1) Abstract

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Are urban-adapted species ready for climate change? Dynamic avian habitat use and its implications for future coexistence

Conserving and managing wildlife communities across shifting landscapes requires understanding of how dynamic environmental factors that shape habitat vary across space and time. Declines in wildlife diversity due to landscape development and changing climate conditions are widely documented. However, the combined future impacts of these multiple environmental stressors on wildlife community composition remain unclear, in part due to the lack of data at the spatiotemporal scales necessary for predicting how wildlife with diverse habitat needs respond to long-term anthropogenic change. Furthermore, wildlife community dynamics have uncertain outcomes for the nature of human-wildlife interactions, as sensitivities to interacting environmental changes can vary among species of conservation need and among wildlife groups that people perceive as contributing ecosystem services (e.g., recreational opportunities, pollination, seed dispersal) and disservices (i.e., human-wildlife conflicts). With these gaps in mind, here we ask: how have combinations of long-term environmental changes impacted ecologically and culturally significant wildlife and their contributions of ecosystem dis/services? We first produced a two-decade, multi-season spatial dataset of environmental conditions (urbanization, vegetation, climate) across the rapidly developing metropolitan region of Phoenix, AZ. We then analyzed long-term drivers of bird communities by combining these spatial datasets with avian point-survey data collected seasonally during the same time periods (winter and spring; 2001-2016), as part of the Central-Arizona Phoenix Long-Term Ecological Research program. Results show that increases in impervious surface area were negatively associated with bird presence, abundance, and species richness, with seasonally variable temperature and vegetation influencing avian site use across the gradient of urbanization. However, these relationships varied widely among functional guilds and species of management interest, including many of Arizona's Species of Greatest Conservation Need. By improving understanding of how long-term trends in environmental conditions interact to shape wildlife community dynamics, our findings – and the methodology used to produce them – can facilitate prediction of how conservation needs may evolve as landscapes and the communities inhabiting them adapt to change.

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3) IRTS:

In order of descending fit:

Adapting to City Life

Ecosystem Structure and Functioning

Environment and Human Wellbeing

Urban Climate and Air Quality