

MODELING REGENERATION AND EARLY STAND DYNAMICS OF MISSOURI OZARK FORESTS

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ABSTRACT

Projecting the effects of silvicultural choices on forest regeneration has traditionally been difficult. In an effort to improve upon this, a collection of empirical models based on leading hypotheses and theories of tree and stand development were constructed to simulate regeneration and early stand dynamics in Missouri Ozark forests. The stochastic models of establishment across a gradient of residual overstory density (Chapter 2) are consistent with the variable nature of the regeneration process. Linking establishment outcomes with models of annual height growth based on residual overstory density (Chapter 3) and size (Chapter 4) provides a powerful tool for both applied and empirical objectives.

Quantitative interpretation of the regeneration process is as important as simulation of it. Developmental milestones for successful canopy recruitment were identified to improve evaluations of individual trees in even-aged stands during the regeneration process (Chapter 4). The reference chart methodology presented in Chapter 5 increases the inference obtainable from a single measurement by providing interpretation of individual tree development in the context of a variety of peer groups. Though imperfect, the combination of these models and tools should increase our understanding and ability to recreate the regeneration process, and as a result, the efficacy of our efforts to manipulate it.