

## Invasion biology: critique of a pseudoscience

Theodoropoulos, D. I. (2003)  
 Avvar Books, Blythe, California. (www.avvar.com)  
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SCIENCE is both highly competitive and highly cooperative, so a rigorous evaluation of an idea comes not from one's close colleagues, but from one's opponents (Hull 1988). While robust disagreement may not lead to consensus, at its best it should lead to clarification of areas of agreement and areas of dispute, as well as dialogue on the empirical tests necessary to solve the disagreements. In this context, David Theodoropoulos' new book on invasion biology attempts a rigorous, sceptical critique of the belief that invasive species are a significant threat to biodiversity.

Theodoropoulos' basic arguments are (i) that emphasis on exotic species and their dispersal by humans as causes of loss of biodiversity or ecosystem change are overstated, (ii) exotic species provide a convenient screen shielding a range of other, more important problems, and (iii) there are ideological and economic pressures that encourage acceptance of the view that exotic species are threats. These ideas are developed in the three main parts of the book, which focus in turn on the biology of dispersal, the socio-political factors that Theodoropoulos believes encourage a focus on exotic species and the role of humans in dispersal of species. Each part is grounded solidly in the relevant literature, although many will disagree with his interpretations. Furthermore, the bluntness of the language and the arguments are often confronting and readers need to be prepared for comments such as:

"... we must insist on accurate, non-prejudicial language, both in the journals and in the mass media. Inaccurate, non-biological and emotionally loaded such as "alien", "invasive", "irruptive", "non-native", "aggressive", "green cancer", "diseased landscapes", "biological pollution", "genetic contamination" and such-like, have no more place in the biological literature than terms like "nigger", "kike", "chink", "bloodthirsty savages", "primitives" and the like have in the anthropological literature. Researchers, academics and land managers who have used such terms in their publications or in dealing with the media have no more credibility than would an anthropologist who had used racist language." P. 171

Thus the book demands patience and not all may be willing to extend it.

All parts of the book are controversial, but the first on "Nature, Dispersal and Reaction" is likely to be the most useful to conservation biologists because so many of its arguments can be structured as testable hypotheses. For example, Chapter 2 "The true causes of invasion" postulates that invasive species are often

a symptom of ecosystem change rather than a cause. Thus, changes in hydrology, nutrient enrichment, pastoralism, altered fire regimes, cessation of indigenous land management and other anthropogenic influences may all facilitate invasion and be the real cause of species decline or ecosystem dysfunction. The potential for different factors, individually or interactively, to cause the decline of species is already highlighted by Caughley and Gunn (1996), who suggested protocols for diagnosing decline that involve the experimental testing of the possibilities. Similar experimental approaches proved effective in resolving the impact of the red fox *Vulpes vulpes* on Australian marsupials (e.g., Kinnear *et al.* 1988, 1998, 2002; Hone 1994). In this context, Theodoropoulos' arguments are a timely warning of the need to test hypotheses rather than accepting a convenient explanation on faith.

Later parts of the book are less helpful, although good ideas can still be distilled. In Part II "Why? Psychology, Politics and Pseudoscience" he seeks to explain why blaming exotic species for ecological problems is so attractive. Here, racial prejudice and the excesses of racial bigots are likened to concerns about exotic species. I found this confronting and at times offensive and found that Theodoropoulos committed many of the faults he saw in others. Thus, although he accused invasion biologists of selectivity in their use of the literature, he overlooked some of the major textbook cases of the impact of introduced species such as the brown tree snake *Boiga irregularis* on Guam (see discussion in Caughley and Gunn 1996). However, readers who can control their tempers may still find stimulating and worthwhile ideas. For example, the connotations of language in determining attitudes and mindsets is a perennial problem (thus should introduced species be "exotic" with a potentially attractive connotation or "aliens" or "invaders" with a negative connotation). Perhaps scientists should also be more aware of potential conflicts of interest where industries funding research have a vested interest in the outcome, such as pesticide or herbicide companies funding research into the putative impacts of introduced species.

Part III develops the challenging thesis that introductions of species to novel habitats may be a valid conservation technique. This deserves serious consideration, but I was puzzled why Theodoropoulos made scant use of the biological control literature, which sets out clear criteria for assessing the likely consequences of a planned introduction of an exotic species.

Overall, the value of this book is in its challenge for studies of exotic species to demonstrate clearer thinking in research planning, implementation and the communication of findings. Consideration of the social dimension of research, including the connotations of language and possible conflicts of interest in research funding, is also important. The drawback is

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that arguments are made polemically and readers need to restrain the temptation merely to be rude in return.

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## Ecosystem Management: Adaptive, Community-based Conservation

Meffe, G. K., Nielsen, L. A., Knight, R. L. and Schenborn, D. A. 2002  
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FOR those wanting to place Australian perspectives on community-based conservation in an international context, Gary Meffe, Larry Nielsen, Richard Knight and Dennis Schenborn have released a new book called *Ecosystem Management: Adaptive, Community-based Conservation*, which examines the application of scientific principles of conservation biology to real-world problem solving. It is intended as a textbook for postgraduate courses in ecosystem management, or as extension material for advanced undergraduates.

The book is structured into three main parts. Part I incorporates chapters 1 to 4 and provides a background of ecosystem management using basic models and concepts. In these first four chapters, there are comprehensive definitions of various concepts such as traditional management versus ecosystem management and some misconceptions about ecosystem management. Examples of past ecosystem management and the different methods of application are used to illustrate many of the concepts covered in those chapters. Part II (chapters 5–9) of the book provides the readers with ecological and biological background. These five chapters cover topics such as genetic diversity in ecosystem management, principles of populations (MVP and PVA estimations) and different management levels ranging from single-species management to landscape-level considerations. Part III (chapters 10–12) explores the ideas of incorporating various human dimensions for the implementation of ecological processes. There are numerous examples in the three chapters of why natural resources cannot be managed effectively without the support of the community, government and interest groups.

This book has over 300 pages of fully illustrated text. In each chapter, there are at least six exercises and discussion questions, and a good range of thought provoking examples of ecosystem management are used to illustrate the complexity of the subject. Even if the book is not set as a text, these exercises are useful inspiration for lecturers in ecology or conservation biology looking for novel approaches to use in workshops and tutorials.

The book will work well for guided student reading. The use of well illustrated figures throughout assist the reader in the explanation of the concept of ecosystem management in a real world, while the background and concepts from the first four chapters give useful revision for experienced students and a clear introduction for those new to the discipline. The complexity of ecosystem approaches from ecological, socio-economic and institutional perspectives are well demonstrated from the examples used in parts I and II. In part III, various techniques and strategic approaches are examined in great detail, providing valuable information on the problems to be confronted and the different objectives and tactics and for their solution. The emphasis on practical applications will silence those students whose most popular question is: "What is the real-world relevance of this and how do we manage it as a community?"

Community-based conservation is in its early stages and this book provides a realistic approach to combining the scientific applications with socio-economic and institutional demands of today's society. It deserves a place in university libraries for background reading and lecturers in need of inspiration for teaching ideas may be keen to buy a personal copy. Those still hunting for a textbook in ecosystem management that takes an applied problem-solving approach may find the solution here.

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