Stream Fish Community Dynamics—A Critical Synthesis

Julian D. Olden

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BOOK REVIEW

Stream Fish Community Dynamics—A Critical Synthesis


Reviewed by Julian D. Olden, School of Aquatic and Fishery Sciences, University of Washington.
E-mail: olden@uw.edu. Twitter: @oldenfish

“Just read all of Bill and Edie’s papers!”—wise words I received from my advisor upon entering graduate school at the University of Toronto. Very quickly I did exactly what I was told, and many (but not that many!) years later the seminal work by this dynamic duo continues to shape the way in which I study freshwater ecosystems. Now, because I am extremely familiar with the Matthews’ research, I was initially leery of what their recent book Stream Fish Community Dynamics—A Critical Synthesis would have to offer me. But likely a better question is what this book might provide to early career scientists who have yet to have the opportunity to fully appreciate the body of research produced by these two fish ecologists over the past half century.

But first, let’s be completely honest—some might quibble over what is implied in the second half of the book title: A Critical Synthesis. To many, this would suggest a comprehensive and up-to-date synopsis and critique of the topic. However, very quickly in the first paragraph of Chapter 1 the authors astutely insert the caveat that the “synthesis arises from our own field and experimental research across five decades” (p. 1). And, indeed, the book represents exactly that—a monograph summarizing their career work studying stream fish communities of the central United States. So, with this said, let us proceed.

The book begins with a number of high-level summaries of the sampling methods deployed by the authors (Chapter 1), the stream study systems (chapter 2), the taxonomic composition of the fish communities (chapter 3), and a trait characterization of the fish species (chapter 4). This comprises the first third of the book and truly is just setting the foundation for the remaining text. Next, the book explores how biotic interactions—including competition, predation, and facilitation—help shape fish community structure and dynamics (chapter 5). This is primarily done by highlighting a diverse patchwork of previous publications by the authors, which are lightly connected by a discussion of classic ecological theory. In chapter 6, the book turns its attention to how extreme disturbances influence fish populations and communities. Using a series of case studies, this chapter focuses predominantly on field and experimental evidence for the consequences of flooding and drought for fish. Next, spatiotemporal dynamics of fish communities are explored through a number of new multivariate analyses and exploration of beta-diversity patterns (chapters 7 and 8), and the effects of fishes on structural and functional properties of stream ecosystems are evaluated (chapter 9). Each chapter ends with a summary, but I must admit that the book fell a bit short on the goal of “point[ing] to potentially useful future studies that the next generation of graduate students might consider” (p. 1). However, the one exception was chapter 9, where an entire section was dedicated to the discussion of unanswered questions about fish effects in ecosystems. Finally, chapter 10 pulls it all together by providing a broad overview of the topics addressed in the book and offering a heartfelt plea to both celebrate and contribute to the long-term study of fish communities. In this vein, I was thrilled to see the Matthews make all of their data freely available online. Kudos!

In conclusion, Stream Fish Community Dynamics—A Critical Synthesis represents a valuable synopsis of the tremendous scientific careers of Bill and Edie Matthews, careers that will continue to influence generations of future scientists. Armed with this book, I can only dream of what else is possible with a simple seine net in one hand and the never-ending desire to gently squeeze a fish in the other.