The gypsy moth was originally introduced near Boston in 1868 or 1869. It has been slowly expanding its range mostly to the south and west. Its slow spread through the Northeast can be attributed to the limited dispersal capabilities of this insect (females do not fly). It is inevitable that the gypsy moth will continue to spread to the south and west over the next century. In order to plan for the management of the gypsy moth over the next decade and beyond, there is a need to delimit the distribution of susceptible stands in areas that are currently unsampled.

We used USDA Forest Service Forest Inventory and Analysis (FIA) data to calculate the basal area at each plot that is composed of susceptible species. The areas with the highest concentration of susceptible forests were in the central and southern Appalachians, the Cumberland Plateau, the Ozark Mountains, and the northeastern lake states. The finding that the gypsy moth has not yet invaded most of the susceptible forests in the US suggests that there still may be considerable value in limiting the future spread of the gypsy moth. It also indicates that the impacts of defoliation and costs of gypsy moth management are likely to increase in the future.

**FOREST SUSCEPTIBILITY**

The geographical distribution of the suitable habitat for gypsy moth was mapped by interpolation of host species abundance estimated from 1981-1991 forested FIA plots located throughout the eastern US. These data represented the most recent available USDA Forest Service Forest Inventory and Analysis data sampled in each of the thirty-seven states in the Eastern United States. Host abundance for gypsy moth was measured as basal area/ha of species preferred by the gypsy moth (Liebhold et al. 1995a). Our research focuses on estimating the expected geographical extent of gypsy moth through 2025 and which areas within that extent will be the most at risk. We used USDA Forest Service Forest Inventory and Analysis (FIA) data to calculate the basal area of species preferred by gypsy moth and historical survey data to model gypsy moth spread.

**Methods**

**FOREST SUSCEPTIBILITY**

The gypsy moth host basal area (m²/ha) was estimated using ordinary kriging (Figure 4) and then multiplied by the forest density map (Figure 5) to create an abundance map of species preferred by gypsy moth adjusted for forest density (Figure 6). A least-squares regression was run to validate the kriged estimates. The linear model explained about 13% of the variation. Historical spread of gypsy moth was estimated at 21 km/year (Liebhold et al. 1992). A predicted gypsy moth spread map was generated using this historical rate (Figure 8). Finally, the spread map and adjusted host species basal area maps were multiplied to create a map of gypsy moth risk for the next 25 years (Figure 9). Gypsy moth defoliation frequency from 1972-2000 is shown in Figure 9.

**Results**

Gypsy moth host basal area (m²/ha) was estimated using ordinary kriging (Figure 4) and then multiplied by the forest density map (Figure 5) to create an abundance map of species preferred by gypsy moth adjusted for forest density (Figure 6). A least-squares regression was run to validate the kriged estimates. The linear model explained about 13% of the variation. Historical spread of gypsy moth was estimated at 21 km/year (Liebhold et al. 1992). A predicted gypsy moth spread map was generated using this historical rate (Figure 8). Finally, the spread map and adjusted host species basal area maps were multiplied to create a map of gypsy moth risk for the next 25 years (Figure 9). Gypsy moth defoliation frequency from 1972-2000 is shown in Figure 9.

**Conclusions**

Gypsy moth is currently occupying less than one-third of its favorable habitat. The areas most at risk to gypsy moth over the next 25 years are in the central and southern Appalachians, the Cumberland Plateau, the Ozark Mountains, and the northeastern lake states.

**Literature Cited**


