

Healthy Forest Restoration Act Projects Title IV-Silvicultural Assessment

Project Title: Hemlock Woolly Adelgid Research in the Southern Appalachians
Otto, NC (SRS-4351)

Significance: Hemlock woolly adelgid (HWA) is a non-native invasive pest that impacts eastern hemlock (*Tsuga canadensis*) and Carolina hemlock (*Tsuga caroliniana*). Without control, hemlocks typically die within 5 to 7 years after infestation. Unfortunately, neither natural predators nor host resistance have been able to stop the spread of HWA. They are a keystone species in near-stream areas, providing critical habitat for birds and other animals, and shading streams to maintain cool water temperatures required by trout and other aquatic organisms.

Approach: A comprehensive research program is underway to address four key elements of the HWA problem on 10 acres: 1) evaluating control strategies to reduce or eliminate the spread of HWA, 2) understanding the impacts of hemlock mortality on ecosystem resources, 3) developing monitoring techniques that determine and predict HWA spread, and 4) developing and evaluating restoration techniques to mitigate the impacts of hemlock mortality on ecosystem resources.



Outcome(s): Expected outcomes include:

- Understanding how the predators respond to low density populations at the leading edge of the infestation and how the milder winters in the South affect their ability to control HWA
- As the HWA infestation progresses, continuous monitoring of both terrestrial and aquatic ecosystems will quantify the impacts of hemlock mortality on ecosystem resources such as terrestrial and aquatic wildlife habitat, biodiversity, and water quality.
- Data will be combined with aerial photography, satellite imagery, and other remote sensing tools to examine the predictive ability of remote sensing tools for detecting HWA infestation. In addition, infestation patterns will be correlated with topographic, edaphic, and biological variables to determine controls on HWA infestation.

Benefits: Hemlock trees serve important social, cultural and ecological roles in the southern Appalachians. Hemlocks are prized for their visual beauty in both forest and urban settings and are critical habitats for many prized species. This research will hopefully offset the potential tremendous losses of hemlocks in the Southern Appalachians.

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