

# **Topics in Biodiversity and Conservation**

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Roseli Pellens • Philippe Grandcolas  
Editors

# Biodiversity Conservation and Phylogenetic Systematics

Preserving our evolutionary heritage in an  
extinction crisis

With the support of Labex BCDIV and ANR BIONEOCAL



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# Foreword

The desperate, and seemingly inexorably worsening, state of biodiversity on Earth is arguably not a consequence of conscious choices. That is much of the problem. There are undoubtedly cases, and many of them, in which people made explicit decisions to forgo the variety of life naturally present in a given area in favour of some alternative benefit (e.g. agricultural activity, energy production, housing). However, by and large, the global losses of species, and the reductions in the abundances and distributions of increasingly the majority of others, are the outcome of outright ignorance of the impacts of anthropogenic activities, of underestimation or misunderstanding of the impacts of those activities, and, perhaps most significantly, a host of individual decisions which whilst independently perhaps quite rational have led to a combined pressure on biodiversity that is far from what it can sustain.

The field of conservation biology has done much to highlight the status and trends in biodiversity, but especially the need for active and explicit choices as to its future. Frustrating as is their failure to date to be realized, the establishment of baselines and targets for biodiversity at regional, national and global scales is the logical framework within which decisions can properly be made as to what environmental changes and management actions are and are not carried forward, and with what consequences. The ‘agony of choice’ needs to be a real choice, albeit the agony may not always be avoided.

Key to determining baselines and targets, and what choices to make, is deciding which metric to use to discriminate between different outcomes, and particularly to compare those of current actions with alternatives. This book provides a cogent argument for the use of phylogenetic diversity as a key metric – that is, measures of biodiversity that capture evolutionary history – and phylogenetic systematics as a core organizing principle. It highlights the benefits and constraints of such an approach, explores the ways in which it can be implemented, and describes a rich diversity of applications. This is the most comprehensive compilation of cutting-edge contributions on this topic to date, provides many valuable insights, and a ‘go to’ source of understanding. The intention to help improve the global condition of biodiversity is apparent throughout.

Biological conservation has oft been hampered by those who have maintained that priorities for action should only be established using approaches that are easily understood by the general public. The same demand has not been made in many other arenas of human endeavor (e.g. medicine, nuclear power), and neither should it constrain biological conservation. That said, there does remain a substantial challenge of encouraging an informed citizenry around the justification and goals of using a phylogenetic diversity approach, and gaining their support. Only by so doing will there be a genuine chance of aligning the multitude of biodiversity-critical decisions being made each and every day across the continents and oceans.

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