

The return of the wildwood

Appendix

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For the full article, see *British Wildlife* Volume 35, Number 1, October 2023

Table 1. Ecological attributes for the evaluation, management and restoration of temperate old-growth forest ecosystems, based on forests in eastern USA (adapted from Newton 2007).

Property	Potential values in old-growth forests
Tree size	Tend to be characterised by relatively high numbers of large, old trees. Basal area values (the cross-sectional area of trees) may be around 30m ² per ha. The high structural complexity of such trees can provide habitat for hundreds of other species.
Canopy composition	Tend to be dominated by only a few relatively shade-tolerant species. Successional forests tend to incorporate a larger number of tree species, including shade-intolerant ones. Such species may also colonise tree-fall gaps in older stands.
Coarse woody debris	Includes fallen logs, snags and large branches. Deadwood is an important habitat resource for many organisms, including birds, mammals, invertebrates and fungi. Highest volumes tend to be recorded in old-growth stands, where values may approach 30 tonnes per ha.
Herbaceous layer	Many old-growth forests are characterised by a diverse herbaceous flora, which may be very sensitive to grazing. Herbaceous plants are an important food resource for invertebrates and other fauna.
Epiphytic bryophytes and lichens	In humid environments, diverse communities of cryptogams (mosses and lichens) may typically be present on the trunks and branches of trees, particularly in undisturbed forests unaffected by aerial pollution.
Wildlife trees	Many birds, mammals and invertebrates require trees with particular characteristics for habitat (e.g. as sites for nesting, perching, roosting or foraging). Large-diameter snags (standing dead trees) and cavity trees (live trees with central decay) are of particular importance. Old-growth forests tend to be characterised by ≥ 4 such wildlife trees per 10ha.
Fungi	Often characterised by diverse communities of larger fungi, which play a critical role in decomposition and nutrient-cycling. Many temperate tree species form associations with ectomycorrhizal fungi, which assist in nutrient uptake and form an important food resource for many other organisms. The composition of fungal communities remains poorly documented, but diversity in old-growth forests may exceed 100 species per ha.
Birds	Diversity is often related to structural complexity of the forest stand, for example the presence of a shrub layer. The composition of bird communities appears to be particularly sensitive to the area of forest patches. Large areas of old-growth contain a higher proportion of birds that depend on old trees and cavities; intact communities of hole-nesting birds are a feature of extensive old-growth.
Large carnivores	As large carnivores tend to be at the top of food chains, their presence indicates an intact food web. Large carnivores have explicitly been exterminated in many temperate forests and might therefore be considered for reintroduction.
Forest area	In many places, once continuous tracts of forest have been reduced in area as a result of human activity. Forest loss and fragmentation reduce species diversity and alter species composition in remaining forest patches. Mammals and birds are most affected because of their extensive territorial requirements. For a forest to contain the full complement of species, it must be large enough to accommodate those species with largest area requirements (i.e. >100,000ha).

Reference Newton, A. C. 2007. *Forest ecology and conservation. A handbook of techniques*. Oxford University Press, Oxford.