

RECONSTRUCTING THE TEMPORAL AND SPATIAL DYNAMICS OF EMERALD ASH BORER ADULTS THROUGH DENDROCHRONOLOGICAL ANALYSES

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ABSTRACT

Emerald ash borer (*Agrilus planipennis* Fairmaire; Coleoptera: Buprestidae) was identified in June 2002 as the cause of widespread ash (*Fraxinus* spp.) mortality in southeastern lower Michigan and Windsor, Ontario. Localized outlier populations have since been discovered across much of lower Michigan and in areas of Indiana, Ohio and Ontario. Two case studies were presented to illustrate how we are using dendrochronological techniques to date when infestations began and to evaluate the subsequent spread and dispersal of emerald ash borer at outlier sites. Preliminary results indicate that the majority of outlier emerald ash borer infestations were established prior to 2002 and that the rate of spread in recently established populations tends to be between 0.1 and 0.2 miles per year, but can be up to 0.4 miles per year under certain conditions (e.g. fragmented urban settings). We are additionally using tree

ring analyses to reconstruct the historical dispersal patterns and rates of spread of emerald ash borer throughout the core emerald ash borer infestation in southeastern lower Michigan. Increment cores or cross-sections from emerald ash borer-killed ash trees were preferentially collected over declining or non-stressed ash trees on at least a 3.0 × 3.0 mile sampling grid over an area greater than 5800 mi² encompassing the core emerald ash borer infestation. To date, increment cores and cross-sections have been prepared using standard dendrochronological techniques. Crossdating and other dendrochronological analyses are in progress that will reveal when and where emerald ash borer initially became established in southeastern lower Michigan and how it spread historically.