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The Economy of Nature



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Ecology: The Economy of Nature

TENTH EDITION

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About the Author



RICK RELYEA is the David M. Darrin '40 Senior Endowed Chair in Biological Sciences at Rensselaer Polytechnic Institute (RPI). From 1999 to 2014, Rick was a professor at the University of Pittsburgh. In 2005, he was named the Chancellor's Distinguished Researcher, and in 2014, he received the Tina and David Bellet Award for Teaching Excellence. From 2007 to 2014, he also served as the director of the university's field station, the Pymatuning Laboratory of Ecology, where he oversaw a diverse set of ecological field courses and facilitated researchers from around the world.

In 2014, Rick moved to RPI, where he served as the director of the Darrin Fresh Water Institute and director of the Jefferson Project at Lake George, which was a groundbreaking partnership between Rensselaer, IBM, and the Lake George Association. From 2014 to 2022, Rick led a team of scientists, engineers, computer scientists, and artists who used an intelligent sensor network, cutting-edge experiments, and advanced computer modeling. After spending a year of sabbatical in Ireland, Rick has continued to conduct research on the ecology and evolution in aquatic ecosystems.

Rick has taught thousands of undergraduate students in introductory ecology, behavioral ecology, and evolution. In addition, nearly 200 undergraduate students have worked in his research group. He has published more than 220 peer-reviewed journal articles in the world's leading scientific journals, including *Ecology*, *Ecology Letters*, *American Naturalist*, *Environmental Pollution*, and *PNAS*. His research is recognized throughout the world and spans a wide range of ecological and evolutionary topics, including animal behavior, sexual selection, ecotoxicology, disease ecology, community ecology, ecosystem ecology, and landscape ecology. Currently, his research focuses on aquatic habitats and the diverse species that live in these ecosystems. Rick is also a coauthor of the best-selling *Environmental Science for the AP[®] Course* and *Biology for the AP[®] Course*.

Preface

After its debut in 1976, Robert Ricklefs's *The Economy of Nature* quickly developed a loyal following that has lasted more than 5 decades, thanks in large part to the book's enduring vision: present the material that instructors want to teach in a way that will excite students and encourage an appreciation of how science is done. Bob not only taught ecology, but also lived and breathed ecology as a top-tier researcher, as he still does today.

Fast-forwarding to 2009, Bob approached me while I was on sabbatical in Montpellier, France, to talk about working with him on this seminal textbook. I was simultaneously honored and humbled by his offer. I had been teaching an ecology course for 10 years, and I really loved his book. I still recall our conversation that day, when we talked about what was needed in future editions. We both wanted to introduce many new ecological discoveries and to bring instructors up to speed on the new research in classic ecological systems, such as Charles Elton's work on lynx-hare cycles in Canada and William Cooper's classic studies of ecological succession in Glacier Bay. In doing so, we wanted to convey to students that ecology is a modern and exciting field of discovery. We also agreed that we needed to emphasize real-world ecological applications, recognizing that while most of the students in our ecology courses

are not going to become professional ecologists, they need to be informed citizens. Thus, they need to understand the natural world so that they can make wise decisions to help sustain nature for the next generation. Finally, we thought it was important that students in ecology develop quantitative skills, which translate to so many other areas of their studies and their lives.

The product of our conversation was the Seventh Edition of the book, published in 2014, which represented a substantial overhaul of stories, images, and figures. The response of instructors was so positive that we are now in the Tenth Edition of the book.

Throughout this time, the entire team at Macmillan never lost sight of our mission to inspire and educate instructors and students. We continue to share our excitement for making new discoveries, creating real-world applications, and building quantitative skills. We always spend a good deal of time searching for engaging stories to open each chapter, such as “The Life of Zombies,” which introduces the chapter on parasitism and infectious diseases. We also search for fascinating stories of real-world applications to close each chapter, such as “The Recovery of the Black-Footed Ferret,” which explains how ecologists have applied new principles of population ecology over decades to save this charismatic animal.

In the Tenth Edition, we continued to make important changes. We have created stand-alone chapters on global climates ([Chapter 2](#)) and global climate change ([Chapter 3](#)). These chapters provide the foundation for students to understand subsequent discussions of

global change that are now woven into all of the subsequent chapters. We have also added an emphasis on the diversity of ecologists in the world by featuring more research of underrepresented groups in STEM and adding lots of photos of researchers so students can see a wide diversity of people doing the science of ecology. Finally, with the recent growth in merging Western science and Indigenous knowledge, we have also included a new emphasis on ecological research that teaches students about the unmatched, long-term knowledge of Indigenous peoples that is increasingly informing our science.

As I wrote the Tenth Edition, I often thought back to that day in Montpellier with Bob, and I remembered the trust he placed in me. That memory was my inspiration to write new editions that would be interesting and engaging to both instructors and students. I sincerely hope that you (and Bob) enjoy this new edition.