

## BOOK REVIEWS

Sharma, B.K.; Kulshreshtha, Seema, and Rahmani, Asad R. (Editors) 2013. Faunal Heritage of Rajasthan, India: Volume 1. General Background and Ecology of Vertebrates. xxxi+648 pages. Springer, New York. ISBN 978-1-4614-0799-7 (Hardcover). € 199.95

Sharma, B.K.; Kulshreshtha, Seema, and Rahmani, Asad R. (Editors) 2013. Faunal Heritage of Rajasthan, India: Volume 2. Conservation and Management of Vertebrates.. xxxi+525 pages. Springer, New York. ISBN 978-3-319-01344-2 (Hardcover). € 169.99

Rajasthan, the largest state of India covering more than 10% of the country's total area, is better known internationally for its rich colourful cultural heritage and diversity that attracts hundreds of thousands of visitors to the fascinating forts and palaces. Also known for its vast sandy Thar desert, Rajasthan is not readily perceived to possess enormous biodiversity and not so much of vertebrate animals alone. Having lived and worked in Rajasthan for long, I was a bit surprised to find two huge volumes on vertebrate fauna alone. Reading the two volumes has been an enlightening experience and sheer pleasure.

A page or two of a book review cannot do justice to the nearly 1200 pages of mine of knowledge that can be appreciated only by exploring it from first page to the last. The title itself reminds us of the 'heritage' value of the fauna. A quote from the Atharva Veda adorns the first page and reminds us of the importance of forests full of wild animals for our own survival. Prof. Paul Harvey in his Foreword appreciates the editors' efforts and hopes that "these volumes will spur a sense of responsibility towards nature".

The Preface, authored by the chief editor, Dr B.K. Sharma, that is generally 'read least' part of a book, is unusually long (11 pages) but in itself a valuable introduction to the State and the making of this book, highly literary in style that makes it worth reading. I cannot resist quoting a little of it:

*"an exotic state of India where tradition and glory meet in a riot of colors against the backdrop of desert and greenery, Rajasthan has an unusual diversity of people, customs, cultures, costumes, music, manners, dialects, cuisine, and physiography. ... "every other village has its own tales of valor and sacrifice, the winds sing them and the sand shift to spread them further beyond." ... "no other region in the country is a conglomeration of so many paradoxes. Rajasthan is a land of superlatives where everything is breathtakingly fascinating."*

Volume 1 comprises of 24 chapters grouped into four parts. First part unveils before the readers the 'vivacious' state of Rajasthan

in all its majesty, splendour, glory and diversity – physiographic, human socio-cultural and biological. Two chapters paint the wide canvass of the book with historical, mythological, socio-cultural and anthropological aspects of faunal conservation and the invaluable contribution of the State's tribal communities. Before moving on to the present vertebrate faunal diversity, the editor have not forgotten to remind the reader of the geological past revealed by the fossils going back to the Proterozoic (about 2500 million years) and a marine connection of the State. The next three parts are devoted to distribution, biology, ecology and conservation status of fishes and herpetofauna (5 chapters), birds (4 chapters) and mammals (10 chapters). It is interesting to note that despite a large part of the State being a desert, there are 160 species of fish, mostly cyprinids. The State is home to 20 lizards, 34 snakes and 50 raptors. Turtles and gharials are discussed in one chapter. Besides a general account of lizards, the Indian Spiny-tailed lizard receives special attention in another short chapter. Among the avifauna, bustards and raptors are discussed in detail and rightfully so as the Great Indian Bustard is the State bird. The chapter on raptors highlights also the impact of the Indira Gandhi Canal on the populations of vulture (*Gyps* sp.). Two short contributions focus on the Lesser Florican and a vulnerable species, White-naped Tit (*Parus nuchalis*). Next ten chapters describe the mammals some of which have been studied in the State for long and in detail. The chapter on non-human primates describes the social organization, communication, feeding and reproductive behaviour and ecology of Rhesus Monkey (*Macaca mulatta*) and Hanuman Langur (*Semnopithecus entellus*). Another detailed account is of small mammals which are represented in the State by 26 species of which 22 belong to order Rodentia. Rodents of Rajasthan have been investigated in detail for decades, particularly at the Central Arid Zone Research Institute, Jodhpur (Prof. Ishwar Prakash and colleagues). The chapter summarises the studies on physiology, ecology, taxonomy, zoogeography, ethology, and toxicology of various rodents. Also described is the habitat preference, food and feeding ecology, and reproductive biology of other insectivorous small mammals. Another group of small mammals – the bats (Chiroptera) - is discussed in another chapter. The Wild Dog and the Indian Gray Wolf representing family Canidae, squirrels, small cats (Fishing Cat, Caracal, Jungle Cat, Wild Cat/Indian Desert Cat, and Rusty-spotted Cat) and Sloth Bear – an endemic to the Indian Sub-continent- are covered in separate chapters. Two chapters are devoted to the status of tiger (*Panthera tigris*) and leopard (*Panthera pardus fusca*). The state has two important tiger reserves – Sariska and Ranthambore. Efforts are now being made to revive tiger in Sariska. The last chapter deals with wild ungulates of the state. It is worth noting that Rajasthan supports four of the six species of antelopes in India (Nilgai, Four-horned Antelope, Indian gazelle and Blackbuck) and of these Indian Gazelle (or Chinkara, *Gazella bennettii*) is recognised as the State animal. It also describes five species of deer most of which (Sambar, Chital, Hog

Deer and Southern Red Muntjac) occur in northeastern Rajasthan except the Mouse Deer (restricted to southern Rajasthan).

At the end of the book, the editors have provided several tables with very useful statistics on the State's forest cover and its legal status, human population (2007 data) and ravines, a checklist of all vertebrate fauna of the State (13 anurans, 57 reptiles, 477 birds, 66 mammals) with their common names and conservation status as per IUCN Red List. Also provided are Rajasthani and Hindi names of more than 90 animals, a glossary and references for further reading.

The second volume under the subtitle *Conservation and Management of Vertebrates* brings together experts (including some from outside India) to contribute another 20 chapters organised into four parts. Though the first volume discussed the faunal diversity with focus on flagship and threatened species and their conservation as well as protected areas (tiger reserves and wildlife sanctuaries) the second volume takes a habitat approach to describe biodiversity, conservation issues, efforts and needs in the major physiographic and ecoclimatic regions of Rajasthan- the Aravallis, the Thar Desert, the Eastern Plains and the southeastern Hadoti Plateau.

The first part on the Approaches and Challenges to Faunal Conservation begins with a detailed account of the Protected Area Network which includes three National Parks, two Ramsar sites, 25 wildlife sanctuaries, three conservation reserves and 12 ecosensitive zones besides more than 1000 community protected patches, called orans (also referred to as sacred groves). Next is a relatively brief account of the environmental factors including climate change which influence the fauna. Authors point out that hotter days and warmer nights are expected in future. Another chapter discusses the impacts of land use changes, induced largely by irrigation on small mammals

The chapter on Aravallis highlights their importance as a reserve for threatened and endangered fauna and the fact that most of the protected areas in the state lie in their vicinity. The chapter on the Great Indian Desert describes species richness, abundance and diversity of different faunal groups including invertebrates from a wide range of habitats (stable and shifting sand dunes, rocky outcrops, grasslands, saline and fresh water bodies and agricultural fields. Some chapters are devoted to specific fauna. The chapter on tigers focuses on their reintroduction in Sariska Tiger Reserve under the species recovery plan for tigers but describes the developments only until 2009. Another chapter describes recent mass mortality of gharial in Chambal river though another contribution also describes the Conservation plans for Gharial and Ganges River Dolphin in the Chambal River Basin. Even the prospects for conserving smooth-coated Otter in the State are discussed. Avifauna receive detailed attention in four contributions. The two Ramsar sites, Sambhar Salt Lake, Jaipur and Keoladeo National Park, Bharatpur are clubbed together despite the fact that their biodiversity, conservation history and management problems are widely different. Another chapter on wetland birds provides a rather general perspective. The authors report that Rajasthan harbours 42% of the total 1225 birds and 40% of the 325 wetland bird species in India. There are 47 major wetlands outside the protected areas of which 24 sites are Important Bird Areas (IBAs) and support some threatened species. The other two contributions on birds describe the conservation of Demoiselle Crane (*Anthropoides virgo*) the Sarus Crane (*Grus antigone*).

Next four contributions in the first part discuss the socio-cultural aspects of conservation, including people's dependence on

natural resources in protected areas, their traditional role in protecting wildlife and forests as in Orans (sacred groves) and other common property Reserves. However, as another contribution points out the gradual breakdown of traditional institutions and the post-Independence dispossession of local peoples from their lands have greatly affected community-based conservation.

Three contributions form the last three parts of the volume. Whereas one describes in considerable detail the status and potential of ecotourism, another examines the numerous legal instruments available for supporting conservation and protecting wildlife and points to the tardy implementation with many examples of poaching, hunting and illegal trade. The final chapter by the editors attempts at a synthesis while 'unfurling' a suite of conservation strategies, identifies major gaps in research and presenting a Vision on the future of the fauna of the State keeping in view the current and predicted threats. On various threats, I must quote the editors,

*An already existing xeric ecosystem, fast pace of urbanization, excessive and unchecked mining, oil and natural gas excavations, and nuclear tests have further altered the situation. In fact, the Indira Gandhi Irrigation Canal Project, popularly known as IGNP, has completely changed the landscape in some regions of the Thar Desert, causing grave changes particularly in the land use patterns. Fauna from the rest of Rajasthan is dwindling in population due to habitat loss, hunting, and habitat fragmentation, resulting in the decline in number of some rare species. It is high time to conduct intensive surveys in order to monitor the altered land-use patterns and assess the status of threatened species in various geographical regions of the state and adopt a concrete conservation planning.*

Volume 2 has its own share of appendices which compile useful information on the fauna according to CITES and the Wildlife Protection Act (2006), international Conventions, databases and a variety of institutions and organisations in the fields of ecology, wildlife biology, conservation, biodiversity and related areas. A glossary and Index complete the volume.

Books devoted to flora, fauna or ecology of geographical areas or ecosystems are quite common. But this 2-volume compendium is somewhat unique in many respects. The compendium is a valuable contribution of lasting value to the ecology of Rajasthan despite its primary focus on vertebrate fauna. The volumes have been edited with great effort. In fact, the editors themselves have coauthored about half of the book that ensures its high quality. "The proof of the pudding is in the eating" and I am sure the book will be enjoyed by zoologists, ecologists, conservationists, wildlife managers, and by many people from outside the State of Rajasthan who will gain useful insights into its natural heritage.

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