

## HEMLOCK WOOLLY ADELGID RESEARCH AT THE COWEETA HYDROLOGIC LABORATORY

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### ABSTRACT

Hemlock woolly adelgid (HWA) is a non-native invasive pest that impacts eastern hemlock (*Tsuga canadensis*) and Carolina hemlock (*Tsuga caroliniana*). Hemlock trees serve important ecological roles in the southern Appalachians as a keystone species in near-stream areas. Scientists at the USDA Forest Service, Coweeta Hydrologic Laboratory and their collaborators have established studies to examine the function of hemlock in riparian areas and the effects of its potential demise through the activity of HWA. We have focused our research activities in four areas: mapping and monitoring, effects, control, and restoration. Utilizing permanent vegetation plots, established in the Coweeta basin in 1934, we can map the extent and monitor the progress of HWA infestation and its effects on plant biodiversity. We have established intensive research plots to measure the effects of infestation on terrestrial and aquatic nitrogen and carbon cycling, forest and stream microclimatology, site productivity, and plant physiology. Future research will explore methods to restore ecosystem function in areas where hemlock is or will be heavily impacted by HWA. Of particular interest is restoring the function of hemlock in terms of providing critical habitat for birds and other animals, shading streams to maintain water temperatures required by trout and other aquatic organisms, and regulating nutrient, carbon, and water pools and fluxes.