

Publications

Intelligent Tinkering: Bridging the Gap between Science and Practice by Robert J. Cabin (2011). xv + 240 pp., Island Press, Washington, DC, USA. ISBN 9781597269643, USD 35.00 (pbk); 9781597269636 (hbk), USD 70.00.

Conservation science is a mission orientated discipline yet many conservation scientists are criticized for undertaking research that is irrelevant and inaccessible to the practitioners implementing conservation action. For their part practitioners are often found guilty of failing to use sound science to underpin decision making and to evaluate the outcomes of their work. This apparent gap between science and practice has become a hot topic within conservation biology: to what extent does this gap really exist? Does the gap hinder the progress of the conservation endeavour as a whole? What can be done to close the gap and would doing so be desirable?

Although these questions do not have straightforward answers, in *Intelligent Tinkering* Robert J. Cabin offers an abundance of well documented evidence, anecdote and philosophy to help the reader form their own conclusions. Cabin is well placed to evaluate the roots and consequences of this gap. This honest and well-written book follows Cabin's early career as a postdoctoral fellow thrust into the middle of a politically charged ecological restoration project in Hawai'i. He finds himself pulled in several directions as he attempts to further his academic career, conduct scientifically robust research and undertake field trials that are of genuine use to a working group whose members follow their convictions much more than the ecological principles familiar to Cabin.

One of the greatest strengths of this book is that Cabin can see both sides to this story (he spends as much time practising the removal of invasive weeds, including the book's villain, fountain grass, as he does conducting rigorous research). This balanced approach is evident throughout, and the author's efforts focus on helping the reader understand the origins of a divide between science and practice, rather than casting blame on either group. To do this he splits the book into two parts, dedicating the first to his experience working within the North Kona Dryland Forest Working Group and the second to an in-depth analysis of the science–practice divide, followed by a number of suggested gap-bridging strategies.

In Part 1 he sets the scene with a thoroughly interesting yet deeply sombre history of the Hawaiian dry forests. The effects of high exploitation, invasive species and increased

incidences of fire have left these last remnants of forest so degraded that they are described as mere pieces to 'the mysterious Hawaiian dry forest ecosystem puzzle'. As Cabin's task at hand is set out the reader is treated to rich descriptions of the other members of the working group, each of whom have a stake in restoring these forests. The efforts the author makes to portray the disparate philosophies, characters and backgrounds of these individuals provides context to the slightly haphazard progress of the group and the frustrations felt by Cabin as his rigorous scientific approach to restoration is increasingly resisted by his more hands-on colleagues. While the money and prestige a research grant brings is valued by the working group, standardized trials and replicated treatments are not, and, in an excellent discussion on the trade-offs between science and practice, even Cabin starts to question the utility of his research programme to the actual restoration effort.

Whereas the first section involves much soul-searching from the author, in Part 2 Cabin looks further afield to other practitioners and scientists for answers. Although he presents a substantial amount of evidence for the divide, Cabin does not directly criticize either group for working in isolation—indeed he wholeheartedly espouses the value of science for science's sake and deeply respects the just-do-it approach taken by many practitioners. Rather, his critique is aimed at the pseudo-attempts of each to bridge the divide—on false claims of the direct utility of academic research and on practitioners for setting up elaborate monitoring programmes that often yield mountains of meaningless data.

The way forward, he argues, lies in 'intelligent tinkering': a more local, holistic and trial-and-error (yet still rigorous) approach to integrating research and practice. The concept of intelligent tinkering is developed in the final chapter and a convincing argument is made for its utility over the more rigid framework still used by most who are currently trying to bridge the science–practice gap. This excellent book ends on a suitably positive note by giving three examples of successful restoration projects in Hawai'i that have adopted the flexible approaches Cabin advocates. The lessons learned from Cabin's time in Hawai'i are well worth a read to anybody interested in developing an integrated approach to conservation science and practice.

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Ecology and Conservation of the Sirenia by Helene Marsh, Thomas J. O'Shea and John E. Reynolds III (2011), xvi + 521 pp., Cambridge University Press, Cambridge, UK. ISBN 9780521716437 (pbk), GBP 43.00/USD 65.00; 9780521888288 (hbk), GBP 85.00/USD 135.00.

I started my journey into the wet, blue and green world of the Sirenia from the Preface, in which the authors provide a brief and concise overview of the only herbivorous, fully aquatic mammals. The breadth of the information is based on the synthesis and review of numerous scientific publications, from genetics to behavioural studies and to the authors' own discoveries in the field. The title of the book is general and thus one would expect purely scientific information rich in facts and diagrams. However, starting with the Introduction the authors stimulate the reader, describing the dugong as 'like a manatee that goes to the gym' in explaining the body shape differences between manatees and dugongs. Quotations from H. Melville and D. Attenborough on the taxonomy and appearances of these mammals further enrich the book, which I recommend not only to professionals but to a wider audience.

The next chapter follows the route of Georg Wilhelm Steller on *MV St Peters* and the discovery of Steller's sea cow in the 1740s. Human acquaintance with this species was very short—it was extirpated just 27 years after its discovery, by ruthless hunting. The facts are enriched with illustrations and excerpts from Steller's notes on the animal's biology and on techniques used by hunters.

The chapter on the evolutionary history of the Sirenia introduces the numerous species that branched from its ancestors more than 50 million years ago. Interestingly, new fossil records show that this order of mammals had a much wider range and greater adaptability than previously assumed, and molecular analyses puts them in the same assemblage as golden moles and elephant shrews.

Chapter 4 is dedicated to feeding ecology and its importance to the conservation and survival of the four modern species of the Sirenia. The authors discuss the theory of optimal foraging and explore the impacts of dugongs and manatees on the productivity and structure of plant communities. The diagrammatic presentation of the skulls of the species nicely supports the differences in feeding habits. The following two chapters provide a wealth of information on the life history, behaviour and habitat of the Sirenians, and range from individual biology to peculiarities of social behaviour such as the

'muzzle to muzzle kiss' that is possibly used for information exchange, through chemoreception.

From the preface to the last chapter one can hear a silent 'Sirenian trill' echoing the challenges to ensure the survival of these mammals. The sound gets louder and culminates in the chapter reviewing established and potential threats to Sirenians, ranging from hunting to the 'cold water syndrome' affecting manatees in Florida. The authors point to one of the main weak links in the chain of conservation actions—the human factor—in which easier management activities are prioritized instead of applying the best available solutions simply because

such actions could require more effort. The thread of conservation concerns continues into the analysis and discussion of the Red List categorizations of the Sirenia. Once again some of the notions cause further reflection—in this case on the generalized global assessment of the probability of the extinction of species and failures to highlight the urgency of an action at the critical point in time.

This journey around the world through the life of manatees and dugongs, participants in and users of marine and coastal ecosystems alongside humans and other species, ends with a framework for conservation of the Sirenians. This framework includes tools and actions such as targeted education, long-term

commitments, and partnerships—all well known and tried but not necessarily easy to implement.

In summary, this book is a synthesis and communication tool for the ongoing work of hundreds of people, from field researchers in Florida or students in Australia to villagers in Senegal. The aim is to provide a creative and practical way to sustain a healthy environment for these unique aquatic mammals, and for us all.

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