Wisconsin Wetlands Association

A statewide, non-profit organization dedicated to the **protection**, **restoration** and **enjoyment** of wetlands and associated ecosystems through science-based programs, education and advocacy.

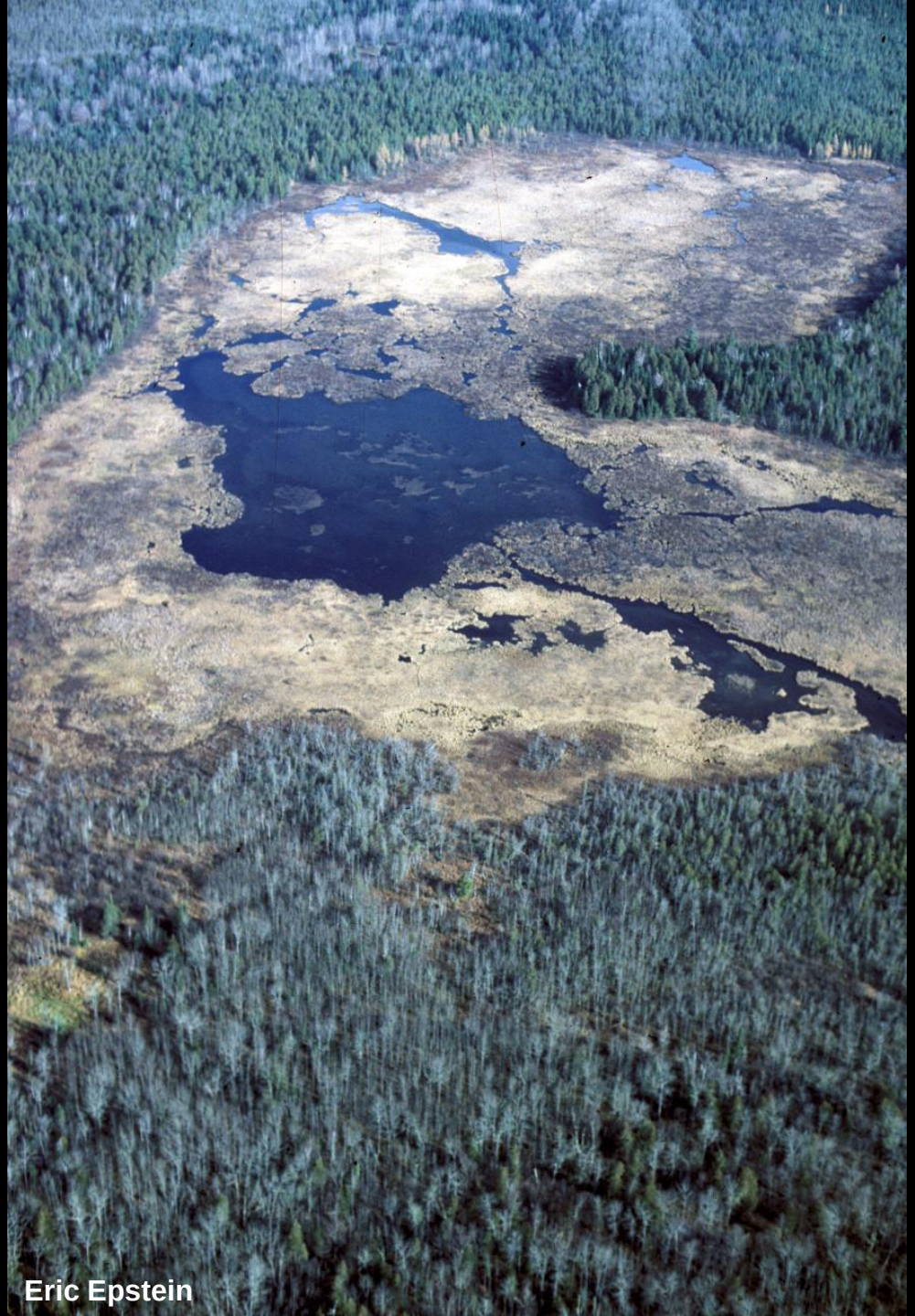
Painting by Judi Ekholm

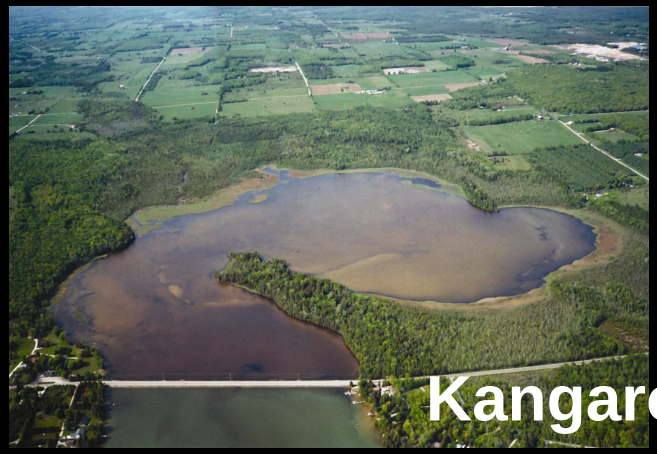
Thomas Meyer

R Carter

Gerald H. Emmerich, Jr.


Gary Shackelford


Eric Epstein



Kangaroo Lake

Grandma Lake

Huiras Lake

Toy Lake

Lulu Lake


WETLAND GEMS

David Schwaegler

Gary Shackelford

75% of Wisconsin's wildlife species use wetlands during some stage of their lifecycle

Gary Shackelford

Jack Bartholmai

Eric Epstein

Gary Shackelford

Wetlands remove pollution, trap sediments, remove nutrients and break down toxins, helping to maintain clean and healthy waters for streams, rivers and lakes.

Kate Redmond

Andy Clark

Ecotourism is the largest growing sector of our nation's tourism and tourism generates more than $11 billion annually in Wisconsin.

Wisconsin Wetlands Association

WETLAND GEMS

"Shorelands"

"Shallows"

"Floodplain forests"

"Lake fringes"

"Sloughs"

We need to develop commonly used messages that make the connection between lakes, rivers, streams ***and wetlands*** *for the good of* ***all*** *of these interconnected water resources.*

"Wetlands are Wastelands"

Negative historical perceptions persist today:

- Wetlands are wastelands
- Wetlands breed disease and pestilence
- Wetlands are obstacles to progress

Language perpetuates negative perceptions:

- "Swamped"
- "Bogged down"
- "Stuck in mire"

Wetlands were not only undervalued, they were actively destroyed

- More than half of Wisconsin's original 10 million acres have been lost
- Many of remaining wetlands are threatened or degraded
  - → Invasive species
  - → Altered hydrology
  - → Fragmented landscapes

Wetlands are not just this…

Bill Volkert

Marsh

Andrew Galvin

Coniferous Bog

Coniferous Swamp

Robin Maercklein

Floodplain Forest

Robin Maercklein

Laura England

Lowland Hardwood Swamp

Open Bog

David Schwaegler

Brynda Hatch

Ephemeral Pond

Alder Thicket

Eric Epstein

Steve Eggers

Shrub Carr

Fen

Steve Eggers

Brynda Hatch

Sedge Meadow

Low Prairie

Brynda Hatch

What makes wetlands wonderful and valuable…

- Diversity of wetland types
- Transitional nature of wetlands – connecting uplands with surface waters
- Dynamic nature of wetlands – changing with the seasons and from year to year

… makes wetlands difficult to protect.



Wetland Controversy

Because wetlands are
not well understood or valued,
they are often typecast as
obstacles to progress
in public dialogue

Project Purpose

Casting change: from "obstacles" to "**treasures**"

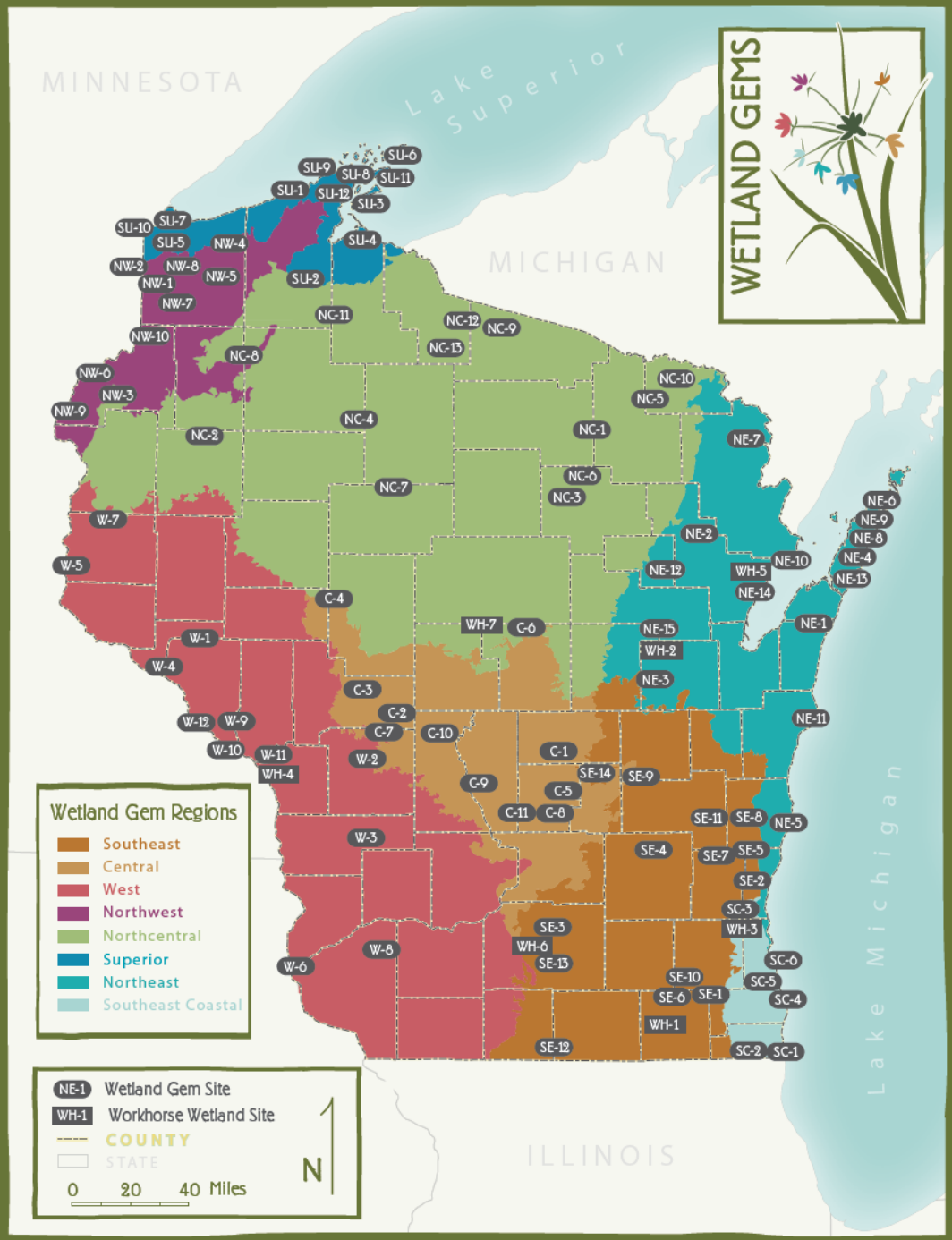
- Raise profile of and elevate public interest in wetlands
- Increase public awareness of wetland values
- Motivate citizens to explore and enjoy wetlands
- Generate community pride in local wetland treasures
- Catalyze community involvement in stewardship and protection of local wetland treasures

Wetland Gems Are…

- Natural treasures
- Representatives of the state's wetland diversity
- Important for biodiversity
- Ecological service providers
- Destinations for recreation/outdoor education

Mink River Estuary, Door County. Clint Farlinger.

Wetland Gems collectively represent Wisconsin's wetland heritage.


WETLAND GEMS
MINNESOTA
Lake Superior
MICHIGAN
Lake Michigan
ILLINOIS
SU-6
SU-9
SU-8
SU-11
SU-1
SU-12
SU-3
SU-10
SU-7
SU-5
NW-4
SU-4
NW-2
NW-8
NW-5
NW-1
SU-2
NW-7
NC-11
NC-12
NC-9
NW-10
NC-13
NC-8
NW-6
NW-3
NW-9
NC-4
NC-2
NC-10
NC-5
NC-1
NE-7
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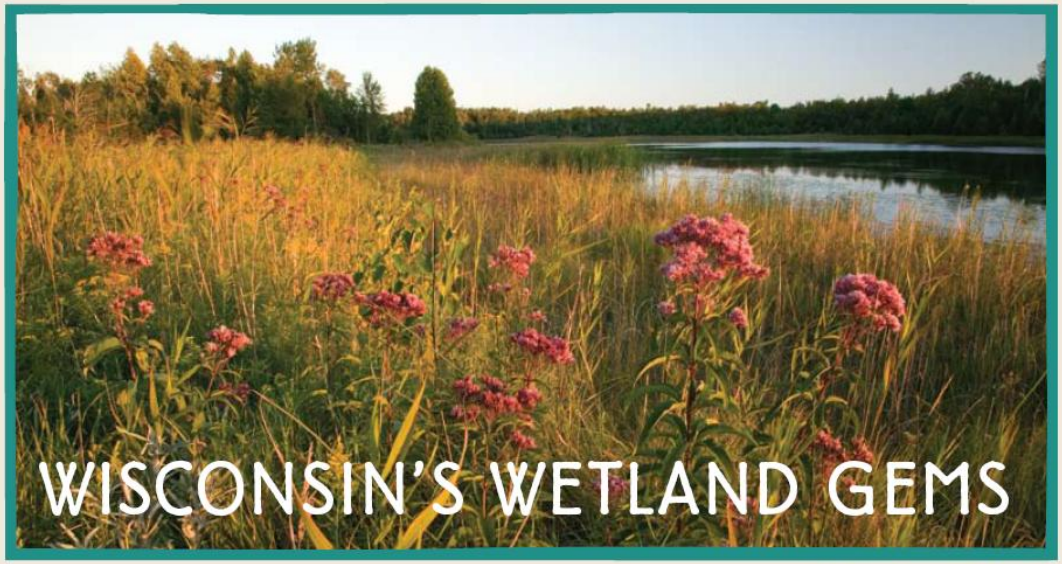
NC-7
NC-3
W-7
NE-6
NE-9
NE-8
NE-2
W-5
NE-10
NE-4
NE-12
WH-5
NE-13
NE-14
C-4
NE-1
WH-7
C-6
NE-15
W-1
WH-2
W-4
NE-3
C-3
C-2
NE-11
W-12
W-9
C-7
C-10
W-10
W-11
C-1
W-2
SE-14
SE-9
WH-4
C-9
C-5
C-11
C-8
SE-11
SE-8
NE-5
W-3
SE-4
SE-7
SE-5
SE-2
SC-3
SE-3
WH-3
WH-6
W-8
SC-6
W-6
SE-13
SE-10
SC-5
SE-6
SE-1
SC-4
WH-1
SE-12
SC-2
SC-1
Wetland Gem Regions
Southeast
Central
West
Northwest
Northcentral
Superior
Northeast
Southeast Coastal
NE-1 Wetland Gem Site
WH-1 Workhorse Wetland Site
COUNTY
STATE
0 20 40 Miles
N



WISCONSIN'S WETLAND GEMS

Mink River Estuary—*Clint Farlinger*

WHAT ARE *WETLAND GEMS*?

Wetland Gems are high quality habitats that represent the wetland riches—marshes, swamps, bogs, fens and more—that historically made up nearly a quarter of Wisconsin's landscape. Critically important to Wisconsin's biodiversity, these natural treasures also provide our communities with valuable functions and services as well recreational and educational opportunities. They are landscapes that both preserve the past and inspire for the future.

Wisconsin Wetlands Association's list of 100 *Wetland Gems* includes 93 sites selected for their ecological value. These sites are distributed throughout the state and include examples of all of Wisconsin's wetland community types. We have dubbed an additional seven *Workhorse Wetland Gems*, sites that illustrate how wetlands deliver priceless services such as flood attenuation, water quality protection, and fish and wildlife habitat. Look inside for more on the purpose of this project, how sites were selected, ideas for citizen and community involvement, a visitor's guide, and a list and map of the *Wetland Gems* sites.

Visit our website for more information on this project: *www.wisconsinwetlands.org/gems.htm*.

Green Darner Dragonfly—*Ken Tapp*

Gail Epping Overholt

WETLAND GEMS

Marsh Wren—Brian Hansen

Blanding's Turtle—Allen Sheldon

WHY PUBLISH A *WETLAND GEMS* LIST?

Historically, wetlands were not recognized and valued as natural treasures, but were instead generally considered wastelands and obstacles to progress. Since European settlement in the early 1800s, nearly half of Wisconsin's original 10 million acres of wetlands have been drained or filled to make way for land uses like agriculture, forestry, and urban and suburban development. A large portion of the 5 million remaining acres have been altered and degraded, which only heightens the value of the high quality wetland treasures that remain. *Wetland Gems* collectively provide examples of our state's wetland heritage.

The misunderstanding and undervaluation of wetlands continues to be a key obstacle to wetland protection, conservation and restoration efforts. Our purpose in promoting *Wetland Gems* is to increase appreciation for these precious resources. Our vision is that the citizens of Wisconsin will someday value all wetlands as natural treasures and that the historic and ongoing loss of wetland acres will be reversed.

HOW WERE *WETLAND GEM* SITES SELECTED?

The *Wetland Gems* list builds upon the results of extensive conservation planning efforts that identified critical habitats, threats and conservation actions to protect the state's natural communities, species, and special places. These include the Nature Conservancy's Ecoregional Plans, the Wisconsin Important Bird Areas Project, and the Wisconsin Department of Natural Resources' Land Legacy Report, Wildlife Action Plan, State Natural Areas Program, and Coastal Wetlands Assessment Report.

After reviewing the above conservation plans, we worked with experts to select 93 sites that collectively represent the diversity of wetland community types (see insert) present in each geographic region (see map, back cover). Our goal was to include high quality representatives of each wetland community type found in each region. Wherever possible, we chose *Wetland Gems* that contained multiple wetland and upland community types representing fully functioning ecological systems.

WORKHORSE WETLAND GEMS

The seven *Workhorse Wetland Gems* illustrate the functional values described in the Wisconsin *Rapid Wetland Assessment Methodology* including wildlife habitat, fishery habitat, flood/stormwater attenuation, water quality protection, shoreline protection, groundwater and recreation/education. *Workhorse Wetland* sites were selected with input from our partners and natural resource experts.

WETLAND TREASURES NOT ON THIS LIST

The Wetland Gems list is not exhaustive, but rather is a *representative* list of important, high quality wetlands in Wisconsin. Not appearing on this list are millions of acres of valuable wetlands that play important roles within our landscapes and watersheds as critical wildlife habitat, sites of water purification, and sites of flood water storage. All of the state's wetlands are valuable and merit protection.

Celebrate and enjoy the beauty and unique nature of these *Wetland Gems*.

PHOTOS FROM TOP: Cope's Gray Tree Frog—Allen Sheldon; White Lady's Slipper Orchid—David Schwaegler; Beaver—Brian Hansen; Northern Shoveler—Dennis Molvig; Purple Pitcherplant—Kate Redmond

Laura England

WETLAND GEMS IN YOUR REGION: CITIZEN & COMMUNITY INVOLVEMENT

Wisconsin Wetlands Association encourages local conservation groups and other community organizations to celebrate and become stewards of their local and regional *Wetland Gems*. Below is a sampling of ideas that local citizens and organizations can use to contribute to the long-term protection of wetland treasures in their communities and regions:

Celebrate & Raise Awareness of Wisconsin's *Wetland Gems*

News Flash: February 2 is World Wetlands Day and May is American Wetlands Month. Use these designations as opportunities to draw community and media attention to a regional Gem site. Write a letter to the editor or pitch a story idea involving your *Wetland Gem* to local outdoor writers.

Field Trips & Outings: Plan an outing to visit a Gem site with family and friends. Make it a community event by recruiting a local naturalist to lead a field trip and inviting members of your community to join you. WWA can help you find a qualified expert for your field trip.

Volunteer Stewardship of Wisconsin's *Wetland Gems*

Working with Site Owners: Talk to site property owners to learn about their needs for volunteer help with on-the-ground stewardship projects such as habitat restoration and invasive species control projects.

Citizen Monitoring: Spend time in a beautiful wetland setting while listening for birds and frogs, surveying for native plants, or checking for invasive plants. WDNR provides a list of opportunities at: *www.dnr.wisconsin.gov/wetlands/volunteer.html*.

Plan for Protection of Wisconsin's *Wetland Gems*

Friends Groups: Organize a friends group for your *Wetland Gem* by bringing together others in your community who are interested in conservation.

Preventing External Threats: Even protected wetlands are vulnerable to threats from outside their boundaries including invasive species, stormwater runoff and regional groundwater drawdowns. Use the results and resources associated with Wisconsin Wetlands Association's Wetland Threats Analysis *(www.wisconsinwetlands.org/threatsintro.htm)* to anticipate and assess potential threats to your *Wetland Gem*. Work with local friends groups, local conservation organizations, and local officials to abate these threats.

Understanding Wetland Laws: Understand how you, as a citizen, can protect your local *Wetland Gem*. Visit WWA's *Protecting Wetlands* web pages at *www.wisconsinwetlands.org/regulation.htm*.

WETLAND VISITOR'S GUIDE: VISIT A LOCAL *WETLAND GEM*

Get your feet wet! Wisconsin Wetlands Association encourages citizens and families to consider wetland destinations when planning recreational and educational outings. Our *Wetland Gems* list provides many wonderful options for outings, which include hiking, hunting, fishing, paddling, bird-watching, photography and exploring. While most of these sites are on public land, some are privately owned; please pay close attention to the ownership and access information provided on our Gem site fact sheets when planning your trips.

Be sure to dress appropriately for weather, walking and wading. Protect your skin from sun, scrapes and insects with long-sleeved shirts, long pants, and a wide brimmed hat. Some sites offer boardwalks and other paths that are relatively dry, but generally recommended footwear includes rubber knee boots or old tennis shoes that you don't mind getting wet and muddy. Be aware that Lyme disease is present in parts of the state. Prevent tick bites by wearing clothes that cover your skin and checking your skin and clothing for ticks when you get home. Bring water, field guides and a sense of wonder.

Walk Lightly

Wetland Gem sites include sensitive species and habitats. Please follow the "take only pictures, leave only footprints" philosophy for your visit. Here are some specific guidelines to follow:

Stay on trails (if available) and observe all regulations about trail usage, especially restrictions on ATVs. Where trails are not available, walk softly and leave the area as undisturbed as possible.

Be aware of private property inholdings at some sites and do not trespass.

Do not bring invaders with you! Prevent transporting invasive plant seeds by removing mud and soil from your shoes/boots and checking your clothing (including cuffs and pockets) to make sure there are no "hitchhikers."

Do not pick flowers or harvest any plants.

Resist the temptation to take home souvenirs. Leave items like stones, feathers, artifacts, wood, etc. so that others may enjoy them. State and federal laws prohibit removal of certain objects at some sites.

Observe wildlife from a distance. Avoid nest areas and other areas where wildlife may be disrupted. Do not feed wildlife.

Pack out what you pack in. Please pick up any trash you find.

Acknowledgments

Many individuals contributed to this project, including site property owners, members of the Wisconsin Department of Natural Resources Wetland Team, and many other partners and natural resource experts. Special thanks to Eric Epstein, Randy Hoffman, Mary Linton, Tod Highsmith and Carolyn Sandberg for exceptionally generous contributions of time and expertise. Laura England, WWA Outreach Programs Director, led the *Wetland Gems* project with assistance from Katie Beilfuss, WWA Programs Manager, and Becky Abel, WWA Executive Director.

Grandma Lake—Gary Shackelford

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

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Madison, Wisconsin 53703
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www.wisconsinwetlands.org

Wisconsin Wetlands Association

100 WISCONSIN WETLAND GEMS

Southeast Coastal Region
SC-1 Chiwaukee Prairie
SC-2 Des Plaines River Floodplain & Marshes
SC-3 Germantown Swamp
SC-4 Renak-Polak Woods
SC-5 Root River Riverine Forest
SC-6 Warnimont Bluff Fens

Southeast Region
SE-1 Beulah Bog
SE-2 Cedarburg Bog
SE-3 Cherokee Marsh
SE-4 Horicon Marsh
SE-5 Huiras Lake
SE-6 Lulu Lake
SE-7 Milwaukee River Floodplain Forest
SE-8 Nichols Creek
SE-9 Rush Lake
SE-10 Scuppernong River Area
SE-11 Spruce Lake Bog
SE-12 Sugar River Floodplain Forest
SE-13 Waubesa Wetlands
SE-14 White River Marsh

Central Region
C-1 Bass Lake Fen & Lunch Creek Sedge Meadow
C-2 Bear Bluff Bog
C-3 Black River
C-4 Blue Swamp
C-5 Comstock-Germania Marsh
C-6 Dewey Marsh
C-7 Jay Creek
C-8 Page Creek Marsh
C-9 Quincy Bluff & Solberg Lake
C-10 Suk-Cerney Wetlands
C-11 Summerton Bog

West Region
W-1 Big Swamp
W-2 Fort McCoy
W-3 Kickapoo Valley Reserve
W-4 Lower Chippewa River Delta
W-5 Lower St. Croix River Corridor
W-6 Lower Wisconsin River & Wyalusing State Park
W-7 Oak Ridge Lake
W-8 Snow Bottoms
W-9 Trempealeau River Sedge Meadow
W-10 Upper Mississippi & Trempealeau River National Wildlife Refuges
W-11 Van Loon Bottoms
W-12 Whitman Bottoms

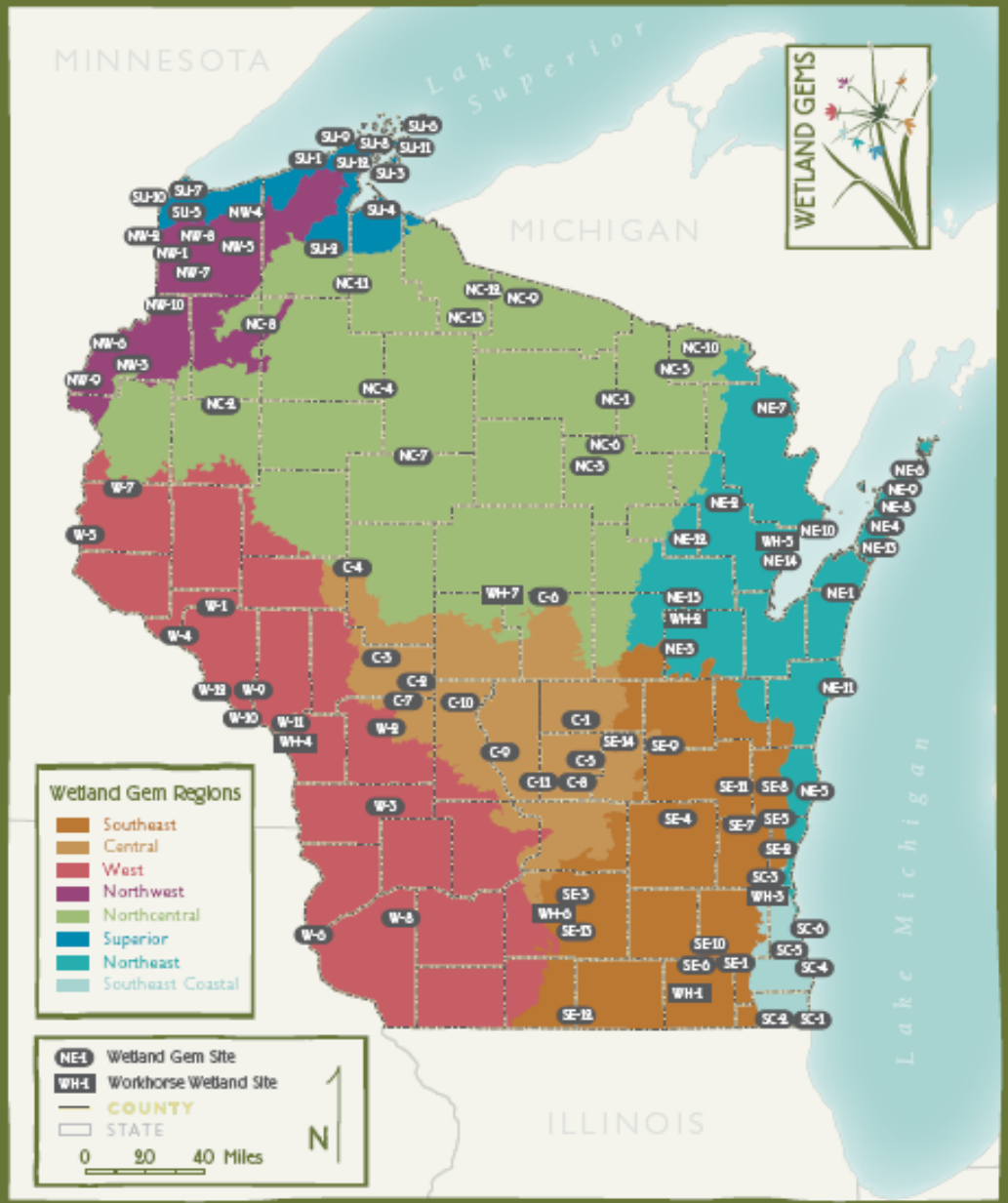
Northeast Region
NE-1 Black Ash Swamp
NE-2 Brazeau Swamp
NE-3 Hortonville Bog
NE-4 Kangaroo Lake
NE-5 Kohler Andrae Dunes
NE-6 Mink River Estuary
NE-7 Miscauno Cedar Swamp
NE-8 Moonlight Bay & Connected Wetlands
NE-9 North Bay
NE-10 Peshtigo River Delta
NE-11 Point Beach & Dunes
NE-12 Rushes Lake
NE-13 Shivering Sands & Connected Wetlands
NE-14 West Shore Green Bay Wetlands
NE-15 Wolf River Bottoms

North Central Region
NC-1 Atkins Lake & Hiles Swamp
NC-2 Bear Lake Sedge Meadow
NC-3 Bogus Swamp
NC-4 Flambeau River State Forest
NC-5 Grandma Lake
NC-6 Hunting River Alders
NC-7 Jump-Mondeaux River Floodplain
NC-8 Kissick Alkaline Bog
NC-9 Rice Creek
NC-10 Savage-Robago Lakes
NC-11 Spider Lake
NC-12 Toy Lake Swamp
NC-13 Turtle-Flambeau-Manitowish Peatlands

Northwest Region
NW-1 Belden Swamp
NW-2 Black Lake Bog
NW-3 Blomberg Lake
NW-4 Blueberry Swamp
NW-5 Brule Glacial Spillway
NW-6 Crex Meadows & Rice Lake
NW-7 Empire Swamp
NW-8 Erickson Creek Peatlands
NW-9 Fish Lake Meadow
NW-10 St. Croix & Namekagon River Corridor

Superior Region
SU-1 Bark Bay & Lost Creek Bog
SU-2 Bibon Swamp
SU-3 Big Bay
SU-4 Kakagon-Bad River Sloughs
SU-5 Nemadji Floodplain Forest
SU-6 Outer Island Sandspit & Lagoon
SU-7 Pokegama-Camegie Wetlands
SU-8 Red Cliff Raspberry Bay
SU-9 Sand Bay
SU-10 St. Louis River Marshes
SU-11 Stockton Island Tombolo
SU-12 Sultz Swamp

Workhorse Wetlands
WH-1 Turtle Valley Wildlife Area: Wildlife Habitat
WH-2 Spoehr's Marsh: Fishery Habitat
WH-3 MMSD Greenseams Program: Flood Attenuation
WH-4 Halfway Creek Marsh: Water Quality Protection
WH-5 Oconto Marsh: Shoreline Protection
WH-6 Pheasant Branch: Groundwater Connections
WH-7 Mead Wildlife Area: Recreation & Education



Wisconsin Wetlands Association

Funding for this project provided by The McKnight Foundation, which seeks to improve the quality of life for present and future generations through grantmaking, coalition-building and encouragement of strategic policy reform, and the Wisconsin Coastal Management Program and National Oceanic & Atmospheric Administration, Office of Ocean and Coastal Resource Management under the Coastal Zone Management Act, Grant # NA07NOS4190064.

THE McKNIGHT FOUNDATION

WISCONSIN COASTAL MANAGEMENT PROGRAM

SEDGE MEADOW

Sedge meadows are open communities with very dense herbaceous plant growth and little bare soil. The plants, including perennial wildflowers, grasses and sedges, grow on saturated soils; standing water is usually only present during floods and snowmelt. Sedge meadows often form a transition zone between open water habitats and uplands. Organic peat/muck soils are commonly present due to slow decomposition in these saturated soils. Sedges in the plant family Cyperaceae dominate. Some sedges form hummocks, also called tussocks, or small mounds of undecayed roots that create fine-scale variations in topography and microhabitats that facilitate plant and insect diversity. In addition to sedges, other plants in the Cyperaceae family such as spikerushes, bulrushes and nutsedges flourish. True rushes and grasses, especially Canada bluejoint grass, may also be present. This is a fire-dependent natural community; fire maintains species richness by creating open soil for germination of minor species and preventing succession to shrub/tree dominated communities.

LOW PRAIRIE

Low prairies are one of the rarest wetland types in Wisconsin. Prairies are open, herbaceous plant communities that are dominated by grasses, and they occur along a moisture gradient from wet to dry. Low prairies, which have saturated soils with standing water only during floods and at snowmelt, are the only prairie type that are considered wetlands. Common grasses and flowering plants include prairie cordgrass, big bluestem, gayfeather, New England aster, prairie dock and sawtooth sunflower. Low prairies support a disproportionate number of rare species such as western and eastern prairie fringed orchids. These wetlands only occur below the vegetation tension zone in southern and central Wisconsin. This is a fire-dependent natural community; fire maintains species richness by creating open soil for germination of minor species and preventing succession to shrub/tree dominated communities.

OTHER RARE TYPES

While most wetland habitats in Wisconsin fit into one of the types described above, *the state hosts a few additional rare wetland types*, including wetland habitats specific to Great Lakes coastal areas (interdunal wetlands and ridge and swale wetland systems), small wetland habitats connected to groundwater discharge (seeps and spring runs), fresh wet meadows (a disturbance-created community becoming more common in southern Wisconsin), and patterned peatlands (found in some peatlands of northern Wisconsin).

Sources

This classification system and the descriptions above are based heavily upon Eggers, S.D. and D.M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota and Wisconsin, 2nd Edition. U.S. Army Corps of Engineers, St. Paul, MN.

For information on the wetland classification system used by the Wisconsin Department of Natural Resources for Natural Heritage Inventory purposes, visit the webpage: dnr.wi.gov/land/er/communities/descriptions.htm.

Funding for this project provided by The McKnight Foundation, which seeks to improve the quality of life for present and future generations through grantmaking, coalition-building and encouragement of strategic policy reform, and the Wisconsin Coastal Management Program and National Oceanic & Atmospheric Administration, Office of Ocean and Coastal Resource Management under the Coastal Zone Management Act, Grant # NA97NOS4190064.

EPHEMERAL POND

Ephemeral ponds are shallow, often poorly-drained basins that contain standing water for the early part of the growing season, but dry out by summer or early autumn. They fill in the spring because of snowmelt, runoff from rain, or a rising water table. Ephemeral ponds in forested areas may have bottomland trees but little or no herbaceous plants, while in open and agricultural areas may have seed-rich herbaceous vegetation such as nutsedge, smartweeds, grasses and bur-reeds. The ephemeral nature of flooding in these wetlands leads to a lack of aquatic vertebrate predators (i.e., fish), but many predaceous aquatic insects. Ephemeral ponds are important breeding sites and juvenile habitat for many frogs and salamanders because of the lack of fish predators and the proximity to upland habitats required by amphibians as adults. Some ephemeral ponds provide important stopover habitat for migratory waterfowl and shorebirds because of the protein-rich seed and insect food sources.

WISCONSINWETLANDS.ORG

WETLANDS OF WISCONSIN

As the last ice age ended in Wisconsin 12,000 years ago, retreating glaciers left poorly drained basins throughout the landscape where wetlands then formed. Due to its unique geography, geology and climate, Wisconsin is blessed with tremendous diversity and an abundance of marsh, swamp, bog, fen, and other wetland habitats.

Wetlands vary based on three factors: soil type, hydrology (the timing, frequency and level of flooding or soil saturation each year), and vegetation. Ecologists have developed wetland classification systems, or groupings of habitats based on similarities in these factors. A key concept for understanding Wisconsin's wetland diversity and classification is the vegetation tension zone. Wisconsin's vegetation is divided into the northern forest floristic province, roughly the northeastern half of the state, and the prairie-forest floristic province, the southwestern half. Between these two areas lies the vegetation tension zone, a transitional band that corresponds to a number of climatic factors and has a mixture of species from both provinces.

While some classification systems are quite detailed and divide the state's wetlands into more than 30 types, Wisconsin Wetlands Association uses a more general system of just 12 wetland types with varying plant communities as described in this guide. Most wetland areas are actually a complex of several of these types. More detailed descriptions of these types, and how this classification system compares with other systems, are available on the Wisconsin Wetlands Association website at www.wisconsinwetlands.org/wetlandwisc.htm.

Wisconsin Wetlands Association

OPEN BOG

Open bogs, like coniferous bogs, are found on saturated, acid peat soils that are low in nutrients. They support a unique acid-tolerant assemblage of trees, low shrubs and herbaceous plants (e.g., wildflowers and grasses) growing on mats of sphagnum moss. Open bogs have few trees and the plants growing through the sphagnum moss include herbs and/or low shrubs of the heath family such as cranberry, bog rosemary and leatherleaf. Carnivorous plants and cottongrass are characteristic herbaceous plants of open bog mats. A scattering of immature or stunted black spruce and/or tamarack trees may be present. The open character of these habitats is probably due to wet conditions, recurrent fires, summer frosts, and/or lack of a tree seed source. In Wisconsin, most bogs are found in and north of the vegetation tension zone.

CONIFEROUS BOG

Coniferous bogs are similar to open bogs in plant community composition, notably the ground layer mat of sphagnum moss, except that mature trees of black spruce and/or tamarack are the dominant species. The understory is characterized by plants that can tolerate shaded conditions including sedges, orchids, pitcher plants and shrubs of the heath family. Black spruce and the heath family shrubs grow only in acid peat soils such as those associated with the sphagnum moss mats of coniferous bogs. Tamaracks, however, can also grow in alkaline peat soils, such as those of northern white cedar dominated coniferous swamps.

FEN

Fens are the rarest wetland type in Wisconsin, and probably one of the rarest in North America. Fens are low-growing plant communities that occur where groundwater that is rich in minerals, especially calcium and magnesium compounds, seeps out from the ground. The minerals precipitate out at the surface, creating harsh, alkaline soil conditions. Only a select group of calcium-tolerant plants (calciphiles) can grow in these conditions. Characteristic species include shrubby cinquefoil, sterile sedge, wild timothy, beaked spikerush, Ohio goldenrod, common valerian and lesser fringed gentian. Fen plant communities in general have a disproportionate number of rare, threatened and endangered plant species compared to other plant communities in the Great Lakes Region. Active springs and trout streams of cold, clear water are frequently associated with fens.

LOWLAND HARDWOOD SWAMP

Lowland hardwood swamps are dominated by deciduous hardwood trees, including black ash, red maple, yellow birch and silver maple. Soils are saturated during much of the growing season and may be covered by standing water. Northern white cedar can be common in these swamps in northern Wisconsin. American elm is an important component of this community, although its numbers have been greatly reduced by Dutch elm disease. The shrub layer of hardwood swamps includes dogwood and alder species. Herbaceous species include some of the ferns, sedges, grasses and flowering plants of sedge meadows. Ephemeral ponds often occur within these forested wetlands.

FLOODPLAIN FOREST

Floodplain forests are swamps associated with streams and river corridors and are dominated by mature, deciduous hardwood trees. Overbank flood events inundate the soils, which are otherwise well-drained or even dry for much of the growing season. The characteristic feature of floodplains is the fine-grained and fertile alluvial soil that is deposited during episodic flood events. Dominant hardwoods include silver maple, green ash, river birch, eastern cottonwood, American elm and black willow. The herbaceous layer is commonly composed of jewelweed and nettles. The shrub layer is sparse to lacking because of the scouring action of floodwaters. Floodplain forests have great wildlife diversity, particularly birds, because they are migration corridors. Within floodplains, ephemeral ponds and areas of open sand provide habitat for amphibians and reptiles, respectively. During high water periods, these forests can be important feeding and breeding habitat for some fish species.

CONIFEROUS SWAMP

Coniferous swamps are forested wetlands dominated by lowland conifers, primarily northern white cedar and tamarack. Balsam fir may also be a component in some stands. Soils are saturated during much of the growing season and may be temporarily inundated by as much as a foot of standing water. Soils are usually organic (peat/muck), but no continuous sphagnum moss mat is present. Tamarack typically dominates on nutrient poor, acid soils, and northern white cedar on fertile, alkaline to neutral pH soils. Herbaceous plants may include marsh and royal ferns, sarsaparilla and some rare orchids. Coniferous swamps occur primarily in and north of the vegetation tension zone, but several large examples occur south of the tension zone.

Swamps Defined

Contrary to the common usage of the term "swamp" to denote an undesirable place or situation, the ecological definition of the term describes highly valuable habitats. A swamp is any wetland that is dominated by woody vegetation (trees and/or shrubs), including lowland hardwood swamps, coniferous swamps, coniferous bogs, floodplain forests, alder thickets and shrub carrs.

MARSH

Marshes are dominated by herbaceous aquatic plants growing in shallow water that is seasonal to permanent. Emergent aquatic plants of shallow marshes include cattails, bulrushes, lake sedges, arrowheads and bur-reeds. Deeper marshes (up to 6 feet) are characterized by submerged and floating aquatic plants, including pondweeds and water lilies. Marshes can be small to very large, and are found throughout Wisconsin, commonly along lake and river shorelines. Marshes are among the most productive habitats for waterfowl, other water birds, furbearers and aquatic insects, and they provide spawning and nursery habitat for some fish species. They are important stopover sites for birds during migration because their submerged plants and aquatic insects provide an abundant food source.

ALDER THICKET

Alder thickets are a deciduous shrub community dominated by speckled alder. Because of its tiny seeds and ability to fix nitrogen, speckled alder can be a pioneer species on exposed peat or alluvial floodplain soils. Alder thickets can include a diversity of shrubs such as highbush cranberry, sweet gale and common winterberry holly. The herbaceous layer may include some of the same ferns, sedges, grasses and flowering plants found in sedge meadows. Rare species, such as swan coneflower, small yellow water crowfoot and New England violet, may be found in alder thickets. Alder thickets provide high quality habitat for game species like ruffed grouse, American woodcock, and white-tailed deer. These wetlands are generally found in and north of the vegetation tension zone.

SHRUB CARR

Shrub carrs are swamps dominated by deciduous shrubs and are common throughout Wisconsin. This plant community can grow on saturated to seasonally flooded soils that are either organic (peat/muck) or alluvial floodplain soils. Willows and/or red osier dogwoods usually dominate the plant community. The herbaceous layer of undisturbed shrub carrs typically includes a rich diversity of ferns, sedges, grasses and flowering plants of sedge meadows. Disturbed shrub carrs may have an herbaceous layer dominated by invasive reed canary grass. Shrub carrs provide habitat for a variety of wildlife species including many songbirds, game birds like ruffed grouse and American woodcock, and small mammals.

NORTHEAST - 4

WETLAND GEMS

KANGAROO LAKE

DOOR COUNTY

Property Owners: The Nature Conservancy, Door County Land Trust
Recognitions & Designations: WI State Natural Area, WI Land Legacy Place, WI Wildlife Action Plan Reference Site, The Nature Conservancy Priority Conservation Area

Funding for this project provided by the Wisconsin Coastal Management Program and the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management under the Coastal Zone Management Act, Grant #NA07NOS4190064.

Wisconsin Wetlands Association
wisconsinwetlands.org

Julie Schartner

KANGAROO LAKE WETLAND TYPES
Coniferous swamp, lowland hardwood swamp, sedge meadow, marsh, shrub carr

ECOLOGY & SIGNIFICANCE

Kangaroo Lake, the largest lake on the Door County peninsula, is a shallow lake fed by Piel Creek, which flows in on the north end of the lake. Piel Creek's headwaters begin in unusual spring-fed calcareous fen habitat several miles upstream of the lake. While the southern end of Kangaroo Lake is highly developed and receives heavy recreational use, a causeway built in the late 1800's separates the northern end, which has remained undeveloped in part because of the extensive wetlands there. Kangaroo Lake's high quality wetland communities provide important habitat for a number of rare and endangered species, including a reproducing population of the federally endangered Hine's emerald dragonfly in the Piel Creek fen.

FLORA & FAUNA

Lowland hardwood and coniferous swamp surround the northern shoreline of the lake and the corridor of Piel Creek. Common trees in this swamp include white cedar, black ash, tamarack, black spruce and balsam fir. Characteristic shrubs include speckled alder, willows and meadowsweet and common understory herbs include three-leaved goldthread, dewberry, naked miterwort and American starflower. Kangaroo Lake's waters and shoreline soils have high levels of calcium, supporting plants that can tolerate calcareous environments such as shrubby cinquefoil, hoary and bog willow, twig rush and wire-leaved sedges. Floating sedge mats surrounding the shore include plants like woollyfruit sedge, water sedge, bluejoint grass and the native swamp loosestrife. A shallow marsh area in the northernmost part of the lake features emergent and floating-leaved plants including bulrushes, wild rice and bullhead lily.

Marsh habitat provides breeding habitat for Virginia and sora rails and sandhill cranes as well as migratory and nesting habitat for many species of waterfowl. Numerous rare and endangered species use wetlands at Kangaroo Lake including the federally endangered Hine's emerald dragonfly, Ohio goldenrod, dorcas copper butterfly, bald eagle, osprey and Caspian tern.

THREATS

The Kangaroo Lake watershed is characterized by a matrix of agricultural, residential and forest land. Agricultural practices in the northern part of the Kangaroo Lake watershed could affect water quality entering these wetlands. Heavy deer browsing pressure threatens the regeneration of the site's conifer trees. Growing recreational use and development in the area could also lead to impacts. The highly invasive Phragmites (common reed grass) is found in localized areas on site. Future invasion by the emerald ash borer beetle threatens the site's ash stands.

ACCESS

These wetlands are best accessed and enjoyed by canoe. For details, visit the State Natural Areas Program website: dnr.wi.gov/org/land/er/sna.

Virginia rail — Dennis Malueg

Piel Creek fen in winter — Terrie Cooper

Sources:
Wisconsin State Natural Areas Program (WDNR)
Wisconsin Land Legacy Report (WDNR)
Great Lakes Ecoregional Plan (TNC)
Coastal Wetlands of Wisconsin's Great Lakes (WDNR)

www.wisconsinwetlands.org/gems.htm

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Thanks for additional photos provided by Melinda Bailey, Treva Breuch, Bob Hay, WI DNR, Pam Strohl, Stephen

Wisconsin's Wetland Gems

INTRODUCTION TO WETLAND GEMS | STATEWIDE WETLAND GEMS LIST | WORKHORSE WETLAND GEMS LIST

WETLAND GEMS EVENTS | REGIONAL WETLAND GEMS LISTS | OTHER WETLAND TREASURES

INTRODUCTION TO WETLAND GEMS

In May 2009, in celebration of American Wetlands Month, WWA launched our new *Wetland Gems* program. This program aims to increase public awareness of and appreciation for all of the state's wetlands and to generate community pride in and commitment to stewardship of local wetland treasures that have statewide, national, and even international importance.

What are *Wetland Gems*? *Wetland Gems* are high quality habitats that represent the wetland riches - marshes, swamps, bogs, fens and more - that historically made up nearly a quarter of Wisconsin's landscape. Critically important to Wisconsin's biodiversity, these natural treasures also provide our communities with valuable functions and services as well as recreational and educational opportunities. They are landscapes that both preserve the past and inspire for the future.

We have created a portfolio of outreach materials for the *Wetland Gems* program to help citizens get to know these wetland treasures of our state. Click the links below to explore printable versions of these materials:

Uses of *Gems* List & Outreach Products

- Landowners, state decision makers
- Local partners & outlets (service centers, nature centers, visitor centers)

  * Let us know if you have an outlet at which you'd like to distribute *Wetland Gems* materials!
- Local Lake Associations (e.g. Kangaroo Lake Association)
- Media work to new audiences
- *Wetland Gems* book

Foundation for future WWA programs

Wetland Gems… the future!

- 2010 Field Trip Series to *Wetland Gems.*
- Assisting landowners, “Friends” groups and other partners to continue to use the *Wetland Gems* designation to:
  - attract additional funding
  - attract more community support
  - aid protection and restoration efforts

Wisconsin Wetlands Association

WITH THANKS TO OUR FUNDERS

Wisconsin Coastal Management Program

NOAA

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