

Book Review

Conservation Medicine: The Power and Productivity of Transdisciplinary Collaboration

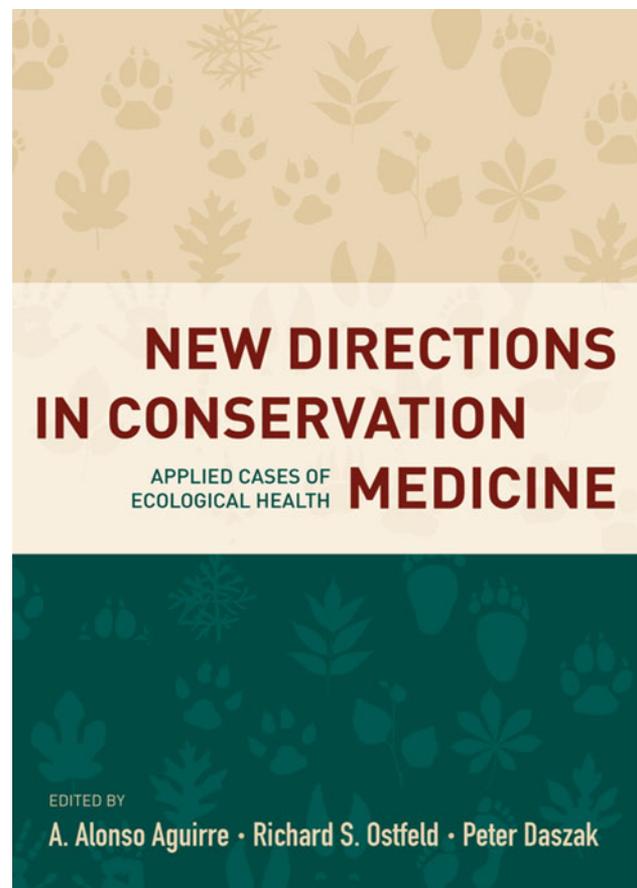
NEW DIRECTIONS IN CONSERVATION MEDICINE: APPLIED CASES OF ECOLOGICAL HEALTH, AGUIRRE A, OSTFELD R, DASZAK P (EDITORS), 2012, OXFORD: OUP, 639PP

New Directions in Conservation Medicine is a large and well-presented book, comprising 42 chapters in six sections, written by an impressive range of expert authors. The book contains much excellent and up-to-date information, well signposted with a 20-page index.

Well over half the volume focuses on infectious diseases in wildlife and livestock and zoonotic disease risks to humans. Key issues relate to the emergence, spread, surveillance and control of infectious diseases. The ‘emerging infectious diseases’ topic has gathered momentum and visibility over the last 3–4 decades of rapid globalisation, mobilisation of human activities and escalating anthropogenic disruption of landscapes, climate and habitats. The emergence of ‘conservation medicine’ on the research-practice-and-policy landscape has been an important outcome of this turn of events.

Indeed, one might ask if conservation medicine is primarily about infectious diseases in animals (and humans)—and, obversely, not much interested in the health of vegetation. There is, too, only the briefest mention of animal nutrition and health (just several pages) despite its dependence on the vitality of natural or managed ecosystems as food sources. Meanwhile, there is more than enough of substance, complexity and policy relevance to be explored and understood in the realm of infectious disease ecology.

The book can be read at two levels. At the first level, it provides a vast and diverse store of interesting, instructive and well-illustrated material. Pictorial and graphic content



is good, and the referencing appears to be up to date. Some chapters provide broad reviews, and draw some good general conclusions. Some provide detailed exploration of one illustrative example (e.g. Chap. 13 on migration, border controls and infectious diseases focuses on the history of the controls at the Mexico–US border at El Paso, combating the spread of typhus especially).

The first four chapters provide an excellent context-setting introduction. They examine the history and evolution of the ‘discipline’, summarise the growing edges of research and practice (which define the book’s six sections), discuss the significance of the One Health idea and how it maps on conservation medicine, consider how ‘sustainable development’ relates to these core concepts, and explore the ways in which biodiversity underpins so much of what we and other species depend on for wellbeing, health and survival.

The next 19 chapters all focus on infectious diseases, almost exclusively in animals (including bees and other insects). Chapter 7 broadens out a little to review how environmental and demographic stresses affect the immune system of animals—and how this immuno-suppression affects susceptibility to infectious disease. Chapter 8, by Raina Plowright and colleagues, provides a well-structured discussion of the various ways in which climate change is likely to influence particular infectious diseases in different species, and their probability of transmission to humans.

Four chapters follow that explore issues and case studies of ecotoxicological exposures and consequences for sea mammals (e.g. carcinogen exposures of beluga whales in the St Lawrence estuary), terrestrial wildlife, biotoxins and bioaccumulation, and the animal–human interface. Then come seven chapters on Place-based Conservation Medicine, telling integrative stories of ecohealth management in particular regions, ecosystems, and elsewhere. One chapter explores the Kibale EcoHealth project in Western Uganda, with its integrated approach to minimising risks to forest and gorilla health, human-to-animal infection, livestock diseases, wood-fuel supplies and wildlife raids on village crops; the project illustrates how tradeoffs and shared understanding is required. Other examples are from Canada, South Africa, Mediterranean forests and Brazil. Infectious diseases are, again, a prominent theme.

Finally, six chapters address examples and case-studies of new and improved research and management practices—spatial analytic techniques; use of remote sense data; infection and pathogen surveillance networks, methods and standards; improved epidemiological research designs and techniques for field studies; and sophisticated modelling options.

At the second level, many readers will hope to find some synthesised insight into what have been the important new developments, and what ‘New Directions’ are currently

evolving that may help us navigate our way through an increasingly ecologically disrupted and precarious future. Earth system scientists now suggest that a 2°C rise in average global temperature will endanger the survival of over a quarter of all species. A 4°C rise looks increasingly probable by 2100, and if sustained over a century or two, could eliminate 60–70% of species.

The editors have missed the opportunity to include a final chapter or two that ties the book together. A Conclusion section might have discussed similarities and differences across taxa and broad categories of ecosystems. Surely the ‘New Directions’ are not of a one-size-fits-all type? Do the circumstances of disease emergence differ between wild animals, livestock and humans? Do different values and priorities compete among those three groupings in ways that hinder conservation?

A final observation is that the name ‘Conservation Medicine’ does not sit comfortably with all the contributory disciplines. This discussion has now spanned a couple of decades. The domain is defined (p. 6) as “the examination of interactions between pathogens and disease, and linkages with ecosystems and species.” That same opening chapter, *The ontogeny of an emerging discipline*, states that “Conservation medicine draws together the fields of ecology and health.” Yet the perspective of the *conservationist* differs somewhat from that of *ecologist*. Conservation, most immediately, preserves the status quo. Ecology seeks to understand (and work with) evolution, dynamic change, adaptive reorganisation, and organisms’ constant probing of niches to occupy.

Similarly with the words ‘medicine’ and ‘health’—two words that are understood differently across the disciplines that constitute ‘Conservation Medicine’. Health can be understood, using Eugene Odum’s hierarchical description, at the levels of genes, metabolic pathways, organ systems, organisms, groups, populations, species and ecosystems. We humans take medicine, we study medicine, and we have personal medical problems. In popular usage, ‘medicine’ refers to addressing the needs of individual patients, the *reactive* complement to shortcomings or limits within the ‘public health’ domain—which has the *proactive* task of protecting the population’s health. The editors argue, however, that ‘medicine’ *can* be applied to whole communities of organisms, to whole species and to ecosystems. Words, as Lewis Carroll’s Alice wisely noted, can mean whatever one intends.

It is easy for me to raise this question, of course; it is less easy to resolve it. The editors have wisely chosen a

subtitle, *Applied Cases of Ecological Health*, that fills any potential gaps. Anyway, what's in a name you might ask? If Conservation Medicine continues to grow, produce and play a central role in reorienting our thinking about how better to live in and with the increasingly endangered and depleted natural world, then that is what matters. This book is an important contribution to that growth and development.

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Published online: February 26, 2013