

BOOK REVIEWS

Moss, C. 2000. *Elephant memories: with a new afterward*. Chicago and London: University of Chicago Press. 364 pp. ISBN 0 226 54237 8 (softcover)

Many years ago, as a school boy in East Ham, I discovered the magnificent Public Library, which had a specialist collection of travel books. They were all there, Henry Bates, Charles Darwin, Joseph Hooker, Patrick Syngé, Alfred Russel Wallace and Edward Whymper, lifting me from the world of the classroom to magical and distant places filled with strange animals and plants. At that time I had no idea that I would spend over 40 years studying these places and enthusing a couple of generations of young people with my own thrill and love of the African bush.

In 1956, I sailed to Mombassa to take up a post at the Royal Technical College of East Africa, which was to become the University of Nairobi in 1960. Shortly after my arrival I drove with some trepidation down the brown earth Mombassa road to visit the great 21 000 km² Tsavo National Park, and it was here that my life as a savanna ecologist really began, for I saw my first elephants, not in ones and twos but in huge herds that sometimes numbered 3000 animals at a single waterhole. They bellowed as they ran down to the water, trunks raised and ears flapping, greeting their friends with enthusiasm and newcomers with caution. In the heat of the day they rolled in the mud and their young trundled into the shallows until they disappeared, with only the tips of their tiny snorkels poking above the surface, until mother heaved them back to the shore. This was love at first sight and the thrill of seeing, hearing and above all smelling them has never diminished, for each encounter is still the same, as if it were the very first time.

Since my first visit to Tsavo East, I have watched the ecological changes that have taken place there with the same fascination but coupled with increasing depression. In the 1960s it was recognized that many Game Reserves and National Parks in Eastern, Central and Southern Africa were beginning to show signs of severe habitat damage as human numbers around the Parks' peripheries began to rise steeply, carrying them in many cases way beyond the carrying capacity of their rangelands. The 'population problem' could be solved by culling the elephants, in which case their breeding would probably have been stimulated, or they could be left to their own devices. These largely theoretical arguments were soon rendered irrelevant when in 1970–71 the area was struck by one of its regular ± 10 year droughts, which are invariably followed by catastrophic floods. Up to 8000 elephants (and many other species, including black rhino) died of starvation over a period of 18 months, suggesting that the population problem might, for the time being at least, have been solved.

Sadly *Homo sapiens* was waiting in the wings with catastrophic levels of poaching, which, following the drought, reduced elephant numbers by up to 80% by the end of 1978. Most of us are familiar with the statement 'you should have been here in the old days' but we never expect that we will also join this band by telling our students that they will never see the elephant herds that we were familiar with no more than a few years ago, and that the Tsavo black rhino, which num-

bered up to 7000 in the early 1970s, are now all but extinct in the wild.

Cynthia Moss is not a lone voice in her concern for these magnificent beasts, but she plays an impressive role in bringing her own superb skills as a scientific journalist to the vital task of bringing the plight of the African elephant to the attention of the general public, without whose finance and moral support these animals will disappear from their natural range in less than fifty years. Our difficulty, though, lies in addressing the problems posed by rising human and domestic animal numbers, which are degrading the savanna of Africa at an alarming rate. The sad truth today is that pastoralism is no longer a sustainable life-style in semi-arid savanna habitats, and despite the aims of our well-intentioned governments and NGOs to 'alleviate poverty in the Third World' their AID must also study and encourage the preservation of undisturbed natural habitats, which are capable of generating considerable tourist income as an alternative to the destructive effects of pastoralism.

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GOSLING, L.M. & SUTHERLAND, W.J. (Eds). 2000. *Behaviour and conservation*. Cambridge: Cambridge University Press. 438 pp. ISBN 0 521 66539 6 (softcover)

The importance of conservation is undeniable. World resources are dwindling as a result of the increasing demands of a mushrooming human population. Consequentially, it becomes imperative that we integrate all our efforts to conserve the remaining biodiversity. This book investigates the potential for interaction between two historically unrelated disciplines, namely behavioural ecology and conservation biology, to achieve more successful programmes of conservation.

Conservation biology has traditionally not been perceived as 'rigorous', owing to its cursory considerations of animal behaviour in conservation programmes. The relatively young science of behavioural ecology incorporates evolutionary theory with classical ethology to investigate how and why behaviours evolve. A more rigorous fusion of the two disciplines has the potential to achieve conservation aims more successfully by considering many aspects of the behavioural biology of rare or endangered species at both the individual and the population level. This detailed knowledge provides the platform to build predictive models to determine the consequences of environmental change on animal populations.

The book contains examples of how the behavioural ecology approach has been used to increase knowledge of animal behaviour in practically applicable ways; e.g. increasing the success of reintroduction programmes of captive bred animals through a greater understanding of how vital survival behaviours are culturally transmitted between individuals in the wild, then applying this knowledge to teach captive animals these essential skills prior to release to increase their survival chances. This 'more scientific' approach has actually overturned some previously held beliefs from traditional

conservation biology. Traditionally it has been assumed that species that do not move from highly disturbed sites are not affected by this disturbance. It is now believed that human presence on estuaries has a significant negative effect on wading bird populations, but that they remain in those estuaries despite the disturbance because they have nowhere else to feed during winter months. Careful studies of how human disturbance affects the behaviour of animal populations can reveal more subtle impacts which are not obvious to the casual observer. Such a comparison requires detailed knowledge of how the animal species behaves in an undisturbed environment.

A recurrent theme running through the book is the use of behaviour-based models to give accurate descriptions of populations of animals. These models are most useful when they can be used predictively to determine the responses of a population when conditions in the habitat change. The accuracy of such predictions will depend upon how much we know about the species or ecosystem being modelled; assuming that all individuals within a population clearly will not lead to accurate predictions, as perturbations will affect different age and sex classes of animals differently. We need detailed behavioural information based on the study of individuals. Such data can be married with knowledge of the social structure of the species to achieve a realistic population model, as illustrated by Durant.

Unfortunately, such approaches cannot be used successfully once, and then generally applied to all such 'similar' cases. Almost invariably each species has unique adaptations that make any previous model inaccurate. A very small ecological difference between two species can have severe impacts on their conservation. For example, dramatic differences in the home range size of two North American congeners mean that the critical reserve size to maintain a viable population of the black bear (*Ursus americanus*) is 36 km² and for the grizzly bear (*Ursus arctos*) is 3981 km². In extreme cases, reserves could be set up for the conservation of a species based upon the data from similar species that might be wholly inappropriate. Reserves set up for the tiger (*Panthera tigris*) in India were hoped to protect dhole also. Unfortunately the critical reserve size for dhole was five times larger than for tiger, leading to its disappearance from these reserves.

The fruitful transplantation of ideas from other biological disciplines into conservation biology is not limited to behavioural ecology. Molecular techniques of genetic analysis have been used to study the effect of reduced genetic diversity on the persistence of small populations and their resistance to environmental perturbations, most notably for the cheetah (*Acinonyx jubatus*) and the elephant seal (*Mirounga angustirostris*).

Overall this book provides food for thought, with an interesting melting pot of ideas and new perspectives on many of these. Ruth Mace refocuses the principles of behavioural ecology to modelling human populations. There are also examples where conservation goals can be compatible with economic gain, depending on the time scale used to determine the economic return, refreshingly suggesting that we can exist as 'ecologically noble savages'.

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REYNOLDS, J. E., WELLS, R. S. AND EIDE, S. D. 2000. *The bottlenose dolphin: biology and conservation*, Gainesville: University Press of Florida. 289 pp. ISBN 0 813 01775 0

Bottlenose dolphins are charismatic animals that have attracted the attention of the general public and scientists alike. This is due to their intelligence, the occasional media reports of dolphins helping floundering swimmers ashore and the fact that they are one of the more commonly sighted cetaceans. As a consequence, a lot is known about bottlenose dolphins. John Reynolds III, Randall Wells and Samantha Eide comprehensively review and discuss this knowledge in *The bottlenose dolphin: biology and conservation*. They have done this eloquently, producing an excellent monograph covering bottlenose dolphin phylogeny, ecology, physiology, behaviour and conservation.

One criticism is that the opening chapter contains a lengthy discussion about the pros and cons of keeping dolphins in captivity. Such a discussion is undoubtedly necessary in a book on dolphins, and is indeed returned to frequently in later chapters. However, I fear that by choosing to open on this issue the authors may alienate some readers who are more interested in learning about the biology of this animal, and the threats that are facing it in its natural environment, than about justification for keeping animals in dolphinarium; but perhaps this is an issue close to the authors' hearts.

Possibly the weakest chapter in the book is the last one, on conservation. This is not really the fault of the authors; it is a result of the lack of data on changes in population size over time, and on the number of animals that fail to breed or that die prematurely as a result of human activity. Although it is hard to make accurate censuses of bottlenose dolphin numbers, circumstantial evidence strongly suggests that some bottlenose dolphin populations are in decline.

Various threats face dolphin populations – all a consequence of human activity: in some countries, for example Turkey and Japan, dolphins are deliberately harvested; throughout the world dolphins are accidentally caught in a wide range of fisheries; pollution is altering the dolphin's coastal environment. All these processes are probably reducing survival and fecundity rates. There is a need for good data on the consequences of these processes from wild populations for us to really understand which threats need to be most urgently reduced.

Perhaps the solution is to send fishermen, polluters and harvesters for 'Dolphin Human Therapy' sessions (p. 163). If dolphins are highly intelligent, we may start to hear stories about them helping floundering swimmers out to sea.

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