

PREFACE

Few fields of study have more direct relevance to the human condition than the field of ecology, the study of the interactions of organisms with their physical and biological environment. The human population continues to grow and with it the demand for food and the pressure of human activities on the natural systems that sustain life on earth. The increasing globalization of our economy and social and political structures has resulted in both intentional and accidental introductions of organisms, including pests and diseases, to all corners of the earth—ecological globalization on a grand scale. Industry, agriculture, and forestry, transform the energy of the natural world for human needs and in the process affect the systems from which the energy is derived. The long-term effects of our interactions with nature are uncertain.

It has been nearly a decade since the publication of the third edition of *Ecology*. This period has seen an increasing awareness of the importance of understanding the dynamics of the natural world. In response, we have seen a proliferation of ecological journals and organizations that focus on the application of ecological principles to conservation and restoration. Equally significant has been a shift in the place of ecology in undergraduate biology curricula and in programs of study for nonscience majors. Ecology is increasingly taught early in the undergraduate curriculum, and is now often required in basic courses at the freshman and sophomore levels. Juniors, seniors, and graduate students are now offered a greater variety of advanced ecology



courses than ever before. Many premedical curricula now include courses emphasizing environmental interactions, parasite ecology, and the evolutionary dynamics of disease. Much of this shift in emphasis has been in response to student interest in courses that will give them an understanding of the natural world that they have come to see imperiled.

The new emphasis in ecological studies has greatly heartened us as we have prepared this fourth edition of *Ecology*. More than ever, we believe that there is a great need for a comprehensive survey of the field of ecology, with a historical perspective, an evolutionary foundation, and an unwavering emphasis on contemporary theory, which we believe are strengths of previous editions of *Ecology*. As with past editions, a major goal of this revision has been to reflect current trends and approaches in the field of ecology. We also believe that a comprehensive treatment of the field need not be inaccessible. Thus, our second goal was to substantially enhance the pedagogical features of the book through a new two-column design, several key organizational changes, and new pedagogical approaches.

Ecological themes and new emphases

As with previous editions of *Ecology* the essential principles of evolution and adaptation, energy flow, population and community interactions, and behavioral ecology form the foundation of our narrative. We retain the view that the responses of individual organisms to conditions of the physical and biotic environment form the basic information of ecological study. To this foundation, we have added new emphasis in several areas.

- Methods of ecological study
- Interactions of humans with the natural world
- Importance of spatial scale in ecology
- Global element cycles
- Biodiversity
- Conservation biology
- Plant ecology
- Coevolution and mutualism

