

Forests before Homo sapiens: Historical baselines of European vegetation

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European landscapes have changed dramatically since the arrival of Homo sapiens. The proliferation of our species has caused widespread ecological consequences, from the mass extinction of Europe's megafauna during the Last Ice Age to the expansion of agriculture at the expense of natural habitats. Increasingly, restoration efforts seek to recover lost habitats, promote biodiversity, and restore functioning ecosystems. Historical reference points, or baselines, can provide much-needed context, allowing us to understand the landscapes in which current biodiversity evolved. Using pollen data, we reconstruct past vegetation structure and composition for the Last Interglacial, before the arrival of Homo sapiens to Europe. Overall, we found that the temperate forest biome had a more open, heterogeneous structure than traditionally believed. Our findings highlight the need for a reconsideration of the ecology of this biome and may help to explain why a large proportion of European biodiversity depends on open and light woodland conditions. Additionally, landscapes appear to have been structurally and compositionally affected by natural disturbance factors beyond climate. We suggest an important role for natural disturbance regimes in temperate forests and advocate for a reimagining of the temperate forest biome to reflect the open and light woodland elements that are part of it.