

**Siitonen, J. (2001): Forest management, coarse woody debris and saproxylic organisms: Fennoscandian boreal forests as an example. Ecological Bulletins 49: 11-41.**

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First author: Siitonen, Juha

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Abstract

Forest management, coarse woody debris and saproxylic organisms:  
Fennoscandian boreal forests as an example  
Juha Siitonen

A conservative estimate for the total number of species dependent on dead-wood habitats is 4000-5000 within the area of Finland, which accounts for 20-25% of all forestdwelling species. A large body of data concerning the average amounts of coarse woody debris (CWD) in both natural and managed forests has accumulated during the 1990s in Fennoscandia, including results from national forest inventories. The average volume of CWD in old-growth forests is generally 60-90 m<sup>3</sup>ha<sup>-1</sup> in southern Fennoscandia, and declines to 20 m<sup>3</sup>ha<sup>-1</sup> close to the timberline. Available data and modelling results indicate that the volume is even much higher following disturbance, and only slightly lower in mature natural forests. In managed forest landscapes the average volumes vary between 2 and 10 m<sup>3</sup>ha<sup>-1</sup> depending on the region. This means that the average amount of CWD at the landscape level has probably been reduced by 90-98%. General species-area relationships suggest that such a reduction in available habitat might lead to the disappearance of > 50% of original saproxylic species in managed forests in the long term. Several recent studies have shown that the number of saproxylic species per stand depends on the amount of CWD, and also on the average size and decay stage of dead trunks. These relationships can be explained by either higher habitat diversity (more different niches) or larger population sizes of individual species (lower risk for local extinction) with increasing amount of CWD. A third important factor explaining local species richness of species living in

ephemeral habitat patches, i.e. dead trees that decay away, is the spatiotemporal continuity of suitable host trees. Important theoretical and practical issues for conservation, management and research include, for instance, how well the remaining high-quality patches (e.g. old-growth fragments, key habitats) can secure the regional persistence of saproxylic species, and how much, what kind, and where CWD should be retained in the ordinary managed forests in order to maintain most of the species.

[biodiversity](#)

[biodiversity: fungus, lichen](#)

[biodiversity: arthropods](#)

[forest management](#)

[deadwood](#)

Notes

Forest management, coarse woody debris and saproxylic organisms:

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Juha Siitonen

Tartalom:

CWD in natural and managed forests

CWD volume in natural forests

CWD quality in natural forests

CWD dynamics in natural forests

Examples of successional CWD models

CWD in managed forests

Saproxylic species in boreal forests

Dead-wood microhabitats and decay succession

Disturbances, succession and continuity

Number of saproxylic species in different taxa

Regional and stand-level species richness

Effects of forest management on species richness of saproxylics

Amount, quality and continuity of CWD

Large-scale substrate decline: effects on regional species richness?

Threatened species

Fennoscandian case studies

Old-growth vs mature managed forests

Comparison including young successional stages, and retention trees

Fragmentation and other large-scale effects

Implications for conservation, management and research

## References

Címszavazva - VA

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