

# Publications

**How to Clone a Mammoth: The Science of De-extinction** by Beth Shapiro (2015) 240 pp., Princeton University Press, Princeton, USA. ISBN 978-0-691-15705-4 (hbk) USD 17.47.

'Extinction is not forever' was the phrase that caught my attention when I first heard about the developing initiatives to bring back extinct species. It was truly a revolutionary thought! The chance to consider de-extincting species is only possible as a result of a remarkable decrease in the cost of reading and writing DNA, together with the creation of a set of innovative tools for manipulating the structure of DNA. The possibility of de-extincting species is being taken seriously and IUCN has commissioned a working group to develop guidelines for the conservation application of de-extinction.

The emerging field has drawn intense journalistic and public interest, with philosophical, ideological and practical objections and assertions battling over something that has not yet happened. Into this commotion comes the first book I am aware of that takes on the issue seriously. A short book, it sets out to provide a road map for de-extinction, in three parts: how we might make the decision about what species or traits to resurrect, how this might be done technically and biologically, and how to manage populations of engineered individuals once they are released into the wild.

This book has been widely reviewed and the author widely interviewed. Everyone loves mammoths and enjoys playing with the idea of seeing their lumbering, impressive forms back on earth, and Shapiro is a mammoth expert. But the important thing to realize is that what is being talked about by Shapiro and others is not really bringing back mammoths but bringing back mammoth traits such as subcutaneous fat and more hair and the ability to survive arctic winters. The IUCN working group on de-extinction is aware of this, and their draft definition of de-extinction is: '... to apply to any attempt to resurrect some proxy of an extinct species or subspecies (hereafter "species") through any technique, including methods such as selective back breeding, somatic cell nuclear transfer (cloning), and genome engineering'. So what we are really talking about is not mammoths per se but mammoth-ness—the qualities of being a mammoth. As such the de-extinction is at the genetic level of biodiversity rather than the species level.

But after much discussion about the details of cloning, genetic architecture and DNA

functioning and the study of ancient DNA (the author's speciality), in the end what Shapiro wants is '... not to create monsters or to induce ecological catastrophe but to restore interactions between species and preserve biodiversity' (p. xi). Here is where the book is weakest. Not an ecologist, Shapiro's desire to restore these interactions is based on an assumption that the mammoth ecosystems (and some claim there were such) have remained the same and will resume their previous functions with the return of the now mammoth-endowed elephants. Clearly this is a contentious point of view and worth the serious consideration of ecologists. The uncertainty around this topic is not a sideshow but vital if the ecological functioning of mammoth-like elephants is the measure of success for de-extinction of these beasts.

So read the book. It will make everyone think, will make some mad, others inspired, and hopefully will educate all conservationists to the extraordinary potential opportunities, good and bad, that de-extinction presents.

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**Conservation and development in Cambodia: Exploring Frontiers of Change in Nature, State and Society** edited by Sarah Milne and Sango Mahanty (2015) 292 pp., Earthscan (Routledge), Abingdon, UK. ISBN 978-0-415-70680-3 (hbk) GBP 85.00/USD 145.00.

One of the significant recent shifts in conservation has been the recognition that achieving conservation outcomes requires engaging in the socially-mediated struggle over resources—resources to conserve rather than for direct use—but resources nonetheless. The division of labour that has taken place in conservation means that often those who publish in journals and attend conferences are not the ones directly engaged in conservation politics. Conservation and development in Cambodia does a valuable service in bringing to the broader field a perspective on the 'dynamic, inter-linked, multi-scalar and power-laden' (p. 1) dimensions of conservation in Cambodia.

Cambodia is a fascinating country undergoing dramatic transformation: it has one of the highest economic growth rates in South-east Asia and one of the highest

deforestation rates. The government has made strong commitments to conservation in the last decades yet the practical outcomes have been what the editors term 'problematic'. Through its three sections and introductory chapters this volume explores the political ecology of conservation and development, focusing on the dynamics between government officials, conservation organizations, local NGOs, the armed forces, elites, private interests and those studying these actors.

The first section of the book looks at how and why nature–society relationships are changing in Cambodia, with four chapters that address issues such as the dynamics of a post-conflict state, the role of powerful state actors and the role of hybrid rice in market integration. The second section addresses the question of how international conservation efforts have played out, focusing on protected areas, community forests and carbon markets. The final section examines the role grass-roots organizations play in Cambodian conservation and development.

The book has a coherent plan, and the chapters were reviewed by all contributors in a workshop setting prior to publication. Despite this hard work on the part of the editors the chapters are uneven and the frame outlined by the editors is not filled in satisfactorily by these contributions. Some of the individual chapters, such as the one on use of the floodplains of Tonle Sap Lake, are first rate, but others struggle to move the central argument forward. The best part is the introductory chapters, which sketch the state of Cambodian conservation and development with deft and masterful strokes. But this book is not about conservation in the sense that many think of it—it is really about the political ecology of human–nature relations in Cambodia. People, as villains (think elite-capture) as well as heroes (the Kuy as storytellers), are the focus of the volume. The message is not an optimistic one but the volume does a good job in educating the reader, and the lessons from Cambodia are relevant everywhere.

Finally, the price: in this day of increasing sensitivity to making information widely available, particularly to broad segments of society in Cambodia and elsewhere, the fact that the publishers charge GBP 85/USD 145 for this volume is hard to defend.

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