

Fishes of the Great Lakes Region Revised Edition

By Carl L. Hubbs and Karl F. Lagler. Revised by Gerald R. Smith. 2004. The University of Michigan Press, Ann Arbor, Michigan USA. xvii + 276 pages, plates 1-32. \$24.95.

This book first appeared in 1941 in a different form and has had several subsequent editions. It is renowned for standardizing the methods for counting scales and fin rays and for measuring a fish specimen. This latest edition adds thirteen newly introduced species, plus hybrids between White Bass and Striped Bass, and geographical distribution maps for each species. It is much more user friendly than the 1964 edition. As was intended originally, this book is aimed at students and the ease with which this book can be used makes this point clear.

The Great Lakes region covers 287 770 square miles, while the Great Lakes themselves occupy 94 700 square miles of this area. Michigan is wholly encompassed by the region, as are small portions of other states bordering the lakes, but Ontario is the largest land area within the Great Lakes region so the book has a Canadian relevance. Within this region there are 28 families, 70 genera, 161 species and 215 forms of native fish. The term "form" is undefined, and seems to be used interchangeably with the term "kind". Presumably subspecies is meant. There are 210 species in total. Thirteen species and hybrids have been recently introduced by the construction of canals, by stocking, and through the dumping of ballast water from international freighters. Warning is given about the more destructive invaders' effects on the fish fauna and the loss of species that will result when the full effect is seen. The introductory sections of this book go into significant detail about the waters of the Great Lakes region, zoogeography, and the effects of postglacial redispersal.

The information in this book is generally well laid out. There is a section on the collection of fishes, on the preservation of fishes, and on how to identify these preserved fishes. All this information is very convenient for an amateur naturalist, including the description of the extent to which field notes should be made. These sections are brief, however, and are intended as basic information only.

There is a key to families and keys to identify species within families. The key to families is very easy to use, outlining the basic and most prominent features, allowing for quick and easy use, even by beginners. Not all the keys are together but the page references are clear. The species keys are also fairly easy to use, and the added line drawings can be helpful when identifying vague features but additional key features are in a second section after each key. There are 62 cyprinid species (carps and minnows) which makes it easy to go astray. Perhaps an initial key to genera would reduce the chance of error. Some exotics (Goldfish, Carp) are included in the key but others are not (Bighead, Black, Grass and Silver carp). A section on these "alien species" appears at the end of

the key to Cyprinidae and might better be placed at the beginning, as would a section on hybridization in Cyprinidae.

Before each key there is a description of the family which is limited to physical features, geographical distribution, a brief biological outline, and occasionally the importance of the family to the fisheries. Species introduction dates and effects are included where applicable. After each key there is a list of all the species supplemented by a brief description, including physical features, geographical distribution, and what the species feeds on. The arrangement of species is not alphabetical by common name or by scientific name and does not follow the appearance of the species in the key, necessitating some searching in larger families. In addition to the descriptions there is a black-and-white photograph of the whole fish on the facing page as well as small line drawing of heads, spines, gill arches, mouths or other key features. The photos here, however, are not of the highest quality. In some cases, almost all detail is missing. The line drawings are small and often have no indication of the key structures so necessitating constant flipping between the key and the description section. The description has a tiny (22 × 16 mm) geographical distribution map. The maps are provided as a quick reference only since exact locations can scarcely be found. Larger maps are provided on the inside of each cover, in significantly more detail, allowing for some cross-referencing. Ontario and Quebec records of the Chestnut Lamprey are not apparent, the Carp and Freshwater Drum are not recorded from the area around Ottawa where they are common, and the White Bass is mapped for Ottawa where it does not occur. Evidently, the maps must be taken as a general guide to distribution and cannot always be used locally, where most students and naturalists work.

At the end of the book there is an appendix of line drawings of the larval stages of some of the fish of the Great Lakes region. This book is geared towards the identification of adult fish and any inquiries as to the identification of larvae are directed to consult other works. The index includes species names, common names and some key words. No glossary is provided though its presence would be ideal. While a section on anatomy is given at the beginning, it is not useful as a quick reference, nor is it complete (for example, adipose and falcate are not explained in the book, nor are markings well described). The book ends with a series of 32 colour plates with several species per plate, which are generally useful to flip through to locate a species that you are already somewhat familiar with, although many of the colours are inaccurate making identification by a beginner difficult.

The page numbering system is a little confusing, sometimes at the bottom of the page, sometimes at the top, sometimes missing and easily confused with

the numbering system for species. There are also some errors of omission and commission. It is noted that scales are not used for ageing mudminnows but does not explain why. The number of lamprey species is given as about two dozen (the same as in the 1964 edition) but this number has increased to about 34 since then. Some scientific names are given as a trinomial; e.g., *Semotilus atromaculatus atromaculatus*, but no other subspecies are mentioned which makes this extensive name unnecessary.

The list of families provided includes native fish only, so to get a comprehensive count of all the different genera and species in the Great Lakes region you would have to look through the entire book. Also, upon comparing the present list to the list provided in the 1964 edition, the latter includes all fish, not just native species. It is therefore not possible, without great effort, to find out how many new native fish have been discovered in the past forty years. There have also been many name changes that have occurred since the last edition was published. *Entosphenus lamotteni* has now become *Lampetra appendix*, *Lepisosteus productus* has become *Lepisosteus oculatus*, and *Pomolobus pseudoharengus* has become *Alosa pseudoharengus*, to name a few.

Some of the criticisms of this book mentioned here could be addressed by an on-line version. This book must be small and therefore concise for use in the field and laboratory. An on-line version could have larger maps (updated as new information or corrections are noted), colour photographs of live fish which would be of use to field workers, keys segmented by lake or country (most work is done locally, a worker in eastern Ontario would not find the same suite of species as a worker in Illinois), larger illustrations of key characters, key characters embedded in the key for easier reference, new species could be added as discovered, and keys to larval fish developed.

This book is a great tool for use in the lab or field by beginners and professionals alike. With some use it will lay open flat, preventing the loss of place while your hands are busy working on the fish. The positive reputation of this book as *the* book for Great Lakes region fishes is long standing and will only increase with time.

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Seabirds and Atlantic Canada's Ship-Source Oil Pollution

By F. Wiese. 2002. World Wildlife Fund, 245 Eglinton Avenue East, Suite 410, Toronto, Ontario M4P 3J1 Canada. 82 pages.

The public seems to have a love-hate relationship with oil. Oil allows for high salaries and contributes to civilisation, but it also can create severe pollution. As this report shows well, chronic offshore oil ranks among the most severe pollution problems in the world.

"Many people consider Canada to be one of the leading nations in environmental conservation in the world". However, the still conservative estimate of 300 000 dead Canadian seabirds due to chronic oil pollution and presented in this report is shocking; to say the least. Besides a seabird population issue this also a major animal care issue: over 300 000 animal individuals are suffering and are dying a gruesome death. As this informative report emphasizes, for each oiled seabird found in Newfoundland one can assume that at least 10 more have died.

Together with several individuals devoted to the issue of marine and oil pollution, author Dr. F. Wiese studied seabirds and their oil-related mortality for many years. His report on chronic offshore oil pollution is structured in two parts: The Problem (11 chapters) and The Solution (8 chapters); four appendices, a list of abbreviations and some references are also given. Half of the report deals with OSIRs (Oil Spill Intelligence Reports 1997-2000), presented in Appendix 4. OSIRs are only accessible for few signed-up members, and it is great that this report provides the wider public with an opportunity to access this information.

Besides reporting baseline numbers of seabird mortalities and oil pollution incidents, other highlights of this document are presented to a wide audience dealing with ocean modelling, detectabilities of oiled birds on a beach, drift block experiments and emphasizing how important such methods are to address the chronic offshore oil pollution efficiently and in accurate terms.

"Most of those in the marine industry carry out their operations in a safe and environmentally responsible manner." This statement is somewhat in contrast to the fact that oiled birds keep washing up on shorelines worldwide which suggests that national legislation and international conventions and guidelines are not being followed or that they are inefficient. "The illegal discharge of oil from ships into the world's oceans is a global problem that affects the entire marine ecosystem". This calls for a global oiled bird survey; e.g., citizen- and volunteer-based marine and beach surveys.

From this nice report it becomes quickly obvious that the history and track-record of chronic oil pollution, a by-product of the current civilisation, is not an environmental success story. Instead, the current progress for trying to keep the (marine) environment clean presents more of an international embarrassment. It is still difficult to understand why the "burden of proof" for chronic oil pollution is not on the industry side. After reading this report and its seabird facts one cannot deny that oil pollution equals environmental massmurder.

It is correct that the Canadian legislation extends the enforcement of shipping, environmental, and



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