

Table of Contents

1. Living Things and Their Surroundings	1
The Human Position in Nature	1
Ecology: Households, Neighbors, and Neighborhoods	4
Food Relationships in an Ecosystem	8
How an Ecologist Works	9
2. Describing an Ecosystem	14
Major Forest Types	14
Layers and Canopies in an Ecosystem	18
Habitat and Niche: Address and Occupation	19
Neighboring Niches	23
Relationships Among Organisms in a Habitat	24
Feeding Levels	28
3. The Food Web	31
Interlinked Food Chains	31
Plant Production in Food Webs	33
The Food Web as a Pyramid	36
The Position of People in the Food Web	38
The Impact of Hunting and Agriculture in Human History	40
4. The Limits of the Environment	44
Limiting Factors	44
The Nitrogen Cycle	45
Oxygen, Carbon, and Trace Elements in the Environment	49
Temperature as a Limiting Factor	51
Water and Light as Limiting Factors	53
5. Populations and Their Interactions	56
Properties of a Population	56
The Birth Rate as a Measure of Population Change	58
Determining the Death Rate	59
Characteristic Patterns of Population Growth	62
The Effects of Overcrowding on Populations	70
Claiming a Territory	72
A Population: Members of the Same Species	74
Communities	76

6. Changes Through Time	79
Changes in an Abandoned Farm	79
The Stability of Climax Communities	86
Human Effects on Ecosystems	88
7. Freshwater Ecosystems	95
The Importance of Water Ecosystems	96
An Unusual Property of Water	97
Sunlight and Food in the Lake Ecosystem	99
Succession in a Lake	102
Running Water	104
Pollution of Freshwater Ecosystems	106
8. Ocean Ecosystems	114
The Physical World of the Oceans	114
Currents and Tides	115
Life Zones in the Sea: The Oceanic Zone	117
Ocean Life at Great Depths	122
Shallow Water: The Near-Shore and Intertidal Zones	125
Special Habitats	127
Food from the Sea	130
Overfishing	131
Sea Farming	133
The Threat of Pollution	135
9. Land Ecosystems	140
The Variety of Land Environments	140
Major Regions of the Earth	141
The Tundra Biome	145
The Coniferous Forest Biome	148
The Temperate Deciduous Forest Biome	149
Grasslands	150
Deserts	153
Chaparral Biome	155
Tropical Rain Forest Biome	158
10. Conservation of Natural Resources	162
The Conservation Movement	162
Natural Resources	164
The Forests	166
Grasslands and Farmland	169

Land Use	171
Other Resources	173
Pollution	174
Applied Ecology	176
11. Human Population	178
Population Crisis	178
The Human Population over the Centuries	179
The Present Human Population	181
Birth and Death Rates in the Past	182
Future Population Trends—Starvation?	188
War and Disease	192
Future Trends in Birth Rates	193
What Can Be Done?	194
12. The Ecology of the City	197
The City as a Habitat	197
The Original Cities	198
Wheels and Growth	200
Metropolis and Megalopolis	201
The Metabolism of a City	203
The Critical Importance of the Water Supply	205
The Quality of Life	206
Toward Better Cities	209
13. An Ecological Viewpoint	219
The Effects of Technology	219
The Environmental Crisis	221
Energy and the Future	223
Balancing Benefits and Costs	226
Internalizing Costs	227
What Can We Do?	229
Additional Readings	233
Index	241
Acknowledgments	249