SPATIAL AND TEMPORAL ANALYSIS OF DEER-VEHICLE ACCIDENTS IN ILLINOIS

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ABSTRACT

Since the 1990s, the number of deer-vehicle accidents has been increasing in Illinois as well as the United States. Deer-vehicle accidents have a great economic impact on society, including property damage as well as human injuries and fatalities. Although state and local governments have installed mitigation devices such as fencing and deer-crossing signs, deer-vehicle accidents continue to rise.

This paper examines whether deer-vehicle accidents are spatial or temporal random occurrences. After determining the strength of relationship between deer-vehicle accidents and possible factors such as landscape characteristics, traffic volume, and deer hunting, statewide accident data were employed in order to analyze temporal patterns of deer-vehicle accidents. At a large scale, locations with high probabilities of deer-vehicle accidents (hot spots prediction model) in McDonough County were identified based on the following criteria: (1) distance from the edge of forest to roads; (2) distance from the edge of water bodies to roads; and (3) degree of slope near these roads.

Additionally, accident data from the McDonough County Sheriff's Department were converted and mapped in order to evaluate the accuracy of the hot spots predicting model. To strengthen the hot spots prediction model, deer accident rate of each road segment in relation to traffic volume was calculated. Based on the results, a couple of suggestions were offered: alternative locations of mitigation devices must be found; and the general public must be educated to reduce the number of deer-vehicle accidents in the future.