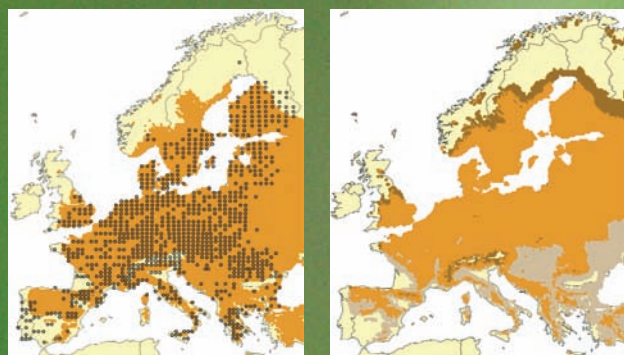


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BioRisk 1
Special Issue

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CLIMATIC RISK ATLAS OF EUROPEAN BUTTERFLIES

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CONTENTS

Acknowledgements	7
Foreword by Butterfly Conservation Europe	8
Context and objectives of a climatic risk atlas of European butterflies	10

A. CLIMATE CHANGE, BIODIVERSITY, BUTTERFLIES, AND RISK ASSESSMENT

A.1 Introduction: Butterflies as indicators	12
A.2 Scenarios and biodiversity	13
A.3 Climate change and Biodiversity Risk Assessment for butterflies	14

B. METHODOLOGY

B.1 The MEB project data as basis for the atlas	18
B.2 Scenarios used to assess climate change risks for European Butterflies	18
B.3 Climate niche modelling	20
Climatic factors of butterfly distribution	20
Modelling procedure	21
Assumptions for species dispersal	24
Visualisation of the multi-dimensional climatic niche	24
B.4 Climate change risk assessment for butterflies	24
Definitions of climate change risk categories for European butterflies	24
Integrated overall risk categories for European species – integrating all scenarios and time steps	25

C. CLIMATE RISKS OF EUROPEAN BUTTERFLY SPECIES

C.1 Species inventory and taxonomy of European butterflies	28
C.2 Climatic fate of individual species	31
Hesperiidae	32
Papilionidae	104
Pieridae	122
Lycaenidae	186
Riodinidae	340
Libytheidae	342
Nymphalidae	344
Danaiidae	618

C.3 Non-modelled European butterfly species **620**

C.4 Summary results **629**

D. DISCUSSION OF METHODOLOGICAL LIMITATIONS

D.1 Limitations of species distribution models and future projections **634**

D.2 Interaction of taxonomic status and modelling results **645**

E. OUTLOOK: CLIMATE CHANGE AND BUTTERFLY CONSERVATION

E.1 Direct and indirect climate change impacts on butterflies and biodiversity **652**

Habitats and trophic interactions **652**

Climate envelopes for European butterflies as a starting point for future research and conservation **653**

Climate change and evolution **654**

Biodiversity Risk Assessment **655**

E.2 Butterflies as indicators of environmental change **656**

Butterfly indicator developments **656**

Butterflies as climate change indicators **657**

E.3 Climate change and butterfly conservation **658**

F. APPENDICES, REFERENCES AND INDEX

Appendix 1: Table on parameters for model suitability assessment **662**

Appendix 2: Table on scenario results: Changes in climatic niches **674**

Appendix 3: Risk category statistics **696**

References **698**

Species index **706**

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Foreword by Butterfly Conservation Europe



Climate change is a new and potent risk to biodiversity. The inevitable rise in global temperatures predicted over the next decades and century is a serious threat to butterfly and moth populations and is likely to exacerbate their decline.

Butterflies are a well-known and popular group of insects that can play a valuable role as early warning indicators of environmental change. They have short life-cycles and respond rapidly to change. Butterflies and moths have declined rapidly in recent decades and are declining more rapidly than other well-known groups such as plants and birds (which often depend on their caterpillars for food).

This Atlas is an early attempt to investigate the possible effects of climate change on butterflies by modelling the impact of various future climate scenarios. The research is based on a unique and comprehensive dataset on butterfly distributions in Europe, derived from the Mapping European Butterflies (MEB) project. We believe that the results are important because butterflies are one of the few groups of insects for which such comprehensive data are available at a European level. As insects comprise over two-thirds of all known species, the results are valuable to help understand the possible impacts of climate change on biodiversity as a whole.

The results are alarming. The models suggest that the vast majority of European butterflies will be badly affected by climate change. Most species will have to shift their distributions considerably northwards and will lose a large amount of their suitable climate space. Furthermore, many butterflies live in discrete colonies and have limited powers of dispersal. Such species are restricted by available habitat and may not be able to alter their distribution to keep in step with climate change.

The results have important implications for conservation and for EU and national policies and for their funding and implementation. We have the chance to mitigate some of the worst effects of climate change, including those on biodiversity, if we act now. Specifically, we need:

- A big shift in the spending of Common Agricultural Policy (CAP) funds to reward the delivery of public goods such as biodiversity.
- More funding of schemes that deliver environmental outcomes, including: better resourced and targeted agri-environment schemes; use of CAP “Envelope” funding to enhance biodiversity; and targeting of Less Favoured Areas (LFA) payments to sustain High Nature Value (HNV) farming.

- Full implementation of the EU Habitats' and Species Directives with proper protection and sustainable management of Natura 2000 sites across Europe.
- New initiatives to resource the creation of habitat networks and mosaics that support biodiversity and help mitigate the adverse effects of climate change.

Together with international commitment to reduce greenhouse gas emissions, this programme of action will help to halt the loss of biodiversity and support the recovery needed. We want our children and grand-children to inherit a Europe where our ecosystems are thriving and butterflies enrich the experience of their every day lives.

Martin Warren
Chair, Butterfly Conservation Europe

Context and objectives of a climatic risk atlas of European butterflies

Insect species contribute more than 60% of all plant and animal species in Europe. They have also declined far more rapidly than other taxa in modern European landscapes (Thomas & Morris 1994, Van Swaay & Warren 1999, Thomas et al. 2004, Van Swaay et al. 2006). Butterflies have proven to be excellent indicators for changes in other insect populations, alerting ecologists to functional and spatial changes in ecosystems and landscapes that will eventually affect multiple species (Erhardt 1985, Erhardt & Thomas 1991, Thomas 2005, Van Swaay & Van Strien 2005). They are easily detected in the field and their habitat requirements are relatively well known. Moreover butterflies have an extremely positive image amongst the public. Butterflies are a symbol for pleasure and beauty of life; they stand for intact and healthy nature. Their decline makes the dimension of biodiversity loss personally relevant to everyone. The publication of this atlas on the possible impact of climate change on a well known group of animals is both timely and important.

The overarching aim of the atlas is to communicate the potential risks of climatic change to the future of European butterflies. The main objectives are to:

- a) provide a visual aid to discussions on climate change risks and impacts on biodiversity and thus contribute to risk communication as a core element of risk assessment;
- b) present crucial data on a large group of species which could help to prioritise conservation efforts in the face of climatic change;
- c) reach a broader audience through the combination of new scientific results with photographs of all treated species and some straight forward information about the species and their ecology.

The atlas does not aim to be a guide to species identification or provide a comprehensive treatment of the species' ecology and taxonomy which are covered in detail in many other publications. The strict methodological requirements also mean that the analysis excludes highly localized species and therefore covers only 294 of the approx. 450 European species.