

Contents

<i>Preface</i>	<i>page</i> vii
<i>Acknowledgments</i>	ix
I. UNSTRUCTURED POPULATION MODELS	1
A. SINGLE-SPECIES MODELS	3
1 Exponential, logistic, and Gompertz growth	3
2 Harvest models: bifurcations and breakpoints	13
3 Stochastic birth and death processes	25
4 Discrete-time models	43
5 Delay models	70
6 Branching processes	93
B. INTERACTING POPULATIONS	107
7 A classical predator–prey model	107
8 To cycle or not to cycle	116
9 Global bifurcations in predator–prey models	140
10 Chemostat models	161
11 Discrete-time predator–prey models	181
12 Competition models	198
13 Mutualism models	220
C. DYNAMICS OF EXPLOITED POPULATIONS	237
14 Harvest models and optimal control theory	237
II. STRUCTURED POPULATION MODELS	265
D. SPATIALLY STRUCTURED MODELS	267
15 Formulating spatially structured models	267

vi *Contents*

16	Spatial steady states: linear problems	276
17	Spatial steady states: nonlinear problems	294
18	Models of spread	311
E. AGE-STRUCTURED MODELS		345
19	An overview of linear age-structured models	345
20	The Lotka integral equation	353
21	The difference equation	365
22	The Leslie matrix	377
23	The McKendrick–von Foerster PDE	391
24	Some simple nonlinear models	401
F. SEX-STRUCTURED MODELS		413
25	Two-sex models	413
<i>References</i>		425
<i>Author index</i>		443
<i>Subject index</i>		447