Conservation of Living Nature and Resources:

Problems, Trends, and Prospects

With 36 Figures and 34 Tables

Springer-Verlag
Berlin Heidelberg NewYork
London Paris Tokyo
Hong Kong Barcelona
Budapest

Contents

Part I		
	on the Biosphere	7
1.1	Use and Transformation of Land Surface	7
1.2	Exploitation of Natural Resources	
	and Pollution of the Biosphere	8
2	Molecular-Genetic Level	18
2.1	Effects on Structural and Functional Systems	
	of the Cell	18
2.2	Biotransformation and Biodegradation of Pollutants	31
3	Problems at the Ontogenetic Level	39
3.1	Changes in Embryogenesis	39
3.2	Disturbance of Growth	41
3.3	Disturbance of Reproduction	43
3.4	Metabolic Disturbances, Poisoning and Diseases	46
3.5	Conclusions	57
4	Problems at the Species-Population Level	59
4.1	General Characteristics of Species Disappearance	59
4.2	Causes of Species Disappearance	73
4.3	Importance of the Minimal Number of the Population	96
4.4	Conclusions	98
5	Problems at the Ecosystem Level	99
5.1	Changes in Ecosystem Structure	99
5.2	Disturbance of Interspecies Interactions	101
5.3	Breakage of Information Flows in Ecosystems	104

X Contents

5.4	Destruction of Vegetation Cover in Toto	105
5.5	Transfer of Toxic Substances by Migrating Animals	106
5.6	Bioaccumulation of Pollutants	
•	and Their Transfer Through Trophic Chains	106
5.7	Acid Precipitations	109
5.8	Changes in Primary Productivity	110
5.9	Conservation Problems	
	in Some Important Ecosystems	112
5.10	Conclusions	129
6	Economic Problems	
-	in the Protection of Living Nature	131
7	Organizational and Legal Problems	
	of the Protection of Living Nature	
7.1	Problems to Be Treated on an International Level	135
7.2	Problems to Be Treated on a National Level	139
8	Problems of Prognostication	142
8.1	Molecular Level	142
8.2	Onthogenetic Level	
8.3	Populations and Species Level	
8.4	Ecosystem and Biosphere Levels	
8.5	Forecasts of the Ecological Consequences	
0.5	of a Nuclear War	149
Part	п	
		
Prosp	ects for the Protection of Living Nature	152
9	Protection of Living Nature	
	and its Connection with Other Global Problems	
9.1	"Nuclear Winter" and Disarmament	
9.2	Demographic Problem and Need for Stabilization	
9.3	Reduction of the Biosphere Pollution Rate	154
10	Need for Ecologization of Society's Activities	157
10.1	Need for Ecologization of Agriculture	
10.2	Need for Ecologization	
	of the Economic Forms of Biosphere Utilization	161
10.3	Need for Ecologization of Industry and Transport	161 166
10.3 10.4		
	Need for Ecologization of Industry and Transport	166
10.4	Need for Ecologization of Industry and Transport Need for Ecologization of the Economy	166 170
10.4 10.5	Need for Ecologization of Industry and Transport Need for Ecologization of the Economy Need for Ecologization of the Urban Environment	166 170 174

11	Ways of Preserving Living Nature	185
11.1	Protection in Natural Habitats	187
11.2	Captive Breeding	195
11.3	Domestication and Cultivation	200
11.4	Ecological Engineering	204
11.5	Genetic Banks	
11.6	Regulated Evolution	
12	Scientific Foundations and Theory	
	of Living Nature Protection	
	Within the System of Biological Science	213
12.1	Biological Sciences and the Scientific Foundations	
	of Living Nature Protection	213
12.2	Axiomatization of the Theoretical Foundations	
	of Living Nature Protection	218
12.3	Conclusion	
Bibli	ography	227
Index	c of Authors	249
Subje	ect Index	253

.*

•

v

.