TEMPERATE AND BOREAL RAINFORESTS OF THE WORLD

TEMPERATE AND BOREAL RAINFORESTS OF THE WORLD: ECOLOGY AND CONSERVATION

Edited by
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Foreword by David Suzuki

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Foreword

When I attended the 1992 Earth Summit in Rio de Janeiro, Brazil, it was a time of great hope. It was there that I witnessed the world's nations come together in an effort to protect the planet's biological richness by signing the Convention on Biological Diversity, the first international agreement to explicitly recognize that conserving wildlife and ecosystems is "a common concern of humankind."

My home country, Canada, stepped forward as the first industrialized nation to ratify the Convention, which commits it and 168 other signatory countries to promote the conservation of biodiversity through strong domestic actions such as establishing new protected areas and enacting new laws to protect and recover endangered species. The signing was a banner moment, one that filled us all with hope.

Though it receives far less attention from the public and policy-makers than other global issues, the precipitous decline and extinction of biodiversity is perhaps the greatest threat to the very sources of the planet's basic life-support systems—clean air, water, soil, and energy. Scientists warn us that we are in the midst of a catastrophic biodiversity crisis on a par with earlier mass-extinction events in the earth's history. Of the species we know, some 17,000 are threatened with extinction, including 12 percent of all known birds, nearly a quarter of all known mammals, and a third of all known amphibians (Vie et al. 2009). Climate change is predicted to sharply increase the risk of species extinction within our own children's lifetime. Indeed, according to the Intergovernmental Panel on Climate Change (2007), around 20 to 30 percent of all plant and animal species assessed are likely to be at increased risk of extinction if the global average temperature rises more than 1.5 to 2.5°C over late-twentieth-century levels.

The immediate threats are well known: destruction of natural habitat such as the old-growth forests needed by the northern spotted owl (*Strix occidentalis caurina*); exotic and invasive species like Sitka mule deer (*Odocoileus hemionus sitkensis*) and other nonnative ungulates introduced into the Haida Gwaii archipelago; over-consumption of wildlife species, including overfishing of salmon (*Oncorhynchus* spp.); pollution of marine ecosystems, including Prince William Sound oil spills; and global climate change that is resulting in the decline of yellow cedar (*Chamaecyparis nootkatensis*) and other trees in the Pacific Northwest (Boyd 2004). But we have only recently begun to fully understand that biodiversity loss at such an unprecedented scale poses major threats to, for example, ecosystem integrity and human welfare (Moola et al. 2007). According to the United Nations' Millennium Ecosystem Assessment (MEA 2005), two-thirds of the direct benefits that people obtain from the "ecosystem goods and services" provided by biodiversity are being degraded or used unsustainably.

The world's remaining temperate and boreal rainforests—such as the Valdivian and Tasmanian rainforests and the Great Bear Rainforest on Canada's Pacific Coast—provide many direct benefits. They are sources of paper and other wood products, as well as medicine, food, and clean drinking water. They also provide habitat for unique assemblages of plants and animals, including a rare white phase of black bear known as the "spirit" bear (*Ursus americanus kermodei*), coastal wolves (*Canis lupus*) that fish for salmon and hunt other marine prey, and canopy-dwelling invertebrates that live in the tallest of treetop gardens. Such rainforests also provide aesthetic, recreational, and spiritual opportunities and experiences for their human inhabitants and have featured prominently in the culture and traditions of indigenous peoples for millennia. And because they sequester and store billions of tonnes of carbon in their vegetation and soils, they are also a critical shield against global warming. This latter ecosystem service is receiving increasing attention due to growing evidence that protecting carbon-rich ecosystems, especially long-lived rainforests, is an effective strategy to both mitigate and adapt to climate change.

Unfortunately, in spite of their global significance, temperate and boreal rainforests and their ecological importance are poorly appreciated. This has resulted in inadequate levels of protection. For example, nearly all these rainforests have been eliminated from Europe. Just half of the original rainforest cover persists in North America and Chile and only the "guts and feathers" of a once-expansive ecosystem survives elsewhere on the planet. Around the globe, protection levels are far too low (about 13 percent) to sustain temperate and boreal rainforests, particularly in light of a rapidly changing global climate and an ever-expanding human ecological footprint.

The good news is that with strong endangered-species laws, conservation-driven land-use planning, core protection of wildlife habitat in parks and protected areas, and ecosystem-based land-use activities such as FSC-certified logging, we can successfully slow the loss of wildlife habitat and concomitant declines in biodiversity in our temperate and boreal rainforests. Protecting these remaining rainforests is also our best chance of keeping them as carbon sinks. It will promote ecological resiliency and provide broader opportunities for adaptation by species and ecosystems to climate change itself. Indeed, as noted by the Intergovernmental Panel on Climate Change, we must reduce nonclimatic stressors on species and ecosystems if we are going to give them a fighting chance to cope with the effects of global warming.

Temperate and Boreal Rainforests of the World: Ecology and Conservation provides a comprehensive synthesis of the unique ecological and conservation importance of one of the most threatened regions of the planet. The book includes the contributions of leading scientific experts from around the globe to outline an ambitious vision of how we can conserve and manage the planet's remaining rainforests in a truly ecological way that is better for nature, the climate, and ultimately our own welfare.

David Suzuki

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Preface

Until now there has been no comprehensive reference from which to build a global understanding of temperate and boreal rainforests and their conservation. In compiling this book, I worked with more than 30 leading scientists to piece together detailed accounts of these remarkable rainforests and elevate their importance among all of the world's unique and rapidly disappearing rainforests. This book includes new map-based technologies and local descriptions of regions poorly understood or completely missed in previous inventories of rainforests, including some surprise additions to the global network of rainforests: the Knysna-Tsitsikamma forests of South Africa, as well as forests in inland British Columbia, western Eurasian Caucasus, Russian Far East and inland Southern Siberia, Eastern Canada, Alps, and northwest Balkans. These forests can now take their place alongside the more recognizable rainforests of Chile, Argentina, Japan, Australasia, and the Pacific Coast of North America as part of a global network of temperate and boreal rainforests.

Perhaps the most compelling reason for doing this book, however, was to shine an international spotlight on the need to conserve the world's rainforests in the face of two looming twenty-first-century threats: rapid changes to the climate that originally shaped these rainforests and humanity's accelerated depletion of the rainforest's finite ecological capital, pushing entire ecosystems to the brink of collapse.

For me personally, the rainforest story begins in Alaska's coastal rainforests, where I first discovered my scientific curiosity and passion for rainforests.

As a young biologist in the early 1990s, I conducted studies on the effects of clearcut logging of old-growth rainforest on neotropical migratory birds,

deer, and wolves in the verdant rainforests on Prince of Wales Island, part of Alaska's Tongass National Forest. My summers began each day at the crack of the Alaskan dawn, 3:30 AM for bird surveys, and continued into the late morning. Summers in southeast Alaska are cool and buggy, with very brief interludes of sunshine. Winters were even more challenging, as I searched for deer and wolf prints in the snow while carefully listening for overwintering birds to determine how they survived Alaska's wet, windy winters in a landscape heavily scarred by logging and road-building. During this time, I began to realize that in spite of having a unique firsthand opportunity to witness rainforests in all their splendor, I was helplessly documenting the demise of its coastal giants.

But I was not alone in my concerns. In 1989, Canadian songwriter Bruce Cockburn focused the world's attention on the plight of rainforests—both tropical and temperate—in his inspiring MTV video “If a Tree Falls” (see lyrics below). Cockburn's video was a wake-up call for me personally to join other scientists in a global effort to save rainforests.

Shortly after my Alaskan experience, I began a 13-year career as director of temperate forest programs for the World Wildlife Fund. At the time, I worked with scientists from around the globe to push for a greatly expanded network of protected areas for all the world's forests. In 1997 my efforts were rewarded with a trip to the United Nation's Earth Summit, where I spoke about the need for international agreements to protect the world's rapidly diminishing old-growth or primary forests. Five years later I arrived in the Valdivian temperate rainforest of Chile to take part in international efforts to link rainforest conservation in the “sister” ecoregions of the Klamath-Siskiyou (southwest Oregon and northern California) and Valdivia because both regions were recognized by scientists as among the most diverse temperate forests in the world and faced equally daunting challenges. Despite its uniqueness, the Valdivian temperate rainforests mirror those of Alaska in climate and breath-taking landscape; and like Alaskans, Chileans are struggling to understand the limits of what they can take from rainforests without triggering ecological and social collapse.

Experiences like these prepared me for the first international conference on temperate rainforests in 2003, organized by the World Temperate Rainforest Network.¹ During this conference, I proposed the idea of a global reference work on temperate and boreal rainforests initially envisioned as a collection of scientific accounts and rainforest stories compelling enough to inspire real action by governments and citizens. This book is the culmination of a journey that began in the rainforests of Alaska and continues today through conserva-

¹www.temperaterainforests.org

tion efforts that are spreading across the globe to protect these underappreciated rainforests before they disappear.

Working with other scientists and using the latest inventories and methods, I attempted to represent the majority of the world's temperate and boreal rainforests. However, while I am confident that the book captures the ecology and essence of conservation for the vast majority of these rainforests, I hope others will build on this effort by including areas that we may have missed and further refine the mapping techniques; and this rainforest story should not be told just from an ecological perspective. I hope this book will spark a companion piece detailing the unique aboriginal and responsible forest-management efforts that are more in harmony with the biological capital of rainforests than industry practices that have ravished rainforests around the globe; and, of course, I hope this book will inspire an international call-to-action that puts the conservation of temperate and boreal rainforests on a par with similar efforts to protect the world's dwindling tropical rainforests.

I would like to thank a number of individuals for contributing in many ways to my scientific understandings and conservation values of these rainforests. Pat Rasmussen of the World Temperate Rainforest Network helped to inspire this book by launching the first international temperate rainforest conference and network (an international consortium of groups working to conserve these rainforests) in 2003. Special thanks to Paul Alaback, who either contributed to or reviewed many of the manuscripts of this book, including preparing several of the boxes and figures, and whose early work on temperate rainforests is reflected in much of thinking throughout this book. Rich Nauman, Jessica Leonard, and Anton Krupicka of the Geos Institute prepared most of the GIS maps. A grant program from the Environmental Systems Research Institute provided software support for the GIS maps. David Albert of The Nature Conservancy provided analytical and GIS support for the Tongass conservation assessments. Baden Cross, GIS Analyst at Applied Conservation GIS, provided data on the inland rainforests of British Columbia. Bruce McLellan, Wildlife Research Ecologist for the British Columbia Ministry of Forests, sharpened our thinking through lively debate on caribou management. Anne Sherrod and Craig Pettitt of Valhalla Wilderness Society shared data and important documents that called our attention to significant omissions in mountain caribou strategy by the British Columbia government. Wayne McCrory of McCrory Wildlife Services Ltd. and the Valhalla Wilderness Society provided many helpful suggestions and edits in Chapter 2. Ecoregional planning conducted by Maximiliano Bello, Ocean South America, and George Powell, WWF-US, was integral to the conservation recommendations in the Valdivian temperate

rainforest. Sian Atkinson of the UK Woodland Trust reviewed the European chapter and provided helpful materials. Eric Hosten of Nelson Mandela Metropolitan University tracked down hard-to-find manuscripts about South African forests. Julie Norman, Randi Spivak and Sunya Ince-Johannsen of the Geos Institute helped prepare and proofread tables, boxes, references, and chapter drafts.

Support for this book was provided by Don Weeden of the Weeden Foundation, James Bohnen of the Osprey Foundation, Anna Wiancko of the Wiancko Charitable Foundation, and the Wilburforce Foundation (photos). I am also grateful to several photographers whose work is generously captured in the color photos of this book.

This book is also offered as a standard reference for conservationists and ecologists around the world who have worked for years to study and advocate for the world's temperate and boreal rainforests. While some of these champions are no longer with us, they are remembered for all that they have accomplished: Bill Devall, formerly of Humboldt State University (California), for his devotion to coastal rainforests and his many contributions to the deep ecology philosophy that inspired countless conservationists; Jim Fulton, the first executive director of the David Suzuki Foundation, for his leadership in the campaign to protect the Great Bear Rainforest; Colleen McCrory, founder of the Valhalla Wilderness Society, as the force behind the protection of British Columbia rainforest; and former congressman and career activist Jim Jontz, who in the early 1990s introduced legislation in Congress calling for the protection of the Ancient Forests of the Pacific Northwest that eventually led to the Northwest Forest Plan largely ending the wholesale liquidation of old-growth forests in the Pacific Northwest, USA. Without these contributions, there would be even fewer rainforests to celebrate in this book.

And to my daughter, Ariela Fay DellaSala, and my wife, LeeAnn DellaSala, I hope this book will inspire decision makers to conserve rainforests around the world so that you and others like you will continue to draw sustenance from rainforests and marvel at the *Great Mystery* present within them.

Dominick A. DellaSala

Rain forest
 Mist and mystery
 Teeming green
 Green brain facing labotomy
 Climate control centre for the world
 Ancient cord of coexistence . . .

Through thinning ozone,
 Waves fall on wrinkled earth—
 Gravity, light, ancient refuse of stars,
 Speak of a drowning—
 But this, this is something other.
 Busy monster eats dark holes in the spirit world
 Where wild things have to go
 To disappear
 Forever

If a tree falls in the forest does anybody hear?
 If a tree falls in the forest does anybody hear?
 Anybody hear the forest fall?

—Bruce Cockburn, *If a Tree Falls*