Emerald Ash Borer

Impacts, Biology and Management

FOREST HEALTH FACTSHEET

Wisconsin Department of Natural Resources, Division of Forestry, Forest Health Program, April 2020

Emerald ash borer (EAB, *Agrilus planipennis*) is native to eastern Asia and was first detected in the U.S. near Detroit, Michigan in 2002. Wisconsin's first detection occurred in Ozaukee County in 2008. As of 2020, EAB is widespread in the southern half of Wisconsin and isolated infestations have been found in northern counties.

IMPACTS

Emerald ash borer is very effective at finding and killing ornamental and forest ash. The pest is expected to cause more than 99% mortality of susceptible Wisconsin species (white, black and green ash, and their ornamental varieties). Blue ash, an uncommon species, is less likely to die. Dead branches and trunks are structurally weakened by EAB infestation and can become a safety hazard.

Less than one percent of larger white, black and green ash are likely to remain alive. These "lingering ash" are being studied for use in tree breeding projects to develop resistant ash.

BIOLOGY

Adult beetle emergence begins in southern Wisconsin in late May. Populations may increase rapidly, as each female beetle lays between 40 and 200 eggs. Larvae tunnel beneath the bark for either one or two summers, depending on climate, tree vigor, and timing of egg hatch.

Figure 1. *Winding galleries created by EAB larvae beneath the bark of an ash tree.*

Emerald ash borer infestation typically begins in the canopy and progresses down the tree. Trees are often infested for two or three years before showing symptoms, then remain alive for only a few additional years. Tree mortality occurs faster when EAB populations are high.

Emerald ash borer continues to be found at low levels after large ash trees in an area have died. EAB has been found in trees as small as one inch in diameter and will infest small ash as they grow larger.

Figure 2. *Characteristic thinning and dieback in an infested ash.*

SIGNS & SYMPTOMS

Larval tunneling creates winding galleries (Fig. 1) that cut off a tree's water movement, resulting in tree mortality. Parts of the tree affected by restricted water movement typically have branch dieback, canopy thinning, and leaves that are small and pale (Fig. 2).

Adult beetles create a D-shaped exit hole as they tunnel out of an infested tree (Fig. 3). If D-shaped holes can be seen on the lower trunk, the tree is usually heavily infested and likely to die soon.

Woodpecker damage ("flecking") that appears during the winter (Fig. 4) is a common first sign of EAB infestation. Woodpeckers remove outer bark to eat many of the overwintering EAB larvae.

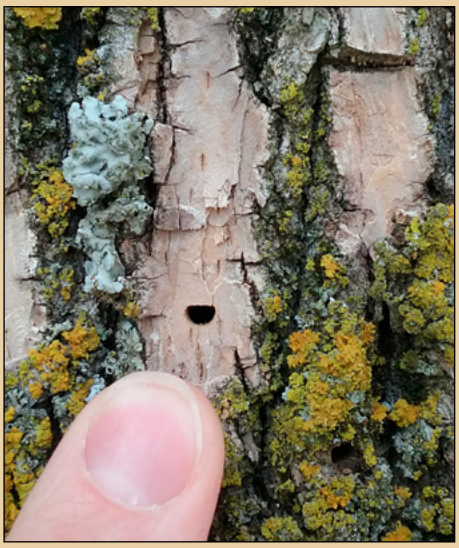

Figure 3. *D-shaped exit hole.*

Figure 4. *Heavy woodpecker damage ("flecking") on infested ash trees.*

Damage typically starts in the upper tree canopy and is light in intensity. Lightly-damaged ash usually have heavy damage within a few years, indicating imminent tree death.

Trees that are stressed by EAB or other causes often produce sprouts along the trunk or at the base.

MANAGEMENT

Property owners with ash trees are strongly encouraged to consult an arborist or forester.

The most heavily impacted sites are typically: 1) residential areas with a high proportion of ornamental ash; or 2) lowland forest sites containing large amounts of green or black ash. Sites with a low percentage of ash will be relatively unaffected by EAB.

Ash mortality in residential areas often results in tree removal and replanting costs, with increased electricity and water use due to loss of shade. Aesthetics and property values are also reduced.

When ash is more than 20% of a forest stand, it is important to increase the proportion of non-ash tree species so that management goals can still be met when ash die or are harvested. Management should begin prior to EAB impacts, when possible, to increase options and reduce costs.

In forests, non-ash tree species and invasive plants can take advantage of openings created by dead ash. Ash seedlings and sprouts may also be abundant in these gaps, but they will become susceptible to EAB once they reach a suitable size.

Heavy ash mortality on lowland forest sites often results in invasive plant abundance, higher water tables or site swamping, and possible conversion of the site to non-forest cover such as brush, sedge or reed canary grass.

Many sites with a high proportion of ash will not be practical or financially feasible to convert into non-ash forest types. Sustainable and proper forestry should be practiced when possible.

Eligibility for Wisconsin tax law programs may be impacted. Limited financial incentives may be available for management.

INSECTICIDE TREATMENTS

In areas where EAB is present, ornamental ash are expected to die unless protected with insecticide. When making a treatment decision, consider the financial cost as well as the tree's benefits, health, location, structure and removal/replacement costs. Ash with heavy woodpecker damage cannot be saved. Treatments are not practical or cost-effective in forests.

Some products can be applied by a homeowner, whereas others can only be applied by a trained professional. Treatments will be needed every 1-3 years depending on the product used, and trees will be re-infested if treatments stop.

Check the credentials of any business that may be hired to apply insecticides.

BIOLOGICAL CONTROLS

Several species of tiny wasps from EAB's native range have been released since 2011 to reduce EAB populations and help young ash reach reproductive age. The wasps are EAB specialists and do not sting people or animals.

FIREWOOD MOVEMENT

Infested firewood can transport EAB long distances and create new infestations. To prevent the spread of EAB, obtain firewood close to where it will be burned, season the wood for at least two years, or use pest-free, certified firewood.

Photo credits: Wisconsin DNR.

WISCONSIN DEPT. OF NATURAL RESOURCES

Printed on recycled paper.

Wisconsin Department of Natural Resources
PO Box 7921, Madison, WI 53707-7921

PUB-FR-622f 2020