

Upland Forests

<u>Ecological Systems</u>	<u>Native Plant Community Types (NPC)</u>	<u>NPC Codes</u>
<i>Fire-dependent Forest (FD)</i>	All FD Native Plant Communities	FDxyn
<i>Mesic Hardwood Forest (MH)</i>	All MH Native Plant Communities	MHxyn



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Forest Upland Deciduous (Aspen)



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Forest Upland Deciduous (Hardwood)



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Forest Upland Deciduous (Oak)



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Forest Upland Coniferous

Distribution

See distribution maps for individual upland forest habitats:

- Forest Upland Deciduous (Aspen)
- Forest Upland Deciduous (Hardwood)
- Forest Upland Deciduous (Oak)
- Forest Upland Coniferous

General Description

Upland forests are found on mesic to dry sites throughout the Laurentian Mixed Forest and Eastern Broadleaf Forest provinces, and much less commonly in the Prairie Parkland and Tallgrass Aspen Parklands provinces. The most characteristic feature of upland forests is a tree canopy, with a combined coverage of species ranging from 50 to 100 percent. The most common upland forest trees are aspens, oaks, maples, birches, basswood, pines, spruce, and balsam fir. Because the forest canopy blocks most of the sunlight before it reaches the understory, most understory plants have evolved some degree of shade tolerance. The amount of light reaching the understory also has a strong effect on the structural complexity of the forest. Forests dominated by sugar maple and basswood typically have a poorly developed shrub layer. As these forests age, they become structurally more complex as canopy trees die, producing gaps in the canopy that allow growth of less shade-tolerant shrubs and trees. Standing large dead trees become more frequent, eventually becoming large down logs, which add to the structural diversity of older forests. Forests dominated by tree species other than maple and basswood tend to have a more open canopy and a denser layer of shrubs such as hazelnuts (*Corylus* spp.), dogwoods (*Cornus* spp.), and mountain maple (*Acer spicatum*).

Historically, the distribution and size of patches of contiguous upland forest were determined by soils, landforms, and natural disturbances (such as windstorms but especially fire). Fire, which was particularly important in drier upland forests, has been essentially replaced with timber harvest, resulting in a different distribution of forest patch sizes, ages, and composition. Moreover, conversion of upland forests to other uses (such as, agriculture, urban development, transportation corridors) has fragmented forests across the state, so that few large patches of upland forest remain in southeastern and central Minnesota. The remaining forests in these regions typically lack the ecological complexity of pre-European settlement forests because of a number of factors (such as, grazing, invasive plants and animals, edge effects, changes in native animal populations, and consumptive uses), whose relative importance varies in different regions of the state. Even in the largely forested areas of northern Minnesota, rural sprawl has greatly reduced the extent of large, contiguous forest areas; most forest areas are within 25 kilometers (15.5 miles) of small housing settlements.

The features of a predisturbance ecosystem that persist after disturbance have been termed “biological legacies” (Perry and Amaranthus, 1997). Biological legacies include green trees, surviving propagules and organisms (such as, buried seeds, seeds stored in serotinous cones, surviving roots, basal buds, mycorrhizal fungi and other soil microbes, invertebrates, and mammals), dead wood, and certain aspects of soil chemistry and structure (such as, organic matter, large soil aggregates, pH, and nutrient balances) Maintenance or re-creation of biological legacies that are important to SGCN can be an effective management strategy, even in the absence of natural disturbance regimes.

Examples of Features Important for Species in Greatest Conservation Need

SGCN are adapted to the wide range of habitat conditions and landscape patterns of upland forests created by natural disturbance regimes. Habitat features important to many SGCN include large areas of relatively undisturbed, contiguous forest (**least flycatcher, black-throated blue warbler, ovenbird**), a dense understory (**Canada warbler, black-throated blue warbler, veery**), a closed canopy (least flycatcher, ovenbird, **northern goshawk, four-toed salamander**), down trees (**Canada lynx, four-toed salamander, and red-backed salamander**), large trees near water (**bald eagle**), and early successional or disturbed forest with a dense understory (Canada warbler). Northern goshawks prefer forests with a relatively open flight path between the canopy and subcanopy. For some species with home ranges that extend over several native plant communities, such as **timber wolves** and northern goshawks, the landscape mosaic is also important. Four-toed salamanders occur most frequently in mature upland forests on glacial moraine landscapes with frequent isolated wetlands that include an alder margin and moss hummocks adjacent to pockets of open water. Red-backed salamanders require decaying coarse woody debris on the forest floor for laying eggs.

Management Options to Support Species in Greatest Conservation Need

Explore opportunities to implement forest management practices that:

- Use natural disturbance return intervals to help guide rotation periods.
- Manage to maintain and create large patches of upland forest.
- Manage stands to retain biological legacies (at site level).
- Manage invasive plants and animals.
- Work with Minnesota DNR Division of Fish and Wildlife to determine ecologically and socially desirable deer population levels across the state.