

Urban Wildlife Institute | Conservation & Science

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Dear Dr. Coulson,

We are pleased to submit a manuscript titled “Landscape differences among cities alter species’ responses to urbanization” to be considered for publication as a letter in *Ecology Letters*.

Urbanization is the most rapidly expanding land use type on Earth, reducing natural habitat for wildlife and increasing overlap between humans and animals. To understand how to preserve biodiversity and increase human well-being in cities, we first need to identify testable predictions of how wildlife respond to urbanization. However, nearly all urban ecological studies focus on a single city, which severely limits our understanding of urban areas as ecosystems because responses cannot be extrapolated to other cities that differ in landscape composition or population density. As such, multi-city comparative approaches are necessary to identify generalizable patterns across cities. Such assessments, however, remain challenging because few coordinated efforts monitor biodiversity in multiple cities.

In this manuscript, we leverage data from 10 cities in the Urban Wildlife Information Network, a systematic multi-city biodiversity monitoring survey, to delineate continent-scale patterns in urban species assemblages of eight widespread North American mammals. By analyzing over 25,000 nights of motion-triggered trail camera data, we illustrate that species’ responses to urbanization (i.e., their within-city distribution) depends on landscape-scale differences in greenspace availability and housing density among cities. If we analyzed these data as independent single-city studies, we would infer dissimilar species-specific responses to urbanization. Analyzing them together, as we have done here, allows us to see that these apparent disagreements are explained by these landscape-scale differences. We also observed consistent declines in species richness with increasing urbanization in only the most densely developed cities. Conversely, species richness either increased, decreased, or stayed the same along the urbanization gradient of less densely built cities.

On an urbanizing planet, a framework for understanding wildlife at a global scale is essential for conservation and human-wildlife co-existence. Our work is a critical step towards that understanding as it is the first multi-city analysis that demonstrates how city characteristics shape species’ responses to urbanization. Finally, this article is currently formatted for Science, though the methods are now located after the introduction. We have also included the additional requested information on the title page.

On behalf of myself and my coauthors, I thank you for consideration of our manuscript.

Sincerely,

Mason Fidino, PhD