

The Golden Eagle

Around the World



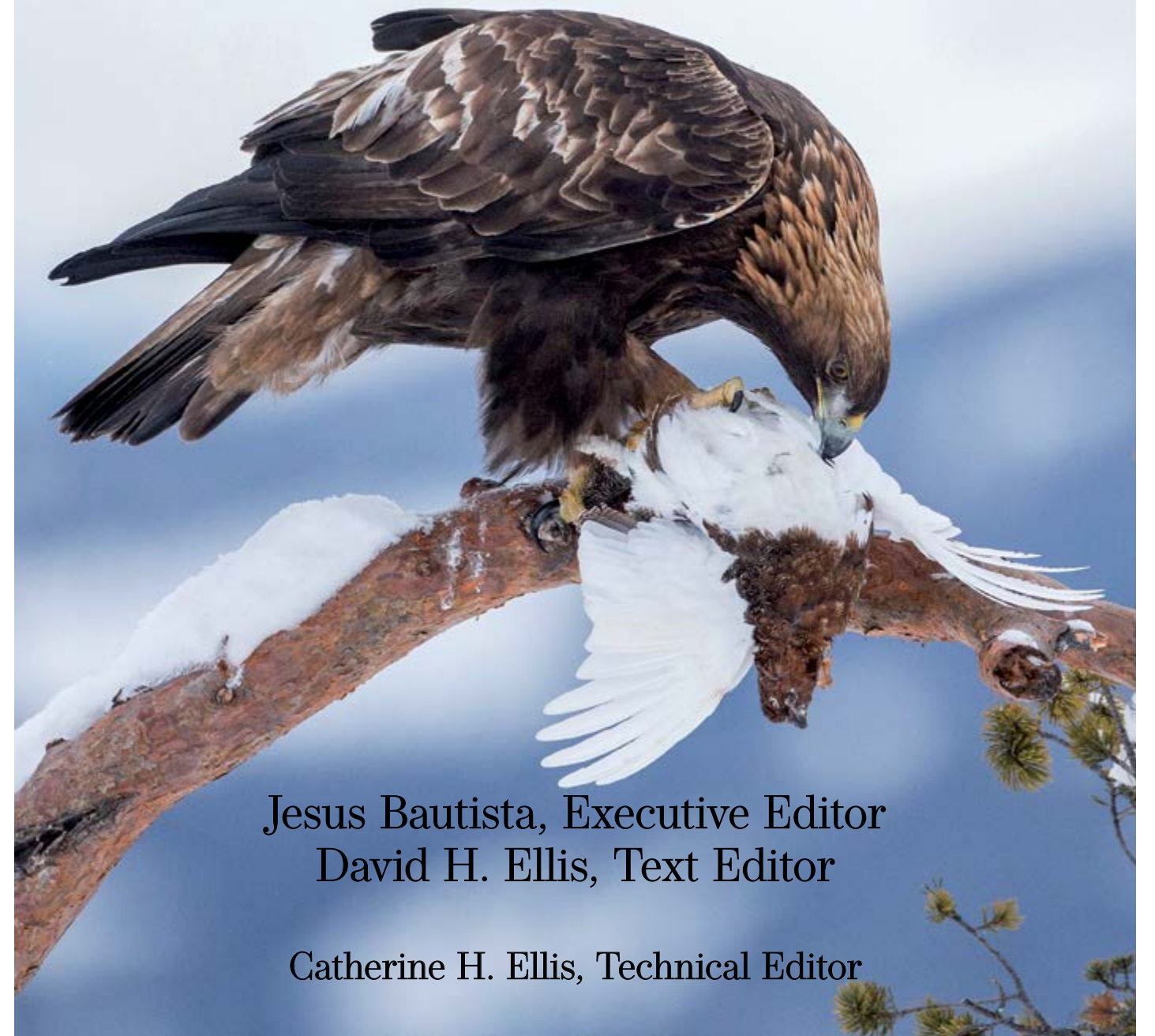
Artist: Jaime Avilés.



Frontispiece: A recently fledged Golden Eagle demanding food from its parent during the dependency period in southern Spain. Illustration: Jesús Rodríguez-Osorio.

Title page (right): Adult Golden Eagle with ptarmigan prey, southeastern Norway. Photo: Thomas Mørch.

The Golden Eagle Around the World



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Dedication

The Union for the Conservation of Raptors is pleased to dedicate this volume to A. Brazier Howell (1886-1961). As an early conservationist and prolific collector of mammals and birds, he authored almost 3000 pages in the scientific literature, including the naming of 27 new taxa. Long before DDT, he reported that fruit tree fumigation killed birds. He was also an early opponent of federal predator control programs. With prominent roles in founding the American Society of Mammalogists and the Council for the Conservation of Whales, he held leading positions in these organizations and in the Cooper Ornithological Society. By profession, he excelled in anatomy, but he was also proficient as an artist, an illustrator, and a musician. Although he had but 1 year of college, he was known as Doctor and Professor while teaching and doing research at Johns Hopkins Medical School.

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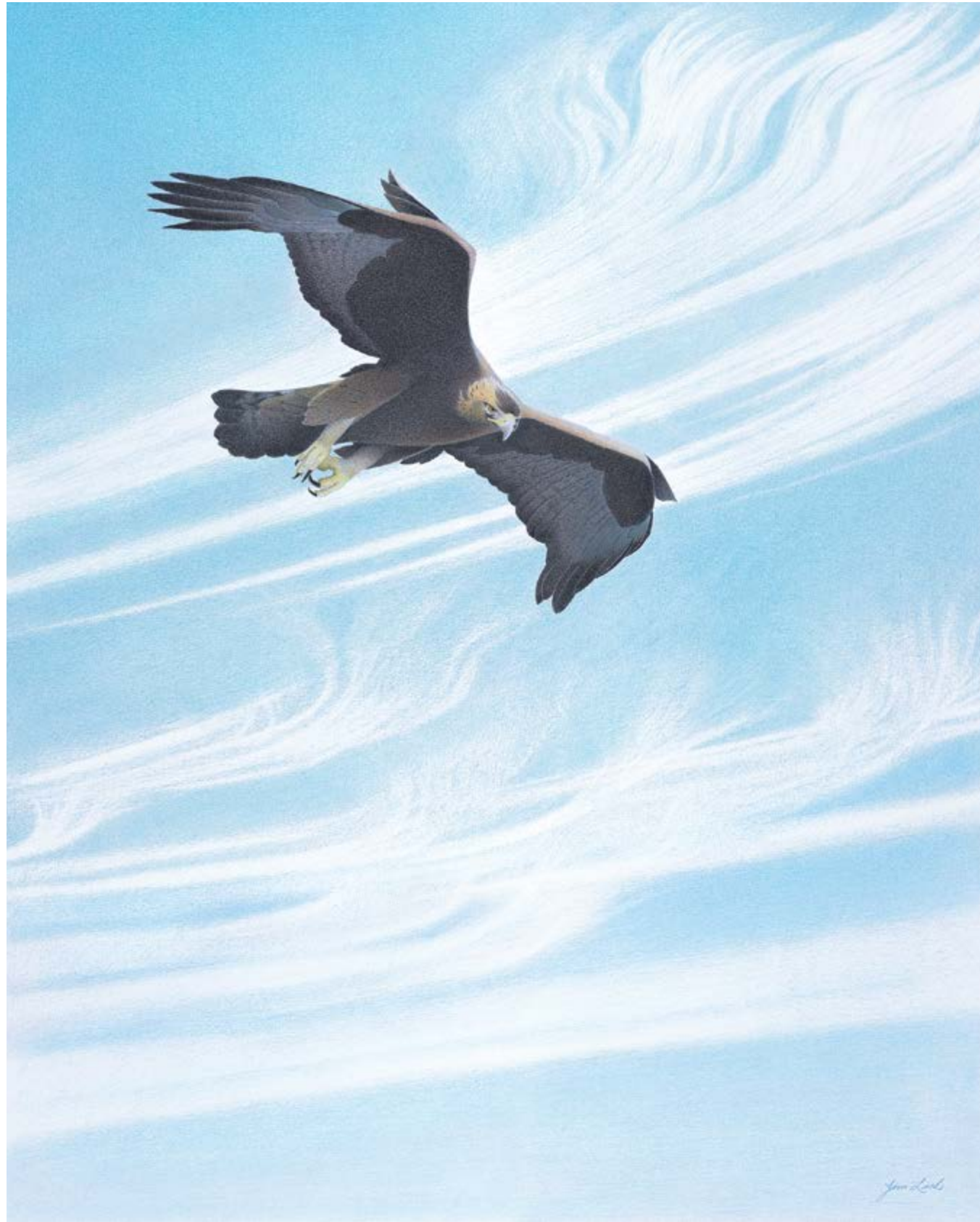
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Illustration: Jesús Rodríguez-Osorio.



Frontispiece: Gliding eagle against a windy, blue sky. "Cirrus," prismacolor pencil on illustration board, James W. Lish.

Foreword



Golden Eagle pair at their territory in Guadarrama National Park, Sistema Central, Spain. Jesús Rodríguez-Osorio.

When David Ellis and Jesus Bautista invited me to write a foreword for their upcoming book on Golden Eagles (*Aquila chrysaetos*), I felt profoundly honored and, at the same time, intrigued. The Golden Eagle is among the most studied of all birds of prey in the world, with thousands of scientific articles and dozens of books published over the last century. So, why write another book about Golden Eagles now? Well, the answer is found in the pages that follow. So much news arising from so many different areas of the world, so many results (coming from cutting-edge telemetry and other new technologies) deserve to be published in an impressive new book. New genetic insights into the relationship among subspecies allow potential inference of the phylogenetic

history. Among *Aquila* eagles, the circumpolar Golden Eagle exhibits the largest distribution area by far. Consequently, Golden Eagles show a high diversity of diet, a high variety in habitat use, and even high diversity in its habits. There are so many different behavioral characteristics among Golden Eagles inhabiting different zones of the world suggesting one of the highest, if not the highest, level of flexibility among large eagles. This probably explains why this unique eagle is doing so well in so many different habitats. However, when you see a Golden Eagle, wherever it occurs, you can be sure that it is a Golden Eagle.

The Golden Eagle is one of the species that survived better than most other species under human persecution

during the last century. Even in Europe, where some other large eagles disappeared entirely from large areas, the Golden Eagle managed to survive, successfully facing severe human persecution. Now, in these areas, the species is recovering and some ancient behavior patterns are becoming evident again. For example, in many areas, it once again selects trees as nesting supports. Facultative tree/cliff nesting likely evolved as an adaptation to increase plasticity in relation to habitat availability and intra and interspecific competition for nesting space. The fact that only some species of cliff nesting raptors, including Golden Eagles, provide sticks, making a “real nest” on the cliff, would be due to evolutionary burden of former tree nesters. Several suggestions can be made about how this flexible behavior of selecting where to breed has evolved, and why some raptor species seem much more flexible than others. However, from a conservation point of view, being able to breed on both trees and cliffs must have been a critical factor in responding to human interference during the 20th century. Spanish Imperial Eagles (*A. adalberti*), for example, do not breed on cliffs at all, and they suffered a strong reduction in their population due to human persecution. Now, when the persecution is mostly over, the proportion of Golden Eagle tree-nesters in Europe is increasing. Nesting on trees or cliffs are not all the possibilities for diurnal raptors; several species also nest on the ground, the Golden Eagle among them. Ground nests are generally found in remote areas with few humans and few large terrestrial predators. Typically, ground nests are more frequent, but not exclusively, on islands. Golden Eagles can nest on the ground, showing again the great plasticity of the species.

In most species of the genus *Aquila*, juvenile plumage is more cryptic than adult plumage. Possible explanations for this include: to signal lower competitive ability to avoid heightened aggression from adults, to lessen energetic-demands for bold colors when the young eagles have no territory to defend, or to be camouflaged to decrease detection by prey. Several of the immature plumages in different species of eagles are similar. Young Golden Eagles, by contrast, have very conspicuous white coloration on the basal half of the tail and white patches on the bases of the inner primaries and secondaries; they are the only member of the genus where young birds have a strikingly more conspicuous plumage than adults. There are some potential explanations for that anomaly. Perhaps in this species non-adult bird ecology is also different from other eagles. In fact, as we can read in this book, some studies seem to show that juvenile dispersal behavior and habitat selection is somehow different from other eagles. Golden Eagles do not show different habitat selection criteria according age classes as has been reported in other species. Juveniles seem to use the same areas as adult birds, so the frequency of encounters with adults is higher than in other eagles. At the same time, several observations show that the juvenile Golden Eagle is much more dependent upon carrion than other *Aquila* juveniles. It is also the only species that normally does not tolerate

other large raptors at the carcass. High levels of aggression and dominance of juveniles over adult birds at carcasses have been reported. Perhaps some of these different characteristics in juvenile ecology would explain the uniquely conspicuous juvenile plumage of this species.

Many fascinating questions are reviewed in this book. Can we expect to find different dynamics among populations of the same species when they are so separated and living in such different environments? Age of first breeding is a density-dependent variable in some species of eagles, but we do not know much about the physiological regulation of maturity and acquisition of adult plumage. Why do differences in age of adult plumage acquisition seem apparent among populations? How are Golden Eagle populations regulated? Why are there frequently significant differences in fecundity between closely located populations? Is there some kind of individual specialization in diet? Why is there only one race described for North America when five races are recognized for the Old World? Are we, the Europeans, more nationalistic and feel more comfortable with our “own race” of the Golden Eagle? Alternately, are there some evolutionary reasons for these differences? With advances in molecular genetics, we can now look at the distribution of rare alleles and gene frequencies in deciding questions about sub-speciation of Golden Eagles and the relatedness of all species within the genus *Aquila*.

Migratory behavior is also updated in this book, particularly timely in the climate change era. New technologies are giving us the opportunity to discover and understand behavioral decisions during migration. We are just recently learning the locations of the most important migratory pathways and how rapidly Golden Eagles travel. Do the adults and their young migrate together or even winter together? Have there been some changes in dates of migration during the last century? Are some formerly migratory populations or individuals now sedentary? Important questions about environmental pollution, regional mortality factors, habitat preferences, climate change, molt physiology, and a host of other topics can be better answered today than ever before. How are human beings and our infrastructures affecting Golden Eagles? Human-induced mortality of all types must be identified and mitigated, especially in installations for emerging energy sources, such as wind farms or solar power plants, that are on the increase due to our intention to end a carbon-based economy.

Golden Eagles are among the most iconic animals in the world. They are called golden or royal eagles in most of the languages of the world. In many cultures, their feathers are treasured, and among some Amerinds, the feathers are even treated as the rays of the sun. Still today, several air forces around the world use the Golden Eagle as a symbol of bravery and power. Now we know that not only humans, but also Neanderthals, used the flight feathers of the Golden Eagle for ornamental/symbolic purposes. What is it in this bird that makes such a profound imprint on our minds? It probably

requires a poet to express these feelings, but what we know for sure is that the vision of an eagle soaring over high mountains is one of the most beautiful and inspiring images imaginable.

David H. Ellis and Jesus Bautista are particularly well qualified to achieve the enormous task of assembling this book. For their own chapters, they are vastly experienced and they have the renown that comes from producing hundreds of respected scientific works. At the same time, they were “brave enough” to invite an incredible team of over 170 authors, experts from a

wide range of study areas around the world, in an attempt, surely without precedent, to provide us with a world-scale appraisal of Golden Eagle populations. And they have succeeded, giving us the opportunity to enjoy one of the most interesting and beautiful books on raptors that we have ever seen.

Miguel Ferrer

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A first year eagle resting along the rimrock of the Mesa de Maya country of southeastern Colorado, USA. "Resting on the Rimrock at Jesus Canyon," ink on scraperboard, James W. Lish.