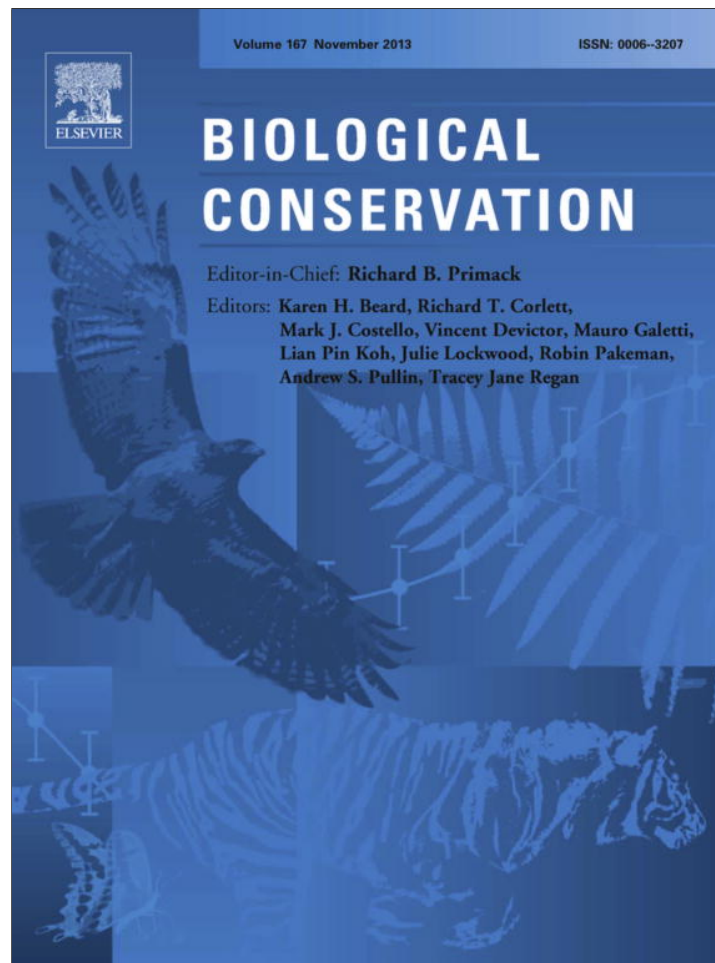


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Letter to the Editor

**Dieback of European ash (*Fraxinus excelsior*)
– Sheer misery or an opportunity for
biodiversity? – Reply to Pautasso**

A recent review in *Biological Conservation* described ash dieback, caused by the ascomycete *Hymenoscyphus pseudoalbidus*, as a serious challenge to nature conservation in Europe (Pautasso et al. (2013)). While ash dieback certainly is a challenge to forestry, we question that the disease is an unequivocal threat to biodiversity. Positive effects are likely to counterbalance or outweigh negative effects, given that attacked stands are managed wisely. The traditional and prevailing focus on forest health is unimaginative and may undermine potential benefits. In this letter we first review the adverse biodiversity effects emphasized by Pautasso et al. (2013). Secondly we evaluate potential positive effects and finally we offer suggestions for targeted management of attacked stands.

Ecosystem health is a strong metaphor in conservation biology. When trees and forests are suffering from acid rain, climate change, hurricanes or diseases, society and scientist alike tend to worry about ecosystem degradation or even collapse. In line with this view, Pautasso et al. (2013) present an alarming scenario of biodiversity loss due to the demise of ash in various forest types, especially in flood-plains. The authors emphasize the loss of ancient ash trees as a particularly serious threat. Given the general scarcity of ancient trees in Europe, we agree that this is a genuine challenge, especially for epiphytic lichens and bryophytes associated with the rough and basic bark of veteran ash trees. These species are however not host specific and will often be able to survive locally on other substrates. A number of fungi and phytophagous insects use ash as their only host, and will go extinct if ash is completely eradicated. These species are generally confined to leaves or young shoots and belong to guilds that in general are well dispersed. Hence, even a regionally severe (yet incomplete) dieback of ash, as reported from some European countries, will undoubtedly lead to reduced population size for host specialist species, but is less likely to pose a fatal threat to them.

From a general perspective, massive dieback of trees in response to naturally occurring disturbances – including insect or fungal outbreaks – is a natural phenomenon in northern temperate forest ecosystems. Globalization has no doubt increased the intercontinental dispersal of pathogens and thereby accelerated outbreak frequency for several tree species during the last century. In Europe the Dutch elm disease (*Ophiostoma novo-ulmi*) is well-known, but North American forests have suffered harder, with several native tree species having gone through substantial dieback. We have searched the scientific literature to find evidence of biodiversity losses resulting from tree dieback events, but convincing

examples are scarce. In fact, the best documented specific effect seem to be an increasing tree species diversity in forests affected by the chestnut blight (*Cryphonectria parasitica*) (Smith et al., 2009).

Positive biodiversity effects of ash-dieback, in terms of dead wood, are mentioned in passing by Pautasso et al. (2013). Slowly dying weakened trees and dead wood are important habitats, especially for fungi and insects, and are virtually missing from managed forests in Europe. But ash dieback also holds a potential for restoration of natural forest glades, especially on mesic to moist fertile soils, on which ash often prevails. From a conservation perspective, forest glades are badly missing in European forests due to forestry (ultimately to loss of natural disturbances). The impacts of the lost glades on biodiversity are well documented, in particular for butterfly species (Robertson et al., 1995). Restoration of forest glades following ash dieback could go hand in hand with increasing populations of wild large herbivores throughout Europe.

A balanced view requires equal emphasis on threats and opportunities. Considering the current dramatization of potential risks, it is only fair to consider the chances of a biodiversity gain. Based on the available evidence – however incomplete it is – we would predict a net increase in biodiversity after ash dieback, was it not for forestry. Today, salvage logging under the pretense of disease control is probably a much worse threat than ash dieback itself. Hence, we strongly agree with the recommendation by Pautasso et al. (2013) to conserve live, dying or dead ash trees in attacked stands. Apart from this, we find the measures proposed to mitigate biodiversity losses to be mainly relevant in a traditional context of forestry and arboriculture. From a biodiversity perspective, we recommend to avoid replanting of stands left open by the disease. Instead such areas should be left to develop into forest glades or, dependent on grazing, enter natural succession. In most European countries legislation will not prevent that these new forest openings are immediately replanted with monocultures of productive, disease-resistant tree species, including introduced conifers. Legislation may even enforce immediate replanting. Our strongest recommendation is hence to use all available means, including legislation and subsidies, to motivate foresters to act differently than the conventional forest health paradigm dictates.

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