

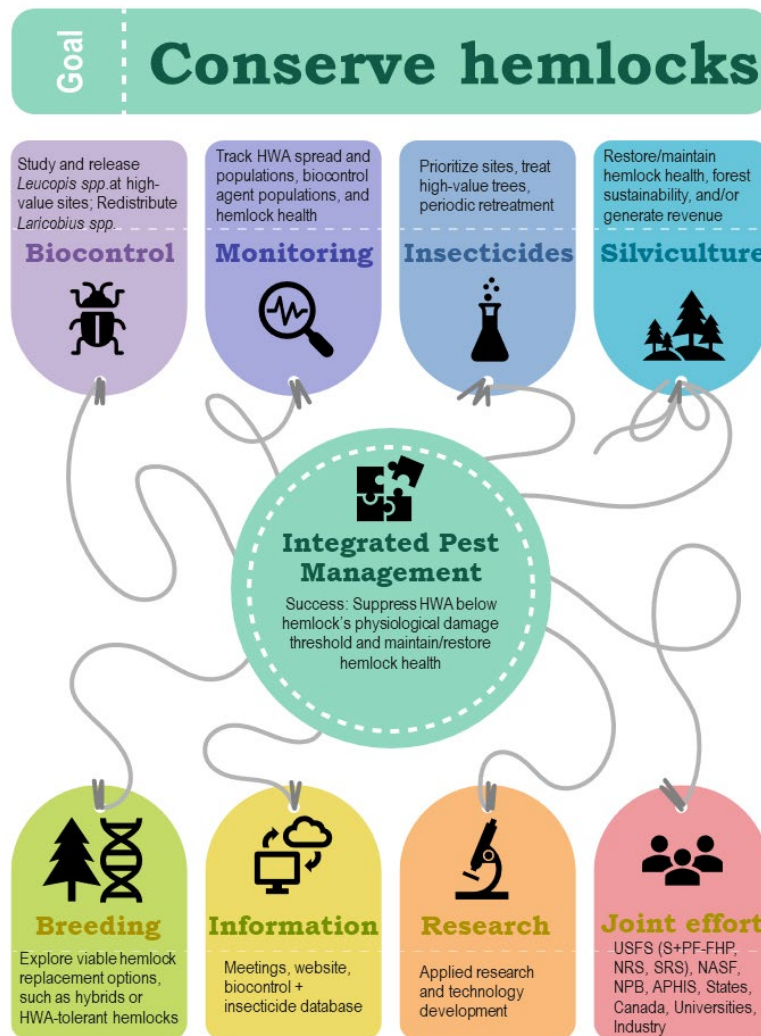
Hemlock Woolly Adelgid Coordinated Commitment to Improved Management and Restoration of Hemlock: 2021-2025 Program Direction

USDA Forest Service
 National Association of State Foresters
 National Plant Board
 USDA Animal & Plant Health Inspection Service



Goals: Control HWA at high-value sites and achieve long-term conservation of eastern and Carolina hemlock

Strategies: Interagency technical and financial support¹ for HWA integrated pest management, applied research, and information transfer.



¹ Funding will not be available for all tactics in each year and prioritization will be required for effective execution. Furthermore, allocation and use of funds may come with restrictions and from various sources.

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Changes from 2014-2018 Initiative Strategic Plan: This document is a supplement to the [strategic plan](#). The purpose is to outline adjustments based on scientific advancements/adaptive management and guide future work by partners to the initiative. Strategic program adjustments for 2021-2025 include:

- Increased emphasis on integrated pest management, developing *Leucopis* spp. biocontrol, silvicultural/restoration practices, and resistance breeding
- Reduced emphasis on methods development and research for *Laricobius* spp. biocontrol
- Reduced emphasis on HWA biology and economic impact assessment work

Recommended tactics for 2021-2025:

- **Integrated pest management:** At high-value sites, integrate biocontrol (*L. nigrinus* or *L. osakensis* paired with both *Leucopis* spp.), chemical control, and silvicultural/forest development practices (e.g., thinning, group selection, planting) to maintain hemlock health by suppressing HWA below hemlock's physiological damage threshold.
- **Biocontrol:** Develop regional release strategies for high-value sites. Increase the *Leucopis* spp. effort (e.g., biology, releases, monitoring of establishment, and rearing). Continue rearing and release of *Laricobius osakensis* in the short-term. Redistribute coastal/inland *L. nigrinus* in the East and augment with western collections if needed. Phase-out rearing of *Laricobius* spp. and retool labs for *Leucopis* spp., if silverfly population establishment occurs (i.e., F3 generation). Continue annual biological control meeting and technical oversight.
- **Chemical control:** Treat high-value sites and create a geodatabase of treated locations. Complete evaluation of imidacloprid treatment impacts on non-target organisms. Evaluate emerging least-toxic pesticides for efficacy and potential use as they become available.
- **Silvicultural practices:** Support a technical committee to identify options for silvicultural management of hemlock stands pre- and post-infestation to address diverse objectives (i.e., hemlock health, forest sustainability, restoration, aesthetics, recreation, wildlife habitat, revenue generation, utilization, or various combinations).
- **Resistance breeding:** Support a technical committee to explore viable hemlock replacement options, such as hybrids or HWA-tolerant hemlocks. Identify surviving trees in the field, collect cuttings/seeds, developing a screening tool to test for resistance/tolerance, and potentially move towards production and planting.
- **Survey and monitoring:** Document HWA spread, HWA winter mortality, and biocontrol agent establishment/abundance to track their dispersal, abundance, risk analysis, and management impacts. Monitor hemlock health and regional change using existing long-term hemlock monitoring plots, FIA, and remote sensing (e.g., ForWarn II).
- **Information transfer:** Coordinate interagency activities by: summer HWA managers' meeting, technical committee meetings, biocontrol release/recovery/insecticide database, contributing to focused coalitions (i.e., Lake States, tribes, Canada), and updating the HWA website.