

STATISTICS FOR ORNITHOLOGISTS (BTO GUIDE NO. 22)

Fowler, J. & Cohen, L. Undated. Tring, United Kingdom: British Trust for Ornithology, 175 pp. Numerous figures and tables. Price £10.00.

The aim of this book is to introduce the fundamentals of statistics to ornithologists who have no background in the subject. The ever increasing dependence of ornithology on statistics makes this a particularly laudable aim.

Two important questions are: will this book be successful in transmitting the information and, secondly, have techniques appropriate to ornithology been included? Considering the first question, I suspect that the book will be very successful, not only with providing its readers with a knowledge of when and how to use statistics but also in imparting a sound theoretical basis to their statistical knowledge. This is a very correct treatment of statistics and no corners are cut for the sake of simplicity. That it is still understandable is partly because all procedures are illustrated with ornithological data and partly because the text is very clear and well written. The answer to the second question is yes, appropriate techniques have been included. There is, however, a qualification. This book is part of a series of guides published by the British Trust for Ornithology and is presumably aimed at its members. A BTO ornithologist is likely to be interested in analysing biometrics, moult data, ringing recoveries and census results and these interests are well served by the book. Ornithologists with different spheres of interest may well be interested in other statistical techniques, but there is still no other book which would cover as many areas as this one.

In the preface the authors recommend that the book should be read from beginning to end and that the reader should not 'dip in'. This is sound advice because there is a logical development of concepts and procedures through the text.

Unfortunately, one of the major hurdles for the uninitiated, terminology, has to be negotiated in the first few chapters. Although each term is simply defined with appropriate examples, I suspect that it would still be impossible to keep hold of all the definitions whilst ploughing through the rest of the chapters. This emphasises the fact that this is not a book for a few evenings' light reading. Confidence in the interpretation and use of all the methods the book covers will only come after many consultations.

Although the book is aimed at ornithologists with no statistical background, even those with a fairly detailed knowledge will find it invaluable. There is much useful advice on the sample sizes suitable for different tests and what to do when field data do not satisfy a test's underlying assumptions, I cannot recall another statistics book which gives so much practical help.

One of the features of ornithology in the last few decades is that it has become a 'harder' science. With less emphasis on descriptive work and more on hypothesis generation and testing there has been a consequent increase in the use of statistics. The great danger for ornithology is that those who do not have a background in statistics, particularly amateur researchers, will not be able to contribute fully. This is why this book is so welcome. It demystifies the subject, explains the jargon and helps towards putting all ornithologists on an equal footing.

The book is available from the British Trust for Ornithology, Beech Grove, Tring, Hertfordshire, HP23 5NR, United Kingdom.

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THE MANX SHEARWATER

Brooke, M. 1990. London: T. & A.D. Poyser, 246 pp., 24 black-and-white photographs, 40 figures, 56 tables and many line drawings. £17.00. ISBN 0 85661 057 7.

Mike Brooke has been studying Manx Shearwaters *Puffinus puffinus* on and off since 1973. This book provides an excellent account of what we now know about the ecology of this species as a result of the various studies carried out since Ronald Lockley first started investigating the birds on the island of Skokholm, Wales in the 1930s.

The first chapter introduced this northern hemisphere seabird and gives an historical account of studies into its biology. The following chapter provides a detailed description of the Manx Shearwater, including plumage, moult, ectoparasites and measurements. There are also comparisons with its nearest relatives: *P. auricularis*, *P. newelli*, *P. mauretanicus*, *P. yelkouan*, *P. opisthomelas*, *P. gavia* and *P. huttoni*.

The Manx Shearwater is primarily a northeastern Atlantic species but in recent years breeding has also occurred in Canada and the USA. There are useful data on changes in numbers at British and Irish colonies where 90% (300 000 pairs) of the world population is thought to nest. Whereas pollution does not seem to be a threat, predation by other birds, rats and, of course, man can have an effect. Surprisingly, Red Deer are a problem on the island of Rhum because they attack and eat fledglings as a way of countering mineral deficiencies in their diet.

Over a quarter of a million Manx Shearwaters have been ringed by British ornithologists and the resulting recoveries have yielded information on both long distance migration patterns and inter-colony movements. The species was the first shown to have navigational abilities after incubating birds

from Skokholm were removed and released at various points around the Atlantic.

Chapters 5 to 7 take the reader through the breeding season including sections on pre-laying attendance, adult mass changes, burrow competition, chick growth and breeding success. Nestlings reach a peak mass about one-third greater than their parent's mass. Thereafter there is a decrease, partly as a result of a period of desertion just prior to fledging. The earlier a nestling fledges the heavier it is likely to be and the better its chances of survival. The author argues that earlier laying is prevented by the difficulties in obtaining enough food to sustain incubation duties rather than because of nutritional restraints on egg formation.

One of the author's particular interests has been the investigation of puffinosis, which he aptly terms "a mysterious disease". It is still uncertain what pathogen causes this complaint which can kill 4% of fledglings. However, it does seem to be restricted to the damper parts of the breeding colonies and to fledglings during the desertion period when they venture out of their burrows. The problem merits further investigation.

Detailed mark-recapture data from Skokholm birds have allowed the author to investigate the population dynamics of this long-lived seabird. He concludes that the current numbers of Manx Shearwater are not changing rapidly, although they may be increasing slowly in southwest Wales.

Chapter 10 looks at the calls of shearwaters and what they might mean. There are sexual differences both in call structure and in the way that individuals respond to the calls of other birds. Chapter 11 discusses the senses that shearwaters might use in order to locate their burrows. They probably rely mainly on vision (and not smell) but there is a need for more research into the possible

role of proprioception.

T. & A.D. Poyser have now been taken over by Academic Press but this does not seem to have affected the quality of these books. My only complaint is that the print quality on my review copy was rather variable. The line drawings produced by Dafila Scott superbly complemented the text. I particularly liked the one of the author dazzling a bird at night - a true likeness, apart from the lack of holes in his clothes!

I thoroughly enjoyed this book which sustained me through a number of pretty diabolical rail journeys to and from work in London. The author has found the right balance between being informative and readable. I recommend it for amateur and professional ornithologists alike - and not just seabird enthusiasts.

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