

Book Reviews

ZOOLOGY

Vanishing Fishes of North America

By R. Dana Ono, James D. Williams, and Anne Wagner.
1983. Stone Wall Press, Washington, D.C. 257 pp., illus.
U.S. \$27.50.

Studying the part in depth may reveal the whole. So it is that a study of the endangered fishes of North America reveals the profound environmental changes that are sweeping across the United States and Canada. In five centuries accelerating waves man-made changes are modifying the environment. As far as the fish are concerned the most striking influences are consumption of water for agriculture, industry and cities and for hydroelectric power (resulting in reduced river flow, modification of seasonal flow and temperature regimes, drying of springs and blockage of migrations); changes in water quality (changes in turbidity, temperature, oxygen levels, salinity, and pollution levels); and changes in biota (exotics, food, parasites, competitors). At least one hundred and sixty-nine species and subspecies (153 species) in the United States have become threatened, endangered, or extinct due to these changes. This means that over one-fifth of the freshwater species of fishes in the United States are menaced (in Canada the proportion is less, so far).

This book is pleasingly and informatively written, with a text that is technically accurate but which can be read easily by the informed layman. A 2-page introduction by Dr. Sylvia Earle is followed by an all too short introductory chapter "The vanishing fishes." I would have liked to see a summary of the environmental changes in this chapter, with perhaps some general recommendations. Chapters III to XV deal with regions of North America or special environments, e.g. Atlantic and Gulf coast freshwater fishes; Great Lakes fishes; desert spring and pool fishes; western trouts, Texas blindcats and cavefishes, Tennessee and Cumberland fishes; and marine and estuarine fishes. This approach enables the author to discuss special regional problems. Thus, the threatened or endangered endemics of the Colorado River system are all affected by the dams, irrigation projects, urban demands, introduction of exotic species, and the "reclamation" schemes (= poisoning of "coarse" fishes). Following the general chapter introduction, the authors present examples of the species which are threatened or endangered.

The species accounts are not formatted. Instead the authors have summarized interesting facts of the life history, morphology, courtship, use of the species by natives, historical accounts from the explorers, and discuss changes in the distribution and population sizes, current threats, remedial plans, and occasional

successes in restoring endangered populations. I've read numerous fish books and considerable literature on endangered species, but seldom encountered such fascinatingly written accounts. Some accounts are dramatic. The Devil's Hole Pupfish was threatened by wells which lowered the groundwater which supplied the spring. Department of the Interior officials tried to negotiate with the well drillers. Attempts to introduce them elsewhere failed. A plastic shelf and lights to provide vital algae were successful in a crucial period of low water levels. An Alaskan earthquake and subsequent three-foot wave nearly destroyed vital habitat. The U.S. Supreme Court ruled in favour of the pupfish, deciding the fate of an entire species for the first time in the court's history.

The successful application of the U.S. Endangered Species Act is related under several species accounts. That law is powerful and specific in its recommendations. There is no comparable set of laws in Canada specifically aimed at saving rare, threatened, and endangered species from extinction. COSEWIC (Committee on Status of Endangered Wildlife in Canada) unites federal and provincial government representatives with members of various wildlife groups to report on and classify the status of biota in Canada. However the status agreed on provides absolutely no protection in law. Governments wishing to avoid economic consequences may successfully downgrade proposed status. The recommendations for protection that were previously included in many reports have now been excluded, even though they were in no way binding.

Chapter XVI discusses 4 of the 21 North American species that have become extinct. Chapter XVII discusses the biogeography of menaced fishes — almost 80% of endangered species are confined to the southeast and southwest of the United States. Chapter XVIII deals with acid rain in only three pages and concludes with "... funding is juggled around with seemingly little commitment by governments, life continues to ebb from the lakes, streams, and ponds."

The last chapter, 2 pages long, tries to summarize the book without taking too gloomy a perspective and ends with a quotation from Henry David Thoreau: "In wildness is the preservation of the world."

An appendix lists threatened, endangered and extinct fishes of the United States (with some Canadian species), maps the ranges of the 44 species which are given accounts in the text, figures of the external anatomy of fishes, and provides a glossary of technical terms. References are provided on threatened and endangered fishes and selected books are listed for states and regions. Twenty-one conservation organizations are listed at the end. An index would have been useful.

Historical drawings, black-and-white photos, and 16 color plates embellish the book. An 1880 etching of Pyramid Lake is contrasted with a recent photo to show the drastic drop in water levels. A photo of a barren Tennessee dam landscape contrasts with a poetic description of the beauties of the river in 1834.

The book emphasizes throughout, the status, environmental, and historical problems of American species. However, two Canadian endemics and several species which range into Canada are discussed. No Canadian conservation organizations are listed. Nevertheless, the Canadian reader should be able to draw useful conclusions from the American experience. And Canadians should take warning that the serious shortage of water in the western United States

may lead to increasing demands to draw on our water supply. Naturalists, anglers, conservationists, and persons working in fish and wildlife agencies on aquatic biota would benefit from having this book in their own library or that of their institution. We all can learn from this book that water is not a limitless resource. Its quality and flow, must be guarded by everyone. The authors and the editors are to be congratulated for producing a high quality, authoritative and very readable volume.

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Chironomidae of the Holarctic Region. Part 1. Larvae

Edited by Torgny Wiederholm. 1983. Entomologica Scandinavica Supplement No. 19. 457 pp. U.S \$73.00.

Entomologica Scandinavica, well known as the publisher of a prestigious entomological journal, has undertaken the ambitious task in its Supplement series of producing, in three volumes, a set of keys and diagnoses to the genera of holarctic chironomids. The first of these, dealing with the larvae, has now appeared in a beautifully manufactured publication which should grace any library for years. The high quality of this publication, however, has been achieved at a hefty price (special price deals are available for the set and those interested should write to the publishers at their Editorial Office, Entomologica Scandinavica, P.O. Box 24, S-240 17, S. Sandby, Sweden).

This first volume is restricted primarily to larval keys and diagnoses, although the relatively short accounts for each genus also include brief notes on ecology and distribution (mainly in continental terms). The text includes only a perfunctory listing of the systematic history of each genus. Synonymies (a particularly severe problem in the Chironomidae) as a result are impossible to resolve from this reference alone and require that the reader also purchase Supplement No. 17 (*A Catalogue of Chironomid Genera and Subgenera of the World Including Synonyms* by P. Ashe, 1983) at an additional U.S. \$15.00. Those already working with the older chironomid literature will find this Supplement a particularly useful guide.

The book does include a general introduction to larval morphology along with a basic guide to the terminology used in the rest of the text. While these are quite adequate for most purposes, there is some confusion in terms. For example, the terms clypeus

and labral sclerite I are used interchangeably in the text, with no apparent mention of their being synonyms. Assistance is available here as well in the form of Supplement No. 14 (*Glossary of Chironomid Morphology Terminology* by O. A. Saether, 1980) at U.S. \$13.60. This latter work is most useful in its attempts to standardize the terminology of earlier chironomid works to one common system. It is not required for use of the present volume on chironomids and is optional only.

The larval keys are primarily to genera, although in certain cases keys to some subgenera and species groups are included. The keys are generally easy to use, and most couplets rely upon distinguishing between reasonable morphological differences. They are of necessity complex due to the scope of coverage, which includes the entire holarctic region. In some cases, as for the Chironominae, this means additional work in preparing the specimens. Some problems may be encountered because of the heavy reliance in the keys on the S-setae. Since these setae may be obscured or difficult to see in all but the best slide preparations, identification attempts using these keys may sometimes be impossible.

Diagrams, so critical in publications of this kind, justifiably make up the major part of the book, comprising over 50% of the total number of pages. However, those familiar with some of the recent taxonomic works on chironomids will be disappointed with their quality. The high standards of other recent publications have been forsaken in favour of line drawings, and though generally clear, the diagrams in some cases can only be described as sketchy. This is particularly disappointing since the diagrams are all large and spaciouly laid out.



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