

Contents

Preface	xi
Chapter 1 Introduction	1
Orders, families and species	3
The historical context	5
The value of fossils	16
Summary	18
PART 1: EVOLUTION AND DIVERSITY OF BIRDS	21
Chapter 2 Bird species and their relationships	23
Delimitation of species	25
Phylogenetic classifications	30
Geographical variation in species	46
Summary	54
Chapter 3 Species formation	55
Anagenesis	56
Cladogenesis and allopatric speciation	56
The re-meeting of previously isolated populations	61
Sympatric speciation	70
Designation of species	72
Adaptive radiation	72
Taxon cycles	79
Speciation times	85
Concluding remarks	90
Summary	90
Chapter 4 Species numbers	93
Comments on species concepts	96
Species through time	100
Summary	105
PART 2: MAJOR DISTRIBUTION PATTERNS	107
Chapter 5 Continental birds: biogeographical regions	109
Palearctic Region	112
Indomalayan Region	128
Afrotropical (or Ethiopian) Region	133

Australasian Region	135
Nearctic Region	143
Neotropical Region	145
Oceania	149
Antarctica	151
Discussion	152
Concluding remarks	161
Summary	161

Chapter 6 Island birds: general features 163

Different types of islands	164
Island birds	169
Land-bridge islands	187
Summary	191

Chapter 7 Island birds: losses and gains 193

Recent extinctions	194
Recent introductions	210
Summary	212

Chapter 8 Seabirds 213

The marine environment	216
Marine productivity	220
Seabird distributions	223
Limitation of nesting places	236
Differentiation and speciation	242
Concluding remarks	246
Summary	249

PART 3: EFFECTS OF PAST CLIMATE CHANGES 251

Chapter 9 Glacial cycles in northern regions: extinctions and distributional changes 253

Glacial advance	256
Glacial retreat	261
Effects on landbirds	264
Effects on seabirds	268
Effects on migration systems	271
Current gradients in species numbers	271
Relict populations	274
Recent range expansions	274
Current climate warming	279
Concluding remarks	280
Summary	282

Chapter 10	Glacial cycles in northern regions: differentiation and speciation	285
	Distributional evidence for past climatic effects	286
	Genetic evidence for past climatic effects	309
	Summary	321
Chapter 11	Dry-wet cycles in tropical regions	323
	Africa	326
	South America	334
	Australia	340
	Comparisons between the southern continents	343
	Southeast Asia	344
	Discussion	345
	Concluding remarks	351
	Summary	352
Chapter 12	Disjunct ranges	355
	Species of rare or patchy habitats	357
	Species of once-continuous but now disjunct habitats	358
	Species with disjunct distributions in continuous habitat	363
	Concluding remarks	367
	Summary	369
PART 4:	LIMITATION OF SPECIES DISTRIBUTIONS	371
Chapter 13	Bird distribution patterns	373
	Measurement of ranges	374
	Smallness of geographical ranges	377
	Variations of abundance within the range	380
	Relationship between abundance and distribution	383
	Concentrations	386
	Concluding remarks	387
	Summary	388
Chapter 14	Limitation of geographical ranges	389
	Dependence of range on population size	390
	Ecological barriers: general surveys	397
	Ecological barriers: climate constraints	398
	Ecological barriers: habitat constraints	407
	Ecological barriers: food and nest-sites	408
	Ecological barriers: predators and parasites	410
	Ecological barriers: competition	411
	Physical barriers	418
	Translocations by people	419
	Consequences of range expansion and competition	420
	Concluding remarks	422
	Summary	422

Chapter 15	Recent range changes	425
Distributional changes associated with climate change		426
Distributional changes associated with human action		432
Other considerations		440
Range expansions through breeding in migration and wintering areas		441
Genetic changes		442
Modelling rates of spread		443
Concluding remarks		446
Summary		447

Chapter 16	Crossing barriers	449
Constraints to cross-barrier colonisations		450
Species differences		455
Successful cross-water colonisations		458
Translocations by people		463
Concluding remarks		466
Summary		466

PART 5: BIRD MOVEMENTS **469**

Chapter 17	Dispersal	471
Natal dispersal		474
Breeding dispersal		482
Dispersal within a breeding season		485
Long-distance dispersers		490
Non-breeding dispersal		495
Genetic research and dispersal		500
Discussion		502
Summary		506

Chapter 18	Migration biogeography	509
Evolution of migration		510
Latitudinal trends		515
Migration and diet		520
Net latitudinal shifts		523
Relationship between breeding and wintering areas		528
Altitudinal migration		537
Movements within the breeding season		539
Movements within the non-breeding season		541
Nomadism		544
Summary		545

PART 6:	CONCLUSIONS	549
Chapter 19	Speciation and biogeography – a synthesis	551
Glossary		565
References		577
Index		631