Index

adaptive management 3 active 353 case study 352-86 in species recovery 271 in the context of the TRIAD 297-8 in threatened species recovery 267-8 key attributes of 353 passive 352 adaptive management scheme 399 Adoxa moschatellina 237 Aegopodium podagraria 237 aggregated harvest pattern 367-9, 395 Alces alces 275, 357 allowable cut effect 284 alpha diversity as an indicator of restoration status 231-3 Ampedus cinnaberinus 83 Ampedus sanguinolentus 84 amphibians and crop production 73 as surrogates for biodiversity 71 spatial patterns in biodiversity 52 threatened 62, 64 threats to 54 Andes conservation in the 53 annual allowable cut 146, 284 applied conservation biology xi area requirements for viable populations 21 area-demanding species 88 Arum maculatum 237 Ascaphus truei 249 Aspergillus fumigatus 271 Atelopus carbonerensis 65-9 as a focal species 59, 63-5, 74-5 ATLAS simulation model 319

AUSRIVAS 251 Australian magpie 179 Baltic Sea region as a case study 111-14 examples of threat factors 119 barochoreous perennials 237 Bayesian statistics 257 Bayesian variable selection 171 BEAST 251 beetles associated with hollow trees 82, 87, 213, 214 click 84, 89, 214 hot spots for red-listed 93 litter-dwelling 82 long-horned 92, 213 red-listed 97 red-listed saproxylic 95 threatened and red-listed 96 before-after control-impact (BACI) design 255 benchmark conditions 148, 394 determining 31-2, 130 beta-diversity 54 Bialowieza Forest 95, 113 biodiversity definition 9 indicators of 79 biodiversity monitoring and reassessment of conservation targets 398 elements monitored 383 in Alberta, Canada 381-6 biological remnants in Turkey 305 biomonitoring 250-1 boreal forest natural region 356

CAMBRIDGE

Cambridge University Press 978-0-521-87709-1 - Setting Conservation Targets for Managed Forest Landscapes Edited by Marc-Andre Villard and Bengt Gunnar Jonsson Index More information

Index | 4°3

broken-stick model 169 brown creeper 141-4 brown treecreeper 173, 179 bryophytes 42 Cacatua roseicapilla 179 capercaillie 80, 83, 92 caribou "mountain" ecotype 273 habitat of "mountain" ecotype 274 model for "mountain" ecotype 276 woodland 146, 269 Castor canadensis 85 Castor fiber 84, 85 Catharus ustulatus 141–4 Certhia americana 141-4 Ceruchus chrysomelinus 95-6 challenges in conservation target setting choosing units to express targets 30, 35 determining benchmarks 30 selecting study design 31 setting the level(s) of organisation 30 Choristoneura fumiferana 289 Chtonicola sagittata 179 chytridiomycosis 74 Climacteris picumnis 173 climate change 72 coarse-filter approach 130, 145, 312 coastal forest 130 Cohen's kappa statistic 143 Colluricincla harmonica 172 colonisation ability 89 communicating research outcomes 180 communication value of a focal or umbrella species 121 competition apparent 275 connectivity xi and landscape structure 18-19 functional 3 structural vs functional 34-5 temporal dimension 396 conservation ambition 10, 22 levels of 10 conservation corridors 51-3 limits of 70 NorAndean 57, 58 conservation goal xii Conservation International 51 conservation planning at the global scale 50-75

ecosystem-oriented 129-30 effects of variation in information quality among scales 50 hierarchical levels in 398 conservation strategies critical issues for the design of 394-400 conservation targets approaches to 11 as proactive measures 9 case study: riparian buffer strips 40-5 community-level 16-17 definition 3 for categories of ecological parameters 4 for critical habitat features 4-5 for ecological processes 6 for habitat and ecosystem components 17-18 for landscape structure 5 for population parameters 5-6 genetic 11-14 implementation of 397 model-driven 22 natural disturbance-based 131, 134-8 population-level 15 rationale for their development 3 species-level 14 conservation value of a forest stand 228 co-occurrence patterns in resident forest birds 116 corridor xi cost-area relationship 331 crested bellbird 171, 179 crested pigeon 179 cryptogams 93 cultural landscapes 32 cumulative effects management of 379-81 of human activities I Dacelo novaeguineae 179 Daldinia loculata 88 dead wood 208-17 relationship with saproxylic species 213

dead wood volume 208–9 predicted 212 decay of dead wood modelling 210 deer 275 Delphi survey approach 122 Dendrocopos leucotos 91

404 | Index

Dendrocopos medius 98 Dendrocopos minor 92 dendroecological studies and forest fires 134 Dendroica caerulescens 188 Dendroica fusca 188 Dendroica virens 188 Dentocollis borealis 83, 112 detrended correspondence analysis (DCA) Dicaeum hirundinaceum 179 Dicamptodon tenebrosus 249 dispersal in herbaceous plants 236 dispersal ability 89 definition 89 dispersal limitation as a colonisation bottleneck 228 dispersal potential in fire-dependent species 87 dispersal propensity 87, 88 definition 89 dispersed harvest pattern 395 dose-response analogy in conservation biology 109, 122 dry open eucalypt forests case study: bird conservation in 165-78 Dryocopus martius 92 dynamic landscapes setting conservation targets for 344-6 eastern rosella 179 ECHO forest model 321 ecological benchmark areas assessing representativity of 376-7 ecological carrying capacity 267 ecological criteria and indicators 304 ecological disturbances 79 ecological integrity 111, 293 ecological memory 396 ecological processes xi managing for 84-6 ecological site selection case study 334-7 ecological thresholds 143 and conservation target setting 144-5 critique of 144 definition 169 ecology vs economics in conservation target setting 328-48

black spruce feathermoss 147 boreonemoral 113 hemiboreal 113 nemoral 113 ecosystem engineers 120 ecosystem management 145-6, 284, 294-6, 306 ecosystem-based management 357-8 landscape-level targets 365-8 stand-level targets 359-63 ecotones management for 84 edge effects 73 minimizing impacts of 73 effective population size 33 Elater ferrugineus as a model species 214-15 endangered species managing for 249-50 endemism in Andean amphibians 59 environmentally significant areas 377 Eopsaltria australis 171 epiphytic lichens 95, 146 effects of forest harvesting on 148 red-listed 95, 97 Eucalyptus spp 20 European beaver 84, 85 even-aged management alternatives to 146 compared to natural disturbance-based management 147 evenness as an indicator of restoration status 233 expert advice 4, 394 expert knowledge 122 expert opinion in conservation target setting 256 vs rules of thumb or models 10 extensive management in the context of the TRIAD 285 extinction debt 97-8 extinction thresholds 212-15 Ficedula parva 92, 95

fine- vs coarse-filter approaches advantages and disadvantages 34 fine-filter approach 145, 310–11 finite rate of increase of hihi population 272 fire history reconstruction 132, 133

ecoregion

Index | 405

fire regimes in eastern Canadian boreal forests 138 fish managing for 250 flagship species 122, 129 flycatcher red-breasted 92, 95 focal species 33 focal species approach 118-20 forest boreal mixedwood 292 northern temperate deciduous 292 forest certification criteria effects of application on dead wood volumes 212 forest configuration vs extent 176 forest cover effect on species occurrence 192 hypothetical effect on species abundance 178 forest fire regimes in boreal zone of eastern Canada 131-3 forest fires and management for biodiversity 84 forest fragmentation 72 by agriculture 164 natural vs anthropogenic 149 forest history and species distribution 86-7 forest landscape conceptualised 306 forest landscape modelling to set conservation targets 304 forest landscape stratification 319 map of 317, 318 forest management even-aged 130, 146 forest mosaics as the unit of study 163 composition of 164 configuration of 164 environmental variation 164 extent of habitat in 164 properties of 164-5 forest openness management for 83-4 forest planning strategic vs tactical vs operational 22 forest recolonisation colonisation bottlenecks during 228

Forest Stewardship Council certification system 81, 386 forest structure management of 82-4 forest values and stand development patterns 313 forestry balanced 284 new 277, 283 sustained-yield 113, 283 traditional intensive 293 FORPLAN model 320 fragmentation boreal forest 98 freshwater ecosystems setting conservation targets for 244-58 frog coastal tailed 249 functional connectivity stream gullies to maintain 72 functional groups 120–1 as surrogates for ecosystem structure and function 110 definition 235 in ecological restoration 234-9 functional measures as conservation targets 251-2 galah 179 Galium odoratum 87 gallery forests 72 gap analysis 376 global 51 gene flow 33 generalized additive models (GAMs) 18, 39 genes and target setting 33 genetic diversity 33 genetic resource management 33 genetic targets 12 geographical information systems (GIS) т88 to depict species ranges 39, 56 geophytes 237 GISFORMAN simulation model 319 Glaucidium passerinum 92 Glechoma hederacea 237 Glossopsitta concinna 179 golden-crowned kinglet 141 grazing and management for biodiversity 85

406 | Index

greater glider 21 green accounting value of TRIAD zoning 299 grey shrike-thrush 172, 179 grizzly bear 268 Grynocharis oblonga 83 guidelines to counter biodiversity loss 53 Gymnobelideus leadbeateri 21 Gymnorhina tibicen 179 habitat aggregation effects on population viability 217 habitat amount vs configuration 36 habitat and ecosystem targets 12 habitat degradation 149, 328 habitat fragmentation 131, 185 habitat loss 131 vs fragmentation 36 habitat loss and fragmentation forest bird response to 140 habitat predictability 207 habitat restoration 71, 221 habitat structure requirements for a breeding pair of woodpeckers 20 for possum nesting sites 21 habitat suitability index (HSI) 12 habitat suitability maps 189 habitat-based protection 252 harlequin toad 59 Harminius undulatus 216 HARVEST simulation model 136, 319 harvest system dispersed multi-pass 366 dispersed two-pass 366 harvesting diameter-limit 33 hemiboreal forest 130 hemicryptophytes 237 HERO forest model 321 hierarchical partitioning method 170 high conservation value forest 377 hihi 269 honeyeater black-chinned 179 regent's 176 white-plumed 171, 173 Hordelymus europaeus 87

incidence function 12, 173 index of biotic integrity 251 indicator species defined 230 of structures and processes 90 selecting 88-93 the need for 86-8 indicator species approach advantages and disadvantages 230-1 indicators herbaceous plants as 228 indicators of restoration status requirements for robust 229-30 indices of aquatic health analysis of trends in 257 instream flow policy 250 integrated landscape management 359 integriting economic value in conservation site selection 337-9 intensive management in the context of the TRIAD 285 Ips typographus 85 irreplaceability 51 IUCN Red List 54, 55 Categories 62 jacky winter 179 jay 115, 118 keystone species 20, 80, 85, 92, 120, 122, 129 Lamium galeobdolon 87 land stratification a priori 316 LANDIS to model fire 22 LANDIS forest model 321 landscape organism-centered perspective 1 definition 1 landscape ecology xi landscape history to predict biodiversity response 396 landscape pattern 168 landscape permeability 185 landscape planning for basic human needs 2 principles 2 landscape scale importance for management 161-2

Cambridge University Press

978-0-521-87709-1 - Setting Conservation Targets for Managed Forest Landscapes Edited by Marc-Andre Villard and Bengt Gunnar Jonsson Index

More information

Index | 407

landscape structure intercorrelation between metrics 165 management for conservation 173-8 landscape thresholds 185-204 as guides to set conservation targets 199-202 consistency across spatial extents 197-8 defined 186 geographical consistency 192-6, 200 influence of variable considered 199, 201-2 temporal consistency 196-7 tests of 186-7 variation among species 198-9, 201 landscape unit 163 landscape variables relative influence on bird incidence 172 landscape-level processes 71-4 Lathamus discolor 179 laughing kookaburra 179 Leadbeater's possum 21 legacies structural and compositional 147 level(s) of organisation selecting 32-5 Lichenostomus penicillatus 171, 173 lichens threatened and red-listed 96 life-history traits enhancing population persistence 235 for functional group approach 236 linear access corridors 380 Lobaria pulmonaria 88, 89, 95 local extirpation 72 local variation controlling for 193 locally weighted regression splines 191 logistic regression sensitivity to noise in data 37 long-term sustainable harvest level 284 mapping harvesting and fire 133 market value of land 328-9 matrix habitat 72, 129 matrix models to predict population dynamics 211 measurability of the population status of a species 121

Mercurialis perennis 231 mesofilter approach 312 metapopulation capacity 19 metapopulation concept 208 Microeca fascinans 179 Milium effusum 87 minimum viable metapopulation 12 minimum viable population 12 minimum viable population size 267 mistletoebird 179 mixedwood forest management of 384 modelling dynamic populations 215-17 models vs expert opinion or rules of thumb 10-11 moose 275, 357 multiple use forest management 307-24 framework 307 multiple-species approach to test natural disturbance-based targets 139-44 musk lorikeet 179 natural disturbance 12 and current forest management 131-4 regimes 22 setting targets for the restoration of 19 natural disturbance regime 81-2, 84 natural disturbance-based targets testing 139 natural range of variation 141, 372–6 natural range of variation model assumptions of 373-4 naturalness 111, 332 nest mite 271 nested subsets theory 112, 114 nestedness 117 nestedness analysis 114-15 nestedness temperature calculator 115 nitrogen and phosporus concentration in streams effects of forestry on 249 no net loss as a policy for fish habitat 250 nonlinear multidimensional scaling 233 nonlinearity in responses to landscape change 177 northern parula 188 Notiomystis cincta 269

Melanodryas cucullata 179

Melithreptus gularis 179

Melica uniflora 87

408 | Index

nuthatch European 94 red-breasted 141 Ocyphaps lophotes 179 Odocoileus sp 275 old forest retention of 369-72 retention, according to timber supply model 375 species sensitive to loss of 142 old-growth forest large live and dead trees in 82 optimal allocation of conservation efforts at the global scale 1 Oreoica gutturalis 171 organism-based approach to modelling species occurrence 189 Ornithonyssus bursa 271 Osmoderma eremita 87, 88, 96, 97 metapopulation dynamics of 216 ovenbird 141-3, 188-202 owl pygmy 92 Pachycephala inornata 179 Pachycephala rufiventris 171 paleoecological studies and forest fires 134 paleoecology and determination of benchmark conditions 32 Pardalotus punctatus 172 Paris quadrifolia 87 Parula americana 188 Peltis grossa 83 Petauroides volans 21 Petroica multicolor 171 Phlebia centrifuga as a model species 220 Phyto kolwensis 88 Picea abies forests 88 Picea mariana forests fire regime of 134 Picoides dorsalis 20, 141 Picoides tridactylus 20, 92 pied currawong 171 Platycercus eximius 179 polypore fungi 83, 88, 89

population viability analysis (PVA) 10, 12, 268-70 evaluation of 20 Potamostomus superciliosus 171 predator control 276 Primula elatior 87 priority sites identification of 56 protected area network and conservation costs 340 and species represented 336, 338 relative biodiversity in 343 protected areas 329 networks of 129 size required to maintain viable populations 219 spatial distribution 82 vs matrix 50 Pteromys volans 344 public acceptability of TRIAD zoning 299 QUAD approach 293 quantitative conservation targets for both reserves and the matrix 2 RANDNEST model 114, 115 range of natural variation 31 Rangifer tarandus caribou 269 Ranunculus ficaria 237 receiver-operating characteristic (ROC) analysis 143, 187, 190 described 20, 36-7 to determine threshold values 36 vs segmented logistic regression 202-3 recolonisation 72 recovery goals vs recovery targets 265-6 recovery of hihi as a case study 270-2 recovery of woodland caribou as a case study 273 recruitment limitation as a colonisation bottleneck 228 red-listed species 333 in protected areas networks 343 reference conditions for the conservation of freshwater ecosystems 251 in freshwater ecosystem management 253-4

Index | 409

reforestation 72 regression logistic 18, 143, 191 non-parametric multiplicative (NPMR) 18, 39 piecewise 38, 169 segmented logistic 187, 190 Regulus satrapa 141 relationships between species and substrates 219 reserve size and location factors influencing 70 reserves xii in the context of the TRIAD 286 vs matrix 2 residual structure retention 363-5 resilience of ecosystems 2 restoration ecological 227-39 forest 227 restoration ecology in freshwater ecosystems 254 restoration status of forest stands 229, 232 retention patches 21, 147, 149, 360-3 Rhyacotriton spp 249 riparian buffer strips 245 as movement corridors 45, 186 design of 31 stated conservation objectives for 41, 45 riparian buffer width guidelines for 40 RIVPACS 251 robin eastern yellow 171, 173, 179 hooded 179 scarlet 171 rules of thumb as quantitative conservation targets II vs expert opinion or models 10 sacred kingfisher 179 salamander coastal giant 249 torrent 249 saproxylic fungi modelling the occurrence of 216 saproxylic insects 146

saproxylic species factors influencing occurrence of 213–15 scale and species response 94-5 scenario planning 291 scientific objectivity 31 scientific training and sustainable forest management 399-400 seismic lines ecological footprint of 380-1 Seiurus aurocapilla 141, 188–202 SELES 297 SELES modelling environment 136 setting conservation targets approaches for 79-80 in dynamic habitats 207–22 politics and science 80-1 siberian flying squirrel as a case study 344-6 trade-offs between conservation and forestry 346 silvicultural systems examples of 295 similarity in species composition as an indicator of restoration status 233 simulating landscape dynamics 137 simulation modelling of forest dynamics under a fire regime 138 simulation models xi sink habitats 117 Sitta canadensis 141 Sitta europaea 94 Smicrornis brevirostris 179 socio-economic considerations in conservation target setting 393 tradeoffs between ecological principles and 6 socio-economic factors and conservation corridors 51-3 socio-economic parameters in conservation target setting xii SORTIE 297 spatial autocorrelation controlling for 193 spatial harvesting pattern 314 spatial patterning of cutover areas 148 spatial requirements in forest landscape models 320 spatially-explicit modelling of species distribution 188

410 | Index

species as surrogates for ecosystem structure and function 110 species at risk 33 species co-occurrence patterns 118 species diversity as an indicator of restoration status 233 species or species assemblages selecting 33-4 species recovery targets conceptual framework 266 species-area relationship 23, 330-3 species-based management 145-6 species-costs relationship in conservation site selection 338 species-level conservation vs ecosystem management 264 species-level targets 12 species-specific modelling at the landscape scale data needed for 218-19 SPECTRUM model 320 spotted owl 316 spotted pardalote 172 spruce budworm as a basis for silviculture 289 stand models 212 STANLEY forest model 321 statistical power in field experiments 255 statistical thresholds as conservation targets 39 Stellaria nemorum 237 stitchbird 269 stream-riparian interactions 246 Strepera graculina 171 strict protection as a forest conservation strategy 81-2 study design and target setting 35 sustainable forest management 352 setting conservation targets for 93 sustainable forestry 75, 79 sustained-yield forestry 352 swift parrot 179 systematic conservation planning 55, 67, 264, 330 target for large live and dead trees 82

for old forest 372

landscape 307 management action 267 target setting approaches examples 20-2 targets xi arbitrary 2 community-level 12 integration of 394-5 taxonomic incongruence 95 taxonomic representativeness lack of, in selection of focal species 123 temporal continuity 87 of forest structures 86 Tetrao urogallus 80 threatened species recovery setting conservation targets for 264-78 threats to freshwater organisms 247-8 threshold in forest cover 170 in species richness of woodland birds 169 threshold detection statistical methods for 190 threshold detection methods robustness to biases 39 threshold response 177 thresholds absolute 202 as conservation targets 34 as targets for conservation 169-70 definition 36 in bird response to landscape structure 161-80 in occurrence vs demographic parameters 204 influence of spatial extent considered 198 interpretation of 203-4 potential insight from 189 temporal consistency 197 to guide conservation target setting 36 thrush Swainson's 140-1, 143 timber vs non-timber values 285 time lags 97-8 tit great 115 marsh 115, 118 Todiramphus sanctus 179

Index | 411

trade-offs among species 329 between multiple ecological objectives 341-3 in alternative land uses 328 in study design 38 Tragosoma depsarium 83 tree mortality rates 209-10 treecreeper 115 trees large live and dead 82-3 TRIAD approach 283-301, 358-9, 376-9 TRIAD zoning in Maine 286-8 TRIAD zoning in New Brunswick 288-92 TRIAD zoning in Québec triad zonings examples of 290 tropical agroforestry 33 tropical rainforest effects of human activities on 51-3 umbrella species 117–18, 122, 129, 218 uncertainty incorporation into PVA models 269-70 understory plant species as indicators of ecological restoration 228

understory protection 385 uneven-aged management 147 ungulates 146 value-driven pressures and conservation target setting 31 warbler blackburnian 188, 191–202 black-throated blue 188, 191-202 speckled 179 water quality guidelines 248-9 weebill 179 whistler Gilbert's 179 rufous 171 white-browed babbler 171, 178, 179 white-winged chough 173 wildlife management and biological conservation 129 woodland key habitats 19 woodpecker American three-toed 20, 141 black 92, 115 Eurasian three-toed 20, 92, 213 lesser spotted 92, 115 middle spotted 98 white-backed 91, 213 WOODSTOCK model 320, 374

Upis ceramboides 83 Ursus arctos 268

Xanthomyza phrygia 176