

LIVING WITH EMERALD ASH BORER: WHICH TREES WERE ATTACKED FIRST IN MICHIGAN'S UPPER PENINSULA?

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ABSTRACT

The exotic emerald ash borer (EAB) (*Agrilus planipennis*) (Coleoptera: Buprestidae) is established in Lower Michigan and some surrounding states. At high population densities, all green, black, and white ash trees are apparently susceptible to attack and can be expected to die. The first record of this insect in Upper Michigan was from Brimley State Park in the eastern Upper Peninsula of Michigan. In the fall of 2005, as part of an ongoing risk-based detection survey, larvae were extracted from a trap tree that had been used at the site since 2004. The insect was most likely introduced via infested firewood. Subsequently, an eradication effort was made by cutting and removing all of the ash trees within one-half mile of the infested trees. This provided the opportunity to identify additional infested trees within the park and to collect disks from all trees for growth ring analysis.

Disks were cut from a total of 53 white ash (*Fraxinus americana*) trees, selected from within the park, including 7 in which EAB larvae were found. An additional five trees in the park were also found to contain EAB larvae,

but did not have disks cut from them and therefore only tree diameter information is available for those trees. Dendrochronology was used to determine whether tree age, tree size (diameter), or tree growth affected the likelihood of EAB larvae being present in an ash tree in the early stages of infestation when the population density is still relatively low. By testing the ranks of ash trees and using non-linear regression techniques, we found that age and tree size were significantly related to the presence of EAB larvae, with the larger, older trees more likely to be infested. Radial tree growth (mean basal area increment) was also lower on attacked trees.

These findings have potentially important implications for design of detection surveys for EAB, because adult landing rates may be higher on larger older trees, and larvae are apparently more likely to be found in larger older trees during the early stages of an infestation. This information, along with other information on the efficiency of trap trees, needs to be considered in future detection efforts.