

Effects of the Removal of Overstory Hemlock on Redback Salamanders and Other Forest-floor Fauna

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Abstract

Eastern hemlock (*Tsuga canadensis* (L.) Carr.) is the second most abundant conifer species in the northeastern United States. It occurs both in almost pure stands and in stands where it is mixed with hardwoods and white pine (*Pinus strobus* L.). Recently, hemlock in the middle-Atlantic and southern New England states has become infested with the hemlock woolly adelgid (*Adelges tsugae* Annand). This insect pest can result in high levels of mortality, opening up the forest canopy and illuminating the forest floor to full sunlight. The effects of the mortality of overstory hemlock on forest wildlife in hemlock-dominated stands is essentially unknown.

In anticipation of adelgid and hemlock looper (*Lambdina* spp.) infestations, overstory hemlock was harvested from 3 hemlock-hardwood stands on the watershed of the Barkhamsted Reservoir in north-central Connecticut between 1992-1998. Some hemlock remained in the harvested stands due to steep slopes, wet areas, or small diameters. The residual structure of the harvested stands was spatially diverse, with essentially clear-cut patches of

pure hemlock mixed with uncut or partially cut patches of hardwoods or mixed species.

To assess the effects of these harvests on forest-floor wildlife, small mammals and terrestrial salamanders were surveyed in the harvested stands and in 3 adjacent and comparable control stands. Vegetation surveys, which included measuring the stumps of harvested trees, showed that the harvested stands were similar to the control stands in both structure and composition prior to the timber harvests. Hemlock seedlings were uncommon in the harvested stands, indicating that it is unlikely that hemlock would predominate in the regenerated stands.

The number of small mammal captures was extremely low in the first year of the study, but increased in the second. In both years, captures were dominated by *Peromyscus* spp. and the number of captured mice were similar in both harvested and control stands. Salamanders, principally the terrestrial, eastern redback salamander (*Plethodon cinereus* Green) occurred in all stands. Salamander numbers were consistently greater in control stands, but they were highly variable among stands within each treatment class. It appears that the terrestrial redback salamander would survive in deciduous and unharvested hemlock refugia in harvested stands, from which they could then repopulate the regenerating stand.

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