

Supporting effect of landscape characteristics of urban green ecotone on avian community: A case study of Huangshan City Center

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Abstract

Urban green ecotone plays an increasingly important role in supporting avian communities. Research on ecotone primarily focuses on large scale and mesoscale effects, leaving small-scale relationships between interface mutations and avian communities poorly understood. This study focused on small-scale urban green spaces and examined 29 sample plots from four urban green spaces in downtown Huangshan, observing bird species and numbers as indicators of avian communities. Landscape patterns such as patch area, density, diversity index, and vegetation characteristics such as vertical forest structure, coverage, evergreen, deciduous, flowering, and fruits plants were selected as factors affecting bird diversity in urban green ecotones. The results showed that 1) ecotone area exhibited a rich composition of avian communities, including greater species diversity and numbers than that in the pure forest area. 2) Ecotone zones showed distinct characteristics—higher patch density and diversity index—indicating rich land-use types and spatial heterogeneity, supporting bird species diversity. While tree and deciduous species appeared similar between the ecotone zone and pure forest area, significant differences were notable in forest facies, cover, shrubs, evergreen, flowering and fruit plants. The coverage value of the ecotone sample was lower than that of the pure forest sample but higher than that of the pure forest sample in terms of forest facies, shrubs, evergreens, and fruit plants. 3) Bird species observed in the ecotone area showed significant correlation with shrubs ($r=0.284$, $p<0.01$), leaf litter ($r=0.261$, $p<0.01$), patch density ($r=0.326$, $p<0.01$), and patch index ($r=0.361$, $p<0.01$). A negative correlation was noticed with coverage ($r=-0.262$, $p<0.01$), though it did not significantly affect bird species. These findings will hopefully help refine the spatial layout patterns of urban green spaces and optimize plant allocation for enhanced environmental impact.

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