Submergent Marsh (Global Rank G5; State Rank G4)

Overview: Abundance, Environmental Setting, Ecological Processes

Submergent Marsh is defined here as an assemblage of permanently inundated aquatic macrophytes where the majority of plant biomass occurs beneath the surface and attains dominance with respect to emergent and floating-leaved species (in aggregate these plants would generally attain cover values of less than 50%). Water depth of Submergent Marsh is highly variable and somewhat dependent on water color and clarity but often exceeds 0.5 meters and in exceptionally clear waters may reach depths of several meters.

Submergent Marsh occurs statewide in lake basins, slow-moving streams, and backwaters that vary in water chemistry, water source, depth, clarity, substrate composition, and use history (Nichols and Vennie 1991). Aquatic vegetation may exhibit strong zonation, based on constancy of inundation, frequency of exposure, and other factors. Emergent species grow in the shallow waters closest to shore (sometimes on organic substrates that are saturated rather than inundated), while the submergent plants occupy the deepest waters that are capable of supporting rooted macrophytes. Floating-leaved species occur at intermediate depths, with overlap among the groups of aquatic plants with their differing life forms and growth habits common.

Within limits, fluctuation in water depth is an important natural process as some submergent species reproduce by seed only when water levels are low.

Community Description: Composition and Structure

Pondweeds (Potamogeton spp.) and naiads (Najas spp.) are frequently among the dominant or prevalent species, and overall representation by members of the pondweed and naiad families (Potamogetonaceae and Najadaceae, respectively) is exceptionally high. Common or widespread representatives of these genera include large-leaved pondweed (Potamogeton amplifolius), grass-leaved pondweed (P. gramineus), Illinois pondweed (P. illinoensis), small pondweed (P. pusillus), Richardson’s pondweed (P. richardsonii), fern pondweed (P. robbinsii), flat-stem pondweed (P. zosteriformis), and slender naiad (Najas flexilis). Among other widespread, sometimes common aquatic macrophytes are sago pondweed (Stuckenia pectinata), common waterweed (Elodea canadensis), coon’s-tail (Ceratophyllum demersum), American elgrass (Vallisneria americana), water star-grass (Heteranthera dubia), water bulrush (Schoenoplectus subterminalis), common bladderwort (Utricularia macrorhiza), water-marinogold (Megalodonta beckii), horned-pondweed (Zannichellia palustris), white water crowfoot (Ranunculus aquatilis), yellow water crowfoot (R. flabellaris), and the water-milfoils (Myriophyllum spp.).

A few submergent species are associated with spring-fed lakes and ponds or spring-fed estuaries, including the stoneworts (Chara spp., Nitella spp.), mare’s-tail (Hippuris vulgaris), and the rare large water-starwort (Callitriche heterophylla).

Some plants, such as wild rice (Zizania spp.), have submergent, floating-leaved, and emergent stages during their life cycles. Others, including many of the pondweeds, have both submerged and floating leaves. During periods of low water, the leaves of some species may become stranded on exposed bottom (or false bottom) substrates.

Among the rare plants of the Submergent Marsh community are the Wisconsin Endangered lake cress (Armoracia lacustris), northeastern bladderwort (Utricularia resupinata), prickly hornwort (Ceratophyllum echinatum), and water-purslane (Didiplis diandra). Zigzag bladderwort (Utricularia subulata) has been collected recently from a bog lake in Manitowoc County, but additional confirmation is needed. At least eight pondweeds are on the Wisconsin Natural Heritage Working list (WDNR 2016c). These include algae-leaved pondweed (Potamogeton confervoides), listed as algae-like pondweed by the Wisconsin State Herbarium), Hill’s pondweed (P. hillii), spotted pondweed (P. pulcher), Vasey’s pondweed (P. vaseyi), and sheathed pondweed (Stuckenia vagyi). Spiral ditch-grass (Ruppiia cirrhosa) is limited to saline aquatic habitats of high alkalinity, all in southeastern Wisconsin.

See Skawinski (2010, 2014) for excellent, well-illustrated, and thorough treatments of Wisconsin’s aquatic plants, including the ecologically significant, difficult to identify, and sometimes overlooked pondweeds and naiads.
Submergent marshes provide an important food source for many waterbirds (e.g., ducks, geese, coots), some mammals, and also support amphibians, reptiles, and numerous aquatic invertebrates.

**Conservation and Management Considerations**

Protection and maintenance of the quality and quantity of waters supporting beds of aquatic macrophytes are the key management considerations. Periodic water level fluctuations (e.g., due to variability of precipitation received, droughts, floods) within the range of natural variability to which the plants at a given site are adapted may be essential components of the processes that maintain the submergent plant assemblages over time.

Waters that become turbid due to the addition of excess sediments and/or the feeding behavior of the exotic common carp (*Cyprinus carpio*) may lose their capacity to support some, or in extreme cases, all members of the submergent assemblages. Floristic diversity may decline, with a small number of species becoming super abundant. These may include native submergent macrophytes such as coon’s-tail as well as exotic species such as curly pondweed (*Potamogeton crispus*) or Eurasian water-milfoil (*Myriophyllum spicatum*).

Some lakes in which marl has accumulated have been mined, destroying the submergent aquatic beds in the excavated areas. Disruption of all marsh communities may be caused by careless operation of powerboats, herbicide use, dredging, mining for marl, and dam construction. Some of these disturbances also facilitate the spread of invasive species.

**Additional Information**

For more information on marshes, see the natural community descriptions for Emergent Marsh, Wild Rice Marsh, Floating-leaved Marsh, and Oligotrophic Marsh. The U.S. National Vegetation Classification type most closely corresponding to Submergent marsh is CEGL002282 Midwest Submerged Aquatic Wetland (Faber-Langendoen 2001).

**Also see:**

Crow and Hellquist (2000a)
Crow and Hellquist (2000b)
Harris et al. (1996)
Nichols (1999)
Nichols and Vennie (1991)
Skawinski (2010)
Skawinski (2014)


For a list of terms used, please visit the [Glossary](#).

For a reference list, please see the [Literature Cited](#).