

Forest-Upland Coniferous

Ecological Systems

Fire-dependent Forest (FD)

Native Plant Community Types (NPC)

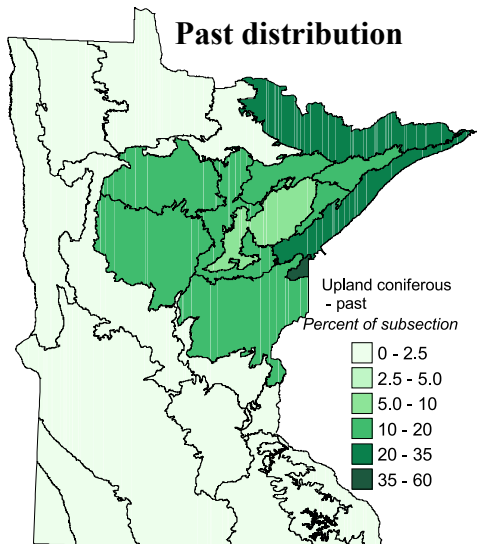
NPC Codes

Jack Pine Woodland (Sand)	FDn12a
Red Pine Woodland (Sand)	FDn12b
Jack Pine Woodland (Bedrock)	FDn22a
Red Pine-White Pine Woodland (Northeastern Bedrock)	FDn22b
Red Pine-White Pine Woodland (Eastcentral Bedrock)	FDn22c
Red Pine-White Pine Woodland (Canadian Shield)	FDn32a
Black Spruce-Jack Pine Woodland	FDn32c
Jack Pine-Black Spruce Woodland (Sand)	FDn32d
Spruce-Fir Woodland (North Shore)	FDn32e
Red Pine-White Pine Woodland	FDn33a
Black Spruce Woodland	FDn33c
White Pine-Red Pine Forest	FDn43a
Upland White Cedar Forest	FDn43c
Jack Pine (Bearberry) Woodland	FDc12a
Jack Pine (Yarrow) Woodland	FDc23a
Jack Pine (Bush Honeysuckle) Woodland	FDc24a
Jack Pine-Oak Woodland	FDc25a
Red Pine-White Pine Forest	FDc34a
Jack Pine-Oak Woodland (Sand)	FDs27a
White Pine-Oak Woodland (Sand)	FDs27b
<i>Mesic Hardwood Forest (MH)</i>	
White Pine-White Spruce-Paper Birch Forest	MHn44b
White Cedar-Yellow Birch Forest	MHn45b

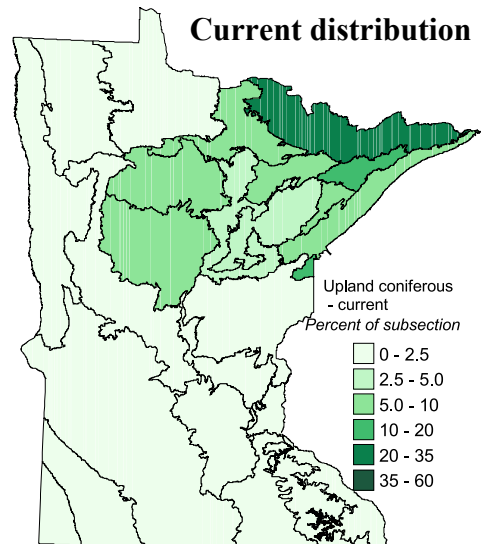


T. J. Whitfield MN DNR

Red Pine-White Pine Forest (FDc34a)



Source: Marschner 1930



Source: MN GAP 1993

General Description

Upland coniferous forest habitats occur primarily on sites with coarse sandy or gravelly soils or with thin soils over bedrock in the Laurentian Mixed Forest Province; this habitat also occurs as small patches in the Blufflands Subsection. The dominant tree species are pines, spruce, balsam fir, or white cedar. These conifers often occur with hardwoods such as quaking aspen, paper birch, oaks, and red maple. The predominant ecological factor shaping this habitat is wildfire. Fires in this habitat vary greatly in intensity from severe crown fires, which kill most of the canopy trees, to moderate surface fires, which kill few canopy trees. The frequency of wildfires in this habitat historically varied from an average of every 20 years to every 100 years. (In upland coniferous forests in the Mesic Hardwood System, return intervals were longer.)

Historically, fire was the major source of plant species mortality, and it exerted a strong influence on the pattern of plant reproduction by exposing mineral soil seedbeds, triggering seed dispersal, and increasing the amount of light reaching the forest floor. Fires played a significant role in nutrient cycling and nutrient availability. Many plant species in upland coniferous forests have evergreen leaves as a response to low nutrient availability and droughty conditions.

Throughout the Laurentian Mixed Forest Province, the extent of upland conifer forest has been reduced by two-thirds since settlement by people of European descent, as upland conifer forests have been replaced by aspen-dominated forests. Fire has been replaced by clear-cut logging as the major stand-replacing disturbance. Most of the remaining upland conifer forests (pine) have been thinned or originated following clear-cutting and typically lack the structural diversity of stands originating following fire. Forest management has resulted in a decrease in the amount of old forests, a decline that will continue for decades. Management to reduce spruce budworm outbreaks (harvesting balsam fir at young ages) may reduce populations of the warblers that eat spruce budworms. Even in the Boundary Waters Canoe Area Wilderness, the huge blowdown of 1999 is resulting in the conversion of pine forests to forests dominated by other tree species.

Examples of Features Important for Species in Greatest Conservation Need

Historically, wildfire played an important role at both the site and landscape level in these forests, but due to land use changes and fire suppression, wildfire is not common today. Following a crown fire, a variety of biological legacies remain in the young regenerating forest. These biological legacies, which include standing dead trees, large trees that escaped the fire, down logs, and small patches of unburned vegetation, provide important habitat features for SGCN. At the landscape level, wildfires create a shifting mosaic of native plant communities with a variety of ages and structural characteristics that provide habitats for SGCN.

Black-backed woodpeckers are largely confined to recently burned coniferous forests, where they feed on wood-boring beetles. Prior to fire suppression, new patches of burned forest occurred near older burn areas within a decade or less, providing a fairly constant supply of optimal habitat for black-backed woodpeckers. Wildfires also created a mosaic of new patches of dense young forests of jack pine and spruce, ideal habitat for **spruce grouse**, which feed primarily on needles of these species. The fire regimes in upland coniferous forests allowed the development of extensive old-growth forests with habitat features such as large snags, down trees with root wads, stumps, very large trees, and small openings in the canopy, which provide optimal habitat for **winter wrens**. Older stands of white spruce and balsam fir provide optimal habitat for **bay-breasted warblers** and **Cape May warblers**, which feed on spruce budworms and increase during periodic outbreaks of budworm in older spruce and fir. Ericaceous shrubs, which require fire to thrive, are important for the **heather vole**, which feeds on their foliage, berries, and seeds. The **smokey shrew**, which has been documented in a variety of upland and lowland habitats in Lake and Cook counties, prefers a cool, damp forest floor with a thick litter layer, mossy covered rocks, and decaying debris (Owen 1984).

Management Options to Support Species in Greatest Conservation Need

Explore opportunities to implement forest management practices that:

- Use fire (“let burn” and prescribed fire), including in the 1999 blowdown in the BWCAW.
- Use natural disturbance return intervals to guide rotation periods.
- Mimic landscape disturbance patterns with timber harvest (e.g., more large patches).
- Manage stands to retain biological legacies (at site level).
- Increase the proportion of forest dominated by conifers.