Threats/Issues and Conservation Actions
Wetland Community Group

This is a summary of threats/issues and conservation actions that are common to all or most of the community types[1] in the wetland community group. As much as possible, the source of the threat is described as well as the stresses or effects that occur directly or indirectly as a result of the threat. Stresses are generally thought of as loss, conversion and/or degradation of the natural community. Distinguishing the **source** of the impact from the **effects** that occur to or in the community is important because the two typically need a different approach and set of conservation actions. Multiple sources of impact may have the same or similar effects on a community. Similar effects may be addressed collectively by a single action or suite of actions.

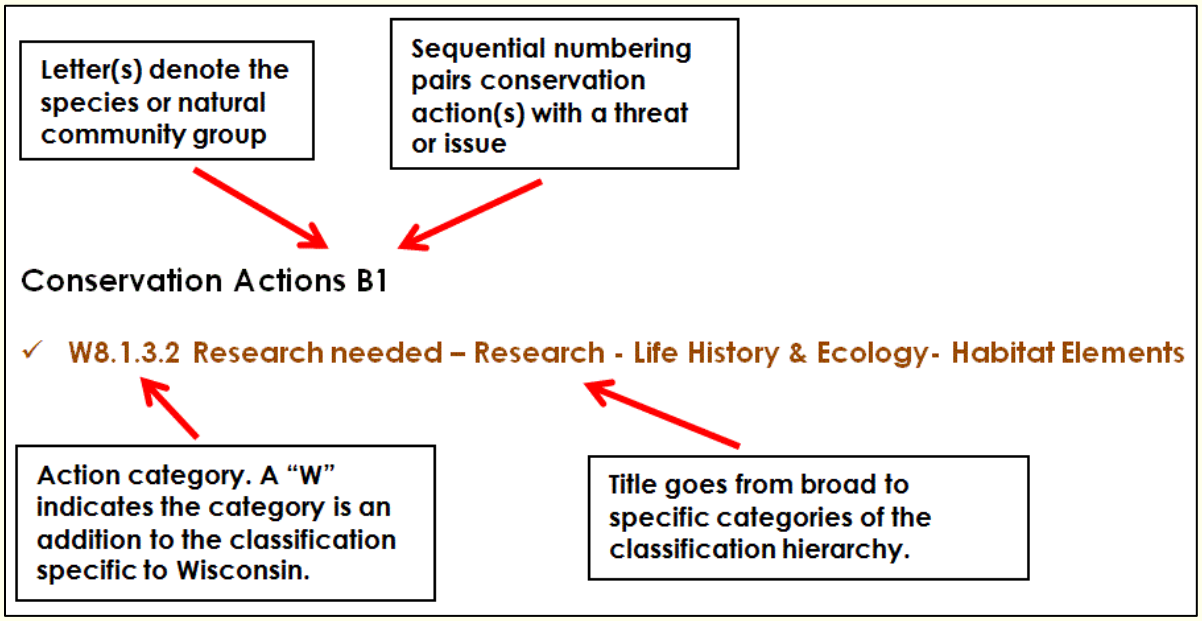
The wetland group includes the following community types:

- Alder Thicket
- Bog Relict
- Boreal Rich Fen
- Calcareous Fen
- Central Poor Fen
- Coastal Plain Marsh
- Emergent Marsh
- Emergent Marsh-Wild Rice
- Ephemeral Pond
- Floating-leaved Marsh
- Interdunal Wetland
- Moist Sandy Meadow
- Muskeg
- Northern Sedge Meadow
- Open Bog
- Patterned Peatland
- Poor Fen
- Riverine Mudflat
- Shore Fen
- Shrub-carr
- Southern Sedge Meadow
- Submergent Marsh
- Submergent Marsh – Oligotrophic

Descriptions for these community types can be found online.[2]

[1] Community or natural community is used in the WWAP as a proxy for habitat.
[2] http://dnr.wi.gov/topic/EndangeredResources/Communities.asp?mode=group&Type=Wetland (Search Terms: Wetland Communities Wisconsin DNR)

Conservation actions for most or all wetland community types are organized according to categories in the Conservation Actions Classification based on the Open Standards threats and actions classification[3]. If the threat/issue and its associated conservation action(s) apply to one or a few species they are identified as such. Conservation actions overlapping in content or scope may be grouped under a single code. Coding and identification for each action category are explained further below.



More about how threats and issues or conservation actions were developed, opportunities to provide input on this topic, and how this information can be used to make conservation decisions can be found on the Conservation Actions and Effectiveness Monitoring page or in Sections 2 and 4.4.7 of the Wisconsin Wildlife Action Plan.

Threat/Issue We1

Wisconsin has lost 47% of its original ten million acres of wetlands since Euro-American settlement. Many of the remaining 5.3 million acres are in the northern third of the state (Wisconsin DNR 1990). In some southern Wisconsin counties, the amount of wetland loss is well over 75%. Wisconsin's losses are reflective of the national status of wetlands; it is estimated that one-half of the nation's original 221 million acres of wetlands have been lost (Feierabend 1992). A large amount of remaining acreage in Wisconsin exists in a partly altered state, such as with old drainage ditches still functional enough to change the hydrology of the wetland. Much of this remaining wetland acreage was at one time disturbed, either by drainage (followed by restoration) or by being cleared,

[3] See the following website for the classifications. http://cmp-openstandards.org/tools/threats-and-actions-taxonomies/ (Search Terms: open standards conservation threats actions). The conservation actions classification is provided in Appendix 2.1.

repeatedly burned, grazed, or periodically plowed (Curtis 1959). Loss of wetlands adversely affects a wide range of wetland functions, from wildlife habitat to water quality to flood storage.

Conservation Actions We1

Depending on your overall objectives, the following conservation actions can address habitat fragmentation and the effects that it has on non-forested wetland natural communities:

✓W2.3.2 Land/water management- Habitat & natural process restoration- Wetland
Continue to work on priorities and strategies identified in "Reversing the Loss" wetland restoration action plan.

✓W8.1.7 Research needed- Research-Natural Community Inventory and Ecology
✓W8.1.8 Research needed- Research- Natural Community Threats and Actions
Incorporate SGCN and their habitat as well as conservation actions and opportunity areas into the identification of restorable wetlands for the Wisconsin Wetland Conservation Trust.

✓W5.2.3 Law & Policy- Policies and regulations- Local
Minimize land use conflicts and improve wetland conservation at the local level by implementing recommendations in Wisconsin Wetlands Association's "Land Use and Wetlands: Zoning Opportunities to Improve Wetland Protection."

✓W2.3.2 Land/water management-Habitat & natural process restoration- Wetland
✓2.1 Land/water management-Site/area management
Maintain and restore native plant communities within the 100 year floodplain along rivers and streams.

Target wetland restoration, enhancement, and preservation of priority areas identified through Wisconsin Watershed Approach to Wetland Functional Assessment.

Threat/Issue We2

Water, and the hydrologic regime that characterized each site, is the life blood of wetlands. Direct hydrologic alteration of wetlands through dams, ditching, draining, or filling causes severe habitat alteration that changes the function and value of a site, often lowering habitat quality for many species. Water levels that are artificially raised can flood out diverse marshes, fens, and sedge meadows, causing native plants to be replaced by monotypic stands of cattails or simply open water. Ditches and drain tiles lower the water table, facilitating tree and shrub invasion and loss of open wetland habitat, while filling simply eliminated wetlands altogether. Indirect alteration can occur from things such as the construction of new roads can disrupt hydrology,

impounding water on one side of a road while causing drying on the other. At a more local scale, unsustainable timber harvesting or recreational vehicle use on sensitive soils can cause soil compaction and rutting. Finally, overuse of groundwater resources for agriculture, municipal, or industrial use can cause a lowering of the water table, starving groundwater fed-wetlands of the source of their existence.

Conservation Actions We2

Depending on your overall objectives, the following conservation actions can address soil disturbance and hydrologic alteration and the effects that it has on wetland natural communities:

✓5.4.3 Law & policy- Compliance and enforcement- Sub-national level (State, Tribal, Local)
Follow forestry best management practices for water quality, especially near riparian areas, and consider additional buffers around sensitive wetland habitats.

✓8.2.2 Research needed -Conservation Planning-Area-based Management Plan
Develop habitat management guidelines for Ephemeral Ponds to protect water quality, pond hydrology, and habitat for herptiles and invertebrates.

✓2.1 Land/water management-Site/area management
Limit hydrological alteration to wetlands as an unintentional consequence of development/road building.

✓W8.3.4.2 Research needed- Monitoring- Habitat trends-Composition, Quality & Function
Identify priority groundwater recharge areas that supply fens, sedge meadows, springs, streams, and other wetlands and conduct groundwater quality and quantity monitoring in regions with high demand on groundwater resources.

Threat/Issue We3

Nutrient enrichment and sedimentation are one of the leading causes of wetland degradation. Excess nutrients, usually in the form of nitrogen and/or phosphorus, favor non-native invasive species (e.g., reed canary grass) and aggressive native species (e.g., cat-tails) which displace native plants. Nutrients can come from a variety of sources, ranging from agricultural fields to lawns. In addition, nitrogen accumulates through atmospheric deposition, mainly due to the burning of fossil fuels. Sedimentation is also problematic, and can arise from unsustainable agricultural practices on steep slopes or near waterways, land-clearing activities, unsustainable timber harvest operation, and poorly designed road crossings at streams or wetlands. Overall, sedimentation increases water turbidity and can cover low-lying plants in silt. Following water quality BMPs greatly reduces the risk from these activities; however, climate

change may add complexity to this issue as severe precipitation events are projected to increase and the season of frozen ground conditions grows shorter.

Conservation Actions We3

Depending on your overall objectives, the following conservation actions can be considered to address nutrient enrichment and sedimentation and the effects that they can have on wetland communities:

✓5.4.3 Law & policy- Compliance and enforcement- Sub-national level (State, Tribal, Local)
Follow water quality best management practices, especially near riparian areas, and consider additional buffers around sensitive wetland habitats.

✓W7.2.3 External capacity building- Alliance and partnership development- Management and Protection
Work with municipal planners, developers, businesses, and local zoning boards to increase groundwater infiltration practices and decrease stormwater input and nutrient enrichment of water from impervious surfaces (parking lots, etc.) through techniques such as the installation of bioswales, etc.

Implement Wisconsin's Nonpoint Source Program Management Plan FFY 2011-2015 and subsequent updates, which addresses impacts from non-point source pollution and provides direct and indirect benefits to SGCNs and their habitats. Work with NRCS Conservationist or follow NRCS guidelines to develop a 'cropland conservation management system' for water quality and water quantity that holistically considers the effects of planting design, crop selection, discontinuous vegetative cover, tillage practices, nutrient management, pest management, and irrigation.

Threat/Issue We4

Invasive species displace native plants and associated animals, lower species diversity, alter structural diversity (such as the ratio of open water pools to vegetation, abundance and distribution of sedge tussocks, etc.) and alter nutrient cycling. The most problematic non-native invasive species in open wetlands include well-established plants such as reed canary grass, narrow-leaved and hybrid cat-tail, purple loosestrife, and non-native Phragmites, as well as more recent, rapidly spreading invaders like Japanese hops. Invasive species are often exacerbated by soil disturbance, sedimentation, and nutrient enrichment. Invasive species are expected to increase over time due to both natural spread as well as climate change, as they are able to take advance of longer growing seasons and rapidly respond to disturbances such as large storm events.

Conservation Actions We4

Depending on your overall objectives, the following conservation actions can address invasive species and the effects that they have on wetland natural communities:

✓2.4 Land/water management- Comprehensive management
Maintain open character and limit invasive species and brush invasion in open wetlands and sedge meadows through the use of herbicide, prescribed fire, and other techniques.

✓W2.2.3 Land/water management- Invasive/problematic species control- Inventory & early detection
Monitor riparian areas 1-2 years post-flooding for new invasive species.

Prevent the introduction and spread of invasive species through early detection monitoring and development of a rapid response plan.

Threat/Issue We5

Prior to Euro-American settlement, some open wetland types experienced regular fire, especially communities such as Calcareous Fen, Southern Sedge Meadow, and Coastal Plain Marsh that occur within fire-dependent landscapes. Fire had the effect of setting back woody species, stimulating grasses, sedges, and wildflowers (especially smaller seeded species and annuals), and volatizing excess nitrogen. However, since the early part of the 20th century, fires have been actively suppressed, leading to ecological simplification through shrub encroachment and increased dominance by tall, coarse perennials.

Conservation Actions We5

Depending on your overall objectives, the following conservation actions can be considered to address fire suppression and the effects that it has on wetland natural communities:

✓2.4 Land/water management- Comprehensive management
Focus management and restoration efforts in fire-dependent regions to emphasize open wetlands through techniques such as prescribed fire and brushing.

Threat/Issue We6

Non-forested wetland communities are projected to range from low to high vulnerability to climate change, with vulnerability highly dependent on the type of wetland (Climate Change Vulnerability Assessment Workshops 2014). In general, potential changes to hydrology are projected to have the greatest impact on wetlands

with narrow hydrologic parameters, especially temperature and water level (e.g., fens). Communities adapted to a wider variety of water levels (e.g, sedge meadows) or with the capacity to buffer against small changes (northern peatlands) are projected to have moderate vulnerability, whereas community a high tolerance to variable hydrology and nutrients (e.g., shrub-carr and emergent marsh) are projected to have the lowest vulnerability.

Anticipated hydrologic impacts include increases in extreme precipitation events as well as longer dry periods in between rain events. Large precipitation or snow melt events also increase the risk of invasive species being spread to new areas, increase erosion and sedimentation, and increase nutrient runoff, which further fuels the growth of non-native invasive plants. The impact of these events is likely to be greatest lower in the watershed, where flood waters collect for a longer period of time (Zedler 2009). In addition, increasingly variable winter conditions may impact groundwater infiltration vs. surface runoff as well. Overall, climate change is likely to interact with other stressors such as invasive species, land use changes, and anthropogenic water use to pose a high degree of risk to many wetland communities, with select communities being less vulnerable.

Conservation Actions We6

Depending on your overall objectives, the following conservation actions can be considered to encourage climate change adaptation for wetland natural communities:

✓2.4 Land/water management- Comprehensive management
Restore degraded open wetlands through the control of invasive species, shrubs, and restoration of ecological process such as hydrology and fire.

✓W8.3.4.2 Research needed- Monitoring- Habitat trends-Composition, Quality & Function
Conduct groundwater monitoring in areas where groundwater dependent species and communities are in close proximity to areas with high groundwater withdrawal.

✓W2.3.2 Land/water management- Habitat & natural process restoration - Wetland
Reverse wetland losses by restoring converted wetlands to provide storage and filtration and to mitigate storm flows and nutrient loading downstream.

Increase groundwater infiltration practices and decrease stormwater input and nutrient enrichment of water from impervious surfaces (parking lots, etc.) through techniques such as the installation of bioswales, rain gardens, etc.

✓W7.2.3 External capacity building- Alliance and partnership development-Management and Protection

Work with agricultural stakeholders to balance water quality and water quantity with planting design, crop selection, discontinuous vegetative cover, tillage practices, nutrient management, pest management, and irrigation.

Estimated Vulnerability of non-forested wetland communities to climate change under low and high change scenarios.

Community type	Vulnerability under Low degree of climate change	Vulnerability under High degree of climate change
Alder Thicket	Low	Moderately low
Bog Relict	Moderate	Moderately high
Boreal Rich Fen	High	High
Calcareous Fen	High	High
Central Poor Fen	High	High
Coastal Plain Marsh	High	High
Emergent Marsh	Low	Moderately low
Ephemeral Pond	Moderate	High
Interdunal Wetland	Moderate	Moderately high
Moist Sandy Meadow	High	High
Muskeg	Moderate	High
Northern sedge meadow	Moderate	High
Open Bog	Moderate	High
Pattered Peatland	Moderate	High
Poor Fen	Moderate	High
Shore Fen	High	High
Shrub-carr	Low	Moderately low
Southern Sedge Meadow	Moderately high	High

Source: WDNR Climate Change Vulnerability Assessment Workshops 2014.