



© 1997 PAUL REZENDES

Hemlock forest

Hope and the Hemlock

Unless something is done soon, the dark forests of hemlock may all fall prey to the woolly adelgid.

by Francis E. Putz

Dust of Snow

by Robert Frost

The way a crow
Shook down on me
The dust of snow
From a hemlock tree

Has given my heart
A change of mood
And saved some part
Of a day I had rued.

Of the many forest types that grow in New England, perhaps the most evocative are the dark groves of hemlock that favor wet ravines, swamp edges, and shady stream banks. Entering into one of these gloomy forest chapels, you sense that anything could happen, that time itself stands still. But the hemlock will be history in New England within the next few decades unless drastic and costly steps are taken to prevent the species from being annihilated by hordes of the hemlock woolly adelgid, a small sucking insect introduced from Asia. Although some choice trees in formal landscapes are being protected and path-breaking efforts are underway to save hemlocks in a few natural stands, the hemlock groves that we so cherish seem bound to disappear within the span of a human generation.

Clarion calls of this sort are so common now that they often fall on deaf ears, but it is already too late for hemlocks in Maryland, New Jersey, Pennsylvania, and down through the Shenandoah Valley, where most trees are already dead or nearly so. The hemlock stands of Connecticut are not far behind, and many in Massachusetts are already infested with the pests, some having already succumbed. Federal, state, and private initiatives are now underway to study and control the pernicious exotic pest, but the wave of hemlock death continues to wash over the landscapes of eastern North America at about twenty miles per year. This means that, unless we mount an

expensive, long-term, and coordinated campaign to save at least a few hemlock forests, it will not be long before a dusting of snow falling from hemlock branches and other poetic images will mean little to future generations.

In contrast to the ill-fated American chestnut, which persists as a sprouting stump after the rest of the tree is killed by blight, when a hemlock is killed by adelgids the entire tree dies for good. In a stand that falls victim, every individual from the mighty monarch of the canopy to the small sapling in the dark understory expires permanently. Hemlocks do not resprout, but, fortunately, there are several ways to protect individual hemlock trees, and some less-well-developed ways to protect at least small hemlock forests. There are also good reasons to believe that if we can keep hemlocks in our landscapes for another decade or so, effective biological control methods for adelgids will become available. Unfortunately, due to unawareness of the threat or concerns about the numerous assorted economic and environmental costs of treating adelgids, few trees and even fewer forests are being saved.

Hemlock woolly adelgids were accidentally introduced to Virginia in the 1950s. Since then the species has moved south through the range of Carolina hemlock and northward almost to the geographical limits of eastern hemlock in southern Canada and northern Maine. Adelgids are easily transported by wind or on the feathers of birds and the fur of mammals. They look like small black dots at the base of hemlock needles into which they insert their mouthparts and literally suck out the life juices of the tree. Much more obvious than the adults are the cottony-wax-covered egg masses that appear in early spring; a thoroughly infested tree appears lightly dusted with snow. The eggs are produced asexually, and therefore hemlock woolly adelgid genetic diversity is probably low and unchanging, which may make the pest easier to control. But so far no one has figured out how to make use of the fact that evolutionarily they are not making progress.

Once a tree is infested, unless it is treated, death usually occurs within three to five years. Trees near streams and in other wet areas usually hang on a bit longer, and irrigation during dry periods can prolong an infested tree's life; but eastern hemlocks that are naturally resistant to adelgids have not yet been found. Researchers still hope to discover genetically resistant individuals, which is one reason why preemptive felling of hemlock trees is so worrisome. Hopes for natural resistance are supported by the adelgid tolerance of western and Asian species of hemlock, but this is still a long shot.

Hemlock tree deaths have profound ecological consequences, which is to be expected given the influences live hemlock trees have on their environs. Their dense crowns cast deep shade that keeps the soil and water they overtop cool and moist, which is appreciated by trout and trout fisherman alike. The understory vegetation beneath

hemlocks is generally sparse because of both the shade and the acids released from its decomposing needles. Other than hemlock angle moths, there are apparently few obligate hemlock specialists and hence few species that are threatened by its extirpation. Nevertheless, many forest dwellers will suffer when hemlock is no longer an important component of our landscapes. For example, when hemlocks disappear we can expect further declines in the already-beleaguered populations of Acadian flycatchers, black-throated green warblers, and Louisiana waterthrushes.

As was the case after the loss of the once-dominant chestnut of eastern North America, the spaces created when hemlock trees die are colonized rapidly by other tree species, but the resulting forest is never the same. The species that will benefit from the destruction of a hemlock grove vary with local seed sources and other factors. Black birch often appears first, but oaks and maples are also common beneficiaries of hemlock disappearance. It is particularly problematic that where seed sources for exotic invasive tree species are present, such as Norway maple and tree of heaven, they can rapidly come to dominate. Some people may draw comfort from the discovery by paleoecologists that an apparently similar episode of hemlock loss and replacement occurred some 5,000 years ago, but most of us operate within considerably shorter time frames.

There is more to this than the simple economics of ecology. In assessing the consequences of the extirpation of hemlocks from our forests, ravines, swamp margins, and glens, we must realize the aesthetic and spiritual importance of what has long been an iconic species in the Northeast. The tree was ruthlessly cut down and peeled for its tannin-rich bark up through the nineteenth century, but hemlocks have always played central roles in our imaginations. Just to mention hemlocks invokes a series of profound feelings and images. In contrast, in the not-too-distant future, landscape painters may be accused of inventing this deep and densely crowned species as an artistic device. More fundamentally, at least until hemlocks fade in our cultural memories, I suspect that generations to come will not be satisfied when we explain that we let hemlock follow chestnut into oblivion because controlling hemlock woolly adelgids cost a lot of money.

Francis E. Putz is a professor of botany and forestry at the University of Florida where he teaches courses in ecology and plant biology. He tries to practice what he preaches on his own hundred acres of pine savanna and swamp near Gainesville.

"Dust of Snow" from The Poetry of Robert Frost edited by Edward Connery Lathem. Copyright 1951 by Robert Frost, copyright 1923, 1969 by Henry Holt and Company. Reprinted by permission of Henry Holt and Company, LLC.