Supporting Information

Demographic consequences of changing environmental periodicity, *Ecology*

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Appendix S6 - Workflow of the stochastic simulations projecting population dynamics and assessing their sensitivity to perturbations in the strength of vital-rate periodicity.

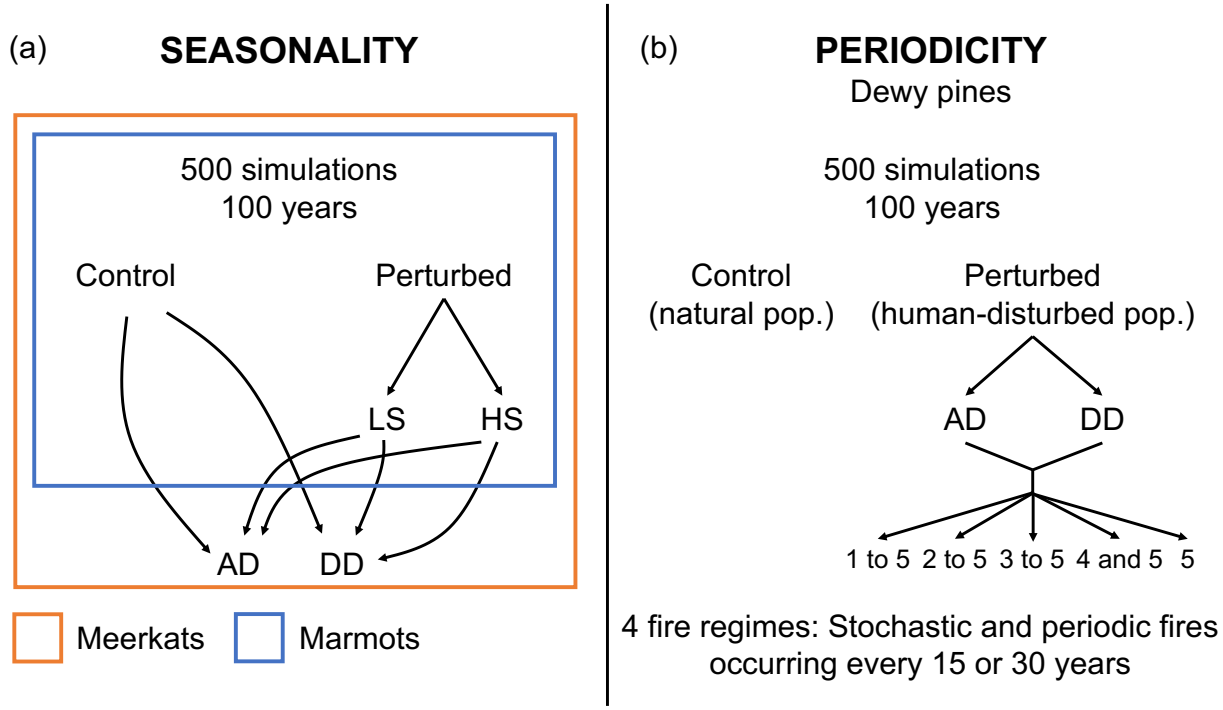

Figure S1 – Stochastic simulations performed to assess the effect of perturbations in the strength of vital-rate periodic patterns on population dynamics. For each simulation scenario (control or perturbed vital-rate pattern), we performed 500 simulations projecting the population dynamics for 100 years. (a) To assess the effect of perturbations in the strength of vital-rate seasonal patterns on marmot and meerkat population dynamics, we simulated population dynamics by projecting matrix population models (MPMs) representing little- (LS) or highly-seasonal (HS) years, for each vital rate that differed among seasons across all years (i.e., for

which the random effect of the year applied on both the mean vital rate and the slope between seasons). Control simulations projected MPMs without perturbing the strength of vital-rate seasonality (i.e., by keeping the observed vital-rate seasonal patterns). For the meerkat and the dewy pine populations, which show density-dependent dynamics, we also performed simulations with density dependence (DD) or at constant average density (AD). (b) For the dewy pine, characterized by periodic patterns in vital rates determined by fire frequency, we projected the populations under four fire regimes: stochastic or periodic fires occurring every 15 or 30 years. In addition, we perturbed post-fire periodicity in vital rates by simulating human disturbance (i.e., using MPMs parameterized with vital rates of a human-disturbed population) in natural (i.e., non disturbed) populations in various combinations of post-fire states (starting from the fifth and last post-fire state and increasingly in earlier states). For each fire regime, we considered periodic transitions in post-fire states in natural populations without human disturbance as the control.