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Species' responses to anthropogenic habitats across the United States

Habitat conversion is the primary threat to terrestrial wildlife. Biologists generally categorize species into three groups based on how they respond: species that have readily adapted and now specialize on anthropogenic habitats; those that are restricted to natural environments; and habitat generalists. However, recent studies suggest that different populations of the same species may respond differently to habitat conversion. That is, in some areas species may readily occupy anthropogenic habitats whereas, in others they may not. Understanding the contexts in which species can be conserved alongside humans in working landscapes, and when protected areas are essential, is key to designing effective conservation plans for wildlife in the Anthropocene. Here, we leverage a large-scale camera trapping dataset, Snapshot USA, with over 2000 sites distributed across the US. Using community occupancy modelling of wide-ranging mammals, we ask two key questions: First, are species' responses to anthropogenic habitats (i.e., agriculture and urban areas) consistent across their range? Or do species change their habitat affiliations, acting as anthropogenic habitat specialists, natural habitat specialists, or habitat generalists in some regions but not others? We predict that although some species will always avoid or affiliate with anthropogenic habitats, many habitat generalists strongly affiliate with anthropogenic habitats in some regions and natural habitats in others. Second, can spatial variation in macroclimate explain species responses to habitat conversion? We predict that in especially warm/dry regions, species will become more restricted to natural environments. This is because many anthropogenic habitats are stressful and lack the key microhabitats needed to avoid temperature extremes. We discuss our findings at both species and community levels.