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In-situ genetic conservation of white ash through insecticide treatment at the Allegheny National Forest

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The emerald ash borer-induced loss of mature ash trees across the eastern United States poses a serious threat to the genetic diversity of the species. Efforts to conserve the standing genetic diversity of ash species, including ash seed collection and in-situ protection of ash trees with insecticides, are ongoing. To best optimize conservation strategies, a better understanding of the current distribution of genetic diversity will be needed. An ongoing insecticide treatment study at the Allegheny National Forest (ANF) was used as a case study to examine the amount of genetic diversity conserved using several management approaches. The ANF treated 20 white ash (*Fraxinus americana*) trees in each of 27 plots spread across the >500,000 acre forest. We sampled leaves from >330 ash trees in 13 plots to determine the amount and distribution of ash genetic diversity on the landscape. Using microsatellite markers, we determined the percent of the genetic diversity of ash that is expected to be conserved through the current treatment approach. We generated scenarios for five other treatment approaches, varying the total number and distribution of treated trees, to calculate the expected percent of genetic diversity that would be conserved. The results will allow managers to consider the genetic “bang for the buck” when planning in-situ conservation of ash and similar species threatened by invasive pests and pathogens.

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