

PREDICTING FUEL CONSUMPTION UNDER HIGH-FREQUENCY FIRE REGIMES IN OAK-PINE MIXEDWOOD FORESTS BY USING THE FIRST ORDER FIRE EFFECTS MODEL IN ALABAMA, USA

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In the Southeastern Region, long-term fire suppression has been tied to mesophication and a landscape-scale decline in the prevalence of oak-dominated forests. To combat this, the restoration of historic, high-frequency, low-intensity prescribed fire regimes is regularly proposed as a management practice for xeric oak-pine systems. The First Order Fire Effects Model (FOFEM) is a fire effects prediction tool designed for use with cover types that span North America, but its accuracy in predicting fuel consumption for frequently burned forest systems in the Eastern United States has not been fully evaluated. We evaluated FOFEM consumption relative to destructive and nondestructive field consumption, over the course of six prescribed burns on a 3-year fire return interval, in pine-dominated mixedwoods on the William B. Bankhead National Forest, AL. FOFEM overestimated consumption of litter, duff, and fine woody fuels (1-hour and 10-hour), but repeated burning reduced the magnitude of this error, such that FOFEM predictions were equivalent to field values within 2.75 Mg ha^{-1} (or less) after three fires. Sampling methodology did not have a strong influence on modeled percentage of consumption, but nondestructive sampling underestimated destructive preburn biomass of litter, duff, and 1-hour fuels and overestimated that of 10-hour fuels. Based on our findings, we will present recommendations for managers interested in using FOFEM to model fuel consumption in Southern United States mixedwoods.

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