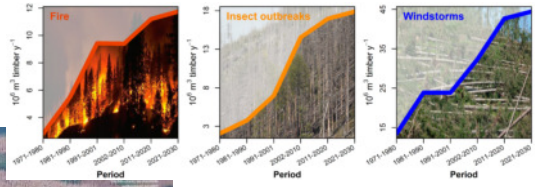
Ökologische Station Fabrikschleichach

Wälder im Wandel - Chancen in der Störung?

Jörg Müller

Nationalpark Bayerischer Wald

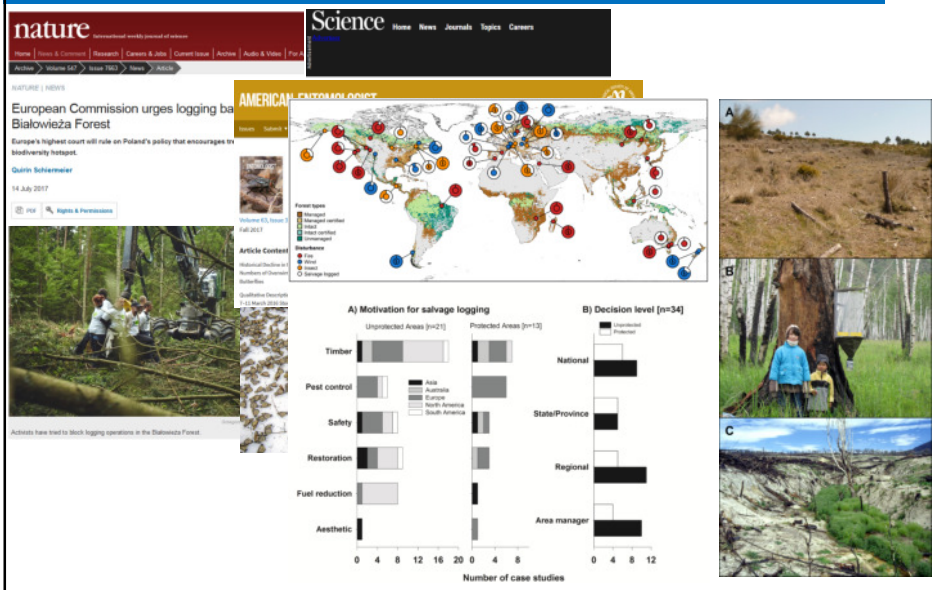
Störungstrends in unseren Wäldern



2018 und 2019 genau so vorhergesagt!

Seidl et al 2014 Nature Climate Change

Gesellschaftliche Diskussionen

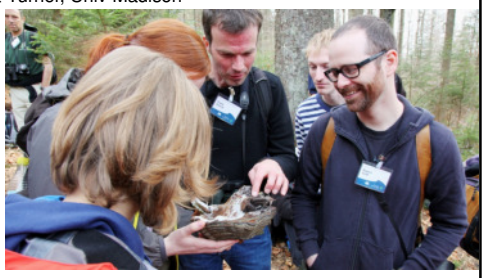


Müller et al 2018 Conserv Letters

Internationale Störungstagung 2013

Prof. Ken Raffa, Univ Madison

Prof. Monica Turner, Univ Madison



Prof. Rupert Seidl, TU München

Auswirkungen von Eingriffen nach Störungen in temperaten Wäldern

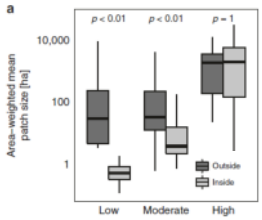

nature COMMUNICATIONS

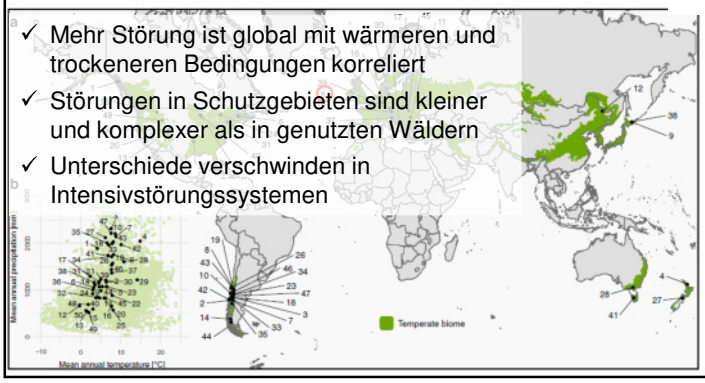
ARTICLE

DOI: 10.1038/s41467-018-06610-9 OPEN

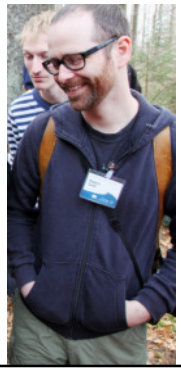
Patterns and drivers of recent disturbances across the temperate forest biome

Andreas Sommerfeld[1], Cornelius Senf[1,2], Brian Buma[3], Anthony W. D'Amato[4], Tiphaine Després[5,6], Ignacio Díaz-Hormazábal[7], Shawn Fraver[8], Lee E. Frelich[9], Álvaro G. Gutiérrez[7], Sarah J. Hart[10], Brian J. Harvey[11], Hong S. He[12], Tomáš Hlásny[3], Andrés Holz[13], Thomas Kitzberger[14], Dominik Kulakowski[15], David Lindenmayer[16], Akira S. Mori[17], Jörg Müller[18,19], Juan Paritsis[14], George L. W. Perry[20], Scott L. Stephens[21], Miroslav Svoboda[5], Monica G. Turner[22], Thomas T. Veblen[23] & Rupert Seidl[1]



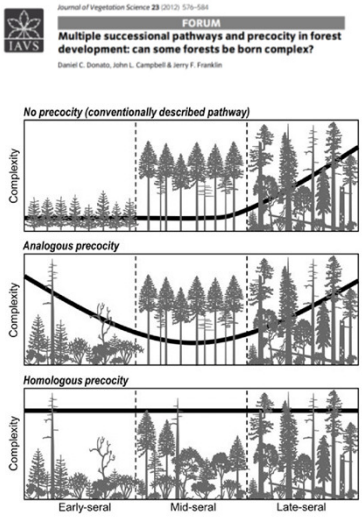


- ✓ Mehr Störung ist global mit wärmeren und trockeneren Bedingungen korreliert
- ✓ Störungen in Schutzgebieten sind kleiner und komplexer als in genutzten Wäldern
- ✓ Unterschiede verschwinden in Intensivstörungssystemen



Produktionsverlust versus höhere Resistenz in der Zukunft

Theorie

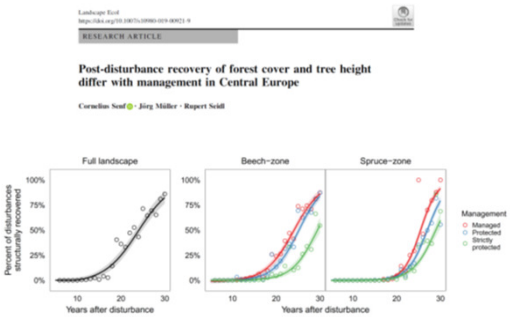

Journal of Vegetation Science 23 (2012) 576–584

FORUM

Multiple successional pathways and precocity in forest development: can some forests be born complex?

Daniel C. Donato, John L. Campbell & Jerry F. Franklin

Beobachtung

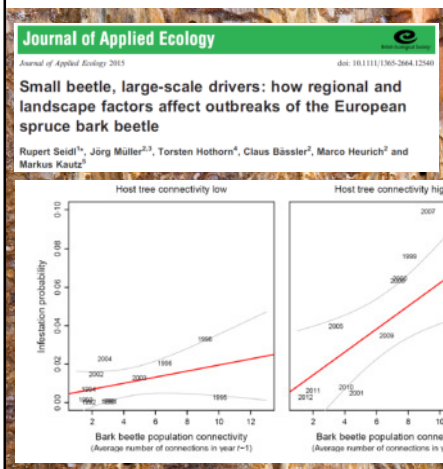

Landscape Ecol

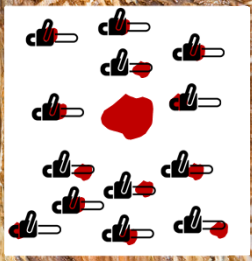
RESEARCH ARTICLE

Post-disturbance recovery of forest cover and tree height differ with management in Central Europe

Cornelius Senf · Jörg Müller · Rupert Seidl

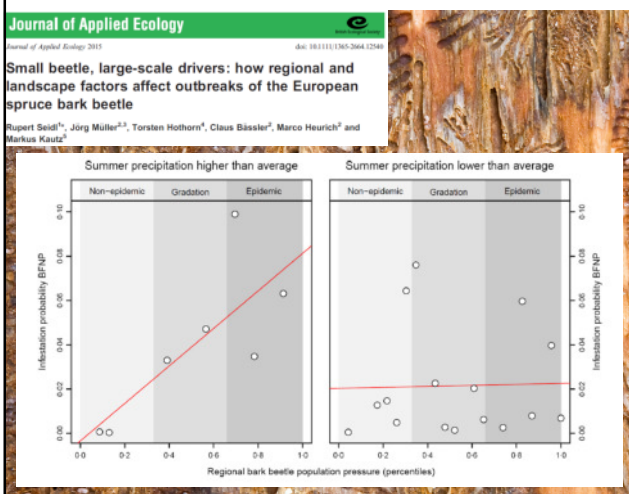
Bekämpfungsmöglichkeiten Buchdrucker?

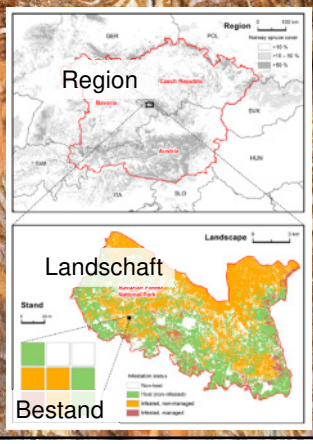




- Bei Windwurf immer zuerst die verstreuten Bäume aufarbeiten um die Vernetzung der lokalen Populationen zu durchbrechen
- Je schlechter die Vernetzung desto geringer die Befallswahrscheinlichkeit

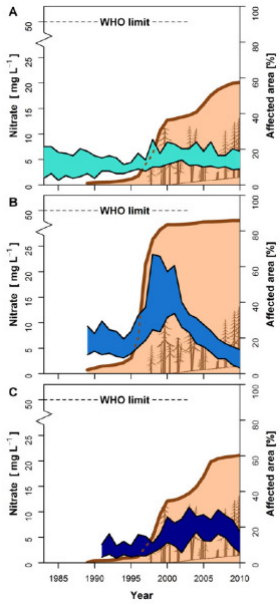
Bekämpfungsmöglichkeiten Buchdrucker?

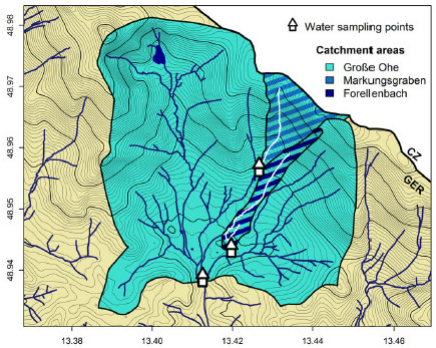




- Unter normalen Witterungsbedingungen bestimmt der Populationsdruck der Region die Befallswahrscheinlichkeit (Saubere Waldwirtschaft hilft!)
- ABER: In Trockenjahren spielt das keine Rolle mehr!

Auswirkungen aufs Trinkwasser





Keine relevante Auswirkungen

Conservation Letters
A journal of the Society for Conservation Biology
Open Access

LETTER

Bark Beetles Increase Biodiversity While Maintaining Drinking Water Quality

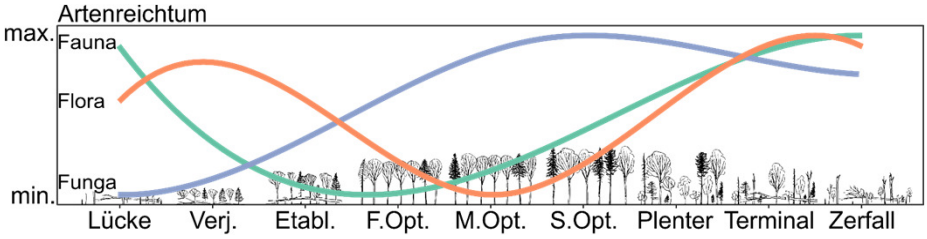
Burkhard Beudert[1], Claus Bässler[1], Simon Thorn[1,2], Reed Noss[3], Boris Schröder[4,5], Helga Dieffenbach-Fries[6], Nicole Foullois[7], & Jörg Müller[1,2]

Frühe Sukzessionsstadien – vergessene Lebensräume

REVIEWS REVIEWS REVIEWS 117

The forgotten stage of forest succession: early-successional ecosystems on forest sites

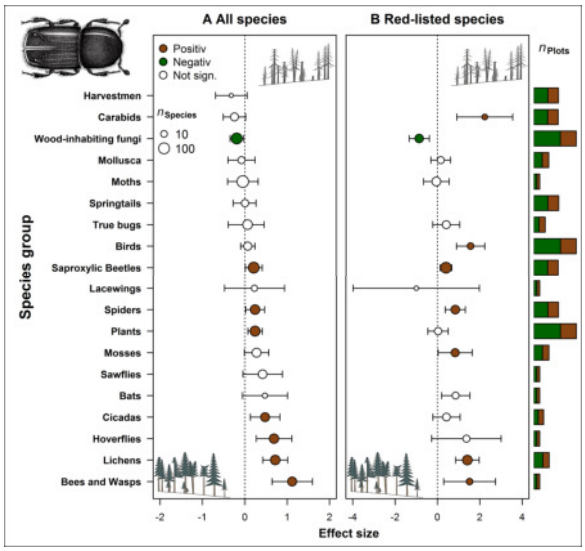
Mark E Swanson[1*], Jerry F Franklin[2], Robert L Beschta[3], Charles M Crisafulli[4], Dominick A DellaSala[5], Richard L Hutto[6], David B Lindenmayer[7], and Frederick J Swanson[8]



„Katastrophenflächen“ sind sicherlich die aktuell artenreichsten Flächen in unseren ME Wäldern!

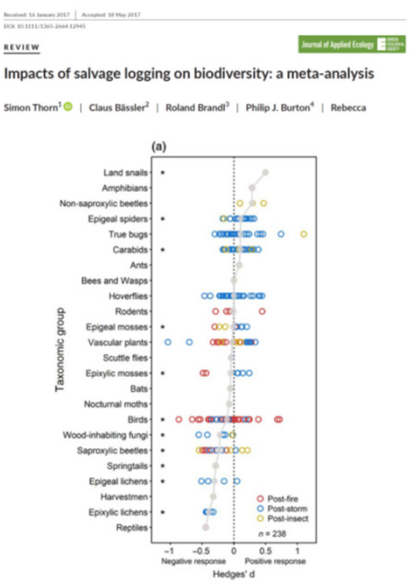
Hilmers et al (2018) J Appl Ecol

Vom Schädling zum Ökosystem-Ingenieur

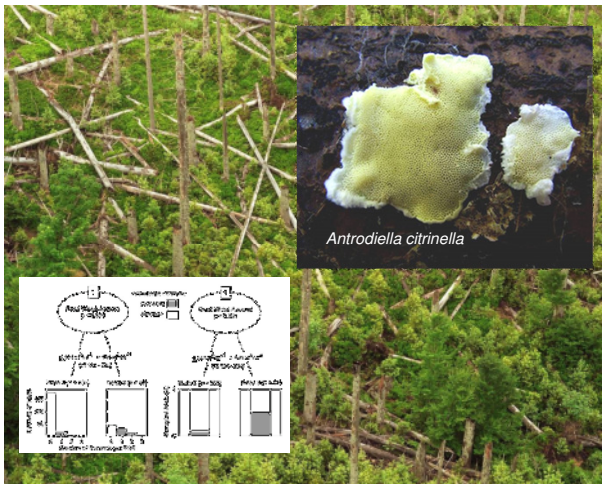


Beudert et al 2015 Conservation Letters
Müller et al 2010 Biological Conservation

Aufräumen schadet vielen Arten



Rückkehr hochbedrohter Arten

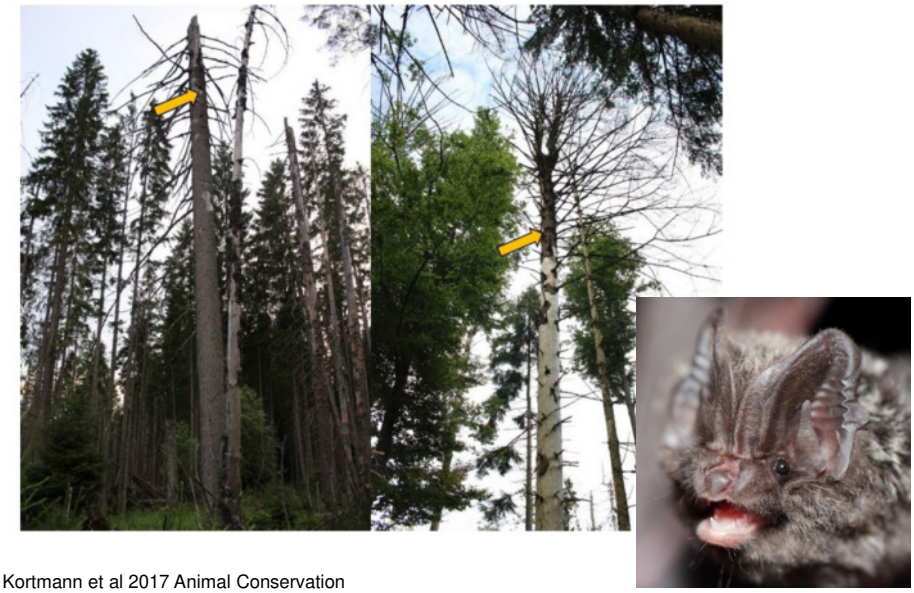


Peltis grossa † 1905

Rückkehr 2019

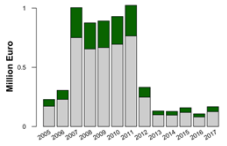
Bässler & Müller 2010 Fungal Biology

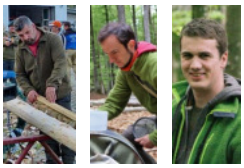
Neuer Wohnraum für Mopsfledermäuse



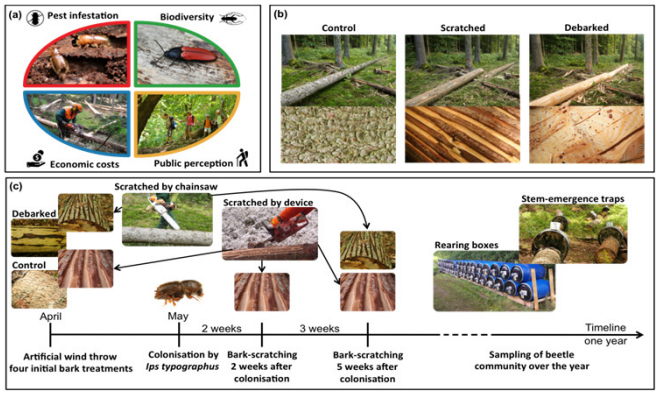
Kortmann et al 2017 Animal Conservation

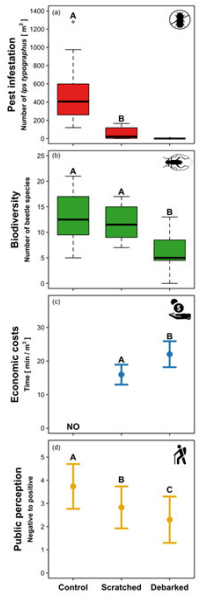
Praxisempfehlungen 1: Liebe Schlitzen statt Schepsen – der Artenvielfalt zuliebe



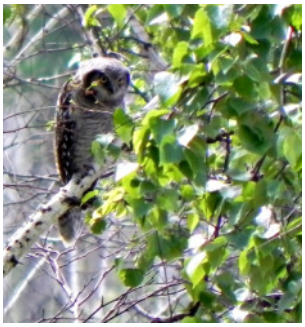


Plechinger Hagge Thorn

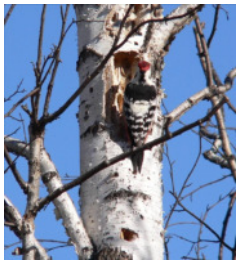




Praxisempfehlungen 2: Sukzessionsflächen sollten als wertvolle und strukturreiche Lebensräume gefördert werden



Mongolei



Praxisempfehlungen 3: Verzögerte Waldverjüngung kann Vorteile in der Zukunft bringen

Praxisempfehlungen 4: Maßnahmen müssen sorgfältig ökologisch und ökonomisch abgewogen werden!

Preventing European forest diebacks

For centuries, forest management has tried to minimize the impact of natural disturbances in Central European forests by removing dead trees and by promoting continuous tree cover (*1*). The consecutive loss of forest gaps and deadwood structures has contributed to a decline in light-demanding tree species and a depletion of forest biodiversity, including the extinction of many specialized fungi and insects (*1*). Many of these forests have faced unprecedented diebacks due to drought, insect outbreaks, and wildfire triggered by extreme climatic events (*2*). In July, the German minister of agriculture called for a "clear-up followed by reforestation strategy" to address the troubled forests, supported by public subsidies on the order of hundreds of millions of euros (*3*). However, this policy increasing forest resilience to extreme weather events (*6*). By contrast, rapid reforestation creates dense, even-aged tree cohorts at high risk (*7*). Subsidies should promote diversity in tree species and age structure, as well as temporary forest gaps, while contemplating species' resistance to projected future climatic and disturbance conditions. This strategy would benefit economically important, light-demanding tree species and highly threatened insects simultaneously.

Past reforestation after natural disturbances was largely motivated by the need for future economic returns from timber, but it has contributed to forest diebacks (*8*). A radical shift is needed in the way disturbed forests are treated to adapt Central European forests to current and future conditions.

The rare longhorned beetle (shown here) thrives in deadwood, a result of bark beetle outbreaks.

Simon Thorn[1*], Jörg Müller[2,3], Alexandro B. Leverkus[4,5]
[1]Field Station Fabrikschleichach, Department of Animal Ecology and Tropical Biology, Biocenter, University of Würzburg, 96181 Rauhenebrach, Germany. [2]Bavarian Forest National Park, 94481 Grafenau, Germany. [3]Department of Ecology, University of Granada, 18071 Granada, Spain. *Corresponding author. Email: simon@thornonline.de

REFERENCES AND NOTES

1. J. N. Stokland, J. Siitonen, B. G. Jonsson, *Biodiversity in Dead Wood* (Cambridge University Press, Octavo, 2012).
2. R. Seidl, M. J. Schelhaas, W. Rammer, P. J. Verkerk, *Nat. Clim. Chang.* **4**, 806 (2014).
3. "Massive Schäden—Wälder benötigen schnelle Hilfe," Bundesministerium für Ernährung und Landwirtschaft (2019); www.bmel.de/DE/Wald-Fischerei/Forst-Holzwirtschaft/_texte/Wald-Trockenheit-Klimawandel.html.
4. S. Thorn et al., *J. Appl. Ecol.* **55**, 279 (2018).
5. "Insektensterben stoppen," Die Bundesregierung (2018); www.bundesregierung.de/breg-de-de/aktuelles/insektensterben-stoppen-1138930.
6. R. Seidl, D. C. Donato, K. F. Raffa, M. G. Turner, *Proc. Natl. Acad. Sci. U.S.A.* **113**, 13075 (2016).
7. K. L. O'Hara, B. S. Ramage, *Forestry* **86**, 401 (2013).
8. R. Seidl et al., *Nat. Clim. Chang.* **7**, 395 (2016).

10.1126/science.aaz3476