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Abstracts

**SPECIAL SECTION: HIERARCHICAL MODELS IN AVIAN ECOLOGY**

**CROSS-SCALE CORRELATIONS AND THE DESIGN AND ANALYSIS OF AVIAN HABITAT SELECTION STUDIES**

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*Abstract.* It has long been suggested that birds select habitat hierarchically, progressing from coarser to finer spatial scales. This hypothesis, in conjunction with the realization that many organisms likely respond to environmental patterns at multiple spatial scales, has led to a large number of avian habitat studies that have attempted to quantify habitat associations at multiple scales. Typically, multiscale habitat selection studies involve the assessment of habitat selection separately at two or more scales. Until recently, these studies have ignored the potential for cross-scale correlations: correlations among habitat variables across scales. If environmental patterns are correlated across the scales being analyzed, researchers using traditional analytical methods may reach erroneous conclusions about the presence or strength of habitat associations at a given scale. We discuss the ways in which cross-scale correlations manifest themselves in two types of habitat selection studies: (1) “constrained” designs that assume a hierarchical ordering of habitat selection decisions, and (2) “unconstrained” designs, which do not assume such a selection process. We demonstrate approaches for quantifying and modeling cross-scale correlations, including a simulation model, a variance decomposition technique, and a hierarchical modeling approach based on classification tree analysis. We conclude that cross-scale correlations have the potential to affect data interpretation in all types of habitat selection studies and that, even with careful attention to experimental design and the application of newly developed statistical techniques, it is likely their effects cannot be eliminated.

*Key words:* classification tree analysis, collinearity, correlation, habitat selection, hierarchy, nest-site selection, variance decomposition.