

MOST ORGANISMS SHOW SUBSTANTIAL CHANGES in size or morphology after they become independent of their parents and have to find their own food. Furthermore, the rate at which these changes occur generally depends on the amount of food they ingest. In this book, André de Roos and Lennart Persson advance a synthetic and individual-based theory of the effects of this plastic ontogenetic development on the dynamics of populations and communities.

De Roos and Persson show how the effects of ontogenetic development on ecological dynamics critically depend on the efficiency with which differently sized individuals convert food into new biomass. Differences in this efficiency—or ontogenetic asymmetry—lead to bottlenecks in and thus population regulation by either maturation or reproduction. De Roos and Persson investigate the community consequences of these bottlenecks for trophic configurations that vary in the number and type of interacting species and in the degree of ontogenetic niche shifts exhibited by their individuals. They also demonstrate how insights into the effects of maturation and reproduction limitation on community equilibrium carry over to the dynamics of size-structured populations and give rise to different types of cohort-driven cycles.

Featuring numerous examples and tests of modeling predictions, this book provides a pioneering and extensive theoretical and empirical treatment of the ecology of ontogenetic growth and development in organisms, emphasizing the importance of an individual-based perspective for understanding population and community dynamics.

"This important and timely book is the best discussion of structured population modeling currently available. De Roos and Persson are true experts in this field and their arguments have particularly significant implications in both applied and basic ecology. Very few others could write such a book."

—Alan Hastings, University of California, Davis

"This is probably the most important new book on animal population dynamics to appear in a decade. It provides a lucid exposition of a coherent, individual-based approach to population dynamics based on fundamental bioenergetic principles. This book has the potential to become a classic."

—Roger M. Nisbet, coauthor of *Consumer-Resource Dynamics*

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MONOGRAPHS IN POPULATION BIOLOGY

Simon A. Levin and Henry S. Horn, *Series Editors*