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Abstract

Biodiversity Differences between Managed and Unmanaged Forests: Meta-Analysis of Species Richness in Europe

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Abstract:

Past and present pressures on forest resources have led to a drastic decrease in the surface area of unmanaged forests in Europe. Changes in forest structure, composition, and dynamics inevitably lead to changes in the biodiversity of forest-dwelling species. The possible biodiversity gains and losses due to forest management (i.e., anthropogenic pressures related to direct forest resource use), however, have never been assessed at a pan-European scale. We used meta-analysis to review 49 published papers containing 120 individual comparisons of species richness between unmanaged and managed forests throughout Europe. We explored the response of different taxonomic groups and the variability of their response with respect to time since abandonment and intensity of forest management. Species richness was slightly higher in unmanaged than in managed forests. Species dependent of forest cover continuity, deadwood, and large trees (bryophytes, lichens, fungi, saproxylic beetles) and carabids were negatively affected by forest management. In contrast, vascular plant species were favoured. The response for birds was heterogeneous and probably

depended more on factors such as landscape patterns. The global difference in species richness between unmanaged and managed forests increased with time since abandonment and indicated a gradual recovery of biodiversity. Clearcut forests in which the composition of tree species changed had the strongest effect on species richness, but the effects of different types of management on taxa could not be assessed in a robust way because of low numbers of replications in the management-intensity classes. Our results show that some taxa are more affected by forestry than others, but there is a need for research into poorly studied species groups in Europe and in particular locations. Our meta-analysis supports the need for a coordinated European research network to study and monitor the biodiversity of different taxa in managed and unmanaged forests.

[biodiversity](#)

[forest management](#)

[taxonomy](#)

Notes

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Tartalom:

Introduction

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Implications for Forest Management and Conservation Policy

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Supporting Information

Literature Cited

conservation policy, forest management abandonment, management intensity, meta-analysis, species richness, taxonomic diversity

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