

## PELICANS, CORMORANTS, AND THEIR RELATIVES: THE PELECANIFORMES

Nelson, J.B. 2006. Oxford, UK: Oxford University Press. ix + 661 pp. with 24 plates. Hard cover. ISBN 0-19-857-727-3. US\$199.

This weighty tome is No. 17 in Oxford University Press series "Bird Families of the World." Like some others in the series, it covers an order, not a family, but nobody seems to mind.

The Pelecaniformes constitute one of the bird world's untidiest "orders"; most researchers agree that having all four toes joined by webbing (the "totipalmate" condition), and the salt gland in the skull rather than on top of it, while decidedly odd, are hardly enough to unite the six families involved in a single order, but neither anatomists, ethologists or biochemists can agree where else to put them.

Part I of *Pelicans, Cormorants, and Their Relatives* considers this question at some length in the first chapter, Relationships. One of four thematic chapters addressing order-wide issues, it generally supports a common conclusion that tropicbirds and frigatebirds are more similar to each other than to other families in the order and that the separation of these two families from the others is probably justified.

Other chapters in Part I cover Breeding Behaviour, Breeding Ecology, and Relationships with Man. The confusion created by having the term "relationships" in two different chapters sets a pattern that unfortunately continues throughout the book. In the Behaviour chapter (the author's speciality), he bemoans the paucity of recent studies in comparative behaviour in favour of "experimental and manipulative work and computer simulations." Taking aim at the journal *Animal Behaviour*, Nelson writes that behaviour "has become a cipher to be subjected to ever more sophisticated statistics and most readers may have no idea what it looks like." Some readers would no doubt welcome from such an authority a stronger case for the resuscitation of more comprehensive quantitative descriptions of behaviour patterns.

I found the description of metapopulation theory (pp. 42–44) confused, confusing and critical, but ill-informed by recent regional studies of seabird metapopulations. In discussing the types of colonies shown by pelecaniforms, the last example is the White-tailed Tropicbird *Phaethon lepturus* "colony" on Aldabra; I was puzzled by this example, because I would not describe the nesting dispersion of tropicbirds there as in any way "colonial," but the reference cited actually refers to Cousin Island, not Aldabra, where the situation is quite different. This kind of mistake is very surprising from one who knows at least one of those places and would be expected to have spotted such an egregious error.

Several of the discussions of general topics (e.g. breeding ecology) lack clear themes—many studies are quoted, often in unnecessary detail, and contradictions duly pointed out, but patterns are unclear and conclusions few. Discussions tend to ramble with no clear destination. This is disappointing from one with so much experience and the demonstrated ability to summarise and integrate relevant information to illuminate an important point.

The chapters on general topics are followed by General Family Accounts (subsequently called GFAs, which I thought at first

was a statistical procedure that had escaped my notice—it is explained only in the list of abbreviations). This section describes characteristics of each family as a whole and occupies one third of the book. It is followed by 12 plates of delightful drawings of territorial and pair behaviour in all the families (by John Busby) and 12 identification plates in colour, of all 65 species recognized (by Andrew Mackay). Plate 12 shows an immature White-tailed Tropicbird with a yellow bill; whether "immature" is meant to encompass "juvenile," which has a grey bill, is not clear. More explanation of the plumages shown and the reasons for choosing them would have been helpful.

Part II consists of individual species accounts, more than 340 pages in all, ranging from two pages for several species of cormorant to 30 pages for the Atlantic Gannet *Morus bassanus*—not surprising, because the author is also the author of the monograph on that species. Note that these 65 species make up about one quarter of all the species of seabirds; this reviewer agrees with the author that "ideally, each family requires its own volume." The book would have been much longer but for the telegraphic style of its species accounts, similar to that used in accounts found in *Birds of North America* and *Birds of the Western Palearctic*.

The author has a substantial career in studying Pelecaniformes and confesses at the outset that he had some difficulty organizing and bringing to fruition the voluminous material he had collected. The reader has similar difficulty knowing where to look for particular pieces of information, because so much potential overlap is found among the various sections of the book. The task is facilitated by a reasonably comprehensive index. An unfortunate result of the confessed delays in publication is the omission of much relevant material published after 2000; the book contains very few references beyond the mid-1990s, making it essentially almost 10 years out of date at the time of publication.

The volume contains many species and topics with which I am not familiar, and so to assess the reliability of the information, I looked carefully at those I know more about. On p. 21, sulids are referred to as the pelecaniform family in which reversed sexual dimorphism (i.e. females larger than males) "is most marked," but according to measurements in the Appendix, this dimorphism averages (by weight) 1.14 in sulids and 1.16 in frigatebirds. The wing loading of *Fregata magnificens* is given on p. 596 as 0.39 (no units) in males and 0.44 in females, but on p. 190 as 36.5 for both sexes. A discrepancy of this magnitude is hard to excuse and speaks to inadequate proofreading, surprising in a book that took so long to fledge. I was taken aback to read (p. 56) that the Blue-Gray Noddy *Procelsterna cerulea* lays the largest egg relative to body weight of any bird, at 40%, because I have long followed Gill (2007) in teaching students that that record is held by the Brown Kiwi *Apteryx australis* at 25%. The author's source was not to hand, but Raouzon *et al.* (1984) give data that show the noddy does indeed hold this record, but at 28% not 40% of adult body weight. On p. 190, referring to juvenile frigatebird plumages, cinnamon coloration is said to be "diagnostic of the Great Frigatebird" *Fregata minor*, but Fig. 5.34 rightly shows the Lesser Frigatebird *F. ariel* juvenile

also with a reddish head. In the account of Magnificent Frigatebird *F. magnificens*, the maximum colony size is given as 2500, with no mention of enormous Mexican colonies much larger than this.

In other places, the author dismisses accepted conclusions without explanation; for example, the recent separation of Nazca Booby *Sula granti* is not recognised, but dismissed as “unnecessary splitting” without justification or further discussion. Other quibbles include curious choices of species to exclude from a number of graphs, where comparable data are equally available for more species than are shown; for example, growth curves of five species of frigatebird are shown in Fig. 5.40, but only two of these in Fig. 3.16. In general, the graphs suffer from symbols being too small, and so distinctions among species are hard to pick out.

The biggest problem with the data in the book is the appendix on Measurements, which occupies the last 12 pages. For each species, figures on wing, tail, bill, weight, and sometimes wing area are given, sometimes by sex and sometimes not. Locations are given in some cases, but not in others. There are no sources and no units. We assume “wing” is wing length, but how measured is not stated. Similarly, which of the many ways of measuring “bill” is meant? But the most extraordinary feature is the way the numbers are presented; not with mean and a measure of variance, but a (presumed) mean and what appears to be a range. I say “appears,” because here is an example, from the first species listed, Great White Pelican *Pelecanus onocrotalus*: “Weight: M up to 11,000 g; 9000–15,000; 10,200 (5500–13,000).” Normally I would take “up to” to indicate a maximum, but it is exceeded by both ranges given, so what is it? There are many more anomalies in this appendix that together leave me in grave doubt as to whether it has any value at all. This is a shame, because the data must have taken an enormous amount of work to compile.

More generally, the book would have benefited from more reference to other birds, particularly seabirds. There are surprisingly few of such references; the general sections of the book (Part I) might have benefited by considering the order within the broader context of the “seabird syndrome” so powerfully described by Gaston (2004). There are occasional references to other birds, particularly raptors, but surprisingly few to other seabirds. I would also have liked more discussion of possible reasons for some patterns that are stated baldly but not explored. For example, why are tropicbirds the only family with coloured eggs? What might this tell us about their evolutionary history? What might explain the extraordinary sexual dichromatism, ornamentation and courtship displays of frigatebirds, unique not just in this order but in seabirds as a whole?

Notwithstanding these criticisms, the book compiles an enormous amount of information and offers the reader an intelligent and thoughtful guide through a fascinating group of birds. It is nicely presented and illustrated, and belongs on the shelf of any self-respecting seabird biologist. Just don’t trust the appendix!

## REFERENCES

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- GILL, F.B. 2007. Ornithology. 3rd ed. New York, NY: Freeman. 758 pp.
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