



Watch your ash because the **EMERALD ASH BORER** could sneak into Wyoming

Emerald ash borer infestation in Wyoming is not a matter of if, but when.

The pest has caused destruction of hundreds of millions of ash trees in at least 37 states and several Canadian provinces.

Emerald ash borer (EAB) has been found as close as Larimer, Boulder, and Adams counties, Colorado, and on the eastern sides of South Dakota, Nebraska, and Kansas. EAB was first identified in Boulder in 2012, but based on the level of infestation at that time, researchers there believe it could have been in Colorado as early as 2007. Colorado has since decided not to actively participate in control measures, which could contribute to future dispersal and infestation.

Cheyenne will most likely be the location for our first infestation because of its proximity to Colorado and the amount of traffic between our states; however, this does not exclude other Wyoming communities because firewood transportation is a real and effective method of dispersal. For more information on how transporting firewood

can easily disperse pests, check out this web site: <https://www.dontmovefirewood.org/>.

The emerald ash borer is a pretty little green buprestid (or jewel) beetle native to northeastern Asia that feeds on all ash species. Little was known about EAB when first discovered in Michigan in 2002, and it is believed to have arrived in the United States via wooden shipping crates.

EAB is not in Wyoming, so why worry about it?

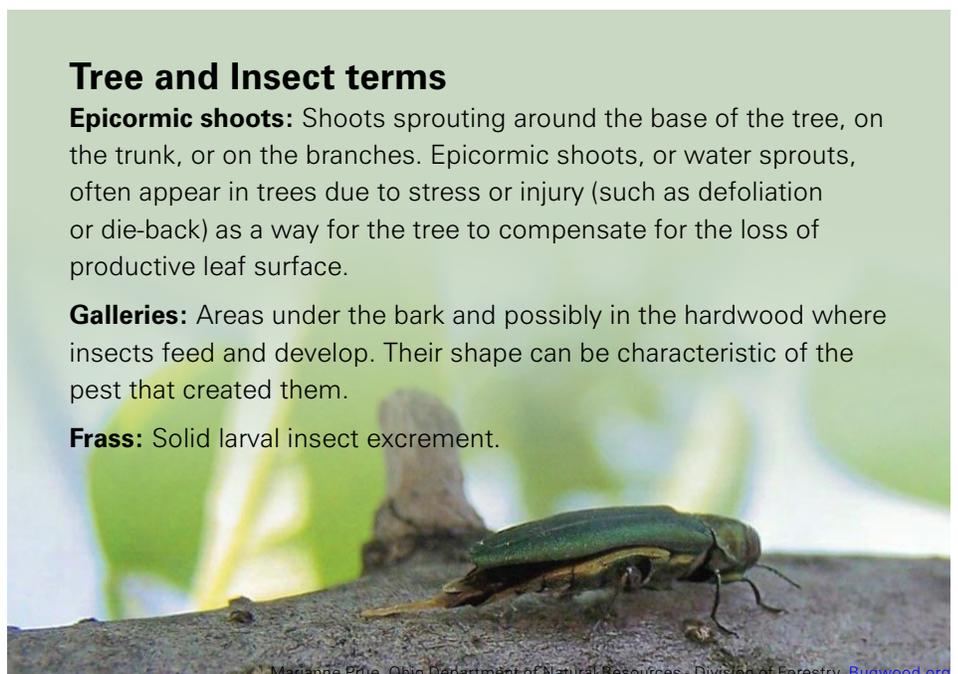
The USDA Forest Service characterizes Wyoming urban forests (street trees) as particularly important because they represent the only forests in some areas of our state. Each urban tree provides a variety of benefits, including moderating wind, heat, cold, and other weather effects.

Tree and Insect terms

Epicormic shoots: Shoots sprouting around the base of the tree, on the trunk, or on the branches. Epicormic shoots, or water sprouts, often appear in trees due to stress or injury (such as defoliation or die-back) as a way for the tree to compensate for the loss of productive leaf surface.

Galleries: Areas under the bark and possibly in the hardwood where insects feed and develop. Their shape can be characteristic of the pest that created them.

Frass: Solid larval insect excrement.



Marianne Prue, Ohio Department of Natural Resources - Division of Forestry, Bugwood.org

These trees also beautify and add value to the areas we see every day. In a statewide survey conducted between 1991 and 1996, Wyoming's urban forests in 37 communities included 108,000 trees valued at over \$115 million (remember these data are from nearly 25 years ago). Due to the nature of Wyoming (high elevation, arid climate, and persistent wind), our urban forests lack the diversity to resist significant weather events and/or pest impacts.

Just three tree species – cottonwood, blue spruce, and green ash – comprise 44 percent of all street trees in Wyoming. Any natural disaster, insect, or disease problem affecting any of these three species would have a big impact on most Wyoming towns. For more information on this study, please visit bit.ly/wyoforesthealth.

Although the adult emerald ash borer beetle (*Agrilus planipennis*) causes slight damage by feeding on leaves, it is most destructive when the eggs hatch and larvae enter the tree through crevices in the bark and begin feeding under the bark. The larvae tunnel and feed on the hardwood and the inner living tissues (cambium) of the tree. Their feeding damage disrupts the tree's ability to transport water and nutrients, which, depending on the level of infestation, will kill the tree.

Signs of EAB

The only visual surface injury specifically characteristic of EAB is D-shaped emergence holes in the bark. The larvae will pupate under the bark and then molt to the adult stage. The adult will then chew an exit hole through the bark on branches or the trunk in late spring. Adults have wings and can fly up to 6 miles from host trees, but research



Crown symptoms in ash following attack



Epicormic shoots.



Emerald ash borer "galleries."

suggests they usually stay in an area where host trees are present.

EAB exit holes will be D-shaped and small (1/8 of an inch). Early infestation exit holes can be difficult to spot from the ground as emerald ash borer tends to infest the upper portions of the tree first.

Other symptoms of infestation (but not limited to EAB) may include:

- Thinning canopy
- Vertical splits in the ash tree bark
- Presence of woodpeckers
- Epicormic shoots – Shoots arising directly from the trunk or base or as a cluster of side shoots from a branch of the tree instead of normal growth from twigs on branches.

Removing the bark you may also see:

- EAB galleries will be frass-filled and s-shaped (serpentine) just beneath the bark or etched into the underside of the bark. This is a definite sign of EAB infestation. The larvae are white to cream-colored, legless, flattened, 10-segmented, 1 to 1 1/2 inches long, and found in the galleries beneath the bark of living ash trees.

Monitoring in Wyoming

USDA APHIS (United States Department of Agriculture Animal and Plant Health Inspection Service), in cooperation with state natural resources agencies and others, has instituted an EAB survey to identify the leading edge of known infestations and to find new or outlying populations. They use purple prism traps baited with a green leaf volatile lure.

Purple prism traps are not available to landowners, municipalities, or individuals.



Ash trees that like our weather

Worried you might have a tree at risk? Here's a list of common ash trees in Wyoming. Ash trees are in the *Fraxinus* genus within the olive (*Oleaceae*) family of woody plants (minimum of USDA Zone 5):

- Black ash (*Fraxinus nigra*)
- Green ash (*Fraxinus pennsylvanica*)
- White ash (*Fraxinus americana*)
- Blue ash (*Fraxinus quadrangulata*)
- Narrow leaf ash (*Fraxinus angustifolia*)
- Pumpkin ash (*Fraxinus profunda*)

Mountain ash is unrelated to true ashes of the genus *Fraxinus* and are not susceptible to emerald ash borer. Mountain ash (genus *Sorbus*), is included in the genus of several shrubs or trees in the rose family (*Rosaceae*).

Management strategies of EAB-infested states include the use of quarantines, tree removal, and pesticides. The long-term management option includes research and development of ash varieties that can resist emerald ash borer. Many of the ash species in Asia are resistant.

A great online resource packed with EAB facts and maps of the distribution and spread of this beetle is the Emerald Ash Borer Information Network (<http://www.emeraldashborer.info>). This website is a collaborative effort between multiple universities and the USDA/APHIS.

So what to do in the meantime? Continue to plant a variety of trees. Getting trees to establish and

grow in Wyoming is challenging between the wind, hail, drought, insect pests, rodents, deer, and human-induced issues. But there is hope. Suggestions for trees suited for Wyoming conditions are at <https://bit.ly/wyolandscaping> under Trees & Shrubs - Choosing Types. Get'em in the ground and get'em growing.

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We imagine **Jeff Edwards** with arms crossed standing watch for emerald ash borers on Wyoming's southern border. Edwards is the University of Wyoming Extension's pesticide training coordinator and can be reached at (307) 837-2000 or at jedward4@uwyo.edu.