

MANUAL OF FISH SCLEROCHRONOLOGY

Jacques Panfili, Helene de Pontual, Herve Troadec, and Peter J. Wright (eds.). 2002. Ifremer-IRD Co edition, Brest, France. (Multimedia DVD included.) ISBN 2-84433-0670-3 (English edition). 464 p. \$139.00. (softcover).-Finally, an appropriately illustrated text has been written about basic techniques for aging fishes. The DVD media include an abundance of videos, interactive and animated images, and a guide for structuring aging protocols. I am aware of nothing since Stevenson (1992) that provides such a synopsis of fish aging mechanics. The *Manual of Fish Sclerochronology* introduces the reader to those calcified structures (scales, otoliths, and skeletal elements) most commonly used to estimate fish ages and explains both economic and logistic procedures for the use of each in fisheries applications. Although nonbony fishes are mentioned, this book is concerned almost entirely with teleosts, those bony fishes making up the bulk of the world's finfish resources.

With world fisheries in demonstrable decline and biologically meaningful management strategies of obvious importance, this text is timely. Although meant for management applications, this account of both recent and time-tested techniques and strategies for fish aging should be of great utility for many life-history studies.

Those familiar with the European Fish Aging Network (EFAN; efan.org) will recognize the authors' names. This work synthesizes findings of the five cells that composed this former European multinational network of fish aging scientists. The volumes overall layout roughly reflects the function of each EFAN cell (methodologies, age validation, information processing, information exchange, and training/research applications).

The book is broken into eight chapters, each detailing various aspects of the calcified structures found to be most useful for estimating fish ages. The accompanying multimedia DVD is organized like the text and contains a multitude of photographs and short videos that wonderfully supplement the text descriptions.

Chapter one explains the general layout of the book and gives a brief history of the study of the calcified structures commonly used for aging. Chapter two details the morphology and physiological development of each of those structures. The third chapter discusses the types of studies that commonly use age determinations. This chapter and the next deal with the most

perplexing problem faced by all investigators of fish age-validating age interpretations. Validation is a universal problem in fish aging studies, and although addressed in this work, it is unfortunate that Campana (2001) is not cited because that work provides additional insight on this issue. The single major flaw in this volume is a lack of emphasis on ensuring accurate age assessment (interpretation of the first valid mark). Accurate assessment is critically important for fish population management the overall goal of this treatise.

Computer interpretive assistance (computer-assisted age and growth estimation [caage]) and the chemical composition and microstructure of otoliths make up chapters six and seven. The first seven chapters serve as a prelude to the last, the most comprehensive synthesis available for techniques of preparation and observation of calcified structures. This is by far the most useful part of the look (this chapter alone is worth the price of the text). When this information is supplemented with examination of the DVD, it is quite possible that a universal standard for processing and examining fish aging structures can be established. That would be very good, because many fish-aging laboratories rely primarily on parochial teachers, who are not always the most gifted instructors.

Two other comments seem necessary: there is an inconsistent sequential listing of calcified structures among the chapters, and there appears to be an absence of references to recent literature. The first is the product of multiple authorship; the second is artifact.

This important book is sure to be widely used in Europe but deserves broader attention. Ultimately, fisheries science could only benefit. The text was dedicated to H. Troadec who was killed in an air crash a few months before the book's release.

LITERATURE CITED

- CAMPANA, S. E. 2001. Accuracy, precision and quality control in age determination, including a review of the use and abuse of age validation methods. *J. Fish Biol.* 59:197-242.
- STEVENSON, D. K. 1992. Otolith microstructure examination and analysis. *Can. Spec. Publ. Fish. Aquat. Sci.* 117:1-132.

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