

Erasing a biodiversity hot-spot: Open woodlands, veteran trees and mature forests succumb to forestry intensification, logging, and succession in Lower Morava UNESCO Biosphere Reserve

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Keywords

forest management, land use/land cover change, Lower Morava UNESCO Biosphere Reserve, pasture woodlands, Natura 2000, oak savanna, canopy closure, biodiversity

Aims

Open woodlands are biologically the richest habitat of temperate Europe that, however, nearly disappeared from the continent. Their original cover and magnitude of their loss remain unknown. Here, we quantify the loss of open woodlands and assess the potential for their restoration in an internationally protected biodiversity hot-spot.

Location

Floodplain woodlands of lower Thaya and March rivers, Dolní Morava UNESCO Biosphere Reserve, Czech Republic, EU.

Methods

Aerial photographs from years 1938 and 2009 were used to analyze changes in forest canopy closure for the area of 146 km². Forestry maps and aerial photographs were used to analyze changes in forest age structure.

Results

Between 1938 and 2009, expansion of closed-canopy forest reduced open woodlands cover from 41% to 5.7% of total wooded area, or 68.5% to 14.1% in the state reserves respectively. Logging has led to a decrease in mature forest cover from 45% to 26% between 1990 and 2009. State reserves prevented logging, but not open woodlands loss.

Main conclusions

The magnitude of open woodlands loss parallels that of tropical habitats, but has gone unabated by nature conservation. Chances to restore open woodlands and conserve associated biodiversity in the internationally protected (e.g. UNESCO, Natura 2000), mostly state-owned, woodlands are being compromised by rapid logging. The logging eased neither after the UNESCO biosphere reserve declaration in 2003, nor after the adoption of EU legislation in 2004. The current intensity of logging within the UNESCO biosphere reserve and Natura 2000 sites surpasses that practiced during war times. It, however, lasts for decades, and slows down only when nothing to log remains. Our results point to the low ability of post-communist EU-members to conserve their biodiversity.

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ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Nationalpark Hohe Tauern - Conference Volume](#)

Jahr/Year: 2013

Band/Volume: [5](#)

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Artikel/Article: [Erasing a biodiversity hot-spot: Open woodlands, veteran trees and mature forests succumb to forestry intensification, logging, and succession in lower Morava UNESCO Biosphere Reserve 513](#)