BOOK REVIEWS


After a dense, fact-filled text of over 350 pages, I found it more than ironic that the final offering in this volume is a little Appendix on ‘Counting tigers, with confidence’. It struck me that if we do not know what we are saving, conservation is indeed a crisis science – it fails even to have a clear subject of study. However, this simple concluding note was both reassuring and symbolic. Reassuring, because it would be very easy for the severe scientific complexities involved in saving tigers (*Panthera tigris*), particularly in the age of sophisticated telemetry and GIS data retrieval programs, to allow us to lose sight of the animal itself. The editors have done a masterful job of ensuring that the biology of tigers lies at the heart of each and every conservation decision, even those that now rest with government authorities. More importantly, though, the difficulty of identifying tigers is symbolic for how tough it is to save this animal: theoretical approaches, field methods and governmental treaties all must interface for tigers to survive. This book nicely summarizes just how complex the problem of tiger conservation really is; it also presents compelling reasons for devoting significant energies to saving a single species while facing the demise of animals that might be saved more easily and less expensively. The volume is structured in three parts. Correctly, the first begins with a review of what factors are generally involved in saving the largest terrestrial carnivore in Asia. Ecologically, the problem is in understanding the influence of critical factors that, on the one hand, restrict their prey to a few ungulate species but on the other hand affords them the flexibility to live in tropical rainforests (Indonesia), seasonally dry evergreen forests (India) and temperate forests (east to Vietnam and north to Russia).

The initial chapter by Sunquist, Karanth and Sunquist immediately telegraphs what this book is about, as it emphasizes just how complicated tiger conservation is: biological factors that significantly influence extinction risk in one area probably have little if anything to do with what is important in other areas. For example, considering populations that have already gone extinct, the demise of the Caspian tiger was probably due to its restricted distribution (requisite close association with water) whereas extinction of the Javan tiger was the result of increases in the hunting of deer and expanding human populations. Two chapters are largely devoted to taxonomy. Morphological analyses show that hypothesized subspecies are not supported with respect to body size, striping patterns, colouration, and skull characters; rather, most variation is associated with clinal patterns, such as larger tigers occurring at higher latitudes (Bergmann’s Rule) and island dwarfing. Genetic analyses found that, of the five putative subspecies of tigers, there is little genetic variation and that with recent range contractions, there has been genetic drift in geographically isolated populations. Such uncertainty in tiger systematics is unfortunate because knowing how to weight subspecific priorities is necessary for making important decisions for the future of tigers; it is unsurprising that toward the end of the volume, when participants were sitting down to make hard decisions about which tiger populations to save, taxonomy was not a consideration.

The second part of the book is the all-important touchstone: ecological patterns and processes that influence the distribution and abundance of tigers. Thorough treatments are given on: population dynamics of the Amur tiger; hierarchical analyses of habitat and prey; prey depletion as affecting tiger viability; factors involved in long-term ecological monitoring; and a host of very useful summary chapters for what are the crucial elements in supporting viable tiger populations in India, Indonesia, Thailand and Nepal. The end result of these studies is that tiger ecology involves complexity and flexibility. Factors such as poaching, prey availability and unbroken habitat may be the primary factors affecting extinction but it is interactive effects that are often unpredictably crucial to saving populations. The difficult task is in translating this ecology into conservation practice, which clearly involves case by case analysis and continual reassessment of what factors are influential at any given time. Largely to the credit of the editors, no author was allowed to describe what is essential to tiger ecology without committing to what they think actually is essential to tiger ecology. Two points are illustrative. In a multivariate analysis of factors associated with geographical range of the Amur tiger, Miquelle *et al.* do not mince words in stating that the formula needed to preserve tigers involves large areas of habitat and incentives for local people to halt poaching and to support populations of potential prey. The other example is a fine description, in the middle of a massive data section on tiger ecology, on how to count prey reliably; I liked the fact that a book on tigers emphasizes the importance of knowing decay rates and identity of dung in prey species. It would be easy for a volume devoted to tigers to downplay the difficulty of estimating population size and variability in prey, but the field studies underscore this essential factor and the volume consequently deals with it.

The last part addresses anthropogenic problems, specifically management and educational value of tigers in zoos, extensive illegal trade in tiger parts and derivatives, anti-poaching strategies, priorities for habitat protection relative to human needs (loss of human life, livestock depredation, competition for prey, road access, timber). The overarching lesson here is that, with careful planning and working with local governments, short-term increases in population numbers can be achieved. Dinerstein *et al.* show that, in the Royal Chitwan National Park, the highest density of tigers in the world is largely the result of protection measures by the government and close consultation with local people so that poaching pressure and economic incentives make it more valuable to have a thriving tiger population. An especially valuable discussion is in attempting to apply the Chitwan model to other geographical areas. Unusual features of ecotourism, the absence of firearms and the general economic payoffs of having tigers in Chitwan may well not work in other high-priority areas of Asia. This form of comparison, where it becomes clear how certain conservation measures that have worked in some places but not others, should be extended to other tiger populations, otherwise conservation measures are liable to become piece-meal. Also, I wish there had been a larger section on zoo...
biology, particularly relating to potential interactive links with field studies.

If presentation is everything, this book has no competition. The quality of type and text is virtually error-free, the colour figure illustrations and pictures of animals are stunning, and the interweaving of ‘boxed’ entries actually works to complement the text, rather than merely appearing as though they were there at some Publisher’s insistence. Bothersome are the back cover, appearing like a billboard sign due to the big funding necessary from public companies to save the tiger, and the colour pictures of tigers that are given in every chapter but often have nothing to do with the text. These are insignificant quibbles, though. If the marketing of tigers actually contributes to saving tigers and to conservation science in general, then such packaging is worthwhile. In the end, I think this volume is the closest I know of for truly being a scientific coffee table book!

Is a conservation effort singularly devoted to saving one species valuable in the larger mission of maintaining and protecting biodiversity? The tiger model, as well-presented in this volume, is a resounding yes. The modern synthesis of conservation biology in terms of science, culture, economics and politics are effectively conveyed in Riding the tiger, and should serve as a clear example of how and why to argue for single species efforts in the face of broad issues in conservation.

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ISBN 0-907649-75-0

Most conservationists who consider themselves pragmatists are preoccupied with extremes; questions such as ‘how can we protect the maximum number of species in the minimum area?’ are their bread-and-butter, and their recommendations are often, of necessity, based on inventories gathered using the quickest, cheapest or easiest of techniques.

How refreshing, then, to read a book that begins the process of conservation recommendation by assembling basic ecological data, gathered by local and international experts during 5 years’ sustained field research. I say begins the process of recommendation because, in addition to the ecological data, the book presents fascinating economic and historical discussions hinting at the profound controversies that pervade conservation activities in Africa and elsewhere.

Mkomazi lies in north-eastern Tanzania, adjoining the larger and more famous Tsavo National Parks in Kenya. Ecologically, however, Mkomazi is more than Tsavo’s poor relation: close to the extremely biodiverse Usambara Mountains, Mkomazi contains plant, bird and butterfly species not found in Tsavo. It is hard to assess the distinctiveness of other parts of Mkomazi’s fauna, because the intensity of sampling carried out there so greatly exceeds that in most of the rest of east Africa. The book reports, for example, a probable 28 new ant species, and several studies make no attempt to identify species beyond the genus level.

Clearly, inventories developed for Mkomazi will provide crucial baseline data for comparison with other areas of east Africa. The editors have been impressively assiduous in ensuring that the book presents data as well as interpretation; detailed checklists are presented for the taxa surveyed, often with collection localities and specimen reference numbers. The book is not, however, simply a collection of species lists: it also details fascinating studies of fundamental ecology: the chapters by Graham Stone and Pat Wilmer on Acacia pollination ecology are particularly impressive, involving structured competition for pollinators and interference in the pollination process by symbionts and guardians.

Mkomazi appears unusual in its biodiversity, and in the level of ecological investigation it has attracted, but its conservation problems are a microcosm of those facing Africa as a whole. Gazetted in 1951, the reserve had formerly been used as wet-season grazing by local pastoralists. People continued to use the reserve, both legally and illegally, until 1988, when they were all evicted from the reserve. This eviction provoked embittered debate about local people’s land rights, resulting in prolonged litigation, funded, in part, by European donors.

The debate continues, albeit in restrained form, in the book. The chapter by Dan Brockington and Kathy Homewood estimates the evictions to have cost the rural economy £150 000 a year in lost cattle sales alone – a subsequent chapter details further natural resources denied local people as a result of enforcement of the reserve’s protected status. In his concluding discussions, Malcolm Coe provides a gentle rejoinder, calculating that a cattle population large enough to generate such revenues would greatly exceed the carrying capacity of the area and must, therefore, have a major impact on wildlife.

The book also raises interesting questions striking at the very heart of conservation philosophy. Mkomazi is a beautiful place, supporting a wide diversity of species and habitats – but it has little infrastructure and virtually nothing to recommend it to the undiscerning tourist keen to get their lion- and elephant-viewing over as soon as possible before heading for the beach. While the area might support low-intensity specialist tourism, it has little hope of generating enough revenue to maintain its own infrastructure, let alone support local communities. Despite the best intentions of community conservationists, conserving Mkomazi is, at present, a loss-making enterprise, with a cost (either real or perceived) both for local people and for the government.

If I have a criticism of the book, it is that the process of conservation planning is somewhat incomplete. The authors present detailed baseline data, and often make management recommendations relevant to the species they have surveyed. However, the management planning chapters are short, somewhat lacking in detail, and do not necessarily concur with the data presented (a case in point is the intended reintroduction of wild dogs to the area which is considered ‘an important contribution to the survival of the species’ by one author, while another cautions that ‘there are constraints on population viability’ – in fact wild dogs bred at Mkomazi and released in neighbouring Tsavo died the area and were killed by local people1). I gather that this reflects the remit of the Mkomazi Ecological Research Programme, which was to provide data on which management decisions might be based, not to advise on those decisions. Nevertheless, the book provides an interesting picture of the biological characteristics and political complexities surrounding a fascinating area of Africa.

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