

## BOOK REVIEW

### **Desert bighorn sheep: wilderness icon**

Mark C. Jorgensen with photographs by Jeff Young. 2014. Sunbelt Publications, San Diego, California, USA. 143 pages. Soft cover. \$29.95. ISBN 978-1-941384-00-8

Mark Jorgensen, who had a stellar career with the California Department of Parks and Recreation and who has spent his professional life as an advocate for desert bighorn sheep has teamed with Jeff Young—a photographer with skills second to none—to produce a book that is both scientifically sound and provides the reader with breathtaking images. Those images clearly illustrate many of the life-history traits of bighorn sheep that Mark so completely describes in the text. This book, albeit not of great length, contains some of the most impressive photographs of desert bighorn sheep, their habitat, and threats to the long-term persistence of those specialized ungulates that I have encountered during my career. Importantly, each image is accompanied by a caption that clearly describes the photograph and that very nicely complements the accompanying text.

The book begins with a brief foreword by Esther Rubin, with whom Mark—and many of us involved in the conservation of desert bighorn sheep—worked for many years; Dr. Rubin provides numerous details regarding Mark’s qualifications to write this book. In an extensive conveyance of acknowledgments, Mark then goes on to thank those individuals and organizations with whom he has worked for decades. Finally, he introduces Jeff Young, with whom he has shared his knowledge of, and passion for, desert bighorn sheep and whose images clearly illustrate the many topics presented in the text. This book is not only a compilation of biology and its implications for conservation, but a visual portrayal of the life history of desert bighorn sheep.

The first chapter, “Origins and Distribution in the United States and Mexico” not only contains information on the origins of wild sheep in North America, but provides descriptions of the relationships between that species and native peoples. Mark touches on the ways that bighorn sheep were hunted and utilized by the earliest Americans, and provides a fine summary of the widespread occurrence of bighorn sheep as subjects of early rock art, primarily in the form of petroglyphs.

The importance of habitat, and the dependency of desert bighorn sheep on it and the ways it is used, are the subjects of Chapter 2. The importance of “escape terrain” is emphasized, particularly as it relates to security. Mark also provides a good summary of the importance and availability of high-quality forage, descriptions of their food habits, a summary description of the ruminant digestive system, a brief summary of the physiological adaptations to the harsh, arid environments inhabited by desert bighorn sheep, and the importance of water to the distribution, life history, and persistence of this species. Chapter 2 is illustrated profusely with many images that more than adequately portray the subject matter.

Chapter 3, “Adaptations to a Desert Environment” contains summaries of the many adaptations of desert bighorn sheep to life in the hot, arid ecosystems of western North America. In this chapter, the author and photographer explore the ways that these animals “take advantage” of habitat conditions and further discuss the physiological adaptations introduced in Chapter 2. Along with a summary of those physiological adaptations, Mark

nically discusses the published information on the behavioral and anatomical adaptations that so clearly contribute to the life history strategies of male and female bighorn sheep.

“Life History and Behavior—A Year in the Life of a Desert Bighorn” is the title of Chapter 4, and it is aptly named. There are some statements that could be construed by some to convey misinformation in the strictest sense (e.g., “The largest, most aggressive and powerful ram is often thought to do more than his share of the breeding with receptive ewes, theoretically passing on the most dominant genetic line to the next generation”), but the point is that dominant breeding males are more apt to pass their genes on to the next generation. Nevertheless, the audience likely to benefit most from this book will understand the intended meaning.

This chapter also describes the behavior of bighorn sheep in the context of various seasons of the year, and the life-history traits associated with those seasons. From the text (and, in particular, the photographs accompanying the text), it is clear that sexual segregation, or the fact that for much of the year male and female bighorn sheep utilize different habitats, is an important life-history trait of desert bighorn sheep (and most other sexually dimorphic ungulates). The word “segregate”—or a derivative thereof—appears only once in the text, but the importance of this concept could be further emphasized, particularly in the context of conservation.

Mark presents an excellent summary of the importance of habitat connectivity to the persistence of viable populations of desert bighorn sheep across an increasingly fragmented landscape. He notes that, “Looking back over the last half of the 20th century, it has become clear that with more insight into the needs of wildlife, planning could have curtailed many of the human impacts on wildlife habitat and wildlife movement corridors.” Clearly, the message is that if we don’t break something, it won’t need fixing, and Mark emphasizes the importance of science-driven forethought and planning as important ways to minimize conflicts in the future. Although the title of the book identifies desert bighorn sheep as a “wilderness” icon, I would argue that the desert bighorn is more of an icon of wild places, and not legislated wilderness; the absence of ecological forethought in the designation of wilderness has contributed to many of the problems with which desert bighorn sheep and other large mammals are faced. Mark’s admonition regarding better planning should be heeded by developers, conservationists, agency administrators, and politicians because, in the end, it will be the actions of all of them that determine the future of bighorn sheep across much of its range.

Chapter 5 consists of an extensive discussion of the causes of mortality and threats with which desert bighorn sheep are faced. Disease, habitat fragmentation, habitat loss, resource depletion, predation, human disturbance, and other such factors are addressed in some detail, and include up-to-date assessments of ongoing episodes. Also discussed are a number of methods or activities that have had benefits to conservation. Mark is not shy about discussing the important role that hunting has played in providing funds that are used to conserve bighorn sheep or acquire habitat. Moreover, he does not shy away from discussing the importance of providing resources or habitat management actions wherever needed to help maintain existing populations, or to help reverse a trend in declining numbers in some populations. He addresses the fallacy of the importance of “pristine” wilderness areas to bighorn sheep, noting that humans have an obligation to wildlife conservation that goes beyond the status quo: part of that obligation exists in a commitment to ensure the survival of desert bighorn sheep by using the methods and technology currently available to amend mistakes that have been detrimental to desert bighorn sheep. That is a gutsy approach, but one that Mark has been an advocate for during the more than 40 years of our friendship

and professional relationship.

In the final chapter, “Hope for the Future—Maneuvering the Modern West” the author brings into clear focus the accomplishments that have occurred on behalf of the conservation of this iconic animal, the ways and means through which those accomplishments have occurred, and clearly emphasizes the importance of active management to conservation and restoration. He then presents a summary of the current status of desert bighorn sheep in the seven states and Mexico, places inhabited by that specialized ungulate. Mark, who is not only a fine scientist and an ardent conservationist, is also a very pragmatic individual, calling attention to the needs to provide resources, primarily in the form of wildlife water developments, or to restore habitat for bighorn sheep using fire, removal of exotic vertebrates or vegetation, the restoration of connectivity (and, thereby, metapopulation function), and translocation as management tools. This chapter concludes with a discussion of predator management and its potential importance in the maintenance of bighorn sheep populations, or their restoration to parts of their historical range.

In preparing this informative book, Mark has delved into the evolutionary history, biology, beauty, and the relevance of appropriate management to the conservation of one of the iconic representatives of North American wildlife. The book is well-done, and profusely illustrated, and presents up-to-the minute descriptions of the challenges with which desert bighorn sheep are faced, as well as the accomplishments that have been made on their behalf. Material presented is based on the author’s extensive experience and his familiarity with the scientific literature and that literature is summarized in language that even those without a background in science can readily appreciate. I noted a few places in the book where more thorough editing might have been helpful (for example, the ways that the verbs evade and avoid—and derivations thereof—in relation to predators and predation are used interchangeably), but these instances do not detract from the value and importance of the material contained in this book. As noted earlier, some subjects could be expanded upon in terms of their relevance to desert bighorn sheep, but these are minor points in the context of the importance of bringing an understanding of the biology and the need for conservation to the reader.

Never one to be shy when offering opinions or advice regarding the management of desert bighorn sheep, Mark has addressed the controversial topics of wildlife conservation and habitat management in legislated wilderness, trophy hunting, captive breeding, and predator management in the context of their overall benefits to the conservation of desert bighorn sheep, and is to be commended for doing so. To complement the text, Jeff Young has provided dozens of outstanding photographs that not only illustrate material being discussed in the text, but also provide insight into many aspects of the life history of this species; I consider myself fortunate to own a signed print of the image on page 55 and display it in my shabby little office.

Mark and Jeff are to be congratulated on a book that, in my opinion, is a contribution and I encourage all with an interest in desert bighorn sheep to take advantage of the information it contains and to enjoy the outstanding photos included therein. The final sentence in the book is a statement that all that read it—and perhaps more importantly those that elect to not take the opportunity to do so—must appreciate: “People have risen up to support sustainable bighorn populations, to restore habitat, and to insure the future of this majestic symbol of wild places. Their future truly is in our hands.”

VERNON C. BLEICH, *California Department of Fish and Wildlife, Office of Communications, Education and Outreach, 1416 9th Street, Sacramento, CA 95814, USA*