

As a working community ecologist who studies predator-prey interactions and their impacts at multiple scales, I found this book highly useful. I particularly appreciated how the authors unify the chapters with concluding sub-sections that connect concepts presented in each chapter to the book's overarching theme—linking ecosystem-scale patterns to the community and individual organism.

I will recommend this book to my graduate students, refer to it when designing new pathways of inquiry, and use it to explore analysis approaches we might take. The book contains abundant tables and figures, with statistical methods presented with sufficient detail to provide informed readers with a clear idea about the suitability of said methods. For graduate students and individuals new to trophic ecology, this book will provide an essential guide as they learn about the complexity of food-web relationships and the tools we have to parse and synthesize these dynamics. Such readers will find the glossary at the end, as well as the extensive bibliography, to be highly useful resources for delving into trophic ecology and shaping their own research.

The future holds many challenges for ecosystems and the organisms they contain, due to a burgeoning human population and a rapidly warming world. As ecologists we know that human involvement in food webs via natural resources extraction (e.g., hunting, fishing, and whaling) has created profound trophic shifts, such as loss of apex predators, and is resulting in unprecedented extinction (Strong and Frank 2010). We also know that in order to help create ecosystems more resilient to climate change, we need to understand and be able to quantify trophic mechanisms.

Garvey and Whiles wrote *Trophic ecology* for the next generation of ecologists, who will be grappling with these

issues as professionals. The authors suggest that synthesis, in a world where ecological datasets are “growing faster than ecologists can analyze them,” will enable us to face the daunting challenge of big data. This means boldly integrating our approach to trophic ecology, from the cellular to the ecosystem scale, as we move forward into a brave, new world that is increasingly dominated by humans, invasive species, and conservation challenges.

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Reciprocity in ecological understanding

Brodie, Nathaniel, Charles Goodrich, and Frederick J. Swanson, editors. 2016. **Forest under story: creative inquiry in an old-growth forest**. University of Washington Press, Seattle, Washington. 264 pp. \$29.95 (cloth), ISBN: 979-0-2959-9545-8 (acid-free paper).

Key words: decomposition; disturbance; forestry; humanities; long-term ecological research; old-growth forest.

Many of the most important advances in ecology have come from outside the discipline: Hutchinson ushered in mathematics; the Odums brought engineering; MacArthur and Pielou integrated statistics; Holling harnessed systems theory. New perspectives yield new knowledge.

By extension, it may also be true that with a greater difference in perspective comes greater potential for new knowledge. (Of course, potential is not always realized; but it's always good to have great potential.) By this rationale, the Long Term Ecological Reflections project, designed to be a humanities analog to the National Science Foundation's (NSF) Long Term Ecological Research (LTER) program, has enormous potential to advance ecology. A new volume, *Forest under story: creative inquiry in an old-growth forest*, edited by Nathaniel Brodie, Charles Goodrich, and Fredrick Swanson, is a collection of stories and poems written for the Reflections program. The stories are intended to serve as a new kind of record documenting the ecological dynamics of a specific landscape. After all, as the editors point out, there are many ways of knowing.

This is not science journalism. The stories and poems collected in *Forest under story* are another type of interpreted data from the H.J. Andrews Experimental Forest, where the Reflections program is based. The Andrews, as it is known, is a 6000 ha temperate rain forest on the western slope of the Cascade Range in Oregon, USA. It was among the inaugural cohort of LTER sites, first funded in 1980. The LTER program has since grown to 25 sites and is, in my opinion, NSF's most important and a productive contribution to the science of ecology and to society's understanding of how the natural world functions and how these functions change through time. The Andrews LTER site has contributed inordinately to the understanding of old-growth forests, watershed management, and ecologically-based forestry practices. For the past dozen years, the Reflection program has recruited poets and artists to tackle these themes from their alternative viewpoint. There is an explicit expectation that the science will enrich the humanities and, in turn, the humanities will enrich the science.

Like LTER, the Reflections program is committed to sustained inquiry into ecological change over the long-term. Through writers' residences, the program hosts creative writers and environmental philosophers at the Andrews headquarters, where they conduct a place-based study of the system on their own terms, then record and publish their observations. There are many parallels with the conventional scientific process and the writers often collaborate with site scientists. All of the writers visit four "Reflections Plots," which are co-located at long-term research plots and several authors choose to write about them. Pyle's "The Long Haul," which leads off the volume, is my favorite of these. In it, he deliberates on the site of a log decomposition study, designed to last 100-years. The essay is evocative about the pace of rot and the merits of taking the long view.

The three sections of this book (*Research and revelation; Change and continuity; Borrowing others' eyes*) each include a variety of genres, from poetry to personal essay. Brief "Groundwork" vignettes punctuate these sections, grounding the narrative with essential ecological context (e.g., *Forest practices*). Bob Keefer's photographs handsomely illustrate the volume, and maps provide necessary context. This framework creates a

book that could be used as a textbook in undergraduate environmental studies courses, or even as a reader in graduate courses that examine the human dimensions of forest community ecology. Indeed, a seminar that pairs scientific papers with their counterparts from humanities found in this book would be a fine way of demonstrating the many ways of knowing ecological change.

I'm no literary critic, but I know what I like and in this eclectic volume I like some a lot more than others. I like the stories and poems that grapple with the ecology of a place, but not the ecological research enterprise, per se. For me, Deming's "The web", Hirshfield's "For the Lobaria, Usnea, witch's hair, map lichen, ground lichen, shield lichen" and, Sanders' "Mind in the forest" are the best of the bunch. Each of these broadened my understanding of the Andrews' ecology. About one third of the writings come from authors who, in their day-job, work as academic ecologists. Here the increment of change in perspective was often smaller and I found these writings less impactful. But tastes vary and unlike scientific peer-review, I'm not sure there's an objective means to scrutinize these data.

Forest under story is loosely organized around ecological themes, for example: decomposition, disturbance, and northern spotted owls. The editors offer short introductions to the themes as they relate to the context and history of the Andrews. Given this organization, I'm sure that it would be satisfying to read this volume cover-to-cover, but that's not how I read it. I carried the compact, 250-page hardcover in my bag for several months and fit poems and stories into my days, selecting entries based on my mood or the time I had available. This, too, was a very satisfying way to read the book and I highly recommend it. I marked each entry with a little check as I read it, to ensure I covered them all. Some accrued many checkmarks and most felt like a treat. All offer careful consideration of a forest ecosystem. Over time, I built more and longer interstitial spaces into my workday calendar so that I'd have time for Reflections.

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BOOKS AND MONOGRAPHS RECEIVED THROUGH OCTOBER 2016

Aguirre, Alonso, and Raman Sukumar, editors. 2017. **Tropical conservation: perspectives on local and global priorities.** Oxford University Press, Oxford, United Kingdom. xxvii + 491 pp. \$99.00 (hardcover), ISBN:

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