

Testing the Eltonian Noise Hypothesis in a Species-rich Community

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Abstract

Few ecological niche models (ENM) incorporate the Eltonian niche or examine a population's niche at multiple spatial scales. We used Bayesian Joint Species Distribution Models (JSDMs) across multiple spatial scales to examine whether freshwater mussel communities in east Texas adhered to the Eltonian Noise Hypothesis, which asserts that species interactions exert greater influence on conspecific species at finer spatial scales. For both abundance and presence data, we observed a statistically greater number of strong interactions at the finest spatial scale compared to larger spatial scales. While 34% of abundance interactions and 24% of presence interactions showed strong positive relationships, only 6% of abundance interactions and 0% of presence interactions showed strong negative relationships. We found that freshwater mussel communities conform to the Eltonian Noise Hypothesis. Inclusion of the Eltonian niche and consideration of spatial scale are necessary to accurately model niches and increase efficacy of ENMs as conservation tools.

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