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 I 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.

## **SYMTOMS 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

Tim Byrns
Carlton SWCD Conservation Forestry Specialist
218-348-3891 Ext 2

tim.byrns@carltonswcd.org

#### **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 Grreat 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 (Ulmas 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 occi-

dentalis)

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)\*

Average Lifespan: 70-100 years Shade Tolerance: Tolerant



**Silver Maple** (Acer Sacharinum)

Height: 50'-100'

Average Lifespan: 100-125 years Shade Tolerance: Intermediate Fast growing with brittle branches

and shallow root system

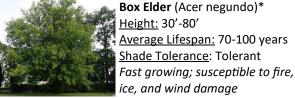


glauca), White pine (Pinus strobus), Balsam fir (Abies balsamea), and Bigtooth aspen (Populus grandidentata)

Other species to consider: White spruce (Picea

\* 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

