

Home Range and Spatial Interaction Modelling of Black Bears

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Abstract : Interaction between individuals within the same species is an important component of population dynamics. An interaction can be either static (based on spatial overlap) or dynamic (based on movement interactions). Using GPS collar data, we can quantify both static and dynamic interactions between black bears. The goal of this work is to determine the level of black bear interactions using the 95% and 50% home ranges, as well as to model black bear spatial interactions, which could be attraction, avoidance/repulsion, or a lack of interaction at all, to gain new insights and improve our understanding of ecological processes. Recent methodological developments in home range estimation, inhomogeneous multitype/cross-type summary statistics, and envelope testing methods are explored to study the nature of black bear interactions. Our findings, in general, indicate that the black bears of one type in our data set tend to cluster around another type.

Keywords : autocorrelated kernel density estimator, cross-type summary function, inhomogeneous multitype Poisson process, kernel density estimator, minimum convex polygon, pointwise and global envelope tests

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