

Book Review

TROPICAL PINNIPEDS: BIO-ECOLOGY, THREATS, AND CONSERVATION. Juan José Alava, Editor. CRC Press, Boca Raton, Florida, USA, 2017. ISBN 9781498741392, 325 pp.

Although most pinnipeds occur in polar and temperate ecosystems, some inhabit tropical ecosystems where they can play critical roles in marine food webs. Much less is known about these tropical pinnipeds, and the literature that exists is often scattered and difficult to access. Tropical pinnipeds have also been severely impacted by human activities, with one species, the Caribbean monk seal, now extinct, and several others occurring at small fractions of their historical population sizes.

Tropical Pinnipeds, edited by Dr. Juan José Alava, attempts to summarize the current state of knowledge of the tropical and subtropical pinnipeds, especially their ecology, population trends, and conservation status. Originally from Ecuador where he began working with tropical pinnipeds as an undergraduate, Dr. Alava is currently a marine eco-toxicologist at the Institute of Oceans and Fisheries at the University of British Columbia and an adjunct professor at Simon Fraser University. He has over 20 years of experience working with tropical marine mammals.

The book is divided into 16 chapters authored by approximately 40 researchers. The first two chapters provide an introduction to the tropical pinnipeds. Chapter 1, authored by Dr. Alava and David Aurióles-Gamboa, sets the scope of the book, indicating the species included and presenting a distribution map with their ranges as well as a table summarizing their population trends and IUCN status. This chapter also discusses the difficulties of defining some species as subtropical/tropical because of their broad ranges and the tendency of individuals to wander well beyond their established geographical ranges. The chapter concludes by discussing the conservation challenges that tropical pinnipeds face and introducing the topics covered in the rest of the book. Chapter 2, authored by Carlos A. Vidoso Morales, reviews the evolutionary history of the tropical pinnipeds. Acknowledging the poor fossil record of pinnipeds in the region, Vidoso Morales uses the existing literature to hypothesize how and when different pinniped lineages may have colonized tropical regions.

The next 12 chapters comprise the core of the book and primarily consist of species-specific treatments of the pinnipeds covered, including

the California sea lion (Chapter 3), the Galapagos sea lion (Chapters 3, 8 & 9), the Hawaiian monk seal (Chapters 4 & 5), the Guadalupe fur seal (Chapter 6), the Galapagos fur seal (Chapter 7), the Juan Fernandez fur seal (Chapter 10), the South American sea lion (Chapter 11), the South American fur seal (Chapter 12), the Mediterranean monk seal (Chapter 13), and the Cape fur seal (Chapter 14). Most of the chapters review the basic biology or population trends and conservation threats of the different species. For example, the Hawaiian monk seal is treated in two chapters: Chapter 4 summarizes its ecology, while Chapter 5 covers its conservation status and threats, resulting in a comprehensive treatment of this species. Most other species are covered in single chapters. An important point to highlight is that some chapters, like Chapter 10 by Layla P. Osman and Carlos A. Moreno on the Juan Fernandez fur seal, represent original research articles. The Juan Fernandez fur seal was severely overexploited in the 18th and 19th centuries, leading to reports of its possible extinction by 1900. Osman and Moreno use census data to show that the population has increased from approximately 750 individuals in 1969 to greater than 32,278 by 2005, a testament of the ability of pinnipeds to recover from over-exploitation. There are also chapters that treat more specialized topics. For example, in Chapter 3, Bohórquez-Herrera et al. use sophisticated geometric morphometric methods to examine variation in the skull morphology of adult male California and Galapagos sea lions.

The scope of the book changes in the last two chapters, which both relate to tropical pinniped pathology and health. Chapter 15, written by Karina Acevedo-Whitehouse and Luis A. Soto-García, highlights that although studies related to pinniped health, disease, or immune function have increased by approximately 1,400% between 1985 and 2015, most of these studies focus on a few common pinnipeds, with little research in these areas conducted on most tropical and subtropical species. A useful table summarizing published health-related studies for each species is included. The authors then go on to discuss the emerging potential health threats to tropical/subtropical pinnipeds, including morbilliviruses, adenovirus and other emerging viruses, toxoplasmosis, alopecia syndrome, ciguatera, and the effect of environmental stress on pinniped immune responses to pathogens. The chapter presents a broad treatment of this topic, and the

Literature Cited section should be useful for readers interested in learning more about tropical pinniped health challenges. Chapter 16 by Baldassin and colleagues reviews the common pathologies observed primarily in the South American sea lion and the South American fur seal in Brazil based on work conducted by rehabilitation centers in southeastern and southern Brazil where pinnipeds are most commonly encountered.

Key among the virtues of the book will be the compilation of the scattered literature and current knowledge of tropical and subtropical pinnipeds in a single, easily accessible volume. Integrating basic biological information on the species covered with data on their population trends, conservation status, and threats is another important contribution. However, there is room for improvement. As is often the case for edited volumes like this, the chapters are uneven in their treatment, with some species covered in depth in multiple chapters, while others are treated more superficially or only over a portion of their geographical range. For example, very little is presented on the California sea lion despite the vast literature on this species. Although the first and last two chapters are intended to be broader in their treatment, the book also lacks chapters that synthesize the ecological importance of tropical and subtropical pinnipeds to tropical marine ecosystems or that discuss the evolutionary shifts involved in colonizing tropical ecosystems. Nonetheless, the information compiled for the individual species, much of which has been collected by local researchers, makes broader integration possible with some effort.

In summary, *Tropical Pinnipeds* summarizes the current state of knowledge of tropical and subtropical pinnipeds in a single volume that will be useful for those interested in the ecology and conservation of this important group of marine mammals. The book will also serve as a historical marker of the state of tropical pinnipeds at this time. We can only hope that it will stimulate more research and conservation efforts on this ecologically important and threatened group.

Windsor Aguirre, PhD
Associate Professor
Department of Biological Sciences
DePaul University
Chicago, IL, USA