



Red maple



Sycamore



Hackberry

The best replacement trees for ash in Wisconsin forests

By Mike Hillstrom

Seeking an alternative tree to sustain the state's forests is ever more important as Wisconsin continues to be impacted by emerald ash borer or EAB. More than 900 million ash trees reside in Wisconsin's forests, not including urban forests.

EAB is spreading across Wisconsin and is estimated to kill more than 99% of all ash trees. It is essential to plan ahead with how you will replace the ash trees on your forest land to increase management options, maximize economic value and reduce future EAB impacts. Having a forest management plan or consulting with a professional forester will help successfully convert ash stands to other species.

Strategies for removing and replacing ash vary depending on the cover type, habitat type, soil texture and drainage, flood tolerance, shade tolerance, cold hardiness, browse susceptibility and presence of competing vegetation. Choosing a diversity of species can help meet your management objectives and provide

an opportunity to adapt your stand to climate change and build resilience to stressors. For additional guidance, read the WDNR recently updated "Emerald Ash Borer Silviculture Guidelines" at <https://p.widencdn.net/a4re0d/EABWIManagement-Guidelines>.

Ash species in Wisconsin

Ash grows throughout the state, but the greatest concentration is in the northern half of Wisconsin and along the Lake Michigan border. Black ash is the most prevalent species (51%), followed by white ash (25%) and green ash (23%). A small number of blue ash exists in far southeastern Wisconsin. When replacing ash in your stand, consider the characteristics of the ash species you are replacing.

- White ash (*Fraxinus americana*) is most common in northern hardwood stands with fertile, well-drained soils.
- Green ash (*F. pennsylvanica*) is most common in southern Wisconsin near streams, floodplains and

swamps, where it may form pure stands or grow in association with other species.

- Black ash (*F. nigra*) is mostly found in swamps and other wet forest types in northern Wisconsin.

Ash replacement species

White ash is typically a small component (less than 20%) of a stand and can therefore be replaced by natural regeneration from other species already present in the stand. In northern hardwood stands, this would usually include sugar maple, basswood, yellow birch and beech. In southern and central Wisconsin, regeneration may be more focused on oak, hickory, aspen or other native hardwoods.

Green and black ash lowland stands are more difficult to manage and may require site preparation, deer fencing, release treatments and invasive plant control to establish regeneration successfully. Silviculture trials and published research suggest planting a diverse mix of the following species for replacing ash in low-

All photos courtesy Mike Hillstrom except black spruce (Eek website), white pine (Nancy Bozek) and sycamore (Illinois Wildflowers).



Swamp white oak

land stands. For additional species and information, see Appendix B: Lowland reforestation species guide in the WDNR's "Emerald Ash Borer Silviculture Guidelines" at <https://p.widenet.net/a4re0d/EABWIManagementGuidelines>.

Red Maple (Acer rubrum)

- Uses include pulpwood, fuelwood and biomass
- Provides food and habitat for wildlife, which are generally not dependent on it, but deer will browse during winter
- Brilliant fall coloring
- Can be used for syrup making

Silver Maple (Acer saccharinum)

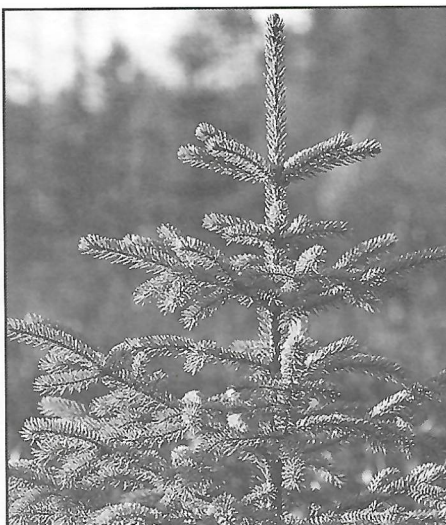
- Makes for excellent fuelwood
- Provides food and habitat for wildlife, but they are generally not dependent on it
- Not a preferred browse species for deer

Hackberry (Celtis occidentalis)

- Makes good fuelwood
- Provides food and habitat for wildlife, as many birds and small mammals eat this fruit, but it is not a preferred browse species for deer

Swamp white oak (Quercus bicolor)

- Valuable timber species for veneer, sawlogs, pulpwood and fuelwood



Black spruce

- Provides a food source for many wildlife including deer, bear and turkeys
- Used as habitat and cover

Elm (Dutch elm disease-resistant cultivars) (Ulmus spp.)

- Uses include sawlogs and fuelwood
- Provides food and habitat for wildlife, but it is not a preferred browse species for deer

Sycamore (Platanus occidentalis)

- Uses include pulp, lumber and particle and fiberboard, but it is not commonly used for fuelwood
- Provides food and habitat for birds and small mammals, but it is not a preferred browse species for deer

Tamarack (Larix laricina)

- Uses include poles, posts and pilings because of its decay resistance and it is sometimes used as pulpwood or fuelwood
- Provides food and habitat for wildlife, but it is not a preferred browse species for deer

White Spruce (Picea glauca)

- Uses include pulpwood, lumber and biomass
- Important habitat for many species because of its wide geographic range and abundance
- Seeds are eaten by many animals,



White pine

but it is not a preferred browse species

Black spruce (Picea mariana)

- Uses include pulpwood and fuelwood and sometimes lumber
- Provides habitat for many species, including shelter and browse for deer in winter

Eastern white pine (Pinus strobus)

- Uses include pulpwood, sawlogs, veneer and grade lumber, and it is sometimes used as fuelwood
- Provides food and habitat for wildlife and it is commonly browsed by deer

Northern white cedar (Thuja occidentalis)

- Uses include pulpwood and fuelwood and miscellaneous products like posts and shingles because of its decay-resistance
- Provides food and habitat for wildlife and is important shelter and browse species for deer.

To learn more about tree planting, ordering trees from the DNR, finding private nurseries that sell trees or a personalized tree planting plan, visit <https://dnr.wisconsin.gov/topic/TreePlanting>.



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