

Emerald Ash Borer (EAB) is an invasive beetle from Asia. It was first discovered in Detroit Michigan in 2002 and it has since become one of the most destructive and costly forest insects in recent history.



In 2022 EAB larvae were found and collected in Carlton County for the first time. Today, Carlton is among the 48 Minnesota counties confirmed for EAB infestation since it was first discovered in our state in 2009.

Emerald ash borer larvae kill ash trees by tunneling under the bark and feeding on the part of the tree that moves nutrients up and down the trunk. Often, the trees show several signs of infestation because of this. Woodpeckers like to feed on EAB larvae thereby damaging the bark. Woodpecker damage may indicate the presence of emerald ash borer. EAB tunneling can also cause the bark to split open, revealing characteristic S-shaped galleries underneath.



Since there are few other trees that grow in our ash forests, there is little potential for a natural replacement. Also, a changing climate is predicted to influence prospective candidates.

Northern Minnesota is home to over 1 billion black ash trees. These forests survive in extremely wet conditions. Their presence here help control the water table and provide valuable habitat. Once ash trees succumb to EAB, vast acreages of wet forests will be converted to poor quality brush and cattails. Ash trees also make up a significant percentage of boulevard and park trees. This brochure offers guidance on what species to plant as replacement species for the black ash forest type.

SYMPTOMS OF EAB DAMAGE

- Dieback of leaves in the upper third of the tree
- Small “D” shaped holes
- Vertical splits in the bark
- Heavy woodpecker activity
- “S” shaped galleries beneath the bark



HOW TO REPORT EMERALD ASH BORER

Contact the Minnesota Department of Agriculture
1-888-545-6684

OR

www.mda.state.mn.us/reportapest

FOR FURTHER ASSISTANCE

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ADDITIONAL RESOURCES

[Replacement trees for ash woodlands with emerald ash borer, UMN Extension](#)
<https://extension.umn.edu/forest-pests-and-diseases/replacement-trees-ash>

[Remediation and Recovery of Forests in the Great Lakes Region Following Emerald Ash Borer Infestation and Competitive Terrestrial Invasive Plants, USDA Forest Service](#)
<https://www.fs.usda.gov/research/nrs/projects/bil-great-lakes-forests-after-eab>



Emerald Ash Borer EAB



**LOOKING FOR A TREE TO
PLANT IN PLACE OF YOUR
ASH?**

HERE ARE 16 OPTIONS...



REPLACEMENT SPECIES



American Elm (*Ulmus americana*)
Height: 60'-100'
Average Lifespan: 150-200 years
Shade Tolerance: Intermediate
Requires Dutch elm disease resistant variety of seedlings



Hackberry (*Celtis occidentalis*)*
Height: 40'-70'
Average Lifespan: 100-150 years
Shade Tolerance: Very Tolerant
Very hardy tree growing in both wet and droughty conditions



Yellow Birch (*Betula alleghaniensis*)
Height: 60'-100'
Average Lifespan: 150-300 years
Shade Tolerance: Intermediate
Yellow birch twigs have a wintergreen taste



Balsam poplar (*Populus balsamifera*)
Height: 50'-80'
Average Lifespan: 75-100 years
Shade Tolerance: Intolerant
Seeds eaten by birds; sticky fragrant buds have medicinal properties



Peachleaf Willow (*Salix amygdaloides*)*
Height: 50'-70'
Average Lifespan: 50-100 years
Shade Tolerance: Intolerant
Larval host for the Mourning Cloak and Viceroy butterflies



Black Spruce (*Picea mariana*)
Height: 30'-80'
Average Lifespan: 100-300 years
Shade Tolerance: Intermediate
Provides habitat for various wildlife species, including birds, mammals, and insects



Basswood (*Tilia americana*)
Height: 60'-120'
Average Lifespan: 150-200 years
Shade Tolerance: Intermediate
Nicknamed the "Bee Tree" due to its strongly flavored flower nectar



Red Maple (*Acer Rubrum*)
Height: 60'-90'
Average Lifespan: 100-150 years
Shade Tolerance: Intermediate
Fast growing tree, and a prolific seed producer with high germination rates



Northern White Cedar (*Thuja occidentalis*)
Height: 40'-60'
Average Lifespan: 200-400 years
Shade Tolerance: Tolerant
Requires protection from deer



Black Willow (*Salix nigra*)*
Height: 30'-60'
Average Lifespan: 40-100 years
Shade Tolerance: Intolerant
Fibrous roots help stabilize soil, particularly along river banks



River Birch (*Betula nigra*)
Height: 40'-70'
Average Lifespan: 50-75 years
Shade Tolerance: Intolerant
The only spring-fruiting birch tree species



Tamarack (*Larix laricina*)
Height: 40'-60'
Average Lifespan: 200-300 years
Shade Tolerance: Tolerant
Our only deciduous conifer, it sheds its needles every autumn



Box Elder (*Acer negundo*)*
Height: 30'-80'
Average Lifespan: 70-100 years
Shade Tolerance: Tolerant
Fast growing; susceptible to fire, ice, and wind damage



Silver Maple (*Acer Sacharinum*)
Height: 50'-100'
Average Lifespan: 100-125 years
Shade Tolerance: Intermediate
Fast growing with brittle branches and shallow root system

Other species to consider: White spruce (*Picea glauca*), White pine (*Pinus strobus*), Balsam fir (*Abies balsamea*), and Bigtooth aspen (*Populus grandidentata*)

* indicates species that are currently not native to Carlton County, but are predicted to have increased suitability in the future



Bur Oak (*Quercus macrocarpa*)
Height: 60'-100'
Average Lifespan: 200-300 years
Shade Tolerance: Intolerant
Bur oaks have some of the largest acorns of any oak found in the U.S



Swamp White Oak (*Quercus bicolor*)*
Height: 50'-100'
Average Lifespan: 200-300 years
Shade Tolerance: Intermediate
Grows faster than most other white oaks

