

*An Exotic Pest Threat to Eastern Hemlock:
An Initiative for Management of Hemlock
Woolly Adelgid*



Hemlock Woolly Adelgid *Adelges tsugae*



The Northeastern Area and Southern Region, State & Private Forestry, and the Northeastern and Southern Research Stations conduct research and technology development focused on producing tools and strategies to mitigate long-term impacts of hemlock woolly adelgid (HWA).

Priorities for 2004:

Biological Control: Improve HWA predator mass-rearing technologies; establish and evaluate predators (including first-time releases of *Laricobius nigrinus* and *Scymnus sinuanodulus*, in addition to *Pseudoscyrnus tsugae*); conduct foreign exploration and laboratory evaluations of promising new natural enemies; and continue assessment of the use of entomopathogens for managing HWA populations.

Survey and Monitoring: Support State surveys to detect new infestations for early response, and develop more efficient and reliable survey methods.

Chemical Control: Assist State and Federal resource managers with chemical treatments to reduce impacts of HWA, develop and publish chemical control guidelines for homeowners, initiate assessment of non-target impacts of chemical treatments, and continue to evaluate new and existing chemical application methods

Impact Assessments: Pursue development of hyperspectral remote sensing capabilities for regional and local assessments of damaged hemlock stands, assess and report on HWA economic impacts, and report on regional hemlock health conditions based on long-term impact plots and other State surveys.

Public Awareness and Information Transfer: Develop and publish a HWA newsletter and post on the HWA Web site; create and post a comprehensive and searchable HWA bibliography on the HWA Web site; conduct a symposium on HWA, publish the proceedings, and post on the HWA website; update and publish latest advancements in HWA biological control and post on the HWA Web site; publish the latest chemical control options for HWA management and post on HWA Web site; and encourage public awareness actions using funds provided by Cooperative Forest Health Protection programs.

Other Pest Interactions: Evaluate the impacts of the elongate hemlock scale, *Fiorinia externa*, on hemlock health, singly and in combination with HWA, and investigate potential biological and chemical control options for management of this pest.

Silvicultural Recommendations: Publish guidelines for rehabilitation of damaged hemlock stands and post on the HWA Web site.

HWA Biology: Evaluate factors affecting survival of HWA populations, including effects of cold winter temperatures on HWA and HWA predators; determine the influence of acid rain and nutrients on HWA survival and assess the combined effects of these and other biotic and abiotic factors on hemlock health; and use molecular technologies to determine the origin of HWA in the eastern U.S. and thus identify target areas for collection of natural enemies.

Host Resistance: Evaluate the resistance of different hemlock species to HWA and initiate studies to assess the role of plant chemistry in resistance. Begin the collection and preservation of hemlock genetic material.