Biology of Perch

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Foreword

Perch *Perca* spp. are known to many due to their wide distribution in temperate climates, their attractive colouration and distinct body stripes and their robust body shape. Many angle them for sport and find them very palatable, especially smoked! I was fortunate to start my career in fish biology research by studying the population dynamics of the European perch *Perca fluviatilis* in a small freshwater lagoon in south-west England and then moved to participate in a long-term investigation on the same animal in Windermere. Following this I also had the opportunity to study the North American perch *Perca flavescens* in Canada. I can still remember being particularly struck by the brilliant golden yellow colour of these fish in northern Manitoba, probably resulting from a transfer of carotenes in their diet of gammarids. I have not had any experience of or even seen the third member of this genus, the Balkhash perch *Perca schrenkii*, which has a much more restricted distribution, although quite by chance I was recently given a picture of it.

My interest in these animals led me to write two books on percids, the family to which perch belong, published in 1987 and 2000. As time goes by technology changes and new techniques are applied in research. In fish research for example, this is particularly apparent in genetics and telemetry. In long-term studies further data points are added allowing new interpretations of the data as a whole. In addition continuing perturbations such as climate change and increased anthropogenic impacts (overfishing and competition for fresh water as a resource) have their effect on the fishes. Thus after a 15 year gap it is probably expedient to produce an update on what we know about these important animals. The pursuit of science requires continual self-correcting and taking on board new or modified concepts. Greg Pyle and Patrice Couture have undertaken this by editing a book containing ten distinct and authoritative chapters. These include a revision on *Perca* phylogeny using the latest molecular tools and more evidence is supplied to support the migration of *Perca* ancestors across the North Atlantic Land Bridge rather than the Bering Land Bridge. I was particularly interested in the chapter on the little known Balkhash perch. New interpretations on long-term studies such as those in the St. Lawrence River and Windermere indicate the importance of gathering data over a long time period; often the importance is ignored or the gathering curtailed by governments. Also covered in this book are advances in our knowledge of perch reproduction, parasites, behaviour and the use of perch in ecotoxicology research.

I continue to be concerned by the decline of fish stocks worldwide including those in fresh water. To manage these stocks, albeit not too successfully in many cases, we need to know more about the biology of these fishes and how they interact with their environment. The present update on our knowledge about perch will help to inform managers and hopefully aid conservation of this precious resource. I wonder what the next 15 years will yield.

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Preface

The three freshwater fish species of the genus *Perca* are major components of freshwater systems all around the Northern hemisphere. Within their respective natural ranges, they are essential as both prey and predators and their presence shapes food webs. Their abundance supports important sport and commercial fisheries and a perch aquaculture industry is emerging. Outside of their range, they are formidable invasive species.

Given their abundance and importance, perch have also been the object of countless scientific investigations in ecology, stock management, ecotoxicology and in several other areas. For instance, years ago we adopted the North American yellow perch (*Perca flavescens*) as our model species during investigations into the effects of environmental contaminants on wild fish populations. Yellow perch was an obvious choice for us, given that it was a very common species in the metal-contaminated lakes that we were studying at the time. In fact, in some contaminated lakes, yellow perch was the only fish species present! Moreover, they were more or less ubiquitous across Canada and the northern United States and were relatively abundant where they occurred, which made them easy to sample and amenable to studies that generalized conclusions over broad geographic areas, even, perhaps, to their two cousins. Unfortunately, we soon realized that the basic literature relevant to our model organism—with a few notable exceptions—was somewhat diffuse and disparate. Yet perch—particularly the North American and European species—have recently seen an increase in research attention, in such diverse areas as population biology, ecology, biogeography, behaviour, and aquatic ecotoxicology.

This book endeavours to update and consolidate the perch literature in a manner that will be useful to fisheries managers, academics and students interested in perch biology. We wanted the book to focus exclusively on the three extant species comprising the genus *Perca*: *P. flavescens*, *P. fluviatilis*, and *P. schrenkii*. We also wanted to capture the range of research that is currently being conducted on *Perca* spp. and how that research is advancing our basic understanding of perch biology. We therefore approached internationally renowned perch specialists from every aspect of fish biology to contribute to this volume. We hope that the following pages meet that goal.

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