
Preface to the First Edition

This book aims to introduce some of the methods used by quantitative ecologists and modellers. The emphasis throughout the book is focused upon fisheries and models used in fisheries, but the ideas relate to many other fields of endeavour. The first few chapters, on simple population models, on parameter estimation (principally using maximum likelihood methods), and on computer intensive methods, should be of interest to all population ecologists. Those chapters on growth, recruitment, and explicit fisheries models are obviously focused on the needs of fisheries scientists.

From 1995 to 1997, I was fortunate enough to be in a position to develop and present short and intensive courses on modelling and quantitative methods to a large number of fisheries scientists and others at fisheries laboratories and universities around Australia. I am grateful to the Australian Fisheries Research and Development Corporation (FRDC) for funding this project and giving me the opportunity to meet so many of Australia's fisheries community. Unfortunately, there was no single text that covered the details of what I felt was necessary for an adequate grounding in the skills required for the quantitative study of marine populations. The course notes I prepared were a first attempt to fill that gap but were designed to complement the presentations given in the short courses rather than as a stand-alone product. For this book, the material has been completely rewritten and expanded with the inclusion of many active examples. While this rewrite greatly slowed the production of the final book, a reader should now be able to pursue a course of independent study of the material and others could use this book as the foundation for a formal course in quantitative fisheries science.

The main objective of this book is to provide a working resource that guides the reader towards an understanding of some of the analytical methods currently being used in quantitative biology and fisheries science. While a theoretical treatment has been provided, a major aim was to focus on understanding the details of how to perform the analyses described. An integral part of this description was to include Microsoft Excel workbooks relating to each example and problem discussed. Excel was chosen because of its flexibility, general availability, and relative ease of use. The appendix on the use of Excel in fisheries should provide sufficient details for those who are not versed in using this program. For maximum benefit the example boxes scattered through the text should be constructed and perhaps modified as the reader becomes more confident. Doing something leads to a much better understanding than just reading about it. These workbooks, and other examples, can be found on the download pages of the following web addresses: www.utas.edu.au/docs/tafi/TAFI_Homepage.html and www.crcpress.com/us/ElectronicProducts/downandup.asp. The files should be downloaded but

try to construct them before considering the finished versions. The reader should try to use them only as a check on what was produced or if he or she becomes deeply stuck. I have tried to use real examples wherever possible in the belief that these are more acceptable.

When I was at school, one of my mathematics teachers used to write an equation on the board and then exclaim, "... as we all know ..." while writing a derived equation underneath. He clearly believed that the algebraic transition from one equation to the other should have been very clear to his pupils. Unfortunately, it was often the case that only a few people understood. Although it is true that omitting the details of the steps between the algebraic changes leads to brevity, it certainly does not improve clarity or ease of understanding. In this book, whenever the details of a set of equations or model are given, an attempt has usually been made to avoid omitting any of the steps needed to understand their derivation equations.

For most of the time it took, I enjoyed writing this book. I hope it helps people move forward in their work.

Malcolm Haddon
Hobart, January 2001