

# Putting Wetlands to Work for Your Community

This publication is intended to help counties, cities, villages, towns, and tribes better understand the public benefits that wetlands provide and how to protect and restore wetlands to meet local needs.



Wetlands contribute to the public health, safety, and welfare of virtually every Wisconsin community. They do this by helping to control the quantity and quality of water that moves across the landscape.

Healthy wetland landscapes, where the right types and amounts of wetlands are in the right locations, provide the greatest benefits to Wisconsin's communities.

The capacity of wetlands to provide these benefits can be hindered by direct, physical disturbance, as well as by activities outside of a wetland that alter the course of water and sediments flowing into or through the system.

The protection and restoration of wetland hydrology, therefore, is a matter of public concern.

Locally elected and appointed officials can maximize the public benefits that healthy wetland landscapes provide by enacting standards and priorities for the review of direct and indirect impacts to wetlands from land disturbing activities.

## HEALTHY WETLAND LANDSCAPES BENEFIT YOUR COMMUNITY BY:

- **Reducing** flooding, flood hazards, damages, and expenditures.
- **Preventing** and controlling water pollution.
- **Preventing** soil loss and erosion of stream beds and banks.
- **Preserving** natural drainage features and minimizing the need to construct, repair, maintain, or replace structural water management systems.
- **Maintaining and supporting** stream base flow and temperature, lake levels, and shallow groundwater supplies.
- **Preserving and improving** fish and wildlife habitat, recreational opportunities, and open space.



# Understanding Local Wetlands

## Wetlands form in response to water

Wetlands all share three characteristics: soils that formed under wet conditions, water-tolerant plants, and the presence of water at or near the surface during part of the year. They form in response to the presence and movement of water when any of the following occur:

- The land is flat and water runs off the surface very slowly;
- Water becomes ponded in depressions;
- Infiltration of rain or snow into the soil is slow;
- Groundwater discharges to the land surface or keeps the sub-surface soil saturated.



MILWAUKEE METROPOLITAN SEWERAGE DISTRICT

*Groundwater discharge wetlands such as springs and seeps, commonly form on the margins of small streams providing a continuous supply of clean, cold water.*

## Wetlands help to control water

Wetlands act to slow the flow of water as it moves across the land. Their location and topography enable them to capture, store and slowly release precipitation and snow melt. This helps to reduce flood peaks and increase infiltration, and provides a steady source of base flow to many lakes and streams.



GARY SHACKELFORD

*Ephemeral ponds like this are abundant across Wisconsin and play a vital role in preventing rain and snow melt from rushing downstream at high volumes and velocity.*

## Wetlands help to cleanse water

Wetlands help improve water quality too. For example, wetlands detain high velocity runoff. This reduces stream scour and bank cutting.

Wetland plants create friction in moving waters which also slows the flow. This allows suspended sediments to settle to the wetland floor, and harmful nutrients such as nitrates to dissolve in the standing water. Once dissolved, specialized wetland plants and bacteria can remove them from the system.

Finally, deep-rooted wetland plants stabilize soils and protect shorelines from the erosive forces of wind and waves.



GARY SHACKELFORD

*Healthy wetland vegetation along stream banks, as shown in this sedge meadow, filters runoff before it enters the stream.*

## Wetlands work together at a watershed-scale

Nature creates wetlands to handle water. The location, type, size, and abundance of wetlands form as a direct response to local hydrologic conditions. The influence of these wetlands is best understood at a watershed scale, where all the wetlands, lakes, rivers, and streams drain to a shared location. While every wetland matters, the combined effect of wetlands working together across the landscape is what supports public safety, health, and welfare.



TRACY HAMMES

*Culverts and other infrastructure downstream from areas with altered wetland hydrology receive more water, more quickly, making them more vulnerable to water-related damage.*

## Wetlands are sensitive to hydrologic disturbance

When it comes to the benefits wetlands provide, it's all about the water. Wetland hydrology can be degraded by activities within and outside of the wetland's boundary, or by "direct" and "indirect" impacts, respectively. Most disturbance to wetland hydrology is a combination of both.

### Common activities in or near wetlands that alter wetland hydrology include:

- Draining, tiling, channelization, levee development, and floodplain reduction.
- Ground disturbance including scraping, removal or compaction of soil, and placement of fill.
- Installation of roads, driveways, culverts, and other land disturbing activities that change the amount and timing of water entering the wetland.
- Input of excessive nutrients or sediments.
- Excessive removal of native wetland plants and/or trees.



MILWAUKEE METROPOLITAN SEWERAGE DISTRICT

*This wetland is immediately downslope of farm fields and buildings. The dead trees and dense stand of cattails are indicators of hydrologic disturbance.*

## Degrading and destroying wetland hydrology causes water-related problems

Man-made changes to wetland hydrology can set off chain reactions in and downstream of wetlands. Fill or drain a wetland, and the water that occupied that space will find a new place to go. The displaced water often moves more quickly downstream, picking up sediment and nutrients along the way.

The combined effects of many small changes across the landscape can lead to expensive problems for adjacent and downstream communities, including: increased flood peaks, polluted lakes and rivers, damaged roads and culverts, and more.

### Wetlands can be protected and restored to address local needs.

**Many communities have established goals and priorities in their respective plans and ordinances to address these water-related problems. Locally-led wetland protection efforts that seek to preserve and improve wetland hydrology can provide cost-effective solutions.**

# Putting Wetlands to Work

The benefits that wetlands provide, and the consequences of wetland loss, are experienced locally and strongly influenced by local land use.

Despite this, many communities defer to state and federal agencies on wetland-related matters. Doing so relinquishes local control and accepts a regulatory framework that was not designed with local needs or priorities in mind (*See box below*).

Establishing local wetland conservation standards and priorities is the only way to ensure that your community has enough of the right types of wetlands, in the right locations, to advance local goals and meet local needs.



PETER ZIEGLER

*Protecting and restoring wetlands can support working farms by storing floodwaters, preventing agricultural soil loss, and minimizing the need for downstream infrastructure maintenance.*

## LIMITATIONS OF STATE AND FEDERAL WETLAND PERMIT LAWS

State and federal wetland laws are not designed to fully address the array of land use concerns local governments routinely consider. Examples include, but are not limited to:

- State and federal wetland regulations discourage outright destruction (e.g. filling) of wetlands, but permits may not be required for activities on lands adjacent or hydrologically connected to wetlands.
- Wetland permit decisions are made in a case-by-case context, making it difficult and rare for regulators to consider locally adopted plans.
- Laws require public notice of some permit applications, but do not require local coordination.
- Review and approval of many activities with small impacts occurs under general permits with no public notice or comment.
- Mitigation to offset wetland impacts rarely occurs in the community where the impacts occur.

## Examples of local wetland policy goals and the benefits of enacting them include:

### GOAL **Protect local control over land use decisions that impact wetlands.**

- Establishes local government as the first point of regulatory contact.
- Ensures that wetland land use decisions are consistent with local plans and policies.
- Increases local input and influence over regulated activities that affect land use.
- Addresses limitations of state and federal wetland regulations.

### GOAL **Protect people, property, and public investment.**

- Reduces flooding, flood damages, and expenditures.
- Prevents and controls water pollution.
- Prevents agricultural soil loss.
- Reduces the need to construct, repair, or replace culverts and other infrastructure.

### GOAL **Promote responsible land development and management.**

- Discourages development in areas where changes to wetland hydrology could lead to flooding, unstable foundations, and leaky basements.
- Helps identify wetlands and associated hydrologic features on proposed development sites (*See box at right*).
- Ensures wetlands are considered early in project planning.
- Helps applicants avoid triggering or violating state and federal wetland permit requirements.
- Encourages care for and pride in privately owned conservation lands.

### GOAL **Enhance habitat, open space, and recreation.**

- Reduces erosion of stream banks and shorelines.
- Supports stream base flow and temperature, lake levels, and shallow groundwater supplies.
- Improves fish and wildlife habitat.
- Increases quality of hunting, fishing, and other recreational activities.



PATTERSON LEETH

*Wetlands support preferred habitat for musky and other popular game species such as waterfowl, deer, and furbearers.*

### **WHAT ARE ASSOCIATED HYDROLOGIC FEATURES?**

Lands or other features that are hydrologically connected to wetlands, and which support or are supported by wetland hydrology such as:

- lakes, rivers and streams
- shorelands or floodplains
- lands that have been tiled, ditched, or impounded
- areas with perched or seasonally high groundwater
- natural drainage, infiltration, or recharge areas, such as springs, seeps, steep slopes, swales, or channels

# Establishing Local Wetland Policies

Local officials can protect the public benefits that wetlands provide by enacting policies to review and discourage direct and indirect impacts to wetland hydrology and habitat.

Options include:

- adoption of a stand-alone wetland conservation ordinance; or,
- insertion of wetland-specific goals and standards in other policies such as zoning, land division, stormwater, and floodplain ordinances.

To support local wetland policy development, Wisconsin Wetlands Association (WWA) has released a **Model Wetland Conservation Ordinance** for use by county, municipal, and tribal governments. Highlights include draft language to help communities:

**Establish goals** to protect and restore wetland hydrology to address local water management resource concerns.

**Establish wetland conservation standards** to ensure that land disturbing activities do not cause or add to local water resource management problems  
(See box below).

**Establish Site-Plan Requirements** to identify wetlands and associated hydrologic features, and the potential for direct and indirect impacts to wetland hydrology (See box opposite page).

**Establish Wetland Protective Areas** to reduce the impacts of land disturbing activity adjacent to wetlands.

**Establish Review Criteria** for the approval, conditional approval, or denial of land disturbing activities with direct and indirect wetland impacts.

**Identify Conservation Measures** that can be required or allowed to minimize the wetland impacts of approved land disturbing activities.

## CONNECTING WETLAND LOSSES TO OTHER WATER-RESOURCE CONCERNS.

Altering wetland hydrology can cause or increase flooding, flood damages, shoreland erosion, and polluted runoff.

These impacts may occur in areas where wetland disturbance is adjacent to, or upstream of:

- flood-prone agricultural, residential, or commercial areas;
- vulnerable infrastructure such as roads, culverts and bridges;
- degraded or impaired waterways;
- public hunting or fishing areas.

Areas that have already experienced significant wetland drainage or development may also be particularly vulnerable.

See page 8 for resources to help identify areas where historic wetland losses may contribute to current water related problems.

To download WWA's Model Wetland Conservation Ordinance visit.  
[www.wisconsinwetlands.org/for-communities/](http://www.wisconsinwetlands.org/for-communities/)

## USING BEST AVAILABLE DATA TO IDENTIFY WETLANDS AND ASSOCIATED HYDROLOGIC FEATURES

Identifying potential impacts to wetland hydrology during site plan review requires consideration of:

- *where* wetlands are on the landscape,
- *where* wetlands used to be, and
- *how* those wetlands are connected to other lands and waters.

Gathering this information requires looking beyond Wisconsin Wetland Inventory maps which tend to under-represent certain wetland types and do little to show how water moves between wetlands and other areas.

Fortunately, the information needed to identify additional wetlands and the lands and waters they are connected to is readily available on-line and easy to compile.

Examples of useful tools to identify wetlands and associated hydrologic features include:

- A. Aerial photographs
- B. Potential wetlands maps; and
- C. Topographic maps.

Proper identification of wetlands and associated hydrologic features is the only way to accurately evaluate the potential impacts of a proposed land disturbing activity in or near wetlands.

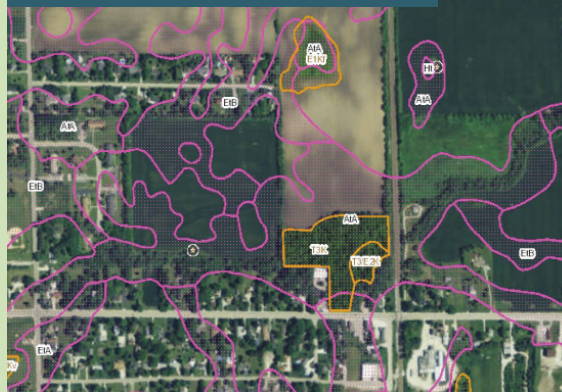
Recommendations for what information to require applicants to submit, and where to get it, are included in the "Site Plan" section of WWA's *Model Wetland Conservation Ordinance*. See additional resources (See page 8) for more information on wetland tools.

### A. AERIAL PHOTOGRAPH



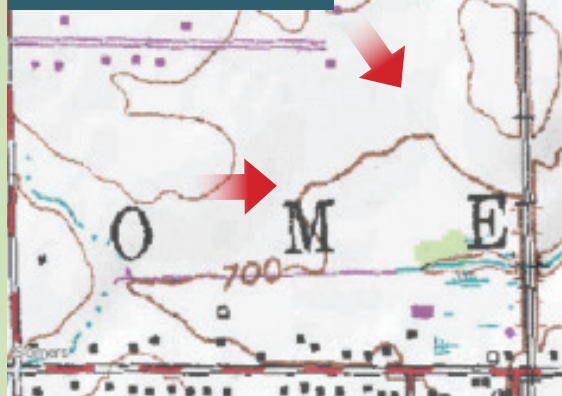
*Darkened soils as shown above are often an indicator of wetland soils. Stressed (pale) crops, standing water, and the presence of drainage tiles and ditches are other clues that wetlands may be present.*

### B. POTENTIAL WETLANDS MAP



*This image shows areas of mapped wetlands (yellow) amidst a larger area of mapped hydric soils or "potential" wetlands (pink), providing further evidence that wetlands are, or were, present.*

### C. TOPOGRAPHIC MAP

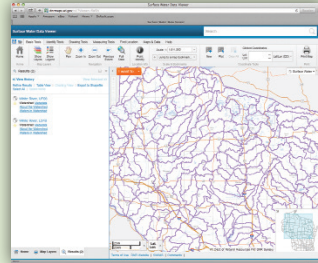


*Topographic maps can be used to understand how water moves through a site. The arrows show how water drains off higher elevation areas (across contours) and into wetlands.*

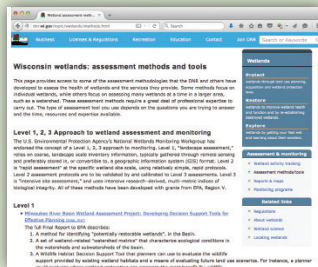
## ADDITIONAL RESOURCES

### Wetland Maps and Data:

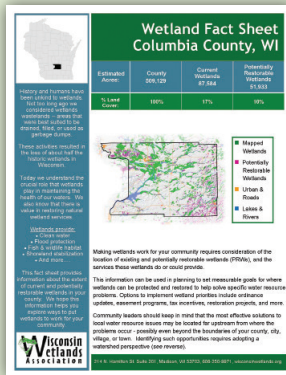
**1 WDNR's Surface Water Data Viewer** – The Wetland Indicator layers show mapped wetlands, potential wetlands (hydric soils), and potentially restorable wetlands. Available online at: <http://dnrmaps.wi.gov/sl/?Viewer=SWDV>



**2 WDNR Wetland Characteristics for 12-Digit Watersheds** – Data on current and historic wetland acreage by subwatersheds. Available at: <http://dnr.wi.gov/topic/wetlands/methods.html> (Level 2/Appendix B).



**3 County Wetland Fact Sheets** – Include facts and figures on the extent of current, historic, and potentially restorable wetlands by county. Available at: [wisconsinwetlands.org](http://wisconsinwetlands.org)



**For more information about WWA's Land Use and Wetlands tools and trainings, or to discuss options for how WWA can help your community evaluate and adopt local wetland conservation policies visit: [wisconsinwetlands.org/for-communities/](http://wisconsinwetlands.org/for-communities/) or call 608-250-9971 and ask for WWA's Local Government Outreach Specialist.**

## ABOUT WISCONSIN WETLANDS ASSOCIATION

Wisconsin Wetlands Association is dedicated to the protection, restoration, and enjoyment of wetlands and associated ecosystems through science-based programs, education, and advocacy.

WWA is a non-profit 501(c)(3) organization.



**Wisconsin Wetlands Association**

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