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Book review

Conceptual ecology and invasion biology: reciprocal approaches to nature.

Edited by M.W. CADOTTE, S.M. McMAHON and T. FUKAMI.

ISBN-10: 1-4020-4158-6 (paperback), ISBN-13: 978-1-4020-4158-7 (e-book), 2006, XVIII + 505 pp.; price US \$ 49.95 (softcover) and US \$ 129.00 (hardcover).

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The history of human attempts to face invasive species is crowded of cases in which indiscriminate interventions have led to increased harms rather than to the solution of the problems initially generated by the invaders. In Jamaica, for instance, cane growers introduced *Formica omnivora* to mitigate the impact of rats on sugarcane fields, but ants soon became pests themselves; to control rats and ants, the toad *Bufo marinus* – a novel pest – was then introduced. Finally, to control rats, ants, and toads, small Indian mongooses were introduced but mongooses soon began preying on indigenous birds and further decreased biodiversity (Silverstein and Silverstein 1974, cited at p. 266). This and several other unfortunate stories of failed control of invasive species are instrumental in showing that the adoption by land managers of trial-and-error approaches is most often counter-productive. Rather, as repeatedly suggested, restoration strategies should be based on a truly sound scientific ground.

The need to intensify our understanding of the biology of invasions, on the one hand, and the potential that ecologists have to put their knowledge at the service of the real world, on the other, are the leitmotifs of “Conceptual ecology and invasion biology: reciprocal approaches to nature”, the inaugural volume of the Springer’s *Invading Nature* series. Indeed, most chapters follow a value-neutral and strictly scientific approach to invasion biology (see, e.g., Chapters 6, 8, and 10). Biological invasions are viewed as natural, large-scale scientific experiments which can benefit from controls and replicas (Chapter 11). Invasions are thus a very rich source of information for capturing the complexities of ecological systems. In the same way that the physiology of an organism may be better studied during illness, anomalies of ecological systems – i.e. species introductions – are fundamental in understanding their functioning (Chapter 5). This viewpoint is what Mark Davis (Chapter 3) calls the “Asilomar path” after the first Symposium of the International Union of Biological Sciences held in Asilomar, California (U.S.A.), in 1964. Conservation issues were excluded from the agenda, while the principal aim of the Symposium was the search for generalizations regarding the evolutionary and ecological processes involved in species’ “colonization”.

Since the 1980s, however, more and more ecologists have been getting aware that studies on biological invasions not only have the potential to contribute to the advancement of “pure” science, but may also allow them to assist land managers in restoring and rebuilding the “ill” ecological systems. So, several of them chose to adopt the conservation and environmental approach advanced by Charles Elton in the 1950s. Reasons that might have induced this shift from the “Asilomar” to the “Eltonian” path (Davis, Chapter 3) might have been either the “infrastructural” pressure for ecologists to justify their research in a larger social context – in other words, funding opportunities – or their personal sense of social responsibility and interest in participating to the political forum. The present concern of ecologists for the environment is evident in the declared purposes of several chapters of the volume, aimed to, e.g., elucidate molecular mechanisms promoting species’ invasiveness (Chapter 9), investi-

gate how theories such as “Biotic Resistance” and “Escape from Natural Enemies” might help understand the efficacy of biological control programs (Chapter 13), explore the role of niche breadth as determinant of invasion success (Chapter 14), understand invasions into patchy habitats by the adoption of metapopulation models (Chapter 17), or evaluate the invasibility of communities from their degree of species saturation (Chapter 19).

In spite of the strong involvement of the today ecologists in facts related to the real world, the Asilomar and Eltonian paths are still perceived as complementary; conceptual ecology and invasion biology are viewed in the book as “reciprocal” approaches to nature (see the title). But the introductory story from Jamaica is illustrative in telling us that reciprocity does not suffice when environmental problems are to be faced: to save biodiversity much effort should be paid to reach the indispensable integration between in-depth knowledge and quick action.

Other volumes of the Springer’s *Invading Nature* series will be soon out.

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