

Distributions of LRS in varying environments

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Abstract

The lifetime reproductive success (LRS) of individuals is affected by random events such as death, realized growth, or realized reproduction, and the outcomes of these events can differ even when individuals have identical probabilities. Another source of randomness arises when these probabilities also change over time in variable environments. For structured populations in stochastic environments, we extend our recent method to determine how birth environment and birth stage determine the random distribution of the LRS. Our results provide a null model that quantifies effects on LRS of just the birth size or stage. Using Roe deer *Capreolus capreolus* as a case study, we show that the effect of an individual's birth environment on LRS varies with the frequency of environments and their temporal autocorrelation, and that lifetime performance is affected by changes in the pattern of environmental states expected as a result of climate change.

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