# Preface

Dispersal is currently one of the most active areas in plant ecology. At a time of focus on climate change and plant invasions, dispersal has become a core item of the research agenda. Empirical or theoretical work on dispersal now appears in just about every edition of ecology journals.

Yet, over the years, there have been but a handful of books devoted to the subject (Beal 1989; Ridley 1930; Van der Pijl—three editions from 1969 to 1982), and these have dealt with the subject in a largely descriptive way. Most plant population biology text books, while recognizing the importance of dispersal in population dynamics, give little coverage of dispersal per se. For example, only 3% of almost 800 pages in Harper's (1977) seminal book deals with dispersal. In recent years several excellent dispersal (and frugivory) conference proceedings have been published as books, bringing together recent work by a relatively small number of ecologists (Estrada and Fleming 1986; Bunce and Howard 1990; Clobert et al. 2001; Bullock et al. 2002; Levey et al. 2002; Dennis et al. 2007). However, with so much current interest in dispersal, we feel that it is high time for a new text that brings together current knowledge of dispersal in a more systematic way.

We also feel that such a book should concentrate on dispersal from a population perspective. All three of us are interested in the population-level consequences of dispersal and it was this that brought us into this project together at the University of York in 2003. We wanted to write the dispersal chapters that have not yet found their way into general texts on plant population biology. We also wanted to show where dispersal fits into the theoretical framework of population dynamics. Theory about the role of dispersal in population and community dynamics is developing fast, but there is no systematic coverage of both the processes and the higher-level consequences of dispersal. A book which covers both data and theory should help modellers to appreciate the data and their limitations, and also guide empiricists towards the theory and the kind of data which would enlighten the subject.

In a book taking a strictly population perspective, there may be some topics about dispersal that are not covered. We have no intention that our book should provide the full story about dispersal, and the reader should not look for an authoritative review of all the relevant literature. In particular, as we wrote Chapters 6 to 8, we thought in terms of guided tours of the subjects, taking the reader through examples that illustrate the principles, rather than comprehensive reviews (how many tourists want to visit *every* chateau in the Loire?). In these chapters, we each covered the area with which we are most familiar and give our personal view of the topics.

With the focus on population dynamics, dispersal becomes a quantitative science and needs some mathematical tools. We cannot, indeed we do not think it is sensible, to hide away the mathematics completely. The formalism of the mathematical language encourages precise thinking, and in addition, the power of statistics to summarize data, allows us to become predictive. We appreciate, however, that ecologists vary in their inclination towards mathematics. Thus, for the most part, we keep the mathematics to a high school or university introductory level, putting more advanced topics into boxes or tables. We do, however, urge the reader to take the time to think about more mathematical parts of the subject because it is at the interface with the theory where we expect important advances to come about in the future.

Finally, we think it is important to stress the role of dispersal at a wide range of spatial scales. Much current research focuses on long-distance dispersal

(LLD) and could easily leave an impression that dispersal only matters at landscape and geographic scales. We take the view that distances moved by propagules are important to population processes and population dynamics at *all* scales, from a few centimetres to hundreds of kilometres. After all, dispersal at small scales is a key component of local population dynamics, able to determine whether the population can persist. We therefore stress the importance of measuring dispersal distances without an emphasis on particular scales.

There are many colleagues, some of whom we have yet to meet, and friends who played a part in the production of the book. Ian Sherman (OUP) made the book possible, provided constant encouragement and helped us through some difficult periods along the way. Jane Cousens helped enormously in the pre-submission processes; Lisa Crowfoot redrew many figures; Errol Hoffman taught RC basic fluid dynamics; Barry Hughes and Andy Rawlinson tried very hard to explain mathematical derivations (when weighty university matters already occupied most of Barry's time). Yvonne Buckley, Alex James, Mark Lewis, Andrew Robinson, Martin Schaeffer, Rob Taylor, and Kimberly With kindly read and commented on chapters (or parts thereof). Clearly, however, all errors and omissions are ours. We appreciate advice from Kimberly Holbrook, Ian Gordon, and Graham Hepworth on particular topics. Mohammad Taghizadeh generated figures from his PhD data; David Merritt revised his figures to meet our needs; David Kleinig generously hunted for trees to photograph according to our specifications; and numerous people allowed us to reproduce figures that we found on the internet (citations given in the legends). Georg Gratzer made available data for a temperate forest (Chapter 7), while George Weiblen provided data on Glacier Lily (Chapter 5). The Forest Research Institute Malaysia kindly gave us permission to use data from the Pasoh Forest Reserve (Chapter 7). Support for RL from NSF Grant NSF-DEB 0414465 is gratefully acknowledged.

Please note that for plant names we give the family name at the first mention of each genus. For animals we give only common names, unless the original source only gives genus and species.