Invasive populations are ubiquitous and invariably carry consequences. A gene for herbicide resistance spreads; a tumour grows in a loved one's body; an agricultural pest sweeps across the country; a new pathogen proliferates around the world. All of these are invasive populations—populations of genes, cells, or organisms spreading without control and having massive impact. Our collective desire to understand how invasive populations spread has inspired a rich body of basic theory developed from foundations laid in physics and statistics over a century ago. This theory has, however, often failed to explain real patterns in nature because a key consideration has been missing—evolution. The last few decades have seen a growing awareness that evolution plays out on timescales that matter to many systems. The recent emergence of evolutionary thinking in invasion biology has generated important new ideas and has enriched our understanding not only of invasions, but also of ecology and evolution more broadly.

This accessible textbook introduces these new ideas. It provides both a survey of the field—a story about the history and development of our understanding—as well as a synthesis of the new developments. There are many titles on biological invasions that typically take a purely ecological viewpoint, while those texts in which evolution does feature have tended to concentrate on adaptation to new environments. This book instead focuses on the intimate interplay between ecological and evolutionary processes as populations spread through time and space.

The Ecology and Evolution of Invasive Populations is an advanced textbook aimed at graduate students and researchers in ecology and evolutionary biology seeking a broad, up-to-date, and authoritative overview of the field. The study of biological invasions is no longer a specialized sub-discipline of ecology; this book will also be of relevance to a far broader academic readership from disciplines ranging across physics, mathematics, and medicine.



Cover image: Bacteria and fungi in a petri dish. Shutterstock;
Asian house gecko (Hemidactylus frenatus). Papilio/Alamy Stock Photo

OXFORD
UNIVERSITY PRESS

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ISBN 978-0-19-289864-7

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