Community ecology and salamander guilds

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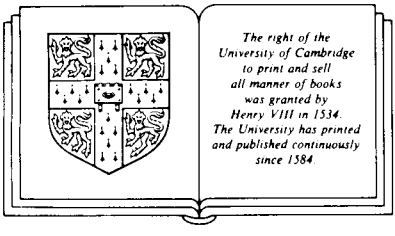

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For Patty

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Preface

This book arose from two stimuli. The first was a desire to put the large amount of published work on salamander ecology into the context of other work on animal communities. Community ecology has a history that has been strongly influenced by the preferences of a few ecologists for particular kinds of animals. It is clear that MacArthur's fascination with birds remains a strong influence, as a perusal of the indexes of recent compendia on community ecology will show. A second group that has had a strong impact has been the lizards, but until recently, lizard ecologists followed or elaborated the theories of MacArthur. Thus, new work on birds or lizards tended to be incorporated into community theory, especially if it confirmed the prevalent models. Theoreticians paid little more than lip service to work in other areas, most specifically to the growing literature on experiments in marine environments. Specific examples demonstrating the existence of interspecific competition were cited, but there have been few attempts to incorporate this large amount of experimental ecology into community theory. Work on salamanders shared the fate of experiments in the rocky intertidal.

The second stimulus was an invitation from John Birks to write this book for the series Cambridge Studies in Ecology. The invitation came just when I had completed a very tiring experiment of four years' duration and had decided not to begin another effort at any such strenuous level. Thus, I was in a susceptible frame of mind.

The first chapter consists of an account, perhaps biased, of community ecology and the problems that are beginning to be faced by at least some workers in the field. It is followed by a comparison of the constancy of salamander populations and populations of groups that have contributed most importantly to community theory. Next, I felt that it was necessary to provide readers with an understanding of the variety of salamander life histories, before describing the research that has been carried out in the three conspicuously different habitats that have attracted the attention of salamander ecologists. It has been my experience in ecological discussions that relatively few biologists are aware that most salamander species do not follow the classical pattern of coming to ponds in early spring to lay eggs for embryolo-

gists. The differences among their life histories make a great deal of difference in the kinds of interaction that are to be expected in the different habitats.

It is rare that evolutionary questions can be attacked experimentally in the field, but unusual opportunities have been perceived and acted on in the case of salamanders. The conclusions from such work depend on the assumption that present ecological forces are the same as those that were involved in natural selection in the past, but if granted, the assumption allows important conclusions to be made. A final chapter describes the opportunities for further research on salamander communities.

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I am grateful to many people whose cooperation and help have contributed to the successful completion of this book. John Birks proposed that I should undertake it and has been helpful and supportive throughout with his comments as the individual chapters have been completed. Kiisa Nishikawa, Alan Stiven, and Nelson Hairston, Jr., read and made valuable comments on various parts. Steve Tilley read the whole manuscript carefully and made a number of perceptive comments. As much as I would like to do so, I cannot blame any of them for such errors as may remain. The many authors and publishers who graciously gave permission for me to copy figures and tables are acknowledged in the appropriate places, but I hereby thank them profusely.

My experiments, described in Chapters 5 and 6, could not have been completed without the help, most of it volunteered, of family members, colleagues, students, and friends. Clambering around steep mountainsides at night, sometimes in the rain, is exhausting work. The following have earned my lasting gratitude: Steve Arnold, Bill Bowen, Bill Bramble, Judy Edson Bramble, Ellen Gilinsky, Tim Goater, Nelson Hairston, Jr., Patty Hairston, Lynn Houck, Ken Kneidel, Bruce Means, Kiisa Nishikawa, Ron Nussbaum, Susie O'Bryan, Ray Plotecia, Julie Roberts, Bill Searcy, Margaret Searcy, Phil Service, Chuck Smith, Mark Southerland, Sally Stenhouse, Steve Tilley, Martha Weston, JoAnn White, Ann Williams, and Del Williams.