that improvement in water quality has encouraged exotic invasions. Holdich (pp. 85–97) shows a negative impact on crayfish farming from the introduction of alien crayfish to the UK. Galil (pp. 47–54) shows that migration into the eastern Mediterranean through the Suez Canal has led to higher diversity and to fisheries dependant on exotic prawns and crabs. Hansen and Richardson (pp. 799–805) demonstrate that the existence of 14 species of freshwater crayfish in Tasmania, previously treated as one, has important conservation implications. And Jamieson (pp. 627–641) discusses how fisheries can be selective agents.

Not all papers address applied issues or bring bad news. Thiel (pp. 211–226) reassures us that many crustaceans display parental (usually maternal) care. Richardson and Swain (pp. 807–816) discuss how amphipods colonised the land. Hartnoll (pp. 519–525) discusses the costs and benefits of different mating strategies in crabs. And Schubart et al. (pp. 817–830) review the value of the 16S rRNA gene in phylogenetic studies.

The editors deserve praise for the high editorial standard and conciseness of the papers, many from authors for whom English is not their first language. But as reprints or photocopies (which is how the information will be disseminated in future) the papers do not stand alone, lacking authors’ complete addresses, the book or journal name, and date of publication.

The volume will be available in libraries that have a standing order for Crustacean Issues and is already in the hands of the 500 carcinologists at ICC-4 (who paid quite high registration costs for the privilege). It is unlikely that any individual will find enough of interest in such a diverse volume to spend US$110 to obtain a copy. But those in universities should encourage their libraries to purchase it because its diversity illustrates the types of research that crustaceans support.

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Reference


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Marine Fish Culture
This large and expensive book of 750 pages covers the culture of a diverse range of marine, catadromous and diadromous fishes. It has 16 chapters covering the biotic and abiotic factors influencing the survival and growth of cultured marine fish, water treatment and supply, hatchery requirements, reproduction, nutrition and fish health. The book is characterised by data rich tables, small black and white photographs, limited line drawings and an extensive reference list. There is a useful index of fish species by Family, glossary of terms and a conversion factor table. It is intended to be a combination reference and textbook for aquaculture students and those interested in marine fish culture. It is written in an idiosyncratic style and is interspersed with homilies and practical advice. The book’s strengths are the wide range of species and reference material examined. The overriding weakness is the lack of synthesis and analysis, clearly seen for example, in the summaries at the end of each chapter. In addition, much of the information in the book is duplicated or hard to access. Add to this the lack of a subject index, many small inaccuracies such as spelling mistakes, poor cross-referencing, the inclusion of freshwater fish, and the use of common names with no reference to species and it is clearly not a good textbook for undergraduate students.

The first chapter provides a brief introduction to marine fish aquaculture production, primarily derived from tables produced by the Food and Agricultural Organization. The second chapter outlines, but does not give sufficient discussion to, some important concepts in the biology and culture of marine fish, such as development strategies and critical rearing periods. This chapter includes a large but poorly constructed table presenting species data sorted on egg size. Like many of the tables in the book it would have been more useful as an appendix or better still on an accompanying CD and the data sorted by Family. Chapters 3 to 6 describe important physical and chemical parameters in fish culture, including water treatment and experimental hatchery design. All the important factors are covered but the level of treatment varies. A major omission is that “greenwater” and pond culture is not given serious discussion. Similarly, the environmental implications of aquaculture are not adequately addressed.

A recurrent theme throughout the book is the experimental breeding and culture of new marine fish and the problems this entails. The focus is therefore not on the longer term requirements for broodstock management, domestication, genetic manipulations or environmentally controlled reproduction. The nutritional needs of cultured fish are comprehensively given in Chapters 8 to 9, however the reading is hard going. Once again the author provides too much detail, some conflicting and from unreliable sources, and primarily fails to find the common threads and provide the reader with guidance and synthesis. Chapters 13 to 15 provide potted summaries of different species restating, in many cases, information provided earlier and duplicating the species synopses given at the conclusion to preceding chapters.

Despite the above criticisms this is a book filled with interesting references and observations. It is written from a different perspective to many co-authored books on fish culture, particularly those out of Europe and has particular relevance to anyone interested in the culture of new or difficult tropical species.
Sustaining Marine Fisheries

This book begins by painting a somewhat gloomy picture of the world’s marine fisheries from severe depletion through to fishery closures and the international disputes that have often resulted as a consequence. To address the wider implications of this problem, The Ocean Studies Board (OSB) of the National Research Council (NRC) of the USA established a Committee on Ecosystem Management for Sustainable Marine Fisheries. This book is a report of the work of that committee. Sustainable fisheries are defined as “fishing activities that do not cause or lead to undesirable changes in biological or economic productivity, biological diversity or ecosystem structure and functioning from one human generation to the next . . . ”. The committee also preferred to use the term ecosystem-based management rather than ecosystem management since it is human activities that are managed.

Chapter 2 provides a global overview of the current status of marine fisheries. It begins with a compilation of global facts and figures on landings, other sources of mortality and degree of utilisation and then goes on to look specifically at the fisheries of the United States before ending with a brief description of the Canadian cod moratorium. Overall this short chapter is an excellent source of these facts and figures that many readers often require when writing or lecturing on fisheries topics.

Chapter 3 comprises a review of fishing and marine ecosystems. The section on by-catch, discards and unobserved fishing mortality highlights the fact that the ecological consequences are not well quantified and that more research is required. The effects of overfishing on large marine ecosystems is illustrated by several examples including Georges Bank, the Bering and Barents Seas. The special problems of deep-sea fisheries are considered and the consequences of over-exploiting these slow-growing fishes are clearly stated. However, the international nature of many of these fisheries makes them difficult to manage. Several examples of the effect of environmental change and variability are described and this is followed by a section on multiple impacts on ecosystems.