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LE SCIENZE AGRARIE NELL'ANTROPOCENE:
DALLA PRODUTTIVITÀ ALLA TUTELA
DEL PATRIMONIO MATERIALE E CULTURALE

BOOK OF ABSTRACTS

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Land use legacy drives post-abandonment forest structure and understorey composition: a multidisciplinary approach to manage novel forest landscapes

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Abstract

In European mountain regions, centuries of interaction between natural and anthropic dynamics have shaped semi-natural agro-silvo-pastoral ecosystems. Traditional practices, such as silviculture and grazing, favoured the establishment of complex landscape mosaics characterised by an interspersion of forests, wood-pastures, grasslands, and cultivated land.
However, post-World War II socio-economic changes have triggered widespread land abandonment, resulting in a transformation of grassland-dominated areasinto forests. This study aimed to spatially discriminate the management strategies suitable for post-abandonment forests using a multiple scales (from landscape to survey scale) and disciplines (plant, forest and historical landscape ecology) assessment of the land use legacy effects on forest structure and understorey. We identified post-abandonment forests within a western Alps catchment through a land use/land cover change detection from 1954 to 2017. Field surveys were conducted across three different land use legacies (transitions from grasslands, wood-pastures, and sparse forests to dense forests) to collect data on forest structure and understorey composition. Using Redundancy Analysis (RDA), we explored the land use legacy effects on post-abandonment forests, with forest structure and understory descriptors as response variables and environmental factors as predictors. Over the study period, 29 % of the landscape experienced land use changes, with forest expanding at the expense of open areas. RDA analysis revealed ecological and environmental differences among post-abandonment forests, notably depending on the historical presence of biological legacies: forests derived from former wooded areas exhibit conditions far from natural trajectories, while those derived from former grasslands are still related with historical land use conditions. Starting from these findings, we advocate an integrated management approach that considers historical land use legacies and their ecological implications on novel landscapes. This approach aims to optimise the planning of post-abandonment forests and identify areas where pastoral activity restoration is ecologically most suitable.

Keywords

land use change, land use legacies, land abandonment, natural reforestation, landscape planning