

TROPHIC ECOLOGY: BOTTOM-UP AND TOP-DOWN INTERACTIONS ACROSS AQUATIC AND TERRESTRIAL SYSTEMS. *Ecological Reviews*.

Edited by Torrance C. Hanley and Kimberly J. La Pierre. Cambridge and New York: Cambridge University Press. \$94.99 (hardcover); \$59.99 (paper). xvi + 410 p.; ill.; index. ISBN: 978-1-107-07732-4 (hc); 978-1-107-43432-5 (pb). 2015.

Globally, ecological communities vary dramatically in the relative abundance of different species present at different trophic levels. What processes explain this variation in trophic configuration? This is one of the defining questions of community ecology, and it used to have a pretty simple answer: some trophic systems are regulated by “bottom-up” processes, while others are mediated by “top-down” processes. Thankfully, this oversimplified depiction of how the dynamics of food webs translate into different community patterns has been largely replaced by a more nuanced view. It turns out that the diversity of different ecological communities is shaped by numerous factors, each of which has the potential to mediate the interaction between top-down and bottom-up processes.

This edited collection chronicles the many manifestations of that interaction in an impressive array of ecological contexts. The first chapter lays out the basic theory of trophic interactions, setting the stage for two larger parts that address top-down and bottom-up processes in particular ecosystems and in light of particular ecological/evolutionary phenomena. These two parts complement each other nicely, as the first looks at the many processes that play out in particular ecosystems while the second considers the different ways that a particular process can play out in various ecosystems. The ecosystem chapters bridge the gap between aquatic and terrestrial environments, which have historically been studied in isolation, and demonstrate just how complex and contingent the top-down/bottom-up interaction can be. I found the process section to be particularly interesting, as I was led to understand that the dynamics we observe in trophic systems do

not just shape the evolution of organismal traits: trait evolution can also dramatically reshape how top-down and bottom-up processes operate within a particular ecological community.

This book is impressively comprehensive in its scope, but it is hard to say how broad its audience will be. It has a lot to offer in terms of its organization and presentation: chapters are nicely composed around logical frameworks and contain abundant figures. Of particular value are the many conceptual diagrams, which are critical to explaining and exploring the complex dynamics that can emerge in trophic systems. But although most chapters give a perfunctory (and after a while, monotonous) introduction to the top-down versus bottom-up dilemma, in general the volume assumes quite a bit of prior knowledge on the part of its readers. As such the intended audience for this collection seems to be other scientists engaged in trophic ecology research rather than students—particularly undergraduates—trying to gain an understanding of the basic principles of trophic ecology. Expect this book to create valuable dialogue among the rather large community of trophic ecologists, but do not expect it to recruit too many new members into this community.

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