

Contents

1	Ecosystem Services (ES): More than Just a Vogue Term?	1
2	Development and Fundamentals of the ES Approach	13
2.1	Key Terms	14
2.2	ES in Retrospect	19
2.3	Values and Services of Nature for Humans	25
	References	31
3	Conceptual Framework	35
3.1	Properties, Potentials and Services of Ecosystems	36
3.1.1	The Cascade Model in the TEEB Study	36
3.1.2	The EPPS Framework	36
3.1.3	The Application of the EPPS Framework–The Example ‘Mountain Meadow’	44
3.2	Classification of ES	45
3.2.1	Introduction	45
3.2.2	Provisioning Services	46
3.2.3	Regulation Services	46
3.2.4	Sociocultural Services	46
3.2.5	Additional Classification Aspects	49
3.3	Space and Time Aspects of ES	53
3.3.1	Fundamentals, Control Scheme	53
3.3.2	Case Study: EU-Water Framework Directive (WFD) and ES	59
3.4	Landscape Services	65
	References	69
4	Ascertainment and Assessment of ES	75
4.1	Indicators and Quantification Approaches	76
4.1.1	Introduction	76
4.1.2	Ecosystem Service Supply and Demand Assessment at the Landscape Scale–the ‘Matrix’	77
4.1.3	Conclusions and Outlook	82
4.2	Approaches to the Economic Valuation of Natural Assets	85
4.2.1	Principles of Economic Valuation	85
4.2.2	The Total Economic Value	90
4.2.3	Valuation Methods and Techniques	91
4.2.4	Conclusion	103
4.3	Scenario-Development and Participative Methods	104
4.3.1	Basics and Fields of Application	104
4.3.2	Framework of Scenario Development	105
4.3.3	Participation and the Case Study Görlitz	108
4.4	Complex Analyses, Evaluation and Modelling of ES	110
4.4.1	Background	110
4.4.2	Energy Crop Production–A Complex Problem for Assessing ES	112
4.4.3	Application of Models of InVEST to Assess Ecosystem Services	118
4.5	Communicating ES	126

4.5.1	The Importance of Communication	126
4.5.2	'Ecosystem Services' as an Umbrella Term for Communicative Intent.....	127
4.5.3	Government and the Market Instead of Communications?.....	128
4.5.4	Communications Efforts as an Approach to the Shaping of Environmental Sciences.....	129
	References	136
5	Governing Biodiversity and Ecosystem Service Provision	145
5.1	Policy Mixes for Biodiversity Conservation and Ecosystem Service Management	146
5.1.1	Why Use a Policy Mix?	146
5.1.2	A Well-Equipped Toolbox of Policy Instruments	147
5.1.3	Assessing Instruments for Biodiversity Conservation and Ecosystem Service Management in Policy Mixes.....	148
5.2	Selected Financial Mechanisms: Payments for Ecosystem Services and Ecological Fiscal Transfers	155
5.2.1	Payments for Ecosystem Services	156
5.2.2	Ecological Fiscal Transfers	160
5.3	Integrating the Concept of Ecosystem Services into Landscape Planning	165
5.3.1	Linking Ecosystem Services with the Landscape Plan	166
5.3.2	Implementation in Practice—Testing the Example of the Service 'Erosion Protection'	167
5.4	Governance in Nature Conservation	172
5.4.1	Governance and Protection of Biodiversity.....	172
5.4.2	The Project GEM-CON-BIO	173
	References	180
6	Land Use, Maintenance and Protection to Ensure ES	185
6.1	Concept for the Selection of Case Studies	187
6.2	Assessment of Selected Services of Agro-Ecosystems	189
6.2.1	Introduction	189
6.2.2	Agri-Environmental Measures: The AEMBAC Methodology.....	189
6.2.3	Agro-economic Evaluation of Landscape Plans.....	196
6.2.4	Species-Rich Grassland Services.....	200
6.3	Economic Benefit Valuation of the Influence of a Forest Conversion Programme on Ecosystem Services in the Northeastern Lowlands of Germany	208
6.3.1	Introduction	208
6.3.2	Raw Wood Production	209
6.3.3	Carbon Sequestration	211
6.3.4	Scenic Beauty and Recreation Values	212
6.3.5	Synopsis and Discussion	213
6.4	Urban Ecosystem Services: Leipzig as a Case Study	216
6.4.1	Urban Ecosystem Services and Urban Land Use: A Complex Nexus	217
6.4.2	An Example of Local Climate Regulation.....	218
6.4.3	An Example of Flood Regulation	218
6.4.4	An Example of Carbon Sequestration in the Urban Area—Reducing the Ecological Backpack of the City?.....	220
6.4.5	An Example of the Recreational and Nature Experience.....	221
6.5	Cultural Landscapes and their Ecosystem Services	224
6.5.1	The Example of Orchard Meadows in the Swabian Alb Biosphere Reserve.....	224

6.5.2	Calculation of Landscape Management Measures and Costs	231
6.6	Specific Nature Protection and Development Strategies.	240
6.6.1	Nature Conservation and Ecosystem Services	240
6.6.2	Soil and Water Protection	258
6.6.3	Economic Valuation of Ecosystem Services–The Case of Wetland Restoration Along the German Elbe River.	264
6.6.4	Peatland Use in Mecklenburg-Western Pomerania, Germany: Monetarization of the Ecosystem Service Climate Protection	273
6.7	Systematisation of the Case Studies	280
	References	283
7	Recommendations and Outlook	293
7.1	Work Steps for the Analysis and Evaluation of ES	294
7.2	Future Challenges Regarding ES	299
	References	304
	Index	307