



Triple N Ranch Wildlife Management Area (Osceola County)

Photo by Ann F. Johnson

### **Depression Marsh**

**Description:** Depression marsh is characterized as a shallow, usually rounded depression in sand substrate with herbaceous vegetation or subshrubs, often in concentric bands. Depression marshes typically occur in landscapes occupied by fire-maintained matrix communities such as mesic flatwoods, dry prairie, or sandhill. The concentric zones or bands of vegetation are related to length of the hydroperiod and depth of flooding. The outer, or driest, zone is often occupied by sparse herbaceous vegetation consisting of longleaf threeawn (*Aristida palustris*), beaksedges (*Rhynchospora microcarpa*, *R. cephalantha*, *R. tracyi*, *R. filifolia*, etc.), Elliott's yellow-eyed grass (*Xyris elliotii*), the subshrub, myrtleleaf St. John's wort (*Hypericum myrtifolium*), and patches of blue maidencane (*Amphicarpum muhlenbergianum*) or sand cordgrass (*Spartina bakeri*). This sparse zone may be followed downslope by a sparse to dense zone of peelbark St. John's wort (*Hypericum fasciculatum*), water toothleaf (*Stillingia aquatica*) and scattered herbs, such as fringed yellow-eyed grass (*Xyris fimbriata*), pipeworts (*Eriocaulon compressum* and *E. decangulare*), narrowfruit horned beaksedge (*Rhynchospora inundata*), and Baldwin's spikerush (*Eleocharis baldwinii*). The innermost, deepest zone is occupied by maidencane (*Panicum hemitomon*), pickerelweed (*Pontederia cordata*), bulltongue arrowhead (*Sagittaria lancifolia*), or sawgrass (*Cladium jamaicense*). Floating-leaved plants, such as white waterlily (*Nymphaea odorata*), may be found in open water portions of the marsh. Depending on depth and configuration, depression marshes can have varying combinations of these zones and species within

each zone. Depression marshes within xeric communities such as sandhill or scrub may have outer borders dominated by bluestem grasses, such as *Andropogon brachystachyus*, *A. glomeratus*, or *A. virginicus* var. *glauca*, or tall herbs such as falsefennel (*Eupatorium leptophyllum*). Where stands of these species are sparse, small rosette plants, such as witchgrass (*Dichanthelium* spp.), Small's bogbutton (*Lachnocaulon minus*), and yellow hatpins (*Syngonanthus flavidulus*), may occupy the spaces between them.

Depression marshes form the characteristic pockmarked landscape seen on aerial photographs of the flat landscapes of the Florida peninsula. They form when the overlying sands slump into depressions dissolved in underlying limestone. These marshes also frequently form an outer rim around swamp communities such as dome swamps. Depression marshes often burn with the surrounding landscape and are seasonally inundated. The deepest zones (dominated by pickerelweed, bulltongue arrowhead or sawgrass) may have a peat substrate and a continuous layer of sphagnum moss, while shallower zones (dominated by peelbark St. John's wort) have a sandy substrate. Maidencane may occur on either sand or peat (Winchester et al. 1985). Common soil types include depressional phases of Basinger, Pompano, and Myakka fine sand (Abrahamson et al. 1984).

**Characteristic Set of Species:** longleaf threeawn, sand cordgrass, peelbark St. John's wort, maidencane, sawgrass, pickerelweed, blue maidencane

**Rare Species:** Rare plant species found in depression marshes include: Elliott's croton (*Croton elliotii*) in the northern Florida Panhandle; karst pond xyris (*Xyris longisepala*), small-flowered meadowbeauty (*Rhexia parviflora*), panhandle meadowbeauty (*Rhexia salicifolia*), and St. Marks yellow-eyed grass (*Xyris panacea*), all endemic to the Panhandle; pondspice (*Litsea aestivalis*), found on edges of depression marshes in northern and western Florida; Curtiss' sandgrass (*Calamovilfa curtissii*), endemic to the western Panhandle with a disjunct occurrence on Merritt Island in Brevard County; piedmont jointgrass (*Coelorachis tuberculosa*) in northwest and Central Florida, and Edison's ascyrum (*Hypericum edisonianum*) and cutthroat grass (*Panicum abscissum*), both endemic to the southern Lake Wales Ridge and vicinity.

Rare animal species include several amphibians, particularly those that require breeding sites that are free of predatory fishes (Moler and Franz 1987); these include the frosted flatwoods salamander (*Ambystoma cingulatum*), reticulated flatwoods salamander (*A. bishopi*), tiger salamander (*Ambystoma tigrinum*), striped newt (*Notophthalmus perstriatus*), and gopher frog (*Rana capito*). More than a dozen other species of frogs and salamanders also breed regularly in depression marshes, and these constitute an important part of the food supply of wading birds and snakes, including the rare eastern indigo snake (*Drymarchon couperi*) and southern hognose snake (*Heterodon simus*; Moler and Franz 1987). Other rare species using this habitat include the Florida sandhill crane (*Grus canadensis pratensis*) and round-tailed muskrat (*Neofiber alleni*). Wading birds, in addition to feeding in depression marshes, use clumps of willows or other trees in the center for roosting or nesting (NeSmith, pers. comm. 2008).

**Range:** Depression marshes occur throughout Florida, but are uncommon in the Panhandle and in extreme South Florida where marshes (e.g., glades marsh, marl prairie) become the matrix communities and uplands are the included communities.

**Natural Processes:** Depression marshes are generally thought to be maintained as herbaceous communities against woody invasion by hydrologic fluctuations or by fire or by both (Kirkman et al. 2000; Casey and Ewel 2006). The frequency of fire in depression marshes is a function of the fire frequency in the surrounding matrix community, as well as the fire-carrying characteristics of the marsh vegetation. The very sparse outer zone of some marshes may act as a natural firebreak. There is little data on natural fire frequency in depression marshes. A lack of fire may lead to an increase in shrubs at the expense of herbaceous species. Peroni and Abrahamson (1986), using 1943 and 1981 aerial photography, documented expansion of bordering shrub communities into two depression marshes at Archbold Biological Station during a period of fire exclusion.

Peelbark St. John's wort is killed by fire but germinates readily from seed (Winchester et al. 1985; LaClaire 1995). It is also killed by prolonged inundation (Winchester et al. 1985). Thus its prominence in any given depression marsh may fluctuate considerably over relatively short time periods, depending on past rainfall history and time since fire. Long-term sampling of permanent transects would be useful to determine how much depression marsh vegetation fluctuates naturally over time. During periodic droughts, upland species, such as slash pine (*Pinus elliottii*) and dogfennel (*Eupatorium capillifolium*), colonize depression marshes, but are killed during subsequent intervals of prolonged high water (Lowe 1986; Abrahamson 1991).

**Community Variations:** Depression marshes on the southern end of the Lake Wales Ridge are distinguished by having the endemic cutthroat grass and Edison's ascyrum as dominants. Sawgrass tends to dominate depression marshes near the coast or where limestone is near the surface. Some depression marshes found on the Panacea Unit of St. Marks National Wildlife Refuge have floating islands of soil and vegetation in the center, surrounded by open water with water lilies, and grassy zones of emergent vegetation toward the shores. The floating islands are home to the recently described St. Marks yellow-eyed grass (Anderson and Kral 2008).

**Associated Communities:** Depression marsh is distinguished from wetlands dominated by woody species (shrub bog, dome swamp, basin swamp) by its predominantly herbaceous and concentric zone pattern of vegetation. Depression marsh is distinguished from other herbaceous wetlands (basin marsh, wet prairie, seepage slope) primarily by its occurrence as isolated depressions within fire-maintained matrix communities. It is distinguished from wet prairie, which often borders its upper edges, by its concentric zones of vegetation, and its lack of wiregrass (*Aristida stricta* var. *beyrichiana*). Depression marsh is similar to the upper margins of sandhill upland lakes ("karst ponds") found in Bay and Washington counties; however, the lakes rarely dry completely, and have a unique flora with several endemic species, including the dominant smoothbark St. John's wort (*Hypericum lissophloeus*).

**Management Considerations:** Fires in surrounding communities should be allowed to burn into depression marshes and extinguish naturally or burn through them. Encroachment of shrubs such as coastalplain willow (*Salix caroliniana*), common buttonbush (*Cephalanthus occidentalis*), groundsel tree (*Baccharis halimifolia*), and wax myrtle (*Myrica cerifera*) are typical signs of lack of fire in depression marshes (Huffman and Blanchard 1991).

Physical disturbance, particularly from hog rooting, livestock, or vehicles (e.g., “mud bogging”) can cause serious damage in many marshes; these activities can destroy native species and churn the soil which is often then colonized by pure stands of Carolina redroot (*Lachnanthes caroliana*) and other weedy species. Such physical disturbances can allow invasive exotic plants to get a foothold, including torpedo grass (*Panicum repens*), Peruvian primrosewillow (*Ludwigia peruviana*), common water hyacinth (*Eichhornia crassipes*), and Brazilian pepper (*Schinus terebinthifolius*).

Drying of the marsh, either through artificial drainage or drawn-down of the water table by wells, perhaps also aided by cattle trampling, can allow pasture grasses to invade depression marshes, especially where the surrounding community has been converted to pasture (Winchester et al. 1985). These include centipede grass (*Eremochloa ophiuroides*), big carpetgrass (*Axonopus furcatus*), bahiagrass (*Paspalum notatum*), and the invasive exotic West Indian marsh grass (*Hymenachne amplexicaulis*).

**Exemplary Sites:** Munson Sandhills Bike Trail in Apalachicola National Forest (Leon County), Triple N Ranch Wildlife Management Area (Osceola County), Three Lakes Wildlife Management Area (Osceola County), Archbold Biological Station (Highlands County), Fred C. Babcock-Cecil M. Webb Wildlife Management Area (Charlotte County)

**Global and State Rank:** G4/S4

**Crosswalk and Synonyms:**

Kuchler	112/Southern Mixed Forest
Davis	13/Grasslands of Prairie Type
SCS	25/Freshwater Marsh and Ponds
Myers and Ewel	Freshwater Marshes - basin or depression marshes
SAF	N/A
FLUCCS	641/Freshwater Marshes 644/Emergent Aquatic Vegetation

Other synonyms: seasonal pond (Abrahamson et al. 1984), temporary pond (LaClaire 1995), flatwoods marsh (Kushlan 1990), isolated ephemeral pond (LaClaire and Franz 1991)

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Goethe State Forest (Levy County)

Photo by Paul Russo



St. Marks National Wildlife Refuge (Panacea Unit; Wakulla County).

Photo by Ann F. Johnson