



Apalachicola National Forest (Liberty County)

Photo by Ann F. Johnson

Wet Prairie/Seepage Slope

Description: Wet prairie/seepage slope is a herbaceous community found on continuously wet, but not inundated, soils and subjected to frequent fires. It is usually dominated by dense wiregrass (*Aristida stricta* var. *beyrichiana*) which, in the wetter portions, 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*). In the Panhandle and northern Florida, pitcherplants (*Sarracenia* spp.) are concentrated in the wetter portions. In the peninsula, Curtiss' dropseed (*Sporobolus curtissii*), blue maidencane (*Amphicarpum muhlenbergianum*), cutthroat grass (*Panicum abscissum*), or Gulf hairawn muhly (*Muhlenbergia sericea*) may also be dominants or co-dominants with wiregrass. Characteristic species throughout its range include longleaved threeawn (*Aristida palustris*), pineland rayless goldenrod (*Bigelowia nudata*), toothache grass (*Ctenium aromaticum*), flattened pipewort (*Eriocaulon compressum*), water cowbane (*Oxypolis filifolia*), and coastalplain yellow-eyed grass (*Xyris ambigua*).

Portions of this community are some of the most diverse in the United States, with an average of over 20 species per square meter and over 100 total species in any given stand (Walker and Peet 1983; Norquist 1984; Kindell 1997; Orzell and Bridges 2006). In North Florida and adjacent states, observations across the entire growing season show

different dominant flowering species from month to month across the growing season (Gaddy 1982). There may also be spatial differences in moisture conditions across a wet prairie that increase diversity, as well as temporal differences in fire and flooding regime from year to year, all of which are thought to prevent any one species from crowding out the others.

Wet prairie/seepage slope is noted for its many showy flowering herbs including the carnivorous pitcherplants (*Sarracenia* spp.), sundews (*Drosera* spp.), and butterworts (*Pinguicula* spp.), and milkworts (*Polygala* spp.), grass pinks (*Calopogon* spp.), meadowbeauties (*Rhexia* spp.), rosegentians (*Sabatia* spp.), pipeworts (*Eriocaulon* spp.), yellow-eyed-grasses (*Xyris* spp.), white-top sedge (*Rhynchospora latifolia*), and composites in the genera *Balduina*, *Carphephorus*, *Coreopsis*, *Eupatorium*, *Eurybia*, *Helenium*, *Helianthus*, *Liatris*, *Phoebanthus*, *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 the 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. 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*) may also be present.

Wet prairie/seepage slope usually occurs on acidic, nutrient-deficient, saturated but not inundated soils. The two names of this community come from different physiographic situations: this vegetation type is often called wet prairie where it is found on broad flat areas, and seepage slope where it is found on hillside seeps or in bowl-shaped streamhead areas. The plant species composition in both situations is similar. Fires from the surrounding communities frequently burn across wet prairie/seepage slope.

In Florida, seepage slopes occur mainly in the western Panhandle on hilly topography where seepage depressions form on hillsides. Clay lenses in the sandy substrate (Pliocene Citronelle Formation) intersect the slope, impeding groundwater drainage and keeping the upper soil layers saturated most of the year. Seepage slopes are also found in the central Panhandle in Bay and Calhoun counties along creek slopes where there is an abrupt transition from sandhill to shrub bog (titi) vegetation and from sandy to heavier soils. Small occurrences are found in northeast Florida in ecotones between pine flatwoods and dome swamps or on stream slopes. Soils series associated with seepage slopes include Plummer, Leefield, Pamlico, Pickney, and Bladen series.

Wet prairie usually occurs on gentle slopes between lower lying depression marshes, shrub bogs, or dome swamps and slightly higher wet or mesic flatwoods. In the Panhandle, wet prairie soils include fine sands (Plummer), sandy loams (Rutledge) or clayey soils (Bladen; Weeks et al. 1980; USFS 1984). In the Florida peninsula, wet prairies, including those dominated by cutthroat grass (Bacchus 1991), are often found on poorly drained Basinger fine sands (Orzell and Bridges 2006). Calcareous wet prairies are found in central and south-central Florida on circumneutral Felda or Wabasso fine sands with sandy loam subsoils (McCollum and Pendleton 1971; Orzell and Bridges 2006).

Characteristic Set of Species: pitcherplants, wiregrass, blue maidencane, cutthroat grass, wiry beaksedges, flattened pipewort, toothache grass, water cowbane, yellow-eyed grasses, pineland rayless goldenrod

Rare Species: The Panhandle is a hotspot for rare plants of the wet prairie/seepage slope community with 25 out of 30 rare species found in this community and 12 of these endemic to the Panhandle (Table 1).

The rare Morse's flightless grasshopper (*Gymnoscirtetes morsei*) is known only from open boggy habitats (including wet prairie/seepage slope) in North Florida.

Range: Wet prairie/seepage slope ranges throughout Florida except for extreme South Florida where limestone soils predominate (Orzell and Bridges 2006). Outside Florida, wet prairie/seepage slope (also known as pitcher plant bog) is found in the southeastern coastal plain from eastern Texas to North Carolina (Folkerts 1982; Walker and Peet 1983; MacRoberts and MacRoberts 2001). Wet prairie/seepage slopes in the Panhandle are closest floristically to other areas in the East Gulf Coastal Plain, i.e. pitcher plant bogs on slopes or flats in Mississippi, Alabama, and southwestern Georgia (Harper 1905; Norquist 1984; Sorrie 1997).

Natural Processes: Natural fires likely entered wet prairie/seepage slopes from surrounding pinelands and burned through them when they were dry enough to carry fire. Hermann (1995) estimates a natural fire return interval of 2-3 years where wet prairie/seepage slope vegetation is adjacent to mesic/wet flatwoods or sandhill in the Apalachicola National Forest; this fire interval was also determined by Huffman (2006) for grassy wet flatwoods near the Panhandle coast from an analysis of fire scars on pine stumps. In the absence of fire, shrubs and trees invade wet prairie/seepage slopes and shade out the light-loving herbaceous species. A further indication of their dependence on fire is the requirement for fire to stimulate flowering in many wet prairie/seepage slope herbs, including two of the dominant grasses, wiregrass and cutthroat grass (Myers and Boettcher 1987).

The nutrient-poor, acid sands of wet prairie/seepage slopes in the Panhandle make these habitats a center for both carnivorous plant diversity and for arthropod diversity of species dependent on them. At least 16 arthropod species are obligate associates of the genus *Sarracenia* (Rymal and Folkerts 1982) including three species of moth in the genus *Exyra* (*E. fax*, *E. ridingsii*, and *E. semicrocea*) and a mosquito (*Wyeomyia smithii*).

Community Variations: Three common variants of wet prairie/seepage slope occur within Florida.

Variants: WIREGRASS SAVANNA – This is the well-drained, drier end of wet prairie/seepage slope dominated mainly by wiregrass without the admixture of wiry beakrushes and concentration of pitcherplants traditionally associated with the more continuously saturated zone of the wet prairie/seepage slope community, although scattered pitcherplants may occur. Other herbaceous species found in this drier type in the Panhandle are thistleleaf aster (*Eurybia eryngiifolia*), and Chapman's crownbeard (*Verbesina chapmanii*);

found in both the Panhandle and peninsula are pinewoods bluestem (*Andropogon arctatus*), Michaux's milkweed (*Asclepias michauxii*), Florida pineland spurge (*Euphorbia inundata*), foxtail club-moss (*Lycopodiella alopecuroides*), cutover muhly (*Muhlenbergia expansa*), yellow butterwort (*Pinguicula lutea*), and savannah meadowbeauty (*Rhexia alifanus*). Other common species found in this variant, as well as in the wetter types, are pineland rayless goldenrod, white-top sedge, and toothache grass

CUTTHROAT SEEP – Wet prairie/seepage slopes dominated by the endemic cutthroat grass occur along the eastern and western edges of the Lake Wales Ridge in Central Florida and are characterized by many wildflowers in common with other acidic wet prairie areas.

CALCAREOUS WET PRAIRIE – In central and south-central peninsular Florida wiregrass may co-occur with Gulf hairawn muhly as a dominant species in wet prairies where calcareous substrate is not far below the surface and soils are circum-neutral (Orzell and Bridges 2006). Other calcium-loving species found in these prairies include pineland heliotrope (*Heliotropium polyphyllum*), sweet shaggytuft (*Stenandrium dulce*), and starrush white-top (*Rhynchospora colorata*).

Associated Communities: Wet prairie/seepage slope differs from depression and basin marshes in having a relatively complete cover of wiregrass, cutthroat grass, nutrush (*Scleria* sp.), blue maidencane, or wiry beaksedges and in being inundated only to very shallow depth, if at all. It differs from the grassy form of wet flatwoods in having no, or only a very sparse, cover of pines. It differs from the wetter forms of dry prairie in the absence of upland shrubs such as saw palmetto (*Serenoa repens*), dwarf live oak (*Quercus minima*), or gallberry (*Ilex glabra*; Orzell and Bridges 2006). The calcareous form of wet prairie differs from marl prairie, which is found in South Florida and may also be dominated by Gulf hairawn muhly, in having a more continuous herbaceous cover, without limestone exposed extensively at the surface, and without standing water or periphyton mats characteristic of marl prairie (Wade et al. 1980).

Management Considerations: In the absence of fire, woody shrubs may encroach on wet prairie/seepage slopes from both the bordering uplands (e.g. gallberry, wax myrtle [*Myrica cerifera*] and wetlands (e.g. peelbark St. John's wort [*Hypericum fasciculatum*], titi [*Cyrilla racemiflora*], and black titi [*Cliftonia monophylla*]; Hermann 1995) and eventually shade out the sun-loving herbaceous species. Hermann (1995) cites one area in the Apalachicola National Forest where fire had been absent for 12-15 years (based on ring counts of titi stems), where shrubs had invaded and the cover of herbaceous wet prairie species was reduced to 15-20 percent of the area, compared to 100 percent cover of herbaceous species in a nearby area burned every 2-4 years. A study comparing extent of shrub cover on geo-rectified aerial photographs of Apalachicola National Forest from the 1930's with current aerials shows expansion of shrubs into formerly grassy areas (Hess 2007).

Wet prairies are sensitive to relatively slight physical alterations to the soil surface which can permanently alter the hydrology (Hermann 1995). Such disturbances include soil rutting within the prairies caused by trampling, vehicles, plowed fire lanes, or other heavy equipment damage, or placing roads and ditches near the prairies. These disturbances can cause major changes in species composition that require expensive restoration to repair (Mize et al. 2005).

Reference Sites: Wet Prairie – Tarkiln Bayou Preserve State Park (Escambia County), Garcon Point Water Management Area (Santa Rosa County), Apalachicola National Forest (Apalachicola Unit; Liberty County), Avon Park Air Force Range (Highlands/Polk Counties), Three Lakes Wildlife Management Area and Triple N Ranch Wildlife Management Area (Osceola County), Kissimmee Prairie Preserve State Park (Okeechobee County)

Seepage Slope – Blackwater River State Forest (Santa Rosa and Okaloosa Counties), Eglin Air Force Base (Brier Creek; Okaloosa County), Chipola Experimental Forest (Calhoun County)

Global and State Rank: G3/S2

Crosswalk and Synonyms:

Kuchler	112/Southern Mixed Forest
Davis	13/Grasslands of Prairie Type 2/Pine Flatwoods
SCS	10/Cutthroat Seeps 23/Pitcher plant bog
Myers and Ewel	Freshwater Marshes - wet prairies Flatwoods - wet flatwoods and seepage savannas
SAF	N/A
FLUCCS	310/Herbaceous 641/Wet Prairies

Other synonyms: moist pine barrens (Harper 1905), grass-sedge savannah (Clewell 1986), grass-sedge seepage bog (Clewell 1986), pine savanna (Gaddy 1982), wet savanna (Kindell 1997), pitcher plant bog (Folkerts 1982)

Table 1. Rare species in wet prairie/seepage slope community.

Panhandle Endemic	Panhandle and northern peninsula
<i>Arnoglossum album</i>	<i>Asclepias viridula</i>
<i>Cuphea aspera</i>	<i>Linum westii</i>
<i>Eriocaulon nigrobacteatum</i>	<i>Parnassia grandifolia</i>
<i>Gentiana pennelliana</i>	<i>Platanthera integra</i>
<i>Harperocallis flava</i> *	<i>Ruellia noctiflora</i>
<i>Justicia crassifolia</i>	
<i>Nyssa ursina</i>	Northeast Florida
<i>Oxypolis filifolia</i> ssp. <i>greenmanii</i>	<i>Balduina atropurpurea</i>
<i>Physostegia godfreyi</i>	<i>Cleistes divaricata</i>
<i>Pinguicula ionantha</i> *	
<i>Scutellaria floridana</i> *	Peninsular Florida Endemic
<i>Verbesina chapmanii</i>	<i>Hartwrightia floridana</i>
	<i>Helianthus carnosus</i>
Panhandle	<i>Panicum abscissum</i>
<i>Dichantherium nudicaule</i>	
<i>Lachnocaulon digynum</i>	
<i>Lilium iridollae</i>	
<i>Macranthera flammea</i>	
<i>Parnassia caroliniana</i>	
<i>Sarracenia rubra</i>	
<i>Sarracenia leucophylla</i>	
<i>Xyris scabrifolia</i>	

* Federally listed species

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Photo by Ann F. Johnson



Blackwater River State Forest (Santa Rosa and Okaloosa Counties)

Photo by Gary Knight