

WETLANDS OF WISCONSIN

As the last ice age ended in Wisconsin 12,000 years ago, retreating glaciers left poorly drained basins throughout the landscape where wetlands then formed. Due to its unique geography, geology and climate, Wisconsin is blessed with tremendous diversity and an abundance of marsh, swamp, bog, fen, and other wetland habitats.

Wetlands vary based on three factors: soil type, hydrology (the timing, frequency and level of flooding or soil saturation each year), and vegetation. Ecologists have developed wetland classification systems, or groupings of habitats based on similarities in these factors. A key concept for understanding Wisconsin's wetland diversity and classification is the *vegetation tension zone*. Wisconsin's vegetation is divided into the northern forest floristic province, roughly the northeastern half of the state, and the prairie-forest floristic province, the southwestern half. Between these two areas lies the vegetation tension zone, a transitional band that corresponds to a number of climatic factors and has a mixture of species from both provinces.

While some classification systems are quite detailed and divide the state's wetlands into more than 30 types, Wisconsin Wetlands Association uses a more general system of just 12 wetland types with varying plant communities as described in this guide. Most wetland areas are actually a complex of several of these types. More detailed descriptions of these types, and how this classification system compares with other systems, are available on the Wisconsin Wetlands Association website at www.wisconsinwetlands.org.



OPEN BOG

David Schaeegler

Open bogs, like coniferous bogs, are found on saturated, acid peat soils that are low in nutrients. They support a unique acid-tolerant assemblage of trees, low shrubs and herbaceous plants (e.g., wildflowers and grasses) growing on mats of sphagnum moss. Open bogs have few trees and the plants growing through the sphagnum moss include herbs and/or low shrubs of the heath family such as cranberry, bog rosemary and leatherleaf. Carnivorous plants and cottongrass are characteristic herbaceous plants of open bog mats. A scattering of immature or stunted black spruce and/or tamarack trees may be present. The open character of these habitats is probably due to wet conditions, recurrent fires, summer frosts, and/or lack of a tree seed source. In Wisconsin, most bogs are found in and north of the vegetation tension zone.



CONIFEROUS BOG

Andrew Galvin

Coniferous bogs are similar to open bogs in plant community composition, notably the ground layer mat of sphagnum moss, except that mature trees of black spruce and/or tamarack are the dominant species. The understory is characterized by plants that can tolerate shaded conditions including sedges, orchids, pitcher plants and shrubs of the heath family. Black spruce and the heath family shrubs grow only in acid peat soils such as those associated with the sphagnum moss mats of coniferous bogs. Tamaracks, however, can also grow in alkaline peat soils, such as those of northern white cedar dominated coniferous swamps.



FEN

Steve Eggers

Fens are the rarest wetland type in Wisconsin, and probably one of the rarest in North America. Fens are low-growing plant communities that occur where groundwater that is rich in minerals, especially calcium and magnesium compounds, seeps out from the ground. The minerals precipitate out at the surface, creating harsh, alkaline soil conditions. Only a select group of calcium-tolerant plants (calciphiles) can grow in these conditions. Characteristic species include shrubby cinquefoil, sterile sedge, wild timothy, beaked spikerush, Ohio goldenrod, common valerian and lesser fringed gentian. Fen plant communities in general have a disproportionate number of rare, threatened and endangered plant species compared to other plant communities in the Great Lakes Region. Active springs and trout streams of cold, clear water are frequently associated with fens.



LOWLAND HARDWOOD SWAMP

Laura England

Lowland hardwood swamps are dominated by deciduous hardwood trees, including black ash, red maple, yellow birch and silver maple. Soils are saturated during much of the growing season and may be covered by standing water. Northern white cedar can be common in these swamps in northern Wisconsin. American elm is an important component of this community, although its numbers have been greatly reduced by Dutch elm disease. The shrub layer of hardwood swamps includes dogwood and alder species. Herbaceous species include some of the ferns, sedges, grasses and flowering plants of sedge meadows. Ephemeral ponds often occur within these forested wetlands.



FLOODPLAIN FOREST

Robin Maercklein



CONIFEROUS SWAMP

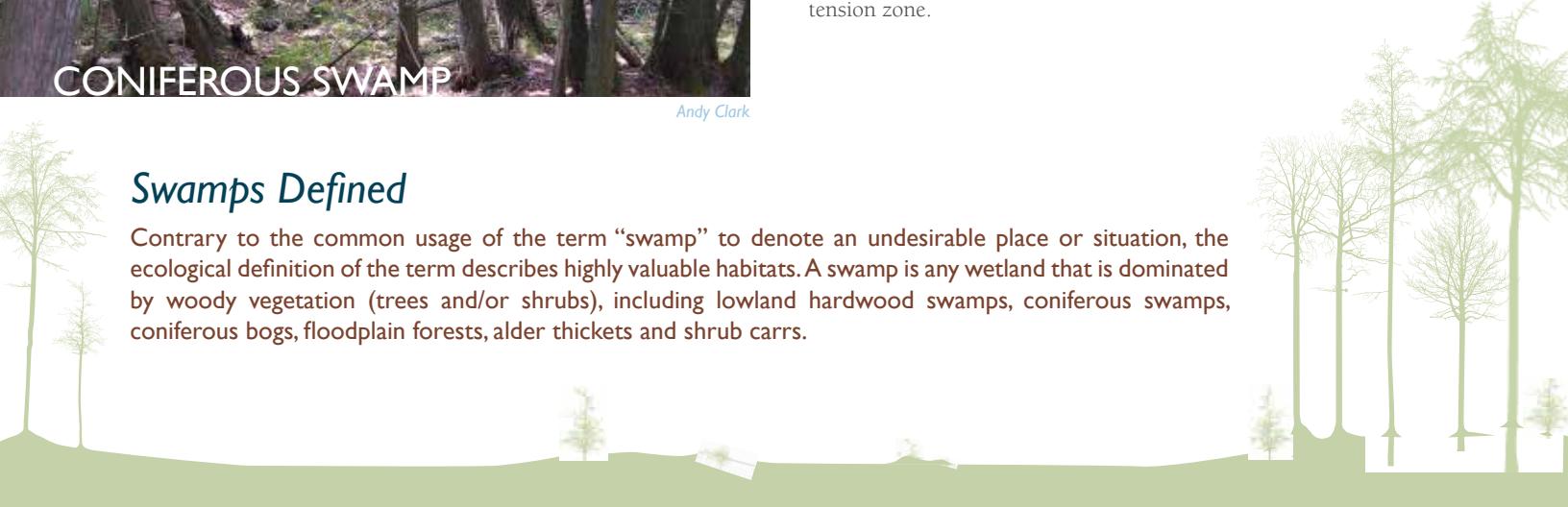
Andy Clark

Floodplain forests are swamps associated with stream and river corridors and are dominated by mature, deciduous hardwood trees. Overbank flood events inundate the soils, which are otherwise well-drained or even dry for much of the growing season. The characteristic feature of floodplains is the fine-grained and fertile alluvial soil that is deposited during episodic flood events. Dominant hardwoods include silver maple, green ash, river birch, eastern cottonwood, American elm and black willow. The herbaceous layer is commonly composed of jewelweed and nettles. The shrub layer is sparse to lacking because of the scouring action of floodwaters. Floodplain forests have great wildlife diversity, particularly birds, because they are migration corridors. Within floodplains, ephemeral ponds and areas of open sand provide habitat for amphibians and reptiles, respectively. During high water periods, these forests can be important feeding and breeding habitat for some fish species.

Coniferous swamps are forested wetlands dominated by lowland conifers, primarily northern white cedar and tamarack. Balsam fir may also be a component in some stands. Soils are saturated during much of the growing season and may be temporarily inundated by as much as a foot of standing water. Soils are usually organic (peat/muck), but no continuous sphagnum moss mat is present. Tamarack typically dominates on nutrient poor, acid soils, and northern white cedar on fertile, alkaline to neutral pH soils. Herbaceous plants may include marsh and royal ferns, sarsaparilla and some rare orchids. Coniferous swamps occur primarily in and north of the vegetation tension zone, but several large examples occur south of the tension zone.

Swamps Defined

Contrary to the common usage of the term “swamp” to denote an undesirable place or situation, the ecological definition of the term describes highly valuable habitats. A swamp is any wetland that is dominated by woody vegetation (trees and/or shrubs), including lowland hardwood swamps, coniferous swamps, coniferous bogs, floodplain forests, alder thickets and shrub carrs.





MARSH

Jack Bartholmai

Marshes are dominated by herbaceous aquatic plants growing in shallow water that is seasonal to permanent. Emergent aquatic plants of shallow marshes include cattails, bulrushes, lake sedges, arrowheads and bur-reeds. Deeper marshes (up to 6 feet) are characterized by submerged and floating aquatic plants, including pondweeds and water lilies. Marshes can be small to very large, and are found throughout Wisconsin, commonly along lake and river shorelines. Marshes are among the most productive habitats for waterfowl, other water birds, furbearers and aquatic insects, and they provide spawning and nursery habitat for some fish species. They are important stopover sites for birds during migration because their submerged plants and aquatic insects provide an abundant food source.



ALDER THICKET

Eric Epstein

Alder thickets are a deciduous shrub community dominated by speckled alder. Because of its tiny seeds and ability to fix nitrogen, speckled alder can be a pioneer species on exposed peat or alluvial floodplain soils. Alder thickets can include a diversity of shrubs such as highbush cranberry, sweet gale and common winterberry holly. The herbaceous layer may include some of the same ferns, sedges, grasses and flowering plants found in sedge meadows. Rare species, such as sweet coltsfoot, small yellow water crowfoot and New England violet, may be found in alder thickets. Alder thickets provide high quality habitat for game species like ruffed grouse, American woodcock, and white-tailed deer. These wetlands are generally found in and north of the vegetation tension zone.



SHRUB CARR

Steve Eggers

Shrub carrs are swamps dominated by deciduous shrubs and are common throughout Wisconsin. This plant community can grow on saturated to seasonally flooded soils that are either organic (peat/muck) or alluvial floodplain soils. Willows and/or red osier dogwoods usually dominate the plant community. The herbaceous layer of undisturbed shrub carrs typically includes a rich diversity of ferns, sedges, grasses and flowering plants of sedge meadows. Disturbed shrub carrs may have an herbaceous layer dominated by invasive reed canary grass. Shrub carrs provide habitat for a variety of wildlife species including many songbirds, game birds like ruffed grouse and American woodcock, and small mammals.



SEDGE MEADOW

Brynda Hatch

Sedge meadows are open communities with very dense herbaceous plant growth and little bare soil. The plants, including perennial wildflowers, grasses and sedges, grow on saturated soils; standing water is usually only present during floods and snowmelt. Sedge meadows often form a transition zone between open water habitats and uplands. Organic peat/muck soils are commonly present due to slow decomposition in these saturated soils. Sedges in the plant family Cyperaceae dominate. Some sedges form hummocks, also called tussocks, or small mounds of undecayed roots that create fine-scale variations in topography and microhabitats that facilitate plant and insect diversity. In addition to sedges, other plants in the Cyperaceae family such as spikerushes, bulrushes and nutsedges flourish. True rushes and grasses, especially Canada bluejoint grass, may also be present. This is a fire-dependent natural community; fire maintains species richness by creating open soil for germination of minor species and preventing succession to shrub/tree dominated communities.



LOW PRAIRIE

Thomas Meyer

Low prairies are one of the rarest wetland types in Wisconsin. Prairies are open, herbaceous plant communities that are dominated by grasses, and they occur along a moisture gradient from wet to dry. Low prairies, which have saturated soils with standing water only during floods and at snowmelt, are the only prairie type that are considered wetlands. Common grasses and flowering plants include prairie cordgrass, big bluestem, gayfeather, New England aster, prairie dock and sawtooth sunflower. Low prairies support a disproportionate number of rare species such as western and eastern prairie fringed orchids. These wetlands only occur below the vegetation tension zone in southern and central Wisconsin. This is a fire-dependent natural community; fire maintains species richness by creating open soil for germination of minor species and preventing succession to shrub/tree dominated communities.

OTHER RARE TYPES

While most wetland habitats in Wisconsin fit into one of the types described above, the state hosts a few additional rare wetland types, including wetland habitats specific to Great Lakes coastal areas (interdunal wetlands and ridge and swale wetland systems), small wetland habitats connected to groundwater discharge (seeps and spring runs), fresh wet meadows (a disturbance-created community becoming more common in southern Wisconsin), and patterned peat (found in some peatlands of northern Wisconsin).



Sources

This classification system and the descriptions above are based heavily upon Eggers, S.D. and D.M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota and Wisconsin, 2nd Edition. U.S. Army Corps of Engineers, St. Paul, MN.

For information on the wetland classification system used by the Wisconsin Department of Natural Resources for Natural Heritage Inventory purposes, visit this webpage: dnr.wi.gov/org/land/er/communities/descriptions.htm.

Funding for this project provided by The McKnight Foundation, which seeks to improve the quality of life for present and future generations through grantmaking, coalition-building and encouragement of strategic policy reform, and the Wisconsin Coastal Management Program and National Oceanic & Atmospheric Administration, Office of Ocean and Coastal Resource Management under the Coastal Zone Management Act, Grant # NA07NOS4190064.



EPHEMERAL POND

Drew Feldkirchner

Ephemeral ponds are shallow, often poorly-drained basins that contain standing water for the early part of the growing season, but dry out by summer or early autumn. They fill in the spring because of snowmelt, runoff from rain, or a rising water table. Ephemeral ponds in forested areas may have bottomland trees but little or no herbaceous plants, while in open and agricultural areas may have seed-rich herbaceous vegetation such as nutsedge, smartweeds, grasses and beggarticks. The ephemeral nature of flooding in these wetlands leads to a lack of aquatic vertebrate predators (i.e., fish), but many predaceous aquatic insects. Ephemeral ponds are important breeding sites and juvenile habitat for many frogs and salamanders because of the lack of fish predators and the proximity to upland habitats required by amphibians as adults. Some ephemeral ponds provide important stopover habitat for migratory waterfowl and shorebirds because of the protein-rich seed and insect food sources.

www.wisconsinwetlands.org

