

PREFACE

The human species came into being at the time of greatest biological diversity in the history of the earth. Today as human populations expand and alter the natural environment, they are reducing biological diversity to its lowest level since the end of the Mesozoic era, 65 million years ago. The ultimate consequences of this biological collision are beyond calculation and certain to be harmful. That, in essence, is the biodiversity crisis.

In one sense the loss of diversity is the most important process of environmental change. I say this because it is the only process that is wholly irreversible. Its consequences are also the least predictable, because the value of the earth's biota (the fauna and flora collectively) remains largely studied and unappreciated. Every country can be said to have three forms of wealth: material, cultural and biological. The first two we understand very well, because they are the substance of our everyday lives. Biological wealth is taken much less seriously. This is a serious strategic error, one that will be increasingly regretted as time passes. The biota is on the one hand part of a country's heritage, the product of millions of years of evolution centred on that place and hence as much a reason for national concern as the particularities of language and culture. On the other hand, it is a potential source for immense untapped material wealth in the form of food, medicine and other commercially important substances.

It is a remarkable fact, given the interdependence of human beings and the other species that inhabit the planet, that the task of studying biodiversity is still in an early stage. Although systematic is one of the two oldest formal disciplines of biology (the other is anatomy), we do not even know to the nearest order of magnitude the number or species of organisms on the

earth. With the help of other specialists, I have estimated the number of species that have been formally described (given a Latinized scientific name) to be about 1.4 million. Even conservative guesses place the actual number of species at four million or greater, more than twice the number described to date.

Terry L. Erwin of the Smithsonian's National Museum of Natural History believes the number of species to be even greater. With the help of co-workers, he applied an insecticidal fog to the forest canopy at localities in Brazil and Peru in order to obtain an estimate of the total number of insect and other arthropod species in this rich but still relatively unexplored habitat. By extrapolating his findings to moist tropical forests around the world and by including a rough estimate of the number of ground-dwelling species in his calculations, Erwin arrived at a global total of 30 million species. Even if this number proves to be a considerable overestimate, the amount of biodiversity in the world is certain to be projected sharply upward in other compensatory ways.

Groups such as the mites and fungi, for example, are extremely rich and also very under explored, and habitats such as the floors of the deep sea are thought to harbor hundreds of thousands of species, most of which remain undescribed. Even the number of bacterial species on the earth is expected to be many times greater than the 3,000 that have been characterized to date. To take one example, an entirely new flora of bacteria has recently been discovered living at depths of 350 meters or more beneath the ground near Hilton Head, South Carolina. Even new species of birds continue to turn up at an average rate of two per year.

This Book will be of immense help to all those contemplating to acquire an expert knowledge of the disastrous effects of biodiversity extinction, deforestation and related issues.

Suggestions are welcome for improving the next edition of this important publication.

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