

# WISCONSIN WETLAND INVENTORY

## BACKGROUND

The Wisconsin Legislature required DNR to inventory (map) wetlands in the state and provided a statutory wetland definition [Ch. 374, Laws of 1978 & s. 23.32(1, Stats.)]. The definition sets a standard for all state wetland regulatory and management programs. A wetland is defined as "an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation, and which has soils indicative of wet conditions. Hydric soils + water near surface + potential for wetland plants = wetland.

The Wisconsin Wetland Inventory consists of wetland maps with statewide coverage and computerized data. Initial mapping and digitizing efforts took 5 years and \$2,500,000 to complete.

## MAP COVERAGE

The Wisconsin Wetland Inventory is the only statewide assessment of wetlands on record. The National Wetland Inventory did not map wetlands in the state, but assisted the Department in it's efforts and adopted DNR wetland maps as the National Inventory maps.

## CLASSIFICATION

The Wisconsin Wetland Inventory classifies all wetlands according to vegetation, hydrology and types of human influences on the wetland (e.g. E1Kg = persistent emergent wet meadow which is grazed).

## MAP REVIEW

To date each county and approximately 215 of 437 municipalities in the state have held public hearings on the accuracy of the wetland maps and have adopted the maps as part of a shoreland wetland zoning ordinance (NR 115 & 117).

## MAP USES

The wetland maps are the regulatory map base for locally administered shoreland wetland protection programs and are used in state Ch. 30 water regulation permit review.

The U.S. Army Corps of Engineers uses the Wetland Inventory maps in their Section 404 regulatory program.

The U.S. Fish & Wildlife Service and Environmental Protection Agency use the wetland maps in their wetland protection, monitoring and enforcement activities.

The U.S. Soil Conservation Service uses the wetland maps as an aid in their "swampbuster" wetland mapping efforts.

Realtors use the wetland maps for disclosure information.

All DNR environmental protection and resource management programs use the aerial photography and wetland data in their daily work activities.

## **DIFFERENCES - DNR / SCS WETLAND MAPS**

DNR maps all wetlands in the state 2 acres in size and larger. SCS swampbuster wetland maps identify only wetlands on cropland or potential cropland. It ignores most wetlands in the northern 1/3 of the state, forested wetlands and wetlands in urban areas.

The Wisconsin Wetland Inventory classification system describes wetland vegetation and hydrology. SCS classifies wetlands according to eligibility for farm program benefits.

DNR wetland maps are used as base maps for almost all state and federal wetland protection and regulatory programs. The SCS maps do not affect farmers or others who do not use federal farm program benefits.

## **MAP AVAILABILITY**

Paper copies of Wisconsin Wetland Inventory maps can be purchased from:

The Wisconsin Geological & Natural History Survey

Map Sales

3817 Mineral Point Road

Madison, Wisconsin 53705

(608) 263-7389

Mylar overlays showing all wetlands 5 acres and greater in size have been produced for each county to assist in implementation of shoreland wetland zoning.

County and township wetland acreage figures by wetland type are available.

Digital wetland data is created by tracing wetland boundaries using computer Geographic Information Systems (GIS) software and a digitizing table. This digital database is available for use.

## **UPDATING THE WETLAND INVENTORY**

The 1984-85 legislature provided for updating the original Wisconsin Wetland Inventory on a 10 year cycle. Budget restraints have limited the update to a 20 year cycle.

With an average update frequency of once every 20 years, the wetland maps will become out dated and of limited use for management and regulatory purposes. A ten year update cycle would protect our investment in the Wisconsin Wetland Inventory and would ensure that information is current and that the function and credibility of the Inventory are preserved.

A digital wetland data base (acreage information) is the only effective means of monitoring wetland gains and losses and assessing the effectiveness of wetland protection and management programs.

Digital wetland data can be overlaid with other computerized resource data (a GIS) to allow better management decisions through more efficient and effective access to information.

## **FOR MORE INFORMATION ABOUT THE WISCONSIN WETLAND INVENTORY ...**

DNR Bureau of Water Regulation and Zoning

Lois Stoerzer (608) 266-8852

## **DIFFERENT WETLAND MAPS FOR DIFFERENT JOBS**

(DNR - 2/91)

State (WWI) and Federal (SCS) wetland maps are designed for different purposes. Legal, technical and practical differences between the two sets of maps make each best suited to its intended use. Those differences prevent combining the maps into a single wetland inventory.

### **MAP USE**

State mapping is recognized as the official National Wetland Inventory maps for the state of Wisconsin. They are used by federal, state and local regulators and resource managers. SCS ("swampbuster") maps are a single purpose map to determine eligibility for federal farm program benefits.

### **WETLAND DEFINITION**

State and federal wetland definitions are essentially the same with one important difference. SCS limits wetland mapping to areas with hydric soils. This practice eliminates a significant number of important wetlands from mapping and protection (e.g. riverine wetlands on alluvial soils).

### **SCIENTIFIC/TECHNICAL BASIS**

The state maps wetlands using a stereoscope and stereoscopic photography which allows three dimensional viewing of topography such as low lying areas and greater resolution of photographic texture to identify wetland vegetation types. The state mapping effort uses soils data, USGS topographic maps, field inspection and other available wetland inventories to guide mapping. SCS maps wetlands based on a series of monoscopic (no third dimension) photographic slides and transfers the boundaries freehand to an unrectified (no accurate scale and distance) photograph. Wetland boundaries cannot be delineated with a reasonable degree of accuracy without using a stereoscope to view the area in three dimensions.

### **WETLAND CLASSIFICATION**

DNR classifies wetlands by vegetation type, hydrology and human influence or special wetland characteristics. This system describes the physical character of wetlands and is useful for regulatory and management purposes. SCS classifies wetlands according to eligibility for federal farm program benefits using a nomenclature which does not describe wetland characteristics.

### **WETLAND ACREAGE INFORMATION**

Under the state wetland map updating program wetland boundaries are digitized to allow computation of changes in wetland acreages. This is possible because wetland boundaries are drafted onto a rectified map base. This means that during processing the base map negative is corrected to delete various distortions such as tilt of the airplane and inaccuracies in scale that occur when the photographs are taken. The negatives are essentially stretched to fit the USGS 1" = 2000' topographic maps. The process of rectification produces a photo that is as nearly as possible a true representation of the earth's surface. This process is absolutely essential for accurate digitizing. It allows computation of acreage data and overlay of that information with other computerized data layers or mapping. SCS wetland maps are not rectified and accurate acreage information cannot be produced.

## **MAP SCALE COMPATIBILITY**

Very small wetland boundaries such as those mapped by SCS cannot be transferred to the smaller scale state maps. Combining the maps would require a much larger scale at prohibitive cost. State maps are produced at the same standardized scale throughout the state. That scale is common to many other map and planning bases. SCS map scale varies across the state depending upon available photography.

## **MAP COVERAGE**

State maps describe boundaries for wetlands of 2 acres or larger in size. SCS maps wetlands on farmlands and potential farmlands as small as 1/10 acre (which omits most of the northern third of the state and incorporated areas).

## **MAP UPDATING**

DNR is currently on a 20 year map update rotation (a 10 year rotation is planned). SCS currently has no plans for updating mapping.

## **MAP REVIEW AND AVAILABILITY**

State wetland maps have been the subject of public review in every county and most incorporated areas in the state (eventually all). Generally only the affected landowner is made aware of the details of SCS mapping. The state maps are reproducible and available through the Wisconsin Geological and Natural History Survey. SCS maps consist of aerial photographs which are not reproduced for public distribution.

## **LIMITED OPPORTUNITY TO COMBINE MAPPING A LOCAL OPTION**

State and SCS mapping could be combined electronically if the SCS maps were transferred to a rectified photo base map and digitized using some form of geographic information system computer software. The cost would be significant.

Because of limited geographic coverage for SCS mapping (only farmlands and potential farmlands) and other incompatibilities, local units of government are in the best position to decide if combining state and SCS wetland maps would be useful for their community. If SCS would not fund the required rectification of photo bases and digitization, a state mapping grant program could be established to allow local government to contract for such services.

## **STATE CONTROL OF WETLAND POLICY**

Wisconsin cannot be assured that the federal wetland definition or SCS mapping standards will not change in the future. An example of the potential problems this could create is the recent federal memorandum of understanding between the Corps of Engineers and EPA which deleted Section 404 regulatory jurisdiction for wetlands mapped by SCS as "prior converted" wetlands. This controversial decision will make substantial farmed wetland acreage available for conversion to other development purposes without any Section 404 regulatory review. This federal policy change is inconsistent with current policy for farmed wetlands in Wisconsin (current ag. use can be maintained but no conversion for development or upgrading of drainage). Similar future federal policy or mapping changes could likewise be detrimental to wetland resources in Wisconsin. The state should maintain the current technical mapping standards of the Wisconsin Wetland Inventory and retain control of related wetland policy decisions.

## WISCONSIN WETLAND INVENTORY DIGITAL DATA DISTRIBUTION POLICY

To ensure that the most current and accurate version of wetland information is used, the Bureau of Water Regulation and Zoning has developed the following policy regarding the use and/or distribution of the Wisconsin Wetland Inventory (WWI) digital database:

The Bureau of Water Regulation and Zoning (WRZ) is the custodian of the Wisconsin Wetland Inventory Digital Database. All wetland map digitizing will be done by WRZ using pcARC/INFO computer software.

**All** requests for use of or copies of the WWI digital data should be addressed to:

Department of Natural Resources  
Wisconsin Wetland Inventory  
Bureau of Water Regulation and Zoning  
101 S. Webster St, P.O. Box 7921  
Madison, WI 53707  
(608) 266-8852 or (608) 266-0756

The original Wetland Inventory maps were digitized using an in-house computer software program called GEDIT (no longer in use). Wetland Inventory maps are constantly being revised or redone to correct mapping errors and to reflect changes in wetland boundaries and types. The GEDIT data has not been updated to reflect these map changes and does not represent the official Wetland Inventory. Because of this discrepancy between the two maps, the GEDIT data **will not** be released for use until the necessary revisions have been made.




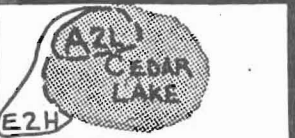

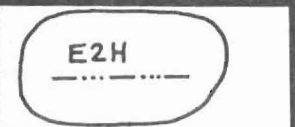



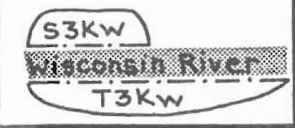


Currently WRZ is digitizing updated WWI maps using pcARC/INFO. The GEDIT data will not be used or distributed for any county where pcARC/INFO digital data is available or in the process of being created by WRZ.

The GEDIT data will not be used or distributed for any county where WRZ has secured funding to digitize in pcARC/INFO.





WRZ's digitizing priorities are currently set by funding sources (coastal counties are high priority because of current federal funding from Coastal Zone Management Program). Counties that have updated WWI maps will receive a higher priority for digitizing than counties with GEDIT data needing revision. WRZ will make every effort to work with the Bureau of Information Management and/or individual counties when a change in priority is necessary.

If you have any questions regarding this policy please contact the Department of Natural Resources, Bureau of Water Regulation and Zoning.







# WISCONSIN WETLANDS INVENTORY MAP LEGEND

Symbol	Example of Use	Description
		Wetland-upland boundary; boundaries between cover types.
		Boundary between wetland and deep water lake. A deep water lake is greater than 6 feet deep and does not support any wetland vegetation except submergents. (Shaded portion represents the lake).
		Level ditch constructed within a wetland for wildlife management.
		Stream or drainage ditch less than 100 feet wide within or adjacent to a wetland. The dot-dash line is drawn down the center of the stream or ditch.
		Boundary between wetland and a primary river channel. A primary river channel is 100 feet wide or more and does not support any wetland vegetation except submergents.
		Indicates the classification for the wetland mapping unit is the same on both sides of the linear feature.




## MAN-MADE FEATURES

	Road
	Railroad
	Dike, man-made levee or abandoned railroad grade
	Man-made dam




## POINT SYMBOLS

	Wetland smaller than 2 or 5 acres depending on the county
	Dammed artificial pond smaller than 2 or 5 acres depending on the county
	Excavated or blasted pond smaller than 2 or 5 acres depending on the county
	Spring within a wetland
	Beaver Dam
	Areas of filled land adjacent to wetlands



## MAP BOUNDARIES

	County Boundary
	Township Boundary
	Indicates the overlap of an orthophotoquad on a township base map

## HIGHWAY SYMBOLS

	Interstate Highway
	U.S. Route
	State or County Highway

## MAP REVISIONS

	Area may no longer be wetland; not field verified
	Area no longer wetland; field verified.

## CLASSIFICATION SYSTEM FOR THE WISCONSIN WETLANDS INVENTORY

This wetland classification system is based on the new U.S. Fish and Wildlife Service "Classification of Wetlands and Deep-Water Habitats of the United States", but with a few simplifications to make it easier to use and understand.

### Mapping Units

All wetlands which can be identified on the aerial photographs are mapped as follows:

- Wetlands larger than 2 or 5 acres, depending on the county, will be mapped and classified. A delineated wetland having only one classification is considered one mapping unit. Larger wetlands may be divided into small mapping units. Minor inclusions of other cover types (less than 30%) may exist within a mapping unit. Wetland classifications and boundaries are based on conditions present as of the aerial photograph date (1978-1980).
- Wetlands smaller than 2 or 5 acres, depending on the county, will be indicated by a point symbol (▲). Man-made ponds smaller than the minimum size are also indicated by a point symbol (□ or △).
- The following counties were mapped using 2 acres as the minimum mapping unit: Adams, Barron, Brown, Chippewa, Dane, Dodge, Green, Jackson, Jefferson, Juneau, Kenosha, Kewaunee, Manitowoc, Marathon, Milwaukee, Monroe, Ozaukee, Portage, Racine, Rock, St. Croix, Walworth, Washington, Waukesha, Waushara and Wood. The remainder of the counties are being mapped using 5 acres as the minimum mapping unit.

### Components of the Classification System

The classification codes describe the class (Table 1), subclass (Table 1), and general hydrologic characteristics (Table 2) of a wetland mapping unit. Some classification codes will also have a "special modifier" (Table 3). The classification code will usually contain 3 or 4 letters and digits:



When small patches of different covertypes (at least 30% of the cover) are intermingled within the wetland mapping unit, a mixed classification code will be used. Mixed classes are separated by a slash (e.g., T3/S3K), with the taller form of vegetation listed first.

TABLE 1. COVERTYPE CLASSES FOR THE WISCONSIN WETLANDS INVENTORY

Vegetated mapping units are classified by the uppermost layer of vegetation which covers 30% or more of the area. Vegetated classes take precedence over unvegetated classes if a choice has to be made. Subclasses in parentheses are only used where the information can be easily obtained from existing soil surveys, lake survey maps, or other data sources.

<u>Class and Subclass</u>	<u>Description</u>	<u>Subclass Examples</u>
A Aquatic bed	Plants growing entirely on or in a water body	--
1 (Submergent)	(Aquatic bed plants growing entirely under water)	(Milfoil, coontail, pondweeds)
2 Floating	Aquatic bed plants having structures which float at the water surface	Rooted or free floating
3 Rooted floating	Rooted aquatic bed plants which have floating leaves	Pond lilies, water shield
4 Free floating	Aquatic bed plants which float freely on the water surface	Duckweed, water meal, surface algae
M Moss	Wetlands where the uppermost layer of vegetation is moss	Sphagnum moss
E Emergent/wet meadow	Herbaceous plants which stand above the surface of the water or soil	--
1 Persistent	Plant remains persist into next year's growing season	Narrow- or broad-leaved
2 Narrow-leaved persistent	Persistent emergents having grass-like leaves without petioles	Cattail, most sedges and grasses
3 Broad-leaved persistent	Persistent emergents with wide leaf blades	Stinging nettle, some asters
4 Nonpersistent	Emergents which fall beneath the water and decompose over winter	Narrow- or broad-leaved
5 Narrow-leaved nonpersistent	Nonpersistent emergents with grass-like leaves without petioles	Wild rice, some bulrush stands
6 Broad-leaved nonpersistent	Nonpersistent emergents with wide leaf blades	Arrowhead, pickerel weed

TABLE 3. SPECIAL MODIFIERS FOR THE WISCONSIN WETLANDS INVENTORY

- a Abandoned - Areas which appear to have been cultivated in the past, but which have since been abandoned from cultivation and have reverted to wetland vegetation.
- c Cranberry bog - Used to indicate all artificially constructed cranberry bogs.
- e Exposed flats complex - Wetland mapping units bearing this modifier are a combination of exposed flats (e.g., sand flats in the Wisconsin River) and secondary river channels which are too small to delineate individually.
- f Farmed - Land cultivated only during drought years and periods of low water table, and which also has soils classified by the National Cooperative Soil Survey as poorly drained or very poorly drained.
- g Grazed - Wetlands which are used for pasturing livestock.
- j Central Sands complex - wetland mapping units bearing this modifier occur mainly in Central Wisconsin where small areas of peat, wet sand, and dry sand ridges are so intermingled that they cannot be delineated individually.
- m Mats - Used to indicate areas where wetland vegetation is floating on water as a mat, rather than being rooted in soil.
- r Red clay complex - Wetland mapping units bearing this modifier occur mainly on old lake plains adjoining Lake Superior, where small areas of wet and dry red clay soils are so intermingled that they cannot be delineated individually.
- s Ridge and swale complex - This landform occurs mainly along the Lake Michigan coast, where narrow beach ridges (strand lines) were formed parallel to the shore as the water in Lake Michigan receded during post-glacial times. Depressions (swales) between the beach ridges contain wetland vegetation, but the ridges themselves are dry. The complex is used to indicate areas where the swales are too small to delineate individually.
- v Vegetation recently removed - Used to indicate areas where the vegetation has recently been totally or partially removed by clearing, shearing, logging, or other means.
- w Floodplain complex - This modifier describes the floodplains of rivers and streams which are composed of small areas of seasonally flooded wetlands, wet meander scars, oxbow lakes, and/or small inclusions of upland, all of which are too small to delineate individually.
- x Excavated - Used to indicate wetlands which have been artificially excavated, usually for the purpose of creating ponds. Gravel pit ponds and other ponds created by mining are not considered to be wetlands unless they support wetland vegetation.
- z Evidence of muskrat activity - When muskrat lodges and eat-out areas can be detected on the aerial photographs, this modifier is used.

S Scrub/shrub	Woody plants less than 20 feet tall	--
1 Deciduous	Shrubs which drop their leaves in the fall	Needle- or broad-leaved
2 Needle-leaved deciduous	Stunted tamaracks	Stunted tamaracks
3 Broad-leaved deciduous	Deciduous shrubs other than tamarack	Willows, alder, young green ash
4 Evergreen	Shrubs which keep their leaves over winter	Needle- or broad-leaved
5 Needle-leaved evergreen	Evergreen shrubs with needle-like or scale-like leaves	Stunted black spruce
6 Broad-leaved evergreen	Evergreen shrubs with wide leaf blades	Labrador tea, leatherleaf
7 Dead	Dead shrubs	Shrubs killed by flooding
8 Needle-leaved	Any coniferous shrubs	Deciduous or evergreen
9 Broad-leaved	Any broad-leaved shrubs	Deciduous or evergreen
T Forested	Woody plants taller than 20 feet	--
1 Deciduous	Trees which drop their leaves in the fall	Needle- or broad-leaved
2 Needle-leaved deciduous	Tamaracks	Tamaracks
3 Broad-leaved deciduous	Deciduous trees other than tamarack	Black ash, elm, silver maple
5 Needle-leaved evergreen	Evergreen trees with needle-like or scale-like leaves	White cedar, black spruce, balsam
7 Dead	Dead trees	Trees killed by flooding
8 Needle-leaved	Any coniferous tree	Deciduous or evergreen
F Flats/unvegetated wet soil	Exposed wet soils which do not support vegetation	--
Ø Subclass unknown	Soil characteristics undetermined	--
(1) (Cobble/gravel)	(Flats composed of gravel and larger stones)	(Gravel bar in a fast flowing river)
(2) (Sand)	(Flats composed of sand)	(Sand flats in the Wisconsin R.)
(3) (Mud)	(Flats composed of silt and clay-sized mineral particles)	(Mud flats in the Mississippi R.)
(4) (Organic)	(Exposed muck)	(Organic flats exposed by drawdown)
(5) (Vegetated pioneer)	(Flats supporting herbaceous pioneer vegetation which is killed by rising water levels before the next growing season)	(Cocklebur growing on a sand flat)
W Open water	Lakes and ponds with a depth of 6 feet or less, and unvegetated river sloughs	--
Ø Subclass unknown	Bottom characteristics undetermined	--
(1) (Cobble/gravel)	(Cobble or gravel bottom)	--
(2) (Sand)	(Sand bottom)	--
(3) (Mud)	(Mud bottom)	--
(4) (Organic)	(Muck bottom)	--
U Upland	Upland areas surrounded by wetland	Also used as a subclass to indicate small inclusions of upland (TU/Elkj)

TABLE 2. HYDROLOGIC MODIFIERS FOR THE WISCONSIN WETLANDS INVENTORY

<u>Hydrologic modifier</u>	<u>Situation applied to:</u>	<u>Used with the following subclasses</u>
L Standing water, Lake	Lakes of 20 acres or more having a maximum depth of 6 feet or less (smaller lakes and ponds receive the "H" hydrologic modifier)	A1-A4, E4, E5, E6, S7, T7 FØ-F5, WØ-W4
R Flowing water, River	The abandoned and secondary channels of rivers and streams	A1-A4, E4, E5, E6, S7, T7, FØ-F5, WØ-W4
H Standing water, Palustrine	Wetlands which have surface water present for much of the growing season	All subclasses
K Wet soil, Palustrine	Areas which are wetlands, but do not appear to have surface water for prolonged periods of time	MØ, E1, E2, E3, S1-S9, T1-T8, FØ-F5