



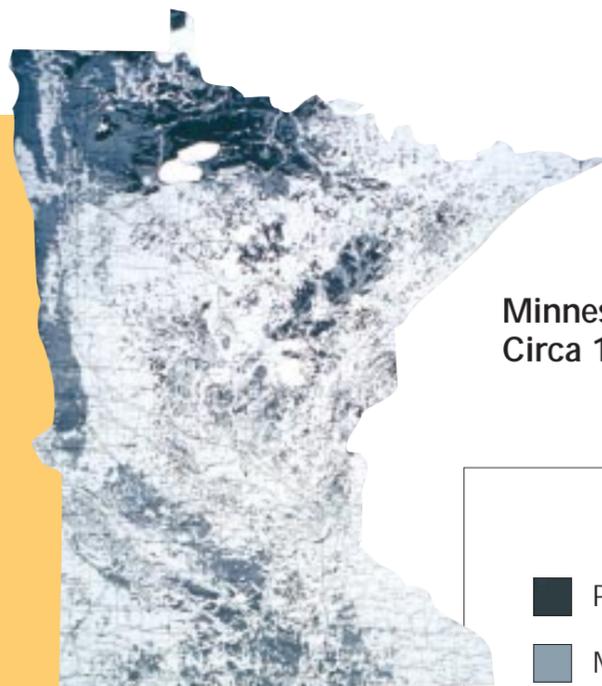
Wetlands

IN MINNESOTA

History of Wetlands in Minnesota

Despite their benefits, wetlands have long been considered a nuisance and have been drained or filled for agricultural production or urban development. Lack of awareness about the benefits of wetlands and governmental policies that encouraged draining and filling are largely to blame for this loss.

Until the settlement of Minnesota in the 1860s, about 18.6 million of its 53.6 million acres were wetland. Today, only half remain.



Minnesota Wetlands Circa 1860s

Legend

-  Peat soil wetlands
-  Mineral soil wetlands
-  Upland areas
-  Deep water areas

Source: Growing Energy Crops on Minnesota's Wetlands: The Land Use Perspective (1984) by Jeffrey P. Anderson and William J. Craig



Minnesota Wetlands Today



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The BWSR is an equal opportunity employer.

Prepared with cooperation from the Minnesota Department of Natural Resources and the U.S. Fish and Wildlife Service.

Wetland Benefits

Water quality.

Wetlands surround some of Minnesota's most valuable resources: our lakes and rivers. Wetlands filter and absorb polluted surface water runoff before it enters lakes and rivers downstream.

Flood control and low flow augmentation.

Wetlands serve as holding areas for water. When rainfall is heavy, wetlands slow the waters, reducing flood damage and soil erosion downstream. During drought, slow release of water from wetlands maintains stream flows, and may help recharge underground water supplies (called groundwater) often used for drinking.

Fish and wildlife habitat.

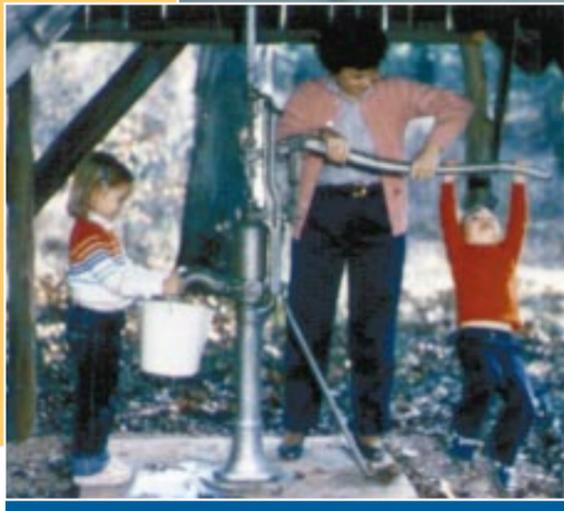
Wetlands provide a permanent or seasonal home to fish and wildlife, including some threatened or endangered species. Wetlands also indirectly support many species by breaking down large amounts of leaves and stems for food for insects, amphibians and fish.

Education and recreation.

Wetlands offer great opportunities for education and recreation. Many schools visit wetlands to learn about aquatic plants and animals; some have even restored or created wetlands on school grounds. Recreational benefits include fishing, hunting, bird-watching and hiking.

Commercial benefits.

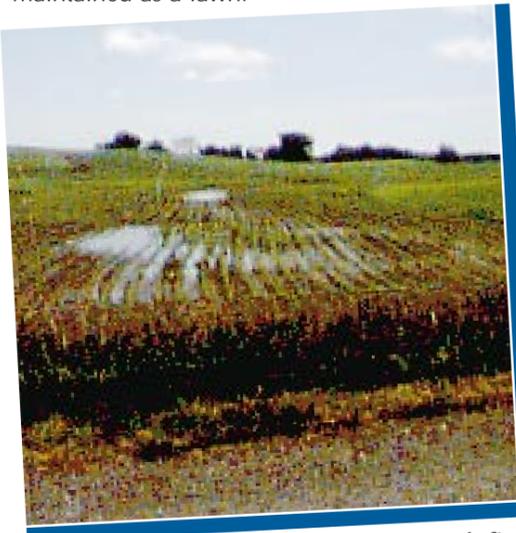
Wetlands are used for development of specialty products such as vegetable farming, peat mining, sod farming, minnow harvesting and timber harvesting.



What is a wetland?

Bog, slough, swamp, marsh, wetland—for most of us, those words mean a peaceful pond with cattails, water lilies, waterfowl and frogs.

That's accurate for some wetlands, but not all. Some may have visible surface water only a few weeks each year. Some are farmed or mowed for hay, or maintained as a lawn.



All wetlands, however, share these characteristics:

- they have mostly hydric soils, soils that developed in wet conditions;
- they are wet either above the ground or wet within 12 inches of the ground surface during all or part of the growing season;
- they have vegetation adapted to wet soil conditions.

Top photo: Some wetlands hold standing water only a few weeks a year.

Left photo: Many wetlands are farmed.

Wetland Classifications

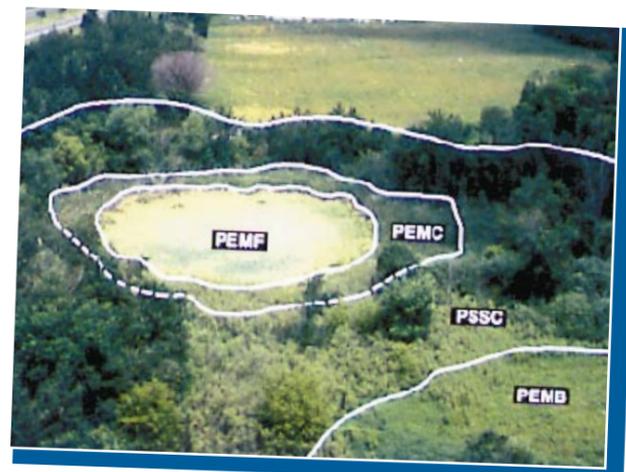
Two different systems are commonly used in Minnesota to classify wetlands.

The Circular 39 system, developed by the U.S. Fish and Wildlife Service in 1956, divides wetlands in Minnesota into eight types. The main differences between them are depth of water and variety of vegetation.

The Cowardin classification, developed by the U.S. Fish and Wildlife Service in 1979, is far more precise. It uses a tier system, with each tier describing the components of a wetland more specifically and narrowly than the last.

The components of the wetland pictured below are described by the Cowardin method. For example, the center of the wetland is classified as PEMF: P means its system is Palustrine (shallow ponds, marshes, swamps, sloughs); EM means its class is Emergent Vegetation (erect, rooted and herbaceous vegetation adapted to wet soil conditions); and its hydrology modifier is F (Semi-permanently Flooded).

By contrast, the entire wetland is classified under the Circular 39 system as a Type 4.



Wetland Types

Type 1

Circular 39

Type 1 wetlands are either **seasonally flooded basins or floodplains**. Vegetation varies according to the season and the amount of flooding. Benefits of Type 1 wetlands include seasonal waterfowl and wildlife habitat, water quality protection and groundwater recharge and discharge.

Cowardin

Upper right: PEMA
Lower right: PFOA (summer)
Lower left: PFOA (spring)



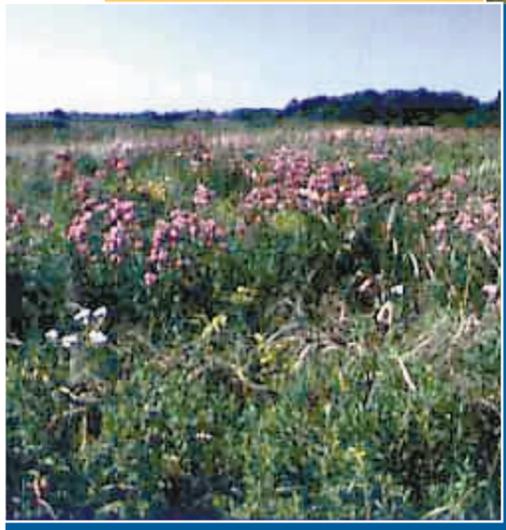
Type 2

Circular 39

Type 2 wetlands are **wet meadows**. The soil is without standing water during most of the growing season, but is saturated below the surface. Vegetation includes grasses, sedges, rushes and various broad-leaved plants. Type 2 wetlands provide waterfowl and wildlife habitat, water quality benefits and groundwater recharge or discharge.

Cowardin

PEMB



Type 3

Circular 39

Type 3 wetlands are **shallow marshes**. The soil is usually waterlogged early in the spring and often covered with six or more inches of water. Vegetation includes grasses, bulrushes, spikerushes, cattails, arrowheads, pickerelweed and smartweeds. Type 3 wetlands protect water quality and shoreland, retain floodwater, provide habitat for waterfowl, amphibians and fish, and offer recreation, including hunting, fishing and canoeing.

Cowardin

PEMC and F; PSSH; PUBA and C



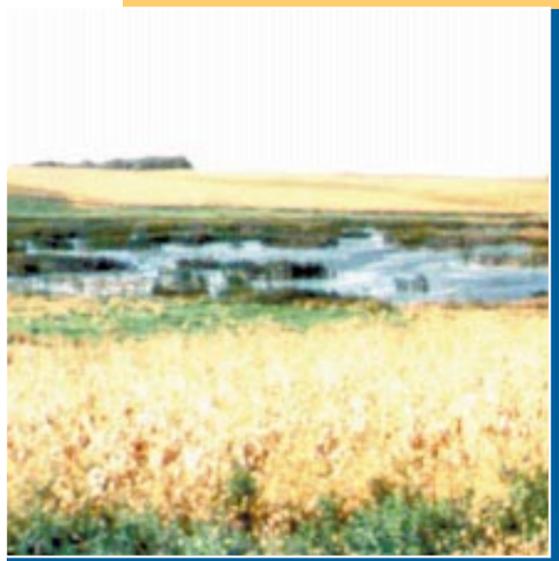
Type 4

Circular 39

Type 4 wetlands are **deep marshes**. The soil is usually covered with water during spring and summer—anywhere from six inches to three feet. Vegetation includes cattails, reeds, bulrushes, spikerushes and wild rice. In open areas, pondweed, naiads, coontail, watermilfoils, waterweeds, duckweeds, waterlilies or spatterdocks may grow. These deep marshes may completely fill shallow lake basins, potholes, limestone sinks and depressions, or they may border open water. Type 4 wetlands provide water quality protection, floodwater detention, wildlife and fisheries habitat, and recreation, including hunting, fishing and canoeing.

Cowardin

PEMF; PEMG and H; PUBB and F; PABF and G; L2US; L2EMF and G; L2ABF



Type 5

Circular 39

Type 5 wetlands are **open water wetlands**, including shallow ponds and reservoirs. The water is less than six feet deep and fringed by a border of emergent vegetation. Type 5 wetlands provide floodwater detention, wildlife and fish habitat, and recreation, including hunting, fishing and canoeing.

Cowardin

L2ABG and H; L2EMA, B and H; L2RS; L2UB; PABH; PUBG and H



Type 6

Circular 39

Type 6 wetlands are **shrub swamps**. Soil is usually waterlogged during much of the growing season, and is often covered with as much as six inches of water. Vegetation includes alders, willows, buttonbush, dogwoods, leatherleaf and swamp-privet. Typical benefits of Type 6 wetlands include water quality, floodwater detention, low flow augmentation and wildlife habitat.

Cowardin

PSSA, C, F and G; PSS1, 5 and 6B



Type 7

Circular 39

Type 7 wetlands are **wooded swamps**. Soil is waterlogged to within a few inches of the surface during the growing season, and can be covered with as much as a foot of water. Typical trees include tamarack, white cedar, arborvitae, black spruce, balsam, red maple and black ash. Type 7 wetland benefits include water quality, low flow augmentation, floodwater detention and timber harvesting.

Cowardin

PFO1, 5, and 6B; PFOC and F



Type 8

Circular 39

Type 8 wetlands are **bogs**. Soil is usually waterlogged and has a spongy covering of mosses. Typical plants include heath shrubs, sphagnum moss, sedge, leatherleaf, labrador-tea, cranberries and cottongrass, and scattered, often stunted, black spruce and tamarack. Typical benefits include peat harvesting, water quality, low flow augmentation and shoreland protection.

Cowardin

PFO2, 4 and 7B; PSS2, 3, 4 and 7B

