INTEGRATING PRESCRIBED FIRE INTO MANAGEMENT OF MIXED-OAK FORESTS OF THE MID-ATLANTIC REGION: DEVELOPING BASIC FIRE BEHAVIOR AND FUELS INFORMATION FOR THE SILVAH SYSTEM

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In Pennsylvania and other mid-Atlantic states, the SILVAH system is an expert system for managing cherry-maple and northern hardwood forests. Developed by the US Forest Service - Northeastern Research Station, SILVAH is now being updated to develop prescriptions to sustain mixed-oak forests based on understory conditions. This latest version will recommend prescribed fire at critical times in stand development to (1) promote oak seedling establishment and (2) release existing oak reproduction from competing vegetation. However, forest managers will be hindered in using fire, in part, because basic fuels and fire behavior research is lacking.

To help fill these knowledge gaps, funding was obtained from the Joint Fire Sciences Program to evaluate the appropriateness of the existing hardwood fuel models (FM 6, 8, and 9) to common fuel conditions found in mixed-oak forests through a series of computer simulations and intensely monitored prescribed fires. Research sites are in Connecticut, New Jersey, Pennsylvania, Virginia, and West Virginia. In each state, mixed-oak forests slated to be prescribe burned are scouted for areas of uniform fuels consisting of ericaceous shrubs, leaf litter, or hardwood slash. In these areas, rectangular fire behavior plots measuring 30 to 50 feet on a side are deline
ated and inventoried for fuel loadings and other forest-floor conditions. In these plots, five data loggers and thermocouplers are placed, one at each corner and the center. These devices measure and record the heat and speed of the passing flame front, allowing us to compare rate-of-spread to outputs produced by the BEHAVE fire prediction system. The prescribed fires are also visually monitored to estimate flame length.

The excessively wet spring and summer of 2003 made prescribed burning last year a difficult operation. Consequently, only a few fires were monitored so results are preliminary and incomplete. At this point in time, it looks as if Fuel Model 8 is a good representation of mixed mesophytic or northern hardwood leaf litter and Fuel Model 9 accurately describes mixed-oak leaf litter. No fuel model appears to depict ericaceous shrubs, especially mountain laurel, and hardwood slash fuels have not yet been tested.

This study will continue for the foreseeable future until enough data are accumulated to definitively determine the applicability of the hardwood fuel models to forest-floor conditions commonly encountered in mixed-oak forests.

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