

The book concludes with a section by Klaus on alien (introduced by humans) species: 6 anurans, 54 lizards, 4 snakes, 1 crocodylian, and 2 turtles, the majority of these established in Florida or Hawaii. Of all these newcomers to North America, only one is in Canada, a European lizard on Vancouver Island. Checklists can only reflect the state of knowledge up to press time and how rapidly they become outdated is a direct reflection of how active and innovative current research is in the field they cover. Taxonomy and phylogenetics

in herpetology have enjoyed explosive growth in recent decades and will continue for the near future at least. This checklist cannot be the last word in species status and relationships, but is an essential authoritative benchmark for naturalists' and conservationists' reference now.

FRANCIS R. COOK

Researcher and Curator Emeritus, Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, Ontario K1P 6P4 Canada

Arctic Fox: Life at the Top of the World

By Garry Hamilton. 2008. Firefly Books Ltd., 66 Leek Crescent, Richmond Hill, Ontario L4B 1H1 Canada. 231 pages. 39.95 USD.

Garry Hamilton has produced a wonderfully written account of a whimsical predator that's not as well researched as some of the more charismatic canid species. He has gone to the source to obtain the most accurate and reliable information: the biologists and graduate students that ventured to the circumpolar region and studied the fox first hand. These interviews and summations of their research provide an added edge that is lacking in today's natural history writing.

The book is divided into three parts: Origins, Adaptations, and Change, with each part containing several chapters. Each chapter covers a particular aspect of Arctic fox biology and is accompanied by outstanding full-color photos by photographer Norbert Rosing. Hamilton uses the stories told by researchers to make various points about the amazing ecology of the Arctic fox and incorporates the journal writings of fox hunters, explorers, and early naturalists that lived within the Arctic fox's realm. With these stories and writings, Hamilton paints a picture of a fox that is a master of conserving energy, is a clever hoarder of goose eggs, and is bold enough to follow polar bears (*Ursus maritimus*) to take advantage of the seal carcasses left behind. Indeed, the most striking aspect of Hamilton's writing is his ability to communicate the adaptability of the little fox, from reproduction to the constant struggle in obtaining food.

When I first saw the book, I assumed it was some sort of coffee table tome – it measures 28 × 22 × 2 cm and is not something easily carried around. However, once I began reading, I soon realized that it was a very well researched book that contains nearly everything currently known about the fox. In short, it is a thorough species account of the Arctic fox, and exceeded my initial expectations.

I was most interested in finding out exactly where the Arctic fox came from. Chapter 3 delves into this question, explaining that it is a result of rapid evolution 200 000 to 400 000 years ago from the swift fox (*Vulpes velox*), which occurs in the Great Plains of the United States stretching from Texas to Canada. Hamil-

ton explains the evolutionary mechanisms and the pressures of natural selection with ease, providing a classic example of adaptation and survival.

The final chapters provide a cautionary statement regarding Arctic fox conservation. One would think that a fox as adaptable as the Arctic fox would not be in jeopardy. But this is not necessarily true. Global climate change is likely to thrust the fox into a state of peril. But other landscape-level challenges are becoming more of an issue. The northern expansion of the red fox (*Vulpes vulpes*) may be driving some populations of Arctic foxes to extinction, especially those in northern Europe. Hamilton explores these inter-specific interactions as well as the lemming cycles and other variables that continue to keep the Arctic fox in survivor mode.

There was only one major error in this book—the use of the Latin name *Alopex lagopus* for the Arctic fox. Whether this is a remnant of past research or the inability to change the name because of publication schedules, it is an unfortunate oversight in a work that is so rich with detail. The 3rd edition of *Mammal Species of the World: A Taxonomic and Geographic Reference* (Wozencraft 2005) places the Arctic fox with the rest of the vulpine foxes, *Vulpes lagopus*. This is mainly due to recent genetic work that proves a close relationship with the swift fox, as mentioned above.

Hamilton's book is a must for those interested in carnivore ecology, and seeking a volume detailing the Arctic fox's struggle within the brutal frozen habitat north of the Arctic Circle. Hamilton states, "...we have come to praise and not to bury our most worthy emperor of the north. Its days are far from done. Indeed, there is only one way in which we could possibly view this most remarkable of creatures – as shining examples of life's ability to survive" [page 216].

Literature Cited

Wozencraft, W. C. 2005. Order Carnivora. Pages 532–628 in *Mammal species of the world: a taxonomic and geographic reference* Edited by D. E. Wilson and D. M. Reeder. 3rd edition. Johns Hopkins University Press, Baltimore, Maryland.

HOWARD O. CLARK, JR.

H. T. Harvey & Associates, 7815 North Palm Avenue, Suite 310, Fresno, California 93711 USA