Issues are typically explained with sufficient examples, e.g., describing single species and individual practices in specific locations. These details make the book much more understandable for, e.g., readers unfamiliar with Europe.

Despite adding case studies from other countries, the book still has a heavy emphasis on Great Britain. This is understandable, given that Great Britain had great fluctuations in human impacts on forests and thus maybe the most extreme shifts in forest conditions in Europe. In addition, scientists from Great Britain have access to a great amount of detailed documentation. However, a brief overview of how issues, such as the inventory of ancient woodlands or their equivalents, are handled in other parts of Europe would have been helpful.

Given the multitude of authors, the chapters are surprisingly consistent and balanced in approach and style, which makes for an easy read. I also enjoyed that the chapters were focused and of sufficient length and detail to thoroughly cover their respective topics. Thus, chapters can easily be used as stand-alone material, e.g., in classes or workshops. On the other hand, the narrowly focused chapters treat topics somewhat in isolation and give the impression of a "collection of papers" (a label used in the *Chartered Forester* review). For example, recent trends in inventories of wood pastures (Chapter 5) and ancient woodlands (Chapter 22) would have lent themselves to comparisons. Also, if it not for Chapter 23, one could get the impression from the rest of the book that exotic diseases had no influence on and were not influenced by historical developments and management and conservation practices. Even adding brief insights to the chapters highlighting the connections among such topics would have provided the reader with a feeling of a more coherent and complete story.

I appreciate the challenges of publishing books with multiple authors, but feel that the editors did not exploit the full wealth of information provided in the chapters. For example, the duality and the potential conflict of using pre-human settlement forests versus cultural landscapes as conservation and restoration goals appears to be a major discussion point in Europe. Accordingly, the topic shows up in numerous chapters, e.g., in the Swedish (pre-human settlement forests) and Italian and Great Britain (cultural landscapes) case studies. Also, Chapter 21 (which would have been better placed in Part I so the reader becomes aware of the subtleties of the issues early on) provides a nice general overview of this topic. However, neither this chapter nor other chapters written by the editors took advantage of the obvious opportunity to use this topic as a common theme or thread that links all chapters in the book. In addition, I was hoping for a more cohesive discussion about the role and value of introduced species (another topic that showed up in various chapters) and the ongoing discussion in Europe of integrated vs. segregated approaches to forest management and conservation. While I really enjoyed reading this book, in this respect it left me longing for more.

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Unraveling the ecology of marine fish migration

Secor, David Hallock. 2015. **Migration ecology of marine fishes**. Johns Hopkins University Press, Baltimore, Maryland. x + 292 p. $99.95 (cloth), ISBN: 978-1-4214-1612-0 (alk. Paper); $99.95 (e-book), ISBN: 978-1-4214-1613-7.

Key words: fish; life cycles; migration; movement ecology; ocean.

Fish are mysterious and have fascinated researchers and the general public alike for centuries. Fish live in environments that are largely hostile to humans, especially the vast oceans of the world. Even when we can find a fish in the ocean, it is likely that they won't be in the same location in a few minutes, hours, days, months, or years. Fish move, and for those fish that live in marine systems, those movements can be quite extensive, spanning ocean basins. Many such movements are cyclical and necessary to maximize fitness, termed migration.

Much has been written about the migration ecology of marine fish, although the taxonomic coverage has been spotty, with grand inferences and educated guesses about the potential mechanisms and true extent of migrations. David Secor's book on the migration ecology of marine fishes represents a comprehensive synthesis of the state of the science in this field. Previous books on the topic have not been bad per se, but have been inherently limited by the tools available to study marine fish migration ecology. Capitalizing on recent discoveries based on the latest technology spanning biotelemetry, oceanographic sensors, remote sensing, and molecular genetics, to name a few, Secor reveals the complexities of marine fish migration and provides the reader with an unprecedented window into movement dynamics under the sea. Secor is a well-respected scientist with significant expertise in the area of marine fish ecology and management.

There are many ways to structure a comprehensive book on animal migration that covers a major taxonomic group. The approach taken by Secor is to emphasize the ecological aspects, relying on the emerging field of movement ecology to frame the book. In doing so, the author follows suit with some recent texts on bird migration and more general migration, which serves to make his book of broader interest beyond marine biologists. This approach is also useful in that it links the mechanistic processes that "drive, motivate, and constrain an individual's propensity to change location" (Secor 2015), implicitly incorporating elements of organismal sensory physiology and locomotory apparatus (including biomechanics), behavioral decisions, environmental factors, and organismal fitness. However, I wish that Secor had stayed truer to the movement ecology framework presented early on and carried it through to the end of the book, coming full circle.

Given advances in our ability to monitor the spatial ecology of fish, characterize the genetic relatedness of individuals, and ocean physics and chemistry in near real-time, some of the most meaningful advances in migration ecology come from where those tools intersect. Chapters 3, 4, and 5 do a particularly good job of demonstrating the complex interactions of animals with each other and their environment. I particularly liked the section on larval dispersal. Nonetheless, I think that there was more room to delve into topics of behavioral decision rules and how state-space modeling and other sophisticated techniques are revealing precisely when and how animals change their behavioral states relative to differences in abiotic characters.

The book contains an appropriate balance of history and new discovery (including recent work on geomagnetic imprinting and oceanographic processes) and attempts to weave in both fundamental and applied perspectives. It is my assumption that the last chapter (titled "Resilience") is intended to be the most applied chapter, essentially about fish ecology in terms of management and conservation. I do not dispute that resilience is an important topic, but something is lost here in what I think is a very "academic" perspective. Any manager that reads this chapters looking for answers will likely have to brush up on contemporary ecological and evolutionary theory to be able to properly relate to the material. Additionally, a student might walk away without a full understanding of the realities of contemporary management of (highly) migratory marine fishes. The message that Secor tries to convey in the applied chapter is important, but I fear the message will be lost in the format of this book.

In general, the book is easy to read. However, at times I feel like the narrative structure is odd (e.g., "We wrap up with an examination…"); this is a single-author book and by phrasing the text in this manner I feel as if I were being read a bedtime story. I also find the sections titled "Segue" to be odd, as this implies that something is amiss with the structure. The chapter headings are also not intuitive (e.g., "Propagating propensities: partial migration"). I appreciate efforts to be creative, but at some point, clarity should win out. Perhaps using the movement ecology framework to identify and shape the subheadings would have been more effective.

Indeed, it took me some time to navigate through the book. My initial scans left me confused, and it was only when I read the book in its entirety that it mostly came together. Chapters 1 and 2 (my favorites) stand alone as interesting syntheses that do not require other chapters to appreciate. I really liked the integration of the avian migration literature into chapter 2. In fact, chapter 2 is sufficiently novel and integrated that it could have stood alone as a synthesis paper in a high-end ecology journal. I'm not sure the same could be said for the other chapters as framed.

I wondered before reading the book whether it would be targeted toward the educated lay person, but after digging into the book, it is apparent that this is really a scientific reference book that will be most used (and understood) by the scientific community. The framework, level of technical detail, writing style, and price point are clearly focused on the scientific reader, but I would think that Secor could easily spin off a more accessible book directed to the general public using this book as the basis. The figures used throughout the book are clear, but are mostly ones that have been redrawn. Given that the book represents a comprehensive synthesis, I was looking for more conceptual diagrams or other original schematics (like the wonderful Fig 1.3, which is a conceptual diagram of the ways in which temporal, spatial, and inferential scales relate to individual movement) developed by Secor to accompany the prose.

Most notably, I learned new things (and found new references) while reading this book that had me rethinking my world view on the migration ecology of marine fish. For example, I learned about the concept of the "storage effect" and how it could be used to frame thinking about redundancy in ecosystems. I would certainly recommend this book to ecologists with an interest in animal ecology and behavioral ecology, as well as those that identify themselves as marine biologists or biological oceanographers. Indeed, several of my graduate students are glad that I have concluded my review so they can get their hands on this copy. For students who work on animal migration, the clear framework and level of synthesis in this book (especially in chapters 1, 2, 4, and 5) could be formative in helping them to structure their own work and thinking. As such, I would expect that the book will find its way onto the pile of materials for students preparing for comprehensive or qualifying exams. However, I would not consider this to be a book upon which to base an undergraduate or graduate course.

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