

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

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Abstract

Hemlock woolly adelgid (HWA) is the greatest threat to the health and sustainability of hemlock in eastern North America. The potential ecological impacts of this exotic insect pest can be compared to those of gypsy moth, Dutch elm disease, and chestnut blight. The USDA Forest Service, with the support and cooperation of the National Association of State Foresters and the National Plant Board, is proposing an expanded program to develop and implement management strategies to reduce the impact and slow the spread of HWA. This 5-year initiative calls for expanded research and technology development combined with accelerated management efforts implementing existing and newly developed control techniques. This document briefly describes this initiative's goals and funding requirements.

Background

In the early 1950s, a small, aphid-like insect was first observed feeding on hemlock in Virginia. This insect was the hemlock woolly adelgid (HWA), *Adelges tsugae* (Annand), an exotic pest native to Japan and China. HWA has since spread to 11 eastern states where it attacks the eastern hemlock and Carolina hemlock. HWA is responsible for extensive decline and mortality of hemlock trees in the eastern United States. The insect has spread steadily north and west from its point of introduction and is a serious threat to hemlock throughout eastern North America.

Key Issues

Continued Spread

- Half the range of hemlock in the East is now infested.

- The entire range of eastern hemlock is at risk.
- In the past year, HWA was found in isolated locations in Maine, New Hampshire, and Michigan.

Resource Impacts

- Extensive tree decline and mortality are found throughout the infested region.
- Severe impacts to date are in Virginia, New Jersey, and Connecticut.
- In New Jersey, hemlock mortality in heavily infested stands is estimated at 48 to 92 percent.
- Scientists predict significant tree mortality throughout the range.
- Harvesting of hemlock is proceeding at a rapid pace in an attempt to salvage value from threatened and dying trees.
- Impacts to hemlock forests and ecosystems are expected to intensify.

Need for Accelerated Development and Implementation of Technology

- HWA is an exotic species with no native enemies to keep it in balance.
- Detection of low-level populations is difficult.
- Current survey and monitoring activities are inadequate.
- Control with insecticides is expensive and limited to accessible areas.
- Biocontrol presently offers the only means to manage HWA in forest environments.
- Additional investments are needed to develop, refine, and implement management tools and strategies.

Table 1.—Estimated funding needs for accelerated HWA initiative (\$ in thousands)

Program Component	FY2003	FY2004	FY2005	FY2006	FY2007	Total
Research & Development	\$3,000	\$3,000	\$2,500	\$2,000	\$1,500	\$12,000
Management	\$1,940	\$1,900	\$2,350	\$2,800	\$3,250	\$12,240
Information Transfer	\$ 60	\$ 100	\$ 150	\$ 200	\$ 250	\$ 760
Totals	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000

Program Components

Research & Development

Research will focus on the following:

- Identifying and providing environmentally safe control options
- Developing ways to recognize the susceptibility of individual trees and vulnerability of stands
- Improving methods to survey populations and damage and to predict spatial and temporal movement and impacts
- Developing a knowledge base for restoration of damaged stands
- Understanding HWA biology and interactions with other pests.

Management

The goals are to:

- Implement control tactics by expanding technical assistance and use of cost-share programs

- Establish a program that will slow the spread of HWA
- Identify ecological and economic impacts so that management activities can be directed properly
- Provide guidelines and demonstrations of best management practices for the harvest and reforestation of damaged stands; and
- Jointly with research, accelerate development of new management tactics and tools to assist forest managers, forest health specialists, and homeowners.

Funding Needs

Initial analysis and review indicates that an estimated \$25 million in federal funds is needed over the next 5 years to develop necessary management tools to mitigate HWA impacts and slow the spread of this pest. Table 1 illustrates these estimates.