

waters surrounding the heavily populated Montreal region. The study was done from April to mid-October 1985 and had as objectives the determination of the diversity of fish species caught, the size and weight of these fishes, and the most exploited areas in the catchment basins around Montreal. Particular attention was given to lakes St. Louis, St. François, des Deux Montagnes, and the St. Lawrence River between the Lachine Rapids and the Boucherville Islands. The collaboration of local outfitters and sport fishing clubs was instrumental in the success of the survey.

In all, 7568 individuals with at least one catch in their fishing basket were interviewed. They captured a total of 41 273 fishes belonging to 27 species and representing a total weight of 16 450 kg. Three species accounted for 86% of all fish captured: the Yellow Perch (65%), the Northern Pike (14%) and the Walleye (7%). In terms of weight, the Northern Pike was the most important contributor with 38%, followed by the Yellow Perch with 23% and the Walleye with 19%. Each interviewed angler returned home with an average of 5.45 fishes weighing around 2.2 kg. Fishing success and the size of fishes captured varied seasonally and geographically.

This report is full of interesting information. Several figures summarizing the biological characteristics (size, weight, etc.) of the captured fish species for each region and maps indicating the most visited (best?) area in each basin for the most sought after species are included.

The M.L.C.P. is to be commended for doing and publishing this study. Its realization must have

entailed a great expenditure. Follow-up studies will have to be made in order to examine the evolution of the exploitative trend. However, to be useful, this information will have to be integrated in a broader management perspective. In the last 100 years, changes in the environment have been far too extensive and rapid for the ecosystem as a whole to absorb without deleterious effects, and for biologists to even begin to understand. To this day, wildlife management policies have centered mainly on the control of the human impact on the exploited natural resources (i.e. hunting and fishing regulations). More often than not, this has been done without a sound knowledge of the biology of the resources and of their place within the ecosystem as a whole. Research priorities must be reoriented toward this last endeavor if we want to develop more coherent and fruitful management policies.

On a more technical aspect, the publication is in the form of a stapled manuscript. The quality of the few photographs is below standard but the writing style and line diagrams are clear. A few misspellings were noted. Also, I fail to see the relevancy of publishing, even in a technical report, photocopies of computer printout showing results of statistical analyses. However, the fact that this report is free and that it provides a wealth of information about sport fishing in the Montreal area far outweigh these minor shortcomings.

FRANÇOIS CHAPLEAU

Department of Biology, University of Ottawa, Ottawa, Ontario K1N 6N5

Guide to the Otoliths of the Bony Fishes of the Northeast Atlantic

By Tero Härkönen. 1986. Danbiu ApS, Hellerup, Denmark. 256 pp., illus. U.S. \$80.00.

This book is meant to be a guide for the identification of otoliths ("earstones") from fishes of northern European shores. Also included are several freshwater and anadromous species, about 15% of the total. It is not a taxonomic treatment. The author's interests are in the feeding habits of seals and cormorants, and faecal samples with their hard remains were the most convenient means of obtaining this information. A total of 103 fish species were examined for their otoliths and over a third of these are also found in Canadian waters.

The book comprises an introduction including the anatomy, function, composition, and growth of otoliths. An explanation is given on how otoliths are used in feeding analyses, including methods of estimating size of the fish consumed.

Methods of preserving and treating otoliths are outlined. A key to families and species follows.

The main part of the text is 97 plates facing a text description of the species. Each plate may have up to six scanning micrographs of fish otoliths showing both the left and right sagitta usually in decreasing size and with "inside" and "outside" views. The text gives Latin, English, German, French, Swedish, and Danish names for each species, a general description of the otolith (only sagittae, the largest of the three otoliths in the fish labyrinth, are described), a sentence summarizing the most important characters, line drawings of the sagitta in lateral and dorsal view to indicate key features, and correlations between otolith length and body size based usually on a minimum of 30 specimens. The book concludes with 63 references and a short species index.

This book is useful for identification of sagittal otoliths where this is meant as a tool for other studies such as diet, archaeological investigations, and species and size composition analyses. It is not an exhaustive treatment of a particular fauna, such as that of northeastern Europe, since many otoliths are too small or too rare to figure significantly in the samples on which the author's primary work is based. Nevertheless, there is a stimulus here for others to develop a collection of scanning micrographs encompassing particular faunas or taxa. This would prove most useful for those interested in adding characters to systematic analyses or to those whose animals consume the smaller species of fish. For both identification and systematic works, it would have been most useful if a few species had been examined in large series including both sexes, all sizes, and distributions whether horizontal or vertical. Individual variation is difficult to estimate from a few micrographs which necessarily reflect an ideal state.

The text has a number of errors in spelling, including scientific names, and of arrangement

although this does not appear excessive. For example, the key on page 45 refers the reader to Gadidae on page 146 but this page is occupied by Cottidae. A glossary of terms would have been useful. Colliculum is defined in the text and pops up in the keys but is not illustrated or indexed.

The most important part of this book to the user is the keys. Attempts on my inexperienced part to key out otoliths in a blind test indicate that this requires considerable practice, all the more so if the otoliths are broken or worn. Hence, the scanning micrographs, though of "perfect" specimens, are most valuable as they show structures in an almost three dimensional aspect. These micrographs make an otherwise highly-specialized book of potential use to workers in fields other than the author's and the book can be recommended on this basis.

BRIAN W. COAD

Ichthyology Section, Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, Ontario K1P 6P4

Biology of the Land Crabs

Edited by Warren W. Burggren and Brian R. McMahon. 1988. Cambridge University Press, New York. 479 pp., illus. U.S. \$59.50.

Biology of the Land Crabs is a comprehensive evolutionary and comparative overview of the current state of knowledge of a diverse group of decapod crustaceans. The editors give a very broad definition for the land crabs: all anomuran and brachyuran crabs that, due to various types of adaptation, are active in air. It is clear that some of the contributing authors do not agree with the definition but all have complied with it.

Subjects included cover the range of evolution and zoogeography, ecology, behaviour, reproduction and growth, and the special physiological adaptations required for life out of water. Activities described include such fascinating topics as tree climbing, sound production, migration, response to predators, etc. The chapters are well

coordinated, with cross references to other parts or chapters of the book. And although there are many areas of overlap, these are of subject matter not of focus: thus different aspects of reproduction are discussed under ecology, behaviour, and physiology. There is an appendix that briefly outlines the natural history of over eighty of the commoner terrestrial species, a list of references, and three indices (to authors, scientific names, and subjects).

I have rarely encountered such a cohesive multi-authored work so excellently edited. Its focus on the evolution of adaptations to life out of water make it of interest to more than just serious carcinologists, and I would recommend it to all who are studying terrestrial adaptation.

DIANA R. LAUBITZ

Zoology Division, Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, Ontario K1P 6P4

Analyses in Behavioral Ecology: A Manual for Lab and Field

By Luther Brown and Jerry F. Downhower. 1988. Sinauer Associates, Sunderland, Massachusetts. viii + 194 pp., illus. U.S. \$12.95.

Behavioural ecology is a fast growing area of biology, appealing to researchers and students alike. For instructors in this subject, a guide to

feasible projects serving as exercises for students would be a boon, and the present manual is designed to fill this almost vacant niche.

Twenty-seven topics are offered under the headings of sensory capabilities, feeding patterns, spacing patterns, and reproduction. The latter 85



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