

red and blue sections, but the colour coding is not explained. Thirdly, the structure of the descriptive text is not always consistent: for most species, information on threats and conservation are presented in separate paragraphs, but these are missing for some species, creating the impression that these are not threatened or do not require conservation action. Finally, some citations do not have corresponding references.

Overall, *All Asian Primates* is an excellent reference book that I would recommend to researchers and students working in primate conservation.

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**Climate Ghosts: Migratory Species in the Anthropocene** by Nancy Langston (2021) 208 pp., Brandeis University Press, Waltham, USA. ISBN 978-1-68458-065-1 (pbk), USD 29.95.

I have always been fascinated by migratory species, especially birds, so this book captured my attention. What happens to migratory birds when they leave an area is a question that has long intrigued people. The ancient Greek philosopher and scientist Aristotle thought that some birds hibernated or transformed into different species as winter approached. People believed this for centuries until scientists started to unravel the mystery of bird migration in 1899, when birds were first ringed for scientific purposes. Today, migratory species face numerous threats such as habitat loss and degradation, illegal hunting and climate change.

In *Climate Ghosts*, environmental historian Nancy Langston focuses on three migratory species in the Great Lakes watershed in North America: the woodland caribou *Rangifer tarandus caribou*, common loon *Gavia immer* and lake sturgeon *Acipenser fulvescens*. The term ghost species is used to describe species that are not completely extinct, but extirpated from an area where they once occurred, and to which they could—if the right actions are

taken—potentially be restored. The book is organized into five chapters: Chapter 1 introduces the three species in the context of their natural environment and the challenges they face in the Anthropocene. Chapter 2 talks about the history of the woodland caribou in the upper Great Lakes and Chapter 3 deals with the effects of a warming world on this species. In Chapter 4 we learn about the Indigenous communities and efforts to restore the lake sturgeon, and Chapter 5 is about the common loon.

The caribou, loon and sturgeon are all of particular importance to the Native communities in the region, who have long considered them to be their non-human relatives, not merely resources to be exploited. The European colonization of North America, however, led to a dramatic drop in their populations, through uncontrolled hunting, development, commercial fishing, habitat loss, pollution and climate change. For example, rising temperatures lead to an increase in wildfires in boreal forests, resulting in the destruction of ground lichens that the caribou feed on during winter. There have been efforts to restore these species, some of which have been more successful than others.

The book provides historical references on the three species, their habitats and migrations, the effect of predators, and their significance for and relationships with the region's Indigenous people. It also highlights the human activities that have negatively affected both wildlife and local communities. For example, sturgeons are seen as a spiritual gift by the Indigenous community in the Upper Great lakes, and their vanishing led to a profound sense of spiritual loss. Similarly, many of the northern cultures associated loons with vision, possibly because of the birds' bright red eyes in the breeding season, and saw in them a reminder for people to treasure the natural world they see.

Historical information, dating back several centuries, is skilfully combined with details on present and planned restoration actions, providing insights into the past, present and possible future of these threatened species. The core challenge for the caribou is described as

trying to survive in a world in which populations of their predators, such as wolves and bears, have been partially restored, but the habitat connections and corridors that historically allowed caribou herds to migrate over vast distances and escape those predators have not been repaired. In an effort to save the rapidly dwindling population, caribou were translocated to potentially suitable areas, but an ecosystem approach was not employed. As a result, a restoration effort known as the Big Bog Project was deemed unsuccessful: the caribou were unable to move freely because their habitat remained fragmented, and Indigenous rights and relationships with nature were not considered.

The case of the lake sturgeon is described as more hopeful. Historically plentiful and an important food source for the Menominee tribe in the spring, lake sturgeons could no longer move upstream after two dams were constructed on the Wolf River, in the 1880s and 1920s. In a collaborative effort between the Menominee tribe and Wisconsin Department of Natural Resources to reintroduce the species to its historic spawning grounds at Keshena Falls, more than 100 adult sturgeons were transferred upstream, beyond the dams, in the hope that the fish would continue their migration. In the spring of 2012, sturgeons were observed spawning at Keshena Falls for the first time in over 100 years.

Nancy Langston's main argument in this book is that restoration of these species and of the Indigenous culture requires a collaborative and holistic approach. The book helped me understand that integrating Indigenous knowledge with western scientific research, often referred to as 'two-eyed seeing', is essential to protect species and habitats effectively, and to ensure a sustainable future. Throughout the book, the prose flows well and without complex jargon, making this an enjoyable and accessible read. I would highly recommend *Climate Ghosts* to anyone interested in migratory species and climate change.

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