

## Threats/Issues and Conservation Actions

### Northern Forest Community Group

This is a summary of threats/issues and conservation actions that are common to all or most of the community types<sup>1</sup> in the northern forest 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 northern forest group includes the following community types:

- Black spruce swamp
- Boreal forest
- Forested seep
- Mesic cedar forest
- Mesic floodplain terrace
- Northern dry forest
- Northern dry-mesic forest
- Northern Hardwood swamp
- Northern mesic forest
- Northern wet forest
- Northern wet-mesic forest
- Tamarack swamp (poor)

Sustainable management of northern forests remains an extremely important industry in Wisconsin, and provides both wood products as well as wildlife habitat. In an effort to provide more meaningful conservation actions to forest managers interested in wildlife SGCN, select northern forest communities have been further divided into seral stages based on typical managed forest conditions, and two additional managed forest types have been added. These include:

- Northern dry forest (young seral, mid seral and late seral forest)
- Northern dry-mesic (young seral, mid seral, and late seral forest)
- Northern mesic (young seral, early seral, mid seral, and late seral forest)
- Aspen
- Conifer plantations

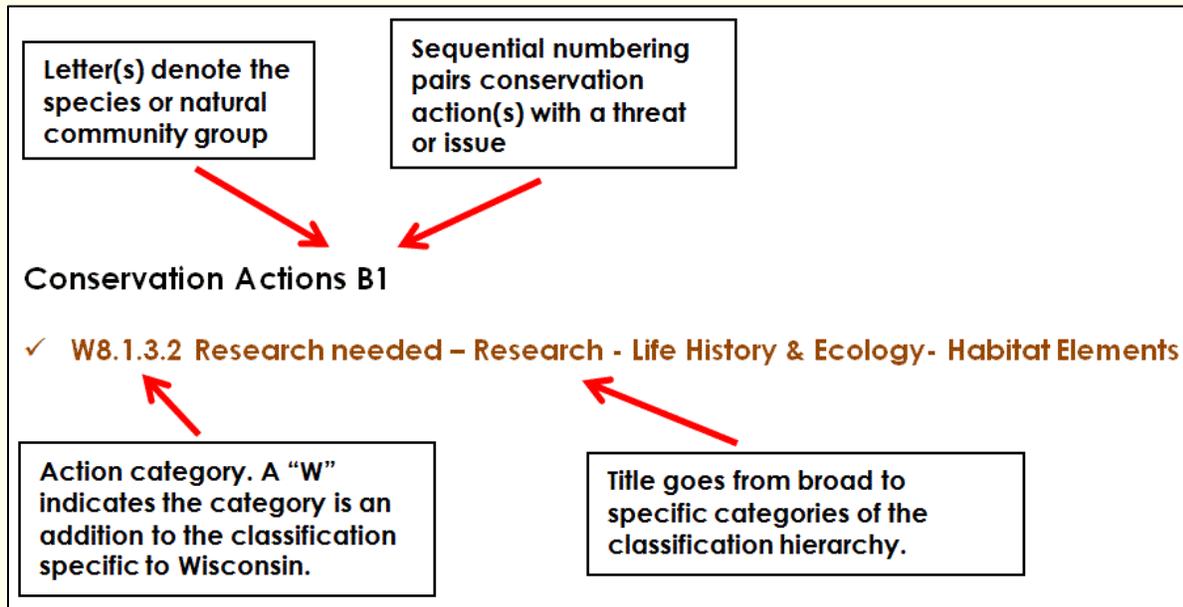
---

<sup>1</sup> Community or natural community is used in the WWAP as a proxy for habitat.



Descriptions for these northern forest community types added to the WWAP can be found in Section Appendix 4.2 of the Wisconsin Wildlife Action Plan; the remainder can be found online.<sup>2</sup>

Conservation actions for most or all northern forest community types are organized according to categories in the [Conservation Actions Classification](#) based on the Open Standards threats and actions classification<sup>3</sup>. 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 4.4.5](#) of the Wisconsin Wildlife Action Plan.

<sup>2</sup> <http://dnr.wi.gov/topic/EndangeredResources/Communities.asp?mode=group&Type=Northern forest> (Search Terms: Northern Forest Communities Wisconsin DNR)

<sup>3</sup> 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.

## Threat/Issue NF1

Most northern forest communities historically occurred within a large forested matrix. Many forest-dwelling species similarly depend on large blocks of forested habitat. Habitat fragmentation, either through conversion to developed or other non-forest land, or converting one type of forest to other, such as a natural forest to a pine plantation, reduces habitat for species needing large blocks of mature forest, such as forest interior birds. In addition, forested wetlands can be inadvertently converted to non-forested wetlands through unsustainable practices that cause swamping, takeover by reed canary grass, or regeneration failure from deer browse. Some species require young forest, and a lack of disturbance can be detrimental. A balanced approach that takes into account the need for large blocks of older forest as well as areas of mid-seral and young-seral forest would benefit the most SGCN.

## Conservation Actions NF1

### ✓2.1 Land/water management – Site/area management

#### ✓W7.2.3 External capacity building – Alliance and partnership development - Management and protection

#### ✓8.2.2 Research needed - Conservation planning - Area-based management plan

#### ✓8.2.3 Research needed – Conservation planning – Harvest and trade management plan

Develop clear goals for desired future condition at a regional scale, considering forest type and age class, as well as the spatial arrangement of different types of forest on the landscape.

Research ways to enhance landscape connectivity (e.g. through forest patch size, arrangement, corridors, etc.) between patches of young, mid-seral, and old forest for species that require large blocks of forested habitat.

### ✓2.1 Land/water management – Site/area management

When managing land surrounding a high quality forest site, manage in a way that does not isolate the site and that minimizes the negative effects of fragmentation.

#### ✓W2.2.2.2 Land/water management – Invasive/problematic species control – Control - Wetland

Avoid rapid and dramatic reductions in canopy cover or basal area in forested wetlands to reduce risk of swamping or takeover by reed canary grass.

## Threat Issue NF2

Much of Wisconsin's northern forests have become simplified and lack much of the species and structural diversity needed to support sustainable populations of some wildlife SGCN. In addition, ecological simplification renders forests more vulnerable to pests and diseases and less resilient to drought, wind storms, long-term changes in climate, and other environmental stresses. Ecological simplification can result from:

- Invasive plants such as garlic mustard, buckthorn, and reed canary grass, which outcompete native plants and inhibit tree regeneration.



- Forest management practices that do not promote snags and coarse woody debris or that limit tree species, age class, or structural diversity, depending on the forest type.
- Regeneration problems for oak, cedar, hemlock, and other species in areas with heavy white-tailed deer browse.
- Lack of controlled fire in northern dry forest and northern dry-mesic forest

## Conservation Actions NF2

### ✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial (upland)

Underplant or use other techniques to establish, promote and release understory trees of under-represented species such as white pine, hemlock, oak, yellow birch, etc., based on local site conditions.

### ✓2.1 Land/water management – Site/area management

### ✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial (upland)

Practice Green Tree Retention during forest management to promote species, structural and size class diversity within stands.

Enhance structural complexity of forests by retaining and promoting features important for wildlife such as large cavity trees and snags.

### ✓W2.2.2.3 Land/water management – Invasive/problematic species control – Control – Terrestrial (upland)

### ✓W2.2.3 Land/water management – Invasive/problematic species control – Inventory and early detection

Survey for and control invasive species prior to forest management; follow terrestrial invasive species BMPs during forest management activities.

### ✓W2.2.2.3 Land/water management – Invasive/problematic species control – Control – Terrestrial (upland)

Implement methods to limit negative impacts of locally abundant deer on regeneration of dominant trees as well as on ground layer species, particularly for browse-sensitive species (i.e. white cedar, hemlock, oak, etc.).

### ✓8.1.6 Research needed – Research – Actions

### ✓W8.3.5 Research needed – Monitoring – Effectiveness monitoring

Conduct silvicultural trials for utilizing prescribed fire as a tool to promote natural regeneration of red and white pine.

---

## Threat/Issue NF3

Though not as yet widespread in comparison to southern forests, invasive species are a growing threat to northern forest communities. From pests like emerald ash borer (EAB) to plants such as garlic mustard and reed canary grass, invasive species can cause a host of problems ranging from difficulties in tree regeneration to direct tree mortality. Non-native earthworms greatly reduce the duff layer and alter soil structure in a way

that disfavors native tree seedlings and many wildflowers and promotes Pennsylvania sedge and invasive plants. Invasive species are expected to increase over time due to their ability to respond quickly to soil disturbance and changes in growing season. Some species which are not yet present on the landscape, such as the mountain pine beetle, which feeds on jack pine, could arrive in the near future and have devastating impacts.

## Conservation Actions NF3

### ✓W2.2.2.3 Land/water management – Invasive/problematic species control – Control – Terrestrial (upland)

### ✓W2.2.3 Land/water management – Invasive/problematic species control – Inventory and early detection

Survey for and control invasive species prior to forest management and recreational development projects; follow existing terrestrial invasive species BMPs for these activities.

### ✓W4.3.1 Awareness and communications – General ecology, biology, habitat related to conservation needs

### ✓5.3 Law and policy – Private sector standards and codes

### ✓W8.1.8 Research needed – Research – Natural community threats and actions

### ✓8.2.2 Research needed – Conservation planning – Area-based management plan

### ✓W8.3.5 Research needed – Monitoring – Effectiveness monitoring

Develop management techniques, demonstration sites, and management plans that retain forest cover following loss of ash from emerald ash borer in ash-dominated hardwood swamps and floodplain forests, and minimize risk of conversion to non-forestland (reed canary grass, etc.).

### ✓8.1.6 Research needed – Research – Actions

### ✓W8.3.5 Research needed – Monitoring – Effectiveness monitoring

Research methods to reduce risk of arrival and spread of new invasive species.

## Threat/Issue NF4

Soil disturbance and hydrologic alterations are a major concern in forested wetlands, as well as a local concern on sensitive soils (especially on clay and in low wet areas, such as ephemeral ponds) in mesic forests, boreal forests, and other northern forest types. Operation of vehicles or heavy equipment in forested wetlands can cause soil compaction and rutting, and poorly designed roads and stream crossings can cause erosion and sedimentation. Following water quality BMPs and seasonal harvest restrictions on sensitive soils greatly reduces the risk from these activities; however, environmental changes may add complexity to this issue if severe precipitation events increase and the season of frozen ground conditions grows shorter in some areas. Direct hydrologic alteration of forested wetlands through dams, ditching, and filling (through road building, waste rock disposal, etc.), is local in scale, but causes severe habitat alteration where it does occur.



## Conservation Actions NF4

### ✓5.3 Law and policy – Private sector standards and codes

Follow forestry BMPs for water quality, especially near riparian areas.

### ✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial (upland)

Where feasible, consider adding buffers around sensitive northern wetland habitats (e.g., fens, bogs, springs, sedge meadows, etc.).

### ✓5.3 Law and policy – Private sector standards and codes

### ✓W8.1.8 Research needed – Research – Natural community threats and actions

Develop habitat management recommendations for ephemeral ponds to protect water quality, pond hydrology, and habitat for herptiles and invertebrates.

Work with partners to refine and implement the strategy to "slow the flow" of runoff and sedimentation.

### ✓1.1 Land/water protection – Site/area protection

### ✓1.2 Land/water protection – Resource and habitat protection

### ✓W2.3.2 Land/water management – Habitat and natural process restoration – Wetland

### ✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial (upland)

Preserve and restore habitat corridors along river systems, including both wetland and uplands, to provide for both linear movement of species along the river corridor and lateral movement to and from upland and wetland to river.

### ✓5.3 Law and policy – Private sector standards and codes

### ✓5.4.3 Law and policy – Compliance and enforcement – Sub-national level (state, tribal, local)

Limit hydrological alteration to wetlands as an unintentional consequence of development/road building.

---

## Threat/Issue NF5

In general, climate change adaptation is best approached from a risk management perspective that acknowledges uncertainty while increasing resistance and resiliency. Northern forests may experience direct and indirect impacts from a changing climate (Janowiak et al., 2014). Many species at the southern end of their range, including jack pine, white spruce, black spruce, and paper birch may suffer significant declines by the end of the 21<sup>st</sup> century, while southern species (e.g. oaks, red maple, basswood) may experience more suitable climate conditions (Janowiak et al., 2014). Extreme storms that cause wind throw and severe flooding are already on the rise and are projected to increase further (WICCI 2010). Climate change may also increase the risk of invasive species, which are often able to respond to disturbance and rapid environmental change, as well as increase the potential damage to vegetation and forest regeneration from deer due to shorter and less severe winters.

## Conservation Actions NF5

### ✓2.1 Land/water management – Site/area management

### ✓5.3 Law and policy – Private sector standards and codes

Increase structural diversity within forest stands to confer resistance to wind and ice storms.

### ✓W8.1.8 Research needed – Research – Natural community threats and actions

Develop silvicultural trials for innovative forest management techniques that increase forest resilience (e.g., increased tree species and structural diversity, natural regeneration of red pine, consistently successful regeneration of oak, etc.).

### ✓W2.4 Land/water management – Comprehensive management

In oak-dominated natural communities, maintain or increase diversity of oak species as appropriate for site conditions through various silvicultural techniques such as planting, etc., to improve resilience to pests, disease and environmental change.

### Estimated Vulnerability of Northern Forest Communities to Climate Change (Adapted from Janowiak et al. 2014).

Community type	Vulnerability across a range of low to high change scenarios
Aspen	Moderately high
Black Spruce Swamp	High
Boreal Forest	High
Conifer Plantation (Red pine)	Moderately high
Dry Northern Forest	Moderate
Hardwood Swamp	Moderately High
Northern Dry-mesic Forest	Moderately low
Northern Mesic Forest	Moderate
Northern Wet Forest	High
Northern Wet-mesic Forest	High
Tamarack (poor) Swamp	High