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*Ecologia e sostenibilità:
strategie per affrontare le sfide del terzo millennio*



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Identify priority areas for protection and restoration action by assessing spatiotemporal changes in forest connectivity in Sicily (1990–2018)

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In Sicily, a Mediterranean island characterized by high biodiversity and increasing anthropogenic pressure, forest connectivity is a key indicator for assessing ecosystem health and guiding effective conservation and management strategies. This study aims to identify degraded areas, areas in need of protection, and potential zones for reforestation efforts, by investigating changes in forest connectivity between 1990 and 2018,. We assessed spatial and quantitative changes in forest connectivity at the regional level, by using Corine Land Cover data and connectivity models based on circuit theory (Circuitscape). A statistical analysis was performed to compare 1990 and 2018 scenarios. The results revealed a decline in forest connectivity in several key areas, primarily due to infrastructure expansion and land-use changes. However, some regions remained resilient or showed improvements, often overlapping with areas protected under the Natura 2000 network. Forest connectivity is particularly relevant in the Sicilian context, given its ecological significance and the island ecosystems vulnerability to fragmentation. Incorporating connectivity metrics into spatial planning may provide a practical approach for identifying vulnerable zones and prioritizing restoration actions. This is especially timely considering the objectives of Italy's National Forest Strategy and the targets set by the EU Nature Restoration Law, which emphasize restoring ecological connectivity as a central pillar for achieving resilient and functioning forest landscapes.