

is reviewed. There are interesting examples of implementation in different countries and a detailed case study example of stray dog population management is given. However, it might have been more relevant to the readership of this book to have used a farm livestock example. The following two chapters review animal welfare developments in regions of the world where this is a relatively new science and policy area — in Asia, Far/Middle Eastern countries and Oceania, and in Latin America. These chapters also lean heavily on the influence of OIE initiatives, resulting in some repetition, but it is interesting to read about the policy development and current welfare landscape in countries with diverse agricultural, economic and religious backgrounds, and where animal welfare activities have been little considered in past literature. Again, it would have been nice to have had a more rounded international picture by inclusion of similar chapters on other regions. This would have provided a useful reference source and also allowed readers to compare and contrast with approaches taken in Europe, North America and, in particular, China where major animal welfare initiatives are now taking place. The role of NGOs in promoting welfare change in different regions could also have received more consideration.

The final section of the book deals with ‘emerging issues.’ The two selected for this volume are slaughter without stunning and urban agriculture. The first of these has long been a contentious topic because of the potential conflict between animal welfare and religious freedom. This subject has been extensively reviewed in the past, and the current chapter provides an in-depth update on the scientific issues and strategies to minimise animal welfare compromise. In contrast, the second topic is relatively novel and deserving of wider discussion. The resurgence in the small-scale keeping of animals by non-professional people, both in urban agriculture and ‘good life’ farming, poses many challenges to safeguarding health and welfare of both the animals and those caring for them. These issues are interestingly reviewed in this chapter from a sociological perspective. However, once again, the emphasis is primarily on the North American experience and a more international consideration would have been of great interest.

Overall, the publishers and editor are to be commended in producing a unique book which explores some of the challenges surrounding the application of animal welfare science to production agriculture. They have brought together a team of authors with differing disciplinary expertise and the result is a set of chapters which will widen the perspective of any reader. As such, the book will be of interest not only to students, but also to established welfare scientists and to those engaged in policy formulation. Many of the chapters or sections could usefully have been further elaborated to give a more complete picture, but perhaps both breadth of topic and comprehensive coverage of each is asking too much of a single volume. Many readers will be left asking for more, which can be the sign of successful engagement.

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Marine Mammal Welfare: Human Induced Change in the Marine Environment and its Impacts on Marine Mammal Welfare

Edited by A Butterworth (2017). Published by Springer Nature, Tiergartenstrasse 17, 69121 Heidelberg, Germany. 625 pages Hardback (ISBN: 978-3319469935). Price £159.99.

The idea behind the book *Marine Mammal Welfare: Human Induced Change in the Marine Environment and its Impacts on Marine Mammal Welfare*, edited by Andy Butterworth, is urgent and timely. For too long those who work to protect wildlife have focused almost exclusively on conservation of populations — how do we save species, populations, biodiversity, habitat? These are clearly vital and essential issues, but what about the individual animals who make up a species or population? What impact are human activities having on their quality of life? A compassionate society should care about this and regretfully we often do not, especially when it comes to policy.

The impacts our activities can have on wildlife well-being and their daily lives can be severe, even if their numbers do not decline. (Often, of course, poor welfare and declining numbers go hand-in-hand). But, poor welfare suffered by individuals can be a harbinger of a slide toward threatened or endangered status for a species and, thus, the two are interlinked, yet this connection is too often ignored by managers and scientists. For small, critically endangered populations of marine mammals, such as the 15 or so vaquita porpoises (*Phocoena sinus*) in the Gulf of California, Mexico, or the 70 or so Taiwanese white dolphins (*Sousa chinensis taiwanensis*) in the Eastern Taiwan Strait, each individual — and his or her welfare — matters not just to that individual but to the population and the species. The need to shift at least some policy and scientific attention to wildlife welfare, especially when negative welfare impacts are human-caused, is overdue. This book rightfully seeks to generate ideas and plans for how to accomplish this shift for marine mammals moving forward.

Some might wonder why an entire 33-chapter volume should be dedicated to the welfare of marine mammals as a distinct ecological group of wildlife. The reason also underlies why the United States and New Zealand have passed separate statutes protecting these species; marine mammals are difficult to study in the wild and their maintenance in captivity is expensive and controversial. Much remains unknown about them and damage, to their welfare and their conservation status, can occur before humans notice. Policy approaches should therefore be precautionary, but the more they can be supported by science, the more likely effective protections are to be adopted. This book, which notes that to-date the scientific literature on marine mammal welfare is sparse, is an attempt to jumpstart the process of generating the data needed to improve the lives of these animals, in the ocean and in captivity.

Butterworth, in a clear introduction and poetic epilogue, eloquently sets the stage for the need and purpose behind the book. He has gathered a diverse and knowledgeable collection of authors for these chapters, hailing from the academic, governmental, non-profit, and zoo communities. The chapters are concise and stand-alone (although they adequately cross-reference other related chapters), allowing readers to move from one to the other as they wish. (There is overlap amongst the chapters; given that many people will read the book non-linearly, this should be seen more as a plus than a minus). The sections and chapters are organised logically and comprehensively and generally in parallel. The sections spotlight each taxon of marine mammal (cetaceans, pinnipeds, sirenians, the polar bear, and otters) and the chapters address key anthropogenic threats to their welfare in the wild, how humans interact with each taxon, and their welfare in captivity.

Threats covered by the more than 50 authors include climate change, fisheries interactions (including entanglement), chemical pollution, noise, marine debris, and hunting. The task set before these writers was to discuss these established marine conservation threats from a welfare perspective. All of the authors, experts in their respective fields, are to be commended for agreeing to contribute to this volume. Modern biological research on these species — that is, studying them *in situ* and alive, rather than dead and dissected on a whaling deck or pathology lab exam table — is still relatively new, meaning marine mammal welfare science is even newer and writing about it still a challenge for most researchers.

I assume the authors were instructed by the editor to cover their topic of expertise or interest while keeping their review firmly embedded in the context of animal welfare. For some, this came easily — several of the chapters, including Chapter 3 on marine debris and pollution, Chapter 10 on cetacean sociality, and Chapter 15 on commercial seal hunting, as well as the chapters on assessing welfare in the various taxa, gave concrete examples of how humans can affect the welfare of marine mammals, in the natural environment and in captivity. These chapters firmly suggested possible research questions and studies that could inform how we interact with these species, in their world and ours. Several authors appeared comfortable speaking the language of animal welfare and did not shy away from articulating not just practical ways to examine or assess marine mammal welfare but also how non-human animals might suffer from negative inputs. Words such as ‘suffer’ and ‘distress’ for these authors were not taboo or awkward.

However, other authors appeared less at ease with discussing their topics of expertise in terms of welfare. Clearly their established approach to these topics, such as climate change or hunting, was in the context of conservation. The transition to focusing on individuals and how their well-being might suffer because of these threats or activities was not necessarily fully made. As an example,

Chapter 2 was an excellent and detailed primer of how climate change is likely to affect the marine ecosystem and thus filter up the food chain to marine mammals, but there was only a suggestion in the text of how it would affect individual welfare. Chapter 26, on the hunting of polar bears, was a useful backgrounder and review of management of aboriginal subsistence and sport hunting, but never considered the welfare of the bears subjected to being chased by dogs or snowmobiles, for example. This may have been a failure of imagination which is needed when discussing issues about which little research has actually been done — but it may also have reflected a level of discomfort with an approach that is still seen as ‘emotional’ and anthropomorphic by many biologists.

In some cases, the authors of particular chapters appeared to lose the thread of the topic entirely. While it is understandable for field researchers who work within aboriginal communities to address the hunting of marine mammals from the point of view of indigenous rights or for zoo biologists to discuss the value of captive marine mammal exhibits as educational tools, these were not the topic of the book. The book was about marine mammal welfare.

For example, whether aboriginal subsistence hunts for dugongs are sustainable or traditional is irrelevant to whether they are humane (Chapter 18). When writing about such hunts and dugong welfare, it is reasonable to clarify the important cultural aspects of the hunt and to note its sustainability and concerns with human safety when developing killing methods. Nevertheless, failing to conclude that drowning a marine mammal, over a period of 3–5 minutes, is highly likely to be inhumane, seems a significant omission in a book on welfare. A chapter on captive polar bears should mention the welfare implications of placing a large, wide-ranging carnivore in zoo enclosures, as did Roz Clubb and Georgia Mason in their 2003 paper in *Nature*. However, the authors of Chapter 27, ostensibly on the welfare of captive polar bears, did not cite this seminal paper at all.

While it is definitely germane to consider the health of animals when addressing welfare, the two are not equivalent. However, a reader might be forgiven for coming away from some chapters thinking they essentially were. In Chapter 7, on noise pollution from humans, emphasis is placed on how such noise might affect an animal’s health, implying perhaps that this would be the obvious way noise would affect welfare. However, large whales (as an example) might not suffer a direct impact to their overall health from having their communication space reduced from the rise in background noise level attributable to human activity in their corner of the ocean. However, they might not find a mate and thus their reproductive output might decline. This could negatively affect a vital rate (birth rate) at the population level, but have an unknown impact on the welfare of an individual whale which does not reproduce (the impact could be positive for a female, for example, to miss a breeding cycle and instead direct all energy acquisition to individual growth and survival). This chapter,

an otherwise exemplary review of the potential (conservation) impacts of anthropogenic noise on cetaceans, considers the former effect but does not mention the latter possibility.

For those readers with limited time, reading through the abstracts of such a book should allow them to come away with a decent idea of what each chapter contains. Unfortunately, several abstracts appeared to be *verbatim* reproductions of the chapters' introductions. I did not find these abstracts very useful. Others were far more informative and gave me a good understanding of what was covered in the chapter. I could not help but wonder if the former were the result of the authors neglecting to provide an abstract and the editor doing his best to supply one.

There were a number of typographical issues with the book — missing words, grammatical errors. Half a dozen sentences or so here and there in the text were frankly garbled. One author's biography was missing. I felt some subsections in some chapters could have been fleshed out just a bit more — they were so short or speculative that they could have easily been deleted without hurting the chapter.

These various flaws were minor overall and largely editorial — the value of the book remains solid and those interested in exploring novel research or policy approaches to marine mammal welfare, in the wild and in captivity, would do well to explore its contents. However, all of these flaws could have been minimised or even eliminated altogether by a slightly heavier hand on the reins by the editor and I would urge him to consider applying one should he decide to produce a second edition of this volume. Some of these authors may have been dealing with their topics in a welfare framework for the first time, at least in a formal sense — stronger editorial guidance, on focus and content, from an experienced welfare scientist like Andy Butterworth would no doubt have been both appreciated and of great value to these writers. And any book benefits from a proper proof-read!

I hope to see a second edition. It is to be expected that the suggestions for research questions and projects found throughout the book have already been or soon will be taken up by the marine mammal science community, swelling the ranks of studies on marine mammal welfare science to rival, perhaps, those on primates or elephants one day. Should this occur, a second volume on marine mammal welfare, summarising that work, will be another valuable addition to the literature.

Reference

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Picking a Pedigree? How to Choose a Healthy Puppy or Kitten

E Milne (2018). Published by 5m Publishing, Benchmark House, 8 Smithy Wood Drive, Sheffield S35 1QN, UK. 182 pages Paperback (ISBN: 978-1912178896). Price £19.95.

The welfare of pedigree dogs has received unprecedented attention in the UK over the past decade, following concerns that breeding practices used to achieve the appearance, uniformity and genetic 'purity' of the over 200 breeds registered in the UK has led to an unacceptable level of disease in the canine population. The past decade has seen an exponentially expanding literature base exploring breed-related inherited diseases, prime time TV exposés, government and charity reports and an independent inquiry into the state of dog breeding in the UK — all of which have been similarly damning in their conclusions. These activities have led to often heated debate between the pedigree breeding community and animal welfare campaigners. Much of the debate around this topic has focused on the *supply* side of the puppy *supply-demand* market. Dog breeders have been heavily criticised for the breeding practices some employ to produce puppies, and conformational 'ideals' they aspire to that run counter to canine welfare. Indeed, systematic reviews have identified nearly 400 diseases in the dog that are thought to have an inherited component. Despite increasing activity to counter some of the worst of these breeding practices from canine registration organisations (eg banning mating of first degree relatives, limiting numbers of Caesarean sections allowed per bitch and amending breed standards) alongside fervent campaigning from animal welfare charities and veterinary bodies to raise awareness of issues surrounding pedigree dog breeding, inherited disorders still feature prominently in the veterinary caseload. Somewhat paradoxically, some of the most popular breeds in the UK in 2018/19 are those afflicted by the most inherited disorders. In recent years, the spotlight has also been shone upon pedigree cats which share some of the same issues identified in dogs, although much fewer in number and with seemingly fewer associated disorders.

Although continued focus on improving breeding practices are essential for animal welfare, resources and activities that focus on the *demand* side of the puppy-buying market are much welcomed. Empowering potential puppy and kitten buyers with up-to-date information on breed health has the potential to improve animal welfare by: (i) using market forces to reduce the popularity of breeds inherently associated with disease (eg those with extreme conformation); and (ii) placing pressure on breeders to use all the tools at their disposal to improve breed health (eg testing for known genetic conditions and screening for phenotypic abnormali-