POTENTIAL PRODUCTION OF EMERALD ASH BORER ADULTS: TREE, SITE AND LANDSCAPE-LEVEL APPLICATIONS

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ABSTRACT

Emerald ash borer (*Agrilus planipennis* Fairmaire; Coleoptera: Buprestidae), a phloem-feeding beetle native to Asia, was identified in June 2002 as the cause of widespread ash (*Fraxinus* spp.) mortality in forest and urban settings in southeastern lower Michigan and Windsor, Ontario. To date, 21 Michigan counties have been quarantined for emerald ash borer and localized outlier populations have been found across much of lower Michigan. Outlier populations are also established in areas of Indiana, Ohio and Ontario. Regulatory officials and managers of forest land near emerald ash borer infestations must be able to compare alternative management strategies to allocate limited funds efficiently and effectively. In this study, we used empirical data to develop models to estimate phloem area and potential production of emerald ash borer adults in ash trees of varying diameter. In trees killed by emerald ash borer, an average of 101.2 ± 5.49 adult beetles emerged per m^2 of phloem area. Models were applied to ash tree inventory data collected at two outlier sites in Michigan. Results showed that large trees (≥ 43 cm DBH) accounted for less than 5 percent of the ash trees but would have contributed 20-40 percent of the total emerald ash borer adult beetle production at each site. While approximately 80 percent of the trees at the two outlier sites were small (≤ 13 cm DBH), these trees would have accounted for less than 10 percent of the total emerald ash borer adult beetle production. Potential emerald ash borer production in relation to selectively harvesting ash trees in different size classes or conducting sanitation cuts of varying area sizes were discussed. Our results, in combination with ash inventory data, can be used by regulatory officials and forest resource managers to compare options for reducing emerald ash borer density and slowing its rate of spread for any area of interest.