodpecker, hermit thrush, cedar waxwing, yellow-throated warbler, opossum, gray squirrel, flying squirrel, raccoon, mink, gray fox, bobcat, and white-tailed deer. Bottomland Forest occurs on low-lying flatlands that usually border streams with distinct banks, such that water rarely overflows the stream channel to inundate the forest. They also occur in scattered low spots in basins and depressions that are rarely inundated, which allows typical upland species to survive. Soils are generally a mixture of clay and organic materials. The water table is high, but Bottomland Forests are inundated only during extreme floods or exceptionally heavy rains (i.e., not annually). Tree density and species diversity is relatively high. The canopy is dense and closed, except during winter in areas where deciduous trees predominate. Thus, air movement and light penetration are generally low, making the humidity high and relatively constant. Because of these characteristics, Bottomland Forests rarely burn. Bottomland Forest is a very stable community that requires a hundred years or more to mature. In some cases, it is an advanced successional stage of a Bog community. Bottomland Forest may be extremely difficult to distinguish from Floodplain Forest or Hydric Hammock. They can generally be separated during periods of typical high water, when the latter two communities would be inundated, while Bottomland Forest would not. Bottomland Forest is often associated with and grades into Floodplain Forest, Hydric Hammock, Mesic Flatwoods, Upland Mixed Forest, Upland Hardwood Forest, Slope Forest, Maritime Hammock, Baygall, or Wet Flatwoods. There may be much species overlap among these communities. Bottomland Forests are widespread throughout the Coastal Plain but are less extensive in Florida than elsewhere. Nearly all Bottomland Forests have suffered from timbering operations, which frequently leave long-lasting scars from soil disturbance. Their location on substrates that occasionally are inundated or saturated make Bottomland Forests generally unsuitable for development.

BASIN WETLANDS - shallow, closed basin with outlet usually only in time of high water; peat or sand substrate, usually inundated; wetland woody and/or herbaceous vegetation.

Dome Swamp - (synonyms: isolated wetland cypress dome, cypress pond, gum pond, bayhead, cypress gall, pine barrens pond). Dome Swamps are characterized as shallow, forested, usually circular depressions that generally present a domed profile because smaller trees grow in the shallower waters at the outer edge, while bigger trees grow in the deeper water in the interior. Pond cypress, swamp tupelo, and slash pine are common plants. Other typical plants include red maple, dahoon holly, swamp bay, sweetbay, loblolly bay, pond apple, Virginia willow, fetterbush, chain fern, netted chain fern, poison ivy, laurel greenbrier, Spanish moss, wild pine, royal fern, cinnamon fern, coastal plain willow, maidencane, orchids, wax myrtle, swamp titi, St. John's wort, sawgrass, lizard's tail, swamp primrose, water hyssop, redroot, sphagnum moss, floating heart, buttonbush, arum, and fire flag. Typical animals include flatwoods salamander, mole salamander, dwarf salamander, oak toad, southern cricket frog, pinewoods treefrog, little grass frog, narrowmouth toad, alligator, snapping turtle, striped mud turtle, mud turtle, eastern

mud snake, cottonmouth, woodstork, wood duck, swallow-tailed kite, barred owl, pileated woodpecker, great-crested flycatcher, prothonotary warbler, and rusty blackbird. Dome Swamps typically develop in sandy flatwoods and in karst areas where sand has slumped around or over a sinkhole, creating a conical depression. Soils are composed of peat, which becomes thickest toward the center of the dome, and are generally underlain with acidic sands and then limestone, although other subsoils may also occur. Some domes have a clay lens that helps retain water levels.

Dome Swamps often derive much of their water through runoff from surrounding uplands, but they may also be connected with underground channels, in which case subterranean flows would dominate the hydrological regime. Dome Swamps generally function as reservoirs that recharge the aquifer when adjacent water tables drop during drought periods. The normal hydroperiod for Dome Swamps is 200 to 300 days per year with water being deepest and remaining longest near the center of the dome. Fire is essential for the maintenance of a cypress dome community. Without periodic fires, hardwood invasion and peat accumulation would convert the dome to Bottomland Forest or Bog. Dome Swamps dominated by bays are close to this transition. Fire frequency is greatest at the periphery of the dome and least in the interior where long hydroperiods and deep peat maintain high moisture levels for most of the year. The normal fire cycle might be as short as 3 to 5 years along the outer edge and as long as 100 to 150 years towards the center. The profile of a Dome Swamp (i.e., smaller trees at the periphery and largest trees near the center) is largely attributable to this fire regime. The shorter hydroperiods along the periphery permit fires to burn into the edge more often, occasionally killing the outer trees. Cypress is very tolerant of light surface fires, but muck fires burning into the peat can kill them, lower the ground surface, and transform a dome into a pond. Dome Swamps may have a Depression Marsh or pond in their center, creating a doughnut appearance when viewed from above. Dome Swamps typically grade into Wet Prairie or Marl Prairie around the periphery, but they may also be bordered by Bottomland Forest or Swale. The species composition of Dome Swamps frequently overlaps with Strand Swamp, Wet Flatwoods, Basin Swamp, Baygall, Floodplain Swamp, and Freshwater Tidal Swamp. Normal hydroperiods must be maintained. Somewhat deeper than normal water levels are not likely to do much harm, but extended hydroperiods will limit tree growth and prevent reproduction. Shortened hydroperiods will permit the invasion of mesophytic species, which will change the character of the understory and eventually allow hardwoods to replace cypress. Dome Swamps may also be degraded by pollution and the invasion of exotic plants.

RIVERINE

Seepage Stream - (Synonyms: steephead stream, clear brook, swift brook, hammock stream). Seepage Streams are characterized as perennial or intermittent seasonal water courses originating from shallow ground waters that have percolated through deep, sandy, upland soils. Seepage Streams typically have clear to lightly colored water maintained at fairly constant temperatures of around 70oF, and are relatively short, shallow, and narrow. Although a stream may be classified as a Seepage Stream along its entire length, they also form the headwaters of many Alluvial and Blackwater Streams. After large sediment loads are picked up or after drainage through extensive swamps, water clarity is diminished and the stream is then classified as Alluvial or Blackwater.

Because they are generally sheltered by a dense overstory of broad-leaved hardwoods which block out most sunlight, Seepage Streams most often have depauperate aquatic floras. Filamentous green algae occur sporadically within the stream, while mosses, ferns and liverworts may grow in clumps at the water's edge. In the lower, broader reaches where insolation levels are sometimes greater, narrow bands of spatterdocks, golden club, spikerush and pondweeds may occur along the shorelines, and tape grass and pondweed may grow in the streambed. Typical animals include sailfin shiner, creek chub, speckled madtom, brown darter, blackbanded darter, amphiuma, Alabama waterdog, southern dusky salamander, two-lined salamander, mud salamander, southern red salamander, bronze frog, snapping turtle, loggerhead musk turtle, rainbow snake, redbelly watersnake, and brown watersnake. Percolation through deep soils slows the release of rainwater, filters the water, and buffers temperature extremes. Thus, Seepage Streams often exhibit perennial, slow flow rates of clear, cool, unpolluted water. Seepage Streams generally have sandy bottoms, although clays, gravel and limestone may be prevalent along stretches where formations composed of these sediments are exposed. Additionally, deep organic deposits may accumulate near stream bends and in other low areas where the leaf litter is not washed away by currents. Seepage Streams are generally confined to portions of the state where topographic relief is pronounced, especially in northern Florida. They are often associated with Seepage Slope and Slope Forest near their head waters, and Bottomland Forest, Floodplain Forest and Swamp Forest near their mouths. Seepage Streams are readily distinguished from other Florida stream communities by their small magnitude, lack of a deep aquifer water source, and the absence of extensive swamp lowlands surrounding their head waters. A unique type of Seepage Stream, the steephead stream, develops by a rather unusual geologic process. Rainfall percolates through the deep sandy soils capping the surrounding uplands until it encounters impermeable clays or other non-porous sediments. Water then travels laterally until reaching the surface and producing a seepage area along a slope or a spring. The seepage waters begin to erode the hill's base and cause the overburden to slump. Thus, the steephead stream valley is largely a product of seepage erosion which begins primarily at the bottoms of valleys instead of at their tops. Consequently, the gradient of steephead streams is generally much lower than that of other upland streams in similar topography, because the head of a steephead stream is already near the bottom of a valley.

Seepage Streams may be threatened by various activities. Applications of fertilizers or biocides on the surrounding uplands, or dumping of hazardous wastes and other refuse within the drainage basin could pollute the shallow ground waters that feed the Seepage Streams. Deforestation of the surrounding slopes could increase surface erosion and cause excessive sedimentation of the stream valley, as well as increase insolation levels and cause the stream to become overgrown with shrubs or emergent herbaceous species. Impounding the stream would destroy much of the lotic habitat and restrict the upstream movements of aquatic animals. Because they are unique natural features of limited distribution within the state, Seepage Streams should be diligently protected from significant disturbances.

Blackwater stream – Blackwater Streams are characterized as perennial or intermittent seasonal watercourses originating deep in sandy lowlands where extensive wetlands with organic soils function as reservoirs, collecting rainfall and discharging it slowly to the

stream. The tea-colored waters of Blackwater Streams are laden with tannins, particulates, and dissolved organic matter and iron derived from drainage through swamps and marshes. They generally are acidic (pH = 4.0 - 6.0), but may become circumneutral or slightly alkaline during low-flow stages when influenced by alkaline groundwater. Water temperatures may fluctuate substantially and are generally correlated with seasonal fluctuations in air temperature. The dark-colored water reduces light penetration and, thus, inhibits photosynthesis and the growth of submerged aquatic plants. Emergent and floating aquatic vegetation may occur along shallower and slower moving sections, but their presence is often reduced because of typically steep banks and considerable seasonal fluctuations in water level. Typical plants include golden club, smartweed, sedges, and grasses. Typical animals include river longnose gar, gizzard shad, threadfin shad, redbelly darter, chain pickerel, ironcolor shiner, Ohooppee shiner, weed shiner, blacktail shiner, chubsucker, channel catfish, banded topminnow, pygmy killifish, mosquitofish, mud sunfish, flier, everglades pygmy sunfish, banded sunfish, redbreast sunfish, dollar sunfish, stumpknocker, spotted bass, black crappie, darters, Alabama waterdog, river frog, alligator, snapping turtle, alligator snapping turtle, river cooter, Florida cooter, peninsula cooter, stinkpot, spiny softshell, red-belly watersnake, brown watersnake, beaver, and river otter.

Blackwater Streams have sandy bottoms overlain by organics and frequently underlain by limestone. Limestone outcrops may also occur. Blackwater Streams generally lack the continuous extensive floodplains and natural levees of Alluvial Streams. Instead, they typically have high, steep banks alternating with Floodplain Swamps. High banks confine water movement except during major floods. The absence of significant quantities of suspended sediments reduces their ability to construct natural levees.

Blackwater Streams are the most widely distributed and numerous Riverine systems in the southeast Coastal Plain. Very few, however, have escaped major disturbances and alteration. Clearcutting adjacent forested lands is one of the more devastating alterations for this community. Additionally, the limited buffering capacity of Blackwater Streams intensifies the detrimental impacts of agricultural and industrial effluents.