

UC Merced

Frontiers of Biogeography

Title

book review: A new encyclopedia for biological invasions

Permalink

<https://escholarship.org/uc/item/546062r7>

Journal

Frontiers of Biogeography, 3(3)

Author

Francis, Robert A.

Publication Date

2011

DOI

10.21425/F5FBG12422

Copyright Information

Copyright 2011 by the author(s). This work is made available under the terms of a Creative Commons Attribution License, available at

<https://creativecommons.org/licenses/by/4.0/>

book review

A new encyclopedia for biological invasions

Encyclopedia of biological invasions, by Daniel Simberloff and Marcel Rejmánek (editors)
2011, University of California Press, 792 pp. ISBN: 9780520264212
Price US\$95 (Hardback or e-book); <http://www.ucpress.edu/>

Despite existing in some form for many decades (Davis 2005), invasion ecology/biology is in many ways a nascent and emerging field, and is still engendering discussion regarding whether it indeed truly exists as a field or discipline in its own right, or is rather a particularly focused aspect of community ecology or biogeography (e.g. Marris 2009, Pyšek and Hulme 2009). As with many ecological disciplines, invasion ecology has seen fundamental disagreements over aspects ranging from core definitions (including 'invasion' itself; Falk-Petersen et al. 2006, Ricciardi and Cohen 2007) to level of scientific objectivity (e.g. Larson 2007). The field is at a stage in its development where (1) dedicated journals exist (e.g. *Biological Invasions*) and there is a substantial number of academic articles published every year (for example a search of 'invasive species' in Web of Knowledge returns 1181 articles published in 2010 alone), 2) there is clear and significant international interest and action in relation to invasions and (3) an extended peer community is involved in researching and managing the threat of invasive species, from world-leading academics at research-intensive universities to local government and conservation volunteers. The result of the burgeoning information and uneven levels of understanding and focus across the peer community is confusion and uncertainty, right from the fundamentals (what is an invasive species exactly, and why is it invasive?) to the specifics (what is the best technique for reducing populations of *Crassula helmsii* in my pond, and how does that differ from managing spread in the local lake?). The time is ripe therefore for an encyclopaedia such as this one by Daniel Simberloff and Marcel Rejmánek to form a baseline for future definitions and discussions.

The book is one of University of California Press' *Encyclopedias of the Natural World* series, and as with the other volumes has a wide range of entries that are effectively short essays or summa-

ries of key topics relating (in this case) to biological invasions, without citations but with relevant further reading at the end. The entries vary in length from 1 to 8 pages, and often incorporate useful figures and occasionally tables. The book is impressively glossy (all figures are in full colour) and well presented, which is all the more remarkable considering the relatively modest price. The editors, Daniel Simberloff and Marcel Rejmánek, are leading invasion ecologists and are well qualified to compile such a text; this is reflected not just in the broad range of well-selected topics that the volume includes (of which there are 153) but also the roll-call of esteemed contributors that have supplied the entries (of which there are 197, many of them high-profile international researchers). The book is aimed not just at an academic audience, however, and the articles are written with the interested and educated general public in mind.

The individual articles cover various aspects of invasions, ranging from particular attributes of invasive species and invaded ecosystems to impacts and management, interesting case studies and historical perspectives. Clearly it is not possible to cover all of the entries in a review such as this, but I did find several articles especially interesting, particularly because they highlight the many socioecological factors that complicate our relationships with potentially problematic species. The entry on *Xenophobia* for example does an excellent job of summarising how society's relationship with non-native species is constructed in certain ways by the use of loaded terms or cultural metaphors, for example the negative personification of zebra mussels as 'outlaws' on the west coast of the US, or the badging of 'harmful' or 'distasteful' species with appellations that note their foreign status (Japanese knotweed, Chinese mitten crab, English sparrow and so on). As a starting point for a discussion of scientific objec-

tivity related to invasion biology it works exceptionally well, and is exactly the right size for digestion by students or interested amateurs.

Indeed, one of the best uses I find for reference works such as these are as opening forays into topics for class discussions, whether at graduate or undergraduate level. Good examples include the entry on *Succession*, which very effectively and concisely summarises key concepts that take up whole chapters in many textbooks, and although invasion biology is only addressed towards the end, it is clear how the two link together. Likewise, the discussion on *Native invaders*, in which issues of 'invasive' terminologies (and when they are appropriate) are covered, is excellently written and illuminating at a range of levels, particularly in relation to the many examples of 'invasion' given. Certainly students and researchers new to the subject will have any initial confusion over what is meant by invasions dispelled by the article, and it will also help them to think objectively about whether a species really may be considered invasive or not. All of the articles I read through were of a high quality and well written/edited, with very little wasted space for such a large volume (although on occasion figures are not always relevant – I'm not sure why an image of Frank Buckland 'physicking a porpoise' (page 2) is worthy of inclusion for example, despite his role in founding the main UK acclimatisation society).

Of course, it is always hard to get the right balance between conciseness and detail in such entries, and to retain the relevant focus. The opening entry, *Acclimatisation societies* is a case in point: the article does an excellent job of summarising the development and impact of such societies in different countries, many of which were responsible for the introduction of significant numbers of non-native species around the globe before dying out in the face of increasing legislation, awareness of ecological risk from introductions and lack of interest from the general public. The article elegantly conveys how originally benevolent intentions, such as the introduction of non-natives to improve food resources, control pests and to soothe homesick colonists (among

other reasons), in most cases failed to be realised and also (with some notable exceptions) that many societies were unsuccessful in actually naturalising many species at all. But much is left unsaid: in some cases one is left wanting to know more about whether species referred to as 'released' became naturalised, whether regions such as South America maintained any such societies (these countries are ignored, while others such as Germany and Italy receive only one sentence) and ultimately whether such societies indirectly provided evidence to force their own discontinuation. As a taster to whet the appetite, the article succeeds very well (and relevant books on the subject are provided in the Further Reading section), but it is not an authoritative, encyclopaedic summary in itself.

As with any vast topic, covering all aspects in a single volume is difficult – in this case there is differential coverage of ecosystems (e.g. entries for canals, lakes, rivers and wetlands, but no coverage of urban ecosystems, despite these being important points of introduction for some invasive taxa); hypotheses (e.g. *Enemy Release Hypothesis*, *Novel Weapons Hypothesis*, but no *Tens Rule*); geographical areas (Australia, the Great Lakes, Hawaiian islands, the Mediterranean, the Ponto-Caspian, New Zealand and South Africa receive a particular focus) and species (good examples of some key species or groups such as zebra mussel, earthworms and fishes, but understandably not comprehensive coverage). This is entirely reasonable, and is not a criticism of the volume – it is impossible to cover the vast range of topics associated with biological invasions in sufficient depth in a single volume, and the material that is included is impressive. The division of the book between invader attributes, processes, taxa, ecosystems, pathways to invasion and so on is very well done and represents a huge effort on the part of the editors, for which they should be roundly congratulated. I would encourage consideration of a second volume, however, at least with regard to key concepts and hypotheses. The opening guide to the *Encyclopedia* notes that there is a website with a list of articles, sample entries and so, and notes that the site 'will evolve with the addition of

new information', p. xxii). The web address has since changed and I was unable to locate the new one. Though I happily agree that this could potentially be a very useful resource, given the rapidly changing environment of the internet, the publication of a second volume would perhaps be the most reliable option.

In summary, this is an excellent reference work that combines readability with academic rigour throughout. Its broad coverage of the field, high quality of production and reasonable price makes it an essential purchase for any university with departments teaching or researching within the broad spectrum of ecology, as well as for individual researchers of species invasions.

Robert A. Francis

Department of Geography, King's College London
e-mail: robert.francis@kcl.ac.uk; <http://rg.kcl.ac.uk/staffprofiles/staffprofile.php?pid=1961>

References

- Davis, M.A. (2005) Invasion biology 1958-2004: the pursuit of science and conservation. In: *Conceptual ecology and invasions biology: reciprocal approaches to nature* (ed. by Cadotte, W.M, McMahon, S.M. and Fukami, T.) , pp. 35–64. Kluwer Publishers, London.
- Falk-Petersen, J., Bøhn, T. & Sandlund, O.T. (2006) On the numerous concepts in invasion biology. *Biological Invasions*, 8, 1409–1424.
- Larson, B.M.H. (2007) An alien approach to invasive species: objectivity and society in invasion biology. *Biological Invasions*, 9, 947–956.
- Marris, E. (2009) The end of the invasion? *Nature*, 459, 327–328.
- Pysek, P. & Hulme, P.E. (2009) Invasion biology is a discipline that's too young to die. *Nature*, 460, 324–324.
- Ricciardi, A. & Cohen, J. (2007) The invasiveness of an introduced species does not predict its impact. *Biological Invasions*, 9, 309–315.

Edited by Markus Eichhorn

book review

A piscine history of the Neotropics

Historical biogeography of Neotropical freshwater fishes, by J.S. Albert and R.R. Reis (editors)
2011, University of California Press, 408 pp. ISBN: 9780520268685
Price £59 (Hardback); <http://www.ucpress.edu/>

The Neotropics leave an indelible impression on everyone who visits them. The seeds of some of the most important concepts in ecology and evolution were sown during the South American travels of influential 19th century thinkers. For example, the latitudinal gradient of diversity, now recognized as ecology's oldest pattern (Hawkins, 2001), was first identified by von Humboldt, while Bates documented the variety and adaptations of species in Amazonian forests, and Wallace and Darwin pondered the mechanisms responsible for the myriad forms of life they encountered. Although the Neotropics have played a crucial role in our understanding of the diversity of life on earth, in many ways they continue to represent an unexplored frontier. This is particularly clear in the case of Neotropical freshwater fish, a group estimated to consist of more than 7000 species, and that accounts for over half the freshwater fish on

the planet and around 10% of all vertebrate species.

James Albert and Roberto Reis' goal as editors of the *Historical Biogeography of Neotropical Freshwater Fishes* is to examine the evolutionary forces responsible for this diversity. In doing so they make the case that multiple processes of diversification were involved and that these operated over long periods of time as well as on a continental scale. The book itself is divided into two parts, the first of which examines current knowledge on the biogeography of the region, while the second is a regional analysis that links contemporary geographical patterns with geological history. The book is ambitious in scope and brings together previously fragmented material to provide an authoritative overview of this impressive group of fish. And while a fish-eye view of the Neotropical ichthyofauna is inevitably drawn to the Ama-