THE WEST VIRGINIA UNIVERSITY FOREST HAZARD RATING STUDY: THE HAZARDS OF HAZARD RATING

Ray R. Hicks, Jr., David E. Fosbroke, Shrivenkat Kosuri, Charles B. Yuill
Division of Forestry, West Virginia University, Morgantown, WV 26506

ABSTRACT

The West Virginia University (WVU) Forest is a 7,600-acre tract located along the leading edge of gypsy moth infestation. The hazard rating study at the WVU Forest serves three objectives. First, hazard rating is being used to determine the extent and distribution of damage that can be expected when gypsy moth defoliation occurs. Second, susceptibility and vulnerability equations currently available in the literature are being tested. Finally, through the use of computer technologies such as geographic information systems (GIS), the project demonstrates how to streamline the hazard rating process by applying surrogate variables (e.g. aspect and slope position) for prediction variables that are expensive to measure (e.g. species composition and site index).

Two of the 23 compartments at the WVU Forest were chosen for an in-depth stand analysis. Data were collected on a 1-chain grid to delineate stands. More complete data (including variables used in published hazard rating systems) were collected on a subsample of plots and analyzed using the Silviculture of Allegheny Hardwoods (SILVAH) software. Stand maps were developed and these were compared to stand maps made in the 1950's. The data from the SILVAH plots were used to compute gypsy moth hazard using several susceptibility and vulnerability equations.

The display shows the result of applying these hazard rating equations to six stands in the Fire Tower Block at the WVU Forest. We expect that the high proportion of oak (>75% of the basal area) makes stands 1-3 highly susceptible and vulnerable to gypsy moth. We also expect stands 5 & 6 to be relatively immune to defoliation because of their low proportion of oak (<25%). The three susceptibility equations that we used classified all 6 stands as probably resistant to defoliation. The two vulnerability rating systems developed by Gansner and Herrick predict 5% stem loss in all six stands. The vulnerability equation developed by Crow predicts higher mortality in stands 1, 5, & 6 (>29% basal area loss) than in stand 2 & 3 (20%). Though defoliation has not occurred, we still expect the highest damage to occur in stands 1-3.

Differences in the conditions of stands used to develop these models and those at the WVU Forest seem to account for the unexpected predictions. We are currently building new equations using data from the Appalachian Plateau and are expanding the testing of published models at the WVU Forest. For more information on gypsy moth hazard rating see the paper by Hicks in this proceedings.