

REGENERATION ATTRIBUTES OF TREE SPECIES IN THE CENTRAL HARDWOODS TYPE

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Processes relating to tree regeneration are many and complex. To develop generalized conceptual models of tree regeneration, we synthesized information from the forest ecology literature. We produced a list of 21 regeneration attributes that describe flowering, seed production, seed dispersal, dormancy, germination environment, seedling characteristics, and vegetative reproduction. Attributes were classified for each of 62 tree species in the central portion of the eastern hardwoods region. The resulting data are categorical, both nominal and ordinal. We applied multivariate techniques to determine which species were similar and which attributes contributed most to species groupings, with special attention to constraints of categorical data. Based on Jaccard's similarity coefficient and Ward's clustering method, seven species clusters were evident. Given the correlations from Bray-Curtis ordination, thirteen attributes that contributed strongly to the groupings (univariate F-tests, $p < .05$) are being used to develop conceptual models of the regeneration pathways for each group. The pathways will be parameterized for each species, and then used to develop a rule-based mechanistic model of tree regeneration (Mechanistic Origination Model: MOM). We will continue to apply the same techniques to other regions (eg., northern hardwoods).

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