

**ACTION PLAN
TO SLOW THE SPREAD AND
MANAGE HEMLOCK WOOLLY ADELGID
WITHIN THE STATE OF NEW HAMPSHIRE
Revised July 2018**



PURPOSE

This ACTION PLAN is designed to guide the appropriate agencies and personnel in the management of hemlock woolly adelgid. The following action plan was developed by the NH Division of Forests and Lands and recommended by the state's Forest Pest Advisory Group which is comprised of pest specialists representing the NH Division of Forests and Lands, USDA Forest Service, NH Department of Agriculture Markets and Foods, UNH Cooperative Extension, The Society for the Protection of New Hampshire's Forests, The Nature Conservancy, the Granite State Society of American Foresters, and the USDA Animal and Plant Health Inspection Service. These organizations are brought together by the State Forester to provide oversight in the management of major forest pest outbreaks.

INTRODUCTION

Hemlock Woolly Adelgid was first reported in New Hampshire in Portsmouth in 2000. Early efforts to control the infestations slowed the spread but did not eliminate the threat. It has since spread to 122 towns in 9 counties in the state. There is a constant threat from natural introduction into the forest from such vectors as birds, mammals and wind. Concern over the threat of Hemlock Woolly Adelgid introduction into New Hampshire's hemlock forest resource, and the potential for significant tree mortality, caused the Department of Agriculture, Markets and Foods, Division of Plant Industry and the Department of Resources and Economic Development, Division of Forests and Lands, to enter into a joint quarantine. This JOINT QUARANTINE #1 became effective on December 13, 1988. It was amended several times and eliminated in 2018.

DETECTION

- 1.) The Division of Forests and Lands, Forest Health Section conducts several survey programs throughout southern NH for the presence of HWA and to monitor its spread.
- 2.) The Division of Plant Industry has an inspection plan for hemlocks imported to New Hampshire.
- 3.) Chances of discovering incipient HWA infestations are enhanced by increasing public awareness of HWA characteristics. Therefore, it is recommended that periodic public service announcements, press releases and updates related to HWA developments be distributed throughout the state. When HWA is detected in the state, press releases and other mass media outlets may be used to update the public and provide instruction and education on desired courses of action.

ACTION UPON INITIAL DISCOVERY

All possible sightings of suspect infestations in uninfested counties must be reported to the Forest Health Program at 464-3016. Infestations in already infested counties should also be made to the Forest Health Program in order to track the spread. Infested nursery stock should be reported to the Division of Plant Industry at 271-2561. At the time of notification the following information will be needed:

- 1) Name, residential and mailing address of the person who made the initial sighting.
- 2) Telephone number of the person who made the initial sighting.
- 3) Travel directions to the area containing the suspected infestation.

- 4) Description of the infested area.
- 5) GPS coordinates if possible.

As soon as agency notification has been completed the Division of Forests and Lands and/or the Division of Plant Industry will collect samples for confirmation if deemed necessary. If HWA is confirmed a delimiting survey may be organized by the Division of Forests and Lands to:

- 1) Determine the extent of the infestation;
- 2) Make management recommendations to landowners;
- 3) Assess infestations for use as biocontrol release sites;

Suppression funding provided to the NH Division of Forests and Lands will be prioritized as follows:

- 1) To obtain biological controls for release on suitable sites on public lands;
- 2) To treat infested trees on public lands such as state parks where trees are an important landscape component such as campgrounds or unique natural areas;

MANAGEMENT OPTIONS

There are many different strategies and control options to eradicate or manage hemlock woolly adelgid (HWA).

Step 1: Assess key components of the infestation.

- Determine the geographic extent of the outbreak. Does the infestation cross ownership boundaries? Is the infestation isolated, increasing the likelihood of successful treatment, or part of a large area with most hemlock infested?
- Evaluate the severity of the infestation. Are many of the trees infested in the area or just a few? Determine the number in the high, moderate and low vigor classes.
- Evaluate the health and vigor of the infested trees. Are they healthy enough to respond to treatment, or are they too far gone?
- Evaluate the value of infested trees to the environment, soil stability, for timber, wildlife, privacy, or as landscape trees.

Step 2: Decide on a plan. Based on the information collected in Step 1 there are several options.

1. **Do nothing.** The geographic extent may be too large and the severity too high to result in successful control. The value of hemlock may be too low to make control worthwhile.

2. **Use cultural control.** When the geographic extent is small and the value of the infested trees is low, removing the infested trees is the best option. Remove infested trees and process the resulting brush by chipping and piling, and covering for several months, or simply piling and burning on-site. If the brush is not to be processed on-site, chip brush before transporting and cover the chips or destroy the chips immediately at the approved receiving site.

3. **Use insecticides.** When the geographic extent is limited, access is good and value is high

insecticides can be an effective option. Insecticides should only be applied by those with knowledge of the state and federal rules, pesticide applicator equipment, and an understanding of the best life stage to treat the insect. Proper safety equipment is needed and all instructions on the pesticide label must be followed.

Foliar sprays are effective when infested trees are short, the volume of foliage is small, and foliage is accessible from all directions. The safest and least toxic foliar sprays are insecticidal soaps and horticultural oils. These products coat the insect and prevent breathing. Treat with oil sprays throughout the growing season, carefully following the timing suggested on the product label to prevent damage to foliage during hot summer months. Other foliar sprays which are effective but more toxic to non-target and beneficial insects, are products with bifenthrin, or permethrin.

Systemic pesticides are applied so the active ingredient is absorbed into the tree—the woolly adelgid then feeds on treated tissue. Systemic pesticides generally take several months to take effect but last in the tree for several years, providing control. Soil injections, soil drench, stem injections or basal bark sprays are all methods used to apply systemic pesticides. The two most effective ingredients are imidacloprid and dinotefuran. Imidacloprid products act slower but last longer and products with dinotefuran act fast but don't last as long. Other insects feeding on hemlocks treated with systemic insecticides may also be impacted, and their exposure should be considered when initiating any insecticide regime.

- Soil injections require specialized equipment but deliver pesticide directly to the root system and leave no pesticide exposed to the ground surface.
- Soil drenches are easy to apply. You mix the product in water and pour the mixture over the ground. There is a higher risk of pesticide exposure and runoff with this method.
- Stem injections need highly specialized injection equipment and damage to the tree's cambium at the injection site is common. Uptake by the tree can be quick and there is low environmental exposure to runoff or drift.
- Basal sprays—spraying the bark from the root flare to 5 feet all the way around the tree—may be the best compromise of all the systemic pesticide application options. Pesticide products labeled for basal application can be put into most sprayers and applied, with little or no exposure to ground water if applied with the proper pressure and nozzle shape.

4. Use a combination of cultural treatment and pesticide application. When HWA is found in state parks, private campgrounds and other large geographic areas an unreasonable amount of insecticide would be needed to control the whole outbreak. Cutting all the trees or allowing the infestation to expand is also problematic because these hemlocks are valuable for aesthetics, privacy, wildlife, water quality, and much more. These sites may require a variety of control measures. Any hemlock in poor health and unlikely to absorb systemic pesticides should be cut and destroyed. Likewise all heavily infested trees, attracting higher populations of HWA compared to neighboring trees, should be removed. When that work is complete a pesticide application of a systemic insecticide can be applied to a buffer area around the core infestation area to treat those valuable trees left behind.

5. Biological Control. The NH Division of Forests and Lands releases predatory beetles on suitable sites. Suitable sites are healthy forested sites with moderate infestations that can sustain a population of beetles. Priority is given to public lands and areas utilized as insectaries.

STEP 3: Post treatment follow-up. Evaluate the effectiveness of control activities before doing further treatments or activities, especially when pesticides were applied. The white cottony mass (flocculence) may persist on a twig for over a year with no live adelgid inside. Examine samples under a microscope or high-powered hand lens to see if the insect is dead or alive.

The objective of any management plan selected for implementation should be customized to each individual infestation. Since any HWA infestation is considered a serious threat to our hemlock resource, prompt action needs to be taken. If necessary, financial assistance should be sought by requesting additional funding or by shifting of available state funds where possible. In addition, Federal financial assistance should be requested as well as appeals to private woodland owners, conservation and forestry organizations.

Forest Pest Advisory Group

PURPOSE: The purpose of the Forest Pest Advisory Group is to provide a forum for public agencies and private organizations to discuss forest pest problems that impact New Hampshire, and to make recommendations relative to forest pests to the Commissioner of the Department of Agriculture, the Commissioner of the Department of Resources and Economic Development, and the State Forester.

OBJECTIVES:

- 1.) Share information and strategies on forest pests.
- 2.) Develop action plans to address New Hampshire forest pest problems.
- 3.) Distribute information to the general public on forest pests.

COMMITTEE MEMBERS:

One representative from NH Department of Resources and Economic Development, Division of Forests and Lands,

One representative from NH Department of Agriculture, Markets and Foods, Division of Plant Industry,

One representative from UNH Cooperative Extension,

One representative from USDA Forest Service,

One representative from NH Audubon Society,

One representative from Society for the Protection of New Hampshire Forests,

One representative from USDA Animal and Plant Health Inspection Service,

One representative from The Nature Conservancy,

One representative from the Society of American Foresters Granite State Division.