The Progression of Hemlock Woolly Adelgid Infestation in the Southern Appalachians

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Abstract

In the Southern Appalachians, hemlock woolly adelgid (HWA) infestation has caused significant mortality in Eastern Hemlock (*T. canadensis*) trees. The progression of this issue and what it may mean for the future is discussed using data from a study performed in the Coweeta Basin of the North Carolina mountains between 2004 and 2008. The study compared *T. canadensis* mortality rates between trees affected by HWA infestation and trees that underwent a girdling treatment in order to gain an understanding of the time it takes for mortality to occur and the effect on trees during the mortality in HWA infestation in comparison to girdling. *T. canadensis* trees are also compared to neighboring hardwood trees which were overall healthy in order to see if the loss of the *T. canadensis* tree had an effect on the other trees in the environment. The hypothesis of this paper was that the neighboring hardwood trees would become more abundant in response to the loss of *T. canadensis* because eliminating the competition allowed the hardwoods to begin establishing dominance. Basal area (BA), litter fall, and total standing root biomass were measured and used to investigate this hypothesis; the data collected showed a significant decrease in BA and total standing root biomass, and an increase in leaf litter in the *T. canadensis* studies, suggesting that mortality was occurring in these trees. In contrast, neighboring hardwood trees showed an increase in BA and total standing root biomass, and no change in leaf litter, suggesting that these hardwood species were beginning the process of establishing dominance. The data from the study shows that HWA infestations are causing changes in dominance in the Southern Appalachians, which supported the original hypothesis.