

INDEX

INDEX	I
AUTHORS	XI
PRESENTATION I	XVII
PRESENTATION II	XIX
Chapter 1	
EXTRACTING LESSONS FROM REAL LIFE EXPERIENCES TO CONSERVE BIODIVERSITY IN THE AMERICAS	1
<i>Eugenio Figueroa B.</i>	
1. ANTECEDENTS	1
2. THE CONTENT	3
3. SOME OVERALL CONCLUSIONS AND LESSONS	25
REFERENCES	27
Chapter 2	
ECONOMIC AND POLITICAL ECONOMY CONSIDERATIONS FOR SOCIAL DECISION MAKING TO PROTECT BIODIVERSITY	31
<i>Eugenio Figueroa B.</i>	
1. INTRODUCTION	31
2. OBSTACLES TO MEETING SOCIAL BIODIVERSITY CONSERVATION CHALLENGES	32
2.1. The need for conservating Biodiversity	32
2.2. Uncertainties and Biodiversity Conservation	33
2.3. A New Paradigm for Biodiversity Conservation	35
3. BIODIVERSITY CONSERVATION TARGET SETTING	37
3.1. Defining Conservation Purposes and Goals	37
3.2. Benefit and Costs of Biodiversity Conservation and Conservation Goals	38
3.3. Biodiversity Conservation and Social Tradeoffs	39
4. IMPLEMENTING BIODIVERSITY CONSERVATION	41
4.1. Democratic Decision Making and Biodiversity Conservation Implementation	42
REFERENCES	44
Chapter 3	
PROTECTING CACTI: A PENDING AND URGENT TASK IN CHILE'S BIODIVERSITY CONSERVATION	47
<i>Helmut E. Walter</i>	
1. INTRODUCTION	47
1.1. The Cactus Family	47
1.2.a. The relevance of cacti for their environment	48

1.2.b. The relevance of cacti for human beings: a brief summary of cactus ethno-botany	49
1.2.b.1. The natural uses of cacti	49
1.2.b.2. Cactus cultivation and collection	50
1.2.b.3. Cacti and tourism in Chile	51
2. THE CONSERVATION STATUS OF CHILEAN CACTI	52
2.1. Phytogeography, Diversity and Endemism in Chilean Cacti	52
2.1.a. Regional cactus distribution at generic and specific levels	52
2.1.b. Cactus endemism and species richness in Chile	55
2.2. The Concept of Threatened Species	58
2.2.a. The UICN categories	58
2.2.b. The conservation status of Chilean cacti at specific level	60
2.2.c. The reasons why cacti are threatened in Chile	61
2.2.c.1. "Natural" threats	61
2.2.c.2. Some selected man-made threats	63
2.2.d. The importance of cactus protection	65
3. STATUS OF CHILEAN CACTUS CONSERVATION POLICIES	66
3.1. General Notes	66
3.2. In-Situ Conservation of Cacti in Chile	68
3.2.a. National Parks	68
3.2.b. Priority of endemic species and Priority Sites	69
3.2.c. Mining and industry	70
3.2.d. Reintroduction and reinforcement	70
3.3. Ex-Situ Conservation of Cacti	70
3.3.a. Botanic Gardens	70
3.3.b. Other collections	71
3.3.c. Seed banks	71
4. SUGGESTIONS AND RECOMMENDATIONS CONCERNING CACTUS CONSERVATION IN CHILE	72
4.1. Ex-Situ Conservation	72
4.2. In-situ Conservation	73
4.2.a. National Parks	73
4.2.b. Cooperation with land owners	73
4.3. Scientific Conservation Projects	74
4.3.a. Priority conservation list	74
4.3.b. Reinforcement and reintroduction	74
4.3.c. Extension of National Parks and upgrading of Priority Sites	75
4.3.d. Studies on Chilean cacti	75
4.3.e. Systematics based on molecular data	75
4.3.f. National Botanic Garden	76
4.4. Conservation and bureaucracy	76
REFERENCES	78

Chapter 4

THE PRESERVATION OF EVOLUTIONARY VALUE OF CHILEAN AMPHIBIANS IN PROTECTED AREAS	81
<i>Christian Jofré and Marco A. Méndez</i>	
1. INTRODUCTION	81
2. THEORETICAL BASES	83
2.1. Amphibian Conservation at National and Global Scales	83
2.2. The Protected Areas in Chile and Their Role in the Conservation of Amphibians	84
2.3. Phylogeny and Conservation	85
3. METHODOLOGICAL ASPECTS	86
3.1. Compilation of Distribution Data for Protected Areas	86
3.2. Measures of Phylogenetic Diversity Based on Nodes	87
3.3. Cladograms To Calculate the W Index at Different Taxonomic Scales	88
4. THE CURRENT DIVERSITY, CONSERVATION STATE AND DISTRIBUTION OF ANURANS IN CHILE	88
4.1. Diversity and Endemism	88
4.2. Conservation States and Population Tendencies	89
4.3. Distribution	91
4.4. Lack of Representation in Protected Areas	92
5. EVALUATING REPRESENTATION USING THE INDEX OF PHYLOGENETIC SINGULARITY (W)	96
6. RECOMMENDATIONS FOR AN ADEQUATE PROTECTION OF THE EVOLUTIONARY VALUE OF CHILEAN AMPHIBIANS	102
7. CONCLUSIONS	103
ACKNOWLEDGEMENTS	104
REFERENCES	105

Chapter 5

INSTITUTIONS AND BIRD CONSERVATION IN CHILE	113
<i>Cristián F. Estades and Eduardo Pávez G.</i>	
1. INTRODUCTION	113
2. CHILEAN WOODSTAR (<i>Eulidia yarrellii</i>)	114
3. ANDEAN CONDOR (<i>Vultur gryphus</i>)	115
4. PERUVIAN TERN (<i>Sterna lorata</i>)	117
5. RUDDY-HEADED GOOSE (<i>Chloephaga rubidiceps</i>)	119
6. ALBATROSSES (<i>Procellariiformes</i>)	121
7. DISCUSSION	122
7.1. The Passive Approach to Conservation of Chilean Institutions	123
7.2. Regulatory framework	123
7.3. No information, no conservation	125
7.4. The role of privates and communities	126
7.5. Challenges	127
ACKNOWLEDGEMENTS	128
REFERENCES	129

Chapter 6

THE INVASION OF NON-NATIVE PLANTS IN CHILE AND THEIR IMPACTS ON BIODIVERSITY: HISTORY, CURRENT STATUS, AND CHALLENGES FOR MANAGEMENT	133
<i>Aníbal Pauchard et. al.</i>	
1. INTRODUCTION	133
2. HISTORY OF PLANT INVASIONS IN CHILE	135
3. INVASIONS OF PLANTS IN CHILE: THE CURRENT STATUS	138
3.1. How many, Which and Where are the invasive Olant?	138
3.2. What Has Been Studied about Invasive Plants?	141
3.3. What Are the Impacts of Invasive Plants on Biodiversity?	142
4. PUBLIC MANAGEMENT OF INVASIVE PLANTS IN CHILE: THE CURRENT SITUATION	144
4.1. National and International Regulatory Framework for the Control of Non-native Species	144
4.2. Pest Risk Analysis (PRA) of the Agricultural and Livestock Service (SAG)	147
5. PUBLIC MANAGEMENT OF INVASIVE PLANTS IN CHILE: NEW SCENARIO	148
5.1. Integrated National Program for Prevention, Control and Eradication of Invasive Non-native Species, Ministry of Environment	148
5.2. Invasive Species Risk Analysis of the Ministry of Environment (MMA)	150
5.3. Non-native species and the Bill that creates the Department of Biodiversity and Protected Areas (SBAP)	152
6. RECOMMENDATIONS FOR ADDRESSING THE PROBLEM OF INVASIVE PLANTS	152
7. CONCLUSIONS	155
ACKNOWLEDGMENTS	156
REFERENCES	157

Chapter 7

INVASIVE ALIEN SPECIES: BUILDING A STATE STRATEGY FOR SAO PAULO, BRAZIL	167
<i>Cristina Azevedo and Michele Dechoum</i>	
1. INTRODUCTION	167
2. THE ELABORATION OF A STRATEGY PROPOSAL FOR THE STATE OF SÃO PAULO THE PROPOSAL ELABORATION PROCESS	172
2.1. Elaboration of the List of Invasive Alien Species (IAS) with Occurrence Recorded in the State of São Paulo	173
2.2. Elaboration of the State of São Paulo Strategy for Invasive Alien Species	176
3. A STATE STRATEGY PROPOSAL FOR INVASIVE ALIEN SPECIES	178
3.1. Technical Components	178
3.1.1. Prevention, early detection and fast response	178

3.2. Management Components	185
3.2.1. Coordination and integration	185
3.2.2. Roles and responsibility of the professionals involved	185
3.2.3. Establishment of priorities and planning	185
3.2.4. Monitoring and evaluation of the state strategy	186
3.2.5. Resources for implementation	186
4. THE PROPOSAL DISCUSSION PROCESS	186
5. NATIONAL CONTEXT	187
6. IMPLEMENTATION OF THE PROPOSAL AND CHALLENGES	190
7. CONCLUSIONS	192
REFERENCES	193
ANNEX	195

Chapter 8

SCALING-UP MARINE COASTAL BIODIVERSITY CONSERVATION IN CHILE: A CALL TO SUPPORT AND DEVELOP ANCILLARY MEASURES AND INNOVATIVE FINANCING APPROACHES	199
<i>Stefan Gelcich et. al.</i>	
1. INTRODUCTION	199
2. COASTAL FISHERY MANAGEMENT SYSTEMS AS ANCILLARY INSTRUMENTS TO SCALE-UP MARINE BIODIVERSITY CONSERVATION	202
3. MUNICIPAL CONSERVATION INITIATIVES AS ANCILLARY INSTRUMENTS TO SCALE-UP MARINE BIODIVERSITY CONSERVATION	206
4. THINKING TOWARDS THE FUTURE: A CALL TO DEVELOP FINANCING SCHEMES FOR ANCILLARY MARINE BIODIVERSITY CONSERVATION INITIATIVES	210
5. CONCLUSION: A CALL FOR A PARADIGM SHIFT IN MARINE CONSERVATION POLICY	214
ACKNOWLEDGMENTS	215
REFERENCES	216

Chapter 9

BIODIVERSITY CONSERVATION IN THE GALÁPAGOS ISLANDS, ECUADOR: EXPERIENCES, LESSONS LEARNED, AND POLICY IMPLICATIONS	221
<i>C. Josh Donlan et. al.</i>	
1. INTRODUCTION	221
2. BACKGROUND	222
3. ORGANIZATIONAL STRUCTURE AND FUNDING	226
4. CONSERVATION ACTIONS AND OUTCOMES	228
5. ORGANIZATIONAL COORDINATION, PERFORMANCE AND CHALLENGES	231
6. ECONOMICS OF PROJECT ISABELA	233
7. LONG-TERM CAPACITY BUILDING	233
8. CONCLUSIONS	235

ACKNOWLEDGEMENTS	236
REFERENCES	237
Chapter 10	
THE CONSERVATION AND RESTORATION OF THE MEXICAN ISLANDS: AN OVERALL SUCCESS STORY WITH SOME FAILURES, LESSONS LEARNT, AND POLICY RECOMMENDATIONS	241
<i>Alfonso Aguirre-Muñoz et. al.</i>	
1. INTRODUCTION	241
2. THE VALUE OF THE MEXICAN ISLANDS	243
3. AN OVERALL SUCCESS STORY	245
4. SOME FAILURES AND LESSONS LEARNT	253
5. POLICY RECOMMENDATIONS	255
REFERENCES	257
Chapter 11	
LESSONS, CHALLENGES AND POLICY RECOMMENDATIONS FOR THE MANAGEMENT, CONSERVATION AND RESTORATION OF NATIVE FORESTS IN CHILE	259
<i>Antonio Lara et. al.</i>	
1. INTRODUCTION	259
2. NATIVE FOREST USES	262
2.1. Native Forest Goods and Services	262
2.1.1 Energy generation (Fuelwood)	263
2.1.2 Industrial use of wood	264
2.1.3 Harvest of non-timber forest products (NTFP)	265
2.1.4 Ecosystem service (ES) production and evaluation	266
3. POLICY, LEGISLATION AND GOVERNMENT PROGRAMS RELATED TO NATIVE FORESTS	268
3.1. Policy and Forest Legislation	268
3.2. Native Forest Conservation Instruments and Mechanisms in Chile	270
3.2.1. Public Instruments	272
3.2.2. Funding mechanisms and international transfers	277
3.2.3. Programs based on incentives associated with the Private sector and public-private collaborations	278
4. CONCLUSIONS AND RECOMMENDATIONS	286
4.1. Conclusions	286
4.1.1. Synthesis and balance in the situation of Native Forests	286
4.2. Effectiveness of Programs to Promote Conservation and Management of Native Forests	287
4.3. Recommendations	288
ACKNOWLEDGEMENTS	294
REFERENCES	295

Chapter 12

IMPROVING PUBLIC POLICIES FOR THE RESTORATION OF RIPARIAN ECOSYSTEMS IN PRIVATE PROPERTIES: THE BIODIVERSITY CONSERVATION PROGRAM OF THE STATE OF SAO PAULO, BRAZIL 301
Thiago Hector Kanashiro Uehara and Helena Carrascosa von Glen

1. INTRODUCTION 301

2. A SCENARIO OF DEGRADATION AND THE PLANNING OF THE PRRE 302

2.1. The Riparian Areas of Permanent Preservation: Degraded Areas Although Legally Protected 302

2.2. Isolated Initiatives and the Prevalence of Command and Control Instruments 305

2.3. The Formulation of the PRRE: Objectives, Structure and Procedures 307

3. THE NEW PROGRAM FOR RESTORING RIPARIAN ECOSYSTEM OF THE STATE OF SAO PAULO 311

3.1. The Ecosystem Restoration Agenda Integrating the Climate Change Law and The New Organizational Structure of the SSE 312

3.2. Other initiatives of the state, municipalities and the Productive sector 313

4. FINAL CONSIDERATIONS: PRRE'S STRENGTHS, WEAKNESSES AND RECOMMENDATIONS 315

4.1. PRRE Strengths 317

4.2. PRRE Weaknesses 317

4.3. Recommendations for Policymakers and Program Evaluators 318

4.3.1. Some notes about public management 318

4.3.2. Obtaining financial resources 319

4.3.3. Building partnerships 319

4.3.4. Participation 320

4.3.5. Communication, information and education strategies 320

4.3.6. Monitoring and evaluation activities 321

REFERENCES 323

Chapter 13

AN OVERVIEW OF PUBLIC POLICIES AND RESEARCH ON ECOLOGICAL RESTORATION IN THE STATE OF SÃO PAULO, BRAZIL 325
Giselda Duran and Antonio Carlos Galvao de Melo

1. A BRIEF HISTORY OF BRAZILIAN RESTORATION 325

1.1. The Pioneer Voluntary Initiatives 325

1.2. Restoration Demanded to Compensate Foreknown Environmental Damage 329

1.3. Requirement for Reparation of Unauthorized Environmental Damages 332

1.4. The Era of Certification and Environmental Marketing 332

1.5. An Era Yet To Come: Financial Compensation for

Volunteer Restoration	333
2. BIOMES, RESTORATION GOALS, TECHNIQUES AND EXTENSION: NATIONAL AND STATE CONTEXT	333
2.1. Atlantic Forest	334
2.2. Cerrado–The Brazilian Savanna	336
2.3. Other Vegetation Types in Brazil	336
3. MAIN CURRENT OBSTACLES TO ECOLOGICAL RESTORATION	337
3.1. African Grasses: The Hardest Biotic Obstacle to Restoration Success	337
3.2. Climate: The Dry Season As The Main Abiotic Filter	339
3.3. After Care: Fire, Livestock, Leaf-cutting Ants	340
3.4. Insufficient Trained Personal (Project and Practice)	340
3.5. High Costs: Who Should Share The Bill?	340
4. THE HIGH POTENTIAL OF NATURAL REGENERATION PROCESSES	341
4.1. Natural Regeneration on Abandoned Lands (Passive Restoration)	341
4.2. Regeneration of Native Species Under Commercial Forestry Stands	343
4.3. Natural Enrichment of Restored Areas	344
5. GAPS IN THE SCIENCE AND PRACTICE OF ECOLOGICAL RESTORATION IN BRAZIL	345
5.1. Hot Topics For Science	345
5.2. Challenges For Practice	346
6. POLICIES TO ACHIEVING MORE AND BETTER RESTORATION	347
6.1. Priority Areas For Restoration	347
6.2. Priority Actions For the Government	348
ACKNOWLEDGEMENTS	348
REFERENCES	349

Chapter 14

PRIVATE CONSERVATION, THE EXAMPLE THAT THE WILDLIFE CONSERVATION SOCIETY BUILDS FROM TIERRA DEL FUEGO <i>Bárbara Saavedra, Javier A. Simonetti and Kent H. Redford</i>	357
1. INTRODUCTION	357
2. BIRTH AND ORIGIN OF KARUKINKA	359
3. ESTABLISHMENT: KEYS TO INTEGRATION. STRATEGIC, LOCAL, GLOBAL ALLIANCES	360
4. VALUES AND THREATS: CHALLENGES THAT ARE OPPORTUNITIES FOR CONSERVATION	363
5. STRATEGIC PLANNING: KARUKINKA BIODIVERSITY MANAGEMENT	367
6. RESTORATION OF TIERRA DEL FUEGO FORESTS, WATER COURSES AND PEAT BOGS THROUGH BEAVER ERADICATION	370
7. PATAGONIAN PEAT BOGS, LOCAL VALUE AND GLOBAL SERVICES	374

8. WCS'S VISION FOR THE COASTAL CONSERVATION OF PATAGONIA, THE ADMIRALTY SOUND	376
9. CROSS CUTTING TOOLS: PUBLIC USE AND EDUCATION FOR CONSERVATION	380
10. FINAL CONSIDERATIONS	384
REFERENCES	385

Chapter 15

A NATURE CONSERVATION INITIATIVE IN A YUNGAS COMMUNITY OF NORTH-WESTERN ARGENTINA: LESSONS ON THE IMPORTANCE OF ENGAGEMENT AND PARTICIPATION IN THE DESIGN AND DEVELOPMENT OF FOREST PLANS	393
<i>Elena Ianni, Lucio R. Malizia and Davide Geneletti</i>	
1. INTRODUCTION	393
2. LOS NARANJOS IN THE YUNGAS: A DYNAMIC SOCIO-ECOLOGICAL SYSTEM	396
3. PROJECT CONTEXT	398
4. PROJECT IMPLEMENTATION AND OUTCOMES	400
5. DISCUSSION AND CONCLUSIONS	404
ACKNOWLEDGMENTS	409
REFERENCES	410

Chapter 16

THE ROLE OF MANAGEMENT PLANS CONTRIBUTING TO BIOLOGICAL CONSERVATION: THE EXPERIENCE OF THE MANAGEMENT PLANS CENTER OF THE SAO PAULO STATE FORESTRY FOUNDATION	413
<i>Cristiane Leonel et. al.</i>	
1. INTRODUCTION	413
2. MANAGEMENT PLANS IN SAO PAULO'S CONTEXT	414
3. THE MANAGEMENT PLANS CENTER: SUCESSFUL AND FAILED EXPERIENCES	415
3.1. Priorities	416
3.2. Financial Resources	416
3.3. Timing	417
3.4. Forms of contracting services	417
3.5. Unsolved questions that make the planning process more complex	417
4. THE PLANNING PROCESS	418
5. THE PARTICIPATORY CHARACTER OF THE ENVIRONMENTAL PLANNING	419
6. DIAGNOSIS	423
7. ZONING	425
8. MANAGEMENT PROGRAMS	430
8.1. Organizational Management Program	431
8.2. Protection and Surveillance Program	431
8.3. Socioenvironmental Interaction Program	432

8.4. Public Use Program and Environmental Education	434
8.5. Land Tenure Regularization Program	435
8.6. Natural and Cultural Patrimony Research & Management Program	436
9. THE MANAGEMENT PLANS APPROVAL	437
10. THE MANAGEMENT PLANS EFFECTIVENESS ASSESSMENT AND MONITORING	437
11. CONCLUSIONS	439
ACKNOWLEDGEMENTS	441
REFERENCES	442

Chapter 17

INBIO AND THE BIODIVERSITY CONSERVATION EXPERIENCE IN COSTA RICA <i>Randall García</i>	447
1. INTRODUCTION	447
2. THE NATIONAL BIODIVERSITY INVENTORY	450
3. BIO-PROSPECTING AND THE SUSTAINABLE USE OF BIODIVERSITY	452
4. BIO-LITERACY	457
5. INFORMATION MANAGEMENT	458
6. LAND MANAGEMENT	459
7. THE INTERNATIONAL ROLE	461
8. INSTITUTIONAL DEVELOPMENT	463
9. FINAL COMMENTS	466
REFERENCES	469

Chapter 18

TAKING BIODIVERSITY TO SCHOOL <i>Jorge V. Crisci and Liliana Katinas</i>	471
1. INTRODUCTION	471
2. WHY TAKING BIODIVERSITY TO SCHOOL?	472
3. WHY BIOLOGICAL SYSTEMATICS?	474
4. WHY EDUCATION?	477
5. PREVIOUS SUCCESSFUL ATTEMPTS TO TAKE BIODIVERSITY TO SCHOOL	479
5.1. Order and Diversity in the Living World: Teaching Taxonomy and Systematics in School	479
5.2. Climbing the Tree of Life: Taxonomy and Phylogeny for High School Biology	483
6. CONCLUSIONS	487
REFERENCES	490
Appendix 1	491
Appendix 2	495
Appendix 3	499
Appendix 4	505