

# PROPERTY PLANNING COMMON ELEMENTS

## COMPONENTS OF MASTER PLANS

### HABITATS AND THEIR MANAGEMENT

#### Emergent Wetland and Shallow Lake/Deep Marsh

##### *Description*

This page covers management of emergent, floating-leaved, and submergent wetlands/marshes. These are open, permanent or semi-permanent wetland communities dominated by robust aquatic plants. They occur statewide in poorly drained basins created by the actions of past glaciers, protected bays and shorelines of lakes, impoundments, streams, riverine lakes, and river backwaters. Many factors can influence the extent and composition of these wetlands, including basin or floodplain morphology, hydrologic regime, current water velocity, water chemistry, and water clarity. In general, emergent vegetation grows in the shallow water closest to shore and submergent plants occupy the deepest waters capable of supporting rooted plants, while floating-leaved species occur at intermediate depths. However, there is high variability in water depths occupied by these different types of aquatic plants, and considerable spatial overlap.

Beds of emergent marsh are generally established in permanent standing water less than 6.5 feet deep. Many of the dominant plants form clones and the vegetation may be strongly zoned by water depth. It can be common for a single species to dominate large areas of more-or-less equal depth. Dominant species include cat-tails, bulrushes, bur-reeds, spike-rushes, water sedge and common lake sedge. Other common species include arrowheads, American water-plantain, pickerel weed, water horsetail, sweet-flag and pond sedge.

The floating-leaved marsh community is characterized by species with leaves that rest on and cover at least 25-50% of the water's surface. Common species include white water-lily, bull-head pond-lily, water-shield, water smartweed, floating-leaf bur-reed, common water-starwort, and pondweeds having both floating and submersed leaves. The pond-lilies have large leaves and, when dominant, can cover most or all of the water surface, inhibiting the development of submergent or emergent plants by casting heavy shade.

Submergent marsh species are an assemblage of permanently inundated aquatic plants where the majority of the plant biomass occurs beneath the surface. Water depth is highly variable but often exceeds 1.6 feet and can reach depths of several meters in very clear waters. Fluctuation in water depth can be an important process as some submergent species reproduce by seed only when water levels are low. Pondweeds and naiads are among the dominant species, including large-leaved pondweed, grass-leaved pondweed, Illinois pondweed, small pondweed, Richardson's pondweed, fern pondweed, flat-stem pondweed, and slender naiad. Other common species are sago pondweed, common waterweed, coon's-tail, American eelgrass, water star-grass, water bulrush, common bladderwort, water-marigold, horned-pondweed, white water crowfoot, yellow water crowfoot, and water-milfoils.

Wild rice marsh is closely related to these other types, but is one of a very few wetland communities in the upper Midwest dominated by an annual grass. Wild rice reproduces only by seed. In favorable years, it can form dense, extensive beds in drainage lakes and flowages (impoundments constructed on streams), low-gradient warmwater streams, large-river backwaters, and estuarine river mouths. Other attributes of water bodies supporting wild rice include moderate fertility (although this is variable), soft substrates of poorly consolidated semi-organic



sediments, low energy shorelines, and slow but critically important constant flow velocity. Wild rice has been recorded growing in water depths up to 6 feet, but is usually found at water depths between 0.5 and 3 feet. Wild rice stands exhibit distinctive structural characteristics: first as the plants are strap-leaved submergents, then as plants with leaves that lay flat and float on the water’s surface, and finally as a robust emergents. In years where conditions are good and the rice is dense, stands can appear almost monotypic. In poor years, the associates are much more prominent. There are two wild rice species recognized in Wisconsin, a taller “southern” species, more prevalent in the southern and eastern parts of the state, and a less robust “northern” species more common in the north and west (although there is considerable range overlap). Associates include pickerel weed, broad-leaved arrowhead, stiff arrowhead, American water-plantain, water-shield, bull-head pond-lily, white water-lily, floating-leaved bur-reed, and several pondweeds. The harvest of wild rice is regulated through a permit process. Wild rice has great cultural significance for Wisconsin’s Native American tribes.

Aquatic plants, both submergent and emergent, form the foundation of healthy and flourishing aquatic systems within lakes and rivers and on the shores and wetlands around them. They protect water quality, produce oxygen, and help clarify water by absorbing nutrients like phosphorus and nitrogen that cause algal blooms. Plant beds stabilize soft lake and river bottoms and reduce shoreline erosion by absorbing effects of waves and currents. Aquatic plants also provide critical spawning habitat for fish and amphibians, shelter for various life stages of many species, and nesting habitat for birds. Plant beds support aquatic insects that serve as a food base for other species. Seeds and other plant parts are important food sources for waterfowl and other birds. Healthy native aquatic plant communities also help prevent establishment of non-native invasive plants like Eurasian water-milfoil.

Emergent wetlands and marshes across the state have been affected by dredging, filling, hydrologic disruption, excessive inputs of sediments, nutrients, and contaminants, and infestation by non-native invasive species.

**Ecological Landscape Opportunities**

Ecological Landscape	Opportunity*		
	Emergent Marsh	Submergent Marsh	Wild Rice Marsh
Central Lake Michigan Coastal	I	I	P
Central Sand Hills	M	M	P
Central Sand Plains	I	I	P
Forest Transition	I	I	P
North Central Forest	M	M	I
Northeast Sands	I	I	P
Northern Highland	M	M	M
Northern Lake Michigan Coastal	M	I	P
Northwest Lowlands	I	I	P
Northwest Sands	M	M	M
Southeast Glacial Plains	M	I	I
Southern Lake Michigan Coastal	I	P	
Southwest Savanna	P	P	
Superior Coastal Plain	M	M	M
Western Coulee and Ridges	M	M	I
Western Prairie	M	I	P



\*M = Major; major opportunity exists in this Landscape; many significant occurrences are recorded, or restorations likely to be successful.

I = Important; several occurrences important to maintaining the community in the state occur in this Landscape.

P = Present; community is present in the Landscape but better opportunity exists elsewhere.

### **Rare Species**

Many Species of Greatest Conservation Need (SGCN) are associated with emergent wetlands and marshes based on the findings in [Wisconsin's 2015 Wildlife Action Plan](#). To learn more, visit the [Wetland communities page](#) and click on "Coastal Plain Marsh, "Emergent Marsh", "Oligotrophic Marsh", Submergent Marsh" and "Wild Rice Marsh" under "Explore non-forested wetlands".

### **Threats**

- Draining, dredging, filling, dam or dike construction, construction of roads or rights-of-way, and excessive groundwater withdrawals can disrupt wetland hydrology via lowering of the water table, inundation, or alteration of ground or surface water flow. These activities either fragment and destroy wetlands outright, or result in invasion by shrubs or trees or replacement by monotypic cat-tail stands or open water.
- Adjacent agriculture, construction, mining, and residential or commercial/industrial development can introduce excess nutrients, sediments, and contaminants into wetlands, damaging water quality and changing composition and structure.
- Invasive species are a significant threat to wetlands. These include non-native invasive species such as purple loosestrife, narrow-leaved and hybrid cat-tails, reed canary grass, common reed, Eurasian water-milfoil, curly pondweed, common carp, as well as aggressive native species such as coon's-tail.
- Recreational activities can harm wetlands through habitat destruction (e.g., raising of water levels to facilitate boating) and degradation (increased water turbidity and direct damage to aquatic plants from frequent or careless motor boat use).
- Altered precipitation patterns associated with climate change (more frequent, higher-intensity storms) may exacerbate sedimentation and nutrient inputs into emergent wetlands, harming many species but possibly benefiting generalists like cat-tails and non-native invasive species. Precipitation and water level changes may reduce long-term suitability of sites that presently support wild rice.

### **Management Techniques**

- [Prescribed fire](#)
- [Mowing/brushing and haying](#)
- [Pesticide treatments](#)
- [Water level manipulation](#)

### **Management Prescriptions**

- Wherever possible, manage emergent wetlands as part of a complex of interconnected, related habitats (e.g., wet prairie, fen, sedge meadow, peatlands, shrubs swamp, bottomland or swamp hardwoods or swamp conifers, etc.).



- Protect and maintain large and/or high-quality examples of emergent wetlands and marshes, particularly when adjacent to other intact habitats. Maintain or increase size of habitat blocks and connectivity with surrounding native habitats, and soften sharp transitions between habitat types.
- Maintain site hydrology; restore where appropriate and feasible.
- Use buffers to protect wetlands from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Use prescribed fire, brushing, tree cutting, mowing, pesticide treatments, and biological control to control invasive species and remove encroaching woody vegetation in wetlands.
- Where appropriate and feasible, strive for a 1:1 ratio of open water to emergent vegetation (often referred to as “hemi-marsh”), as this is considered optimal for many breeding migratory birds such as ducks, terns, and rails.
- On appropriate sites where water level manipulation is possible, seasonally manipulate water levels to improve and enhance habitat for waterfowl and shorebirds and to facilitate vegetation management practices. In particular, partial or complete drawdowns can promote desirable emergent and submergent aquatic species such as smartweeds and arrowheads.
- Plant only natural (not cultivated) wild rice when conducting restorations of wild rice beds.

