



Salt Lake Wildlife Management Area (Brevard County)

Photo by Ann F. Johnson

Basin Marsh

Description: Basin marshes are regularly inundated freshwater herbaceous wetlands that may occur in a variety of situations but, in contrast to depression marshes, are not small or shallow inclusions within a fire-maintained matrix community. Species composition is heterogeneous both within and between marshes but can generally be divided into submersed, floating-leaved, emergent, and grassy zones from deepest to shallowest portions; shrub patches may be present within any of these zones. Common species found in the floating-leaved zone of basin marshes include white waterlily (*Nymphaea odorata*), American lotus (*Nelumbo lutea*), and yellow pondlily (*Nuphar advena*); the emergent zone may have pickerelweed (*Pontederia cordata*), bulltongue arrowhead (*Sagittaria lancifolia*), southern cattail (*Typha domingensis*), sawgrass (*Cladium jamaicense*), and softstem bulrush (*Scirpus tabernaemontani*); the grassy zone is typically characterized by maidencane (*Panicum hemitomon*), smooth beggarticks (*Bidens laevis*), dotted smartweed (*Polygonum punctatum*), and sand cordgrass (*Spartina bakeri*), accompanied by a diverse mixture of less common forbs such as sweetscent (*Pluchea odorata*), spadeleaf (*Centella asiatica*), and lemon bacopa (*Bacopa caroliniana*; FNAI 2004). Coastalplain willow (*Salix caroliniana*), common buttonbush (*Cephalanthus occidentalis*), elderberry (*Sambucus nigra* ssp. *canadensis*), and wax myrtle (*Myrica cerifera*) are common shrubby components. During droughts exposed marsh and lake beds may be colonized by large native weedy species such as southern amaranth (*Amaranthus australis*) and dogfennel (*Eupatorium capillifolium*; Lowe 1986).

Occasional isolated areas of salt flat vegetation, including shoreline seapurslane (*Sesuvium portulacastrum*) and perennial glasswort (*Sarcocornia perennis*) occur in the marshes of the St. Johns Basin (FNAI 2006b). These salt pockets are presumably relict deposits from an earlier geologic episode when the area was an arm of the sea.

Basin marsh occurs in a variety of isolated or mostly isolated depressions. They occur around fluctuating shorelines of lakes, on the former lake bottoms of “disappearing” lakes, at the head of broad, low basins which were former embayments of the sea during times of higher sea level, and as large deep inclusions within pyrogenic upland communities, or as inclusions in non-pyrogenic communities such as hardwood forests or basin swamps. They are regularly inundated with water originating from localized rainfall. While water is generally not flowing, some basin marshes have outflow, particularly where large marsh systems form the headwaters of rivers, such as the St. Johns. Basin marsh may occur on either sand or peat soils. Common soil series include Ledwith-Wauberg, Wabasso, and Riviera.

Characteristic Set of Species: white water lily, maidencane, sawgrass, bulltongue arrowhead, pickerelweed, sand cordgrass

Rare Species: Rare plants found in basin marshes include Florida corkwood (*Leitneria floridana*), narrowleaf naiad (*Najas filifolia*), and Mexican tear-thumb (*Polygonum meisnerianum* var. *beyrichianum*) in northern Florida, plus piedmont jointgrass (*Coelorachis tuberculosa*) and piedmont water milfoil (*Myriophyllum laxum*) from the Panhandle to south-central Florida. Rare animal species found in basin marshes include American alligator (*Alligator mississippiensis*), snail kite (*Rostrhamus sociabilis plumbeus*), black rail (*Laterallus jamaicensis*), Florida sandhill crane (*Grus canadensis pratensis*), numerous species of wading birds, and round-tailed muskrat (*Neofiber alleni*).

Range: Basin marshes are found throughout the southeastern United States and Florida.

Natural Processes: Natural fires probably occasionally burned basin marshes at the end of the dry season. Dense sawgrass and maidencane marshes will burn even when there is standing water. Frequency of fire varies depending on the hydrology of the marsh and its exposure to fire from surrounding areas. Few studies have indicated the natural fire interval for marshes, except for glades marsh where intervals of 5-7 years are usually mentioned (Wade et al. 1980; Snyder 1991).

Natural seasonal and longer-term fluctuations in water level are important for maintaining the diversity of marsh vegetation. If the water level is artificially stabilized, species such as cattail that can tolerate long periods of inundation will tend to dominate. This was observed when the Kissimmee River was channelized in the 1960s (Goodrick and Milleson 1974), diminishing the invertebrate base of the food chain and causing crashes in the populations of fish, ducks, and wading birds (Toth et al. 1998).

Community Variations: Basin marshes occurring in different landscape positions share many of the same wetland herbaceous species, but zonation and dominance of these species vary from place to place. In general there is little species differentiation in marsh vegetation between North and South Florida. Of the more common species, willow herb

(*Decodon verticillatus*) is confined to northern Florida and alligatorflag (*Thalia geniculata*) to southern Florida.

Common species in small, shaded depressions in hydric hammock in northern Florida are Florida millet beaksedge (*Rhynchospora miliacea*) and lizard's tail (*Saururus cernuus*). Depressions in basin swamps often are dominated by Walter's sedge (*Carex striata*). Depressions in the Florida Keys occurring in pine rockland and rockland hammock are often dominated by sawgrass and spikerush (*Eleocharis* sp.) and have a peat or calcitic mud substrate (Ross et al. 1992).

Variant: LAKE BOTTOM – Basin marshes may be present on former lake bottoms of “disappearing” lakes in northern Florida. These areas alternate between lake and marsh when the sinkholes draining them are plugged or re-opened. Well-known examples are Lake Miccosukee (Burks 1992) and Paynes Prairie (Patton and Judd 1986). In addition to the common species mentioned above, the emergent zone of these marshes is characterized by flatsedges (*Cyperus odoratus* or *C. strigosus*), willow herb, smallfruit beggarticks (*Bidens mitis*), and swamp smartweed (*Polygonum hydropiperoides*); and the grassy zone by southern cutgrass (*Leersia hexandra*) and soft rush (*Juncus effusus* ssp. *solutus*). Floating islands of detached peat from the bottom of the lake support floating marshpennywort (*Hydrocotyle ranunculoides*), waterspider false rein orchid (*Habenaria repens*), and frog's bit (*Limnobium spongia*). Patches of hydrophytic shrubs and trees are common. Other marshes that may alternate between marsh and lake are those in shallow erosional valleys in the karst area of western peninsular Florida, such as Lake Tsala Apopka (FNAI 2006a) and Lake Panasoffkee.

Associated Communities: Unlike depression marsh, basin marsh is not a small or shallow inclusion in a pyrogenic community, but is either a large landscape feature or an inclusion in an infrequently burned community. It is distinguished from floodplain marsh by its occurrence in a headwaters basin or adjacent depression rather than along a river floodplain subject to periodic flooding from the river drainage, and is distinguished from basin and dome swamps by the dominance of herbaceous and shrubby species, rather than trees. It is distinguished from slough marsh by the absence of periodic directional water flow and by the absence of a surrounding pyrogenic landscape and from glades marsh by the absence of flow, as well as its occurrence north of the Everglades basin.

Management Considerations: Hydrological alteration is the main threat to marshes in Florida. Ditching and cutting of canals to drain water lowers the water table and dampens the natural fluctuations of water levels in the marsh, altering the vegetation. A lowered water table allows shrubby species such as coastalplain willow to invade the marsh, shading out the herbaceous vegetation. Water table draw-downs for human consumption have been shown to negatively affect nesting success in sandhill cranes in marshes (Dwyer 1990).

Stabilized water levels, along with increased nutrient levels from agricultural runoff, can result in the invasion of exotics, such as water hyacinth (*Eichhornia crassipes*) and Cuban bulrush (*Scirpus cubensis*) which invaded the Kissimmee River marshes after the river was channelized in the 1960s (Goodrick and Milleson 1974).

Fire has been used to control the spread of coastalplain willow in the St. Johns River upper basin marshes that were invaded by willow after the water levels were lowered by drainage (Lee et al. 2005). Prescribed burns in marshes have to be conducted with caution to avoid peat fires that will kill the dominant species, especially in areas where the water table has been artificially lowered for human consumption (Bacchus 1995). Another consideration is how completely a marsh area burns. Complete burns of marsh habitat leaving no patches as refuge areas can extirpate animals, such as black rails, snail kites, and round-tailed muskrats, that are dependent on marsh habitat for foraging and nesting (Miller et al. 1998; Legare et al. 1998).

Exemplary Sites: Lake Miccosukee (Leon and Jefferson counties), Lake Kissimmee State Park (Osceola County), Blue Cypress Lake Conservation Area (St. Lucie County), Three Lakes Wildlife Management Area (Osceola and Polk counties), John C. and Mariana Jones/Hungryland Wildlife and Environmental Area (Martin and Palm Beach counties), Grassy Waters Preserve (Palm Beach County)

Global and State Ranks: G4/S3

Crosswalk and Synonyms:

Davis	13/Grasslands of Prairie Type 16/Fresh Water Marshes
SCS	25/Freshwater Marsh and Ponds
Myers and Ewel	Freshwater Marshes - basin or depression marshes
SAF	N/A
FLUCCS	641/Freshwater Marshes 643/Wet Prairies 644/Emergent Aquatic Vegetation

Other synonyms: prairie (in case of lake bottom)

References:

- Bacchus, S.T. 1995. Groundwater levels are critical to the success of prescribed burns. Pages 117-133 in S.I. Cerulean and R.T. Engstrom, editors. Fire in Wetlands: A Management Perspective. Proceedings of the Tall Timbers Fire Ecology Conference, No. 19. Tall Timbers Research Station, Tallahassee, Florida.
- Burks, K.C. 1992. A critical floristic study of Lake Miccosukee and environs. Thesis, Florida State University, Tallahassee.
- Dwyer, N. 1990. Nesting ecology and nest-site selection of Florida sandhill cranes. Thesis, University of Florida, Gainesville, Florida.
- Florida Natural Areas Inventory FNAI. 2004. Natural community descriptions to accompany a vegetation map of Three Lakes Wildlife Management Area.

- Unpublished report to the Florida Fish and Wildlife Conservation Commission. Florida Natural Areas Inventory, Tallahassee, Florida.
- Florida Natural Areas Inventory FNAI. 2006a. Natural community descriptions to accompany a vegetation map of Flying Eagle Ranch. Unpublished report to Southwest Florida Water Management District. Florida Natural Areas Inventory, Tallahassee, Florida.
- Florida Natural Areas Inventory FNAI. 2006b. Natural community descriptions to accompany a vegetation map of Salt Lake Wildlife Management Area. Unpublished report to the Florida Fish and Wildlife Conservation Commission. Florida Natural Areas Inventory, Tallahassee, Florida.
- Goodrick, R.L., and J.F. Milleson. 1974. Studies of floodplain vegetation and water level fluctuation in the Kissimmee River Valley. Technical Publication 74-2. South Florida Water Management District, West Palm Beach, Florida.
- Lee, M.A.B., K.L. Snyder, P. Valentine-Darby, S.J. Miller, and K.J. Ponzio. 2005. Dormant season prescribed fire as a management tool for the control of *Salix caroliniana* Michx. in a floodplain marsh. *Wetlands Ecology and Management* 13:479-487.
- Legare, M., H. Hill, R. Farinetti, and F.T. Cole. 1998. Marsh bird response during two prescribed fires at the St. Johns National Wildlife Refuge, Brevard County, Florida. Page 114 in T.L. Pruden and L.A. Brennan, editors. *Fire in Ecosystem Management: Shifting the Paradigm from Suppression to Prescription*. Tall Timbers Fire Ecology Conference Proceedings, No. 20. Tall Timbers Research Station, Tallahassee, Florida.
- Lowe, E.F. 1986. The relationship between hydrology and vegetational pattern within the floodplain marsh of a subtropical, Florida lake. *Florida Scientist* 49:213-233.
- Miller, S.J., K.J. Ponzio, M.A. Lee, L.W. Keenan, and S.R. Miller. 1998. The use of fire in wetland preservation and restoration: are there risks? Pages 127-139 in T.L. Pruden and L.A. Brennan, editors. *Fire in Ecosystem Management: Shifting the Paradigm from Suppression to Prescription*. Tall Timbers Fire Ecology Conference Proceedings, No. 20. Tall Timbers Research Station, Tallahassee, Florida.
- Patton, J.E., and W.S. Judd. 1986. Vascular flora of Paynes Prairie Basin and Alachua Sink Hammock, Alachua County, Florida. *Castanea* 51:88-110.
- Ross, M.S., J.J. O'Brien, and L.J. Flynn. 1992. Ecological site classification of Florida Keys terrestrial habitats. *Biotropica* 24:488-502.
- Snyder, J.R. 1991. Fire regimes in subtropical south Florida. Pages 303-319 in *High Intensity Fire in Wildlands: Management Challenges and Options*. Proceedings of

the Tall Timbers Fire Ecology Conference, No. 17. Tall Timbers Research Station, Tallahassee, Florida.

Toth, L.A., S.L. Melvin, D.A. Arrington, and J. Chamberlain. 1998. Hydrologic manipulations of the channelized Kissimmee River - implications for restoration. *Bioscience* 48:757-764.

Wade, D., J. Ewel, and R. Hofstetter. 1980. Fire in South Florida ecosystems. Forest Service General Technical Report SE-17. Southeastern Forest Experiment Station, Asheville, North Carolina.