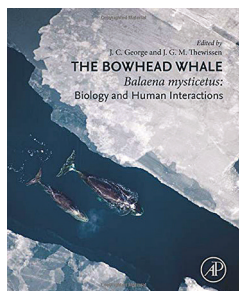


## ZOOLOGY

**The Bowhead Whale *Balaena mysticetus*: Biology and Human Interactions**

Edited by J.C. George and J.G.M. Thewissen. 2020. Academic Press. 516 pages, 120.00 USD, Cloth.

Bowhead Whale (*Balaena mysticetus*) is an iconic Arctic marine mammal. Among baleen whales, and even mammals as a whole, bowheads stand out, and hold the record for many traits. They are the longest living mammal (>200 years old), they have the thickest skull, and they have the thickest



blubber. Among whales, they have the longest baleen plates. Bowhead Whale is also one of the few whale species that are still the focus of subsistence hunting and are a cultural keystone in Inuit and other Arctic Indigenous cultures. There are four known stocks or populations of Bowhead Whales: the Bering-Chukchi Beaufort (BCB) stock, the Eastern Canada-West Greenland (ECWG) stock, the East Greenland-Svalbard (EGSB) stock, and the Okhotsk Sea (OKS) stock. All of these stocks were the focus of commercial whaling (mid 1500s to early 1900s), and their numbers were severely depleted. Both the EGSB and OKS stocks remain Endangered, with only a few hundred whales remaining in each stock, whereas both the BCB and ECWG populations have rebounded and are considered Special Concern in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). However, the BCB stock seems to have rebounded the most, and it is perhaps culturally the most important out of all four, as quite a few villages in Alaska hunt this stock every year. The BCB stock also overlaps with increased shipping traffic in the Bering Strait region and has been exposed to wide-spread oil and gas exploration (seismic survey vessels) and extraction activities, and for these reasons it has been the focus of far more research than the other three stocks, particularly in the 1980s and 1990s.

Much of the early research on bowheads culminated in a book called *The Bowhead Whale* (Burns *et al.* 1993), which presented a large amount of research, mainly from the BCB stock, on all aspects of Bowhead Whale biology and ecology. Since the original book was published, there have been large advances in technology and in our understanding of Bowhead Whales, which was the impetus behind this new book with the same title, *The Bowhead Whale*, edited by John George and Hans Thewissen. This new book offers further insights into all four bowhead stocks. Technology has evolved in leaps and bounds since the 1990s. For example, field studies of

bowheads used to rely solely on aerial surveys, boat-based and shore-based observations, and fairly limited short-term passive acoustic monitoring. Now, bowheads are studied with advanced satellite telemetry, three-dimensional movement tags, unmanned aerial vehicles, and long-term passive acoustic monitoring. Many lab-based techniques have similarly undergone major advancements, particularly in genetics, which has allowed for interesting perspectives on the differentiation, relatedness, and genetic diversity among the different stocks of bowheads.

Beyond the advances in our knowledge of bowheads, the timing of this book is quite important. The Arctic is warming at twice the rate of the global average, and the ice-covered seas that bowheads are adapted to are undergoing important changes, including physical changes in sea ice and oceanography, and biological changes in the presence and abundance of different species (i.e., a shifting food web). The loss of sea ice is also allowing for increased human access throughout the region. When the original 1993 book was published, warming in the Arctic was less extreme. In fact, most long-term studies of Arctic sea ice and ship traffic compare back to averages in the 1990s, because changes that have occurred over the last three decades are quite drastic. This book therefore provides an update on our knowledge of Bowhead Whales, but also reminds readers of the many threats currently facing bowheads.

The book's structure spans 39 chapters divided into three main themes: 1) basic biology (Chapters 1–24), 2) the bowhead ecosystem (Chapters 25–30), and 3) interactions with humans (Chapters 31–39). The broad themes encompass recent physiological knowledge, evolutionary insights, population sizes, anthropogenic interactions, and future threats to Bowhead Whales. Numerous chapters within each theme provide the reader with a thorough selection of topics discussed by relevant specialists. Closer examination of individual chapters reveals a generally straightforward framework, which facilitates comprehension of the included information. Many specialists have contributed through discussion of their past and current research to this book, which has as well a substantial inclusion of traditional knowledge shared by members of several Indigenous communities. A large amount of detail and references are provided in certain chapters; however, other chapters are more focussed on the authors' personal research and are missing the inclusion of research led by other specialists within a particular field.

In general, this book can be viewed as the “Bowhead Encyclopedia”, presenting readers with past and current knowledge in a comprehensive format. If readers desire to dig deeper into a specific topic, numerous references (albeit not exhaustive) are provided within each chapter. There is a great interconnectedness within chapters in this book which lends to some repetition, but also helps to direct readers to specific additional chapters for further information on certain topics. However, all essential information a reader might require, to gain full topic-specific understanding, is provided within each chapter. Thus, individual chapters can be read independently of one another, which is certainly a strength of the book’s format and structure. Overall, this book provides knowledge about each of the four unique Bowhead Whale stocks. The greatest amount of information is about the BCB stock, slightly less about the ECWG stock, and very little about the EGSB and OKS stocks. By nature, bowhead research is represented by a strong American focus, and the inclusion of a greater number of non-American authors would have added a beneficial angle of perspective to the book. The addition of non-American authored research, especially from Russia, could greatly reduce the lack of information on the under-represented bowhead populations in this book.

This book is a must-read for researchers, from general marine biologists to specialized cetacean biologists, and undoubtedly to the dedicated Bowhead Whale investigators. All chapters recognize gaps in our knowledge related to bowheads, and also highlight important topics for future research, which may help many generations of scientists to navigate their explorations. With *The Bowhead Whale* being a relatively detailed description of nearly everything related to this remarkable species, it will be of great interest to both experts and whale or Arctic enthusiasts with some grasp of basic science. It satisfies the reader as an encyclopedic book that marries scientific advances with historical facts and Indigenous knowledge, and people with interest in whaling history or in Indigenous Arctic culture will find several of the chapters (31–34) quite insightful. *The Bowhead Whale* covers the entire spectrum of the iconic species’ history: from 10 million years ago when Bowhead and Right Whale lineages split, to the cultural ties between whales and Indigenous Arctic communities dating from at least a thousand years ago, to their almost extirpation by commercial whaling in the 19th century, reaching the threats bowheads face in 2020. Despite the extensive slaughtering the species underwent from commercial whalers for 400 years, the current recovery of at least two stocks (the BCB and ECWG) remains a rare and

remarkable conservation success story meant to inspire managers, administrators, scientists, and advocates to continue and focus their conservation battles.

There is probably no other species of baleen whale of such critical importance to a human society. Bowheads have been a prominent resource, culturally and nutritionally, for Inuit and Yupik, sustaining the survival of many Indigenous communities. *The Bowhead Whale* devotes considerable space to the traditional and Indigenous knowledge emerging from the intertwined history of humans and bowheads, and highlights the significance of this knowledge to science and conservation efforts today. An entire chapter (31) focusses on anecdotal stories by Indigenous people who share powerful emotions and personal experiences from traditional bowhead hunts. Indigenous whaling never posed a threat to the sustainability of the whale stocks, but instead stems from respect to the animals and reinforces the health of the bowhead populations. The traditional bowhead hunt is very hard work, but it creates a unique social glue for the community that works together to catch the animal and share the meat within the community. The hunt’s success is based on trust, partnership, collaboration, coordination, and teamwork. The same practices have been key to the communal understanding of bowhead ecology and biology, and to the conservation of the Arctic ecosystem.

### Literature Cited

**Burns, J.J., J.J. Montague, and C.J. Cowles.** 1993. *The Bowhead Whale*. Special Publication Number 2, Society of Marine Mammalogy, Lawrence, Kansas, USA.

WILLIAM D. HALLIDAY

Wildlife Conservation Society Canada,  
Whitehorse, YT, Canada and

School of Earth and Ocean Sciences, University  
of Victoria, Victoria, BC, Canada

NIKOLETTA DIOGOU

Wildlife Conservation Society Canada,  
Whitehorse, YT, Canada and

School of Earth and Ocean Sciences, University  
of Victoria, Victoria, BC, Canada

ANNIKA F. HEIMRICH

Department of Biology, University of Victoria,  
Victoria, BC, Canada

MORGAN J. MARTIN

Wildlife Conservation Society Canada,  
Whitehorse, YT, Canada and

Department of Biology, University of Victoria,  
Victoria, BC, Canada