

Threats/Issues and Conservation Actions

Southern Forest Community Group

This is a summary of threats/issues and conservation actions that are common to all or most of the community types¹ in the southern 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 southern forest group includes the following ten community types:

Upland Southern Forests

- Central Sands Pine - Oak Forest
- Hemlock Relict
- Pine Relict
- Southern Dry Forest
- Southern Dry-Mesic Forest
- Southern Mesic Forest

Lowland Southern Forests

- Floodplain Forest
- Southern Hardwood Swamp
- Southern Tamarack Swamp
- White Pine - Red Maple Swamp

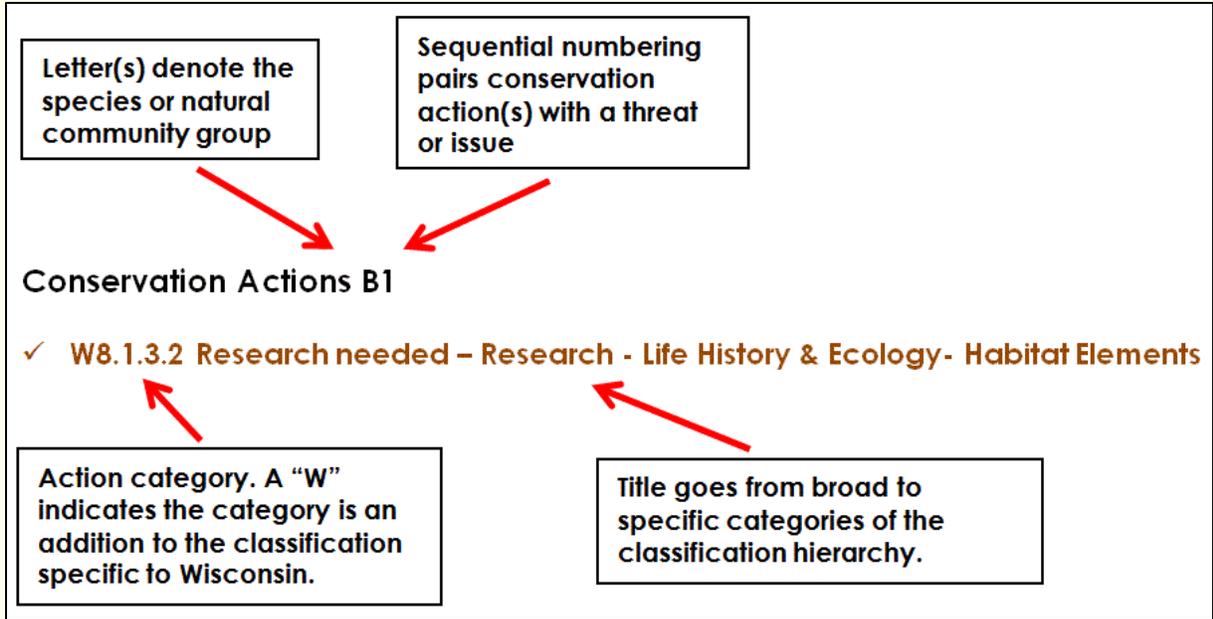
Descriptions for the southern forest community types can be found online.²

Conservation actions for most or all barrens community types are organized according to categories in the [Conservation Actions Classification](#) based on the Open Standards threats and actions classification³. 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.

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=Southern forest> (Search Terms: Southern Forest Communities Wisconsin DNR)

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.



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 4.4.6](#) of the Wisconsin Wildlife Action Plan.

Threat/Issue SF1

Historically, the oak- and pine-dominated upland forests of southern Wisconsin were exposed to fire of variable frequency and intensity, either started by lightning strikes or by Native Americans. Fire is important to Wisconsin's southern upland forest communities for a variety of reasons: 1) it limits mesophication; 2) it can facilitate reproduction of key canopy species such as oak; 3) it can deter growth of some non-native invasive species; and 4) it increases plant species diversity. In the absence of regular fire, especially in areas showing impacts of deer herbivory, these forest types will succeed to more shade tolerant species and will become less diverse over time.

Conservation Actions SF1

- ✓1.1 Land/water protection – Site/area protection
- ✓2.1 Land/water management – Site/area management
- ✓5.3 Law and policy – Private sector standards and codes

Maintain blocks of related fire-dependent communities that capture a complete gradient from grassland/open wetland to savanna to oak forest.

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

Maintain and restore semi-open canopy in southern dry forests through techniques such as intermediate thinning and prescribed fire.

✓W4.3.3 Education and awareness – Awareness and communications – Negative perceptions

Work to make the use of prescribed fire safe, effective, and more broadly accepted as a management tool.

✓2.1 Land/water management – Site/area management

Take actions to facilitate rapid mobilization of prescribed burn crews (e.g., prepare units in advance of burn season).

Maximize impacts of limited burn seasons by burning larger units.

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

Develop prescribed burn guidelines for pine relicts and oak regeneration using research on historical fire regimes as a reference, but with special consideration to current and future projected climatic conditions and past land use impacts.

Threat/Issue SF2

Non-native invasive plants, earthworms, and overabundant native plants and animals present serious challenges to the persistence of southern forests. Invasive plants are prolific reproducers in the absence of their homeland's natural checks and balances and can outcompete native plants by monopolizing light, water or nutrient resources. The most common non-native invasive plants of southern forests include herbs such as garlic mustard (*Alliaria petiolata*) and shrubs such as common buckthorn (*Rhamnus cathartica*) and Eurasian bush honeysuckles (*Lonicera* spp.). Non-native invasive earthworms disrupt normal nutrient cycling by rapidly consuming all of the leaf litter, thus exposing the soil to erosion, compaction, and invasion by non-native invasive plants. Local white-tailed deer populations can limit regeneration and growth of trees and ground layer plants. Climate change is likely to exacerbate the impacts of invasive exotic and overabundant native plants and animals.

Conservation Actions SF2

✓W2.4 Land/water management – Comprehensive management**✓8.2.2 Research needed – Conservation planning – Area-based management plan**

At the site level, employ an eight-part approach to non-native invasive species: 1) careful planning; 2) prevention; 3) early detection and rapid response; 4) control; 5) slowing the spread; 6) reducing impacts; 7) monitoring; 8) restoration.

Develop invasives control plans that include surveys and mapping of invasives locations and densities. Consider designating management zones based on degree of



infestation and available resources (zero tolerance, acceptable threshold, slow the spread).

✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial

Restore sites to confer resistance to infestation by non-native invasives, pests and diseases. This may involve restoring system functions (e.g., fire), restoring natural community structure (canopy, mid-story, shrub layer), and ameliorating ground layer species.

✓W2.2.1.3 Land/water management – Prevention – Terrestrial (upland)

Prevent invasions of non-native plants by limiting human vectors (e.g., install boot brushes at trail heads, clean out seeds from maintenance equipment), minimizing soil disturbance, maintaining healthy and diverse natural communities, conducting periodic inspections of high-risk areas (e.g., trails), and revegetating disturbed sites with native plants.

✓W2.2.1.3 Land/water management – Invasive/problematic species control – Prevention – Terrestrial (upland)

Conduct outreach to prevent invasions of non-native earthworms via release of fishing bait-worms or vermicomposting.

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

Implement an Early Detection-Rapid Response approach by finding new populations of non-native invasives as early as possible when eradication and control are still feasible and less costly.

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

Control non-native invasive species and problematic woody species by manual, mechanical, and/or chemical means.

If eradication, control, and containment methods fail to manage an infestation of non-native invasives, reduce their impact on elements of the natural community by focusing control efforts to allow for specific functions to occur (e.g., tree regeneration), translocating sensitive species, or accommodating unavoidable changes.

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

✓W8.3.5 Research needed – Monitoring – Effectiveness monitoring

Conduct regular monitoring of sites to detect new invasions and to evaluate the success of pest management plans and control measures.

Threat/Issue SF3

Much of Wisconsin's southern forests have experienced simplification from pre-Cutover times, and lack the species and structural diversity needed to support sustainable populations of some SGCN. In addition, ecological simplification renders forests more vulnerable to pests and diseases and less resilient to drought, wind storms, climate change, and other environmental stresses. Ecological simplification can occur at both structural and species levels, and is a legacy of altered disturbance regimes, grazing, non-native invasive species, problematic native species, and tree pests and diseases. Forest management may also contribute to ecological simplification if tree species diversity is limited or snags and coarse woody debris are not recruited. In lowland forests, hydrological alteration may also lead to simplification (for example, dams may limit the natural water level fluctuations in floodplain forest that contribute to landform development [sand bars, islands, slough channels, levees] and the diverse species that are associated with them).

Conservation Actions SF3

✓2.1 Land/water management – Site/area management

✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial

✓5.3 Law and policy – Private sector standards and codes

Maintain a diverse representation of tree species as appropriate for a given region or landscape setting

Work toward a balanced mosaic of tree age classes by developing clear acreage goals and geographic priority areas for both young forest and old forest.

✓2.1 Land/water management – Site/area management

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

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

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

✓8.1.6 Research needed – Research – Actions

✓W8.3.5 Research needed – Monitoring – Effectiveness monitoring

Conduct research on oak regeneration methods in different regions, landscape settings, and on various soil types to ensure persistence of oak in oak-dominated natural communities.

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

✓5.3 Law and policy – Private sector standards and codes

Survey for and address invasive species issues (both plant and animal) prior to forest management (see “Non-native invasive plants and aggressive native plants” above); follow “Wisconsin's Forestry BMPs for Invasive Species”⁴ during forest management activities.

⁴ <http://dnr.wi.gov/topic/Invasives/bmp.html> (Search Terms: Wisconsin forestry bmp invasive)



Threat/Issue SF4

Many forest-dwelling plants and animals depend on large blocks of uninterrupted forested habitat. Habitat fragmentation, either through conversion to developed or other non-forest land, or converting one type of forest to another, such as natural forest to 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 forest management that causes takeover by reed canary grass or regeneration failure from deer browse. On the other side of the coin, some species require young forest, and a lack of management can be detrimental. A balanced approach that takes into account the need for large blocks of old forest as well as areas of mid-seral and young-seral forest is recommended.

Conservation Actions SF4

✓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 takeover by reed canary grass.

✓1.1 Land/water protection – Site/area protection

✓2.1 Land/water management – Site/area management

✓5.3 Law and policy – Private sector standards and codes

Maintain blocks of related fire-dependent communities that capture a complete gradient from grassland/open wetland to savanna to oak forest.

Threat/Issue SF5

In general, climate change adaptation is best approached from a risk management perspective that acknowledges uncertainty while increasing resistance and resiliency. Southern forests will experience direct and indirect impacts from a changing climate. Species of more northerly latitudes (e.g., red pine, hemlock, sugar maple and red oak) are projected to decline by the end of the 21st century, while southern species (e.g., black oak, white, oak, bur oak, red maple, silver maple, American elm, hackberry, and shagbark hickory) may experience more suitable climate conditions (Prasad et al., 2007). Extreme storms that cause wind damage, severe flooding, and excessive runoff are already on the rise and are projected to increase further⁵, particularly affecting lowland forests already under stress from emerald ash borer and reed canary grass. Climate change is also likely to increase the risk of invasive species, which are adapted to respond to disturbance and rapid environmental change. Finally, prescribed burning, sometimes used as a management tool in upland forests, may change due to periodic drought, earlier spring green-up, and frequent and intense storms. Managers may wish to adopt a proactive approach that offers them the most flexibility in the face of changing and unpredictable conditions.

Conservation Actions SF5

✓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., in order to improve resilience to pests, disease and environmental change.

✓W2.4 Land/water management – Comprehensive management

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

At the site level, employ an eight-part approach to non-native invasive species: 1) careful planning; 2) prevention; 3) early detection and rapid response; 4) control; 5) slowing the spread; 6) reducing impacts; 7) monitoring; 8) restoration.

✓W2.3.3 Land/water management – Habitat and natural process restoration – Terrestrial

✓8.1.6 Research needed – Research –Actions

Promote drought-tolerant species through regular prescribed burning of dry forest (i.e., Southern Dry-mesic Forest, Southern Dry Forest, Central Sands Pine-Oak Forest, and Pine Relict).

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

Develop management techniques, silvicultural trials, and management plans to 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 (e.g., reed canary grass, etc.).

⁵ <http://www.wicci.wisc.edu/publications.php> (Search Terms: Wisconsin Initiative Climate Impacts publications)



✓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)

Reverse forested 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.

✓2.1 Land/water management – Site/area management

✓5.3 Law and policy – Private sector standards and codes

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.

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 Southern Forest Communities to Climate Change under Low and High Change Scenario

Community type	Vulnerability under Low degree of climate change	Vulnerability under High degree of climate change
<i>Upland forest</i>		
Central Sands Pine-Oak Forest	Moderate	Moderately high
Hemlock Relict	High	High
Pine Relict	Moderate	Moderately high
Southern Dry Forest	Moderate	Moderately high
Southern Dry-mesic Forest	Low	Moderately high
Southern Mesic Forest	Moderately low	Moderately high
<i>Lowland forest</i>		
Floodplain Forest	Moderately low	Moderate
Southern Hardwood Swamp	Moderately high	High
Southern Tamarack Swamp	High	High
White Pine – Red Maple Swamp	Moderate	Moderately high

Source: WDNR Climate Change Vulnerability Assessment Workshops 2014.