

IMPACT OF EMERALD ASH BORER ON FORESTS WITHIN THE HURON RIVER WATERSHED OF SOUTHEAST MICHIGAN

Annemarie Smith¹, Daniel A. Herms² and Robert P. Long³

¹The Ohio State University, Environmental Science
Graduate Program, 400 Aronoff Laboratory,
318 W. 12th Street, Columbus, OH 43210

²Department of Entomology, The Ohio State University,
Ohio Agricultural Research and Development Center,
1680 Madison Avenue, Wooster, OH 44691

³USDA Forest Service, 359 Main Road, Delaware, OH 43015

ABSTRACT

Emerald ash borer (*Agilus planipennis* Fairmaire) (EAB), a buprestid beetle native to Asia, has killed millions of ash trees (*Fraxinus* spp.) over thousands of square miles in southeast Michigan, northwest Ohio and neighboring Ontario. This invasive pest has the potential to decimate ash across North America with major impacts on forest ecosystems.

The objectives of this study were to determine (1) if community structure affects forest susceptibility to EAB invasion; and (2) the effects of EAB-induced ash mortality on forest community composition. Transects were established in 31 forested stands in southeast Michigan that varied in ash density, topography, hydrology, stand structure, and community composition. Three replicated ¼-acre plots were established in each transect for quantification of overstory and understory woody vegetation. The impact of EAB was quantified by assessing crown dieback of each ash tree and counting the characteristic

D-shaped emergence holes of the beetles and woodpecker attacks at a standard location on the trunk of each ash tree.

We found no relationship between EAB-induced dieback or mortality of ash and density, basal area, relative dominance, or relative density of ash. Severity of ash dieback was negatively correlated with distance of the stand from the putative epicenter of the invasion. Black ash (*F. nigra*) dieback was greater than that of white (*F. americana*) or green ash (*F. pennsylvanica*). As EAB eliminates ash from infested stands, abundance of saplings and seedlings suggests that *Acer* (maple), *Ulmus* (elm), *Tilia* (basswood) and *Prunus* (cherry) are most likely to replace ash in the canopy.

Each stand has been spatially referenced via GPS to facilitate long-term monitoring of successional trajectories and other ecological impacts, which are important to understand so consequences of the EAB invasion can be mitigated if efforts to contain the spread of EAB are unsuccessful.