Eco-friendly soil amendments improve growth, antioxidant activities, and root colonization in lingrain (Linum Usitatissimum L.) under drought conditions

ABSTRACT

Fragmentation and habitat loss can restrict species movement and reduce connectivity, negatively impacting biodiversity. Characterising the overall connectivity of an area can inform better management of human modified landscapes. Contemporary connectivity modelling methods seldom incorporate fine-scale movement patterns associated with movement between fine-scaled structural connectivity elements such as scattered trees, roadside corridors and small patches of habitat. This study aims to characterise connectivity within the Karuah-Myall catchments, a typical woodland ecosystem that is fragmented by agriculture, using least-cost path analysis and a graph-theoretic approach; it focuses on how fine-scaled vegetation such as scattered trees support connectivity. We mapped scattered (and paddock) trees within this agricultural landscape where the main human modified land use was pasture. We modelled connectivity for a general representative woodland species using an interpatch dispersal distance and gap crossing threshold, and resistance from different land cover types. The gap crossing distance threshold was used to model movement between fine-scaled vegetation features. We compared the least-cost paths modelled with and without scattered trees. Results: Our results show that by excluding scattered trees, least-cost paths across the cleared pasture landscape did not reflect the types of movement patterns typically observed from field studies, such as those associated with a foray-search strategy used by small and medium mammals and birds. The modelling also shows that the Karuah-Myall catchments are well connected and provide value to biodiversity beyond the catchment borders, by connecting coastal vegetation to the Great Eastern Ranges national wildlife corridor initiative. Conclusion: Connectivity models that exclude fine-scale landscape features such as scattered trees and small, linear patches risk misrepresenting connectivity patterns. Models of regional-scale connectivity can be influenced by the presence or absence of even the smallest features, such as scattered trees.

Keyword: Scattered trees; Landscape connectivity; Gap crossing; Fragmentation; Agricultural landscape