



# Diversitätstrends im Wald und Agrarbereich



# Gliederung

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- 1. Veränderungen im Klimawandel**
- 2. Landnutzung**
- 3. Herausforderungen**

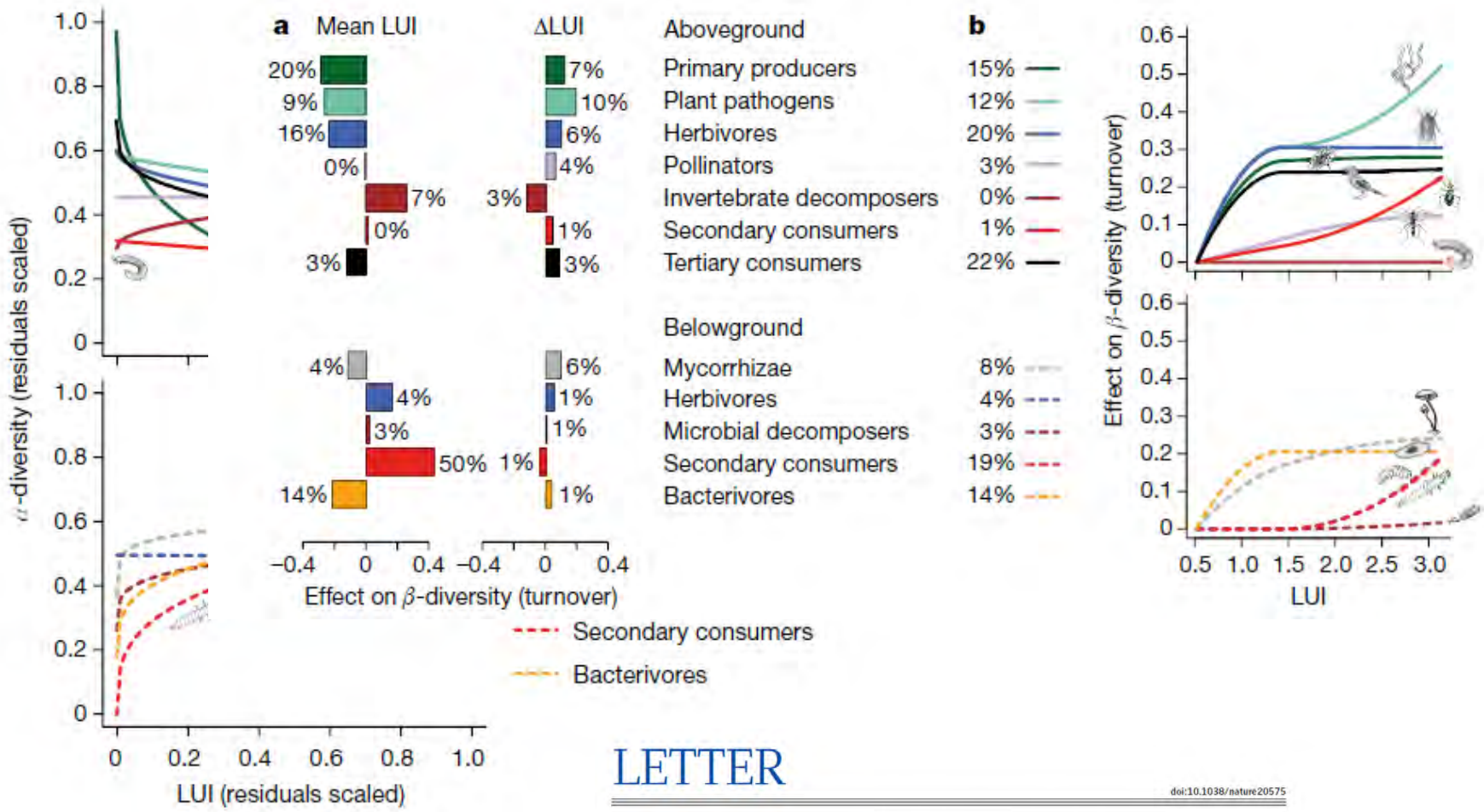
# Landnutzung und Artenschwund

## Artenvielfalt: Entwicklung der lebensraumbezogenen Teilindikatoren Agrarland und Wälder



Quelle: Wahl, J., R. Dröschmeister, B. Gerlach, C. Grüneberg, T. Langgemach, S. Trautmann & C. Sudfeldt (2015):  
Vögel in Deutschland – 2014. DDA, BfN, LAG VSW, Münster.

# Landnutzung und Artenschwund



## LETTER

doi:10.1038/nature20575

### Land-use intensification causes multitrophic homogenization of grassland communities

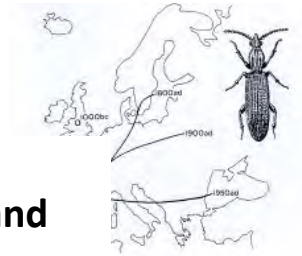
Martin M. Gossner<sup>1,2,3</sup>, Thomas M. Lewinsohn<sup>1,4</sup>, Tiemo Kahl<sup>5,6</sup>, Fabrice Grassein<sup>7</sup>, Steffen Boch<sup>7</sup>, Daniel Prati<sup>7</sup>, Klaus Birkhofer<sup>8,9</sup>, Swen C. Renner<sup>10,11</sup>, Johannes Sikorski<sup>12</sup>, Tesfaye Wubet<sup>13,14</sup>, Hartmut Arndt<sup>15</sup>, Vanessa Baumgartner<sup>12</sup>, Stefan Blaser<sup>16</sup>, Nico Blüthgen<sup>16</sup>, Carmen Börschig<sup>17</sup>, Francois Buscot<sup>13,14</sup>, Tim Diekötter<sup>18,19</sup>, Leonardo Ré Jorge<sup>2</sup>, Kirsten Jung<sup>11</sup>, Alexander C. Keyel<sup>20</sup>, Alexandra Maria Klein<sup>21</sup>, Sandra Klemmer<sup>22,23</sup>, Jochen Krauss<sup>17</sup>, Markus Lange<sup>2,23</sup>, Jörg Müller<sup>24</sup>, Jörg Overmann<sup>25</sup>, Esther Pasalic<sup>2,2</sup>, Caterina Penone<sup>1</sup>, David J. Perovic<sup>25,26</sup>, Oliver Purschke<sup>2,27,28</sup>, Peter Schall<sup>29</sup>, Stephanie A. Socher<sup>30</sup>, Ija Sonnemann<sup>31</sup>, Marco Tschapka<sup>31</sup>, Teja Tschardt<sup>26</sup>, Manfred Türke<sup>1,2,14,27</sup>, Paul Christian Venter<sup>15</sup>, Christiane N. Weiner<sup>16</sup>, Michael Werner<sup>16</sup>, Volkmar Wolters<sup>32</sup>, Susanne Wurst<sup>33</sup>, Catrin Westphal<sup>16</sup>, Markus Fischer<sup>1</sup>, Wolfgang W. Weisser<sup>12</sup> & Eric Allan<sup>7,32</sup>

# Waldnutzung und Artenschwund

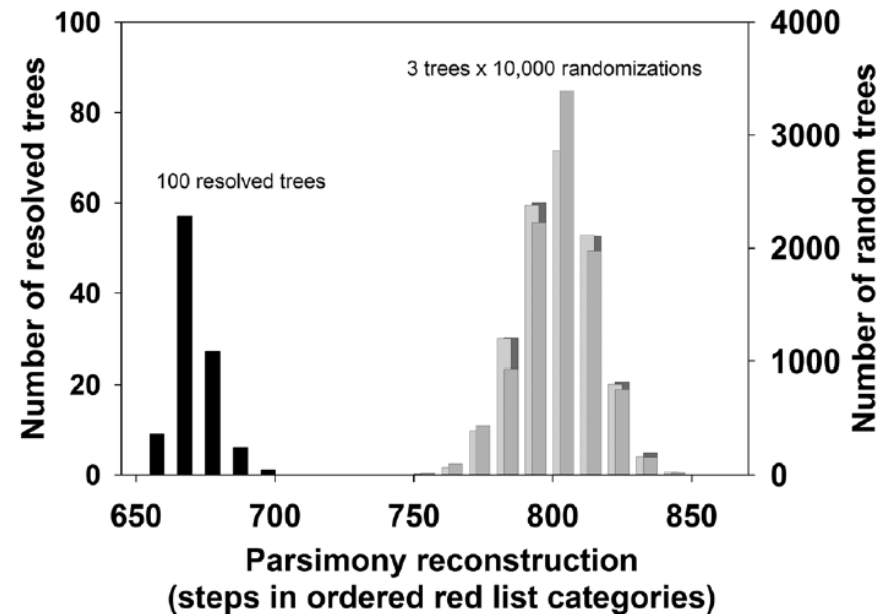


„Saproxylic Insects and the unsustainable Management of Forests: A 5000-Year European Experiment“

*Grove 2002*



**RL Beetles Germany**



Seibold et al 2015 Conservation Biology

Grove 2002 Annu Rev Ecol Syst



*Megapenthes lugens*



Species of the lowlands more threatened



*Ceruchus chrysomelinus*



Large species and species of large dead wood more threatened



*Dicerca berolinensis*

Species of broadleaf trees more threatened



*Eurythrea austriaca*

Species of sunny habitats more threatened

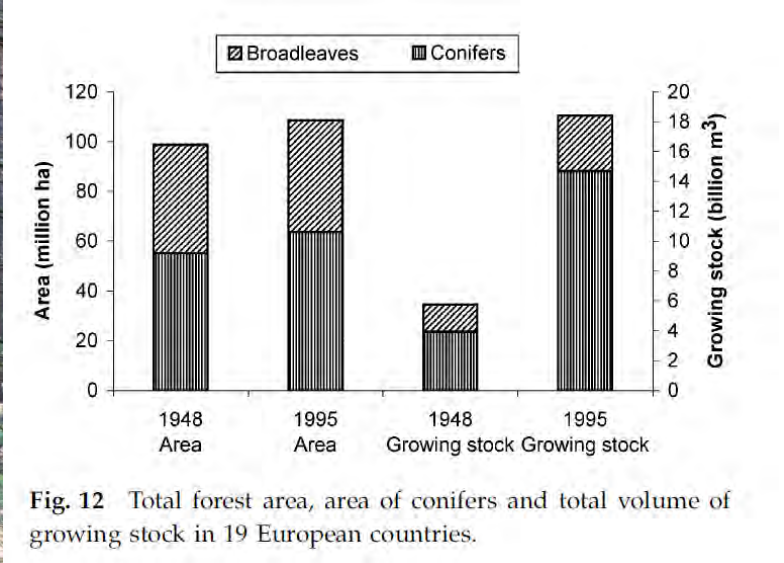
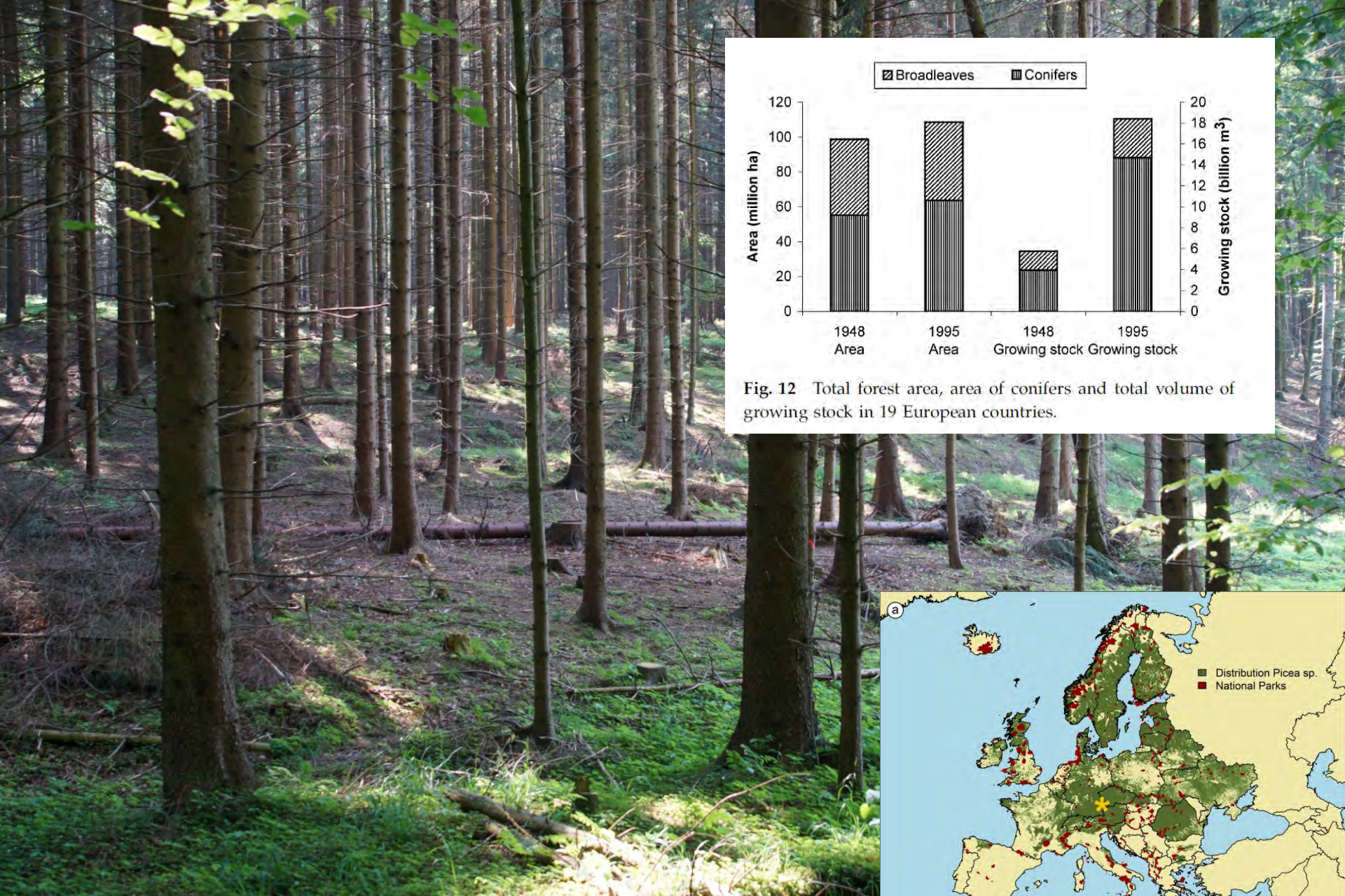
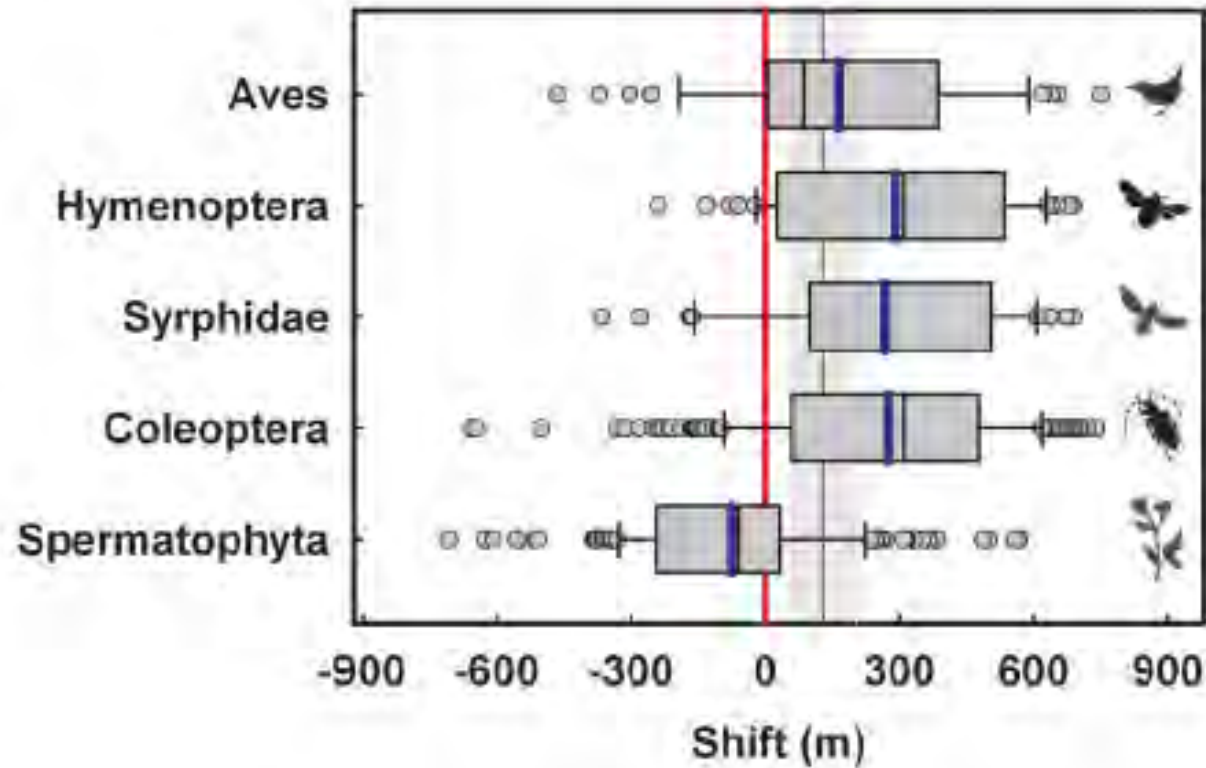


Fig. 12 Total forest area, area of conifers and total volume of growing stock in 19 European countries.



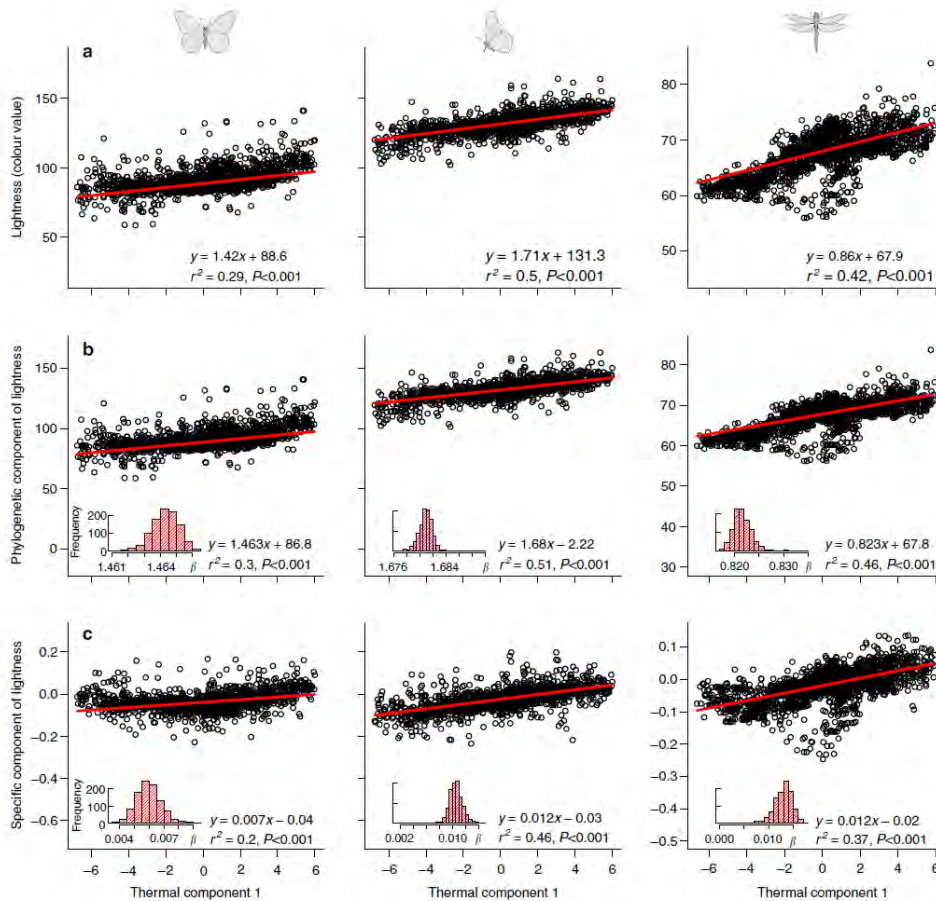
# Arten im Klimawandel



## Insects Overshoot the Expected Upslope Shift Caused by Climate Warming



# Arten im Klimawandel



## ARTICLE

Received 14 May 2013 | Accepted 14 Apr 2014 | Published 27 May 2014

DOI: 10.1038/ncomms4874

OPEN

## Global warming favours light-coloured insects in Europe

Dirk Zeuss<sup>1</sup>, Roland Brandl<sup>1</sup>, Martin Brändle<sup>1</sup>, Carsten Rahbek<sup>2,3</sup> & Stefan Brunzel<sup>1</sup>

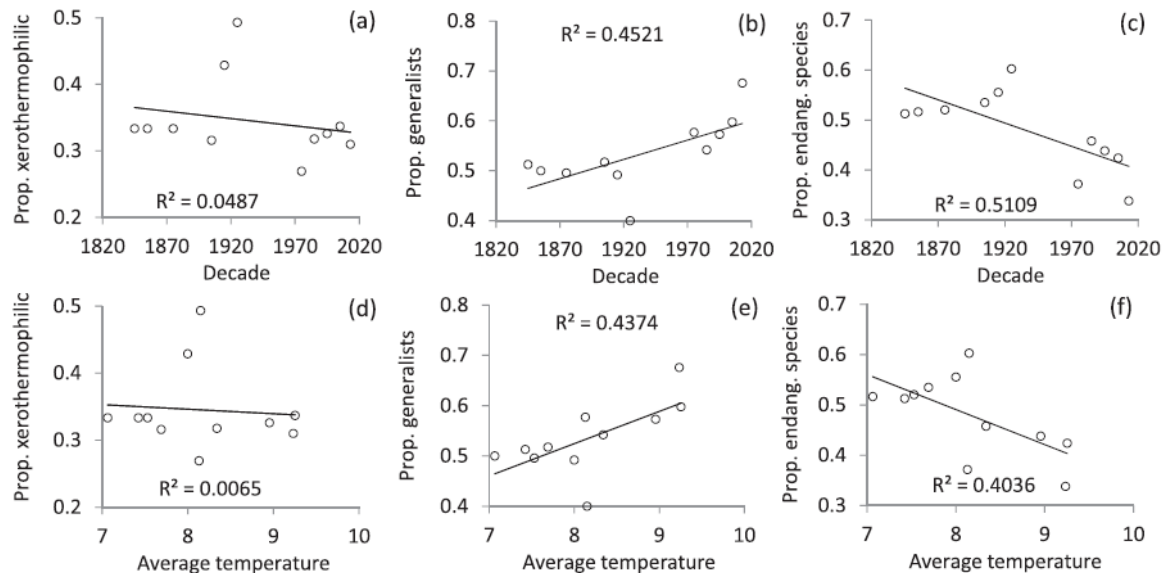
# Schmetterlinge auf einem Trockenrasen

*Conservation Biology*

*Contributed Paper*

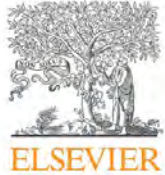
## Butterfly community shifts over 2 centuries

Jan Christian Habel,<sup>\*¶</sup> Andreas Segerer,<sup>†</sup> Werner Ulrich,<sup>‡</sup> Olena Torchyk,<sup>\*</sup> Wolfgang W. Weisser,<sup>\*</sup> and Thomas Schmitt<sup>§\*\*</sup>



# Schmetterlinge auf einem Trockenrasen

BIOLOGICAL CONSERVATION 128 (2006) 542–552



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## The severe decline of butterflies on western German calcareous grasslands during the last 30 years: A conservation problem

Miriam Wenzel<sup>a,1</sup>, Thomas Schmitt<sup>b,\*1</sup>, Matthias Weitzel<sup>c</sup>, Alfred Seitz<sup>a</sup>

### ABSTRACT

Butterflies and burnet moths are a suitable model species group with which to analyse the general decline of invertebrate biodiversity over the last few decades. In this study, we analysed which ecological groups of butterflies and burnet moths are most affected and how the recent modifications of the landscape have influenced them. Therefore, we studied the species composition of seven calcareous grassland remnants in south-western Germany in 1972 and 2001. We observed a strong change in the community composition and a severe decline in species richness. In general, the incidence of the autochthonous non-ubiquitous species declined by more than 50%, whereas ubiquitous species showed no significant difference in numbers during this period. Especially affected by the decline were those species which need structured habitats, those which are poor dispersers, species which need habitat sizes of 16 ha and more, monophagous species, K strategists and Red Data Book species. Most probably, either habitat outside the reserves is affecting dynamics within the reserves or loss of habitat outside the protected areas has reduced the overall area and connectivity of habitat for some species, increasing extinction rates and reducing colonisation rates in meta-populations. We conclude that these negative trends can only be stopped or even reversed if the landscape structure is made less hostile for species with conservation interest.

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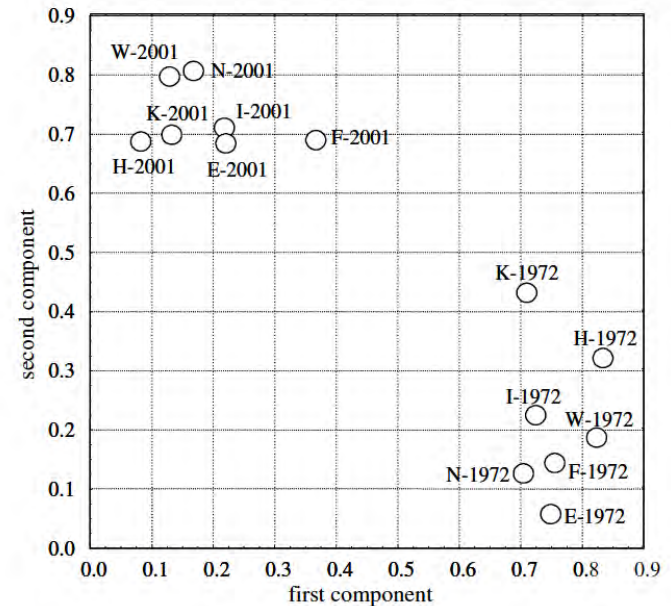
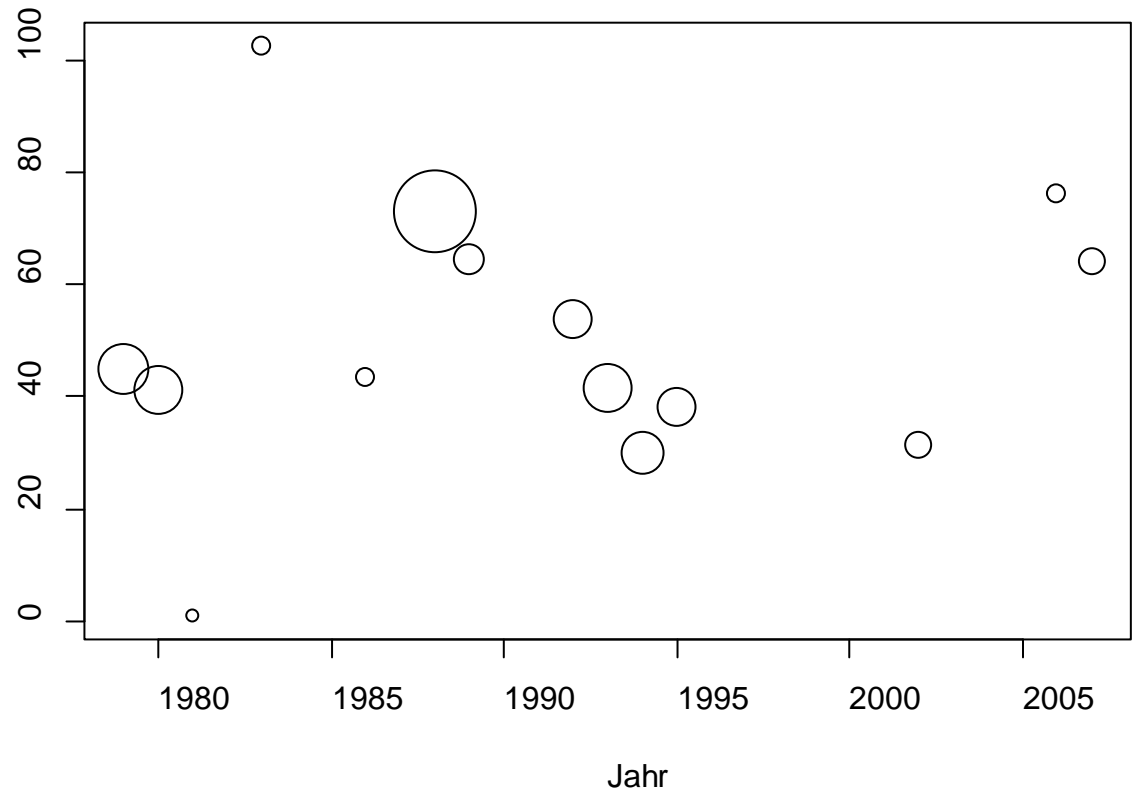
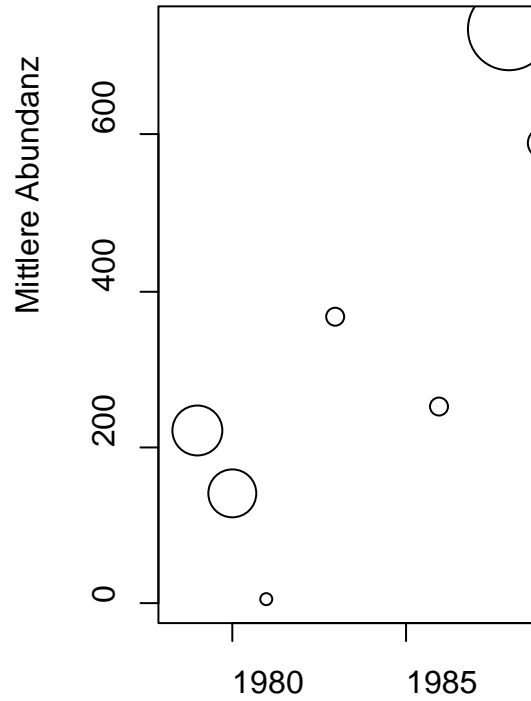


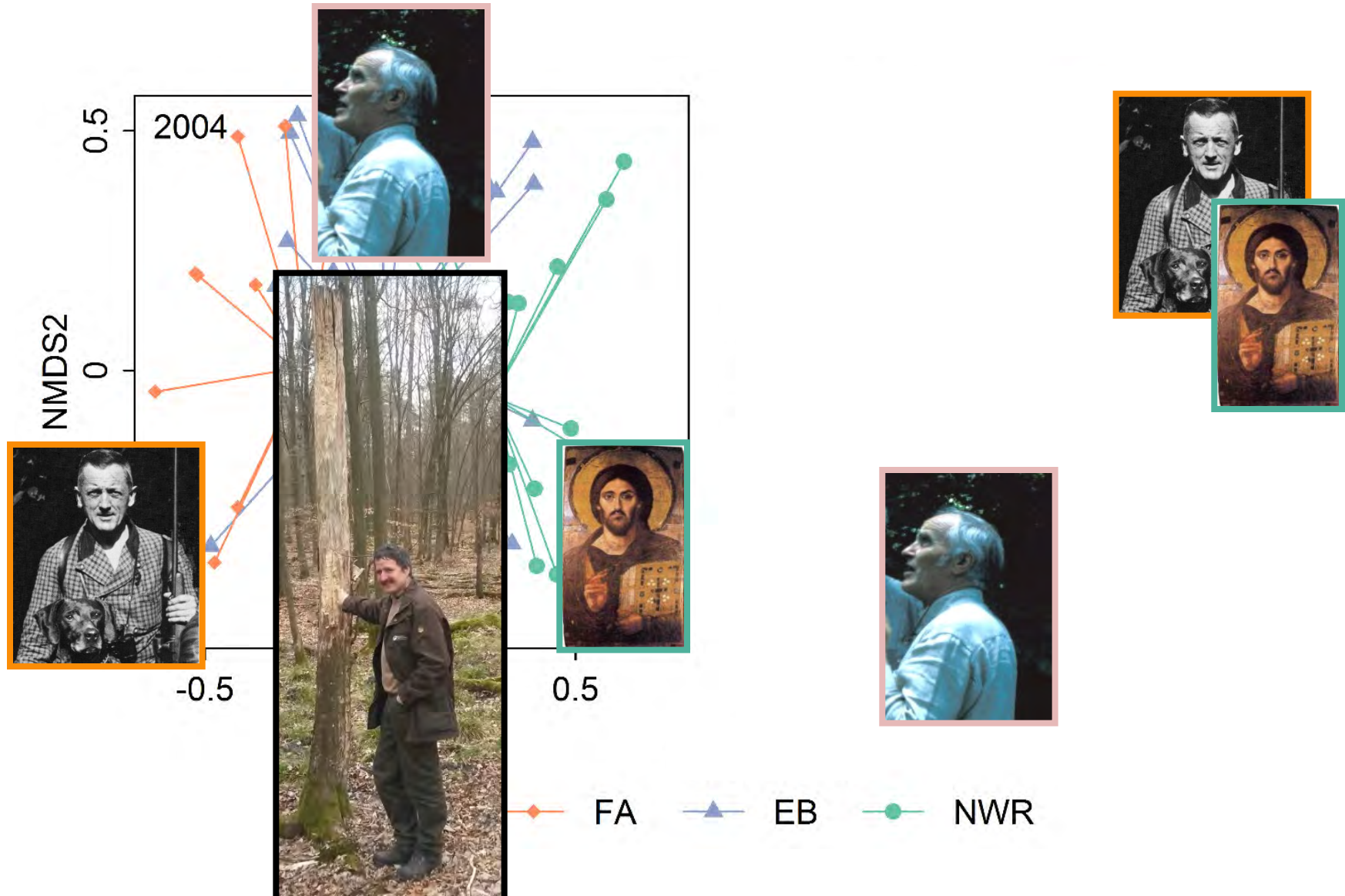
Fig. 2 – Principal components analysis of the species compositions of the seven analysed calcareous grassland remnants in 1972 and 2001. The first component explains 30.9%, the second 29.1% of the total variance. E: Echternacherbrück; F: Freudenburg; H: Hüttingen; I: Igel; K:

# Langzeitrends im Eichen-Mittelwald

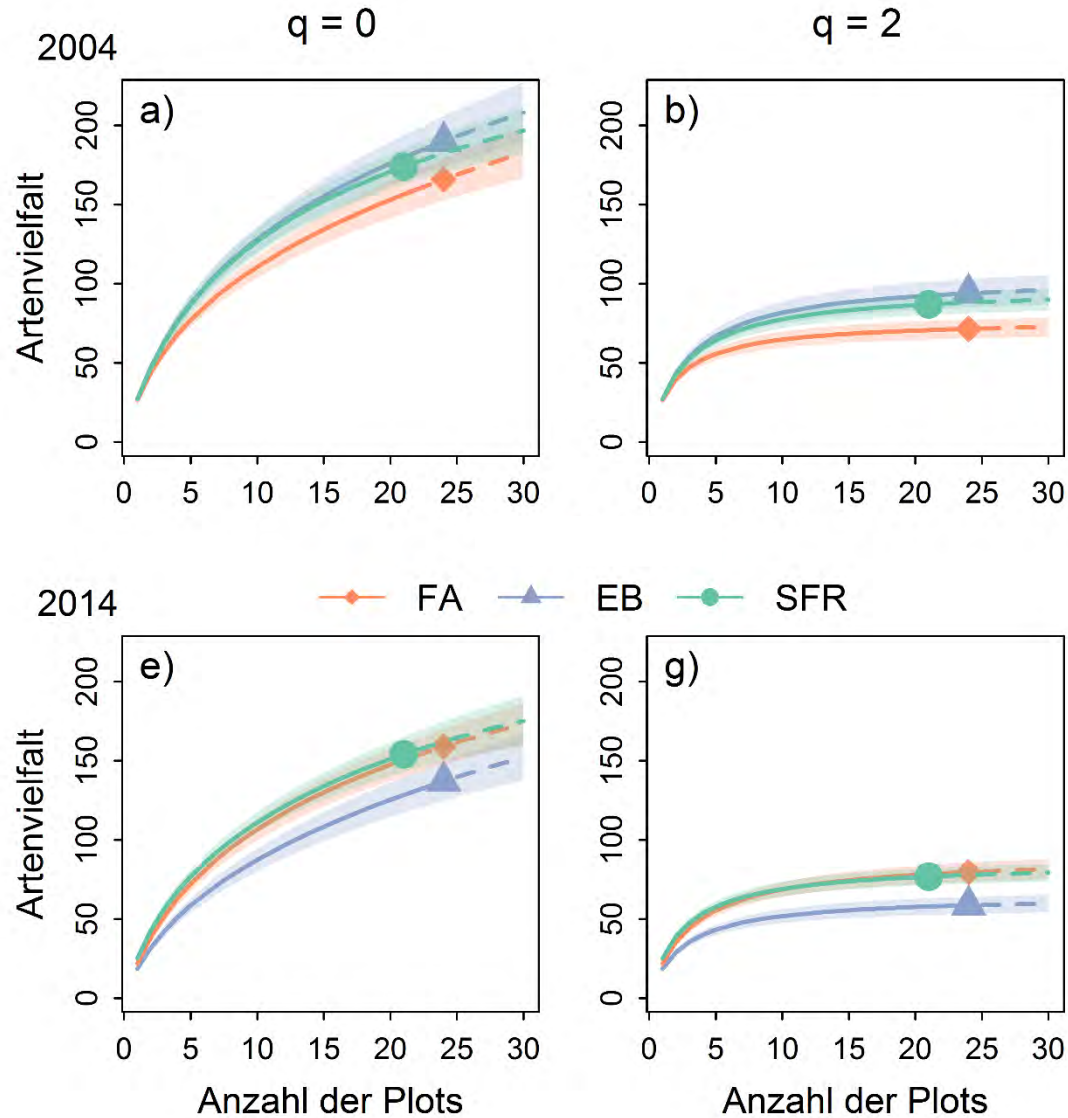




# Langzeitrends im Buchenwald

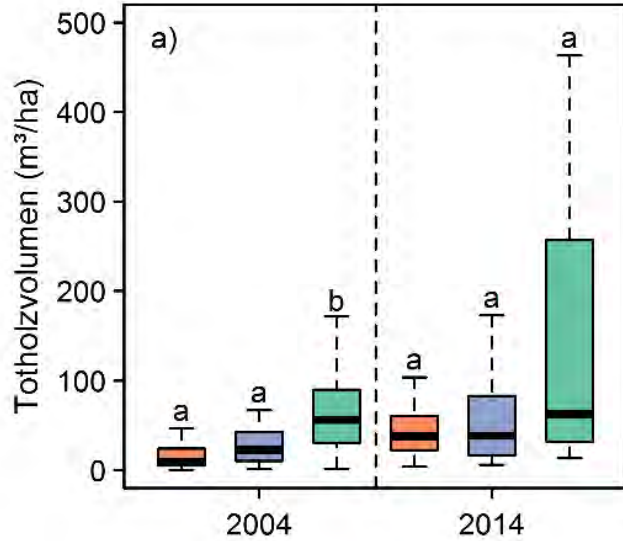


# Artenvielfalt

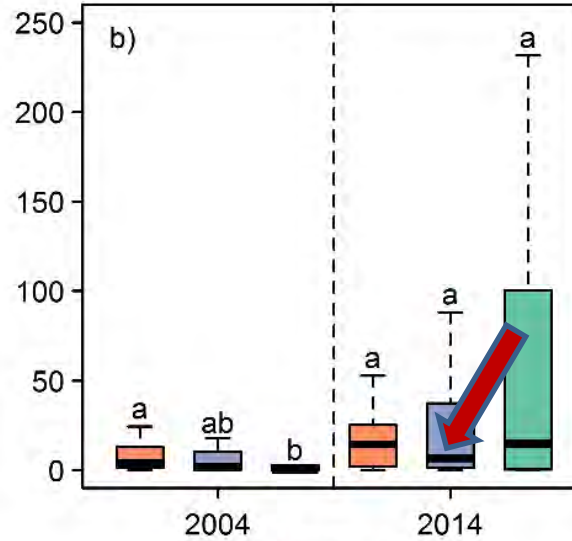


# Totholzvolumen

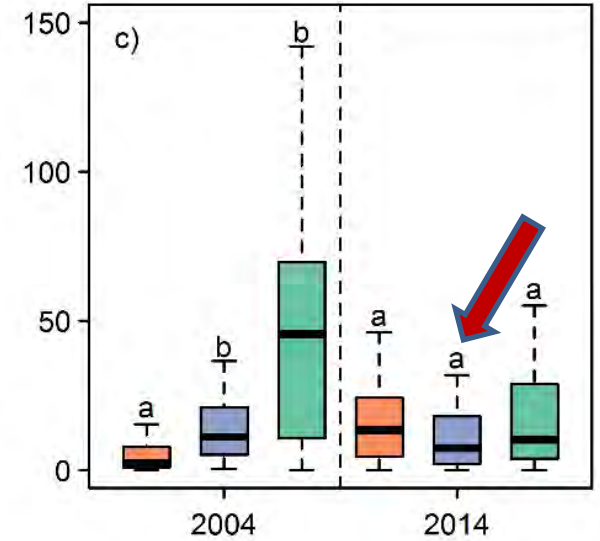
Gesamt



Zersetzungsgrad 1 & 2



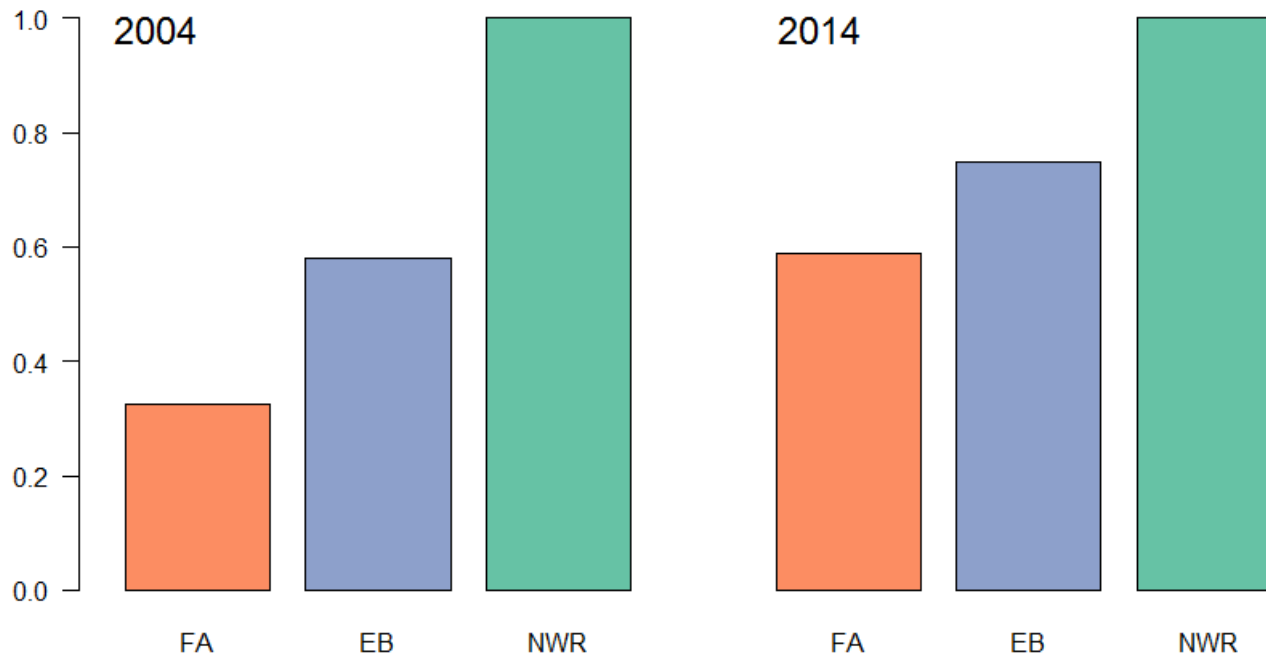
Zersetzungsgrad 3



FA EB NWR

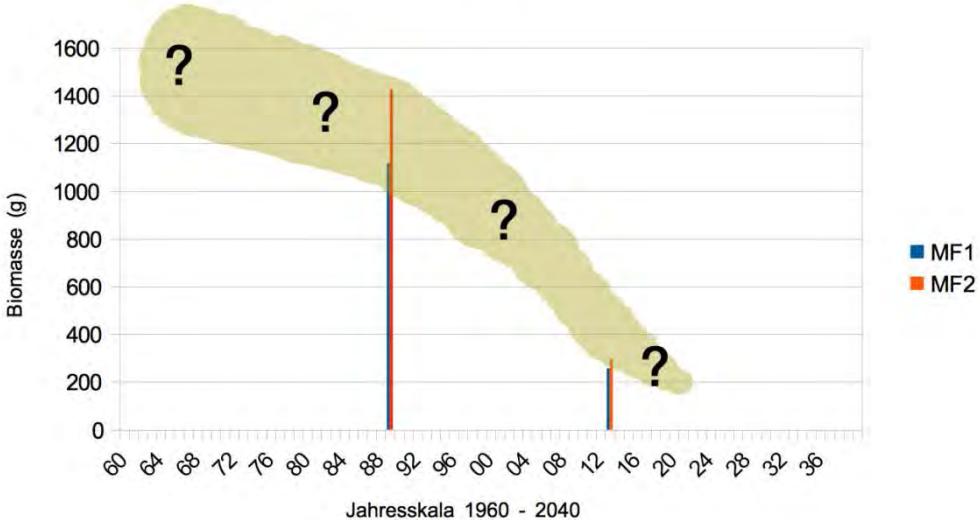
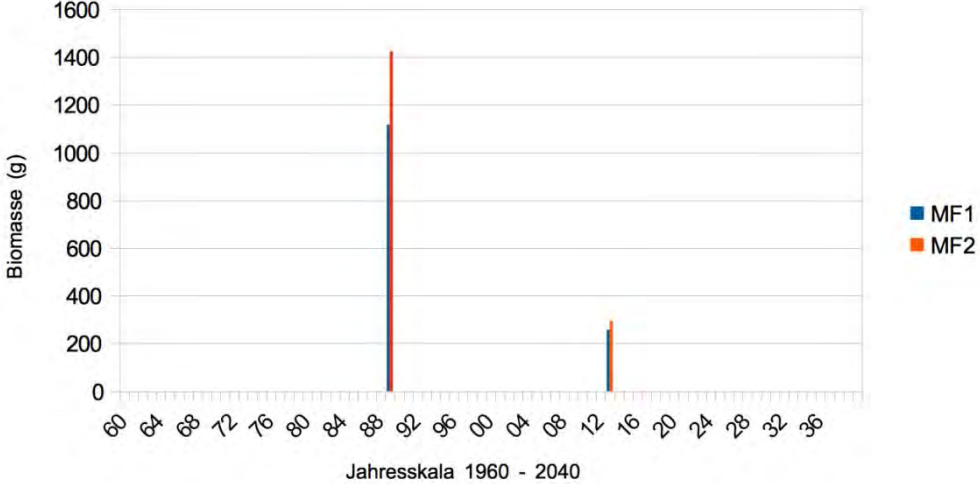


# Naturnähezeiger





# Landnutzung und Artenschwund



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Ermittlung der Biomassen flugaktiver Insekten im Naturschutzgebiet Orbroicher Bruch mit Malaise Fallen in den Jahren 1989 und 2013

# Herausforderungen

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Datenreihen? Datenzeitschnitte?

Wald und Offenland?

Confounding Entwicklungen (Klimawandel,  
Pestizideinsatz, Anbaufrüchte, Vorrat in Wäldern)

Lter Deutschland