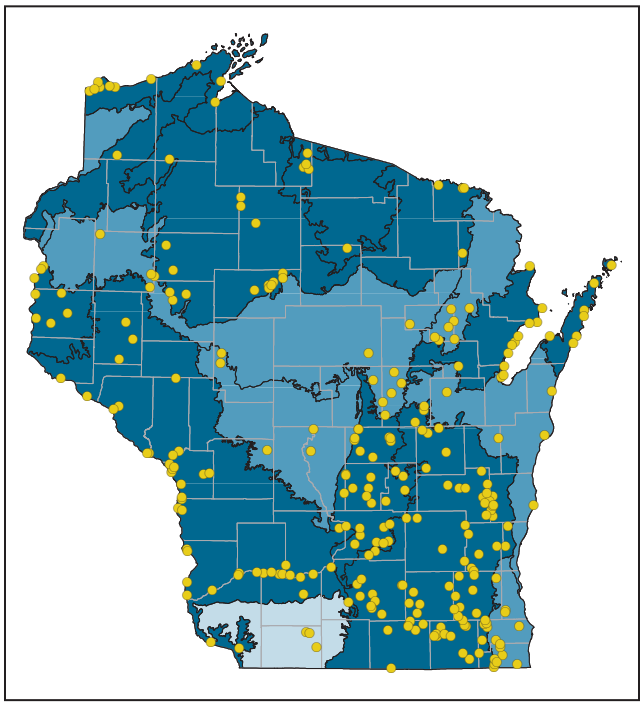
Emergent Marsh (Global Rank G4; State Rank S4)

Overview: Distribution, Abundance, Environmental Setting, Ecological Processes

The Emergent Marsh community occurs statewide. It is best developed in shallow topographic basins, on the margins of shallow ponds, in protected bays of lakes and impoundments, in riverine lakes, and in river backwaters. Beds of Emergent Marsh are generally established in permanent standing water of less than 2 meters in depth. Many of the dominant plants form clones (Wetzel 2001), and the vegetation may be strongly zoned by water depth. It is common for a single species to dominate large areas of more or less equal depth, though water clarity, substrate type, and disturbance history also influence the distribution of characteristic marsh plants. Depth gradients and terms such as "shallow marsh" or "deep marsh" are used in some vegetation classifications to identify marsh types or variants. Marshes in protected bays along the shores of the Great Lakes have been separated out as distinct entities in some state and provincial vegetation classifications (Albert 2003, Kost et al. 2007).

Factors that affect the extent and composition of Emergent Marsh include basin or floodplain morphology, hydrologic regime, current velocity, water chemistry, and water clarity. Emergent Marsh occupies poorly drained basins created by the actions of past glaciers and that now retain some standing water virtually year-round. Marshes also occupy the backwaters of major rivers and protected bays and shorelines of lakes and streams shielded from high energy wind, wave, and ice events. In the unglaciated Driftless Area of southwestern Wisconsin, marshes occur almost entirely within the lower portions of the floodplains of low gradient streams and rivers. If basin morphology is such that the slope of the bottom is gradual, the emergent species may be replaced by macrophytes with floating or submersed leaves. Both temporal and spatial overlap between emergent, floating-leaved, and submergent species may occur, so delineations of distinct communities may be difficult and imprecise. As water levels change, species dominance may shift seasonally as well as over periods of years or decades.

Ground and surface water characteristics vary greatly in different parts of the state, influenced by the nature of the bedrock, the underlying soils, and chemical composition of the glacial deposits. Some regions support lakes and low-gradient streams with extremely hard water (e.g., areas in northeastern Wisconsin in the Northern Lake Michigan Coastal and Northeast Sands ecological landscapes), and other areas support lakes and some streams with soft water (for example, in the extensive areas of glacial outwash in the Northern Highland and Northwest Sands ecological landscapes). The estuarine marshes found along the Great Lakes coasts are dynamic and have unique hydrological attributes that affect wetland development, maintenance, and succession.



Locations of Emergent Marsh in Wisconsin. The deeper hues shading the ecological landscape polygons indicate geographic areas of greatest abundance. An absence of color indicates that the community has not (yet) been documented in that ecological landscape. The dots indicate locations where a significant occurrence of this community is present, has been documented, and the data incorporated into the Natural Heritage Inventory database.

Community Description: Composition and Structure

The dominant herb genera are often robust and graminoid in form and may include cat-tails (*Typha* spp.), bulrushes (*Schoenoplectus* spp., *Scirpus* spp.), bur-reeds (*Sparganium* spp.), spike-rushes (*Eleocharis* spp.), water sedge (*Carex aquatilis*), and common lake sedge (*C. lacustris*). Prairie cord grass (*Spartina pectinata*) sometimes co-occurs with marsh associates rather than with species characteristic of prairies and sedge meadows. Among the common broad-leaved emergent species are some of the arrowheads (*Sagittaria* spp.), common water-plantain (*Alisma subcordatum*), and pickerel-weed (*Pontederia cordata*). Other common emergent marsh plants are water horsetail (*Equisetum fluviatile*), sweet-flag (*Acorus calamus*), and three-way sedge (*Dulichium arundinaceum*). Marshes dominated by wild rice, American lotus-lily (*Nelumbo lutea*), floating-leaved, or submergent species are treated separately elsewhere in this chapter.

Rare marsh plants include clustered bur-reed (*Sparganium glomeratum*), Torrey's bulrush (*Schoenoplectus torreyi*), Robbins' spike-rush (*Eleocharis robbinsii*), small yellow water-

Vast marshes and a network of sloughs and abandoned channels occur over thousands of acres on the lower Wolf River just above Lake Poygan. Winnebago County, Southeast Glacial Plains Ecological Landscape. Photo by Eric Epstein, Wisconsin DNR.

This extensive emergent marsh within the St. Louis River estuary is one of only two freshwater estuaries in NOAA's nationwide system of National Estuarine Research Reserves. Douglas County, Superior Coastal Plain Ecological Landscape. Photo by Eric Epstein, Wisconsin DNR.

crowfoot (*Ranunculus gmelinii*), marsh horsetail (*Equisetum palustre*), and floating marsh-marigold (*Caltha natans*). Water-purslane (*Didiplis diandra*) is perhaps better grouped with species of Submergent Marshes, but it does occur on exposed shorelines under certain conditions.

Emergent marshes provide critical nesting, foraging, and staging habitats for many birds, especially waterfowl, rails, herons, egrets, bitterns, grebes, terns, and shorebirds. Some songbirds, such as Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), Marsh Wren (*Cistothorus palustris*), and Swamp Sparrow (*Melospiza georgiana*), use marshes as their primary nesting and feeding habitats. Marshes are also of high significance to herptiles and invertebrates, and mammals such as common muskrat (*Ondatra zibethicus*), American beaver (*Castor canadensis*), American mink (*Neovison vison*), and North American river otter (*Lontra canadensis*) are at least partially dependent on emergent marshes.

At the location pictured here, this extensive emergent marsh near the confluence of the Rat and Lower Wolf Rivers is heavily dominated by cattails. Elsewhere, other important marsh plants include bulrushes, arrowheads, and bur-reeds. Winnebago County, Southeast Glacial Plains Ecological Landscape. Photo by Eric Epstein, Wisconsin DNR.

Conservation and Management Considerations

Management issues include maintaining the integrity of site hydrology, water quality, and water quantity. The spread of invasive species has become a significant management problem, especially in dynamic ecosystems such as those in Green Bay. Poor water quality due to excessive inputs of nutrients and sediments has affected emergent marsh composition and structure in regions such as southeastern Wisconsin and in the impoundments of major rivers in southwestern and central Wisconsin. Pollution from industrial contaminants is significant in urban-industrial areas such as the Milwaukee Harbor, Lower Green Bay, and the St. Louis River Estuary.

Among the problematic marsh plants are highly invasive species such as purple loosestrife (*Lythrum salicaria*), narrow-leaved cat-tail (*Typha angustifolia*), hybrid cat-tail (*T.* x *glauca*), reed canary grass (*Phalaris arundinacea*), and common reed (*Phragmites australis*). Common carp (*Cyprinus carpio*) can physically uproot and damage the emergent vegetation and increase water turbidity, reducing the depths at which aquatic plants can receive sufficient light to thrive and develop properly.

Restoration of marsh habitats in areas that were formerly drained or otherwise damaged has been an important focus of wildlife and fish management programs across Wisconsin and in many other parts of the continental United States. Horicon Marsh, in east central Wisconsin, has been a wetland restoration and reclamation project and, at approximately 32,000 acres, is promoted as the largest cat-tail marsh in North America. Such activities are laudable and have played significant roles in the recovery of many birds, mammals, and other species dependent on these restored or re-created habitats. However, the local and landscape level effects of proposals to convert stands of wetland communities such as sedge meadows, fens, shrub swamps, and lowland forests to marshes need to be carefully weighed to ensure that the habitats provided

by these other communities are not diminished to the point where they will also require restoration activities in an attempt to avoid the loss of their many dependent native plant and animal species. Local, regional, and continental perspectives are useful for and needed by conservationists when weighing alternative management possibilities.

Additional Information

For additional information, see the descriptions for Wild Rice Marsh, Submergent Marsh, Oligotrophic Marsh, Floating-leaved Marsh, and American Lotus-lily Marsh. In the U.S. National Vegetation Classification (US NVC), Emergent Marsh is treated broadly, but they define several similar types: CEGL002026 Bulrush – Cattail – Burreed Shallow Marsh; CEGL002229 Midwest Mixed Emergent Deep Marsh; CEGL002233 Midwest Cattail Deep Marsh; CEGL0092221 River Bulrush Marsh (Faber-Langendoen 2001). The US NVC types are not sharply defined and may demonstrate considerable overlap, even when co-occurring in the same basin. There is also potential overlap with Floating-leaved and Submergent marsh types.

Also see:
Hipp (2008)
Judziewicz (2014)
Kahl (1993)
Keddy and Reznicek (1986)
Keough et al. (1999)
Nichols et al. (1991)
Nichols (1999)
Singer et al. (1996)
Skawinski (2010)
Skawinski (2014)
Wetzel (2001)

FROM: Epstein, E.E. Natural communities, aquatic features, and selected habitats of Wisconsin. Chapter 7 *in The ecological landscapes of Wisconsin: An assessment of ecological resources and a guide to planning sustainable management*. Wisconsin Department of Natural Resources, PUB-SS-1131H 2017, Madison.

For a list of terms used, please visit the **Glossary.**

For a reference list, please see the **Literature Cited.**