Habitat heterogeneity affects the thermal ecology of an endangered lizard

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June 24, 2021

Abstract

Global climate change is already contributing to the extirpation of numerous species worldwide, and sensitive species will continue to face challenges associated with rising temperatures throughout this century and beyond. It is especially important to evaluate the thermal ecology of endangered ectotherm species now so that mitigation measures can be taken as early as possible. A recent study of the thermal ecology of the federally endangered Blunt-Nosed Leopard Lizard (Gambelia sila) suggested that they face major activity restrictions due to thermal constraints in their desert habitat, but that large shade-providing shrubs act as thermal buffers to allow them to maintain surface activity without overheating. We replicated this study and also included a population of G. sila with no access to large shrubs to facilitate comparison of the thermal ecology of G. sila in shrubless and shrubbed populations. We found that G. sila without access to shrubs spent more time sheltering inside rodent burrows than lizards with access to shrubs, especially during the hot summer months. Lizards from a shrubbed population had higher midday body temperatures and therefore poorer thermoregulatory accuracy than G. sila from a shrubless population, suggesting that greater surface activity may represent a thermoregulatory tradeoff for G. sila. Lizards at both sites are currently constrained from using open, sunny microhabitats for much of the day during their short active seasons, and our projections suggest that climate change will exacerbate these restrictions and force G. sila to use rodent burrows for shelter even more than they do now, especially at sites without access to shrubs. The continued management of shrubs and of burrowing rodents at G. sila sites is therefore essential to the survival of this endangered species.

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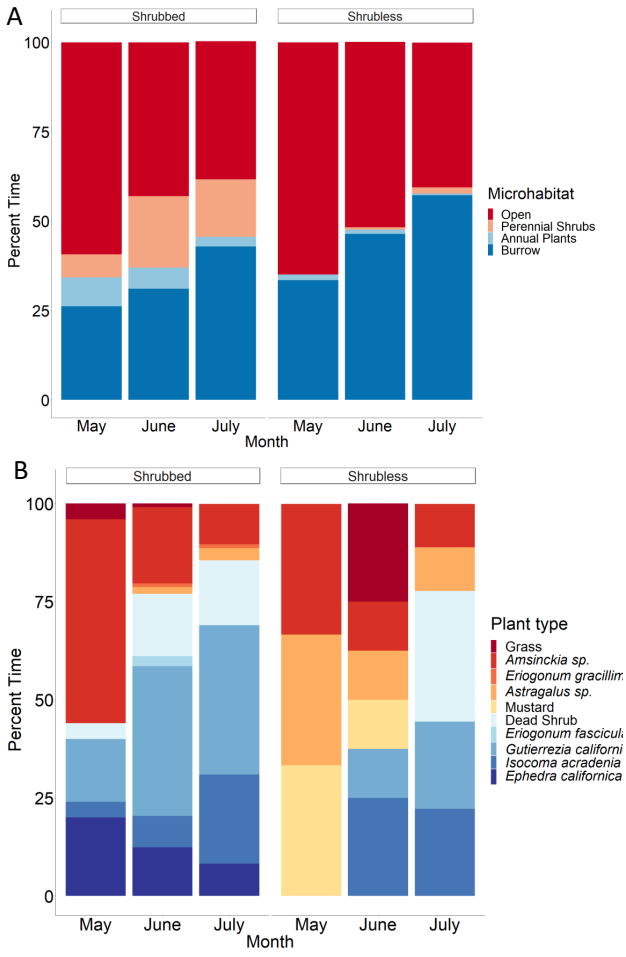

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