



# Conservation Social Science

Understanding People,  
Conserving Biodiversity

**Daniel C. Miller | Ivan R. Scales | Michael B. Mascia**

Foreword by Inger Andersen, Executive Director  
United Nations Environment Programme

**WILEY**

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Understanding People, Conserving Biodiversity

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**WILEY**

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*From the cover:*

The “Forest of Oma” by Basque sculptor and artist Agustín Ibarrola, near the village of Kortezubi in the Basque Country (northern Spain). Ibarrola painted the individual trees with colorful geometric forms that only reveal themselves as part of a larger whole when viewed from a certain vantage point. This work is one of many he has created that brings together nature with human invention so as to make us see the world around us in new ways.

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## Foreword

Nature—from the majestic blue whale to the humble dung beetle—is the foundation of human existence and society. We rely on functioning ecosystems, and the biological diversity that underpins them, for the food we eat, the water we drink, the air we breathe, and the building blocks of our economies. A healthy planet also contributes to human well-being in less material ways, as a source of inspiration, identity, spirituality, and mental health.

Yet these vital functions are too often overlooked by governments, businesses, and policymakers. As a result, we have allowed the world's biodiversity to become critically imperiled. We are in the midst of Earth's sixth mass extinction, with species being lost at a rate not seen since the last mass extinction 65 million years ago. Along with widespread habitat and biodiversity loss, the global climate is changing rapidly, placing additional stresses on already threatened species, ecosystems, and those who rely on them for their livelihoods and well-being.

Human activities are the driving factor behind both biodiversity loss and climate change. Industry, agriculture, fishing, and transportation place significant pressures on the planet's ecosystems. Wealthier nations and consumers in particular use resources at rates that are simply not sustainable.

While the scale of global environmental challenges can seem daunting, the good news is we have the ability to make change. As individuals, households, communities and nations, together, we can act to stop and reverse biodiversity declines. To do so will require marshaling insights from a range of disciplines. Here, the social sciences hold particular importance. The conservation of biological diversity is, at heart, a social issue, cutting across the political, economic, social, and cultural spheres of human life.

Tackling global biodiversity loss and ecosystem degradation will require applying lessons from the social sciences about human behavior and how we might change and harness it. To identify leverage points, we will need tools from the social sciences to analyze problems and their underlying drivers. We will need to build and test theories of change, as well as ask profound questions about what it means to be human in an era of rapid social, technological, and environmental change. Finally, we will need new ways of engaging with and building knowledge that effectively draw from diverse constituencies, particularly those who have been historically marginalized.

*Conservation Social Science: Understanding People, Conserving Biodiversity* is a vital resource for these tasks. This book provides an easy-to-use overview of the social sciences and what they have to offer both to understanding and tackling global biodiversity loss. Written by leading scholars, it provides a discipline-by-discipline guide to the social sciences and their relevance to conservation.

Too often, social science knowledge and approaches have gone unused in conservation research, policy, and practice. Their absence goes some way to explaining our failure to effectively conserve the planet's natural wealth. But the required integration into the biophysical sciences, engineering, and other disciplines, as well as conservation planning and practice, can be challenging. This book provides a basis for greater integration. It explains and demonstrates key social scientific theories, tools, and ideas through a rich set of case studies drawn from around the world to help students, practitioners, and policy makers understand real-world challenges and develop solutions.

This book is a key reference for the world community as we develop and implement the post-2020 Global Biodiversity Framework for 2030 and beyond. It not only instructs and illustrates. It invites us to draw from the deep history and new developments across the social sciences to develop innovative approaches to tackling one of the most urgent challenges of our time: conserving Earth's rich biological heritage while ensuring thriving human societies. It is now time for us to accept this invitation.

*Inger Andersen*  
*Under-Secretary-General of the*  
*United Nations (UN) and*  
*Executive Director of the UN*  
*Environment Programme*

## Acknowledgements

This book has been long in the making. Yet the central idea—to hold up and examine the relationship between a set of core social science disciplines and biodiversity conservation—has remained the same since it was formulated nearly two decades ago. It is, as we believe the pages that follow show, an idea that remains as timely and as important as ever.

Throughout, the contributors to this book have been exceptionally generous and patient. For this and for the scholarly acumen they have brought to these pages, we express our sincere thanks. We also thank Inger Andersen for providing the foreword and Nandita Surendaran for helping to facilitate its creation.

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Finally, most special thanks go to his parents, Steve and Joyce Miller, and his wife, Bea Zengotibengoa, and his children, Eneko, Maite, and Izei—may theirs be a world in which social sciences, arts and humanities are more insistently fused with the biophysical sciences and other fields to advance the mutual flourishing of people and nature.

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Of course, any mistakes that remain are our responsibility.

Finally, we thank the reader for putting this book in their hands. We hope it helps inform their thinking—and even action—on the role of the social sciences in a conservation that is equitable, effective, and enduring.

## Abbreviations and Acronyms

ABM	Agent-based model
AC	Advocacy coalition
CBC	Community-based conservation
CBNRM	Community-based natural resource management
CITES	Convention on International Trade in Endangered Species
CPR	Common-pool resource
EM	Ecological modernization
EPA	Environmental Protection Agency
FBS	Folk biological system
FAO	Food and Agricultural Organization
GDP	Gross domestic product
GEF	Global Environmental Facility
GIS	Geographical Information System
GISc	Geographical Information Science
GPS	Global Positioning System
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
IDB	Inter-American Development Bank
ICDP	Integrated Conservation and Development Project
IEK	Indigenous Environmental Knowledge
IRC	Institutional rational choice
IUCN	International Union for the Conservation of Nature
LEK	Local Environmental Knowledge
NGO	Non-governmental organisation
NHP	Non-human primate
NRM	Natural Resource Management
PA	Protected Area
PES	Payment for Ecosystem Services
PGIS	Participatory Geographical Information System
PMT	Protection-motivation theory
PPP	Parks and Peoples' Program
RCT	Randomized control trial



REDD+	Reducing Emissions from Deforestation and Forest Degradation
RFF	Resources for the Future
SC	Structural choice
SES	Socio-ecological system
SES	Socio-economic status
SI	Symbolic interactionism
TEK	Traditional Environmental Knowledge
TOP	Treadmill of Production
USAID	United States Agency for International Development
UN	United Nations
UNESCO	United Nations Education and Scientific and Cultural Organization
VBN	Value-belief-norm
VP	Veto player
WEIRD	Western, educated, industrialized, rich, and democratic
WST	World-systems Theory

## 1

## Introduction: Biodiversity Conservation and the Social Sciences

*Ivan R. Scales, Daniel C. Miller, and Michael B. Mascia*

### 1.1 Global Biodiversity and the Need for Conservation Social Science

Earth's **biodiversity** is under threat. Agricultural expansion, urbanization, industrial pollution, the spread of non-native species, as well as overfishing and overhunting, have led to extinction and continue to place unsustainable pressures on the planet's **ecosystems** (IPBES 2019). From 2000 to 2010, tropical forests were cleared at a rate of over 76,000 square kilometers per year (Achard et al. 2014). Recent studies have revealed dramatic reductions in insect populations around the world, with serious implications for ecosystem function (Sánchez-Bayo & Wyckhuys 2019). Climate change is creating additional stresses for both terrestrial and marine ecosystems and, even with strong mitigation measures, will have profound implications for biodiversity (Seddon et al. 2016; Pecl et al. 2017). Species loss is occurring at a rate not seen since the last planetary mass extinction event more than 65 million years ago (Barnosky et al. 2011). Now, however, this loss is driven not by geological cataclysms or giant meteorites, as in previous epochs, but by human actions (IPBES 2019).

The loss of biodiversity—the variety of living organisms at genetic, species, and higher taxonomic levels—has major implications for our own species. Human well-being is dependent on functioning ecosystems and the biological diversity that underpins them (Diaz et al. 2006; Chivan & Bernstein 2008; IPBES 2019). Natural ecological and evolutionary processes sustain air quality, deliver freshwater, enrich soils, and provide pollination and pest control, among other benefits. For example, more than three-quarters of global food crop types, including fruits, vegetables, and major cash crops like coffee and cocoa depend on animal pollination (Potts et al. 2016). The only planetary sinks for **anthropogenic** carbon emissions are marine and terrestrial ecosystems, which together sequester an estimated 5.6 gigatons of carbon per year—about 60% of total global anthropogenic emissions (IPBES 2019). Forests, grasslands, oceans, and other ecosystems support all dimensions of human health, from reducing disease burden (Herrera et al. 2017) to improving mental health (Cox et al. 2017) and developing new treatments for cancer (Newman & Cragg 2016). A biologically rich and healthy planet also contributes to

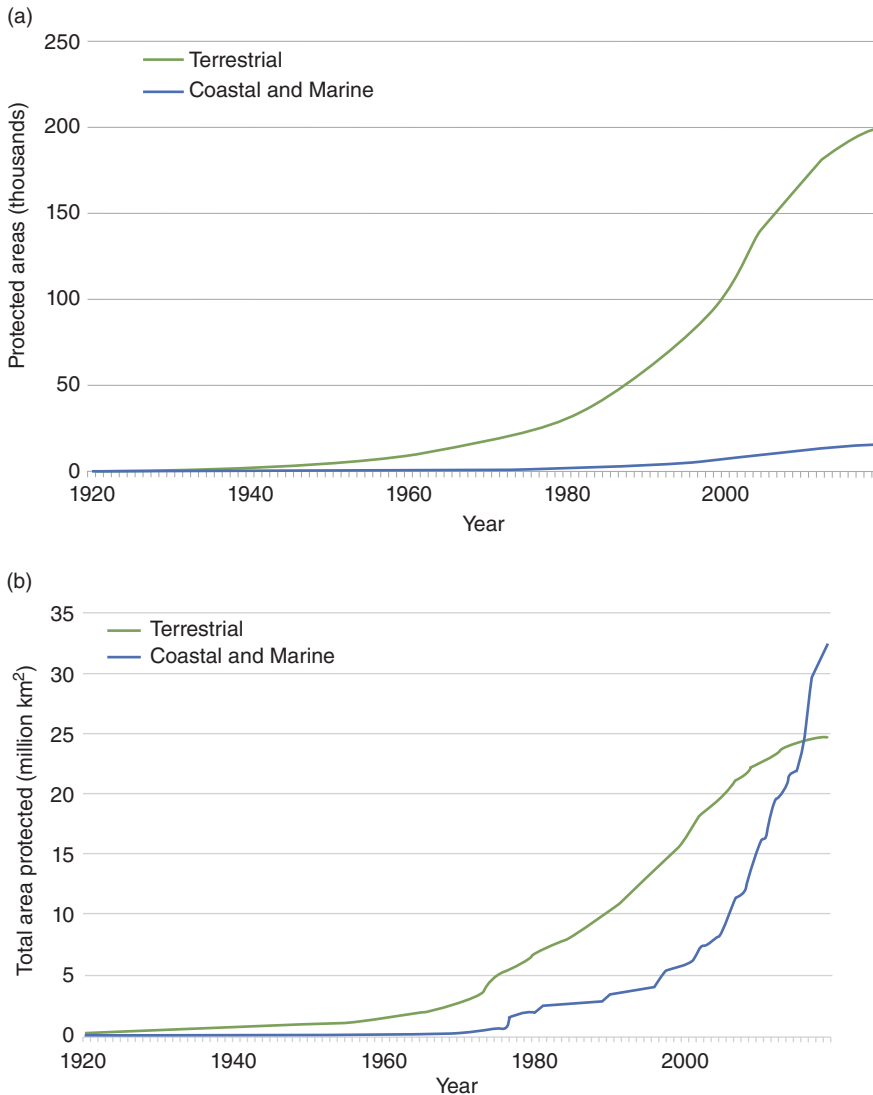
non-material aspects of human well-being, such as identity, inspiration, learning, spirituality, and psychological experience (MEA 2005; Fish et al. 2016). In short, “nature is essential for human existence and good quality of life,” as the most comprehensive report on biodiversity and **ecosystem services** yet produced puts it (IPBES 2019). The conservation of biological diversity and ecosystem function therefore stands as one of the biggest challenges facing humanity this century.

Recognition of the importance of biodiversity, as well as mounting threats to it, has spurred a range of different conservation responses around the world. Concerned citizens, conservation scientists, non-government organizations, philanthropic foundations, and government agencies have mobilized to protect vital habitats and take other actions to conserve the Earth’s rich natural heritage. From the creation of the first national park in the United States of America in the 1870s to recent attempts to establish payment for ecosystem services schemes, the field of conservation science, policy, and practice has grown remarkably. Conservation now includes a wide array of perspectives (Sandbrook et al. 2019), even as racial, gender, nationality, and other inequalities persist in the conservation movement and among those who study it (Taylor 2014; Wilson et al. 2016; Campos-Arceiz et al. 2018; Jones & Solomon 2019; Bailey et al. 2020).

National parks and other kinds of protected areas perhaps best illustrate the growth of the modern conservation movement. The global protected area estate has increased from a handful of sites at the beginning of the twentieth century to almost 240,000 legally designated protected areas (Figure 1.1). Together, these areas cover over 26 million square kilometers or nearly 15% of the Earth’s terrestrial surface and 7.3% of the ocean (UNEP-WCMC 2020). The international community is negotiating much more ambitious targets under a new global biodiversity framework through the Convention on Biological Diversity. Proposals call for setting aside 30% of the Earth for protection with an additional 20% designated as climate stabilization areas outside formally protected areas where carbon-sequestering vegetation is maintained and greenhouse gas emissions prevented (Dinerstein et al. 2019).

In addition to the growth in protected areas, conservation now has its own journals, university departments, international non-government organizations, government agencies, consultancies, and global treaties. Conservation has become a major global enterprise, with tens of billions of dollars spent every year in efforts to protect the planet’s biological diversity and ecotourism, and other conservation-related activities, estimated to generate more than one hundred billion dollars annually (Waldron et al. 2013; Deutz et al. 2020).

Conservation science has made major inroads into assessing levels of biodiversity, identifying threats to it, and suggesting where conservation efforts should be concentrated (Myers et al. 2000; Olson et al. 2001; Brooks et al. 2006; IPBES 2019). Almost all countries of the world are parties to the Convention on Biological Diversity (CBD 2019), and conservation actions have been undertaken widely across the globe (IPBES 2019). However, major questions remain concerning the effectiveness of conservation efforts, and how best to focus scarce resources to get the most biodiversity “bang for the buck” (Ferraro & Pattanayak 2006; Waldron et al. 2013; Gerber et al. 2018). Why have some conservation efforts succeeded while others have failed to achieve their aims and sometimes even generated negative social impacts? How might conservation policies and practices be improved to increase the protection of biodiversity, reduce potential negative social impacts, and



**Figure 1.1** Change in (a) the number and (b) coverage of protected areas globally, 1920–2020. Data source: UNEP-WCMC (2020).

contribute to more sustainable economies? How can conservation science, policy, and practice be more inclusive and engage with a broader range of sociocultural values and perspectives?

The central claim of this volume is that the social sciences (Box 1.1) are vital to understanding the drivers of biodiversity loss, the consequences of this loss, and possible solutions to it. To support this argument, the book pulls together insights from six classic social science disciplines—anthropology, economics, human geography, political science, psychology, and sociology—relevant to understanding human–environment interactions

**Box 1.1 What are the social sciences?**

The social sciences are academic disciplines that study human societies and the relationships between individuals and groups within those societies. This is a necessarily broad definition. Human thought, behavior, and interaction encompass many different overlapping spheres, including culture, economics, and politics. Furthermore, social processes can be studied at various levels, from the brain functions and psychology of individuals to the actions of households, communities, regions, and nations. Because people can behave and interact in so many different ways, the social sciences draw on a wide range of both **quantitative** and **qualitative** methods to study humans.

For those not familiar with the social sciences, the diversity in methods, approaches, and theories can be overwhelming. Furthermore, as the chapters in this book show, there can often be tensions between different traditions in the social sciences as to how to study social processes. On one end of the spectrum we find approaches that mirror the natural sciences and their emphasis on quantification, large sample sizes, statistical rigor, and hypothesis testing. At the other end of the spectrum, some social science disciplines operate on the assumption that the human condition is something entirely different from biological or physical processes and is best studied through qualitative approaches that emphasize the complexity, richness, individuality, and therefore specificity, of human experience. Given the diversity of the social sciences, it is best not to think of them as a homogenous group but more as a vibrant and sometimes fractious family.

generally and conservation more specifically. To introduce the substantive chapters that form the core of this book we first highlight an important set of issues and themes to orient the reader.

The next section describes the intended audience for this book and what readers will gain from the material it contains. We begin by highlighting three major challenges at the heart of the global **biodiversity conservation**. We then summarize the potential contributions of the social sciences to conservation research and policy making. We also consider the barriers to integrating social sciences into conservation research, policy, and practice. Having staked a claim for the social sciences, we make the case for **conservation social science** as a distinct field, defined as the study of the conservation-relevant aspects of human society, including the relationships among humans and between humans and their environment. We finish by providing a brief overview of the chapters that make up the rest of this book.

## 1.2 Whom and What This Book Is For

The goal of this book is to furnish the reader—conservation student, practitioner, scholar, philanthropist, policy maker, or concerned citizen—with a thorough introduction to the diverse approaches that social scientists employ to make sense of conservation problems and conservation itself. We provide tools and knowledge that can inform the myriad forms of

conservation policy and practice. To illustrate the theories, tools, and empirical insights discussed in this book, the chapters include case study examples drawn from a range of different countries and ecosystems around the globe. By bringing the rich intellectual traditions of the social sciences to the fore, and by making explicit their collective links to the study and practice of conservation, our ambition is that this primer helps elevate the social sciences to an equal partner to the natural sciences in conservation scholarship and decision-making.

We expect that our audience will be as diverse as the topics and theories that we cover. First and foremost, we are writing for advanced undergraduate and early career graduate students, to provide them with the broad foundation for further scholarship in one or more dimensions of the conservation social sciences. For students with prior training in the social sciences, this book represents an initial foray into conservation-related aspects of six classic social science disciplines and an exploration of the diverse perspectives that disciplines beyond one's own bring to bear on conservation. For students with a background in the natural sciences, this book provides a different way of thinking about and approaching the conservation of biodiversity. For senior scholars, this book will serve as a reference and as a resource to orient one's own work. We believe that an advanced understanding of conservation as a social phenomenon can both translate into a broader scientific understanding and help generate knowledge for science-based conservation policy and practice.

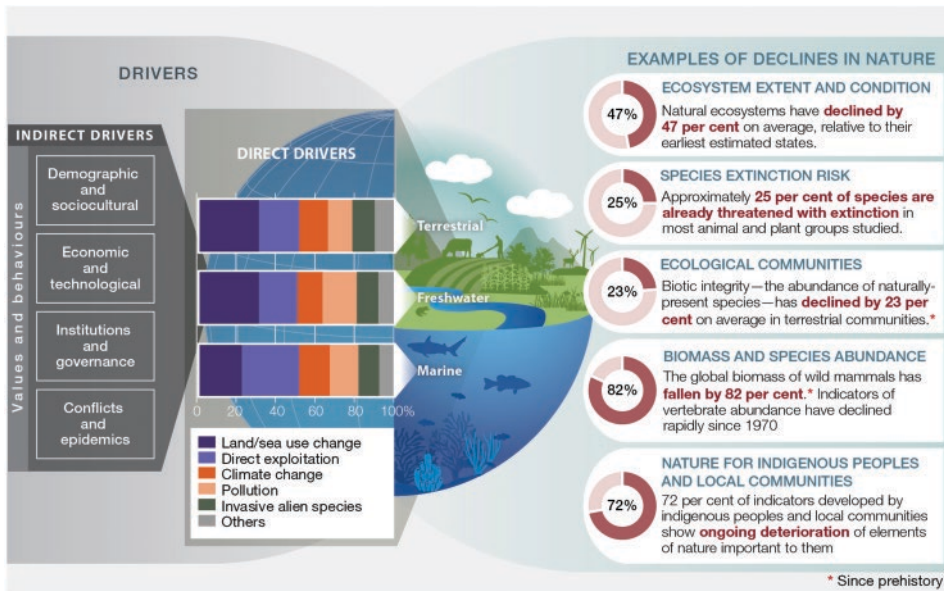
This book is also for practitioners, those involved in the “doing” of conservation: local activists and project managers; grant administrators and philanthropists; concerned citizens, agency staff, and senior officials. For these readers, particularly those primarily trained in the natural sciences, this book will serve as a resource to organize and make sense of personal experiences and observations in novel ways. By providing a new perspective on a topic of long-standing familiarity, this book will help to inform day-to-day conservation decisions and, in the aggregation of these individual choices, inform broader conservation policy and practice.

## 1.3 Challenges for Global Biodiversity Conservation in the Twenty-First Century

The threats driving biodiversity loss are diverse and complex. While humans have a long history of modifying ecosystems and driving species to extinction, the scale and intensity of human environmental impacts is now so great that some argue we are now in the **Anthropocene**, a new geological era where humans are the dominant force (Steffen et al. 2007). Here we identify three major challenges.

### 1.3.1 Understanding Threats to Biodiversity

The major direct threats to biodiversity are well-documented: habitat loss, direct harvesting of organisms, climate change, pollution, and competition from non-native species (Figure 1.2). These processes are themselves underpinned by a wide range of economic, political, cultural, and demographic drivers that shape what and how much humans consume. Responses to these threats have emphasized safeguarding ecosystems and species



**Figure 1.2** Drivers of global declines in biodiversity. Drivers are listed in order of relative importance according to their contribution to biodiversity loss. Color bands represent the relative global impact of direct drivers on terrestrial, freshwater, and marine ecosystems. Circles show the magnitude of the negative human impacts on a range of different aspects of nature. Figure used with permission from IPBES (2019).

through the creation of protected areas (Watson et al. 2014; Dinerstein et al. 2019). Through community-based conservation schemes and engagement with local stakeholders, conservation efforts have also attempted to change the practices of resource users (for example, hunters, fishers, and farmers) to reduce pressure on ecosystems. Conservation strategies have thus often focused “downstream” on the impacts of human actions on threatened species and habitats. Those advocating and implementing conservation have tended to pay less attention to what happens “upstream”—the broader political, economic, and cultural factors that drive patterns of resource use and the interactions between them. However, recent scientific consensus has begun to present a more holistic picture, with recognition that sustainable conservation will require transformation of the current political–economic systems (IPBES 2019).

Conservationists can be quick to identify human population growth as a major threat to biological diversity (Maurer 1996; Cincotta et al. 2000; McKee et al. 2004). As the subsequent chapters will show, the social sciences are generally skeptical of models and explanations of human natural resource use that focus narrowly on population growth as a driver of environmental degradation. Such **neo-Malthusian** models tend to underplay the critical role of high levels of consumption in wealthier countries in driving biodiversity loss. Simplistic models along these lines also often ignore the capacity of human societies to change how they manage resources as population densities increase, including through the use of technology (Tiffen et al. 1994; Boserup 2014 [1965]).

When discussing threats to biodiversity, conservation thinking and practice have been dominated by certain stories and cautionary tales. Many of these will be familiar to

readers: environmental “collapse” on Easter Island, the extinction of the dodo, the destruction of the Amazon rainforest. Such stories are powerful and help conservationists increase awareness of important issues and raise funds to tackle them. But they can also create problems by oversimplifying complex issues, leading to misguided policies. The “tragedy of the commons,” popularized by ecologist Garrett Hardin (1968), represents an especially prominent example of how an oversimplified story can capture the imagination of scientists and policy makers and persist despite deep flaws (see Box 6.3 in Chapter 6, Political Science and Conservation). While we do not wish to downplay the magnitude of conservation challenges and threats to biological diversity, conservationists need to pay closer attention to the stories they tell each other and the world.

Studies of the environmental and socioeconomic interactions between distant regions of the world, known as telecoupling (Liu et al. 2013), provides a promising example of research seeking to provide a fuller picture of threats and opportunities to biodiversity conservation. In an increasingly interconnected world, telecoupled forces like international trade of agricultural products and wildlife are unprecedented in their speed, extent, and intensity (Carrasco et al. 2017). These forces underpin many of the threats to biodiversity like habitat loss, direct exploitation of valuable biota, and invasive species. Production of beef, palm oil, soybean, and other commodities, driven by consumer demand in increasingly affluent societies, has led to tropical deforestation (Newton et al. 2013) with negative impacts on biodiversity (Lenzen et al. 2012; Moran & Kanemoto 2017).

At the same time, however, telecoupling has also brought potential opportunities for conservation “in distant supermarkets, corporation boardrooms, stock markets, and the Internet” (Carrasco et al. 2017, p. 7). For instance, shifting consumer demands have created pressures on multinational corporations and governments to support more sustainable commodity production. Certification of commodities like coffee, paper, seafood, and wood as sustainably sourced is increasingly widespread and can help advance conservation objectives (Tayleur et al. 2017; Lambin et al. 2018), although critics suggest that consumers have limited power to influence large-scale commodity chains in comparison to large businesses and governments (Scales 2014). Conservation research and practice are increasingly recognizing that a global perspective is needed that trains attention on consumers, corporations, and governments in wealthy countries as much as on small-scale producers in poorer yet often biologically rich ones.

### 1.3.2 The Effectiveness of Conservation Policy and Practice

Given the growing threats to biodiversity and the expanding roll call of species on the brink of extinction, there is an urgent need to better understand what determines the effectiveness of conservation interventions. Historically, conservation policy has tended to focus on establishing protected areas. In reality, many protected areas are little more than “paper parks” that exist only on maps and in policy documents, with resource extraction and environmental degradation often continuing to occur. Global studies of protected area performance have found that less than half of protected areas are effectively managed (Leverington et al. 2010; Watson et al. 2014) due in significant part to insufficient capacity (Gill et al. 2017) and funding (Coad et al. 2019). Legal changes that reduce the protections and extent of protected areas further challenge the effectiveness of conservation efforts (Golden Kroner et al. 2019). Conservation policy has also often proved faddish, with



organizations chasing the latest policy fashions and funding trends (Redford et al. 2013). It seems that the urgency of the problem leads to an ever faster policy treadmill. There have been too few efforts to take stock of what has worked (or not worked) and why (Ferraro & Pattanayak 2006; Miteva et al. 2012; Burivalova et al. 2019; Wardropper et al. 2022).

In response to shortcomings and unintended consequences of many conservation projects, more rigorous and systematic assessments of the effectiveness of different conservation tools and practices are being published (Sutherland et al. 2004). A recent boom in gathering and analyzing conservation evidence has been driven by a desire to make conservation policy and practice more rigorous and objective. While we welcome efforts to improve the success of conservation interventions, as Adams and Sandbrook (2013) note, two important questions must still be answered: What counts as evidence? and How does evidence count?

With regard to the first question, it is crucial that conservation decision makers resist the temptation to draw only on forms of knowledge with which they are familiar (e.g. **quantitative** data from the natural sciences) and engage with different kinds of social scientific data (both quantitative and **qualitative**) as well as indigenous and other relevant forms of knowledge (Charnley et al. 2017). In terms of how evidence is used to inform policy, it is not simply a case of getting conservation experts to gather “better” data to hand over to decision makers so they can make the “right” decision. This sort of conservation decision-making privileges certain individuals, groups, and forms of knowledge and excludes others. The production, distribution, and use of knowledge are processes intimately tied to the exercise of power. What counts as knowledge, how it is generated, and who gets to make decisions on whose behalf should be at the heart of any discussion of conservation evidence and policy making.

Efforts to conserve biodiversity have brought mixed results for people living in and around protected areas. Evidence of positive impacts on livelihoods and other aspects of human well-being (McKinnon et al. 2016) coexists with studies finding a range of negative impacts, including evictions, loss of access to natural resources, and exclusion from decision-making (Brockington & Igoe 2006; West et al. 2008; Dressler et al. 2010; Oldekop, Holmes et al. 2016). Conservationists have often been poor at understanding the different worldviews and priorities of other stakeholders, leading to antagonism and conflict (Scales 2012; Parathian 2019). The fact that some of the poorest people on the planet pay the highest costs for the conservation of global biodiversity is morally unacceptable (Martin 2017). The principal problem is that the conservation of biological diversity largely remains something that is done by conservation experts rather than a process that engages with diverse interest groups. This reduces the chances that conservation policies will succeed.

### 1.3.3 The Search for Sustainable Conservation Solutions in an Uncertain Future

Given the urgency of the global conservation challenges, there has been a tendency in policy circles to look for panaceas—magic bullets that will solve all problems (Ostrom et al. 2007). However, as will become apparent in many of the subsequent chapters, win-win solutions can be elusive in conservation and context is key. Conservation challenges are often the result of the complex interactions among various social and environmental factors, which preclude simple one-size-fits-all solutions.

In addition to the issues surrounding evidence-based conservation highlighted in the previous section, we lack knowledge of which kind of intervention is most effective in what context. Do incentive programs like paying landowners for habitat conservation work better than government-run protected areas? Are information-based approaches like those to inform consumers about sustainably harvested seafood or zero-deforestation beef, palm oil, or soybean more effective than encouraging conservation through ecotourism? Under what conditions do approaches implemented successfully in one country or ecoregional context work in another? Recent reviews are beginning to synthesize available evidence to answer such questions (Miteva et al. 2012; Agrawal et al. 2018; Burivalova et al. 2019), but relevant research remains scant. A national-scale study from Mexico (Sims & Alix-Garcia 2017) comparing the effectiveness of setting aside land for conservation versus paying landowners to protect it provides a notable exception. The authors find that protected areas and payments for ecosystem services approaches had about the same positive effects in conserving forests, but that the latter was more successful in also alleviating poverty. They conclude that interventions combining sustainable financing, flexible zoning, and recognition of local aspirations are more likely to deliver conservation gains without compromising local livelihoods.

Beyond considering the relative efficacy of different conservation approaches and devoting closer attention to local social context, conservation policy and practice also need to do more to recognize and address tradeoffs between different outcomes (McShane et al. 2011). Biodiversity conservation involves difficult decisions, especially in the context of limited resources: which species to focus on; which geographical areas and ecosystems to prioritize; how to balance the needs of humans and non-human species; and how to balance the demands and priorities of different groups and stakeholders. Once again, questions of power emerge. Who gets to decide on the tradeoffs that are made, as well as how the costs and benefits of different projects and actions are shared? The social sciences have an important role in addressing such questions.

To date, conservation actions have largely been reactive, responding to threats and attempting to slow the loss of habitats and species. There have been notable attempts to “horizon scan” and identify future trends and priorities (Oldekop, Fontana et al. 2016; Sutherland et al. 2019). However, conservation policy and practice need to go further in thinking about the future. Climate change will complicate efforts to manage biodiversity. The rate and scale of projected climate changes in the twenty-first century are likely to have profound impacts on the functioning of Earth’s ecosystems. It is still unclear how this will unfold and which ecosystems and species will be most affected (Seddon et al. 2016). As well as the important biological questions of how different species and ecosystems will react, there are also major questions about how humans will adapt and what this will mean for biodiversity and human well-being (Maxwell et al. 2015; Pecl et al. 2017; Marselle et al. 2019). A greater emphasis on prediction and learning from other fields like finance, military studies, and public health promise to help conservation advocates to anticipate shocks and pre-empt their impacts in an increasingly uncertain world (Travers et al. 2019).

Nevertheless, it is also important to remember that even when conservation strategies work for a time, there is no guarantee that they will endure. Studies of protected area downgrading, downsizing, and degazettement have shown, for example, how conservation policies can quickly be undone (Mascia & Pailler 2011; Golden Kroner et al. 2019). Research on the long-term impacts of conservation interventions remains rare, however (Miller et al.

2017), and this situation will need to change to enable more informed efforts to foster just and sustainable conservation.

## 1.4 Opportunities and Challenges for Conservation Social Science

Traditionally, biodiversity conservation has been viewed primarily through the lenses of the discipline of biology, especially genetics, population biology, and biogeography. Given that the term *biodiversity* refers to the variety of living organisms, it is tempting to see the natural sciences (especially the various biological disciplines) as the most relevant to supporting conservation policy and practice. This is indeed the way much of modern conservation has developed, including the discipline of conservation biology. Conservation research has mainly focused on measuring extinction rates, compiling data on biological diversity at various levels, assessing threats to species and ecosystems, and more recently on calculating the economic values of ecosystem services in the hope of convincing businesses and policy makers that biodiversity matters. So while Soulé (1985, p. 727) labeled conservation biology as “multidisciplinary,” “synthetic,” and “eclectic” (and explicitly noted the need for insights from the social sciences), the reality has been a concentration on biological processes rather than relevant, but often harder-to-measure indicators from many of the social sciences (Hicks et al. 2016).

However, a growing number of conservation researchers and practitioners are realizing that conservation is in fact not primarily about biology but about people and the choices they make (Balmford & Cowling 2006; Amel et al. 2017). It is clear that **biodiversity conservation** is a social phenomenon. Threats to biological diversity are influenced by a wide range of social factors. The conservation of biodiversity is conceived and carried out by people. Biodiversity conservation is a manifestation of human beliefs and values. In every corner of the planet, formal and informal social **norms** establish expectations and standards for protecting genes, species, ecosystems, and the relationships among them. Written laws and unwritten taboos govern hunting, fishing, logging, recreation, agriculture, and human settlement. Choices about which species and habitats to conserve, how to prioritize efforts, and how to conserve them are inherently political. Environmental education programs attempt to provide individuals with sufficient information to make informed decisions (Box 1.2) about how they interact with the environment while marketing, advocacy, and lobbying campaigns promote specific conservation agendas. Government agencies, non-profit organizations, for-profit corporations, and individuals invest billions of dollars and spend countless hours designing and implementing these and other conservation actions.

It is clear that the conservation of biological diversity is a social process, with consequences that affect humans and other species. The choice to conserve is a human one. The various ways of doing it are social initiatives. The impacts of how it is done are felt by people (as well as other species), and yet conservation policy and practice have been dominated by various branches of the biological sciences. This book argues that the social sciences have much to offer. In developing our argument, the chapters that follow extend and deepen previous efforts that have sought to show how social science contributions are vital to understand conservation and to the field’s overall success (Mascia et al. 2003; Kareiva & Marvier 2012; Bennett, Roth, Klain, Chan, Christie et al. 2017).

**Box 1.2 Crossing boundaries: changing consumer behavior to reduce wildlife trade in Asia. Author: Sophia Winkler-Schor, University of Wisconsin**

Influencing the choices people make is crucial to conservation and thus, conservationists must understand human behavior to achieve global conservation goals (Balmford et al. 2021). Conservation marketing is a burgeoning discipline and is defined as “the ethical application of marketing strategies, concepts and techniques to influence attitudes, perceptions and behaviors of individuals, and ultimately societies, with the objective of advancing conservation goals” (Wright et al. 2015, p. 46). Advertising and marketing techniques in commercial sectors have seen great success in identifying segments of a population who are most persuadable and then developing techniques to influence their preferences and behavior. During the last few decades, conservation marketing experts have increasingly adopted these techniques to identify subpopulations and frame campaign messages in a way that speaks to the values, norms, and attitudes of the people (Verissimo 2019). From the protection of endemic endangered St. Vincent parrot (*Amazona guildingii*; Jenks et al. 2010) to reducing lawn watering by North American homeowners (McKenzie-Mohr 2000), conservation marketing has helped change human behavior and contributed to conservation success.

In recent years, conservation marketers have turned their attention to tackle the problem of elephant ivory consumption in China and other countries in Asia, which threatens the existence of global elephant populations. Various campaigns have been designed and implemented to dissuade consumers from buying ivory, with conservation marketing as a core strategy of these campaigns (Greenfield & Verissimo 2019). The spike in ivory consumption over the past 15 years has been spurred by increasing affluence in China and other Asian countries, and so conservation marketing experts have sought to understand what would influence ivory consumers’ behavior through focus groups, interviews, and surveys (see, e.g. Lee et al. 2016). Results indicate that:

- 1) People were unaware of the basic facts of where ivory comes from (many did not know that elephants are killed for their tusks) and the future implications of the illegal ivory trade (overall elephant extinction).
- 2) There was confusion surrounding legal and illegal ivory. Ivory consumption was not banned in China until December 31, 2017.
- 3) People wanted to reduce government corruption, and ivory consumption is linked to government corruption and bribery. Ivory is largely used as “gifts” for government officials in China.
- 4) People wanted to combat organized crime, and ivory consumption is illegal as of 2018.
- 5) Ivory is highly ingrained into Chinese tradition and seen as a wise financial investment. Thus, these cultural norms must be uncoupled from ivory.

Conservation marketers compiled the findings from focus groups and interviews to develop persuasive campaign messages featuring local celebrities. Preliminary results suggest that since the ivory ban took effect in 2018 and the public campaign, only 12% of respondents claim to have purchased ivory in the past six months compared to 26% of respondents who reported doing so in a similar 2017 pre-ban survey (GlobeScan 2021), a 54% decline. The entirety of the campaign success has not yet been evaluated as it is still in its implementation phase. However, while such behavior change

(Continued)

**Box 1.2 (Continued)**

campaigns are becoming increasingly popular, very few define clear, time-bound objectives or a control group to enable rigorous assessment of success (Veríssimo & Wan 2019). Such measures are necessary for this type of conservation action to effectively address the unsustainable trade in wildlife.

Conservationists have long recognized the important role social sciences have to play in advancing conservation objectives (Soulé 1985; Leopold 1987 [1949]). The conservation literature is full of strong calls for their greater use and integration (Mascia et al. 2003; Fox et al. 2006; Cowling 2014; Bennett, Roth, Klain, Chan, Clark et al. 2017) and for interdisciplinarity (Schultz 2011; Guerrero et al. 2018; Stern 2018). The social sciences are increasingly better integrated into conservation science (Teel et al. 2018; Hintzen et al. 2019), but their incorporation into the mainstream of conservation policy and practice lags behind (Mascia et al. 2003; Adams 2007; Bennett, Roth, Klain, Chan, Christie et al. 2017; Nature Editorial Board 2022).

The challenges to integrating the social sciences into conservation research and practice are manifold. Most readers will be aware that the natural and social sciences have different vocabularies and different **methodologies**. But as will become apparent through this book, differences between the natural and social sciences go even deeper. They can be based on very different philosophies of what research is for and even what counts or does not count as valid knowledge (Chapter 2, Social Science Foundations). To some, the immensity and diversity of social science theory, research foci, methods, and philosophical foundations represent substantial barriers unto themselves: “To the uninitiated, the social sciences can seem like the “Tower of Babel”” (Phillipson et al. 2009).

Beyond these linguistic and philosophical barriers, more mundane and bureaucratic barriers often inhibit more integrated conservation knowledge. Professional incentives tend to discourage interdisciplinary collaboration and applied problem-solving and push researchers down ever narrower subfields of specialization (Fox et al. 2006). In addition, social scientists (like natural scientists) often struggle with the tension among the roles of scholar (to document, explain, and critique), practitioner (to identify problems and implement solutions), and advocate (to encourage specific goals and actions). Indeed, some scholars fear that engaging too deeply in the policy process hinders one’s ability to observe and critique (Lackey 2007) and that one’s knowledge or expertise might be misused (Chapin 2004). Others counter that specialization is essential to rigorous scholarship or that social scientists lack sufficient conservation knowledge to contribute effectively to conservation science and policy (Fox et al. 2006).

Despite these considerable barriers, there is a growing trend toward interdisciplinarity in conservation research and policy making (Bennett, Roth, Klain, Chan, Clark et al. 2017; Charnley et al. 2017). We very much welcome this development but with two important caveats. The first is that conservationists need to draw on a wider range of social science methods and approaches. To date, conservationists have tended to engage with a relatively narrow subset of the social sciences, favoring quantitative approaches from economics, political science, and behavioral sciences (Moon et al. 2019). The reasons for this are explored in Chapter 2 (Social Science Foundations) but mainly relate to the fact that these

approaches fit well with the quantitative scientific traditions within the conservation sciences. In contrast, conservation scientists drawing on the social sciences have tended to be less engaged with questions of values and power (Hicks et al. 2016).

The second caveat follows from the observation that conservation practitioners and policy makers have tended to have a rather instrumentalist view of the social sciences. In other words, they have seen the social sciences as a means to help conservationists achieve their desired goals. However, the social sciences are not simply at the service of conservation science or conservation policy and practice. For example, many social scientists work *on* conservation rather than *for* conservation (Sandbrook et al. 2013). That is, their main interests are to study and critique conservation science, policy, and practice. Such social scientists view conservation as an important object of study itself, capable of yielding more general insights about human behavior and meaning.

While conservationists often can find it uncomfortable to be under the gaze of social scientists—to be the object of academic study—this form of conservation social science can add significantly to biodiversity conservation. It can help researchers and practitioners reflect on values and beliefs, as well as the power relations, that are often taken for granted. For example, research has shown that even within the world of conservation research, policy, and practice, there is a wide range of contrasting and even conflicting views of what conservation is for and how it should be carried out (Sandbrook et al. 2011, 2019). Through studying conservation as a social process, the social sciences can help conservation policy and practice with dialogue, discussion, and debate. Only when we can acknowledge and recognize different viewpoints can we begin constructive dialogue.

The social sciences have a long history of studying human interactions with nature. However, this book serves as a platform for taking this engagement further and for moving from social science approaches to studying human–environment interactions to conservation social science. This book is organized according to the classic disciplines within the social sciences. It is distinctive in its in-depth treatment of these different social science disciplines as opposed to exploration of more applied, cross-cutting social sciences and humanities as reviewed elsewhere (Bennett, Roth, Klain, Chan, Christie et al. 2017). Nevertheless, it will become apparent that the boundaries between the core social science disciplines are often fuzzy. Our hope is that conservation social science will develop into a mature field that transcends these boundaries as it also helps break down others between expert knowledge, citizen science, and indigenous knowledge; between Western and non-Western values; and between research, policy, and practice.

## 1.5 Plan of the Book

Given the diversity of our audience, we have chosen a straightforward and consistent organization. Before we get to the discipline-based chapters that form the bulk of this book, and are ordered alphabetically, there is an important chapter that we have titled “Social Science Foundations.” While it is perfectly possible to read each chapter individually and in no particular order, we encourage readers to start with this overview chapter. As we have already alluded, some of the biggest barriers to bridging the natural and social sciences involve the different ways in which many social scientists approach knowledge: what it is,