

Classification of Wetlands based on Groundwater Dependence



DOUG NORRIS

WETLANDS PROGRAM COORDINATOR

ECOLOGICAL AND WATER RESOURCES DIVISION

DOUG.NORRIS@STATE.MN.US

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This wetland classification scheme was originally developed for a Minnesota Department of Natural Resources (DNR) effort to establish protective permit thresholds for groundwater appropriations subject to DNR regulation. The classification of various wetland types were made in consultation with wetland professionals from several state and federal agencies and from academia and were helpful in discussing the potential effects of groundwater withdrawals. However, they are based on best professional judgment, not empirical data, and are subject to revision and further clarification. The basic units of classification are the wetland native plant communities (NPC) as described in the series of Field Guides to the Native Plant Communities of Minnesota (MnDNR 2005a, 2005b, 2003). The NPCs are grouped somewhat loosely into more readily recognizable wetland type categories. Comments/suggestions are welcome and should be directed to Doug Norris, above.

1.0 Wetlands dependent on sustained groundwater discharge

The following wetland types are characterized by constant or nearly constant groundwater discharge, which may originate from regional, deep aquifers (except for OPn91). Calcareous fens, due to their rarity and the fact that they support a number of state-listed plant species are afforded special protection under the Minnesota Wetland Conservation Act (Minn. Statute 103G.223).

Fens and Seepage Wetlands

- OPn91 Northern rich fen (water track)
- OPn93 Northern extremely rich fen (calcareous fen)
- OPp91 Prairie rich fen
- OPp93 Prairie extremely rich fen (calcareous fen)
- WMs83 Southern Seepage Meadow/Carr

2.0 Wetlands dependent on groundwater associated with consistently high water tables

The following wetland types are highly groundwater-dependent and are found where the water table is consistently within the rooting zone or above the ground surface throughout much of the growing season. They are typically located low in the landscape associated with lakes, rivers or streams, on poorly drained glacial lake plains, or as basins in rolling topography where unconfined aquifers are near or exposed to the surface. The plant communities of these wetland types are comprised of mostly or nearly all obligate or facultative-wet plant species that are adapted to growing in anoxic conditions.

Forested Wetlands

- WFn53 Northern Wet Cedar Forest
- WFn55 Northern Wet Ash Swamp
- WFn64 Northern Very Wet Ash Swamp
- Wfs57 Southern Wet Ash Swamp
- FPn62 Northern Rich Spruce Swamp (Basin)
- FPn63 Northern Cedar Swamp
- FPn71 Northern Rich Spruce Swamp (Water Track)
- FPn72 Northern Rich Tamarack Swamp (Eastern Basin)
- FPn81 Northern Rich Tamarack Swamp (Water Track)
- FPn82 Northern Rich Tamarack Swamp (Western Basin)
- FPs63 Southern Rich Conifer Swamp
- FPw63 Northwestern Rich Conifer Swamp

Shrub Swamps

- OPn81 Northern Shrub Shore Fen
- WFn74 Northern Wet Alder Swamp
- FPn73 Northern Rich Alder Swamp

Wet Prairies

- WPs54a Wet Seepage Prairie (Southern)

Wet Meadow/Shrub Carr Wetlands

- OPn92 Northern Rich Fen (Basin)

Peatland/Bog

- APn91 Northern Poor Fen

Marshes

- MRn83 Northern Mixed Cattail Marsh
- MRn93 Northern Bulrush-Spikerush Marsh
- MRp83 Prairie Mixed Cattail Marsh

3.0 Wetlands dependent on groundwater associated with water tables that are high for some portion of the growing season

The hydrology for the following wetland types is primarily due to high water tables early in the growing season (including flooding from adjacent rivers/streams) but often declining later. The plant communities of these wetland types support more species that are less tolerant of constant inundation or saturation to the surface.

Forested Wetlands

- WFW54 Northwestern Wet Aspen Forest
- WFS55 Southern Wet Aspen Forest
- FFN57 Northern Terrace Forest
- FFN67 Northern Floodplain Forest
- FFS59 Southern Terrace Forest
- FFS68 Southern Floodplain Forest

Wet Meadow/Shrub Carr Wetlands

- WMP73 Prairie Wet Meadow/Carr
- WMN82 Northern Wet Meadow/Carr

Wet Prairies

- WPN53 Northern Wet Prairie
- WPS54b Wet Prairie (Southern)
- WPS54c Wet Saline Prairie (Southern)

4.0 Wetlands not highly dependent on groundwater

Temporary/Seasonal Basins -- These wetlands may reflect high water tables for a short period early in the growing season, but are more dependent on snowmelt and precipitation for their hydrology. They are often dry by mid-summer but may re-flood periodically due to heavy precipitation.

- WMS92 Southern Basin Wet Meadow/Carr

Bogs – Plant communities in acid peatlands are rooted in peat that has typically accumulated above the water table and are therefore dependent on precipitation. However, the water table within bogs is usually not far below the surface and bog communities can be affected by actions that alter groundwater elevation and flow.

APn80 Northern Spruce Bog
APn81 Northern Poor Conifer Swamp
APn90 Northern Open Bog

Literature cited:

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