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- Wetland types and definitions.



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Wetland Types and Definitions

Two wetland classification methods are commonly used in Minnesota. The mapping method used for the initial wetland protection program and the Protected Waters Inventory legislation of 1976 and 1979 was Wetlands of the United States, published as U.S. Fish & Wildlife Service Circular 39 in 1956 and reprinted in 1971. Eight wetland types are recognized in Minnesota but none are assigned to rivers or lakes.

In 1979, the U.S. Fish & Wildlife Service published the Cowardin et al. method, Classification of Wetlands and Deepwater Habitats in the United States. This comprehensive representation of all water and wetland habitats is used on National Wetland Inventory maps.

The backside of this brochure relates the two wetland classification methods.

Wetlands provide direct benefits to the environment. These benefits will vary according to the type (or class) of wetland, the season, and the year. Collectively, they provide:

Floodwater Detention. Wetlands reduce flooding by slowing down flood waters and providing temporary storage of large amounts of storm or snowmelt water. This lessens damage to roads, bridges, crops, etc., by reducing peak discharges.

Nutrient Assimilation. Wetland plants absorb nutrients during their growth and development. This removal of nutrients means cleaner water leaving the wetland.

Sediment Entrapment. Wetlands moderate water flows, providing time for sediments and associated nutrients to settle out before the water is released to other wetlands, lakes, or streams.

Ground Water Recharge and Discharge. Some wetlands serve as a source of ground water recharge. They collect and retain surface waters that would otherwise end up in distant lakes or rivers and help assure long-term supplies of quality ground water. Many wetlands are ground water discharge areas and buffer water flows to lakes and streams.

Low Flow Augmentation. Wetlands augment low flows in streams by either retarding direct runoff or by contributing to groundwater-based flows. This helps reduce the impact of short term droughts on rivers and streams.

Aesthetics and Recreation. Wetlands are often beautiful areas to observe unique plant and animal species. They are visual and spatial amenities to residential and commercial developments in urban environments. Hunters, trappers, fishermen and wildlife observers also frequent wetland areas.

Shoreland Anchoring and Erosion Control. Wetland vegetation reduces erosion along lake and stream banks by reducing forces associated with wave action.

Wildlife Habitat. Many species of wildlife spend all or certain seasons of the year in wetland habitats for breeding, brood rearing, feeding, or cover purposes.

Fisheries Habitat. Many species of fish utilize wetland habitats for egg laying, food, or protection.

Education. Wetlands provide ideal conditions for studying various ecological processes and are a focus for art.

Wetland Terminology *(from Cowardin, et al, 1979)*

A **SYSTEM** refers to a complex of wetlands and deep-water habitats that share the influence of similar hydrologic, geomorphologic, chemical, or biological factors. The Systems in Minnesota are:

- Lacustrine (lakes)
- Palustrine (shallow, usually vegetated)
- Riverine (river, channels)

A **SUBSYSTEM** subdivides the Lacustrine and Riverine Systems into more specific categories (e.g. Limnetic and Littoral are Subsystems of the Lacustrine System)

Rock bottom (rock or rubble substrate, less than 30% vegetative cover)

Scrub-shrub (shrubs, young trees less than 6 meters)

Unconsolidated bottom (substrate particles smaller than stones and less than 30% vegetative cover, includes deep water habitats)

A **WATER REGIME** generally describes the duration and timing of surface inundation. Water regimes in Minnesota include: temporarily flooded (A), saturated (B), seasonally flooded (C), semipermanently flooded (F), intermittently exposed (G), permanently flooded (H), and artificially flooded (K).

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A **CLASS** describes the general appearance of the habitat in terms of either the dominant form of vegetation or the physiography and composition of the substrate.

Common Classes in Minnesota include:

- Aquatic bed (plants growing on or below the water surface)
- Emergent (erect, rooted, herbaceous wetland plants)
- Forested (vegetation taller than 6 meters)

Rock bottom (rock or rubble substrate, less than 30% vegetative cover)

Scrub-shrub (shrubs, young trees less than 6 meters)

Unconsolidated bottom (substrate particles smaller than stones and less than 30% vegetative cover, includes deep water habitats)

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a swamp or marshland is physically unattractive



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***To some of our citizens
a swamp or marshland is physically unattractive,
an inconvenience to cross by foot
and an obstacle to road construction or improvement.
However, to an increasing number of our citizens
who have become concerned enough
about the vanishing wetlands to seek legislative relief,
a swamp or marsh is a thing of beauty.***

***To one who is willing to risk wet feet to walk through it,
a marsh frequently contains
a springy soft moss,
vegetation of many varieties,
and wildlife not normally seen
on higher ground.***

***It is quiet and peaceful
- the most ancient of cathedrals -
antedating the oldest of manmade structures.
More than that, it acts as nature's sponge,
holding heavy moisture to prevent flooding
during heavy rainfalls and
slowly releasing the moisture and maintaining
the water tables during dry cycles.***

***In short,
marshes and swamps are something to protect & preserve.***

*From the Minnesota Supreme Court's 1976 decision
disallowing the construction of a highway through William Bryson's marsh,
which he brought suit to save.*



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(612) 296-5484
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Wetland Types and Definitions

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Wetland Types and Definitions in Minnesota

Adapted from: <i>Wetlands of the United States*</i> FWS Circular 39		<i>Classification of Wetlands and Deepwater Habitats of the United States, Cowardin et al. *</i> FWS/OBS - 79/31		
Type & Definition	SYSTEM Subsystem Wetland Classes Typical Subclass	Typical Water Regimes	Typical NWI Symbols	
<p>Type 1 - Seasonally flooded** basin or flat. Soil is covered with water or is waterlogged during variable seasonal periods but usually is well-drained during much of the growing season. Vegetation varies greatly according to season and duration of flooding: from bottom-land hardwoods (floodplain forests***) to herbaceous plants.</p>	<p>PALUSTRINE (P) Emergent (EM) Forested (FO) Unconsolidated Shore (US)</p>	<p>Temporarily flooded (A)</p>	<p>PEMA PFOA PUS</p>	
<p>Type 2 - Wet meadow. Soil is usually without standing water during most of the growing season but is waterlogged within at least a few inches of surface. Meadows may fill shallow basins, sloughs, or farmland sags, or these meadows may border shallow marshes on the landward side. Vegetation includes grasses, sedges, rushes and various broad-leaved plants. Other wetland plant community types include low prairies, sedge meadows, and calcareous fens.***</p>	<p>PALUSTRINE (P) Emergent (EM)</p>	<p>Saturated (B)</p>	<p>PEMB</p>	
<p>Type 3 - Shallow marsh. Soil is usually waterlogged early during the growing season and may often be covered with as much as 6 inches or more of water. These marshes may nearly fill shallow lake basins or sloughs, or may border deep marshes on the landward side. These are common as seep areas on irrigated lands. Vegetation includes grass, bulrush, spikerush and various other marsh plants such as cattail, arrowhead, pickerelweed and smartweed.</p>	<p>PALUSTRINE (P) Emergent (EM) Scrub-Shrub (SS) Unconsolidated Bottom (UB)</p>	<p>Temporarily flooded (A) Seasonally flooded (C**) Semipermanently flooded (F) Permanently flooded (H)</p>	<p>PEMC and F PSSH PUBA and C</p>	
<p>Type 4 - Deep marsh. Soil is usually covered with 6" to 3' or more of water during growing season. These deep marshes may completely fill shallow lake basins, potholes, limestone sinks and sloughs, or they may border open water in such depressions. Vegetation includes cattail, reed, bulrush, spikerush and wildrice. In open areas, pondweed, naiad, coontail, water-milfoil, waterweed, duckweed, waterlily or spatterdock may occur.</p>	<p>LACUSTRINE (L) or PALUSTRINE (P) Littoral (2) Aquatic Bed (AB) Emergent (EM) Unconsolidated Bottom (UB) Unconsolidated Shore (US)</p>	<p>Saturated (B) Semipermanently flooded (F) Intermittently exposed (G) Permanently flooded (H)</p>	<p>L2ABF L2EMF and G L2US PABF and G PEMG and H PUBB and F</p>	

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Unconsolidated Shore (US)

PUS



Type 2 - Wet meadow.

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PALUSTRINE (P)

Emergent (EM)

Saturated (B)

PEMB



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PALUSTRINE (P)

Emergent (EM)

Scrub-Shrub (SS)

Unconsolidated

Bottom (UB)

Temporarily flooded (A)

Seasonally flooded (C**)

Sempermanently flooded (F)

Permanently flooded (H)

PEMC and F

PSSH

PUBA and C



Type 4 - Deep marsh.

Soil is usually covered with 6" to 3' or more of water during growing season. These deep marshes may completely fill shallow lake basins, potholes, limestone sinks and sloughs, or they may border open water in such depressions. Vegetation includes cattail, reed, bulrush, spikerush and wildrice. In open areas, pondweed, naiad, coontail, water-milfoil, waterweed, duckweed, waterlily or spatterdock may occur.

LACUSTRINE (L) or

PALUSTRINE (P)

Littoral (2)

Aquatic Bed (AB)

Emergent (EM)

Unconsolidated

Bottom (UB)

Unconsolidated

Shore (US)

Saturated (B)

Sempermanently flooded (F)

Intermittently exposed (G)

Permanently flooded (H)

L2ABF

L2EMF and G

L2US

PABF and G

PEMG and H

PUBB and F



Type 5 - Shallow open water.

Shallow ponds and reservoirs are included in this type. Water is usually less than 10' deep and fringed by a border of emergent vegetation similar to open areas of Type 4.

LACUSTRINE (L) or

PALUSTRINE (P)

Limnetic (1)

Littoral (2)

Aquatic Bed (AB)

Emergent (EM)

Rocky Shore (RS)

Unconsolidated Bottom

(UB)

Temporarily flooded (A)

Saturated (B)

Intermittently exposed (G)

Permanently flooded (H)

L1

L2ABG and H

L2EMA, B and H

L2RS

L2UB

PABH

PUBG and H



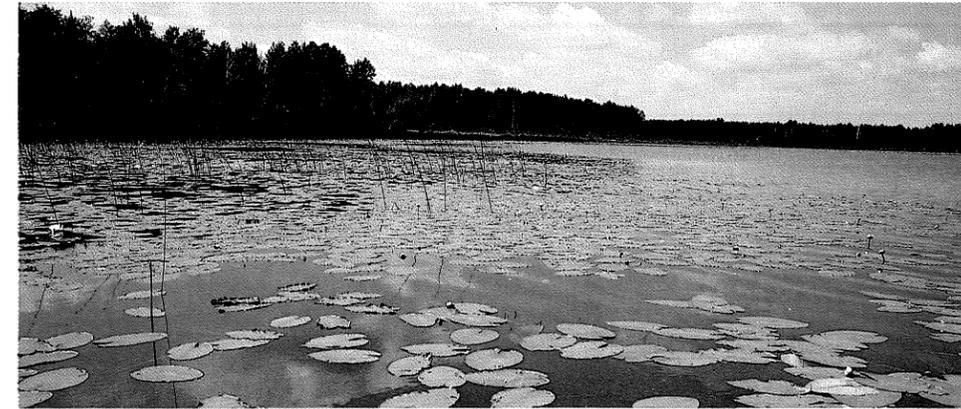
L1, PUBG, and PUBH are usually considered deepwater habitats

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LACUSTRINE (L) or
 PALUSTRINE (P)

Limnetic (1)	Temporarily flooded (A)	L1
Littoral (2)	Saturated (B)	L2ABG and H
Aquatic Bed (AB)	Intermittently exposed (G)	L2EMA, B and H
Emergent (EM)	Permanently flooded (H)	L2RS
Rocky Shore (RS)		L2UB
Unconsolidated Bottom (UB)		PABH
		PUBG and H

L1, PUBG, and PUBH are usually considered deepwater habitats



Type 6 - Shrub swamp.
 Soil is usually waterlogged during growing season and is often covered with as much as 6" of water. These occur mostly along sluggish streams and occasionally on flood plains. Vegetation includes alder, willow, buttonbush, dogwood, and swamp-privet.

PALUSTRINE (P)

Scrub-Shrub (SS)	All nontidal water regimes except permanently flooded (A, B, C, F, G)	PSSA, C, F, and G
Broadleaf deciduous (1)		PSS1, 5, and 6B
Dead (5)		
Deciduous (6)		



Type 7 - Wooded swamps.
 Soil is waterlogged at least to within a few inches of surface during growing season and is often covered with as much as 1' of water. These occur mostly along sluggish streams, on old riverine oxbows, on flat uplands and in ancient lake basins. Forest vegetation includes tamarack, arborvitae, black spruce, balsam fir, red maple and black ash. Deciduous swamps frequently support beds of duckweed and smartweed. Other wetland plant community types include lowland hardwood swamps and coniferous swamps.***

PALUSTRINE (P)

Forested (FO)	Saturated (B)	PFO1, 5, and 6B
Broad-leaved deciduous (1)	Seasonally flooded (C**) Semipermanently flooded (F)	PFOC and F
Dead (5)		
Deciduous (6)		



Type 8 - Bogs.
 Soil is usually waterlogged. These occur mostly in ancient lake basins, on flat uplands and along sluggish streams. Vegetation is woody or herbaceous or both, usually on a spongy covering of mosses. Typical plants are heath shrub, sphagnum moss and sedge. In the North, leatherleaf, Labrador tea, cranberry and cottongrass are often present. Scattered, often stunted, black spruce and tamarack may occur.

PALUSTRINE (P)

Forested (FO)	Saturated (B)	PFO2, 4, and 7B
Needle-leaved deciduous (2)		PSS2, 3, 4, and 7B
Needle-leaved evergreen (4)		
Evergreen (7)		
Scrub-Shrub (SS)		
Needle-leaved deciduous (2)		
Broad-leaved evergreen (3)		
Needle-leaved evergreen (4)		
Evergreen (7)		



NOTES: * It is not possible to directly equate Circular 39 to Cowardin et al. Cowardin classifies wetland habitats whereas Circular 39 maps wetland basins.

** The term "seasonally flooded" does not have the same meaning in the two classification systems.

*** Other wetland plant communities are described in Eggers, Steve D. and Donald M. Reed. 1987. Wetland Plants and Plant Communities of Minnesota and Wisconsin. USA Corps of Engineers, St. Paul. 201 pages.