

Subject Index

- adaptation xii, 21, 32, 62, 68–71, 87, 89, 117–118, 129, 282, 304, 308, 326
- adoption 207, 278, 279, 281
- affiliative 50, 126–127, 135, 169, 252
- aggregation 1–2, 7, 47, 56, 76, 192–202, 252, 280, 317
- aggression 37–42, 54, 77–82, 87, 91–100, 120–135, 178, 224, 228, 242–244, 253, 272–280, 310–311
- agonistic support 149–151, 174
- alarm call 51, 196–197, 215, 285, 294–295, 316
- allogrooming 128, 141, 152, 158, 161, 164, 169, 171, 174–175, 178, 240, 302–306
- allonursing 152–153, 161, 241
- alloparental care 148–149, 166, 179, 183, 247, 257, 259, 297, 302, 305–307
- alternative reproductive tactics 55, 246
- altruism 3–4, 16–20, 92, 117, 122, 137, 139, 144, 178, 181–184, 210, 238, 242, 246, 259, 313
 reciprocal altruism 4, 7, 9, 17, 144, 145, 155, 201, 238, 291–292, 314
- appeasement 81, 91, 244, 253, 257
- arms race 23, 246, 282, 284, 314, 316
- assessment model 113–115
- associations 110, 131–134, 187, 189, 195–196, 221–222, 249, 274–280, 285, 295
- associative learning 190, 209
- battleground models 97
- benefits
 by-product benefits 138–139, 144, 247, 295, 315, 318
 delayed benefits 141, 290
 fitness benefits 5, 17, 20, 22, 27, 50, 60, 63–64, 77, 130, 132, 179, 187, 189, 201–202, 234, 259, 313
 immediate benefits 140–141, 239, 286
 mutual benefits 201, 288, 293
- biparental 15, 71, 88, 177, 226, 229, 315, 320
- body condition 158, 169, 179, 237
- bonanza resource 8, 306
- breeder turnover 189–190, 204
- breeding experience 29, 236
- brood care 147–148, 179, 184, 227–228, 235–237, 245, 252–261, 279–281, 302, 313–317
 interspecific brood care 276–285
- brood parasitism 5, 212, 238, 246, 249, 277, 281, 283, 314, 316
- broods
 mixed-species broods 276–280, 317
- by-product mutualism 137–139, 146, 176, 247, 288, 295, 316
- caste 2, 21, 69, 181, 242–243, 249, 297
- character displacement 266–267, 272, 316
- cheating 79, 85, 140, 145, 212, 238, 284, 286–289, 294, 316
- clumping 35–39
- coalitions 59, 119, 123, 151, 163, 195–196, 199, 202, 204–205, 243, 280
- co-breeding 61, 183, 225, 324
- coercion 17, 23, 91, 107–108, 111, 136, 176–177, 236, 238, 241–242, 247, 251, 263, 314, 316, 318–319
- coevolution 97, 99–100, 107, 122, 129, 135, 282, 310, 312, 316
- coexistence 141, 210, 266, 268, 270, 294, 316
- cognition 135, 155, 157, 174, 177, 212, 248, 314
- collective
 collective action 66, 73–74, 119
 collective behaviour 47
 collective movement 46–47, 60, 66, 309
- colonies 48, 90–91, 118, 121, 123, 127–128, 182, 192–195, 212, 239, 247, 256, 259, 279, 298–308
- colouration 52, 272
- commensalism 266, 285–286, 294–295, 316
- commodity 19, 147, 163, 174
- common descent 20, 137, 139–140, 180, 190, 249, 313
- communal
 communal breeding 17
 communal care 63, 224
 communal litter 63–66
 communal thatch 90
- communication 14, 17, 50, 290, 292

- communities 266, 293
- competition
- among-kin competition 187, 234
 - destructive competition 106
 - interference competition 267, 269, 280
 - interspecific competition 266, 273
 - intra-buccal competition 278
 - local mate competition 299
 - non-interference competition 269
 - resource competition 6, 21–24, 38, 54, 224, 257, 273, 316
 - scramble competition 35–48, 59–60, 309–310
- competitive exclusion 266
- conflict
- conflict behaviour 22, 69, 72, 99, 107, 129, 295
 - conflict of interest 256, 274, 288, 318
 - evolutionary conflict 68–69, 97–105, 107, 117, 128
 - interspecific conflict 265, 274
 - sexual conflict 20, 55, 87, 216, 221, 226, 314, 321
- conflict–cohesion hypothesis 126
- contest 2, 18, 35–47, 53–59, 77–80, 99–117, 123, 134–135, 146, 309–312, 317–318
- contest success functions 99–104, 113, 312
- cooperation
- (en)forced cooperation 4, 23, 28, 108, 136, 236–251, 281, 314, 316
 - indiscriminate cooperation 183, 190, 265, 316
 - interspecific cooperation 264, 284, 288, 295, 315
 - mutual cooperation 264, 285, 295
 - nepotistic cooperation 196
 - reciprocal cooperation 19, 141, 145–178, 205, 256, 289, 313–314, 319
- cooperative
- cooperative breeders 21, 61, 84, 131, 164, 180–185, 192–193, 205, 207, 209, 234, 241, 243, 251–262, 297, 308, 315, 318
 - cooperative hunting 8, 136, 140, 172, 247, 291
 - cooperative transitions 67–71, 118, 127–129
- correlated pay-offs 12, 18, 137–138, 140, 165, 175, 179, 247–248, 288, 313
- cost–benefit analysis 285, 295
- courtship 16, 51, 53, 57–58, 197–203, 221, 320
- credible threats 5, 92, 98, 108–110
- cross-feeding 293
- cryptic female choice 85
- deceit 212, 263, 316
- deception 23, 48, 51–52, 247–249, 310, 313–314
- decision rules 4, 19, 147, 154–160, 166–178, 205, 237, 248, 263, 310, 314, 319
- decisions
- adaptive decisions 319
 - behavioural decisions 2, 21, 156
 - collective decisions 47
 - cooperation decisions 262
 - foraging decisions 7
 - life-history decisions 94, 261
 - optimal decisions 22
 - social decisions 2, 21
- decisiveness 103–104, 106, 117
- defection 108, 111, 154, 157, 159, 167, 170, 248, 256, 289
- defence 11, 16, 22, 37–39, 72, 96, 129, 141, 144, 147–153, 172, 241, 244, 251–261, 273–281, 284
- density 37, 43, 53–60, 96, 141, 221, 224–225, 259, 267, 270, 284, 300, 310
- deterrence 108, 112
- dictatorship 118, 129
- direct fitness benefits 17, 23, 25, 29, 130, 195, 199, 206, 212, 214, 223, 226, 234
- dispersal
- delayed dispersal 26, 73, 189, 193, 195, 213–214, 216, 297, 302, 306–307
 - dispersal in kin coalitions 202
 - limited dispersal 122, 192, 194, 221, 224, 313
 - natal dispersal 192–193, 195, 202, 213
- dispersal constraints 182
- divisibility 38, 41
- division of labour 4, 78, 131, 243, 260, 297, 302–308, 315, 318
- divorce 54, 190
- dominance hierarchy 62, 77, 80, 82, 87, 110–111, 124, 129–131, 252, 311
- eavesdropping 49, 143, 156, 285, 289, 295
- ecological constraints 22, 27, 60, 95, 310
- economic defendability 36, 55
- effort-matching 89
- energetic war-of-attrition 114
- environmental conditions 33, 56, 159, 171, 268
- eusocial 12, 18–20, 21, 68–69, 118, 181, 192, 242–243, 249, 259, 297–298, 302–308, 318
- eviction 63–76, 81, 98, 107–110, 129, 178, 205, 243, 310, 315
- evolutionarily stable strategy (ESS) 45, 100–101, 109, 113
- exploitation 5, 44, 50, 77, 121, 136, 138, 144, 166, 172–173, 179, 237, 246, 248, 252, 267, 310, 317
- extortion 246
- familiarity 159, 166, 209, 211, 313
- family groups 97, 141–142, 181, 192, 195, 211, 214, 324
- farming out 277–278
- fecundity 34, 82, 92–93, 189, 216, 226–227, 273, 304, 311
- fertility 75, 83, 119–120, 273, 321–322, 325–326
- fertilization 10, 144, 147, 174, 230, 275, 286, 300, 317
- fighting 7, 12–13, 22, 35–36, 38, 52, 56, 60, 64, 67, 77–78, 80, 94, 106, 110, 114–116, 121, 123, 126, 134–136, 156, 219, 224, 311, 388
- filial cannibalism 18, 229–230

- fish schools 1, 47, 76
 fitness costs 17, 23, 31, 44, 103, 120, 122,
 139–140, 160, 180, 207, 216, 230, 238, 252,
 260, 263, 281, 293, 295, 305, 313, 324, 326
 food provisioning 149–150, 152, 161, 169, 194,
 235, 238
 food resources 30, 214, 295, 355
 foraging
 cooperative foraging 290
 foraging success 33, 50, 285, 291, 294
 forced altruism 23
- generalists 266, 268, 270, 316
 generosity 157, 313, 319
 genetic altruism 18–20, 259
 Goldilocks principle 48
 group
 group composition 1, 181, 259–260
 group size 1, 7, 18, 30–34, 40–41, 44, 71–75,
 127, 133, 139–144, 154, 159, 212, 234, 255,
 259, 261
 group structure 47, 147, 252, 260–261
 group transformation 68, 117, 128–129
 grouping 10, 33, 46, 49, 68, 72–76, 129, 275, 310
 group augmentation 18, 140, 142–143, 195, 234
 group selection xi, 71, 118, 138, 312
- habitat
 habitat quality 25, 30–32, 271
 habitat saturation 25, 27, 32, 213, 224, 244
 Hamilton's rule 3, 19, 92, 137–138, 180, 202, 248,
 313
 harassment 79, 87, 176, 221
 harming 97, 216–221, 311, 324
 helpfulness 145, 154, 157, 171
 helping
 helping behaviour 25–32, 61, 82, 95, 122,
 130–131, 181, 190, 193, 195, 204, 207, 236,
 244
 helping experience 29, 236
 hierarchical information hypothesis of reciprocal
 cooperation 156, 167
 hierarchy 41, 67, 77, 79, 128, 132, 134
 home ranges 55, 62, 274
 hybridization 272–273, 395
- ideal despotic distribution 6, 44
 ideal free distribution 6, 42, 46, 48, 60
 image-scoring 157, 289
 imprinting 15, 209
 inbreeding 55, 63, 210, 221, 226–229, 300, 304,
 306, 314, 390
 inbreeding depression 63, 226
 inclusive fitness 3, 16, 50, 63, 71–74, 79, 89, 91,
 100–101, 103, 117, 120, 134, 139, 141, 196,
 205–208, 226–227, 238, 305, 326
 indirect fitness benefits 5, 17–20, 22, 25, 27–28,
 180–184, 187, 192–209, 214, 259, 313
- indiscriminate altruism 182
 individual quality 190
 infant handling 150–151, 176
 infanticide 62, 69, 86, 94, 102, 105, 108, 129, 204,
 230, 238, 311
 infidelity 190, 204
 mate infidelity 206
 infinite island model 93, 123
 information centres 48
 information parasitism 51
 inheritance rank 80, 130, 133–134
 insider–outsider conflict 72–74, 310
 interactions
 acoustic interactions 294
 agonistic interactions 280
 competitive interactions 135
 cooperative interactions 192, 249, 262, 315, 318
 host–parasite interactions 271
 predator–prey interactions 23
 interdependence 49, 72, 178, 315
 interference
 interference rivalry 21, 35, 77, 263, 266, 271,
 294, 316
 reproductive interference 272
 intergroup conflict 22, 55, 61, 65–66, 72, 88,
 120–129, 239, 312
 intergroup cooperation 127–128
 interspecific
 interspecific mutualism 69, 105, 144, 175, 276,
 287, 294–295, 315, 318
 interspecific interactions 4, 178, 263, 265, 294, 317
 interspecific relations 23, 263, 281, 286, 316–317
 investment 10, 31, 39, 69, 76, 84, 88–91, 97, 99,
 105, 112, 143–145, 166, 177, 180–183, 186,
 190, 212, 224, 233, 245, 249, 251–252, 258,
 260, 305, 315, 325–326
 parental investment 55, 88, 97, 161, 229, 245,
 247, 259, 315
 reproductive investment 83
- kidnapping 11, 142, 212, 232, 235
 kin clustering 193, 216
 kin discrimination 5, 23, 64, 92, 182, 189–190,
 192–193, 202–207, 234–235, 313
 active kin discrimination 204, 207, 209
 fine-scale kin discrimination 207, 212
 kin recognition 19, 186, 189, 202–213
 kin selection 4–6, 19, 92–97, 100, 102, 107, 129,
 137–140, 164, 166, 180–184, 196, 198, 201,
 205–208, 218, 233, 242–251, 259, 263, 285,
 294–297, 305, 312–324
 kinship viii, 5, 28, 118, 159, 183, 187, 190–193,
 204, 207–212, 221, 233, 311, 314, 319, 321,
 324, 326
- landscape of fear 42
 learning 155, 171, 190, 209–210, 212
 lekking 55, 196–202

- life-history segregation 119–120, 312
 lifetime reproductive success xii, 88, 125, 206, 218, 220
 linkage disequilibrium 210
 load lightening 31, 84, 245
 local enhancement 49
 longevity 79, 171, 187, 189, 192, 216, 219, 274

 major transitions 20, 67–71, 117–129, 311, 316, 318
 maladaptive 110, 272, 278, 284, 314
 manipulation 57, 66, 88, 133, 137, 158, 167, 223, 230, 237–251, 258, 268, 281, 294, 312, 319
 mate attraction 196, 200
 mate guarding 54, 64, 87, 210, 311
 mate sharing 162, 196, 200
 mating skew 87, 196
 mating system 1, 5, 10–11, 181, 300, 309
 memory 71, 111, 116, 134–135, 157, 166, 171, 319
 menopause 96, 119, 321–322, 324, 326
 monogamy 2, 39, 54, 87–88, 118, 227, 305
 monopolization 2, 6–12, 36–41, 55, 62, 77, 84, 87, 119, 129, 164, 243, 271, 310, 322
 morphological divergence 242, 249, 271, 295, 297
 morphology 14, 20, 243, 266–269
 mortality 31, 33, 64, 94, 121–124, 203, 258, 277, 321–326
 mortality risk 219, 267, 278, 287
 mouthbrooding 277–278, 281
 multilevel selection 117, 122, 139
 mutualism
 by-product mutualism 17, 137–139, 143, 176, 179, 247, 288, 295, 316
 interspecific mutualism 14, 69, 105, 175, 276, 287, 294–295, 315, 318
 mutual benefits 126, 143, 200, 235, 258, 288–289, 294

 natural selection xii, 3, 19, 22, 35, 44, 67, 113, 138, 140, 177–178, 210, 249, 262, 283, 294, 310, 312, 322
 negotiations 99, 106–107, 112, 129, 147, 176–177, 240, 248–249, 257, 259, 288, 310–311, 315, 318
 nepotism 196, 249
 nest building 26, 200
 networks
 interaction networks 68, 154, 158–161, 258
 social networks 68, 156, 160, 191, 262
 niche
 ecological niche 266, 293
 foraging niche 61, 64–65, 267
 social niche 78, 236, 262
 niche differentiation 64, 266
 niche overlap 267
 niche shifts 266

 olfactory cues 211, 227, 230
 open box models 116

 opportunity costs 10, 160, 273, 277, 288, 291
 optimal group size 75, 310
 organismality 70, 123, 318
 outgroup threat 120
 outside options 97, 100, 236, 240–241, 243, 246, 249, 251, 288, 315, 318

 parasites 5, 9, 160, 222, 264, 271, 280–281, 289, 297, 316–317
 parasitism
 nest parasitism 281
 reproductive parasitism 59, 229–230, 280
 parentage 26, 29, 66, 69, 83, 190–191, 229
 parental
 parental care 31, 87–88, 112, 177, 209, 226–233, 249, 277, 279, 281, 294, 311
 parental facilitation 213–214
 partial compensation 88
 partner choice 176, 290
 partnership 68, 88–89, 178
 pay-off 11–12, 18, 41, 43, 50, 52, 55–60, 80, 97, 109, 113, 118, 126, 137–138, 145, 165, 176, 247, 249, 313–314
 pay-to-stay 19, 29, 91, 147, 149, 178, 243–259
 pedigree
 genetic pedigree 199, 208, 211
 multi-generational pedigree 202
 social pedigree 184
 personality 23, 47, 55, 159, 236, 262, 319
 phenotype matching 209–210, 313
 philopatry 25, 27, 32, 96, 182, 187–189, 192–196, 202, 216, 252, 306, 323
 policing 76, 85, 107, 118, 236, 238–239, 242, 249
 policing model 100–105
 polydomy 127
 population demography 129, 223, 326
 population viscosity 23, 92, 97, 154, 182, 192, 223–224, 265, 314
 post-reproductive lifespan 321
 power asymmetry 73, 238–247
 power symmetry 238
 predation
 predation risk 2, 9, 25, 31–32, 42, 46, 50, 196, 213, 228, 251, 258–261, 267, 275–276, 278–279, 287, 295, 317
 predator deterrence 294
 predator inspection 147–148, 160, 172
 predictability 2, 38–40
 predictive adaptive response 84
 prisoner's dilemma 2, 126, 155, 165, 167, 246
 producer 50, 91
 promiscuity 11, 189–191
 prosocial behaviour 9
 protection 41, 144, 166, 195, 213–214, 251, 254, 256, 258, 274–280, 286, 306
 provisioning rate 184, 207, 282
 proximate mechanisms 14, 19, 145, 160, 166, 186
 pseudoreciprocity 140, 143

- public goods 6, 19, 90–91, 172, 222, 239, 293, 297, 305
- punishment 17, 19, 51, 91, 109, 111, 129, 236, 238–240, 288, 306, 316
- ratio form contest success function 100–101, 104–105
- reciprocity
 direct reciprocity 4, 20, 149, 152–159, 164–169, 177, 190, 248, 288
 generalized reciprocity 4, 9, 59, 150–159, 163–165, 167, 171–179, 182, 248, 265, 314, 316, 319
 indirect reciprocity 4, 20, 146, 155–158, 163–164, 166, 168, 248, 289, 314, 319
 interspecific reciprocity 289
- recognition 71, 134, 166, 186, 190, 192, 202–213, 249, 272, 313, 319
- recognition errors 190, 205, 212, 234, 272
- recruitment 48, 203, 290
- reproductive
 reproductive altruism 16, 18–20, 182
 reproductive competition 61, 63, 75, 84, 94, 96, 99, 103, 129, 225, 257, 260, 305
 reproductive conflict 97–98, 321–326
 reproductive levelling 66, 118–120, 129, 312
 reproductive restraint 76, 94, 238, 252
 reproductive skew 37, 61, 65, 82, 95, 97–99, 107, 239, 243, 260
 reproductive success 27–32, 57–58, 63–66, 75–76, 84–88, 95, 105, 141, 192, 196–200, 206, 212, 216, 218, 220, 231, 279, 283, 305
 reproductive suppression 61–63, 83, 86, 118, 120
- reputation 111, 155–156, 166
- resolution models 97, 99–100
- resources
 resource availability 37–38, 53
 resource defence 32, 37–42, 53, 73–74
 resource holding potential (RHP) 9, 52, 56, 78, 80–81, 98, 113–116, 126, 311, 318
 resource overlap 272, 295
- robots 50
- safety in numbers 143, 275, 278, 287, 295
- satellite males 56, 58, 147, 317
- schooling 36, 47, 59, 76
- scramble 6, 8, 22, 35–45, 48, 55, 58–60, 77, 97, 105, 266–267, 309–310, 317–318
- scrounger 50
- sealed-bid models 97, 99, 106, 126, 129
- selfish herd 76–77
- selfishness 22, 100–105, 111, 126, 137
- sequential assessment 113, 115
- sequential models 107, 129
- sex allocation 182
- sex-biased dispersal 187, 193, 228, 323
- shared genes 23, 137, 145, 164, 176, 243, 247, 250, 313, 315, 318
- shared interests 285, 288, 295
- shoals 2, 7, 47, 287
- simultaneous hermaphrodites 11, 173
- site-fidelity 187
- sneaking 53, 55–58, 317
- social
 social behaviour 1, 14–17, 21–24, 35, 60, 129–130, 134–135, 139, 193, 221, 233–234, 252, 262, 310, 319
 social conflict 22, 59, 67, 69, 72, 131, 310–311
 social immunity 302
 social interactions 1, 4–6, 23, 36, 59, 95, 100, 102, 129, 138, 159, 167, 184, 252, 280, 309, 318
 social learning 49
 social parasitism 5, 23, 136, 246
 social queue 79, 130, 133
 social rank 77–80, 123, 129–130, 132, 134
 social structure 2, 6, 13, 47, 71, 95, 250, 252, 260, 262
 social support 150–153, 174
- solicitation 169
- spawning 173, 200, 202, 228, 230–231, 278, 317
- specialists 266, 268, 270, 316
- spite 94, 281
- stable group size 73–74
- structured environments 293
- structured population models 92, 94–95, 311, 325
- submission 16, 80–83, 91, 130, 244, 249, 253
- surveillance 126, 163, 289
- survival 21, 25–34, 63–65, 75, 133, 141, 163, 180, 195, 214, 218, 220, 233, 244–245, 258, 279, 281, 303, 324
- swarming 43, 143
- symbiosis 105, 143, 264–265, 307
- sympatry 267, 272
- synergistic effects 4, 6, 22, 136, 178, 241, 252, 260
- territoriality
 interspecific territoriality 271, 295, 316
 serial territoriality 273–274, 295
- territory
 territory defence 141, 147, 152, 172, 236, 244, 254, 257, 260
 territory inheritance 29, 142, 152, 235
- thermoregulation 9, 141
- threats 5, 76, 84, 91, 98, 107–112, 120, 129, 134, 178, 238, 241, 244, 312, 315, 318
- Tinbergen's four questions 15
- tit-for-tat 146, 169
- trade-offs 71, 89–90, 124, 166, 237, 258, 276, 295, 297
- trading 20, 147–153, 172–176, 248–251, 254, 288, 295, 315–316, 318
- tragedy of the commons 77, 97, 256, 284

- tug-of-war model 100–104, 123, 323
turn-taking 129, 148, 161
 unconditional prosociality 168
- uncorrelated asymmetry 8, 78
undermatching 43–44
unpredictability 40
- veil of ignorance 66, 106, 118
vigilance 42, 121, 141, 147, 160, 185, 197, 267,
 280, 285, 287, 294–295
viscous populations 182, 192, 223, 314
vocalizations 203, 206
- winner/loser effects 146, 172

Taxonomic Index

- Acanthisitta chloris*. See rifleman
Accipiter gentilis. See goshawk
Accipiter nisus. See sparrowhawk
Acinetobacter baylyi 293
 acorn woodpecker 84, 191, 194, 214, 225, 241
Acrocephalus scirpaceus. See reed warbler
Acrocephalus sechellensis. See Seychelles warbler
Actinia equina. See sea anemone
Aegithalos caudatus. See long-tailed tit
Aepyceros melampus. See impala
Aetobatus narinari. See spotted eagle ray
 African grey parrot 148
 African honeybee 247
 African wild dog 141, 185–186, 188
Agelaius phoeniceus. See red-winged blackbird
Aidablennius sphyinx. See sphyinx blenny
Alces alces. See moose
Alopex lagopus. See Arctic fox
Alpheus spp. See burrowing shrimp
 ambrosia beetle 188, 226, 297–308
 American white pelican 140
 American wood warblers 272
Amphiprion percula. See orange clownfish
Ancistrus spinosus 43
Amphiprion. See clownfish
 Antarctic plunder fish 178–179
Apholecoma coeruleascens. See Florida scrub jay
Aphelocoma ultramarine. See Mexican jay
Apis cerana 85
Apis florea. See Asian honeybee
Apis mellifera capensis. See Cape bee
Apis mellifera scutellata. See honeybee
Apis mellifera. See honeybee
Apodemus microps. See herb-field mouse
 apostlebird 188
Aptenodytes patagonicus. See king penguin
 Arabian babbler 75, 186
Archocentrus nigrofasciatum. See convict cichlids
 Arctic fox 276
 Arctic ground squirrel 269
Arenaria interpres. See ruddy turnstone
Argya squamiceps. See Arabian babbler
Artibeus jamaicensis. See Jamaican fruit-eating bat
Asemichthys taylori. See spinynose sculpin
 Asian honeybee 85
 Assamese macaque 151
Ateles geoffroyi. See spider monkey
 Atlantic salmon 40, 42
 Attini 297
Auchenoglanis occidentalis. See bagrid catfish
 Australian magpie 190–191
Australopithecus africanus 322
Austroplatypus incompertus 307
 baboon 119, 151
 bacteria 69, 95, 172, 222–223, 264, 293, 306
 bacterial symbionts 264
 bagrid catfish 278, 287
Bagrus meridionalis. See bagrid catfish
 banded mongoose 11, 55, 59, 61–66, 75–88, 98,
 108, 124, 185, 188, 194, 202, 205, 224, 235
 bank vole 280
 Barbary macaque 150, 158, 178
 barn owl 148
 barnacle goose 188
 Bechstein's bat 49
 bed bug 216–217
 Belding's ground squirrel 185, 197–198
 bell miner 185, 193
 belted sandfish 148
 beluga whale 321
Betta splendens. See fighting fish
 black grouse 188, 196
 black hamlet 148
 black skimmer 276
 blue chromis 53
 blue jay 149
 blue monkey 126, 150
 bluegill sunfish 47, 230
 bluehead wrasse 202
Bombus terrestris. See bumblebee
 bonnet macaque 126, 151
 bonobo 152, 322
Boulengerochromis microlepis 277
Brachydanio rario. See zebrafish
Branta canadensis. See Canada goose
Branta leucopsis. See barnacle goose
Branta ruficollis. See red-breasted geese

- brown hare 39
 brown jay 30, 194
 brown tree creeper 193
 brown-headed nuthatch 149
 buffalo sculpin 281
 buff-breasted wren 149, 173
 Bullock's oriole 275
 bumblebee 85
Buphagus spp. *See* oxpecker
 burrowing shrimp 286
 burying beetle 227–228
Buteo galapagoensis. *See* Galápagos hawk
- Cabanis's greenbuls 188
 cactus finch 187, 270
Callithrix jacchus. *See* common marmoset
Calocitta formosa. *See* white-throated magpie-jays
Campylorhynchus nuchalis. *See* stripe-backed wren
 Canada goose 188
Canis familiaris. *See* dog
Canis latrans. *See* coyote
Canis lupus. *See* wolf
Canis simensis. *See* Ethiopian wolf
Cantorchilus leucotis. *See* buff-breasted wren
 Cape bee 246
 capercaillie 196
 capuchin monkey 155, 158, 161
Carollia perspicillata. *See* short-tailed fruit bat
 carrion crow 84, 185, 213–214
Castor canadensis. *See* North American beaver
 catenulid flatworm 264
Cebus apella. *See* tufted capuchin
Cebus capucinus. *See* white-faced capuchin
Cercocebus atys. *See* sooty mangabey
Cercopithecus mitis. *See* blue monkey
Cercotrichas coryphaeus. *See* Karoo scrub-robin
 Cervidae. *See* deer
Ceryle rudis. *See* pied kingfisher
 chaffinch 271
Chalinochromis 262
 chalk bass 148
 chestnut-crowned babblers 241
 chimpanzee 50–51, 64, 87, 120, 122, 140, 151,
 155, 158, 161, 173–174, 322, 326
 Chinese crested tern 280
 Chinook salmon 56
Chironomus plumosus 46
Chiroxiphia lanceolata. *See* lance-tailed manakin
Chiroxiphia linearis. *See* long-tailed manakin
Chlorocebus pygerythrus. *See* vervet monkey
Chordeiles rupestris. *See* sand-coloured nighthawk
Chromis cyanea. *See* blue chromis
Chrysolophus pictus 288
Cichlasoma dovii 283
Cichlasoma nicaraguaense. *See* Nicaragua cichlid
Cimex lectularius. *See* bed bug
 cleaner wrasse 92, 157, 288–289, 316
Clethrionomys gapperi. *See* red-backed vole
 cliff swallow 49
Climacteris picumnus. *See* brown tree creeper
 clownfish 41, 109–110
 coal tit 266
 coati 153
 cockatiel 148
 coho salmon 41
Columba livia. *See* pigeon
Columba palumbus. *See* woodpigeon
 Columbian ground squirrel 185, 186, 197
 common cactus finch 268
 common cuckoo 282, 288
 common degu 186
 common eider 188, 195
 common guillemot 148, 163
 common marmoset 150, 188
 common shiner 276
 convict cichlid 38
 cooperative cichlid ix, 74, 76, 81, 84, 85, 92, 110,
 115, 126, 127, 141, 147, 165, 201, 204, 228, 229,
 236, 240, 241, 245, 251–262, 315
Copidosoma floridanum. *See* polyembryonic wasp
 coral trout 292
Corcorax melanorhamphos. *See* white-winged
 chough
Corthylus columbianus 308
Corthylus zulae 308
Corvus corax. *See* raven
Corvus corone. *See* carrion crow
Corvus frugilegus. *See* rook
Corvus macrorhynchos. *See* large-billed crow
Corvus monedula. *See* jackdaw
 cotton-top tamarin 149
Cottus gobio. *See* river bullhead
Coturnix japonica. *See* Japanese quail
 coyote 269
 crested tit 266
Crotophaga ani. *See* smooth-billed ani
Crotophaga major. *See* greater ani
Crotophaga sulcirostris. *See* groove-billed ani
Ctenochaetus striatus. *See* striated surgeonfish
Ctenodactylus gundi. *See* gundi
 cuckoo catfish 281, 288
Cuculus canorus. *See* common cuckoo
Cyanocitta cristata. *See* blue jay
Cyanocorax morio. *See* brown jay
Cynictis penicillata. *See* yellow mongoose
Cyrtocara pleurostigmoides 288
- Dactylopus ceylonicus*. *See* mealybug
 Damaraland mole-rat 119
 damselfish 273
 dark-eyed junco 39
 Darwin's ground finch 267
Dascyllus aruanus. *See* humbug damselfish
 deer 42, 153

- deer mouse 270
Delphinapterus leucas. See beluga whale
Dendroplatypus impar 308
Desmodus rotundus. See common vampire bat
Dicrurus adsimilis. See fork-tailed drongo
Dinopteropter cunningtoni 278
 dog 81, 140, 153, 155–159
Doliopygus dubius 308
 dolphin 82, 153
Dorylus wilverthi. See driver ant
 driver ant 69
Drosophila melanogaster. See fruit fly
 dung fly 43
 dunnock 75
 dusky-footed woodrat 188
 dwarf mongoose 61, 141, 153, 185
- Egyptian fruit bat 152
 El Oro parakeet 241
Elassoma spp. See pygmy sunfish
 emerald coral goby 75, 110–111
Enophrys bison. See buffalo sculpin
Equus caballus. See horse
Equus quagga. See zebra
Escherichia coli 293
Etheostoma flabellare. See fantail darter
Etheostoma olmstedii. See tessellated darter
 Ethiopian wolf 285, 286
Eulemur fulvus. See common brown lemur
Eulemur rufifrons. See red-fronted lemur
 Eurasian hobby 276
 European bee-eater 185
 European earwig 57
 eusocial hymenoptera 181, 298, 303
 eusocial insects 68–69, 118, 123, 192, 242–243,
 249, 297, 302, 307, 318
 evening bat 49, 222
- Falco columbarius*. See merlin
Falco naumanni. See lesser kestrel
Falco peregrinus. See peregrine falcon
Falco subbeteo. See Eurasian hobby
 fantail darter 233
 fathead minnow 233
Ficedula hypoleuca. See pied flycatcher
 field vole 280
 fieldfare 276
 fig wasp 95, 224
 fighting fish 156
 Florida scrub jay 185–186, 236
Forficula auricularia. See European earwig
 fork-tailed drongo 51
Foudia sechellarum. See Seychelles fody
Fregata minor. See great frigatebird
Fringilla coelebs. See chaffinch
 fruit fly 189, 218
Fukomys damarensis. See Damaraland mole-rat
- Galápagos hawk 186
 Galápagos mockingbird 185, 190
 garibaldi 233
Gasterosteus aculeatus. See threespine stickleback
 gelada monkey 160, 285
Geospiza spp. See Darwin's ground finch
Geospiza fortis. See medium ground finch
Geospiza fuliginosa. See small ground finch
Geospiza scandens. See common cactus finch
Geospiza magnirostris. See large ground finch
Geronticus eremita. See northern bald ibis
 giant moray eel 291
Giraffa camelopardalis. See giraffe
 giraffe 153
Globicephala macrorhynchus. See short-finned
 pilot whale
Globicephala melas. See pilot whale
 goby 111, 286
 goldcrest 266
Gorilla gorilla. See western gorilla
 goshawk 198
 great frigatebird 226
 great gerbil 188
 great tit 50, 148, 160, 188, 271
 greater ani 85
 greater crested tern 280
 greater honeyguide 289
 greater mouse-eared bat 160
 green woodhoopoe 141, 148, 186
 grey-cheeked mangabey 150
 grey-crowned babbler 188
 groove-billed ani 82
 ground tit 84, 194
 ground-hopper 273
 grouper 291
Gryllidae 53
Gryllus 53
 guira cuckoo 188
Guira guira. See guira cuckoo
 gundi 188
 guppy 53, 147, 156, 160, 188
Gymnorhina tibicen. See Australian magpie
Gymnorhinus cyanocephalus. See pinyon jay
Gymnothorax javanicus. See giant moray eel
- harlequin bass 148
Harpagifer bispinis. See Antarctic plunder fish
Helogale parvula. See dwarf mongoose
 herb-field mouse 152
 hermit crab 41
Hetaerina damselflies 272
Heterocephalus glaber. See naked mole-rat
Homo neanderthalensis 322
Homo sapiens. See human
 honeybee 84–85
 hornyhead chub 276
 horse 153

- house mouse 86, 185, 286
 house sparrows 50
 hover wasp 78–79, 133
 human 20, 59–70, 89, 96, 118–128, 154–158,
 168–175, 286–291, 321–326
 humbug damselfish 202
 hummingbird 37
 hyaena 82
Hybopsis biguttata. See hornyhead chub
Hylobates lar. See white-handed gibbon
Hypoplectrus nigricans. See black hamlet
Hypsypops rubicundus. See garibaldi
- Icterus galbula bullockii*. See Bullock's oriole
 impala 153, 160
Indicator indicator. See greater honeyguide
- jackdaw 149
 Jamaican fruit-eating bat 152, 222
 Japanese macaque 120, 151
 Japanese quail 221, 276
Julidochromis 262
Junco hyemalis. See dark-eyed junco
- Karoo scrub-robin 188, 193
 kea 237
 killer whale 96, 325
 king penguin 160
 Kribensis cichlid 147
- Labroides dimidiatus*. See cleaner wrasse
 Lake Tanganyika cichlid 186, 188, 201, 228, 236,
 274
 Lamprologini 262
Lamprologus brichardi 251, 255
Lamprologus callipterus 230–231
Lamprotornis superbus. See superb starling
 lance-tailed manakin 198
 large ground finch 268, 270
 large-billed crow 149
 large-billed tern 276
Lepidolamprologus attenuates 277
Lepidolamprologus elongates 253–254
Lepidolamprologus 262
Lepomis macrochirus. See bluegill sunfish
Lepus americanus. See snowshoe hare, See brown
 hare
 lesser kestrel 188
 lichen 143
Linepithema humile 127
 lion 82, 95, 99, 140, 161, 194–204
Liostenogaster flavcolina 133
Liostenogaster flavolineata. See hover wasp
Litoria peronei. See Peron's tree frog
Lonchura punctulata. See spice finches
 long-tailed macaque 87, 150
 long-tailed manakin 199
 long-tailed tit 185, 192, 194, 202, 205–207, 209
Lophocebus albigena. See grey-cheeked mangabey
Lycaon pictus. See African wild dog
 lynx 42
Lynx lynx. See lynx
Lyrurus tetrrix. See black grouse
- Macaca arctoides*. See stump-tailed macaque
Macaca assamensis. See Assamese macaque
Macaca fascicularis. See long-tailed macaque
Macaca fuscata. See Japanese macaque
Macaca mulatta. See rhesus macaque
Macaca radiata. See bonnet macaque
Macaca sylvanus. See barbary macaque
Macaca thibetana. See Tibetan macaque
 mackerel 46–47
macrotermes 243
 Macrotermitinae 297
Malurus cyaneus. See superb fairy-wren
Malurus splendens. See splendid fairy-wren
Manacus manacus. See white-bearded manakin
 mandrill 151
Mandrillus sphinx. See mandrill
Manorina melanophrys. See bell miner
 mantis shrimp 115
 mealybug 131
 medium ground finch 268
 meerkat 51–92, 119, 141, 152, 178–186, 205–212,
 234–241
Melanerpes formicivorus. See acorn woodpecker
Meleagris gallopavo. See wild turkey
 merlin 276
Merops apiaster. See European bee-eater
Merops bullockoides. See white-fronted bee-eater
 Mexican jay 186, 236
Microtus agrestis. See field vole
Monodon monocerus. See narwhal
 moose 160
 mound-building mouse 188
 mountain bluebird 95
 mourning cuttlefish 51
 mouthbrooding cichlids 281
Mungos mungo. See banded mongoose
Mus domestica. See house mouse
Mus spicilegus. See mound-building mouse
Mustela erminea. See stoat
 mycophagous beetle 189
 mycorrhiza 143
Myodes glareolus. See bank vole
Myotis bechsteini. See Bechstein's bat
Myotis myotis. See greater mouse-eared bat
Myotis septentrionalis 222
- naked mole-rat 119, 244
 narwhal 322
Nasua nasua. See coati
Neotropus nematopus 284

- Neogonodactylus bredini*. See mantis shrimp
Neolamprologus obscurus 245
Neolamprologus pulcher. See cooperative cichlid
Neolamprologus tetracanthus 274–275
Neotoma fuscipes. See dusky-footed woodrat
Nesomimus parvulus. See Galápagos mockingbird
Nestor notabilis. See kea
 Nicaragua cichlid 283
Nicrophorus vespilloides. See burying beetle
 North American beaver 188
 Northern bald ibis 148
 Northern paper wasp 245
 Norway rat 146, 152, 155–158, 165–171, 211, 286, 315
Notropis cornutus. See common shiner
Nycticeius humeralis. See evening bat
Nymphicus hollandicus. See cockatiel
- ocellated wrasse 86, 147, 317
Octodon degus. See common degu
Oecophylla. See weaver ant
Oncorhynchus tshawytscha. See Chinook salmon
Oncorhynchus kisutch. See coho salmon
Ophryotrocha diadema. See polychaete worm
 orange clownfish 75, 202
 orangutan 120, 151
Orcinus orca. See killer whale
 osprey 287
- Paguroidea*. See hermit crab
Pan paniscus. See bonobo
Pan troglodytes. See chimpanzee
Panthera leo. See lion
 paper wasp 72, 78, 80–81, 85, 110, 115, 130–135, 186
Papio cynocephalus. See baboon
Paracatenula 264
Paragobiodon xanthosomus. See emerald coral goby
Paranthropus robustus 322
Parulidae. See American wood warblers
Parus ater. See coal tit
Parus cristatus. See crested tit
Parus humilis. See ground tit
Parus major. See great tit
Parus montanus. See willow tit
Passer domesticus 50
Pavo cristatus. See peafowl
 peafowl 196
Pelecanus erythrorhynchos. See American white pelican
Pelvicachromis pulcher. See Kribensis cichlid
Pelvicachromis taeniatus 227–228
Pemphigus obesinymphae. See social aphid
 peregrine falcon 276
Perisoreus infaustus. See Siberian jay
Perissodus microlepis 277
- Peromyscus maniculatus*. See deer mouse
 Peron's tree frog 226
Petrochelidon pyrrhonota. See cliff swallow
Phaetusa simplex. See large-billed tern
Phalacrus substriatus. See mycophagous beetle
Philetairus socius. See sociable weaver
Philomachus pugnax. See ruff
Phoeniculus purpureus. See green woodhoopoe
Phyllostomus cabanisis. See Cabanis's greenbul
Phyllostomus hastatus 222
Pica nuttali. See yellow-billed magpie
Picoides borealis. See red-cockaded woodpecker
 pied babbler 11, 50, 51, 90, 294
 pied flycatcher 148
 pied kingfisher 75, 186–187
 pigeon 47
 pilot whale 188
Pimephales promelas. See fathead minnow
 pinyon jay 185
Pipra filicauda. See wire-tailed manakins
 platypodid 298, 307
 Platypodinae 297
Plectropomus leopardus. See coral trout
Plectropomus pessuliferus. See grouper
Plectropomus arealootus. See squaretail coral grouper
Poecilia reticulata. See guppy
 polar bear 69, 188
Polistes chinensis 85
Polistes dominula. See paper wasp
Polistes fuscatus. See Northern paper wasp
Polistes semenowi 72
Polistes versicolor 240
 polistine wasp 79
Polybia occidentalis 240
 polychaete worm 173, 179
 polyembryonic wasp 185
Polyrhachis 303
Pomacentrus. See damselfish
Pomatostomus ruficeps. See chestnut-crowned babbler
Pomatostomus temporalis. See grey-crowned babbler
Pongo pygmaeus. See orangutan
Porphyrio porphyrio. See pukeko
 Princess of Lake Tanganyika 147, 214, 251, 255, 262
Procyon lotor. See raccoon
Prunella modularis. See dunnock
Pseudomonas aeruginosa 222–223, 240
Psittacus erithacus. See African grey parrot
 pukeko 82
 pygmy sunfish 39
Pyrrhura orcesi. See El Oro parakeet
- rabbitfish 147
 raccoon 286
Ramphocinclus rachyurus. See white-breasted thrasher

- Rangifer tarandus*. See reindeer
Rattus norvegicus. See Norway rat
 raven 49, 149
 red fire ant 210
 red flour beetle 189
 red fox 269
 red squirrel 207
 red-backed vole 270
 red-breasted geese 276
 red-cockaded woodpecker 73, 186, 214
 redfronted lemur 75, 149, 194
 red-winged blackbird 149
 reed warbler 282–283
Regulus regulus. See goldcrest
 reindeer 153
 rhesus macaque 53, 151
Rhombomys opimus. See great gerbil
Rhynchonycteris naso 222
 rifleman 186
 river bullhead 233
 rook 149
Ropalidia marginata. See social wasp
 round-tailed ground squirrel 185, 197
Rousettus aegyptiacus. See Egyptian fruit bat
 ruddy turnstone 39
 ruff 201
Rvnchops niger. See black skimmer
- Saccopteryx bilineata* 222
Saguinus oedipus. See Saguinus oedipus
Salmo salar. See Atlantic salmon
Sancassania berleisei 57
 sand-coloured nighthawk 276
Scarus croicensis. See striped parrotfish
Scathophaga stercoraria. See dung fly
 Scolytinae 297
 Scombridae. See mackerel
 sea anemone 98
Sepia plangon. See mourning cuttlefish
Sericornis frontalis. See white-browed scrubwren
Serranus subligarius. See belted sandfish
Serranus tabacarius. See tobaccofish
Serranus tigrinus. See harlequin bass
Serranus tortugarum. See chalk bass
 Seychelles fody 31
 Seychelles warbler 25–34, 54, 88, 185, 189–192,
 204–216, 235–238
 short-finned pilot whale 96
 short-tailed fruit bat 49
Sialia currucoides. See mountain bluebird
Sialia mexicana. See western bluebird
 Siberian jay 185, 196–197, 215
 side-blotched lizards 210
Siganus corallinus. See rabbitfish
Sinosuthora webbiana. See vinous-throated
 parrotbill
Sitta pusilla. See brown-headed nuthatch
 slave-making ant 212
 small ground finch 268
 smooth-billed ani 84
 snowshoe hare 269
 sociable weaver 73, 91, 185, 188
 social aphid 96
 social cichlid See cooperative cichlid
 social wasp 238
Solenopsis invicta. See red fire ant
Somateria mollissima. See common eider
 sooty mangabey 150, 186
 spadefoot toad 273
 sparrowhawk 198
Spea bombifrons. See spadefoot toad
Spea multiplicata 273
Spermophilus beldingi. See Belding's ground
 squirrel
Spermophilus parryii. See Arctic ground
 squirrel
Spermophilus tereticaudus. See round-tailed ground
 squirrel
 sphynx blenny 233
 spice finches 50
 spider monkey 39
 spinynose sculpin 281
 splendid fairy wren 84
 spotted eagle ray 188
 squaretail coral grouper 188
Stenella coeruleoalba. See striped dolphin
Sterna supercilii. See yellow-billed tern
 stoat 280
 striated surgeonfish 288
 stripe-backed wren 30, 149, 186, 188
 striped dolphin 188
 striped parrotfish 59
Struthidea cinerea. See apostlebird
 stump-tailed macaque 150
 superb fairy-wren 73, 75, 149, 185, 188, 190–193,
 205, 214
 superb starling 87
Suricata suricatta. See meerkat
Symphodus ocellatus. See ocellated wrasse
Synodontis multipunctatus. See cuckoo catfish
- Taeniopygia guttata*. See zebra finch
 Tasmanian native hen 75, 194, 199
Tasmiasciurus hudsonicus. See red squirrel
Telmatochromis vittatus 231
 tessellated darter 179, 231
Tetrao urogallus. See capercaillie
Tetrix ceperoi 273
Tetrix subulata 273
Thalasseus bernsteini. See Chinese crested tern
Thalassoma bifasciatum. See bluehead wrasse
Thalasseus bergii. See greater crested tern
Theropithecus gelada. See gelada monkey
 three-spined stickleback 47, 148, 179, 231, 233

- Thyroptera tricolor* 222
 Tibetan macaque 151
 tobacconfish 148
Trachyostus ghanaensis 308
Tribolium castaneum. *See* red flour beetle
Tribonyx mortierii. *See* Tasmanian native hen
Trochilidae. *See* hummingbirds
 tufted capuchin 150
Turdoides bicolor 11
Turdus pilar. *See* fieldfare
Tyto alba. *See* barn owl
- Uria aalge*. *See* common guillemot
Urocitellus columbianus. *See* Columbian ground squirrel
Ursus maritimus. *See* polar bear
Uta stansburiana. *See* side-blotched lizard
- vampire bat 152, 161, 163, 166, 173–174, 315
 vervet monkey 126, 150
Vibrio bacteria 69
 vinous-throated parrotbill 188, 194
Vulpes vulpes. *See* red fox
- waterfowl 195
 weaver ant 303
 western bluebird 95, 186, 190, 214
 western gorilla 194
 white fronted bee-eater 185
 white-bearded manakin 188, 196
 white-breasted thrasher 188, 193
- white-browed scrubwren 185–186
 white-faced capuchin 150
 white-fronted bee-eater 190
 white-handed gibbon 151
 white-throated magpie-jays 188
 white-winged chough 11, 149, 186, 188, 194, 212
 wild turkey 196, 202
 willow tit 266
 wire-tailed manakins 226
Wolbachia 300
 wolf 42, 121
 woodpigeon 276
- Xyleborini 298
Xyleborinus saxeseni 298–299. *See* ambrosia beetle
Xyleborus affinis 305
Xylosandrus germanus 298. *See* ambrosia beetle
- yellow mongoose 188
 yellow-billed magpie 275
 yellow-billed tern 276
 Yuhina 84
Yuhina brunneiceps. *See* yuhina
- zebra 7, 149, 173, 287
 zebra finch 7, 149, 173
 zebrafish 39, 42
Zenaida aurita. *See* Zenaida dove
 Zenaida dove 39–40
 zooxanthellae 69, 143, 178