

ever before. The issue has been met with calls for reductions in fleet size and fishing effort, elimination of public subsidy for the fishing industry, increased selectivity and banning of damaging fishing practices. But to many the problem is rooted far deeper: we need nothing short of a revolution in the science underpinning fisheries management and a move towards an ecosystem-based approach to management.

Managing fish stocks in an ecosystem context is not a new concept but it is certainly not in the mainstream. Ecosystem-based fisheries management is generally regarded as too complex, uncertain and data-hungry a process to be feasible. Yet, meeting these challenges head on, this book provides a manifesto that defends this type of management as not only a priority but also as a workable solution.

Throughout much of this well written and energetic book, Link assumes a casual style that those acclimatized to fisheries literature may not be used to but all can appreciate. This doesn't reduce the legitimacy of the science, which in places is thick, and will no doubt boost readership. But although this book will primarily appeal to fisheries scientists and postgraduates it is not a reference manual, and is written to be read from cover to cover.

The book is in three sections, the first of which defines ecosystem-based fisheries management and provides an historical, theoretical and contextual background. These initial chapters are generally positive and, in places, refreshingly optimistic about where we are and where we need to be in terms of managing fisheries responsibly. Only in the third chapter, which examines the religious philosophies underlying stewardship, does Link perhaps overstate his personal views on why this type of management is justified. The pragmatic question asked by the final chapter of the section is particularly useful: when does it make sense to do ecosystem-based fisheries management? This question will be asked by many, and Link answers using a medley of case study examples.

The second section provides a synopsis of the science required to make ecosystem-based fisheries management operational, and introduces the analytical basis from which to monitor, evaluate and generate management advice for an ecosystem. These middle chapters are illustrative, and mildly prescriptive, of how the wide array of approaches to implement ecosystem-based fisheries management can be, and have been, brought together. This section gave me a real sense of the many practical but potentially treacherous simplifications made in fisheries science. No fish stock exists within an ecological

vacuum and ignoring this can be dangerous. Encouragingly, Link demonstrates that the methodology to do ecosystem-based fisheries management is already available, even in data-poor situations, and all that is required is the institutional will.

The final section picks up on this idea and looks at institutional considerations. Throughout the book up until this point I had been mulling over how emerging ecosystem-based fisheries management models, methods and techniques would be received by those tasked to do it. Unfortunately this last section—the shortest by several chapters—doesn't provide an outright answer. I concede that this question isn't likely ever to receive a straight answer but to me at least it remains an important consideration in the success of implementing ecosystem-based fisheries management.

The bottom line, which I think resounds clearly throughout, is that ecosystem-based fisheries management is a concept that we would be reckless to ignore. Fisheries science guides the commercial exploitation of countless marine ecosystems, yet in many cases it does this blindly. A move to this type of management will no doubt be a challenge but is also a necessity if we are to manage our marine resources responsibly. But, encouragingly, as Link shows, we already have the means to do this.

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### **Safe Passages: Highways, Wildlife, and Habitat Connectivity** edited by Jon P. Beckmann, Anthony P. Cleverger, Marcel P. Huijser & Jodi A. Hilty (2010), xix + 396 pp., Island Press, Washington, DC, USA.

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Several tropical, biodiversity-rich nations are going through rapid economic growth, bringing welcome benefits including infrastructure development. One of the key sectors of such growth is the building of roads and road expansion projects. However, these benefits carry environmental costs, including habitat fragmentation, which have a lasting impact on wildlife communities and especially wide-ranging, threatened species. The subject of roads, particularly highways, as a conservation threat has recently drawn much attention. However, although road ecology is well developed in Europe and North America, it is still in a nascent phase in the tropics.

Divided into 17 chapters, *Safe Passages* involves 34 authors, some highly reputed in their fields, including road ecologists, conservation scientists, civil engineers, GIS specialists and transportation planners. Divided into four main parts, the first section broadly outlays the problems of roads for wildlife including fragmentation effects, mortality, influence on landscapes and other negative consequences. This section of the book also describes various mitigation and crossing structures.

Part two analyses the policy issues related to project planning, reviews processes of road formation and gives insights into how conservation practitioners could involve themselves in planning and in engaging with transportation planners. However, some of the processes suggested may be less relevant to tropical countries, where systematic planning is largely non-existent and agreed commitments by agencies may not always be honoured because of diverse goals, sometimes political. This is largely true for highway projects as they are ridden with corruption in many developing nations. However any project that affects wildlife needs to collaborate and develop mitigation strategies early in the planning and review process or else it will end up in needless controversies, delays in project delivery timelines, and in most cases cause irreversible damage to wildlife habitats.

The next part of the book is an interesting section, with some success stories presented. A series of case studies, including The Trans-Canada Highway, and US Highways 93, 64, I-40 and I-75 (Alligator Alley), of successful implementation of ecologically sound solutions that helped the Florida panther, mule deer, black bear, cougar, elk, red wolf and a range of other species are discussed. This part describes the key players, critical factors and effective partnerships, along with scientific knowledge, required to achieve conservation goals. Having worked to mitigate the impacts of three highways in two southern Indian tiger reserves, I understand the significance of building partnerships, especially within the Government.

The final section of the book looks at recent innovative developments and technological solutions in road ecology (although these may not be viable solutions for developing nations). It also illustrates citizen science projects and collaborative approaches with volunteers and decision makers to promote wildlife conservation.

In places the book becomes somewhat monotonous as there are too many similar examples, repeated descriptions of threats caused by highways, and a lack of a diversity of solutions (or perhaps there aren't many).

Some of the quantitative data provided could have been better presented in tables and figures rather than as currently hidden within long paragraphs of text. The quality of the maps could be better, although the photographs are useful.

Despite the fact that the book is rooted in North American case studies it could be a practical guide for conservation scientists and practitioners, transportation professionals or anyone interested in studying effects of highways and/or attempting to address the problem with appropriate solutions. The book successfully takes the reader from laying out the problem to feasible solutions.

In developing nations there is an urgent need for informed developmental planning that is integrated and based on the conservation needs of wildlife. Road projects find greater public support and political patronage than wildlife concerns. This book should inform and inspire new efforts in road ecology. If it helps address wildlife concerns in the planning, design and implementation of highway construction projects, the goals of this book will be worthily met.

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**World Atlas of Mangroves** by Mark Spalding, Mami Kainuma and Lorna Collins (2010), 336 pp., Earthscan, London, UK. ISBN 9781844076574 (hbk), GBP 65.00

The preface of the *World Atlas of Mangroves* states that it aims to present up to date information on the distribution and status of mangroves to 'as wide an audience as possible' and strengthen the case for mangrove conservation. I think that the authors have succeeded in doing this, giving an accessible and detailed account of these important ecosystems from an ecological, social and geographical perspective.

From a conservation perspective the need for a book like this is evident: mangroves have suffered serious losses in the past, although formal protection and awareness of their value is now improving. Their global distribution also makes them significant, with mangrove forests found in the coastal zones of over 120 countries worldwide, providing food, building materials and protection to millions of people and a home to large numbers of threatened species of plants and animals.

Chapter one provides a detailed introduction to the ecology of individual mangrove species and to the ecosystem as a whole. This chapter covers a lot of basic information, from mangrove distribution and biogeography to productivity statistics and brief descriptions of some of the species commonly found in these ecosystems. The authors consider the importance of mangrove forests at various scales, including their role in global carbon cycles and on a local scale supporting threatened and endemic species. The photographs included with this section are particularly useful in demonstrating the specific adaptations and diversity of organisms in mangrove ecosystems.

The authors have dedicated chapter two to mangroves and people, a welcome addition to the book and one that helps to highlight their significance and need for protection in a different context. This chapter covers both the historical and contemporary values associated with mangrove ecosystems. Examples of the local use of mangrove products from several countries are included. The impact that humans have on mangroves is also considered and a box focusing on the effects of climate change nicely summarises recent work on this subject.

As the title would suggest, maps of the world's mangrove forests make up a large part of the rest of the book and chapter three gives some background information on their development. The work of institutions such as the UN Environment Programme-World Conservation Monitoring Centre, and the Food and Agricul-

ture Organization of the UN was used to update the maps from the original 1997 *World Mangrove Atlas* and this has resulted in detailed global, regional and national mangrove maps. The following 10 chapters focus on different regions and each begins with a full page regional distribution map. The ecology and values of mangroves in each country are then discussed in more detail. The country maps are likely to be of the most use to practitioners as they also show the overlap between mangrove forests and marine and terrestrial protected areas. Boxes focusing on mangrove conservation and local importance are included for some countries and these help to give depth to the otherwise more general country information. The case studies chosen are interesting and varied, with the only downside being that there are so few, with several regions having none at all.

The annexes provide further information on individual mangrove species and a breakdown of mangrove statistics by country. The species profiles are particularly useful from a conservation perspective, with many accompanied by a detailed range map and botanical line drawings to aid identification. These are not included for all species and I think this should be a priority for future work on this subject as this information would be particularly useful for those working in the field.

As the authors intended, the *World Atlas of Mangroves* is likely to be of use to a wide range of people. A lot of information is included but the language used is accessible for a non-expert reader whilst remaining scientific. The photographs that accompany the text illustrate the subjects well. Some of the more general information will be an excellent introduction to the subject for anybody researching mangroves, and the in-depth maps and species' profiles will be a useful resource for conservation practitioners.

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