

Preface

The discovery of new species—figuring out what they do in nature and how they contribute to our wealth and happiness—is one of the most exciting branches of science today. The study of biological diversity, or biodiversity for short, is revealing a previously unimagined variety of life forms on Earth. This research has become a powerful generator of ideas, opening fresh horizons of scientific knowledge with many new products and industries as spin-offs. It has also given us a glimpse into the workings of those natural mechanisms called ecosystems that keep us all alive.

As an example, how often have you heard a friend ask exasperatedly, “Why on earth do mosquitoes exist!?” as he swats the little animal with his hand. Yet we now know that adult mosquitoes are important components of the food chains that feed birds, and their larvae are a major ingredient of the diet of many fish. Most people appreciate birds and fish, one way or another, and therefore appreciate (with their heads, if not their hearts) the place of mosquitoes in nature. But there is more. Some orchids require mosquitoes for pollination; and research on one mosquito species in particular is revealing a potential breakthrough in the fight against malaria, one of the world’s most disastrous diseases. We know all this because scientists are in the process of discovering just how many species of mosquito there are, what they do, and how they may be useful to us.

The study of biodiversity is providing answers to everyday questions about the millions of species that surround us—questions such

as What do all these species do? What are they for? Do we need them all?

This book is for anyone interested in questions such as these, anyone interested in joining in the excitement of the discovery and exploration of life forms on this planet. The science of biodiversity is in its pioneering phase; we still know shockingly little about the species with which we share our tiny rock in space. Still, what we do know promises discoveries that will benefit all humanity. In many ways, this science resembles space exploration: both are in their infancy, and both are developing complex technologies to achieve their goals. However, in the science of biodiversity, microscopes replace telescopes, and the organisms we seek are on the ground beneath our feet rather than light years away.

The glimpses into the future offered in *Wild Solutions* show that our ignorance about the interactions of species in natural ecosystems demonstrates that we humans are not really in control. For example, many organisms regulate the fertility of the soil and the content of the atmosphere, but we have very little knowledge of which species are involved, how many there are, and what precisely they do. This book will also present many examples of the basic proposition that species that appear to be totally insignificant right now are likely in the future to become extremely valuable to medicine, to agriculture, and to a variety of other human needs. The species with which we share the planet are, if nothing else, a vast insurance policy against the problems we will probably face in the years to come.

Our ignorance also fosters a false view of the world. "Get real!" is a demand we often hear from people who wish to convince us that the harsh imperatives of modern life, especially economics and politics, must dominate decision-making in environmental and other debates. They claim that economics and politics are the real world. Yet the evidence that this hypothesis is false is an inescapable part of everyday living. Eating, drinking, and using the rest room remind us all too fre-

quently that the real world is biological. Try ignoring your feelings the next time you are hungry or thirsty; your nervous system will soon forcibly remind you that you are an organism, and that your organs require food and drink on a regular basis. Or try ignoring your next fever. A host of microbes will soon make it clear that biology is what controls your life. While money enables you to buy food, drink, and medicine, it is biodiversity that provides these essentials in the first place.

We humans are a natural part of this biological world. Each one of us, every family and community, is a living, breathing inhabitant of an ecosystem. Every town, city, business, and industry is a wholly owned subsidiary of one or more ecosystems, each of which is shared with hundreds of thousands of other species. A tiny minority of these species are harmful, and unfortunately the media tend to focus on that handful. The vast majority of species are beneficial; if they were not out in the world, going about their daily business, life as we know it would cease.

The ecosystems in which we live and the many species on which we depend are the products of millions of years of evolution. The genetic information they contain is an irreplaceable source of information that has already provided humanity with all of its biological resources. In *Wild Solutions* we will show that ecosystems can provide us with a huge variety of new resources, products, and services—*if* we allow them to coexist with us, and *if* we manage them with foresight, imagination, enthusiasm, and respect.

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