

Disentangling the effect of linear barriers from other landscape elements to identify potential movement pathways

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Overview

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Abstract

Identifying potential movement pathways while designing corridors takes into account various landscape elements that impede animal movement. However, current approaches make it difficult to incorporate fine resolution data on linear barriers to identify potential crossing points. Often these linear barriers occur at spatial resolutions that are much smaller than other landscape elements, and are ignored during the modelling process. In reality, they might actually impede movement of animals (eg, embankments along roads). Further, the presence of associate structures along these linear barriers (eg, houses along roads), makes it difficult to separate the two processes and prioritise effective conservation action. We surveyed animal populations across body size and dispersal distances and mapped linear barriers in a critical wildlife corridor, the Shencottah Gap in the southern Western Ghats. Adopting a graph theory approach and using resistance matrices, we demonstrate the possibility of using data at multiple resolutions to disentangle effects of linear barriers from other landscape features. Our results identified potential crossing points across a national highway and a railway line. We also prioritised conservation actions that are necessary to restore connectivity within this corridor, including engineering structures and land-use changes.