

# Forest vulnerability and adaptation to climate change

## Biodiversity conservation as an adaptation option

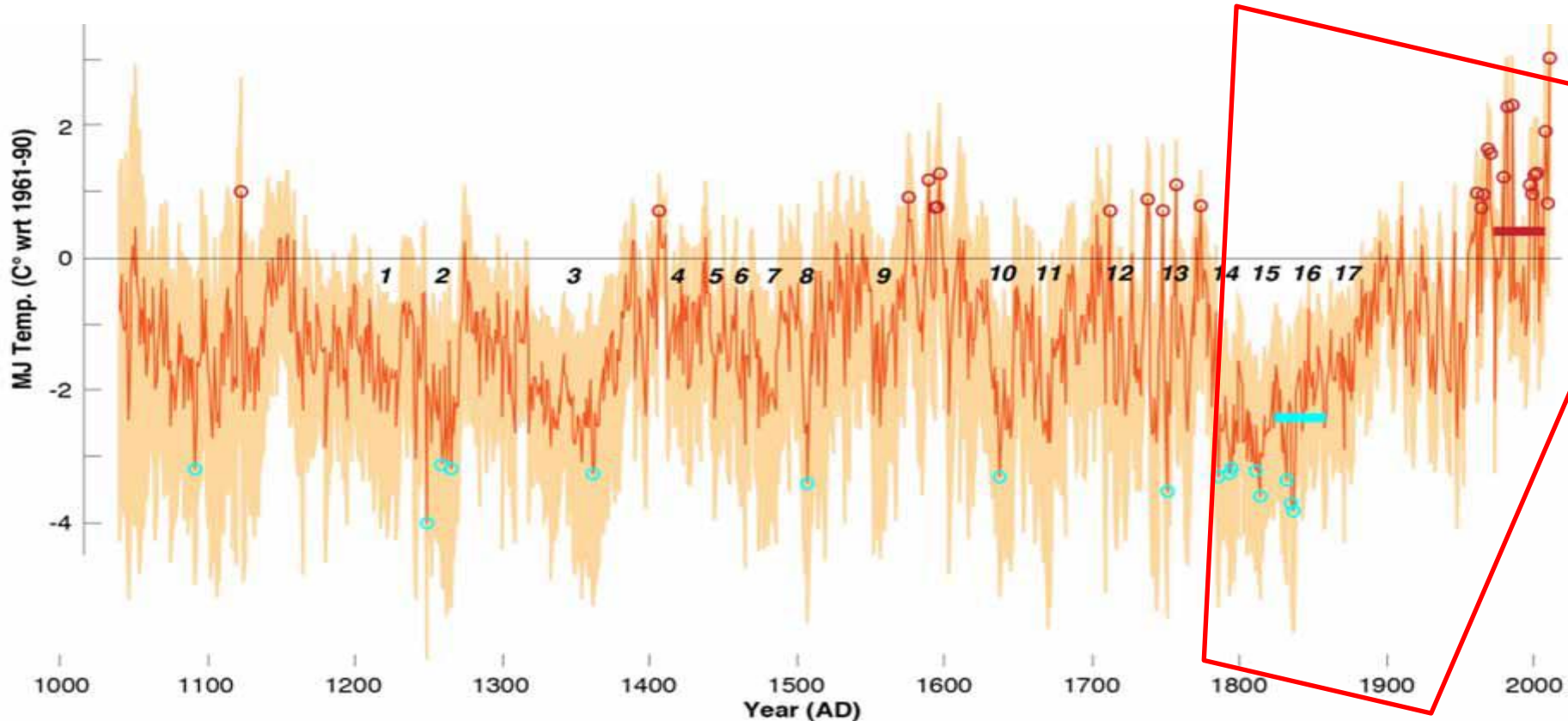
Michal Wiezik

4<sup>th</sup> February 2020

Forests for Biodiversity and  
Climate Conference



# Adaptation of forest(ry), how, when and to what?



Proceedings of the National Academy of Sciences of the United States of America

PNAS

CURRENT ISSUE // ARCHIVE // NEWS & MULTIMEDIA // AUTHORS // ABOUT // COLLECTED ARTICLES // BROWSE BY TOPIC // EARLY EDITION // FRONT MATTER

Home > Current Issue > vol. 110 no. 5 > Ulf Büntgen, 1773–1778, doi: 10.1073/pnas.1211485110

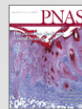
Check for updates

## Filling the Eastern European gap in millennium-long temperature reconstructions

Ulf Büntgen<sup>a,b,c,1</sup>, Tomáš Kyncl<sup>d</sup>, Christian Ginzler<sup>a</sup>, David S. Jacks<sup>e</sup>, Jan Esper<sup>f</sup>, Willy Tegel<sup>g</sup>, Karl-Uwe Heussner<sup>h</sup>, and Josef Kyncl<sup>d</sup>

Author Affiliations

### This Issue



January 29, 2013  
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Masthead (PDF)  
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**Modern  
forestry Era  
approx. 200 yrs**



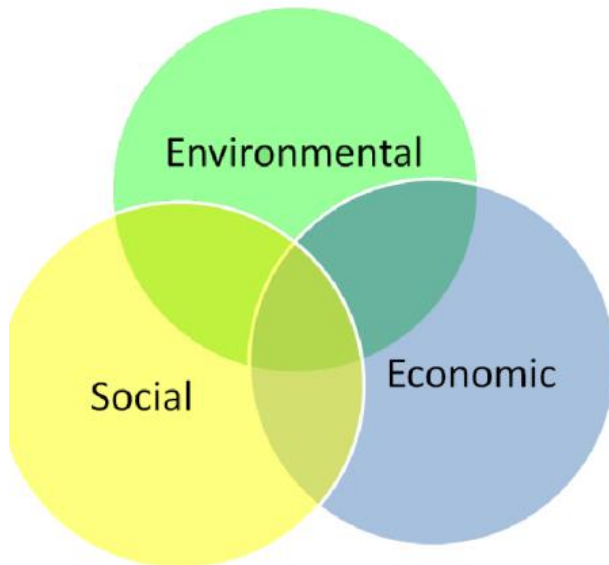
## NO COUNTRY FOR OLD ... FOREST?

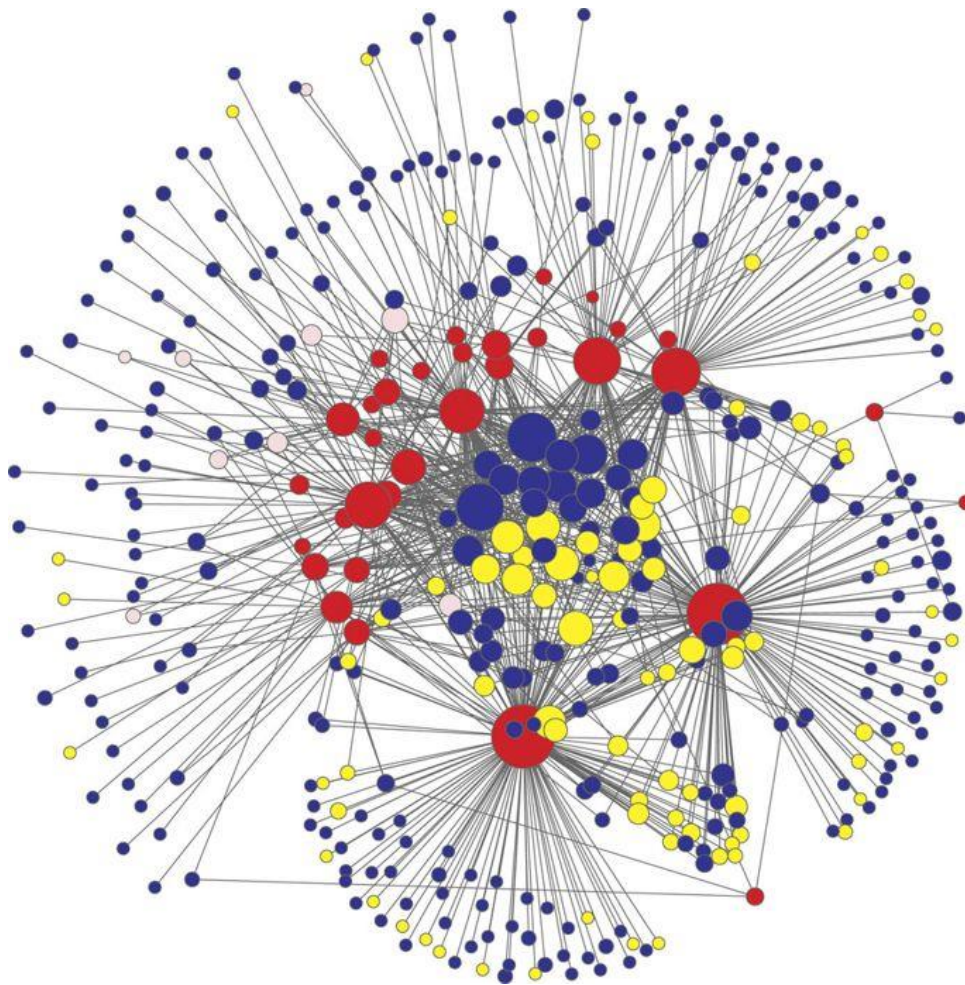


**Sustainable forest management? What about the Environmental Pillar?**

**To:**

**Protect, sustain, and restore the health of critical natural habitats and ecosystems**





## COMPLEXITY of a forest

Implications for **ADAPTATION** and  
**RESILIENCE** potential

Role of **BIODIVERSITY**

**nature  
communications**

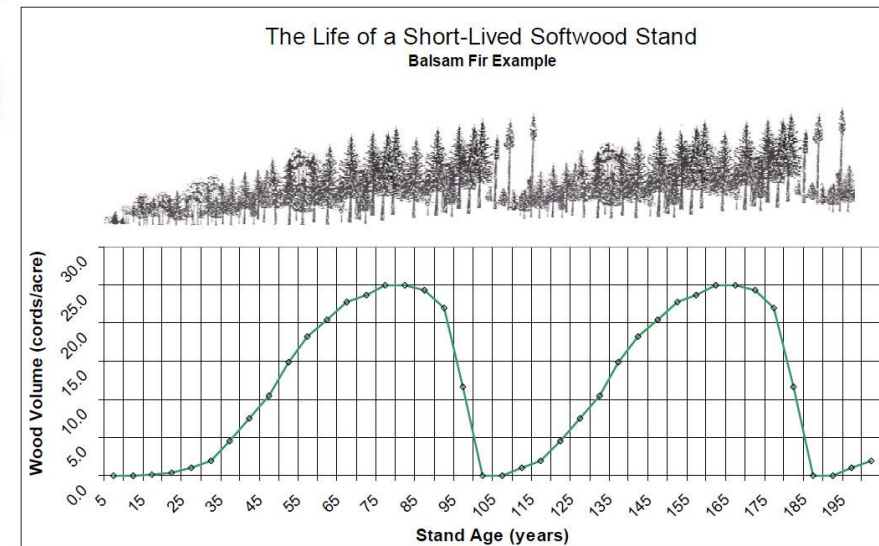
Article | [Open Access](#) | Published: 20 October 2014

### Assembly of complex plant–fungus networks

Hirokazu Toju , Paulo R. Guimarães, Jens M. Olesen & John N. Thompson

*Nature Communications* **5**, Article number: 5273 (2014) | [Cite this article](#)

**1880** Accesses | **65** Citations | **34** Altmetric | [Metrics](#)



### Architecture of the **below-ground** plant–fungus network in a temperate forest

# What and where is the BIODIVERSITY?

## The role of *Early seral stages* and *Old-growth forest*




Received: 7 March 2018 | Accepted: 22 June 2018

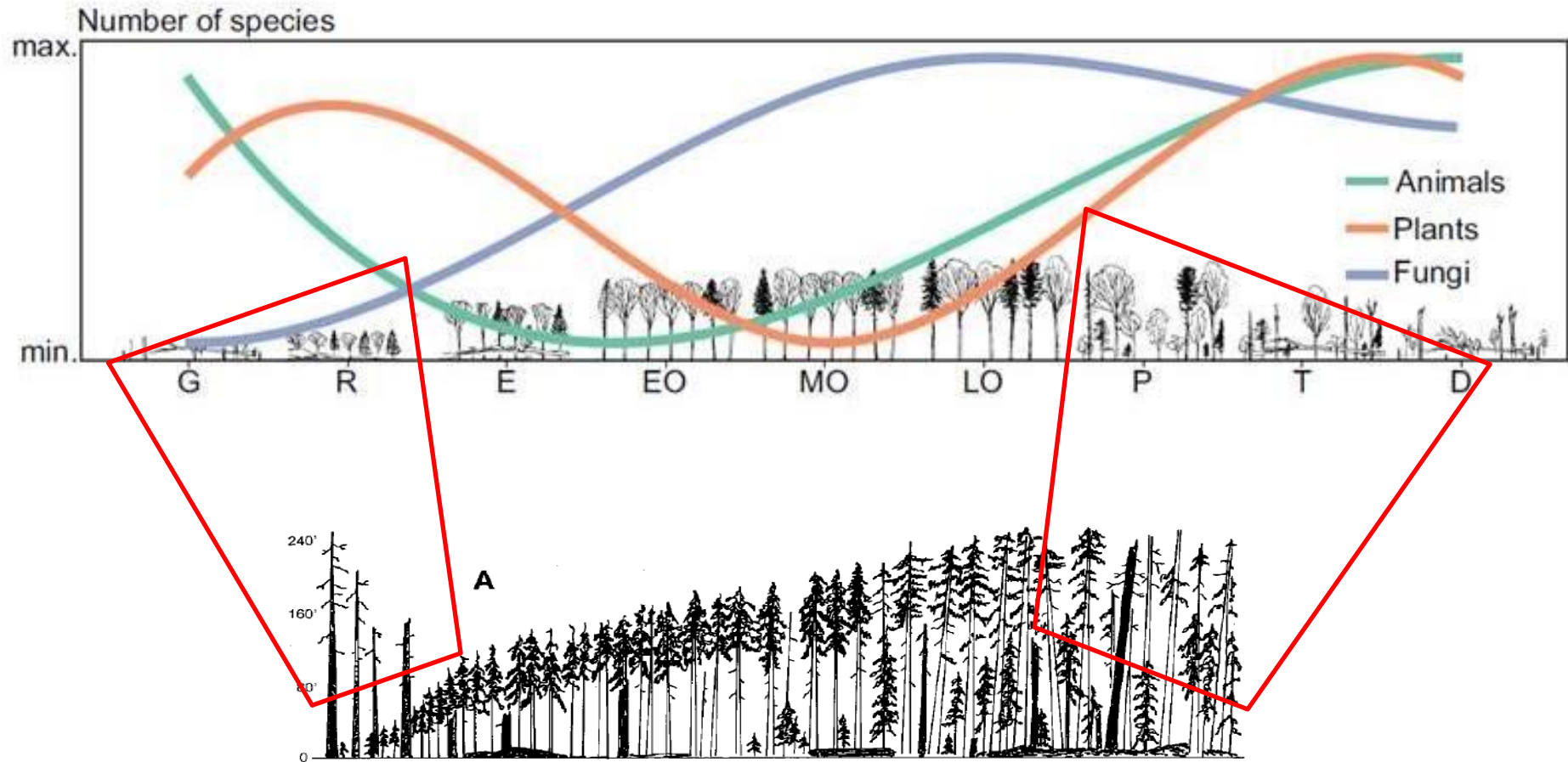
DOI: 10.1111/1365-2664.13238

### RESEARCH ARTICLE

Journal of Applied Ecology 

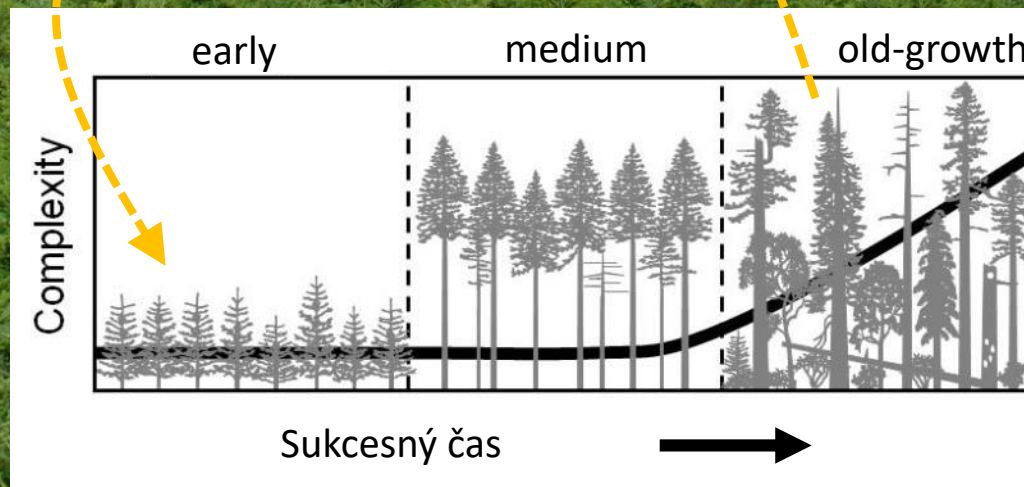
## Biodiversity along temperate forest succession

Torben Hilmers<sup>1</sup>  | Nicolas Friess<sup>2</sup>  | Claus Bässler<sup>3</sup> | Marco Heurich<sup>3</sup> |  
Roland Brandl<sup>2</sup> | Hans Pretzsch<sup>1</sup> | Rupert Seidl<sup>4</sup> | Jörg Müller<sup>3,5</sup> 





# Managed forest, simplification of structure





# Typical structure of primary forest, with relatively open canopy (Pilsko, Slovakia)

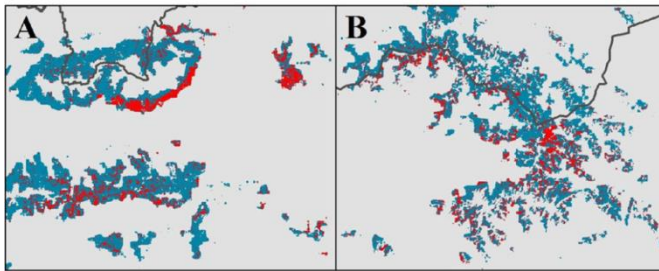
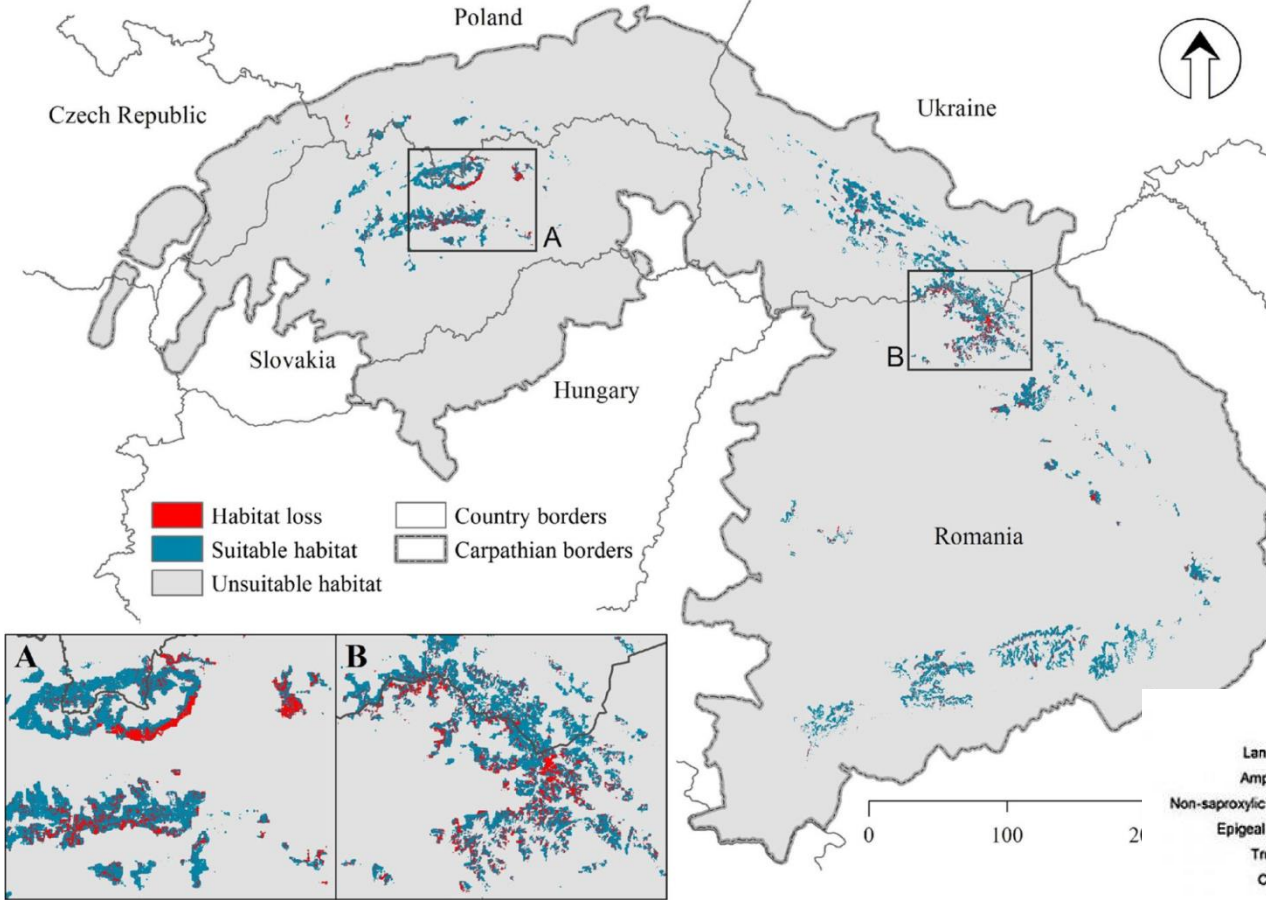






Extrem yet wide spread form of spruce plantation. Maximum stock vs minimum resilience, stability, biodiversity and aesthetics. (Collapse due to climate change?)



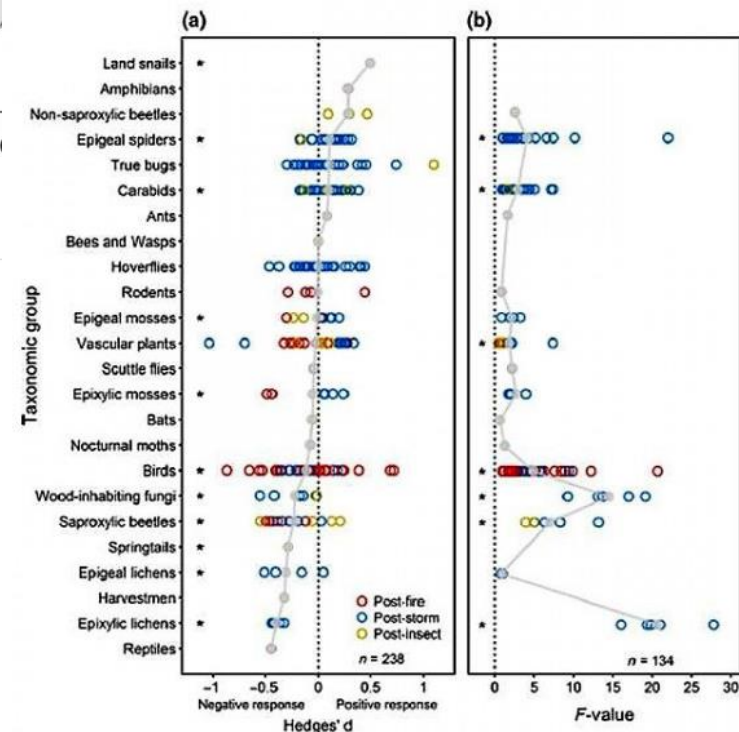


Landscape Ecol  
DOI 10.1007/s10980-016-0433-3

RESEARCH ARTICLE

# Forest management impacts on capercaillie (*Tetrao urogallus*) habitat distribution and connectivity in the Carpathians

Martin Mikoláš · Martin Tejkal · Tobias Kummerle · Patrick Griffiths · Miroslav Svoboda · Tomáš Hlásny · Pedro J. Leitão · Robert C. Morrissey





**Complex/Intact ecosystems HAVE GREATER CAPABILITY TO OVERCOME ENVIRONMENTAL STRESSORS, including changes to climate, than simplified (degraded) ones as they have inherent properties that enable them to maximize their adaptive capacity.**

- more above- and belowground **carbon stored**
- **more faunal complexity** (helps carbon storage and sequestration)
- major carbon sequestration (soil, biomass, necromass)
- regulating local and regional weather regime
- generation of rain and reduced risks of drought
- ensuring hydrological services
- **conserving biodiversity**
- consistently higher number of forest-dependent species
- sustain important large scale ecological processes
- **higher functional diversity**
- **higher intra-specific genetic diversity**
- higher chance for dispersal or retreating refugia
- provision of key pollination and dispersal processes
- human health benefits
- and **BEAUTY**



nature  
ecology & evolution

Perspective | Published: 26 February 2018

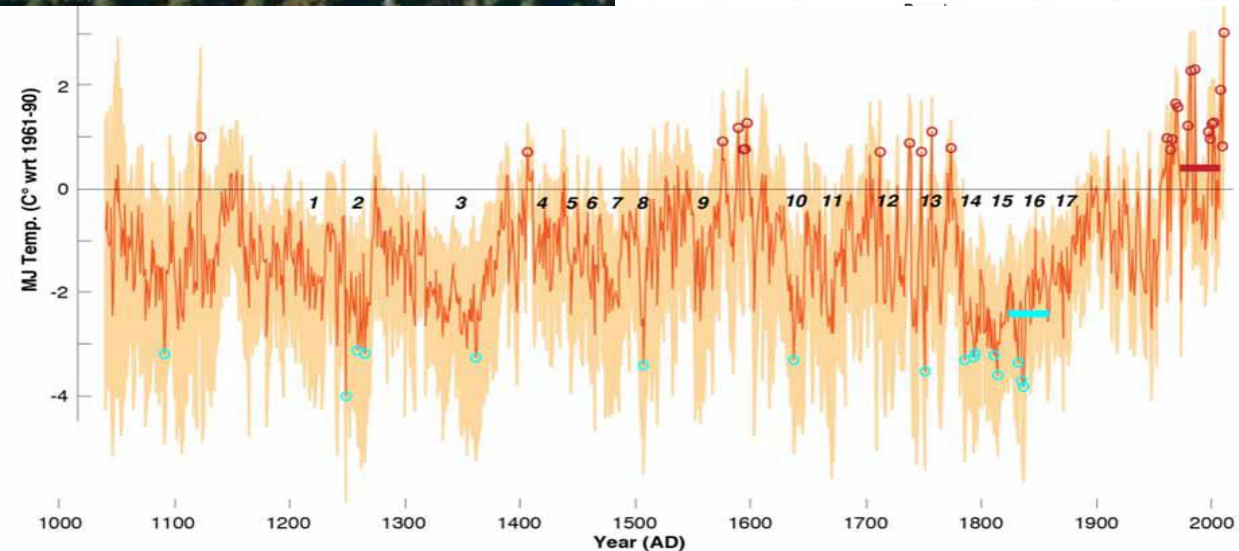
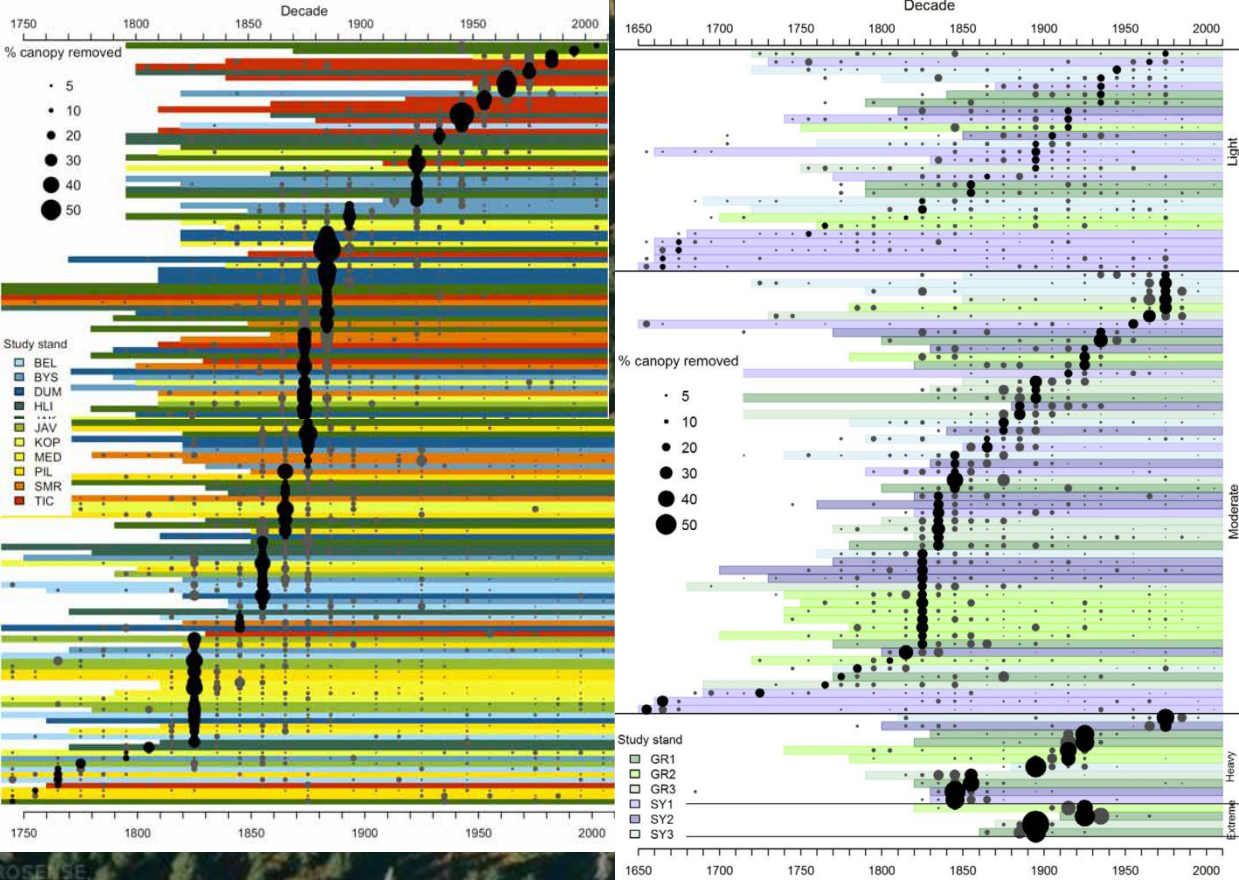
## The exceptional value of intact forest ecosystems

James E. M. Watson , Tom Evans, [...] David Lindenmayer

*Nature Ecology & Evolution* **2**, 599–610(2018) | [Cite this article](#)

**2601** Accesses | **99** Citations | **610** Altmetric | [Metrics](#)





Is Large scale canopy  
COLLAPSE a part of long  
term ecosystem RESILIENCE  
and ADAPTATION?