

# Species facing climate change could find help in odd place: Urban environments

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Devoting 15% of space in urban and suburban environments to high quality habitat is enough to facilitate movement of many species to areas where they may better survive. Credit: Leone Brown, Tufts University

When it comes to wildlife conservation efforts, urban environments could be far more helpful than we think, according to new research. A

study published today in *Ecology* shows that animals move faster through 'low quality' habitats—evidence that could change the way conservationists think about managing landscapes to help species move in response to climate change. In light of the recent UN report indicating that 1 million species are threatened with extinction, the study provides a framework for definitive action to help preserve many species at risk. The work was carried out by researchers at Tufts University, University of Liverpool, Washington State University and the University of Ottawa.

For landscapes to facilitate range expansion, there is a balance to be struck between promoting movement with low-quality habitat (places where a species can survive, but does not have all the resources it needs to complete its life cycle) and promoting population growth with high-quality habitat. They conclude that low-quality habitats that meet a minimum standard could actually provide a benefit as conduits for movement.

The underlying behaviour that explains this surprising result is that when animals find themselves in an inhospitable area they tend to make longer and straighter movements. As long as they do not die in this area, their arrival at another breeding area will tend to be quicker. The researchers used data from 78 species in 70 studies to show that in 73 percent of cases, animals moved faster through 'lower-quality' habitats. To illustrate what this principle means on the ground, the team used mathematical models to calculate rates of range expansion across a variety of landscapes for an exemplar species—the Baltimore checkerspot butterfly. They showed that range expansion is fastest through landscapes composed of around 15 percent high-quality habitat and 85 percent unsuitable habitat.

"At landscape scales, 15% high-quality habitat is still more than currently exists in most ecosystems. Nonetheless, our findings point to the potential of using suburban and even urban greenspace as

underappreciated areas that could facilitate range shifts, if [green spaces](#) such as lawns were converted to native plant gardens, which have high conservation potential for insects and other [wildlife species](#)," said lead author Elizabeth Crone, a professor of biology at Tufts University.

Jenny Hodgson, co-author of the study and lecturer in evolution, ecology and behaviour at the University of Liverpool added: "This could offer a new perspective of flexibility for landscape planners: they needn't worry if they can't create unbroken tracts of high-quality wildlife habitat, instead they can create strategic 'stepping stones' in urban and agricultural areas. However, the stepping stones need to provide resources for breeding, not just temporary food resources."

The researchers hope their study will make designers of city and suburban environments start to think differently about their approach, by providing a starting point to assess the consequences of [landscape](#) structure in the management of wildlife, regardless of whether the goal is to enhance or restrict the potential for range expansion.

"Nearly all high-profile studies about biodiversity conservation have focused on documenting the patterns of species habitat use and movement. We feel that more insights are gained by considering the mechanisms behind these patterns," said co-author Cheryl Schultz, professor of conservation biology at Washington State University. "In this case, our discovery that lower quality habitats assist [species](#) movement to better habitats sets up a more realistic and achievable objective for urban landscapers, and provides an important complement to conservation efforts focused on preserving large tracts of natural areas and high-quality [habitat](#)."

**More information:** Elizabeth E. Crone et al, Faster movement in nonhabitat matrix promotes range shifts in heterogeneous landscapes, *Ecology* (2019). [DOI: 10.1002/ecy.2701](https://doi.org/10.1002/ecy.2701)

Provided by Tufts University

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