

Development and application of a spatial IBM to forecast greater prairie-chicken population responses to land use in the Flint Hills region of Kansas

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Greater prairie-chicken (*Tympanachus cupido*) populations have been on the decline for decades. Recent efforts to reverse this trend are focusing on two specific disturbance regimes, cattle grazing and field burning, both prevalent in the Flint Hill region of Kansas -- an area of critical prairie-chicken habitat. Field burning and grazing is necessary for arresting the transition of prairies into shrublands and forests, but fire application (frequency and timing) is managed to optimize livestock production, and thus may not be ideal for prairie-chicken preservation. Not surprisingly, it is completely infeasible to perform real-world tests that might quantify the relationship between fire management and prairie chicken population trends at large spatial scales. We addressed this constraint by developing a spatial IBM (individual-based model) capable of forecasting prairie chicken population trends and their responses to multiple interacting disturbance regimes. Here, we report on our initial results from this work, in which we have examined how sensitive prairie chicken population trends are to changes in landscape structure.