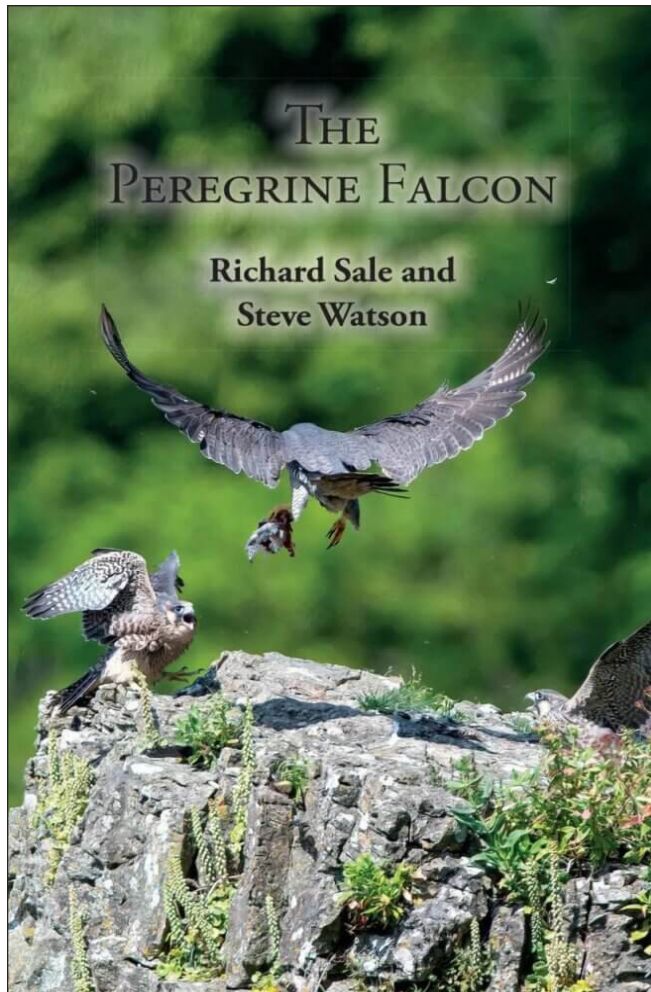


Book Review

The Peregrine Falcon

by Richard Sale and Steve Watson

Snowfinch Publishing, Coberley, Gloucestershire, UK, 2022. Hardcover, 528 pp., tables, graphs, figures, drawings, many colour photographs. RRP £49.99.



This is the latest in a series by Richard Sale and sometimes co-authors on British or Holarctic raptors. Sale is a physicist and falcon enthusiast with a special interest in avian flight dynamics, and Watson is a non-scientist with a lifetime's amateur study of British Peregrine Falcons, including an evident association with falconry. The stated aim of the book is to provide a detailed understanding of the Peregrine Falcon.

The book starts with an overview of the evolution of birds, of diurnal raptors in their now separate orders (hawks vs falcons), and the relationship of the Falconiformes to parrots, then narrows down on the main groups of falcons: the hierofalcons ('great' or desert falcons), Peregrine group, kestrels, hobbies and others. The chapter then

covers the general anatomical characteristics of falcons, particularly as they relate to the demands of flight in 'attackers' (or 'hunters') versus 'searchers' (or 'soarers'), e.g. wing loading, mass of certain organs compared with body mass, or length of the digestive tract.

The next chapter focuses on the Peregrine Falcon, discussing its representation in ancient religions and cultures before a detailed account of falconry and its origins. Then follows a description of the nominate (British/European) subspecies' plumages, measurements and weights; a detailed discussion of theories on reversed sexual size dimorphism; an account of the many subspecies; the Peregrine Falcon's global distribution; moult and its timing; habitat; and vocalisations and their associated life stages and behaviours.

Chapter 3 is a detailed discussion of flight characteristics, covering flight types, hunting techniques and strategies. It is an in-depth exploration of the physics of falcon flight and especially of the Peregrine Falcon's stoop, in relation to anatomy and physiology and with equations and diagrams for various aspects such as wing-beat frequency, minimum power speed, maximum range speed, terminal velocity, and energy requirements for take-off. It covers aspects such as drag, vortices, *g*-forces, and stresses on the falcon body, and explains why top speed is not ideal attack speed, while tempering the claimed, theoretical or experimental (contrived) stoop speeds with real-world measurements of actual stoops. As well as descriptions and measurements of hunting flights by falconry birds, it describes the Peregrine Falcon's anatomical adaptations for and adjustments during high-speed stoops. A section on eye structure and vision provides a fascinating explanation (with diagrams and equations) of why a stoop at prey follows a curving path. Explanatory 'boxes' cover wing-loading, telemetry tagging, *g*-forces and the electromagnetic spectrum.

Chapter 4, on diet, presents a detailed discussion of the dietary proportions for the various subspecies. It also discusses in detail hunting strategies (with a 'box' on attack intensities), defence techniques of avian prey, hunting success, kleptoparasitism (as pirate and victim), and food caching.

Chapter 5 covers the physiological aspects of food consumption and energy balance, as they relate to body weight, and to annual and seasonal variation and stages of the breeding cycle. Again, there are equations for basal metabolic rate and energy-time budget, the latter factoring in additive causes for energy expenditure.

Chapter 6 (Breeding I: pair formation to nest sites) covers territory and hunting range, mating system and pair bond, displays, characteristics of nest sites, and copulation, with a 'box' on floaters (roaming territory-seeking birds). Chapter 7 (Breeding II: eggs to fledglings) describes the rest of the breeding cycle, discussing the laying interval, clutch size, incubation, chick growth, and factors influencing any variation. It covers breeding success, site and mate fidelity, territorial residency and dispersal, again with graphs showing variation in e.g. productivity in relation to environmental factors.

Chapter 8 is an account of the movements and wintering grounds of the various continental subspecies, including departure or passage dates by latitude or age class, and showing the routes of tracked birds. It includes a 'box' on polarised light, as part of the discussion on how birds navigate.

Chapter 9 (Friends and Foes) is an account of seemingly beneficial interspecific nesting associations, and of interspecific antagonism and predation between carnivorous bird species, including the effect of a larger apex predator on Peregrine Falcon breeding pairs and productivity. It finishes with brief mention of incidental human impacts such as nest disturbance and bird-proof netting on city buildings.

Chapter 10 (Population) discusses survival and causes of death, and factors influencing these, before a detailed account of the effects of DDT and other contaminants. It proceeds to an account of human impacts, including habitat loss (affecting prey species), human proximity to nests, collision and electrocution risks (powerlines, windows, windfarms and other infrastructure), urban electromagnetic 'noise', and lead poisoning. Then follows an account of human persecution of Peregrine Falcons in the United Kingdom, with 'boxes' on pigeon fanciers and the historical raptor toll by gamekeepers. The global Peregrine Falcon population is discussed, before a detailed account of regional British populations over time. The chapter finishes with a review of the effects of climate change on the Peregrine Falcon's breeding, and a plea for a change of human priorities to reversing biodiversity and habitat loss, and restoring Earth's ecosystems.

The book finishes with a reference list of 33 pages in small font (or >600 titles!), and an index of subjects, historical falconry figures, and species, with a comprehensive subject listing under the Peregrine Falcon subheading. It displays an extraordinary level of scholarship.

The book comprehensively succeeds in its stated aim, with much new and interesting information from other relevant

disciplines as essential background to falcon biology. It will appeal to raptor biologists and amateur enthusiasts alike, on account of its combination of science, explanation and anecdotes, graphical and other illustrations, and of course the plentiful stunning photographs, many taken by Sale himself. Parts of some later chapters are strongly UK-centric, so the chapters likely to be of most interest to Australian readers include Chapters 1 to 7, and especially Chapter 5 on stooping speeds. There is some Australian content throughout, relating to our endemic subspecies *macropus*.

I have few quibbles. The section on falcon phylogeny in Chapter 1 is complicated, and obfuscated by the figure reproduced from Wilcox *et al.* (2019, Figure 1, p. 14526), compared with the clearer Figure 3 of Fuchs *et al.* (2015, p. 173) and interpretive summary thereof (Debus 2022, pp. xvii–xx). Chapter 2, on reversed size dimorphism, could have been clearer and simpler, and provided a more definitive answer, by giving greater weight to the paper by Schoenjahn *et al.* (2020). Also in Chapter 2, alleged south-western Australian subspecies *submelanogenys* is now considered invalid by Australian authorities. There is a problem with printing of the correct Figure 6.4 on p. 262, and there are minor glitches in punctuation. Overall, the book strongly builds on, but lacks the editorial polish and conciseness of, its predecessor by Ratcliffe (1993) and other Poyser raptor titles. Nevertheless, it is essential, if at times dense, reading for those wanting up-to-date global information on the Peregrine Falcon.

References

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