Helen Kopnina · Haydn Washington
Editors

Conservation

Integrating Social and Ecological Justice

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Editors
Helen Kopnina
The Hague University of Applied Sciences
The Hague, The Netherlands

Haydn Washington
PANGEA Research Centre
BEES, UNSW
Kensington, Australia

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Contents

Editors and Contributors

About the Editors

Helen Kopnina (Ph.D., University of Cambridge, 2002) is currently employed at The Hague University of Applied Science (HHS) in The Netherlands, coordinating the sustainable business program and conducting research in three main areas: environmental sustainability, environmental education, and biological conservation. She is the author of over 90 peer-reviewed articles and (co)author and (co)editor of 15 books.

Haydn Washington is an environmental scientist and writer who also writes extensively on ecological economics and ecological ethics. He is Adjunct Lecturer at the PANGEA Research Centre, BEES, University of NSW. He was variously worked in CSIRO, as Director of the Nature Conservation Council of NSW, as an environmental consultant, and as Director of Sustainability in local government. He has a four-decade involvement with environmental NGOs in Australia. He is the author of seven books on the environment, including *Ecosolutions* (1991), *Climate Change Denial: Heads in the Sand* (2011 with John Cook), *Human Dependence on Nature* (2013), *Demystifying Sustainability* (2015), and *A Sense of Wonder Towards Nature* (2018). He is Co-Director of the NSW Chapter of the Center for the Advancement of a Steady State Economy, and is on the Steering Committee of the group GENIE (www.ecodemocracy.net).

Contributors

Kaitlyn Creasy researches and writes in the areas of nineteenth- and twentieth-century Continental philosophy (especially Friedrich Nietzsche), nihilism (especially affective nihilism), and environmental philosophy. Her work has been featured in *Environmental Philosophy* and the *Journal of Nietzsche Studies.* Her recent work on Nietzsche focuses on self-knowledge and the transformative

potential of affect. Her recent work in environmental philosophy critiques new conservationist logic and envisions bio- and ecocentric alternatives to human supremacist frameworks in conservation and environmental ethics more broadly.

Eileen Crist received her bachelor's from Haverford College in sociology, and her Ph.D. from Boston University, also in sociology with a specialization in life sciences and society. She is Associate Professor in the Department of Science, Technology, and Society at Virginia Tech. Her work focuses on the biodiversity crisis and the destruction of wild places, and pathways to halt these trends. She is the author of *Images of Animals: Anthropomorphism and Animal Mind*. She is also the co-editor of a number of books, including *Gaia in Turmoil: Climate Change, Biodepletion, and Earth Ethics in an Age of Crisis*, *Life on the Brink: Environmentalists Confront Overpopulation*, *Keeping the Wild: Against the Domestication of Earth*, and *Protecting the Wild: Parks and Wilderness, the Foundation for Conservation*. She is the author of numerous academic papers and popular writings and Associate Editor of the online journal *The Ecological Citizen*. Her most recent book, *Abundant Earth: Toward an Ecological Civilization*, was published by University of Chicago Press in 2018. For more information and publications, visit her website www.eileencrist.com.

Patrick Curry is a Canadian-born writer and scholar living in London. He holds a Ph.D. in the history and philosophy of science from University College London and has been Lecturer at the University of Kent and Bath Spa University. He remains a tutor at the University of Wales Trinity St. David. His books include *Defending Middle-earth: Tolkien, Myth and Modernity* (Houghton Mifflin, 2004), *Deep Roots in a Time of Frost: Essays on Tolkien* (Walking Tree Books, 2014), and *Ecological Ethics: An Introduction,* rev. ed. (Polity Press, 2017), and he is finishing a book on natural enchantment. He is also Editor-in-Chief of the online journal, *The Ecological Citizen* (http://www.ecologicalcitizen.net/). More information and most of his papers, articles, and reviews can be found on www.patrickcurry.co.uk.

Dominick A. DellaSala is President and Chief Scientist of the Geos Institute, Ashland, Oregon, and former President of the Society for Conservation Biology, North America. He is an internationally renowned author of over 200 publications on forest ecology, endangered species, conservation biology, and climate change. He has given keynote talks ranging from academic conferences to the United Nations Earth Summit. He has been featured in hundreds of news stories and documentaries, testified in the US Congress, has co-founded organizations, and has received conservation leadership and book writing awards. He is on the editorial board of Elsevier's *Earth Systems and Environmental Sciences*, co-editor of the *Encyclopedia of the Anthropocene* and *The World's Biomes* (Elsevier), and editor of several scientific journals. He is motivated by his work to leave a living planet for his daughters, grandkids, and all that follow.

Joe Gray is a field naturalist and eco-activist who lives in the east of England. He has an M.Sc. in forestry from Bangor University and an M.A. in zoology from the University of Cambridge. He is a Fellow and Trustee of the British Naturalists' Association and a Fellow of the Royal Entomological Society, and in his spare time, he serves as county recorder for a group of insects known as terrestrial Heteroptera. He is Co-Founder of the recently formed Global Ecocentric Network for Implementing Ecodemocracy (GENIE; https://ecodemocracy.net/). Joe is also Co-Founder and Associate Editor of *The Ecological Citizen* and Knowledge Advisor on ecological ethics for the United Nations' Harmony with Nature program. Finally, he is married with no children and he enjoys the regular visits to his home of a neighborhood cat, as well as exploring France and Spain by train.

Richard Grossman has been concerned about human population since 1960. He chose the profession of obstetrics and gynecology to be able to help couples have healthy children when they want and to help people limit their fertility if that is their goal. He practiced medicine and public health in Colorado for 40 years and now writes the monthly column "Population Matters!". Past essays are available at: www.population-matters.org.

David Johns has advocated for large-scale conservation for many decades. A Co-Founder of the Wildlands Network, Yellowstone to Yukon Conservation Initiative, and Conservation Biology Institute, he currently serves as Chair of the Marine Conservation Institute which is home to the Global Ocean Refuge System Initiative. He has worked on conservation projects in the Russian Far East, Australia, Europe, Southern Africa, and throughout the Americas. He is the author of *A New Conservation Politics* (2009), a manual on effective advocacy for conservationists, and *Conservation Politics: The Last Anti-Colonial Battle*, about overcoming the major obstacles to conservation. He teaches politics and law at Portland State University.

Reed Noss is a writer, photographer, lecturer, and consultant in natural history, ecology, and conservation and serves as Chief Science Advisor for the Southeastern Grasslands Initiative and the Endangered Ecosystems Alliance. He was formerly Provost's Distinguished Research Professor of Biology at the University of Central Florida. He received a B.S. in education from the University of Dayton, an M.S. in ecology from the University of Tennessee, and a Ph.D. in wildlife ecology from the University of Florida. He served as Editor-in-Chief of *Conservation Biology*, Science Editor for *Wild Earth* magazine, and President of the Society for Conservation Biology. He is Elected Fellow of the American Association for the Advancement of Science. His recent research topics include disturbance ecology; road ecology; ecosystem conservation and restoration; and vulnerability of species and ecosystems to sea-level rise. He has more than 300 publications, including eight books. His most recently published books are *Forgotten Grasslands of the South: Natural History and Conservation* (Island Press, 2013) and *Fire Ecology of Florida and the Southeastern Coastal Plain* (University Press of Florida, 2018). He is currently working on a book on the endangered ecosystems of North America.

Veronica Strang is an environmental anthropologist and Director of Durham University's Institute of Advanced Study. Her research focuses on human–environment relations and, in particular, people's engagements with water. She has conducted ethnographic research in Australia, the UK, and New Zealand and has held posts at the University of Oxford, the University of Wales, Goldsmiths, University of London, and the University of Auckland. In 2000, she received a Royal Anthropological Institute Urgent Anthropology Fellowship, and in 2007, she was awarded an international water prize by UNESCO. From 2013 to 2017, she was Chair of the Association of Social Anthropologists of the UK and the Commonwealth. The key publications include *Uncommon Ground: cultural landscapes and environmental values* (Berg 1997); *The Meaning of Water* (Berg 2004); *Gardening the World: Agency, Identity and the Ownership of Water* (Berghahn 2009); *Ownership and Appropriation* (Berg 2010); *Water: Nature and Culture* (Reaktion 2015); and *From the Lighthouse: Interdisciplinary Reflections on Light* (Routledge 2018). She is currently working on a major comparative text exploring diverse societal trajectories in long-term human–environment relationships.

Alessio Thomasberger received his bachelor's degree in cultural and social anthropology at University of Vienna. With experience among indigenous people in the Peruvian Amazon, and his main interest being the study of indigenous people, he studied a semester abroad at the indigenous and intercultural University URACCAN in Nicaragua. In 2017, he received his master's degree at Leiden University in cultural anthropology and development sociology. For his thesis, he conducted field research among rural charcoal producers in Ghana. Specializing in environmental issues, his main research area of interest is the role of indigenous knowledge in the process of finding solutions concerning global climate change.

List of Figures

Part I
Society and Environment: Perspectives from Social Science and Ecology

Chapter 1
Conservation and Justice the Anthropocene: Definitions and Debates

Helen Kopnina and Haydn Washington

> *Wilderness is not a luxury but a necessity of the human spirit, and as vital to our lives as water and good bread. A civilization which destroys what little remains of the wild, the spare, the original, is cutting itself off from its origins and betraying the principle of civilization itself.*
> —Edward Abbey (1968: 169).

Introduction: Outlining the Aims of This Volume

As many in society work towards global sustainability, we live at a time when efforts to conserve biodiversity and geodiversity, and combat climate change, take place simultaneously with land grabs by large corporations, food insecurity, and human displacement through an ecological breakdown. Many of us seek to reconcile more-than-human nature and human nature, and to balance intrinsic value and the current human expansion phase. These and other challenges will fundamentally alter the way people, depending on their worldview and ethics, relate to communities and the environment.

This book takes as its point of departure today's pressing environmental challenges, particularly the loss of biodiversity and geodiversity, and the role of communities in protected areas' conservation. In its chapters, we discuss areas of tension between local livelihoods and international conservation efforts, between local communities and wildlife, and finally between traditional ways of living and 'modernity'. The central premise of this book is that while these tensions cannot be easily resolved they *can* be better understood by considering both social and ecological effects, in

H. Kopnina (✉)
The Hague University of Applied Sciences, The Hague, The Netherlands
e-mail: h.kopnina@hhs.nl; alenka1973@yahoo.com

H. Washington
PANGEA Research Centre, BEES, UNSW, Kensington, Australia
e-mail: h.washington@unsw.edu.au

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equal measure. We believe that ecological justice and social justice must be entwined, as both are essential.

While environmental problems cannot be seen as purely ecological because they always involve people, who bring to the environmental table their different assumptions about nature and culture, so are social problems connected to environmental constraints. Similarly, social problems are fundamentally connected to environmental constraints and ecological health. While nonhumans cannot bring anything to this negotiating table, the distinct perspective of this book is that there is a need to consider the role of nonhumans as equally important stakeholders—albeit without a voice. This book develops an argument that *human-environmental relationships are set within ecological reality and ecological ethics*. Rather than being mutually constitutive processes, humans have obligate dependence on nature, not vice versa. We argue that over-arching ecological ethics is necessary to underpin conservation in the long-term. This requires a holistic 'justice', where both social justice (for humans) and ecological justice (for nature) are entwined. However, given the escalating environmental crisis and major extinction event we face, and given that social justice has been dominant for centuries, we believe that in many cases ecojustice will need to be *prioritized*. This will depend on the situation, but we feel that under ecological ethics, holistic ethics cannot always allow social justice to dominate, hence there is an urgent need to prioritize ecojustice today. Accordingly, this book will deal with questions of both social and ecological justice, putting forth the idea that justice for both humans and nonhumans and their habitats can only be achieved simultaneously. This book will explore the following questions: What is the relationship between social and ecological justice? How might we integrate social and ecological justice? What are the major barriers to achieving this simultaneous justice? How can these barriers be overcome? What are the major debates in conservation relevant to this?

We hope that this volume will encourage discussion about the complexity and contradictions, as well as reconciliation, in regard to what justice *is*. This means reconciliation is needed for both research and policy, for instance by highlighting both competing claims, and the tendency for outcomes to reflect a dualistic view of nature being separate from humanity. In this volume, one of the central dualisms discussed refers to that between the human and non-human world. We believe that this is a false dichotomy, as humanity is intimately connected to, and is part of, 'nature'—and we should explore the philosophical, political, as well as practical implications of this. We will refer in this volume to *collective* humanity—although we are very aware of varying environmental impacts and material needs of different social groups and individuals. 'Nonhumans' will be referred to in this chapter as animals and other living organisms, including plants and fungi, as well as terrestrial and marine ecosystems.

In the sections below we shall examine key definitions and concepts, including the Anthropocene; anthropocentrism; environmental and ecological justice; and conservation.

The Anthropocene

In the Anthropocene, humans dominate most fluxes and cycles of the planet's ecology and geochemistry (Crist 2013). We use the term 'Anthropocene' purely because so many in academia use it. We agree, however, with Moore (2016) that the name 'Anthropocene' muddles the message. In fact, some who use the term seem proud that humanity is having such a huge impact! Another term for the Anthropocene could be 'ecocide'. A better term, we suggest, would be the positive term 'The Ecozoic' coined by Swimme and Berry (1992), which describes the geologic era that the Earth needs to be entering—when humans live in a mutually enhancing relationship with Earth and the Earth community. According to some estimates, we run the risk of losing more than half of the total amount of species in the world before the second half of the 21st century (Broswimmer 2002). Raven et al. (2011) suggest that by 2100 we may lose *two-thirds* of the Earth's species. By explicitly privileging human welfare over that of all other living beings, anthropocentrism denies ecological justice, or justice between species (Eckersley 1992; Schlosberg 2004; Baxter 2005; Strang 2016; Washington et al. 2018) and the 'Rights of Nature' (Borràs 2016) and Earth jurisprudence (Cullinan 2003; Burdon 2011). Baxter (2005: 4) argues that nonhuman species have a moral right to 'distributive justice' in regard to a fair share of the environmental resources that all life-forms need to survive and to flourish'. Mathews (2016) speaks of "bioproportionality", an ethic that reaches beyond mere 'viability', seeking optimal populations of all species. This clearly has policy implications in regard to the need to control human overpopulation (Crist et al. 2017). It also strengthens the case for increasing the extent of protected areas and especially the 'Half Earth' vision' (Wilson 2016).

These concerns are not new, as (for example) environmental sociologists have warned us for many years about the dangers of the Dominant Western Paradigm encompassing economic growth (e.g. Catton and Dunlap 1978). Similarly, philosophers explored the exclusion of nonhumans from dominant ethics (e.g. Naess 1973; Goodpaster 1978; Shepard 1982; Rolston 1983; Taylor 1983; Katz 1996). Multiple authors in fields of sciences—biologists, ecologists, geologists, climate specialists and other scholars (e.g. Ehrenfeld 1978; Curry 2011)—have outlined the danger of industrial development to ecosystems and their inhabitants, including ourselves. Mass consumption and expanding populations worldwide have led to the conversion of wild habitats into agricultural or industrial areas, and exploitation of billions of animals for food production (Crist et al. 2017).

These concerns are documented by several joint 'Statements of concern' by scientists. For example, in 1992, 1700 of the world's leading scientists published a 'Warning to Humanity' (UCS 1992) that stated:

> Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on critical resources. If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our present course will bring about.

In 2017, over 15,000 scientists endorsed the 'World Scientists Warning to Humanity: A Second Notice' (AWS 2017) which noted that most problems were getting worse. They have pointed out that the Anthropocene is intertwined with the practice of industrialization and the ideology of economic growth, which ignore the needs of other living beings on this planet (Dietz and O'Neill 2013; Daly 2014; Chapron et al. 2018). The rhetoric of 'sustainable development' proposes win-win solutions (WCED 1987) reflected in the triple bottom line approach of 'People, Planet, and Profit'. This approach is rooted in classical economic assumptions that growth will maximize human well-being through *spreading evenly*—thus, that the "rising tide will raise all boats" (for critical discussion, see Washington 2015). However, trying to achieve low mortality, economic prosperity and ecological sustainability is all but impossible (Rees 2008; Rolston 2012). Unless Western-style consumption is made more sustainable, and human population growth is voluntarily halted, the crisis of limited resources is virtually certain to deepen (Crist 2015, 2016; Washington 2013, 2015) and conservation is likely to be twisted as a concept to serve nothing more than the utilitarian needs of a single species (Crist 2012; Crist and Cafaro 2012; Kopnina 2015, 2016; Washington et al. 2018). In this context, the Anthropocene has come to signify the domination of economic industrial thinking, steeped in anthropocentrism.

Anthropocentrism

Anthropocentrism typically allocates ethical consideration only to the human species, where only humans have rights. It generally glorifies human domination over nature. Anthropocentric modernism generally seeks technological solutions to problems created by industrial development (Cornucopianism). Yet, the prospects for reconciling the conflict between economic growth and nature conservation with technological progress are limited at best (Daly and Cobb 1994; Czech 2008; Dietz and O'Neill 2013). The term "human ingenuity" is spoken of in regard to environmental problems, however the result is exclusive human welfare (The Economist 2015a, b), and not that of other living beings and their habitats (Higgins 2010).

Typically, discussions of environmental problems involve environmental disasters that threaten economic progress, as in the case of climate change that endangers food production and coastal communities. Significantly less attention is given to biodiversity conservation unless it is seen as *useful* for humanity (Katz 1996; Taylor 2013; Gren et al. 2016). In fact, the use of conservation for advancing *human* welfare has become common in the so-called "new conservation" (ideologically neo-liberal) and also in "critical social science' (ideologically neo-Marxist) (these distinctions are described in Kopnina et al. 2018a, b). New conservation considers only strictly economic benefits (or disadvantages) of protected areas (e.g. Marris 2014; Marvier 2014). In fact, new conservation can be seen as a surrender to the logic of economic growth and industrial development (Miller et al. 2014). For the 'critical social scientists' (Sandbrook 2015) the concept of justice is often connected with the neo-Marxist discussion of downtrodden communities. Environmental justice in

connection to conservation is often linked with gendered, racial, and inter-class differences that affect forest livelihoods of local communities, arguing that outcomes of conservation policies often reflect elite interests (e.g. Büscher and Fletcher 2016). These schools of thought will be further discussed in Chap. 2.

Anthropocentrism is reflected in the paradoxical nature of the concepts widely used in policy and economics, which include "sustainable development" (Kopnina 2012, 2016; Washington 2015). Anthropocentrism denies the concept of bioproportionality, which supports an abundance and flourishing of *all species* according to their living requirements (Mathews 2016). Anthropocentrism is also antagonistic to any vision of an increased area of conservation reserves, such as the 'Nature Needs Half' movement (e.g. Noss 1992; Cafaro et al. 2017; Wilson 2016).

Anthropocentrism, in its original and most common connotation in environmental ethics, is the belief that value is human-centered and that all other beings are just means to human ends (Grey 1993; Curry 2011; Quinn et al. 2016). Anthropocentrism is the belief that humans are more important and superior to other species, where the assessment of 'reality' is through an exclusively human perspective. Anthropocentrism can also operate both in the case of: (1) disregarding entire ecosystems and habitats and geodiversity that support biodiversity as a whole (Callicott 2006; Cafaro and Primack 2014; Doak et al. 2015; Fitzgerald 2015; Cafaro et al. 2017), and: (2) disregarding individual animals (Bisgould 2008; Borkfelt et al. 2015; Kopnina and Gjerris 2015; Sykes 2016).

Recent decades have witnessed a rising concern with anthropocentrism and a renewed interest in the radical examination of the ethical underpinnings of animal rights and welfare (e.g. Singer 1977; Regan 1986; Bisgould 2008; Borràs 2016); biological conservation (e.g. Nelson and Vucetich 2009; Rolston 2012; Tallis et al. 2014; Doak et al. 2015; Nelson et al. 2016; Shoreman-Ouimet and Kopnina 2016; Cafaro et al. 2017); compassionate conservation (e.g. Bekoff 2013; Waldau 2013) and a plea for ecocentrism (Taylor 2010; Curry 2011; Rolston 2012; Fisher 2013; Vetlesen 2015; Weber 2016; Washington et al. 2017).

Environmental Justice

Not all human beings on this planet have equal access to natural resources, leading to questions of inequality and injustice. According to Veronica Strang (2016: 259), an anthropologist concerned with both social and ecological justice, the notion of justice is: "fundamentally concerned with equalizing relations between those who have power and those who do not". Environmental justice is thus often defined from the general "justice" in terms of fairness: "the condition of being morally correct or fair" and "the system of laws by which people are judged and punished" (Cambridge dictionary). Environmental justice usually excludes the environment when it is unconnected to human welfare, as it mostly refers to environmental risks and benefits for human communities (Schlosberg 2004; Kopnina 2014; Washington et al. 2018). Environmental justice refers to the equitable distribution of environmental

goods such as natural resources and clean air and water, or the economic proceeds of biological conservation among human populations (Kopnina and Shoreman-Ouimet 2013; Strang 2016). It is thus justice for humans in regard to environmental issues—it is thus quite different from *ecological* justice, which is about justice for nature.

Environmental justice is associated with social equality in regard to the access of different social groups to environmental benefits such as food security, water, and energy services. Often, social justice as intimately interlinked with neoclassical economics. Proponents of environmental justice often speak of unequal exposure of vulnerable, poor, marginal or indigenous communities to the negative effects of the creation of protected areas that restrict economic activities (Baviskar 2013; Nonini 2013; Büscher and Fletcher 2016). Some have argued, "it is ethically problematic to privilege conservation of a maximum level of biodiversity at the expense of livelihood security and poverty alleviation" (Benjaminsen et al. 2008: 225). In cases of conflicting interests such as human-wildlife conflicts (e.g. Jacobsen and Linnel 2016) or ecosystem services trade-offs social and environmental justice is sometimes counter-posed to ecological justice (e.g. Low and Gleeson 1998). Thus, the objective of environmental justice is to raise living standards of disadvantaged human groups permitting biological conservation *only* if it serves this purpose.

Yet, raising living standards is often used as a euphemism for the spread of the logic of neoliberal capitalism and global consumerism (Crist 2012). Raising people out of poverty without tackling over-consumption by the rich is likely to lead to a greater crisis of, and competition for, resources (Rees 2008). In fact, critics of conservation rarely address the fact that most communities are actually displaced and disadvantaged by industrial development, and rarely tackle the root causes of poverty. Rather, as Crist (2015: 85) argued, "strictly protected areas are scapegoated and wild nature, once again, is targeted to take the fall for the purported betterment of people, while domination and exploitation of nature remain unchallenged." As Monbiot in his blog (2012) argues:

> The politically easy way to tackle poverty is to try to raise the living standards of the poor while doing nothing to curb the consumption of the rich. This is the strategy almost all governments follow. It is a formula for environmental disaster, which, in turn, spreads poverty and deprivation.

Kidner (2014) argues that the current industrialist neoliberal ideology presents a barrier to both human and ecological interests. Industrocentric ideology is a self-serving system that destroys cultural and biological diversity, and portrays living beings as just a 'resource', at the expense of both ourselves and nonhumans (e.g. Baxter 2005; Taylor 2010; Crist and Kopnina 2014). Additionally, discussing only consumption and not tackling human population growth is likely to result in continuous demand for more resources, both by the poor and the rich (Crist 2012).

In terms of ethics, while in some definitions environmental justice may encompass ecological justice (Schlosberg 2004) or justice between species (Baxter 2005), most commonly environmental justice ignores the environment or nonhuman species as a focus of moral concern. Essentially, this type of justice is human-centered or anthropocentric (Cafaro et al. 2017; Washington et al. 2017, 2018; Kopnina et al. 2018a, b;

Piccolo et al. 2018) It is also self-defeating if long-term human flourishing is what we aim for (Washington 2015; 2018b). While displacement or disadvantages to local communities are touted as violations of human rights (e.g. Büscher and Fletcher 2016), there is little mention of violation of nonhuman rights through destruction of their habitat and the physical extermination of not just individuals, but in some cases entire species (Cafaro and Primack 2014; Kopnina 2016; Kopnina et al. 2018a).

Noting interdependence between human and non-human species, Strang (2016: 259) notes that a, "short-term focus on immediate human interests has longer-term detrimental effects on humans and non-humans alike" as 'social' and 'environmental' domains are intertwined. Indeed, Strang notes, a theoretical frame in which human needs are, "separated and prioritized" which "inevitably gives insufficient weight to the needs of the non-human" (Ibid). Strang continues: "giving humankind priority in the provision of justice leads down a path that is morally questionable, carries high risks, and is intellectually problematic" (2016: 259). Indeed, as the most privileged classes around the world live in unsustainable affluence, it is difficult to suggest that poorer people should be prevented from enjoying the material benefits that economic development promises. Yet, "discourses on justice often imply that the most disadvantaged human groups should have special rights to redress long-term imbalances" Strang (2016: 259). However, "if the result is only a short-term gain at the long-term expense of the non-human (and thus humans too), this is not a sustainable way to achieve either social or ecological equity" (Ibid). Thus, ecological justice is proposed both as a more inclusive moral framework, but also a more practical strategy in the long run.

Ecological Justice

So what *is* ecological justice, or what should it be? Ecological justice (Schlosberg 2004; Baxter 2005) is concerned with other species independent of their instrumental value for humans and refers to justice between human and non-human species (Naess 1973). Ecological justice is associated with biospheric altruism, and extends concern beyond human beings (Shoreman-Ouimet and Kopnina 2015: 130). This is *justice for nonhuman nature*. We feel that the simplest and most holistic meaning is 'justice for nature' and we will use this in the book.

The inclusion of non-humans by eco-advocates within political systems could be the next step in achieving ecological justice (Schlosberg 2004; Cafaro and Primack 2014; Kopnina 2014; Washington et al. 2018), as discussed by Joe Gray and Patrick Curry in this volume (see also www.ecodemocracy.net). Ecological justice has profound implications for how biological conservation is practiced. However, it is also central to how an ecocentric ethical movement can, and should, manifest itself.

Recent developments in international law have addressed a number of areas in which ecological justice finds political and legal support. On the one hand, there is a trend toward the development of ecocide law (Higgins 2010), and on the other hand, animal rights law (Sykes 2016; Borràs 2016). The

United Nation's Office on Drugs and Crime (UNODC) has recently recognized the trafficking of wildlife as both a specialized area of organized crime and a significant threat to nonhuman species. The World Wildlife Crime Report takes stock of the present wildlife crime situation with a focus on illicit trafficking of protected species, and provides a broad assessment of the nature and extent of the problem at the global level. Another notable initiative is the Rights of Mother Earth petition, which seeks to persuade the UN to adopt the universal declaration of the rights of nature (http://www.rightsofmotherearth.com/). This conception of ecological justice has great implications for how biological conservation is ethically framed and practically conducted.

Conservation and Its Main Challenges

There are a great many definitions of conservation. We face a future *bottleneck* in terms of the survival of life, as an eminent biologist E.O. Wilson (2003) has observed. We live in a time of exponentially fast change, and the 'bottleneck' represents how successful we will be in terms of saving ourselves and our world's rich biodiversity and geodiversity. Conservation is ideally the best strategy of *widening* the bottleneck—so that more of nature survives into the future in this century, at the 'crunch time' when all the negative impacts of our growth economy peak. We will not save it all, but we can save as much as possible.

For the purpose of this volume we will subscribe to a simple definition: conservation is the protection or preservation of nonhuman nature. This includes species, including animals, plants, algae, fungi, bacteria, and also, crucially, entire ecosystems that sustain them. It also includes conservation of geodiversity (Washington 2018a), which is the variety of geological, geomorphological and soil features. The greatest challenges to the aim of protection of nonhuman species and ecosystems are the destruction of habitat, industrial development, and associated unsustainable production and consumption, and of course ongoing human population growth (though many scholars shy away from talking about this, as discussed by Kopnina and Washington 2016). Intensive agriculture, urban development, and the expansion of human activity everywhere on the planet—result in land clearing and deforestation, as well as climate change. The greatest threats to biodiversity are summed up by the acronym HIPPO: Habitat Loss, Invasive Species, Pollution, Human Population, and Overharvesting. While, as we shall discuss in this volume, conservation as a movement has many different orientations, some of them conflict. The over-arching aim of conservation so far has been the creation of protected areas, in an effort to protect both biodiversity and geodiversity. We agree with this, though of course other strategies are also needed.

However, there is a threat to conservation as a movement, assuming we mean conservation is the maximum protection of remaining nonhuman nature. The so-called 'environmental pragmatism', and anthropocentrism have taken hold of the conservation debate in recent years. Rather than trying to meet the ambitious targets

for conservation through addressing the root causes of species' extinction—some policy-makers, academics, and even practicing conservationists, seem to have re-oriented themselves *solely towards human welfare*. While the root causes of the environmental crisis are population growth, overconsumption, habitat clearing for agricultural and urban development, pollution and climate change—the ideology of 'pragmatic conservation' favors only conservation that helps people. One example is the *Eco-modernist manifesto* (http://www.ecomodernism.org/), which represents a surrender to development by celebrating an assumed technical ingenuity and the human ability to control anything, from climate to biodiversity. It thus *subverts the meaning of sustainability to suit neoclassical economic needs* (Washington 2015). In this volume, we are worried that the idea of 'control and management' increasingly dominates conservation objectives (Kopnina et al. 2018a) and that this derives from neoliberal ideology. Conservation goals seemed to have moved from trying to preserve ecosystems and biodiversity (Miller et al. 2014) to making them subservient to growing human needs and 'designing' new human-dominated environments so that nature is just a 'garden' (Marvier 2014; Marris 2014). They argue that 'traditional' conservation is outdated. In reflecting on how conservation is supposedly "being overtaken by fast-moving reality", The Economist (2015b: 12) suggests:

> Conservation is nearly always backward-looking. *It aims to keep plants and animals not just where they are but where they were before* humans meddled. The only real debate is over how far to turn back the clock … In future the question will no longer be how to preserve species in particular places but to how to move them around to ensure their survival.

This clearly advocates that humanity must become extensive 'ecological engineers' to keep species alive, rather than solve the problems *causing* the environmental crisis. It is not entirely clear how humanity is going to engage in such a planetary ambitious project, undertaking this hubristic monumental effort to move all species into safety, as if we are the new Noah. What region will truly be 'safe'? What makes us think we know enough to control nature? Many ecologists question the later.

Conservation today is thus fraught with many issues, which include worldviews and ethics (though commonly these are hidden and not stated) as well as different strategies in terms of what will work. This volume will discuss some of these, and look to the best solutions to conserve our living world into the future.

References

Abbey, E. (1968). *Desert solitaire*. New York: McGraw-Hill Education.

AWS. (2017). *World Scientists' warning to humanity: A second notice*. Alliance of World Scientists, http://scientistswarning.forestry.oregonstate.edu/sites/sw/files/Warning_article_with_supp_11-13-17.pdf.

Baviskar, A. (2013). *Hallsworth plenary debate*. https://www.youtube.com/watch?v=oldnYTYMx-k.

Baxter, B. (2005). *A theory of ecological justice*. New York: Routledge.

Bekoff, M. (Ed.). (2013). *Ignoring nature no more: The case for compassionate conservation*. Chicago: University of Chicago Press.

Benjaminsen, T. A., Kepe, T. & Bråthen, S. (2008). Between global interests and local needs: Conservation and land reform in Namaqualand, South Africa. *Africa: Journal of the International African Institute, 78*(2), 223–244.

Bisgould, L. (2008). Power and irony: One tortured cat and many twisted angles to our moral schizophrenia about animals. *Animal Subjects: An Ethical Reader in a Posthuman World, 8,* 259.

Borkfelt, S., Kondrup, S., Röcklinsberg, H., Bjørkdahl, K., & Gjerris, M. (2015). closer to nature? a critical discussion of the marketing of "Ethical" animal products. *Journal of Agricultural Environmental Ethics, 28*(6), 1053–1073.

Borràs, S. (2016). New transitions from human rights to the environment to the rights of nature. *Transnational Environmental Law, 5*(1), 113–143.

Broswimmer, F. (2002). *Ecocide: A short history of mass extinction of species*. Pluto Press.

Burdon, P. (Ed.) (2011). *Exploring wild law: The philosophy of earth jurisprudence*. Wakefield Press.

Büscher, B., & Fletcher, R. (2016). Why E O wilson is wrong about how to save the Earth https://aeon.co/ideas/why-e-o-wilson-is-wrong-about-how-to-save-the-earth.

Cafaro, P., Butler, T., Crist, E., Cryer, P., Dinerstein, E., Kopnina, et al. (2017). If We want a whole earth, nature needs half. A reply to 'Half-Earth or Whole Earth? Radical ideas for conservation, and their implications'. *Oryx—The International Journal of Conservation, 53*(1), 400.

Cafaro, P. J., & Primack, R. B. (2014). Species extinction is a great moral wrong. *Biological Conservation, 170,* 1–2.

Callicott, J. B. (2006). 'Conservation values and ethics'. In M. J. Groom, G. K. Meffe, & C. R. Carroll (Eds.), *Principles of Conservation Biology.* Sinauer, Sunderland.

Catton, W. R., & Dunlap, R. E. (1978). Environmental sociology: A new paradigm. *American Sociologist, 13,* 41–49.

Chapron, G., Levrel, H., Meinard, Y., & Courchamp, F. (2018). A final warning to planet earth. *Trends in Ecology & Evolution*. In print.

Crist, E. (2012). Abundant earth and population. In P. Cafaro & E. Crist (Eds.), *Life on the brink: Environmentalists confront overpopulation* (pp. 141–153). Athens: University of Georgia Press.

Crist, E. (2013). Ecocide and the extinction of animal minds. In M. Bekoff (Ed.), *Ignoring nature no more: The case for compassionate conservation*. Chicago: Chicago University Press.

Crist, E., & Kopnina, H. (2014). Unsettling Anthropocentrism. *Dialectical Anthropology, 38*, 387–396.

Crist, E. (2015). I walk in the world to love it. In G. Wuerthner, E. Crist, & T. Butler (Eds.), *Protecting the Wild: Parks and Wilderness, The Foundation for Conservation* (pp. 82–95). Washington, London: The Island Press.

Crist, E. (2016). *Choosing a planet of life* (pp. 43–54). Towards a Steady State Economy, New York, Routledge: A Future Beyond Growth.

Crist, E., & Cafaro, P. (2012). Human Population Growth as If the Rest of Life Mattered. In P. Cafaro & E. Crist (Eds.), *Life on the brink: Environmentalists confront overpopulation* (pp. 3–15). Athens: University of Georgia Press.

Crist, E., Mora, C., & Engelman, R. (2017). The interaction of human population, food production, and biodiversity protection. *Science, 356*(6335), 260–264.

Cullinan, C. (2003). *Wild law: A manifesto for earth justice*. Totnes, Devon: Green Books.

Curry, P. (2011). *Ecological ethics: An introduction* (2nd ed.). Cambridge: Polity Press.

Czech, B. (2008). Prospects for reconciling the conflict between economic growth and biodiversity conservation with technological progress. *Conservation Biology, 22*(6), 1389–1398.

Daly, H. (2014). *From uneconomic growth to the steady state economy*. Cheltenham: Edward Elgar.

Daly, H., & Cobb, J. (1994). *For the common good: Redirecting the economy toward community, the environment, and a sustainable future*. Boston: Beacon Press.

Dietz, R., & O'Neill, D. (2013). *Enough is enough: Building a sustainable economy is a world of finite resources*. San Francisco: Berrett-Koehler Publishers.

Doak, D. F., Bakker, V. J., Goldstein, B. E., & Hale, B. (2015). What is the future of conservation? In G. Wuerthner, E. Crist, & T. Butler (Eds.), *Protecting the Wild: Parks and Wilderness, The Foundation for Conservation* (pp. 27–35). Washington, London: The Island Press.

Eckersley, R. (1992). *Environmentalism and political theory: Toward an ecocentric approach*. London: UCL Press.

Ehrenfeld, D. (1978). *The arrogance of humanism*. New York: Oxford University Press.

Fisher, A. (2013). *Radical ecopsychology: Psychology in the service of life*. Albany: State University of New York Press.

Fitzgerald, K. H. (2015). The silent killer: Habitat loss and the role of african protected areas to conserve biodiversity. In G. Wuerthner, E. Crist, & T. Butler *Protecting the Wild: Parks and Wilderness, The Foundation for Conservation* (pp. 170–188). Washington, London: The Island Press.

Goodpaster, K. E. (1978). On being morally considerable. *The Journal of Philosophy, 75*(6), 308–325.

Gren, M., Campos, M., & Gustafsson, L. (2016). Economic development, institutions, and biodiversity loss at the global scale. *Regional Environmental Change, 16*(2), 445–457.

Grey, W. (1993). Anthropocentrism and Deep Ecology. *Australasian Journal of Philosophy, 71*(4), 463–475.

Higgins, P. (2010). Eradicating ecocide: Laws and governance to prevent the destruction of our planet. *Shepheard Walwyn Publishers Ltd*. 62–63.

Jacobsen., K. S., & Linnell, J. D. (2016). Perceptions of environmental justice and the conflict surrounding large carnivore management in Norway—Implications for conflict management. *Biological Conservation, 203*, 197–206.

Katz, E. (1996). Envisioning a de-anthropocentrised world: Critical comments on anthony weston's 'The incomplete eco-philosopher'. *Ethics, Policy and Environment, 14,* 97–101.

Kidner, D. (2014). Why 'anthropocentrism' is not anthropocentric. *Dialectical Anthropology, 38*(1), 465–480.

Kopnina, H. (2012). Education for sustainable development (ESD): The turn away from 'environment' in environmental education? *Environmental Education Research, 18*(5), 699–717.

Kopnina, H., & Shoreman-Ouimet, E. (Eds.), (2013). *Environmental Anthropology: Future Directions*. Routledge: New York.

Kopnina, H. (2014). Environmental justice and biospheric egalitarianism: Reflecting on a normative-philosophical view of human-nature relationship. *Earth Perspectives, 1*, 8.

Kopnina, H. (2015). Revisiting the lorax complex: Deep ecology and biophilia in cross-cultural perspective. *Environmental Sociology, 43*(4), 315–324.

Kopnina, H. (2016). Half the earth for people (or more)? Addressing ethical questions in conservation. *Biological Conservation, 203*(2016), 176–185.

Kopnina, H., & Gjerris, M. (2015). Are some animals more equal than others? Animal rights and deep ecology in environmental education. *Canadian Journal of Environmental Education, 20,* 109–123.

Kopnina, H., Taylor, B., Washington, H., & Piccolo, J. (2018a). Anthropocentrism: More than just a misunderstood problem. *Journal of Agricultural and Environmental Ethics, 31*(1), 109–127.

Kopnina, H., & Washington, H. (2016). Discussing why population growth is still ignored or denied. *Chinese Journal of Population Resources and Environment, 14*(2), 133–143.

Kopnina, H., Washington, H., Gray, J., & Taylor, B. (2018b). The 'future of conservation' debate: Defending ecocentrism and the Nature Needs Half movement. *Biological Conservation, 217*(2018), 140–148.

Low, N., & Gleeson, B. (1998). *Justice, Society and Nature*. Routledge: London and New York.

Marris, E. (2014). 'New Conservation' is an Expansion of Approaches. *Not an Ethical Orientation. Animal Conservation, 17*(6), 516–517.

Marvier, M. (2014). A call for ecumenical conservation. *Animal Conservation, 17*(6), 518–519.

Mathews, F. (2016). From biodiversity-based conservation to an ethic of bio-proportionality. *Biological Conservation, 200,* 140–148.

Miller, B., Soule, M., & Terborgh, J. (2014). 'The "New Conservation's" surrender to development', Rewilding Institute, http://rewilding.org/rewildit/the-new-conservations-surrender-to-development/.

Monbiot, G. (2012). Is protecting the environment incompatible with social justice? *The Guardian*. February 13. https://www.theguardian.com/environment/georgemonbiot/2012/feb/13/protecting-environment-social-justice.

Moore, K. D. (2016). *Great tide rising: Towards clarity and moral courage in a time of planetary change*. Berkeley: Counterpoint.

Naess, A. (1973). The shallow and the deep: Long-range ecology movement. *A summary, Inquiry, 16,* 95–99.

Nelson, M. P., Bruskotter, J. T., Vucetich, J. A., & Chapron, G. (2016). Emotions and the ethics of consequence in conservation decisions: Lessons from Cecil the Lion. *Conservation Letters, 9*(4), 302–306.

Nelson, M. P., & Vucetich, J. A. (2009). On advocacy by environmental scientists: What, whether, why, and how. *Conservation Biology, 23*(5), 1090–1101.

Nonini, D. (2013). *Hallsworth plenary debate*. Available at: https://www.youtube.com/watch?v=oldnYTYMx-k.

Noss, R. F. (1992). The wildlands project land conservation strategy. *Wild Earth, 1,* 9–25.

Piccolo, J., Washington, H., Kopnina, H., & Taylor, B. (2018). Back to the future: Why conservation biologists should re-embrace their ecocentric roots. *Conservation Biology, 32*(4), 959–961.

Quinn, F., Castéra, J., & Clément, P. (2016). Teachers' conceptions of the environment: Anthropocentrism, non-anthropocentrism, anthropomorphism and the place of nature. *Environmental Education Research, 22*(6), 893–917.

Raven, P., Chase, J., & Pires, J. (2011). Introduction to special issue on biodiversity. *American Journal of Botany, 98,* 333–335.

Rees, W. (2008). Toward Sustainability with Justice: Are Human Nature and history on Side? In C. Soskolne (Ed.), *Sustaining life on earth: Environmental and human health through global governance*. New York: Lexington Books.

Regan, T. (1986). A case for animal rights. In M. W. Fox & L. D. Mickley (Eds.), *Advances in animal welfare science* (pp. 179–189). Washington, DC: The Humane Society of the United States.

Rolston, H., III. (1983). Values gone wild. *Inquiry, 26*(2), 181–207.

Rolston, H., III. (2012). *A new environmental ethics: The next millennium for life on earth*. New York: Routledge.

Sandbrook, C. (2015). What is conservation? *Oryx, 49,* 565–566.

Schlosberg, D. (2004). Reconceiving environmental justice: Global movements and political theories. *Environmental Politics, 13*(3), 517–540.

Shepard, P. (1982). *Nature and madness*. London: University of Georgia Press.

Shoreman-Ouimet, E., & Kopnina, H. (2016). *Culture and Conservation: Beyond anthropocentrism*. New York: Routledge.

Singer, P. (1977). *Animal liberation: A new ethics for our treatment of animals*. New York: Random House.

Strang, V. (2016). Justice for All: Inconvenient truths and reconciliation in human-non-human relations. H. Kopnina & E. Shoreman-Ouimet (Eds.), *Routledge Handbook of Environmental Anthropology* (pp. 263–278). New York: Routledge.

Swimme, B., & Berry, T. (1992). *The universe story: From the primordial flaming forth to the ecozoic era*. San Francisco: Harper Books.

Sykes, K. (2016). Globalization and the animal turn: How international trade law contributes to global norms of animal protection. *Transnational Environmental Law, 5,* 55–79.

Tallis, H., Lubchenko, J., et al. (2014). Working together: A call for inclusive conservation. *Nature News, 515,* 27–28.

Taylor, P. W. (1983). Defense of biocentrism. *Environmental Ethics, 5*(3), 237–243.

Taylor, B. (2010). *Dark green religion: Nature spirituality and the planetary future*, Berkeley & Los Angeles: University of California Press.

Taylor, B. (2013). 'It's not all about us: Reflections on the state of American environmental history. *Journal of American History, 100*(1), 140–144.
The Economist. (2015a). Hot and bothered. November 28. pp. 3–5.
The Economist. (2015b). Biodiversity: A modern ark. November 28. pp. 3–5.
UCS. (1992). 'World scientists' "Warning to Humanity"', Union of Concerned Scientists, online, available at: www.ucsusa.org/about/1992-world-scientists.html.
UNODC The World Wildlife Crime Report http://www.unodc.org/unodc/en/data-and-analysis/wildlife.html.
Vetlesen, A. (2015). *The denial of nature: Environmental philosophy in the era of global capitalism*. London: Routledge.
Waldau, P. (2013). Venturing beyond the tyranny of small differences: The animal protection movement, conservation, and environmental education. In M. Bekoff (Ed.), *Ignoring Nature no more: The Case for Compassionate Conservatio* (pp. 27–44). Chicago: University of Chicago Press.
Washington, H. (2013). *Human dependence on nature: How to help solve the environmental crisis*. London: Earthscan.
Washington, H. (2015). *Demystifying sustainability: Towards real solutions*. London: Routledge.
Washington, H. (2018a). The intrinsic value of geodiversity. *The Ecological Citizen, 1*(2), epub-007.
Washington, H. (2018b). *A sense of wonder towards nature: Healing the world through belonging*. London: Routledge.
Washington, H., Chapron, G., Kopnina, H., Curry, P., Gray, J., & Piccolo, J. (2018). Foregrounding ecojustice in conservation. *Biological Conservation, 228,* 367–374.
Washington, H., Taylor, B., Kopnina, H., Cryer, P., & Piccolo, J. (2017). Why ecocentrism is *the* key pathway to sustainability. *Ecological Citizen, 1*(1), 32–41.
WCED (United Nations World Commission on Environment and Development). (1987). Brundtland report. In *Our common future: The world commission on environment and development.* New York.
Weber, A. (2016). *The biology of wonder: Aliveness, feeling, and the metamorphosis of science*. Canada: New Society Publishers.
Wilson, E. O. (2003). *The future of life*. New York: Vintage Books.
Wilson, E. O. (2016). *Half-earth: our planet's fight for life*. New York: Liveright/Norton.

Chapter 2
Ethical Approaches to Conservation

Helen Kopnina and Haydn Washington

Introduction

This chapter will elaborate on issues discussed in Chap. 1, where we have mentioned that environmental justice is often associated with social justice, or justice in the distribution of environmental risks and benefits. In cases of conflicting interests such as human-wildlife conflicts (e.g. Jacobsen and Linnell 2016) or ecosystem services trade-offs, social and environmental justice are sometimes counter-posed to ecological justice or animal welfare. This chapter introduces various ethical perspectives on conservation, positioned across the anthropocentrism-ecocentrism continuum, outlining debates about the locus of justice. These debates reflect a larger discussion in the cross-disciplinary fields of environmental social science and biological conservation. While some scholars support the idea that it is good to have plural ethical perspectives on conservation (Tallis et al. 2014; Sandbrook 2015), others feel that plurality of perspectives actually masks persistent anthropocentric bias. This chapter will further discuss combined and nuanced ethical approaches to conservation.

H. Kopnina (✉)
The Hague University of Applied Sciences, The Hague, The Netherlands
e-mail: h.kopnina@hhs.nl

H. Washington
PANGEA Research Centre, BEES, UNSW, Kensington, Australia
e-mail: h.washington@unsw.edu.au

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Anthropocentric Orientations

Critical Social Scientists

As discussed in the first chapter, the work of critical social scientists (e.g. Sandbrook 2015) often engage with aspects of the inequitable or contested distribution of (for instance) natural and financial resources. Critical social scientists are well-represented in the fields of anthropology and political ecology. The common concern of critical social scientists is the domination and oppression of rural people, who have their own beliefs, customs, institutions and needs in the context of distribution and procedures. For example, in his widely quoted article on the origins and basic principles of ecological anthropology, Kottak (1999) called upon anthropologists to prioritize people's interests, and not to be, "dazzled by ecological evidence", stating that for anthropologists, "people should come first" (ibid: 27). In the case of the Madagascar people and the protection of lemurs, Kottak called upon his readers to support local communities *against* the efforts of conservationists.

Generally, the so-called "critical social scientists" are focused on the needs of poor, vulnerable, marginal, or indigenous people, especially in rural and remote areas (Kopnina et al. 2018). Some social scientists support local initiatives, focusing on biocultural diversity (Cocks 2006) and community-based conservation.

Critical social scientists are skeptical about the relationship between international development agencies, conservation, and local wellbeing (e.g. West and Brockington 2006; Rantala et al. 2013; Büscher and Fletcher 2016). Research by critical social scientists includes: (a) efforts to better engage local peoples and organizations involved in forest management; (b) efforts to examine how these new approaches to conservation have genuinely departed from conventional integrated conservation and development projects; and/or (c) research that interrogates these distinctions (e.g. http://www.forestlivelihoods.org/annual-meeting-2018/).

In their article *Justice and conservation*, Martin et al. (2016: 254) for example, call for respect for, "alternative ways of relating to nature and biodiversity". These alternative ways are meant as a counter-balance to the injustice of colonialism, "that creates structural oppression over marginalized sectors of society whose alternative worldviews become devalued and stigmatized" (Ibid: 258). Conservation is seen as imposed by post-colonial Western governments that disadvantage local communities, while profiting from developing countries' natural wealth (e.g. Kalland 2009; Brockington and Duffy 2011; McElroy 2013). In Iceland, Kalland (2009: x) championed his argument that anti-whaling environmental organizations are 'culturally imperialistic', 'intolerant', and 'militant', even though whaling was done on large scale for export, not to sustain local livelihoods (Stoett 2002). Arguing that in Greenland, hunting constitutes an important part of cultural identity, anthropologist Nuttall (2016) argues that conservationists and animal rights activists threaten the 'cultural survival' and northern economies. He does not discuss the threat of biodiversity extinction or the ethics of nonhuman suffering.

In this volume, authors certainly support the plight of vulnerable communities, as well as alternative views that do not commodify or commercialize 'natural resources'. We also support views that embrace indigenous holistic worldviews and traditional custodianship that 'cares for country'.

However, what we editors object to is the critics supporting economic priorities that in fact do not equate with indigenous worldviews (which often they say they support). Ironically, rather than appreciating traditional societies' respect for nature, these supposed 'indigenous rights advocates' often use Western terminology of 'property-rights' such as, "local control over land use" (Martin et al. 2016: 260). In the case of Inuit seal hunting, conservationists were blamed for organizing boycotts of seal products, leading to changes in export regulations, and thus "hurting local livelihoods" (e.g. McElroy 2013). Again, the commercial scale of seal hunting, or the inhumane conditions in how 'hunting' occurs (e.g. baby seal clubbing) were not discussed (Lavigne and Lynn 2011). Vucetich et al. (2018) address the financial costs of the loss of cultural tradition as part of 'just conservation'—but not the 'costs' incurred by nonhuman species. Rantala et al. (2013: 99) speak of conservation undermining, "measurable market value of lost physical assets" for local people. Such corporatist terminology that equates nature with resources has not been part of traditional or indigenous worldviews (Knudtson and Suzuki 1992; Shoreman-Ouimet and Kopnina 2016).

Some critical social scientists suggest that even community-based conservation masks persistent power hierarchies. Brockington and Duffy (2011) imply that practices such as poaching should be seen as part of cultural tradition, and poor people's economic rights. Büscher and Fletcher (2016) insist that strict measures to control poachers *violate human rights* and disadvantage the poorest communities. Von Hellerman (2007) has suggested that the very idea of illegal practices (logging and poaching) and corruption in Africa has been imposed by neo-colonial elites.

This assessment basically negates any ecological ethics condemning poaching, logging, and abuse of nonhumans. This view is particularly dangerous, as they seem to suggest that no responsibility can be attributed to any local actors, no matter whether their actions drive species to extinction, or erase ecosystems. Prioritizing human 'culture' or 'tradition' over the very existence of nonhumans is problematic (indeed unethical). In other words, social justice is seen by critical social scientists as separate from ecological integrity and the flourishing of complex ecosystems, of which humans are a part.

As Goodall (2015) has pointed out, poaching is not a question of impoverished local people driven to desperation, but involves international criminal cartels, with heavily armed poachers flying in by helicopters. The driving sources of poaching are global, such as Chinese traditional medicine (The Economist 2016a). Demand is not driven by doctors who foster ancient Chinese traditions, but by the "networks that feed supply—poachers, holders of stocks of banned items, farmers and their allies in some governments" (The Economist 2016a: 48).

For example, in Tanzania (Wasser et al. 2010; Bennett 2015) and Vietnam (Kopnina 2016a), poaching is linked to high-level political corruption in which politicians willingly participate in illicit wildlife trade and slaughter. Despite the fact that there

were 100,000 elephants killed in Tanzania between 2011 and 2014, the government has failed to investigate and persecute high-level offenders (The Economist 2014). At the bottom of the poaching networks are the hired hunters recruited from the military (The Economist 2014). If caught, the militants, escorted by police convoys and supported by many local senior officials, are "transferred to new posts rather than fired" (Ibid: 37). Elephant slaughter has continued unabated, leading to a 60 percent reduction of the elephant population in Tanzania in the last five years, as documented in the Great Elephant Census (http://www.greatelephantcensus.com/).

Despite this dire situation, those advocating for stricter controls were claimed to violate human rights in the 'war to save biodiversity' (Brockington and Duffy 2011). This highlights the fact that conservation is not a neutral category, but an ethically-charged one.

New Conservation

While critical social scientists can be defined as neo-Marxist in outlook (Kopnina et al. 2018) in their rejection of capitalist accumulation by society; conservationists supporting 'new conservation' promote economic development, poverty alleviation and corporate partnerships as surrogates or substitutes for endangered species listings, protected areas, and other mainstream conservation tools (e.g. Marris 2011; Kareiva and Marvier 2007, 2012; Kareiva 2011; Marvier 2012, 2014). Miller et al. (2014) have shown that new conservation builds its arguments on ecological science *distorted* by anthropocentric ideology. They critique new conservation assumptions as being: (1) nature is a warehouse for human use; (2) humans can construct new ecosystems from non-native species; (3) humans do not have to live within limits; (4) nature is resilient; (5) nature is a social construct; (6) conservationists preach too much doom and gloom; and (7) people can manage nature intensively while preserving biodiversity.

While contributors to this volume agree that human interests, especially of most vulnerable communities, have to be respected, most chapter authors object to the strong anthropocentrism that permeates these critics. When indigenous property rights, traditions, or "livelihoods" are discussed, the question of expanding indigenous populations, "modern" agricultural activity, the vulnerability of ecosystems, and endangered species are simply ignored (Kopnina 2017a). The critics of conservation rarely address the imbalance created by the expansion of industrial or agricultural land associated with population growth, which not only "disadvantages" but existentially threatens the existence of wildlife (Laurence et al. 2014). The common argument by critical social scientists is that the creation of national parks was a disaster in social justice terms. This almost universally fails to mention the *ecojustice* side of such park creation, which has protected wild ecosystems from clearing and degradation, and stopped an even greater extinction event than the one we face. Also, in conservation planning and practice, recognition of ecojustice has not featured centrally (Washington et al. 2018).

Just as society has learned that it is morally wrong to disadvantage local communities (or for that matter, that slavery, racism, and sexism are wrong), we hope that society can also learn that it is wrong to discriminate against nonhuman nature—be it in conservation, or in industrial food production systems or medical experimentation. We, editors, agree that the rich and the powerful are to blame for much of the world's environmental destruction. We wonder however whether it is possible to *permanently eliminate* social inequalities and hierarchies in a world of competition for limited resources. After all, historically such has not occurred. Also, the collapse of ecosystems and the predicted extinction of over half the world's biodiversity (without action) this century (Wilson 2003) will not support peace and prosperity in the long term. In fact, they will lead to social collapse. As Doak et al. (2014) stress, human well-being is already one of the core features of conservation policy and planning in any case. In fact, consideration of human well-being alone does not require a radical departure from current practices. Indeed, conservationists confirm that justice demands that local people be considered in all programs to protect biodiversity (Cafaro and Primack 2013: 316).

In this sense, if an alternative path to the present idea of 'economic development' based on endless growth cannot be found, raising the global living standards will likely have catastrophic impacts on both natural ecosystems and human wellbeing. Society should work harder to strengthen small-scale traditional economies through cultural protection. However, we doubt whether, pragmatically speaking, this is realistic on a global scale. Human populations and their material demands have expanded hugely in the last few decades, while wildlife populations have drastically declined. Accordingly, safeguarding human rights and preserving biodiversity can only be compatible if local communities (as well as the surrounding population) are, "willing to limit their numbers and their demands on nature" (Cafaro and Primack 2013: 316). In addition, as more and more land is appropriated both inside (illegally) and outside of national parks for agriculture, wildlife literally has no place to go (Laurence et al. 2014). This results in human-wildlife conflicts, with predictable outcomes (Sinclair 2014). It is also essential that industrial developers and timber and mining lobbies are held accountable for the damage they cause.

The editors (and most contributors to this volume) agree with the need to challenge inequality and society's fixation on economic growth as a measure of social well-being. However, we do not believe that, practically speaking, mere equal division of wealth is going to eliminate the challenge of limited resources in an overpopulated world, nor address the global injustice of human supremacy (Crist 2012; Kopnina 2017a; Kopnina et al. 2018). Indeed, "empowering ever more people with a belief in their right to ever higher consumption is a recipe for ecological disaster" (Cafaro and Primack 2013: 316). If what is meant by 'equality' is that every human on this planet is raised to developed counties' consumer level, our collective lifestyle will be completely unsustainable (Kopnina 2016b), requiring in effect four new planets (Graff 2010). To quote Crist (2015: 93):

> The literature challenging traditional conservation strategies as lock-ing people out, and as locking away sources of human livelihood, rarely tackles either the broader distribution of poverty or its root social causes; rather, strictly protected areas are scapegoated, and wild nature, once again, is targeted to take the fall for the purported betterment of people,

> while domination and exploitation of nature remain unchallenged. The prevail-ing mindset of humanity's entitlement to avail itself of the natural world without limitation is easily, if tacitly, invoked by arguments that demand that wilderness … offer up its "natural resources"—in the name of justice.

Both critical social scientists and new conservationists have one key point of agreement, they put people's interests first, both in ethical and practical terms (Sandbrook 2015). Yet, as far as other species are concerned (as shown by the ecological indicators that anthropocentric authors rarely talk about), the simple truth is that *Homo sapiens* is an apex predator on top of the food chain (Kopnina 2014). If (instead of us) there were 7.6 billion other apex predators, let's say lions, walking around on this Earth, it is likely that we would end up in a major environmental crisis (Vieira 2016). This is why we editors believe (as do most of the authors in this volume) that the greatest effort in academia and conservation in practice should lie on finding a feasible path to a sustainable future (Washington 2015). Solutions must entail recognition of ecological limits (see Chap. 4 by Washington in this volume), and require humility and respect for nature, as nature is in the end the best example of sustainability over time. New economic systems that operate within ecological limits (and are not based on endless growth) are needed. Some key examples are the steady-state-economy (Daly 2014), 'de-growth', 'circular economy', and the 'cradle to cradle' (Kopnina and Blewitt 2018).

Some authors assume that by widening the scope of social justice to include nonhumans they advance the cause of 'just' conservation. For example, Vucetich et al. (2018: 23) define social justice as being wide enough to encompass non-human "others". Vucetich et al. (2018: 23) propose new principles for just conservation: "If a significant and genuine conservation interest calls for restricting a human interest, that restriction should occur except when doing so would result in injustice".

The key question is: *injustice for whom*? For only humans, or individuals within species, or for entire ecosystems, or for all of them? While some speak of 'justice for all', they then normally actually speak only about the vulnerable and downtrodden *human* communities, not all communities of life on this planet. Indeed, offering an expansion of the social justice category is a bit like arguing that nature is part of culture, rather than the other way around. Nonhuman nature thus becomes an adjunct, one pushed into social justice around the edges of justice for people. The next step is for society to also talk about *justice* in the broader sense, ecojustice for the nonhuman (Washington et al. 2018).

Ecocentric Orientations

While the perspectives outlined above illustrate human-centered approaches to conservation, contributors to this volume overwhelmingly support ecocentric perspectives that oppose anthropocentrism. Ecocentrism focuses on a system of values centred on nature. Because both ecocentrism and biocentrism attribute intrinsic value to habitats supporting life, as well as all living beings, including humans,

these perspectives still consider human beings (as humans are part of nature in terms of evolution). Batavia and Nelson (2017: 368) argue that what they call 'non-anthropocentrism' refers to any ethical stance that de-centers (but does not exclude) humans from the moral universe by granting direct moral standing to at least some non-humans.

Ecocentrism finds inherent (intrinsic) value in all of nature. As noted by Washington et al. (2017) it takes a much wider view of the world than does anthropocentrism, which sees individual humans and the human species as more valuable than all other organisms. Ecocentrism is the broadest of worldviews, but there are related worldviews (that might be called 'intermediate varieties' (Curry 2011: 57). Ecocentrism goes beyond biocentrism (ethics that sees inherent value to all *living* things) by including environmental systems as wholes, and their abiotic aspects. It also goes beyond zoocentrism (seeing value in animals) on account of explicitly including flora and the ecological contexts for organisms. While other scholars may differ, we see ecocentrism as the umbrella that includes biocentrism and zoocentrism, because all three of these worldviews value the non-human as well as human, with ecocentrism having the widest vision (Washington et al. 2017). Given that life relies on geology and geomorphology to sustain it, and that 'geodiversity' also has intrinsic value (Gray 2013), the broader concept 'ecocentrism' is more inclusive (Curry 2011).

The proponents of zoocentrism, biocentrism and ecocentrism generally reject a dichotomized worldview separating humans from the rest of the natural world, denying the basic grounds of anthropocentrism that assert humanity's inherent superiority (Washington et al. 2017). These "-centrist' positions are often associated with an emotional attachment to certain entities, e.g. biophilia (love of life), zoophilia (love of animals) (Kellert and Wilson 1995) or arborphilia (love of trees) (e.g. Taylor 2013). While the terms eco-philia or geo-philia do not seem to have been used, most people who care about ecosystems, biodiversity and/or geodiversity, also share an affection for individual inhabitants of the land (although this becomes complicated in the case of, for example, invasive species in fragile biodiverse environments).

Contributors to this volume overwhelmingly support the idea of wilderness, biodiversity and geo-diversity and/or individual organisms as an *intrinsic good*. As discussed in Chap. 1, the Anthropocene poses many questions, both practical and ethical. We ask ourselves what 'pragmatism' really consists of? To what extent is it 'pragmatic' to accept the ecocide of the Anthropocene, which is destroying the nature upon which society relies (Washington 2015)? This business-as-usual Anthropocene turns wild lands into areas of human control and 'management' (what Crist in this volume calls 'The Blueprint'). While accepting humanity's enormous effect on the planet, in line with Caro et al. (2012) we see a crucial need to identify remaining intact ecosystems at local levels, to protect them, and to remind the public of them. An ecocidal Anthropocene is not, in fact, pragmatic or practical (Washington 2018a). Rather, we need to have a vision of 'The Ecozoic' era where humanity reaches harmony with the Earth (Swimme and Berry 1992). Leopold's (1949) 'Land Ethic' assigns moral rights to the entire species and to the ecosystems that support them—what he referred to as 'biotic communities'. We see this as retaining its legitimacy as a key part of an Earth ethics (Rolston 2012), part of the underpinnings of a new Ecozoic era.

Combined Social-Ecological Justice Perspectives

As the MEA (2005), 'The Economics of Ecosystems and Biodiversity' (Kumar 2010), Wijkman and Rockstrom (2012) and Washington (2013) have stressed, humanity is *completely dependent* on nature, and thus justice for people must necessarily involve maintaining the ecosystems that support us. We believe consequently that this must also be based on justice for nature (Washington et al. 2018).

Both social justice approaches and ecological justice approaches often converge in their critique of industrial development and endless economic growth, which is associated with technocentric or industrocentric ideology (Kidner 2014; Poirier and Tomasello 2017). Modernism, based on its cult of continuous economic growth and profit, is threatening both civilization as we know it, and nonhuman nature. Activities such as mining, logging, and industrial agriculture pollute waterways, cause deforestation, and facilitate poaching (Poirier and Tomasello 2017). Also, more insidiously and profoundly, our very way of thinking seems to be taken over by the endless growth ideology, which constructs both physical and psychological processes to complement the 'Dominant Western Paradigm', which sees humans as separate and superior to non-human nature (Catton and Dunlap 1978). Part of this paradigm, as David Kidner (2014) notes, are the claims that humanity is exempt from this transformative process, or that we are 'in control' of it. These are fanciful and hubristic.

An invisible cabal of 'growthism' thinking is drawn around both ourselves and the natural world, redefining all within it in terms of commodities. Humans, we are told, are simply the rational consumers of marketing hype, and always have been—just as wild nature has supposedly always consisted of 'cultural landscapes' (Washington 2015). Not only is wild nature being destroyed in physical reality; its obliteration is completed by its elimination from history and the imagination. This is undermining our sense of ourselves as embodied creatures with a natural past, so that a felt resonance with the natural order gives way to largely cognitive assimilation into the consumer culture.

Combined Ecocentric Perspectives: Animal Rights, Animal Welfare and Wildlife and Ecosystem Conservation

At least three different applications can be outlined in ecocentric perceptions of animals (but also plants, fungi, bacteria, protozoans, etc.): animal rights, animal welfare and wildlife conservation. In animal rights, Singer (1977) advocated the intrinsic value of all *sentient* creatures, arguing that needless suffering to all species able to feel pain, should be avoided. In some cases, the ability to feel pain has also been attributed to plants and other organisms, thus the idea of 'animal rights' should be more accurately represented as 'non-human rights' (Stone 1972; Kopnina 2012, 2015, 2017b, 2018; Marder 2013; Kopnina and Gjerris 2015). Regan (1983)

advocated for the recognition of the intrinsic value ("what is desired for its own sake") of those organisms that have certain mental capacities, thus drawing a line between the value of a life of (for example) bacteria, and a chimpanzee.

Animal welfare has been defined as how well an animal survives in its environment, using indicators to measure welfare such as observed behaviour, physiology, longevity, and reproduction (Rowlands 1998). Animal welfare focuses on the well-being of individual animals, and the treatment of domesticated animals, animals for consumption and experimentation (Bisgould 2008), which are (by human design) abundant (Sykes 2016). Often animal rights and welfare concerns are associated with farm and domestic animals (Singer 1977; Regan 1983; Turner and D'Silva 2006).

Conservation has a different focus, being concerned with the survival of wild species and ecosystems and preservation of overall bio- and geodiversity (Curry 2011; Washington et al. 2017; Piccolo et al. 2018; Washington 2018b). Cafaro and Primack (2013: 309) argue that the:

> … diversity of organisms is good; ecological complexity and natural evolution are good; the untimely extinction of populations, species, and biological communities is bad; biological diversity has great value both to people and in its own right; and human beings have both strong altruistic and strong self-interested reasons for preserving biodiversity.

In conservation, the discussion of *what* (e.g. entities such as rivers) or *who* should have intrinsic values has often returned to the discussion of hierarchies of species and ecosystems. Arguments have also been made that wildlife conservation should include animal rights/welfare concerns (Lu et al. 2013; Borràs 2016). The example of wild species used for human consumption has been shifting to 'farmed' or 'cultivated' varieties of animals, e.g. bear bile extracting laboratories or rhino or tiger farms as an alternative to poaching have raised new ethical concerns (Yee 2013; The Economist 2016b). These concerns have led some conservationists and animal rights/welfare advocates to dwell on the idea of basic principles that underlie the *value of all life*, based either on sentience or on other shared characteristics or interests. As Holmes Rolston (1982: 144) put it, "Animals may not have aesthetic, moral, philosophical, or religious sensibilities. They may be incapable of normative discourse. But they can undergo pain and pleasure; they have interested concerns. To this extent, they own values".

Yet, the persistent question as to the locus of value has remained open. Is value (whether instrumental, inherent or intrinsic) found in individuals, in species or communities, or entire ecosystems or all of these (Sykes 2016)? And by recognizing the value for a species, does that mean its value is always the same, even if it is then introduced in another land where it sends native species extinct (Washington 2018a). Some seem to think value recognition is absolute, others that it can be subject to a hierarchy depending on the area under consideration. After all, we all have to consider and bring together a range of 'rights' in our lives, so why not 'intrinsic values'? This debate rages, and even the two editors of this book (while agreeing on a great deal) at times take different stances regarding this.

The differences between animal rights/welfare and biological conservation have been persistent (since Baird Callicott reflected on it in 1980). Basically, most conservationists argue that preserving species and whole biological communities should take precedence over individual members of species (Cafaro and Primack 2013). In practice, this means that invasive introduced species may need to be controlled to preserve the overall vitality and diversity of native ecosystems (Callicott 1980; Washington 2018a).

Callicott's essay has caused criticism since it was seen to lead to the division between animal rights/welfare perspectives and the "Land Ethics" developed by Aldo Leopold (e.g. Warren 1983). While not underplaying the differences in perspectives in cases when hard choices need to be made (e.g. when invasive species dominate or threaten to eradicate native ones), there are also significant connections between animal welfare and animal conservation. In defense of an argument for unification, Crist (2012, 2013) and Vieira (2016) have noted that both ecocentric values and animal rights can be reconciled in their explicit critique of human superiority over other species. Callicott revised his article later (Callicott 1988) arguing that unity between perspectives is strategically important for advancing the cause of both conservation of habitats and their individual inhabitants.

Lu et al. (2013) stress three interlinked perspectives: wildlife conservation, companion animal protection, and laboratory animal protection. The animal rights advocate Sykes (2016) uses the term 'animal protection' to capture the linkages between animal welfare and (animal) species protection. In any ecocentric perspective, humans are not the sole center of the moral universe, and it is immoral to limit concern only to human interests in moral decision-making (Batavia and Nelson 2017: 368). Considering that conservation ethics increasingly deals with the question of 'good' and 'bad', the idea of *rights* comes to the fore. Indeed, Cafaro and Primack (2013) argue that conservation and animal rights ethics criticize anthropocentrism and are usually complementary. Limiting animal suffering and preserving wild nature allows the entire realm of biodiversity to flourish (Cafaro and Primack 2013: 315).

Eminent environmental ethicist Holmes Rolston III has emphasized: "Where humans cause the pain, they are under obligation to minimize it" (Rolston 2012: 75). While Rolston is critical of animal ethicists who over-emphasize the moral ideal of minimizing suffering (as predation exists in nature), it is not the case that he censures all efforts to safeguard the welfare of animals in the wild. In fact, he provides several notable examples in which he does just the opposite (Diehm 2012: 32).

Sykes (2016) has argued that animal conservation and animal welfare can be seen as aspects of a single overarching principle of *protection of nonhumans*—wild and domestic—and their habitats. This merger is seen in recent progressive developments in international animal rights law (Bisgould 2008; Sykes 2016), ecocide law (Higgins 2010) or earth jurisprudence (Cullinan 2003). A number of conventions protecting both individual rights of nonhumans, as well as entire species, have emerged. The International Convention for the Regulation of Whaling, the Convention on the Conservation of Migratory Species of Wild Animals, and the Convention on Biological Diversity recognize (at least on paper) the intrinsic value of nature for its own sake (Borràs 2016).

Conclusion

As the ethics around conservation is still evolving, conservation stands at the crux of the worldviews of anthropocentrism versus ecocentrism. We argue (e.g. Washington et al. 2017) that we will not reach meaningful sustainability nor an effective long-term conservation strategy, without a move to ecocentrism. Yet, movements such as 'new conservation' and 'critical social science' remain strongly anthropocentric. Similarly, the question of 'justice' for nature, that is *ecojustice*, remains virtually a taboo in academia (Washington et al. 2018). While there are some gradations on the anthropocentrism-ecocentrism scale, we champion ecocentrism (along with a return to indigenous kinship ethics), which requires we focus on nature, of which humanity is a part.

References

Batavia, C., & Nelson, M. P. (2017). For goodness sake! What is intrinsic value and why should we care? *Biological Conservation, 209,* 366–376.

Bennett, E. L. (2015). Legal ivory trade in a corrupt world and its impact on African elephant populations. *Conservation Biology, 29*(1), 54–60.

Bisgould, L. (2008). Power and irony: One tortured cat and many twisted angles to our moral schizophrenia about animals. *Animal Subjects: An Ethical Reader in a Posthuman World, 8,* 259.

Borràs, S. (2016). New transitions from human rights to the environment to the rights of nature. *Transnational Environmental Law, 5*(1), 113–143.

Brockington, D., & Duffy, R. (Eds.). (2011). *Capitalism and conservation*. Chichester: Wiley-Blackwell.

Büscher, B., & Fletcher, R. (2016). *Why E O Wilson is wrong about how to save the Earth*. https://aeon.co/ideas/why-e-o-wilson-is-wrong-about-how-to-save-the-earth.

Cafaro, P. J., & Primack, R. B. (2013). Ethical issues in biodiversity protection. In S. A. Levin (Ed.), *Encyclopedia of biodiversity* (2nd ed., Vol. 3, pp. 309–318). Waltham, MA: Academic Press.

Callicott, J. B. (1980). Animal liberation: A triangular affair. *Environmental Ethics, 2*(4), 311–328.

Callicott, J. B. (1988). *Animal liberation and environmental ethics: Back together again*. http://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1703&context=bts.

Caro, T., Darwin, J., Forrester, T., Ledoux-Bloom, C., & Wells, C. (2012). Conservation in the anthropocene. *Conservation Biology, 26,* 185–188.

Catton, W. R., & Dunlap, R. E. (1978). Environmental sociology: A new paradigm. *American Sociologist, 13,* 41–49.

Cocks, M. (2006). Biocultural diversity: Moving beyond the realm of 'indigenous' and 'local' people. *Human Ecology, 34*(2), 185–200.

Crist, E. (2012). Abundant Earth and population. In P. Cafaro & E. Crist (Eds.), *Life on the brink: Environmentalists confront overpopulation* (pp. 141–153). Athens, GA: University of Georgia Press.

Crist, E. (2013). Ecocide and the extinction of animal minds. In M. Bekoff (Ed.), *Ignoring nature no more: The case for compassionate conservation*. Chicago: Chicago University Press.

Crist, E. (2015). I walk in the world to love it. In G. Wuerthner, E. Crist, & T. Butler (Eds.), *Protecting the wild: Parks and wilderness, the foundation for conservation* (pp. 82–95). Washington: The Island Press.

Cullinan, C. (2003). *Wild law: A manifesto for earth justice*. Totnes, Devon: Green Books.
Curry, P. (2011). *Ecological ethics: An introduction* (2nd ed.). Cambridge: Polity Press.
Daly, H. (2014). *From uneconomic growth to the steady state economy*. Cheltenham: Edward Elgar.
Diehm, C. (2012). Unnaturally cruel: Rolston on animals, ethics, and the factory farm. *Expositions, 6*(1), 29–40.
Doak, D. F., Bakker, V. J., Goldstein, B. E., & Hale, B. (2014). What is the future of conservation? *Trends Ecological Evolution, 29,* 77–81.
Goodall, J. (2015). Caring for people and valuing forests in Africa. In G. Wuerthner, E. Crist, & T. Butler (Eds.), *Protecting the wild: Parks and wilderness, the foundation for conservation* (pp. 21–26). Washington, London: The Island Press.
Graff, J. (2010). Reducing work time as a path to sustainability. In L. Starke & L. Mastny (Eds.), *State of the World 2010: Transforming cultures from consumerism to sustainability*. New York: Worldwatch Institute/Earthscan.
Gray, M. (2013). *Geodiversity: Valuing and conserving abiotic nature* (2nd ed.). Hoboken, NJ, USA: Wiley.
Great Elephant Census. The Paul G. Allen Fam. Foundation, http://www.greatelephantcensus.com/.
Higgins, P. (2010). *Eradicating ecocide: Laws and governance to prevent the destruction of our planet* (pp. 62–63). Shepheard Walwyn Publishers Ltd.
Jacobsen, K. S., & Linnell, J. D. (2016). Perceptions of environmental justice and the conflict surrounding large carnivore management in Norway—Implications for conflict management. *Biological Conservation, 203,* 197–206.
Kalland, A. (2009). *Unveiling the Whale: Discourses on Whales and Whaling. Studies in environmental anthropology and ethnobiology series*. New York: Berghahn Books.
Kareiva, P., et al. (2011). Conservation in the anthropocene; Beyond solitude and fragility. *Breakthrough Journal*. http://thebreakthrough.org/index.php/journal/past-issue/issue-2/conservation-in-the-anthropocene.
Kareiva, P., & Marvier, M. (2007). Conservation for the people. *Scientific American, 297,* 50–57.
Kareiva, P., & Marvier, M. (2012). What is conservation science? *BioScience, 62,* 962–969.
Kellert, S. R., & Wilson, E. O. (Eds.). (1995). *The biophilia hypothesis*. Island Press.
Kidner, D. W. (2014). Why 'anthropocentrism' is not anthropocentric. *Dialectical Anthropology, 38*(4), 465–480.
Knudtson, P., & Suzuki, D. (1992). *Wisdom of the elders*. Sydney: Allen and Unwin.
Kopnina, H. (2012). "People are no plants, but both need to grow": Qualitative analysis of the new ecological paradigm scale for children. *The Environmentalist, 32*(4), 394–404.
Kopnina, H. (2014). Environmental justice and biospheric egalitarianism: Reflecting on a normative-philosophical view of human-nature relationship. *Earth Perspectives, 1,* 8.
Kopnina, H. (2015). Requiem for the urban weeds: An exploration of green spaces in Amsterdam. *Urban Ecosystems, 18*(4), 1125–1137.
Kopnina, H. (2016a). Of big hegemonies and little tigers: Ecocentrism and environmental justice. Special Issue "On the politics of policy-making for education for sustainable development". *The Journal of Environmental Education, 47*(2), 132–150.
Kopnina, H. (2016b). The victims of unsustainability: A challenge to sustainable development goals. *International Journal of Sustainable Development and World Ecology, 23*(2), 113–121.
Kopnina, H. (2017a). Just conservation: In defense of environmentalism. In S. K. Dhiman & J. Marques (Eds.), *Handbook of engaged sustainability: Contemporary trends and future prospects* (pp. 1–18). Dordrecht: Springer.
Kopnina, H. (2017b). Beyond multispecies ethnography: Engaging with violence and animal rights in anthropology. *Critique of Anthropology, 37*(3), 333–357.
Kopnina, H. (2018). From wilderness to plastic flowers and mowed lawns. *Ecological Citizen, 1*(2), 191–197.

Kopnina, H., & Blewitt, J. (2018). *Sustainable business: Key issues* (2nd ed.). New York: Routledge.
Kopnina, H., & Gjerris, M. (2015). Are some animals more equal than others? animal rights and deep ecology in environmental education. *Canadian Journal of Environmental Education, 20,* 108–123.
Kopnina, H., Washington, H., Gray, J., & Taylor, B. (2018). The 'future of conservation' debate: Defending ecocentrism and the nature needs half movement. *Biological Conservation, 217*(2018), 140–148.
Kottak, C. P. (1999). The new ecological anthropology. *American Anthropologist, 101*(1), 23–35.
Kumar, P. (2010). *The economics of ecosystems and biodiversity: Ecological and economic foundations*. London: Earthscan.
Laurence, W. F., Sayer, J., & Cassman, K. G. (2014). Agricultural expansion and its impacts on tropical nature. *Trends in Ecology & Evolution, 29,* 107–116.
Lavigne, D. M., & Lynn, W. S. (2011). Canada's commercial seal hunt: It's more than a question of humane killing. *Journal of Animal Ethics, 1*(1), 1–5.
Leopold, A. (1949). *A sand county almanac*. Oxford: Oxford University Press.
Lu, J., Bayne, K., & Wang, J. (2013). Current status of animal welfare and animal rights in China. *Alternatives to Laboratory Animals: ATLA, 41,* 351–357.
Marder, M. (2013). Plant intelligence and attention. *Plant Signaling & Behavior, 8*(5), e23902.
Marris, E. (2011). *Rambunctious Garden: Saving nature in a post-wild World*. USA: Bloomsbury Publishing.
Martin, A., Coolsaet, B., Corbera, E., Dawson, N. M., Fraser, J. A., Lehmann, I., et al. (2016). Justice and conservation: The need to incorporate recognition. *Biological Conservation, 197,* 254–261.
Marvier, M. (2012). The value of nature revisited. *Frontiers in Ecology and the Environment, 10,* 227.
Marvier, M. (2014). A call for ecumenical conservation. *Animal Conservation, 17*(6), 518–519.
McElroy, A. (2013). Sedna's children: Inuit elders' perceptions of climate change and food security. In H. Kopnina & E. Shoreman-Ouimet (Eds.), *Environmental anthropology: Future directions* (pp. 145–171). New York and Oxford: Routledge.
Miller, B., Soule, M. & Terborgh, J. (2014). The "New Conservation's" surrender to development. Rewilding Institute. http://rewilding.org/rewildit/the-new-conservations-surrender-to-development/.
Nuttall, M. (2016). Climate, environment, and society in Northwest Greenland. In H. Kopnina & E. Shoreman-Ouimet (Eds.), *Handbook of environmental anthropology* (pp. 219–229). New York: Routledge.
Piccolo, J., Washington, H., Kopnina, H., & Taylor, B. (2018). Back to the future: Why conservation biologists should reembrace their ecocentric roots. *Conservation Biology, 32*(4), 959–961.
Poirier, N., & Tomasello, S. (2017). Polar similar: Intersections of anthropology and conservation. *Animalia*, 1–17.
Rantala, S., Vihemäki, H., Swallow, B. M., & Jambiya, G. (2013). Who gains and who loses from compensated displacement from protected areas? The Case of Derema Corridor, Tanzania. *Conservation and Society, 11*(2), 97–111.
Regan, T. (1983). *The case for animal rights*. Berkeley & Los Angeles: University of California Press.
Rolston, H. I. I. I. (1982). Are values in nature subjective or objective? *Environmental Ethics, 4*(1982), 125–151.
Rolston, H. I. I. I. (2012). *A new environmental ethics: The next millennium for life on earth*. New York: Routledge.
Rowlands, M. (1998). *Animal rights: A philosophical defence*, 192 pp. Basingstoke, UK: Palgrave MacMillan Press.

Sandbrook, C. (2015). What is conservation? *Oryx, 49,* 565–566.
Shoreman-Ouimet, E., & Kopnina, H. (2016). *Culture and conservation: Beyond anthropocentrism*. New York: Routledge Earthscan.
Sinclair, A. R. E. (2014). *Serengeti story: Life and science in the World's greatest wildlife region*. Oxford: Oxford University Press.
Singer, P. (1977). *Animal liberation: A new ethics for our treatment of animals*. New York: Avon Books.
Stoett, P. (2002). The international regulation of trade in wildlife: Institutional and normative considerations. *International Environmental Agreements, 2*(2), 193–208.
Stone, C. D. (1972). Should trees have standing—Toward legal rights for natural objects. *Southern California Law Review, 45,* 450–487.
Swimme, B. & Berry, T. (1992). *The Universe Story: From the Primordial Flaming Forth to the Ecozoic Era.* San Francisco: Harper Books. https://onlinelibrary.wiley.com/doi/full/10.1111/cobi.13067.
Sykes, K. (2016). Globalization and the animal turn: How international trade law contributes to global norms of animal protection. *Transnational Environmental Law, 5,* 55–79.
Tallis, H., Lubchenko, J., et al. (2014). Working together: A call for inclusive conservation. *Nature News., 515,* 27–28.
Taylor, B. (2013). Introduction: Arborphilia through the ages. *JSRNC, 7,* 239–242.
The Economist. (2014). *Big game poachers: Tanzania's dwindling elephants* (p. 37). November 8. https://www.economist.com/news/middle-east-and-africa/21631202-claims-links-between-politicians-and-poachers-merit-further-investigation-big.
The Economist. (2016a). *Prescription for extinction* (p. 48). April 14. https://www.economist.com/.
The Economist. (2016b). *Last chance to see? The Trade in wild-animal parts* (pp. 47–48). April 16–22. https://www.economist.com/news/international/21696961-first-two-articles-we-look-how-poachers-smugglers-and-lax-law-enforcement.
Turner, J., & D'Silva, J. (Eds.). (2006). *Animals, ethics and trade: The challenge of animal sentience* (pp. 111–128). London, UK: Routledge Press.
Vieira, P. (2016). Is overpopulation a growth? The pathology of permanent expansion. *Oxford Literary Review, 38*(1), 67–83.
Von Hellermann, P. (2007). Things fall apart? Management, environment and Taungya farming in Edo State, Southern Nigeria. *Africa, 77*(3), 371–392.
Vucetich, J. A., Dawn Burnham, D., Macdonald, E. A., Bruskotter, J. T., Silvio Marchini, S., Zimmermann, A., et al. (2018). Just conservation: What is it and should we pursue it? *Biological Conservation, 221*(2018), 23–33.
Warren, M. A. (1983). The rights of the nonhuman world. In R. Elliot & A. Gare (Eds.), *Environmental philosophy: A collection of readings* (pp. 109–131). University Park: The Pennsylvania State University Press.
Washington, H. (2013). *Human Dependence on Nature: How to help solve the Environmental Crisis.* London: Earthscan.
Washington, H. (2015). *Demystifying Sustainability: Towards Real Solutions.* London: Routledge.
Washington, H. (2018a). *A sense of wonder towards nature: Healing the World through belonging*. London: Routledge.
Washington, H. (2018b). The intrinsic value of geodiversity. *The Ecological Citizen, 1*(2), epub-007.
Washington, H., Taylor, B., Kopnina, H., Cryer, P., & Piccolo, J. (2017). Why ecocentrism is *the* key pathway to sustainability. *Ecological Citizen, 1*(1), 32–41.
Washington, H., Chapron, G., Kopnina, H., Curry, P., Gray, J., & Piccolo, J. (2018). Foregrounding ecojustice in conservation. *Biological Conservation, 228*, 367–374. https://doi.org/10.1016/j.biocon.2018.09.011.

Wasser, S., Poole, J., Lee, P., Lindsay, K., Dobson, A., Hart, J., et al. (2010). Elephants, ivory, and trade. *Science, 327*(5971), 1331–1332.
West, P., & Brockington, D. (2006). An anthropological perspective on some unexpected consequences of protected areas. *Conservation Biology, 20*(3), 609–616.
Wijkman, A. & Rockström, J. (2012). *Bankrupting Nature: Denying Our Planetary Boundaries.* New York: Routledge.
Wilson, E.O. (2003). *The Future of Life*. New York: Vintage Books.
Yee, A. (2013). Market for bear bile threatens Asian Population. *New York Times blog*. January 28. https://green.blogs.nytimes.com/2013/01/28/market-for-bear-bile-threatens-asian-population/.

Chapter 3
"Contending with New Conservationism"

Kaitlyn Creasy

Introduction

In this essay, I investigate the ways in which identifying human interests as the orienting goal for conservation efforts might hinder the conservation of nature and non-human life and unwittingly inspire the devaluation of nature. I focus especially on the new direction that the paradigm of "new conservationism" urges us to take in conservation efforts and rationales. As Daniel Doak and his colleagues (2015: 29) note in their paper on the future of conservation, "new conservationists" believe that conservation efforts ought to focus more, "on urban areas and on landscapes and species most useful to humans, since human benefits should drive conservation efforts." In particular, these thinkers identify economic development as the proper aim of conservation and insist that economic growth will lead both to more successful conservation efforts and to greater valuing of nature by those who benefit (Kareiva et al. 2012; Kareiva and Marvier 2013). In what follows, I argue that this anthropocentric ideology to which new conservationists subscribe both devalues wild nature and—knowingly or unknowingly—obscures the interests of non-human life. Indeed, I identify this as the fundamental danger of new conservationism's "surrender to development" (Miller et al. 2014). Note here that while I refer to the movement I characterize in this paper as "new conservationism" (as those who belong to this movement do), one should make a clear distinction between (1) this ideology and its suggested practices and (2) the primary aim of traditional conservation: preserving or protecting nonhuman nature.

I have two primary aims in this chapter. The first is to investigate the way in which new conservationists justify conservation proposals and interventions by appeal to the alleged arrival of the "Anthropocene," an epoch characterized by human dominance

K. Creasy (✉)
Philosophy Department, California State University, San Bernardino, CA, USA
e-mail: kcreasy@butler.edu

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over non-human life and the natural world.[1] In such a human-dominated age, new conservationists insist, the categories of "natural" and "artificial," of "nature" and "human," no longer apply: given the extent of anthropogenic change, nature can no longer be separated from human artifice (Marris 2011; Vogel 2015). Indeed, for such thinkers, everything has become artificial. I critique this view in the first section of my chapter.

My second aim is to problematize the anthropocentric prioritization of human interests in the new conservationist understanding of mutual benefit. In this section, I critique the human supremacist ideology underpinning (and ultimately undermining) the mutuality on which these thinkers insist. Then, in order to demonstrate both the explicit and implicit anthropocentrism inherent in new conservationist notions of mutual benefit, I proceed through a small selection of new conservationist recommendations for environmental action. Though I focus mainly on the ideological underpinnings of "new conservationism," some aspects of my analysis run parallel with those offered by Doak et al. (2015).

In large part, this chapter is a philosophical critique of the ways in which new conservationists justify their conservation vision. But the stakes are not merely philosophical: as Sagoff (2008: 26) argues, "[our] environmental goals rest on views or beliefs that find their way, as ethical principles and intuitions, into legislation and common-law adjudication". Indeed, I contend that the way we understand: (1) "nature" and the natural world (as inseparable from humanity and human interests, for example), and (2) our obligations thereto will have real-life consequences, making certain conservation policies, laws, or proposed interventions seem intuitive, self-evident, or "common-sense," while others are seen as examples of wishful thinking. This is especially true for those scholars and thinkers in leadership roles at influential environmental agencies, universities, corporations, and elsewhere. If this is the case, then the practical stakes of contending with new conservationism are high (Kopnina et al. 2018).

Problematizing New Conservationist Notions of Nature and Artifice

In pursuit of my first aim, I show how new conservationists utilize the breakdown between the categories "natural" and "artificial" to justify future courses of action. I want to problematize both: (1) the new conservationist move from a descriptive claim about the Anthropocene to a *prescriptive* one, and; (2) the kinds of interventions justified by new conservationists' appeal to the breakdown of the natural/artificial divide. A number of thinkers, such as Washington on resilience and adaptive management

[1] I say "alleged" here keeping a certain set of reflections on Anthropocene discourse in mind. Though the "keystone rationale" for isolating and naming a specific geological epoch "the Anthropocene" is sound (Crist 2016), the discourse surrounding this new geological epoch is much broader. For more on this, see Moore (2016).

in this volume, resist new conservationist attempts to collapse the natural into the artificial (Rolston 1998; Woods 2017). Although there are solid reasons for doing so, I do not pursue this set of arguments here.[2] Rather, I aim to show here that *even if* it is exceedingly difficult to parse out the natural from the artificial, new conservationists would not be justified in deriving an ethical "ought" from this purely factual claim.

Characteristic of new conservationist thought is the notion that, in light of the arrival of the Anthropocene, or "the Age of Humans," there has been a breakdown between the natural and the artificial, such that it no longer makes sense to speak of the natural world as separate from human influence. In her book *Rambunctious Garden,* Emma Marris (2011: 114) claims that, "all ecosystems on the planet have seen anthropogenic change"; Kareiva and Marvier (2011: 965) claim that, "no place is free of human influence." On such a view, national parks are "no less constructions than Disneyland" (Kareiva et al. 2012). In *Thinking Like a Mall,* Steven Vogel (2002: 32) notes that, "the human and the putatively 'natural' worlds are inextricably intertwined to a degree that makes it pointless and indeed conceptually incoherent to distinguish them". Insofar as, "the world we inhabit is always already one transformed by human practices," this world to which environmental philosophers refer must be understood as the "built environment," as the world environing human beings (Ibid: 23).[3]

From this series of descriptive claims about the way the world allegedly is, these new conservationist thinkers derive a series of prescriptive claims about how conservation ought to proceed. According to Vogel (2002), for example, environmental philosophy must shift its orientation from responsibility for the natural world (as a world separate from human interests) to responsibility for an environment that always-already includes transformative human practices. The "post-naturalist" environmental philosophy for which Vogel calls must therefore prioritize human interests, especially in conservation decision-making.

We see another example of this leap from the descriptive to the prescriptive in Marris et al. (2013: 345) in which the authors argue that, in light of extensive anthropogenic change, all ecosystems on Earth are technically "novel ecosystems." In the Anthropocene, the authors claim, "the whole Earth is a novel ecosystem: a creation of anthropogenic change under varying levels of day to day management, a global garden with some corners gone feral and others planted in neat rows" (Ibid: 346). Furthermore, Marris et al. claim, since all of Earth is now a novel ecosystem (due to the omnipresence of human influence), we ought to manage it as such, coming up with conservation plans as novel and varied as the endlessly many ecosystems they intend to manage (Ibid: 347-8).

From their characterization of Earth in the Anthropocene, Marris et al. (2013: 347) derive two prescriptions: we must reject historical ecological fidelity as a conserva-

[2] See also Chap. 4 by Washington on resilience and adaptive management in this volume.

[3] Note that there is also a version of this breakdown that appeals to the conceptual blurriness between the "natural" and "artificial," especially given the social construction of our concept of nature. This version of the natural/artificial breakdown appears, for example, in Callicott's naturalist critique of wilderness (1998) and Vogel's social constructivist critique of nature (2015). This critique of the *concept* of nature leads some to a kind of nature skepticism, as Plumwood points out (2006) or nature denial (Vetlesen 2015).

tion goal, and develop a conservation vision according to which, "we, collectively, have to decide on management goals for every piece of land". They argue that to achieve conservation progress in the Anthropocene, we need to not only acknowledge the extent of anthropogenic change, but embrace this new task that emerges from the irreversible ways in which we have changed our planet: the increase of human intervention and control of the natural world. We see this same emphasis in *Rambunctious Garden,* where Marris (2011: 171) remarks that:

> In different places, in different chunks, we can manage nature for different ends – for historical restoration, for species preservation, for self-willed wilderness, for ecosystem services, for food and fiber and fish and flame trees and frogs. We've forever altered the Earth, and we cannot abandon it to a random fate. It is our duty to manage it. Luckily, it can be a pleasant, even joyful task, if we embrace it in the right spirit.

In short, the fact of anthropogenic change is carried forward as an imperative for the future, as an obligation to expand and enhance our influence. New conservationists interpret how things have been so far with human beings and the natural world as a license for expanding and enhancing the human shaping of the natural world. Following this line of thinking, because human beings have dominated the natural world to such a large extent, it no longer makes sense to speak of an other-than-human world. According to Marris, all of nature has become artifice; according to Vogel, all of nature always already was artifice, constructed and transformed by human practices. This view about the world is promoted as licensing us to intervene even more substantially than we have so far. After all, new conservationists claim, we must take responsibility for what we have done—and that requires expanding our control.

This tendency to utilize the breakdown between the natural and the artificial to justify claims about how conservation *ought* to proceed is a widely shared tendency among new conservationists. Some new conservationists argue that wilderness conservation as the preservation of biodiversity is pointless: because humanity has left its mark on everything in the Anthropocene, there is no true wilderness to preserve, and future conservation efforts ought instead to focus on interventions which, "seek to enhance those natural systems that benefit the widest number of people, especially the poor [and] measure its achievement in large part by its relevance to people" (Kareiva et al. 2012).

Other thinkers claim that we can strike a balance between conserving for biodiversity and supporting human interests, justifying the urgency of this new vision by appealing to the inextricability of the human and the natural. For example, Marris describes a "post-wild" world (Marris 2011), a world that has forsaken the, "human-made category of 'wild'" and recognizes that human beings are, "not outside of nature" (Marris 2015). In such a world, she claims, conservationists ought to embrace the creation of "designer ecosystems" as, "new, human-influenced combinations of species that can function as well or better than native ecosystems and provide for humans with ecosystem services of various kinds" (Marris 2011: 112).

These examples reveal the first argument characteristic of contemporary new conservationism. To begin, new conservationists observe the extent of anthropogenic

change. By pointing to the pervasiveness of anthropogenic change, they then establish the inextricability of human beings and the natural world. As result of this supposed inextricability they argue that the categories of "natural" and "artificial" become completely blurred, since to their mind all of the natural world is artificial in some way.[4] From these premises, an *ethical* conclusion—an entirely unobvious one—is drawn. Since humans dominate the world already, we are now obligated to use this domination 'for good' (or at least, the idea seems to be, 'for better' than we have so far (Creasy 2017)).

Although new conservationists have a number of proposals for how humanity might intervene to preserve or "improve" nature, they never sufficiently justify the extent and kinds of intervention they recommend. We see the improvement of nature (framed either as the ability to benefit humans or as the improvement of ecosystem function) cited as an aim of new conservationist interventions in the following claims: (1) Kareiva's claim "new conservation should seek to enhance those natural systems that benefit the widest number of people" (Kareiva et al. 2012); (2) Marris's claim that, "…scientists studying novel ecosystems have shown that historical ecosystems aren't always without equal at performing particular services… depending on what you want, and given variables including size of project, budget, and how much the place has already changed, a designer ecosystem may be *better* than a recreation of a historical ecosystem" (Marris 2011: 127); and (3) Marris's claim that the creation of, "new, human-influenced combinations of species that can function as well or better than native ecosystems and provide for humans with ecosystem services of various kinds—from water filtration and carbon sequestration to habitat for rare species" (Ibid: 161).

New conservationists thus make an argumentative "leap" from a description of the way they believe the world is in the face of pervasive anthropogenic change to an ethical claim: since human beings are already influencing the world in innumerable ways, we *ought* to either continue or increase this extent of influence, albeit in more benevolent and thoughtful ways. This, it seems to me, need not follow. Indeed, one might concede the truth of all of the above premises—the extent of anthropogenic change, the inextricability of humanity from the natural world, and the ambiguity of the categories "natural" and "artificial"—yet still arrive at a very different conclusion about the direction in which conservation should go (Kopnina 2016).

For example, one might argue that although the categories "natural" and "artificial" are more difficult than ever to parse, we ought to continue trying to parse them, and should not be too quick to use our confusion to push an agenda that advocates for even more of that which got us into this mess in the first place: human influence and control. After all, human intervention has not only been pervasive, it has also been catastrophic. Therefore, it is sensible to ask: What about this catastrophic impact licenses our further intervention?

[4]For the record, I am not taking a position on the inextricability of the natural and the artificial, except to say that we seem to know what we mean by the difference and that there already seem to be a number of helpful ways of parsing this.

One might also argue that although human and natural worlds *seem* inseparable in the age of the "Anthropocene," we should not allow this semblance to distract us from elaborating the many ways in which natural life-forms or landscapes retain other-than-human traces. Even if "nature" as the other-than-human is an ideal concept or category, might it not still be useful—perhaps even critical—to employ such a concept in conservation decision-making? After all, conservation decisions that offer room for a robust category of other-than-human nature would certainly be more likely to conserve with the values and interests of non-human life forms and landscapes in mind, just in case there are such values and interests.[5]

In sum, while it might prove difficult to discern what we *mean* when we refer to nature and the natural world as independent from human beings in some way, and while it might take some philosophical heavy-lifting to figure out what "nature" could mean in this time, it does not follow from the difficulty of doing so in a world of extensive anthropogenic change that we ought not to try. If we "buy into" the new conservationist program, we do away with other potentially productive avenues of conservation thought. And indeed, the quicker humanity surrenders to the new conservationist program, the quicker will such potentially productive avenues disappear.

The Misshapen "Mutuality" of New Conservationism

Significantly, in advocating for the expansion of human management of the Earth in their work on novel ecosystems, Marris et al. (2013: 347) argue that the management goals upon which conservationists decide ought to offer, "local, regional, and global stakeholders the opportunity to add to the values and services of multifunctional landscapes". Such goals must take what these authors call, "the human system context" of economics, culture, and institutions into account, managing land in order to enhance human flourishing and protect a variety of social institutions (Ibid: 347). In this example, as with many new conservationist recommendations, the call for enhanced and expanded human intervention takes a particularly anthropocentric turn. In order to achieve conservation progress in the Anthropocene, new conservationists suggest that the conservation of nature must aim to preserve the conditions of human flourishing.

In selections from their work, we see again that new conservationists appeal to the natural/artificial breakdown to justify their conservation vision. For example, Kareiva et al. (2012) appeal to the "unmistakable domestication of our planet" to argue that, "conservation cannot promise a return to pristine, prehuman landscapes… [since] humankind has already profoundly transformed the planet and will continue to do so". These authors then propose an ideal world in which nature is a, "garden… [as] a tangle of species and wildness amidst lands used for food production, mineral extraction, and urban life" (Ibid 2012). This vision is echoed in the work of Marris (2011: 2), who

[5]Think, for example, of Woods (2017) on degrees of naturalness in *Rethinking Wilderness* for one alternative.

argues that we ought to understand the Earth as a, "global, half-wild rambunctious garden, tended by us." "We are already running the whole Earth, whether we admit it or not," she notes (Ibid), but to, "run it consciously and effectively, we must admit our role and even embrace it." In these selections, the breakdown mentioned above plays a different justificatory function. Since, in the Anthropocene, "people are actually part of nature" (Kareiva et al. 2012), conservation efforts must also make non-human life and landscapes available for human development, flourishing, and prosperity. This second new conservationist argument is further bolstered by the work of Vogel (2015), who calls for a shift in conservation priorities from conservation of the "natural environment" to conservation of the "built environment," which will always already involve human interests.

The notion that conservation in the Anthropocene should focus especially on preserving the conditions of human flourishing—with a particular eye to human development and economic interests—is a vision advanced by the Natural Capital Project (https://www.naturalcapitalproject.org/). And what kinds of conservation decisions and interventions does this project justify? The tagline on its website—"prosperity springs from nature"—provides a hint. A selection of projects and initiatives supported by the Natural Capital Project offer a much more concrete picture.

According to an article on, "securing natural capital and expanding equity" by Ehrlich et al. (2012), the inclusion of human economic and cultural interests into the goals of nature conservation transforms non-human life and natural landscapes into "natural capital." As the authors put it, "Earth's lands and waters and their biodiversity can be seen as a capital stock from which people derive vital ecosystem services" (Ibid: 69). This reconfiguration of the natural world as natural capital is grounded in the idea that humans and nature are no longer separable from one another. The authors emphasize a need for contemporary conservation efforts to "[secure] natural capital and human well-being," and they attempt to answer the question: "What natural capital is most vital for sustaining human well-being?" (Ibid: 70).

Presenting China as an exemplar, the authors laud Chinese initiatives for utilizing the logic and appeal of natural capital to protect ecosystems. In particular, they celebrate China's vision of the natural world as natural capital, according to which the protection of ecosystems is justified by appeal to flood control measures, hydropower, and more productive agriculture and tourism. Of course, this course of action *does* involve protecting non-human life and the natural world to some degree. But how is this protection justified? By appeal to the instrumental uses these ecosystems, as "natural capital," have for human development and flourishing. If such ecosystems were to no longer serve these purposes—if they were to lose their instrumental value as means for achieving human ends—the justification for ecosystem protection would disappear or significantly weaken, leaving little to no reason to protect them. Such an instrumentalizing mindset encourages the protection of nature and non-human life only when it promotes human interests to do so.[6]

New conservationists imagine we can have the best of both worlds here: they think we can motivate the conservation of nature and non-human life, while also furthering

[6]See also Chap. 6 by Washington in this volume on ecosystem services.

the economic development of human beings. But when economic development is cited as the primary justification for conservation decision-making, and nature is understood primarily as natural capital, we risk losing the ability to see nature as valuable apart from the ways in which it serves human interests and aims. In short, we lose the ability to see the intrinsic value of nature.[7]

We find another example of the kind of conservation recommendation developed by the Natural Capital Project in a paper about the protection of coastal habitats (Arkema et al. 2013). In this study, the authors justify the preservation of coastlines and coastal habitats by appealing in large part to the property value represented by each mile of coastline. The new conservationists in this piece develop a, "national map of risk reduction owing to natural habitats" and indicate where conservation efforts ought to be focused, depending on the potential these habitats have, "to protect coastal communities." (Arkema et al. 2013: 913). By determining the value of a variety of coastlines, conservationists are able to prioritize which habitats to preserve, as well as identify habitats on which they ought to expend fewer conservation efforts.

The authors begin their article by reflecting on the way in which, "prioritizing ecosystems for conservation or restoration in service of natural hazard reduction" requires knowing not only where one might productively intervene to lessen coastal erosion and flooding, but also where coastal habitats are, "most likely to protect vulnerable people and property," where vulnerable means susceptible to a variety of misfortunes and losses from sea-level rise and storms (Ibid: 918). In order to determine which habitats are, "critical for protecting the most valuable coastline," the authors look to "difference in total property value exposed to coastal hazards, with and without habitats." (Ibid). Arkema et al. (2013) use Zillow, a US-based website which estimates property resale values, to predict the property value of miles of coastline, the authors predictably find a wide variation among the "value of property now protected by coastal habitats … ranging from US $0 [per mile] (for example, in Jefferson County, Florida) to more than US $20 billion [per mile] (in Suffolk and Kings Counties in New York)." According to the new conservationist logic of this article, while Jefferson County, Florida deserves little to none of our concern and conservation efforts, Suffolk and Kings counties in New York deserve supreme concern and ought to be the focus of extensive efforts.[8]

And what about Jefferson County, Florida, these miles of coastline the preservation of which would allegedly waste our conservation energies? As described by Florida's Department of Environmental Protection website (2018a), the five-mile coastline is "wilderness, sanctuaries and saltmarsh—with no beaches or paved roads". A bit more research (Florida State Parks n.d) reveals that these ostensibly worthless miles of coastline are located in a county home to the St. Marks National Wildlife Refuge, the Big Bend Seagrasses Aquatic Preserve, a wildlife management area (the Aucilla Wildlife Management Area), and three conservation areas (the Upper and Middle Aucilla Conservation Areas and the Wacissa Conservation Area) (Ibid). The seagrass beds and saltmarsh in these areas, "[provide] nursery and forage areas for finfish and

[7] See also Batavia and Nelson (2017) on this topic.

[8] See also Eileen Crist's contribution to this volume.

shellfish…such as mullet, sea trout, redfish, shrimp, oysters and scallops" as well as habitat for, "manatees, ospreys, bald eagles, sea turtles, sturgeon, dolphins and many other species" (Florida Department of Environmental Protection 2018b).

Directly adjacent to Jefferson County on the coast is yet another wildlife management area and a state park in which, "the Econfina River meanders like a dark ribbon through pine flatwoods and oak-palm forests to broad expanses of salt marsh dotted with pine islands." (Florida State Parks n.d.). In short, the miles of coastline, which are seen in the Natural Capital Project study as being without value (and thus on which we ought to expend little to none of our conservation energies) remain *either under- or undeveloped* by human beings. By relying on property values as a factor in determining where to devote conservation efforts—and in this case, to determine the value of coastlines—we tilt the scales of concern against conserving undeveloped natural landscapes which remain unprotected. Kareiva and his colleagues might be happy to concede this point. After all, they straightforwardly claim that "identifying the best locations to target for ecosystem-based strategies depends on where habitats effectively reduce hazards and where people benefit the most" (Arkema et al. 2013: 916). But should *we* be?

It might be a felicitous byproduct of the above conservation plan that *some* undeveloped land would still be protected by keeping coastal habitats intact in areas where there are high property values or people particularly vulnerable to sea-level rise. On such a view, environmental protection is warranted mainly as a means of protecting people or property from environmental hazards. If we accept such a justification, however, we find no good reason to value landscapes apart from human interests. Thus, I suggest that we view the authors' property- and human-centered justification for conservation with a good deal of skepticism. That is because, as with the previous example of natural capital in China, new conservationists encourage us to see the natural world as instrumentally valuable: we deem a particular coastal habitat's worthy of protection from harm *only* if there is some human harm that might result from our failure to conserve such habitats. If a given coastal habitat is no longer effectively protecting human beings from sea-level rise and storm surge, our ethical obligation to conserve such natural areas weakens considerably and perhaps falls out of ethical consideration altogether.

If there is some good reason for valuing land without people and property to protect, adopting a new conservationist vision would block the potential to find it. Such a vision obscures the still-very-live possibility that there might be more important considerations in conservation decisions than human development. Otherwise put, by either intentionally adopting or unintentionally inhabiting the utilitarian mindset encouraged by new conservationism, we risk a potential failure to see any possibility of intrinsic value in the non-human natural world—when, in fact, this possibility very much remains (Batavia and Nelson 2017). Given the stakes for non-human life and natural landscapes, this is far too big a risk to take.

Conclusion

New conservationism embraces "economic development for all" (Kareiva et al. 2012) and insists that such a decidedly human benefit will be beneficial for non-human life and the natural world. This emphasis on economic development, new conservationists argue, will require conservationists to shift their rationales and priorities. Conservationists, on this view, must see the natural world as instrumentally valuable so that "in the long run" what "really matters" and is "worth saving" in nature — those miles of coastline with the highest property values; those species that seem most important to us; those novel, post-natural ecosystems– can be saved. As I have argued above, this approach to conservation lends itself easily to an instrumentalizing straightjacket and the unjustified prioritization of human interests and ends over those of non-human life. Thus, we ought to be skeptical of the new conservationist appeal to the mutual benefit of human and non-human life as a justification for their conservation suggestions.

The hope of new conservationists is that the prosperity of human beings will lead them to develop more sympathetic stances toward conservation efforts (Kareiva and Marvier 2013: 963–4). Yet new conservationists offer no convincing argument for this prediction, and it remains unclear that artificially-generated human sympathy for nature's plight, acquired from seeing nature "as a garden" and one's own interests as "natural" interests, will aid nature conservation efforts in the long run. Indeed, this call for a thoroughgoing instrumental orientation— which sees nature as a means to economic flourishing and economic flourishing as a means to a supposedly thriving 'post-natural' world— is profoundly anthropocentric and flatly ignores the reality of how economically flourishing individuals and societies have treated nature so far (Dietz and O'Neill 2013; Daly 2014; Washington 2015).

For this reason, and the others discussed above, I argue that conservationists should be wary of efforts to utilize the arrival of a new "human age," as well as the blurring of the natural with the artificial, as a mandate for an increase in the appropriation of non-human modes of life and the natural world for human benefit. New conservationists might be able to implement more "conservation" (of the new conservationist variety) in the immediate future by appealing to self-interest, but there is a real risk in entrenching the view of nature conservation as solely and narrowly self-serving.[9] Both the new conservationist collapse of the natural/artificial divide and the new conservationists' appeal to human-centric motivations for conservation encourage us to center the human in our field of environmental concern. If conservationists continue to situate the human being in this way, however, the protection of nature and the interests of non-human life might start to seem completely inextricable from the protection of human interests. If this becomes the dominant paradigm, there is a real and serious danger that the non-human natural world will come to be understood as valuable *only* for what it can get us. Such a conception precludes an understanding of the natural, non-human world as intrinsically valuable. And indeed, the more

[9]It is worth noting that such a "conservation" agenda cannot straightforwardly be characterized as conservation in the typical sense of the term.

widespread such an anthropocentric paradigm becomes, the more we risk extinction of the idea that nature and non-human life forms have goods all their own. In a time when nature needs our respect and protection more than ever, this is far too big a risk to take.

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References

Arkema, K., et al. (2013). Coastal habitats shield people and property from sea-level rise and storms. *Nature Climate Change, 3,* 913–918.

Batavia, C., & Nelson, M. (2017). For goodness sake! What is intrinsic value and why should we care? *Biological Conservation, 209,* 366–376.

Callicott, J. B. (1998). The wilderness idea revisited: The sustainable development alternative. In J. B. Callicott & M. P. Nelson (Eds.), *The great new wilderness debate*. Athens, GA: University of George Press.

Creasy, K. (2017). Environmental Nihilism: Reading Nietzsche against new conservationism. *Environmental Philosophy, 14,* 339-3.

Crist, E. (2016). The poverty of our nomenclature. In J. Moore (Eds.), *Anthropocene or capitalocene? Nature, history, and the crisis of capitalism.* Oakland, CA: PM Press.

Daly, H. (2014). *From uneconomic growth to the steady state economy*. Cheltenham: Edward Elgar.

Dietz, R., & O'Neill, D. (2013). *Enough is enough: Building a sustainable economy in a world of finite resources*. San Francisco: Berrett-Koehler Publishers.

Doak, D., et al. (2015). What is the future of conservation? In G. Wuerthner, E. Crist, & T. Butler (Eds.), *Protecting the wild: Parks and wilderness, the foundation for conservation* (pp. 27–35). Washington, DC and London: The Island Press.

Ehrlich, P., Kareiva, P., & Daily, G. (2012). Securing natural capital and expanding equity to rescale civilization. *Nature, 486,* 69.

Florida Department of Environmental Protection. (2018a). *Jefferson County*. See: https://floridadep.gov/fco/coastal-access-guide/content/jefferson-county. Accessed October 25, 2018.

Florida Department of Environmental Protection. (2018b). Big Bend Seagrasses aquatic preserve. See: https://floridadep.gov/fco/aquatic-preserve/locations/big-bend-seagrasses-aquatic-preserve. Accessed October 25, 2018.

Florida State Parks. (n.d.). *Econfina River State Park*. See: https://www.floridastateparks.org/park/Econfina-River. Accessed October 25, 2018.

Kareiva, P., Lalasz, R., & Marvier, M. (2012). *Conservation in the anthropocene: Beyond solitude and fragility*. Winter: Breakthrough Journal.

Kareiva, P., & Marvier, M. (2011). *Conservation science: Balancing the needs of people and nature.* Greenwood Village, CO: Roberts & Co (Macmillan Learning).

Kareiva, P., & Marvier, M. (2013). What is conservation science? *BioScience, 62,* 962–969.

Kopnina, H. (2016). Nobody likes dichotomies (but sometimes you need them). Special forum: Environmental and social justice? The ethics of the anthropological gaze. *Anthropological Forum, 26*(4), 415–429.

Kopnina, H., Washington, H., Gray, J., & Taylor, B. (2018). The 'future of conservation' debate: Defending ecocentrism and the nature needs half movement. *Biological Conservation, 217,* 140–148.

Marris, E. (2011). *Rambunctious garden*. New York, NY: Bloomsbury.
Marris, E. (2015). Handle with Care. *Orion.* See: https://orionmagazine.org/article/handle-with-care/. Accessed October 25, 2018.
Marris, E., Mascaro, J., & Ellis, E. (2013). Perspective: Is everything a novel ecosystem? If so, do we need the concept? In R. Hobbs, E. Higgs, & C. Hall (Eds.), *Novel ecosystems: Intervening in the new ecological world order*. London: Wiley.
Miller, B., et al. (2014). 'New conservation' or surrender to development? *Animal Conservation, 17*(6), 509–515.
Moore, J. (Ed.). (2016). *Anthropocene or capitalocene? Nature, history, and the crisis of capitalism*. Oakland, CA: PM Press.
Natural Capital Project Website. (n.d.). See https://naturalcapitalproject.stanford.edu/. Accessed October 25, 2018.
Plumwood, V. (2006). The concept of a cultural landscape. *Ethics and the Environment, 11,* 115–150.
Rolston, H., III. (1998). The Wilderness Idea Reaffirmed. In J. B. Callicott & M. P. Nelson (Eds.), *The great new wilderness debate*. Athens, GA: University of George Press.
Sagoff, M. (2008). *The economy of the Earth: Philosophy, law, and the environment*. Cambridge, MA: Cambridge University Press.
Vetlesen, A. (2015). *The denial of nature: Environmental philosophy in the era of global capitalism*. London: Routledge.
Vogel, S. (2002). Environmental philosophy after the end of nature. *Environmental Ethics, 24*(1), 23–39.
Vogel, S. (2015). *Thinking like a mall*. Cambridge, MA: MIT Press.
Washington, H. (2015). *Demystifying sustainability: Towards real solutions*. New York: Routledge.
Woods, M. (2017). *Rethinking wilderness*. Ontario, CA: Broadview Press.

Chapter 4
The Science (and Ethics) of Conservation: Ecological Perspectives

Haydn Washington

Introduction

This chapter aims to cover several topics relevant to conservation and to the question of a valid holistic justice that includes 'ecojustice'. It is written in the light of both the science of the environmental crisis, but also in the light of the need for a major change by society towards ecocentrism, ecological ethics and ecojustice (e.g. Curry 2011; Washington 2018a; Washington et al. 2018). First, in the Section "Conservation of What?" is discussion of the question of 'conservation of what?', and the battle between various ideas of what 'conservation' *is* or should be. The Section "A Summary of Humanity's Ecological Predicament" discusses the ways that humanity is fully dependent on nature. Governments, and much of academia, act as if this were not the case—hence the need for a summary. This is followed by a brief summary of humanity's ecological predicament, the fact that society is in overshoot of the Earth's ecological limits. I am continually amazed how many people are either ignorant of, or in denial about, the reality of the environmental crisis. They seem unaware of the extent of humanity's overshoot. I then briefly summarise how there are in fact *solutions* to all these problems.

The Section "Problems with Theory in Biology and Ecology" then addresses the problems of 'theory' in ecology that impact strongly on conservation. There are major ideological underpinnings to such theory that derive from anthropocentrism and neoliberalism. The ideological attacks on 'wilderness' are then discussed. Section "Where Is the Justice in Ecology?" concludes the chapter by considering where the 'justice' lies in conservation.

H. Washington (✉)
PANGEA Research Centre, BEES, UNSW, Kensington, Australia
e-mail: h.washington@unsw.edu.au

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Conservation of What?

In Chap. 1, the editors argued that 'conservation' is about keeping as much as we can of the world's biodiversity and geodiversity into the future, during a time of major environmental crisis. We should however note that 'conservation' itself has changed in meaning over the years. Once 'conservation' was deemed by Gifford Pinchot of the US Forest Service as: "the wise use of the earth and its resources for the lasting good of men" (USDOI 2017). In this view, conservation was where nature was being used for human benefit, but in a wise way that did not substantially degrade it. Action to protect natural areas *for themselves* at that time in the US was called 'preservation', meaning reserves were not being exploited physically as a resource for humans (other than visitation). Wilderness champion John Muir thus considered himself a 'preservationist' (Westover 2016). However, this distinction has not lasted since the early 1900s, when Pinchot and Muir battled together to create reserves of different types in the US. The idea of protection of nature in reserves without resource extraction gained some acceptance—it is what we now mostly call 'national parks'. Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride (EF 2009).

'National parks for nature' was not just a 'great' idea (PBS 2009), it was an *ecocentric* one. However, there is currently a battle as to what conservation should mean today. Ecocentrism is not the dominant worldview in Western society (Washington et al. 2017), hence conservation remains a battleground. For example, the 'Wise Use' movement in the US seeks to exploit (log, mine, graze) national parks and wilderness areas (Luoma 1992; Hendricks 2005). This idea of exploiting parks has also been promulgated under less threatening terms such as 'multiple use' (Cronon 1996), and more recently in academia as 'sustainable use' (IUCN n.d.; UN 2012).

It is not hyperbole to say that we stand at a *moment of decision* as a society as to what we do regarding 'conservation'. Are we acting to protect nature for herself, through creating reserves to retain native biodiversity and geodiversity? Alternatively, are we doing it to maximise resource exploitation in the long-term, and thus make money out of reserves? The fact that society's conservation strategies to protect biodiversity are failing can be seen from the current major extinction crisis we face. Two very different approaches are now being canvassed in regard to conservation. First, that we should expand nature reserves from the Aichi target of 17% by 2020 (CBD 1992) to the 'Half Earth' or 'Nature Needs Half' (NNH) vision (Wilson 2016; Dinerstein et al. 2017) where half the Earth is reserved and protected. The second approach is that our reserves should produce resources for humanity (through logging, grazing or mining), an idea often dressed up as being needed 'for social justice'. Regarding the first approach, one of the world's most eminent biologists, E. O Wilson, argues we will not save the diversity of life on Earth *unless* we reserve and protect half of all lands (Wilson 2016). This case for rewilding and moving to the NNH vision remains of critical importance for conservation (see Chap. 12 in this volume by Reed Noss). However, many in the conservation community are silent

regarding this proposal. Others are outright hostile, often on social justice grounds (see Chaps. 1 and 2), or because they hold to the second view, and argue that reserves should include resource extraction.

Any discussion about conservation and aspects of justice needs to consider some perspectives from biology and ecology.

A Summary of Humanity's Ecological Predicament

Human Dependence on Nature

Society is completely dependent on nature, yet operates as if it was not. I wrote the book 'Human Dependence on Nature' (Washington 2013) to demonstrate the many ways humans *are* reliant on nature. It is worth briefly summarising humanity's ecological predicament, given society's tendency to deny reality (Washington 2018b). Key points are:

Food webs: Leopold (1949: 216) characterised ecosystems as a: 'fountain of energy flowing through a circuit of soils, plants and animals'. Energy is continually being added to ecosystems from the sun, being trapped by plants (producers) and these plants are eaten by herbivores, which may then be eaten by carnivores. The energy limits of the Earth's ecosystems cannot be ignored. Energy is life, but the amount coming to Earth is fixed (Washington 2013). Humanity is now using about 12,000 times as much energy per day as was the case when farming first started (Boyden 2004). So how much of the Earth's productivity should be controlled by just one species? Vitousek et al. (1986) estimated that about 40% of net primary productivity (NPP) in terrestrial ecosystems was being co-opted by humans each year. Others have estimated figures somewhat higher or lower, but all are a huge percentage of the planet's NPP. The fact that 60% of ecosystem services are now being degraded or used unsustainably (MEA 2005) shows our current appropriation of NPP is too high. Clearly, we are way beyond what could be considered *just* in terms of our 'fair share'.

Keystone species: Some species have more effect on how energy moves through a food web, and even on what species are present in communities. These are known as 'keystone species', important but little known parts of ecosystems. There are three types: 'predators', 'mutualists' and 'ecosystem engineers' (Washington 2013). Keystone *predators* are often found at high levels in the food web, such as top predators like wolves, dingos and jaguars (Washington 2015). Keystone *mutualists* are organisms that participate in mutually beneficial interactions with other organisms, and their loss impacts strongly upon ecosystems. Keystone *ecosystem engineers* create habitat for other species, examples being grizzly bears (move nutrients derived from eating salmon into the forest) and prairie dogs (tunnels create habitats for other species) (Washington 2013). It is thus critical we keep keystone species, the trouble is we don't know what many (perhaps most) of them are.

The nutrient cycles: Ecosystems require nutrients to be continually recycled. Essential nutrient cycles include those for phosphorus, sulfur, nitrogen and potassium. Ecosystem services are dependent on the balanced functioning of nature's nutrient cycles. However, humanity has pushed these cycles out of kilter, essentially doubling the amount of phosphorus and nitrogen moving through ecosystems, with major negative impacts (Washington 2013).

Overshoot

'Overshoot' is 'to shoot or pass over or beyond' (Catton 1982). The term is relevant because it demonstrates that society has *exceeded ecological limits*, causing an environmental crisis (Washington 2015). To understand overshoot, one needs to consider several factors covered below (Washington 2018c). Many environmental scientists, ecological economists and other scholars believe the overarching drivers of overshoot are the endless growth myth, overpopulation, and overconsumption (as summarized in Washington 2015).

Environmental Indicators

Environmental indicators all show that society is in overshoot in regard to ecological limits. The *Ecological Footprint* (Wackernagel and Rees 1996) is based on the idea of 'biocapacity', the capacity of a given area to generate an ongoing supply of renewable resources and to absorb wastes. The ecological footprint is monitored by the Global Footprint Network (GFN 2018). Ecological Footprint analysis compares human demands on nature with the biosphere's ability to regenerate resources and provide services. Unsustainability occurs if the area's Ecological Footprint exceeds its biocapacity. Both are usually expressed in global hectares (written as 'gha') or global hectares per person. In 2014, the Earth's total biocapacity was 12.2 billion gha, or 1.68 gha per person, while humanity's Ecological Footprint was 20.6 billion gha, or 2.84 gha per person (GFN 2018). Hence the Global Ecological Footprint is an unsustainable **1.7 Earths**—as we must live on only one Earth (Ibid). It should be noted however that this assumes that no land is set aside for *other species* that consume the same biological material as humans (Stechbart and Wilson 2010). This is actually a dangerous assumption, as apart from any ethical 'right', nonhuman species provide the ecosystem services on which society depends [see Chap. 6 on ecosystem services in this volume].

The Living Planet Index developed by the World Wide Fund for Nature (WWF) measures trends in thousands of vertebrate species populations, and shows a decline of 60% since 1970. In other words, the number of mammals, birds, reptiles, amphibians, and fish across the globe is (on average) less than half the size it was 40 years ago (WWF 2018). Biodiversity is declining in both temperate and tropical regions,

but the decline is greater in the tropics. Habitat loss and degradation, and exploitation through hunting and fishing, are the primary causes of decline (Ibid).

Planetary boundaries is a concept that seeks to define a 'safe operating space for humanity' and Rockstrom et al. (2009) identified that three planetary boundaries (out of nine) had been exceeded—climate change, biodiversity extinction, and nitrate pollution. Steffen et al. (2015) added phosphorus pollution. It is worth remembering that 'planetary boundaries' is also an anthropocentric concept. They are boundaries to define a 'safe operating space for *humanity*' and thus do not consider the rest of life on Earth. The concept however could be broadened to embrace this.

Extinction

Species extinction is at least 1000-fold above normal levels in the fossil record (MEA 2005). Wilson (2003) believes the extinction rate is possibly 10,000 times greater than normal, so that something like three species go extinct every hour. He concluded that humanity has become a serial killer of the biosphere. We are now in the midst of the sixth mass extinction we know of in the last 600 million years (Ceballos et al. 2015). Wilson (2003) has warned that without action, by the end of the century, *half* of all species on Earth may be extinct. More recently, a 2011 paper (Raven et al. 2011) suggested that (without action) *two-thirds* of terrestrial species were likely to become extinct by 2100. As Crist (2012: 150) concludes: "We are losing our own family". This will close off the evolutionary potential of more than half the living world. As Soulé and Wilcox (1980) observed: "Death is one thing – an end to birth is something else". The massive loss of living beings due to human action is what happens when society goes into overshoot.

Ecosystem Collapse

Ultimately, human existence depends on maintaining the rich web of life within which we evolved (Washington 2013). The rapidity of current environmental change is unique in human history (MEA 2005; Gowdy et al. 2010). Many entire ecosystems are degraded and verging on collapse. This situation has been described as the 'rivet popper' analogy by Ehrlich and Ehrlich (1981). If you keep taking out rivets from an aeroplane, at some point it will fall apart and crash. If you keep removing species, so will ecosystems. The reality of the trend towards collapse (sometimes called 'irreversible regime shifts', Elmqvist et al. 2010) is highlighted by the 'Millennium Ecosystem Assessment' (MEA 2005) and 'The Economics of Ecosystems and Biodiversity' (Kumar 2010). The environmental science regarding this trend is thus well known, however the risk largely remains ignored or denied (Washington 2015).

Positive (if Challenging) Solutions Do Exist

Given the gravity of the problems in the above section, I cannot leave readers feeling it is all 'doom and gloom', or that things are hopeless. There is indeed hope, and positive (if challenging) solutions do exist. Catton (1982) listed some long ago, while Ehrlich and Ehrlich (1991) built on these, as have others (Suzuki 2010; Brown 2011). There is a lot of agreement about solutions in these authors, and in 'Demystifying Sustainability' (Washington 2015) I condense such solutions into nine key solution frameworks:

(1) Changing our worldview and ethics to ecocentrism
(2) Redesigning ourselves to enable change (e.g. moving past denial of unpleasant realities)
(3) Stabilising then reducing population
(4) Re-engineering our consumer culture and moving to a steady state economy
(5) Solving climate change (primarily through mitigation)
(6) Appropriate technology—a renewable future
(7) Reducing poverty and inequality
(8) Education and communication re the problems (simultaneously with their solutions)
(9) Effective grassroots political action for change.

So solutions exist, and actions based on the above frameworks are part of the exciting (and ethical) 'Great Work' (Berry 1999) of healing the planet—of which we can all be a part. It is not 'too late' and there is no excuse for apathy or despair. Our biggest problem is that many in society remain in denial of both the problems and the solutions. Consequently, probably the greatest solution of all is breaking this denial dam (Washington 2018b).

Problems with Theory in Biology and Ecology

There is another aspect to biology and ecology we should consider that affects conservation—the dominance of anthropocentric 'theory'.

Ideological Underpinnings of Biology

Biology is the study of life, and ecology is the study of the relationship between plants, animals and their environment. However, the influence of worldview is central in regard to what ecology considers important. Goodall (in Taylor 2010) speaks of breaking out beyond a reductionist science that ignores the spiritual dimensions of life. Weber (2016) argues that many of us feel that something is wrong with the

reduction of life by biology to a struggle of meaningless competition and efficiency. He argues that the science-based ideology of efficiency recognizes no values apart from egoistical greed, which it: 'elevates to a law of nature' (Ibid: 9). Weber (2016: 341) concludes:

> Bioeconomical thinking is invisibly influencing the image we have of ourselves and the world, although it rarely explicitly pretends to offer ethical advice. Its moral impacts are conveyed in a rather subtle way as the paradigm invades our entire conception of reality.

In fact Weber is rightly calling for a *revolution* in biology, so as to create an 'ecology of feeling', a poetic ecology that: "understands the household of nature less as an economy of checks and balances than as the creative interpenetration of sentient beings" (Ibid: 14). We should also consider the ideas and theories that have gained prominence within ecology itself. Historian Worster (1994) explains that there has always been a dichotomy in how the natural sciences were taught—the 'Arcadian' or naturalist way, and the 'Linnaean' or imperial way. The Linnaean stream of thought in ecology comes to the fore in mathematical and theoretical ecology. It tends to be anthropocentric, with a focus on human 'mastery of nature'. It does not focus on cooperation in ecosystems but on competition. Nature is thus not envisioned as a superorganism (as in Gaia theory, and by renowned ecologist Eugene Odum, Callicott 2013), but as a machine of competing parts. Linnaean ecology however is now dominant in academia. The anthropocentric underpinnings of biology thus make it harder to argue for the conservation of nature for its *intrinsic value*, its right simply to exist (Washington 2018a).

Biology and ecology are thus not 'value neutral' ethically, they have been infiltrated by society's anthropocentric bias. This is not to say that there are not biologists and ecologists who disagree with this, and speak out against it, just as there are other scholars who do so (this book is an example of this). However, it is important to understand this ideological barrier in both biology and ecology—anthropocentrism—one that needs to be overcome if we are to reach a strategy of conservation of nature based on its intrinsic value (Washington 2018a).

Adaptive Management and Resilience Thinking

Scientists (indeed all academics) are not good at realizing that their work is influenced by their beliefs and theories. 'Adaptive management' is a case in point (e.g. Holling 1973; Gunderson and Holling 2002). At its simplest, adaptive management has been called 'learning by doing' in regard to science. A more detailed definition is that it is a structured, iterative process of robust decision-making in the face of uncertainty, with an aim to reducing uncertainty over time via system monitoring (Shamshiri et al. 2017). Now this definition looks fine at first glance, however, there are ideological underpinnings that need to be considered.

Key proponents of adaptive management, Gunderson and Holling (2002: 101) argue: 'there is no such thing as nature separated from human social processes'.

Indeed it becomes clear they write from an anthropocentric stance (discussed further in Washington 2018a). Gunderson and Holling (2002: 192) claim that: "collapses … are likely the inevitable consequence of human interactions with nature". This makes it sound as if ecosystem collapse is natural and normal. However, it confuses natural change and cycles in ecosystems with the hugely larger (and often previously unknown) stresses that humans are putting on nature today (Washington 2013, 2015). Their misleading claim provides justification for exploiters to argue there are no environmental limits or crises, and hence society should not worry about escalating environmental degradation. This just aids further extinction and loss of the Earth's life-support systems (Washington 2015). Dovers and Mobbs (1997: 49) warn how adaptive management: "may be used to defend regimes which avoid reform, justifying doubtful practices while waiting for further evidence (in conflict with the precautionary principle)".

In terms of the problems adaptive management can create, I list here three Australian case studies (in my state of New South Wales, Australia) where adaptive management was used to justify doubtful (indeed indefensible in terms of ecological ethics) projects. First was to justify horse-riding trials in wilderness (Colong 2013). Second was to justify logging of mature stands of native cypress (*Callitris* spp.) in State Conservation Areas (areas meant to conserve nature's native species) (NRC 2014). Third was to justify 'ecological thinning' (= logging) in the Murray Valley National Park (OEH 2015), when national parks are meant to be free of logging. Adaptive management has thus been used to justify experiments (especially those that are extracting resources and raising money) in national parks and other conservation reserves. The approach (and I have discussed this with key bureaucrats in the NSW Government) seems to assume that no harm can be done, because the study will be 'assessed by adaptive management'. This is a justification of extraction of resources (logging in two cases above) from conservation reserves. I would argue that from an ecocentric perspective, and in the interests of long-term conservation, a project being monitored by adaptive management does not (and cannot) justify a destructive experiment in reserves established for conservation, certainly not logging or other extractive uses. Adaptive management is thus being used to justify a 'resourcist' view of nature (Crist 2012), where conservation reserves become just another resource for extractive use.

Resilience is an offshoot of adaptive management. The most common definition is that it represents the capacity of a system to cope with disturbances without shifting into a qualitatively different state (Elmqvist et al. 2010). Simonsen et al. (2015) of the Stockholm Resilience Centre argue re ecosystems that we should: "ensure that they remain resilient and able to provide the ecosystem services needed to sustain and support the well-being of people". This is clearly anthropocentric in focus, as the 'resilience thinking' expressed is in fact about providing resilience *just for people*, not for the rest of life on Earth. Lotz-Sisitka et al. (2015: 74) observe that resilience thinking is: "inadequate or inappropriate for leading to sustainability". Resilience discussion tends to focus on humans, and the resilience of non-human species and their habitats to continuous anthropogenic expansion and industrial activity is less evident (Cafaro 2015).

Resilience thinking also carries out a huge anthropocentric 'sleight of hand', as it renames ecosystems as 'socio-ecological systems' (Walker and Salt 2006). The latter term puts the focus not on nature, but on society. Rather than there being 'socio-ecological systems', we actually have ecosystems of different types. In forests, they are *forest* ecosystems, in cities we have *urban* ecosystems, in farmland, *agro*ecosystems, etc. Humans are part of nature, but we also have culture, and there is no problem making a distinction between society (human) and nature (largely non-human) (Washington 2018a). Conservation is about protecting the nonhuman—native biodiversity and geodiversity—as these have intrinsic value in themselves (Washington et al. 2017). Hence we should continue to speak of *ecosystems*, not the anthropocentric 'socio-ecological systems' promoted by resilience thinking.

Walker and Salt (2006) concluded that resilience thinking is about enhancing *human* well-being, not that of both humans and nature. Conservation based primarily on resilience thinking may thus suffer from the same anthropocentric ideology that underpins adaptive management. Part of the problem is that resilience thinking is open to being coopted by neoliberal thinking. Miller et al. (2014: 511) note that the neoliberal 'new conservation' approach (see Chaps. 1 and 2) seeks to use resilience to 'promote ecological tinkering'. Nature does have resilience, but, this has definite limits (as Walker and Salt 2006 accept), and the world is effectively shrinking as population grows, pushing ecosystems closer towards thresholds of change.

However, 'adaptive management' and 'resilience thinking' are now deeply entrenched in ecology, yet their anthropocentric roots mean that they do not allocate intrinsic value to nature, nor consider ecojustice.

The Ideological Attack on Wilderness

Wilderness is a key conservation issue. Western society in its expansionist phase has been exploiting and shrinking wilderness for centuries, and this continues today both there and in the developing world. Only following the writings of visionaries Thoreau and Muir in the US did a movement spring up to protect wilderness (Washington 2018a). Wilderness is by definition a 'large natural area' (IUCN 2008), the most natural left on Earth, and these are essential for the ongoing conservation of life (Washington 2006). They are also a key example of ecojustice in operation (as they exist primarily for nature). However, 'wilderness' as a term is also beset by confusion and multiple meanings, and I wrote my Ph.D. about this confusion (Washington 2006). In recent decades, postmodern academics (e.g. Cronon, Callicott, Langton) have worsened that confusion through attacks that lack logical coherence, and the creation of several fallacious myths (see also Johns this volume). I detail these in my website www.wildernesstruths.com. The ideological attack by postmodernist critics is making it that much harder to conserve the remaining large natural areas of the world, a key part of making the 'Half Earth' vision work (of half of lands being reserved) (Wilson 2016). Given that society (including academia) should support the retention of the Earth's large natural areas (based on decades of ecological research),

it is time for all (academics included) to abandon such misguided attacks, and lobby *for* the protection of our remaining wilderness (Washington 2018a).

Where Is the Justice in Ecology?

In terms of survival or extinction, the future of life on Earth is at a critical stage, as is whether society will itself reach a sustainable future (Washington 2015). Yet most of humanity remains ignorant—or in denial—about the reality of the predicament we face. Similarly, humanity pretends that our own existence is not at risk. It is almost beyond belief that society can deny what is happening around us (Washington 2018b). What could possibly be the cause of this, given the risks society is running? One key cause is a poor worldview, Western society (and much of the world due to globalization of Western ideologies) remains locked in the belief that—while we live in a wondrous diverse world of living beings—the source of value remains *just the human species*. This is anthropocentrism (Washington et al. 2017), indeed it is 'human supremacy' (Crist 2012). Another associated worldview is neoliberalism, the idea that the market is God, and that all things must be reduced to monetary value (Washington 2015). Thus, rather than seeing the living world as 'sacred', society commodifies nature and turns it into a 'thing' that can be bought and sold (Crist 2012) (see also Chap. 6 by Washington in this volume on ecosystem services). Anthropocentric modernism and neoliberalism are thus poor ideologies, as they are key drivers of the environmental crisis, and hence threaten the diversity of life on Earth. This has been clear for at least 35 years (Catton 1982), yet society and governments around the world, and the UN—have largely failed to act. DellaSala in this volume discusses how some conservation organisations themselves have become anthropocentric and neoliberal.

Within this background, we face issues of 'conservation' and 'justice'. If we value the life we share this planet with (and hopefully most of us do) then what are the most *appropriate* strategies to bring along with us as much life as possible through the future bottleneck created by society's worldview and growth obsession? Conservation has to be about saving that wealth of life (and wealth of geodiversity). At the core of ethics is 'right' and 'wrong'. What is the right way to live on Earth, both to give justice to our fellow humans, and also to the rest of life we travel with on our evolutionary odyssey? Do ethics and justice just apply to me; or to my ethnic subgroup; or to my tribe or nation; or to all humanity; or to the sentient animals of the world; or to all animals; or to all species; or to ecosystems; or to the planet itself? This expansion outwards of ethics is called 'ethical extensionism' (Vilkka 1997). History shows its extension over the centuries from the personal to the group, to women (universal suffrage), to all people (the end of slavery), and largely to sentient animals (animals welfare). However, we are in the midst of another transformation—will we extend ethics to all of nature, acknowledging that it has intrinsic value and moral status (Washington et al. 2017)? You will rarely see it on any headline or media broadcast, but this is the *greatest ethical and justice issue of our times*.

This conflict is taking place within conservation today. Anthropocentric conservationists such as 'new conservation' and 'critical social science' (see Chaps. 1 and 2) use anthropocentric terms such as 'ecosystem services', and anthropocentric theory such as 'adaptive management' to continue the old anthropocentric worldview. Effectively, they insist that nature is just a 'thing', a machine for human use (Crist 2012). Ecocentric conservationists insist that nature has intrinsic value, a right to exist for itself (Curry 2011; Washington et al. 2017), and nature must be a locus of justice—*ecojustice* (Washington et al. 2018). Critically, ecocentrism also provides nature with respect, and insists that humanity has a 'duty of care' towards nature (Curry 2011). Ecocentrism is thus a truly *appropriate* conservation strategy, while anthropocentrism is a literal 'dead end' (Washington 2018a). The key decision that society has to make now is whether ethics and justice remain locked just into humanity—or whether we finally extend them to the nature from which we evolved (our kin).

Scientists (biologists included) have pretended for centuries that science is not about ethics. Yet science has actually been ethically dominated by an anthropocentrism that saw nature as essentially a dead machine (Vetlesen 2015). Those of us who do want to retain the amazing wealth of life on Earth will now have to stand up and *speak out about ethics*. What we are doing to our planet is simply wrong—a grand injustice to life, a moral crime of enormous magnitude. So we should not be fooled by nice-sounding phrases such as 'sustainable use' or 'just conservation' that actually leave out any justice for nonhuman life (Washington et al. 2018). The future of conservation now requires ethical extensionism to the rest of life we share our planet with. Only by changing our worldview from anthropocentrism to ecocentrism do we have a chance of conserving into the future most of the life on Earth. Only by something of a revolution (or evolution) in biology and ecology will they gain the ethics that supports viable conservation into the future.

Society and academia are not doing well in terms of this key and necessary transition to ecocentrism, as several authors in this volume reflect on (Crist focuses in detail on Western society's obsession with 'ownership'). The science is clear, society is currently undertaking massive ecocide. However, biologists and ecologists today predominantly seem to be involved in a blinkered discussion of 'conservation', based on an insidious and unacknowledged anthropocentric theory—a discussion that ignores the need to foreground ecojustice (Washington et al. 2018). It is time to put our sense of wonder towards nature back into the biological sciences (Weber 2016; Washington 2018a). If ever there was an appropriate time to bring back feeling and a 'joy of life' into biology—it is now.

References

Berry, T. (1999). *The great work: Our way into the future*. New York: Bell Tower.

Boyden, S. (2004). *The biology of civilisation: Understanding human culture as a force in nature*. Sydney: UNSW Press.

Brown, L. (2011). *World on the edge: How to prevent environmental and economic collapse*. New York: W.W. Norton and Co.
Cafaro, P. (2015). Three ways to think about the sixth mass extinction. *Biological Conservation* 387–393.
Callicott, J. B. (2013). *Thinking like a planet: The land ethic and the earth ethic*. Oxford: Oxford University Press.
Catton, W. (1982). *Overshoot: The ecological basis of revolutionary change*. Chicago: University of Illinois Press.
CBD. (1992). *Convention on biological diversity—Target 11*. United Nations. see: https://www.cbd.int/sp/targets/rationale/target-11/default.shtml.
Ceballos, G., Ehrlich, A., & Ehrlich, P. (2015). *The annihilation of nature: Human extinction of birds and mammals*. Baltimore: Johns Hopkins University Press.
Colong. (2013). *Briefing note: Horseriding trails in declared wilderness*. Colong Foundation for Wilderness (Australia). see: https://www.colongwilderness.org.au/files/pages/eia_brief_on_riding_in_declared_wilderness_areas.pdf.
Crist, E. (2012). Abundant Earth and the population question. In P. Cafaro & E. Crist (Eds.), *Life on the brink: Environmentalists confront overpopulation* (pp. 141–151). Georgia: University of Georgia Press.
Cronon, W. (1996). The trouble with wilderness; or getting back to the wrong nature. In W. Cronon (Ed.), *Uncommon ground: Rethinking the human place in nature* (pp. 69–90). New York: WW Norton and Co.
Curry, P. (2011). *Ecological ethics: An introduction* (2nd ed.). Cambridge: Polity Press.
Dinerstein, E., Olson, D., Joshi, A., et al. (2017). An ecoregion-based approach to protecting half the terrestrial realm. *BioScience, 67,* 534–545. https://doi.org/10.1093/biosci/bix014.
Dovers, S., & Mobbs, C. (1997). 'An alluring prospect? Ecology, and the requirements of adaptive management'. In N. Klomp & I. Lunt (Eds.), *Frontiers in ecology. Building the links* (pp. 39–52). Oxford: Elsevier Science.
EF. (2009). *Living parks, 100 years of national parks in Europe*. Europarc Federation, Munich: Oekom Verlag.
Ehrlich, P., & Ehrlich, A. (1981). *Extinction: The causes and consequences of the disappearance of species*. New York: Random House.
Ehrlich, P., & Ehrlich, A. (1991). *Healing the planet: Strategies for resolving the environmental crisis*. New York: Addison-Wesley Publishing Company.
Elmqvist T., Maltby, E, Barker, T., Mortimer, M., & Perrings, C. (2010). Biodiversity, ecosystems and ecosystem services. In P. Kumar (Ed.), *The economics of ecosystems and biodiversity: Ecological and economic foundations* (pp. 1–96). London: Earthscan.
GFN. (2018). *Country trends—World, global ecological footprint website*. See: http://data.footprintnetwork.org/#/countryTrends?cn=5001&type=BCpc,EFCpc.
Gowdy, J., Howarth, R., & Tisdell, C. (2010). Discounting, ethics and options for maintaining biodiversity and ecosystem integrity. In P. Kumar (Ed.), *The economics of ecosystems and biodiversity: Ecological and economic foundations* (pp. 57–284). London: Earthscan.
Gunderson, L., & Holling, C. (2002). *Panarchy: Understanding transformations in human and natural systems*. Washington: Island Press.
Hendricks, S. (2005). *Divine destruction: Dominion theology and American environmental policy*. New York: Melville House.
Holling, C. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics, 4,* 1–23.
IUCN. (n.d.). *Specialist group on sustainable use and livelihoods*. International Union for the Conservation of Nature. See: https://www.iucn.org/commissions/commission-environmental-economic-and-social-policy/our-work/specialist-group-sustainable-use-and-livelihoods-suli.
IUCN. (2008). IUCN guidelines for applying protected area management categories. In N. Dudley (Ed.), *International Union for the Conservation of Nature*. Gland, Switzerland: International Union for Conservation of Nature.

Kumar, P. (2010). *The economics of ecosystems and biodiversity: Ecological and economic foundations*. London: Earthscan.

Leopold, A. (1949). *A Sand County Almanac, with essays on conservation from Round River*. New York: Random House.

Lotz-Sisitka, H., Wals, A., Kronlid, D., & McGarry, D. (2015). Transformative, transgressive social learning: Rethinking higher education pedagogy in times of systemic global dysfunction. *Current Opinion in Environmental Sustainability, 16,* 73–80.

Luoma, J. R. (1992). Eco-backlash. *Wildlife Conservation, 95*(6), 27–36.

MEA. (2005). *Living beyond our means: Natural assets and human wellbeing, statement from the Board, Millennium Ecosystem Assessment*. United Nations Environment Programme (UNEP). See: https://www.millenniumassessment.org/documents/document.429.aspx.pdf. Accessed February 19, 2018.

Miller, B., Soulé, M., & Terborgh, J. (2014). "New conservation" or surrender to development? *Animal Conservation, 17,* 509–515.

NRC. (2014). *Active and adaptive management of the Brigalow and Nandewar State Conservation Areas*. NSW Natural Resources Commission. See: www.nrc.nsw.gov.au/_literature_177527/Active_cypress_management_-_Draft_report.

OEH. (2015). *Public environment report: Ecological thinning trial in New South Wales River Red Gum Forests*. NSW Office of Environment and Heritage. See: http://www.environment.nsw.gov.au/research-and-publications/publications-search/ecological-thinning-trial-in-new-south-wales-river-red-gum-forests.

PBS. (2009). *Documentary 'The National Parks: America's best idea'*. Arlington VA: Public Broadcasting Service. See: http://www.pbs.org/nationalparks.

Raven, P., Chase, J., & Pires, J. (2011). Introduction to special issue on biodiversity. *American Journal of Botany, 98,* 333–335.

Rockstrom, J., Steffen, W., Noone, K., et al. (2009). Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society, 14*(2), 32. See: http://www.ecologyandsociety.org/vol14/iss2/art32/. Accessed July 21, 2014.

Shamshiri, R., Mahadi, M., Thorp, K., et al. (2017). *Adaptive management framework for evaluating and adjusting microclimate parameters in tropical Greenhouse Crop Production Systems*. INTECH Publication. See: https://www.intechopen.com/books/plant-engineering-adaptive-management-framework-for-evaluating-and-adjusting-microclimate-parameters-in-tropical-green.

Simonsen, S., Biggs, R., Schlüter, M., et al. (2015). *Applying resilience thinking: Seven principles for building resilience in social-ecological systems*. Stockholm: Stockholm Resilience Centre. See: http://www.stockholmresilience.org/download/18.10119fc11455d3c557d6928/1459560241272/SRC+Applying+Resilience+final.pdf.

Soulé, M. E., & Wilcox, B. A. (1980). Conservation biology: Its scope and its challenge. In M. Soulé & B. Wilcox (Eds.), *Conservation biology: An evolutionary-ecological perspective* (pp. 1–8). Sunderland (MA): Sinauer.

Stechbart, M., & Wilson, J. (2010). *Province of Ontario ecological footprint and biocapacity analysis*. Oakland, CA: Global Footprint Network. See: www.footprintnetwork.org/content/images/uploads/Ontario_Ecological_Footprint_and_biocapacity_TECHNICAL_report.pdf.

Steffen, W., Richardson, K., Rockstrom, J., et al. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science, 347*(6223). https://doi.org/10.1126/science.1259855.

Suzuki, D. (2010). *The legacy: An elder's vision for our sustainable future*. Vancouver: Greystone Books.

Taylor, B. (2010). *Dark green religion: Nature spirituality and the planetary future*. Berkeley: University of California Press.

UN. (2012). *The future We want*. UN General Assembly Resolution 66/288, 27 July 2012. See: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/66/288&Lang=E.

USDOI. (2017). *Gifford Pinchot: A legacy of conservation*. US Department of Interior blog. See: https://www.doi.gov/blog/gifford-pinchot-legacy-conservation.

Vetlesen, A. (2015). *The denial of nature: Environmental philosophy in the era of global capitalism*. London: Routledge.
Vilkka, L. (1997). *The intrinsic value of nature*. Amsterdam: Rodolpi.
Vitousek, P., Ehrlich, A., & Matson, P. (1986). Human appropriation of the products of photosynthesis. *BioScience, 36*(6), 368–373.
Wackernagel, M., & Rees, W. (1996). *Our ecological footprint: Reducing human impact on the Earth*. Gabriola Island, B.C., Canada: New Society Publishers.
Walker, B., & Salt, D. (2006). *Resilience thinking: Sustaining ecosystems and people in a changing world*. Washington: Island Press.
Washington, H. (2006). *The wilderness knot* (Ph.D. thesis). The University of Western Sydney. See: http://researchdirect.uws.edu.au/islandora/object/uws:44.
Washington, H. (2013). *Human dependence on nature: How to help solve the environmental crisis*. London: Earthscan.
Washington, H. (2015). *Demystifying sustainability: Towards real solutions*. London: Routledge.
Washington, H. (2018a). *A sense of wonder towards nature: Healing the planet through belonging*. London: Routledge.
Washington, H. (2018b). Denial—The key barrier to solving climate change. In D. A. DellaSala & M. I. Goldstein (Eds.), *Encyclopedia of the anthropocene* (Vol. II., pp. 493–499). London: Elsevier.
Washington, H. (2018c). Overshoot. In In D. A. DellaSala & M. I. Goldstein (Eds.), *Encyclopedia of the anthropocene* (Vol. IV., pp. 239–246). London: Elsevier.
Washington, H., Chapron, G., Kopnina, H., Curry, P., Gray, J., & Piccolo, J. (2018). Foregrounding ecojustice in conservation. *Biological Conservation, 228,* 367–374.
Washington, H., Taylor, B., Kopnina, H., Cryer, P., & Piccolo, J. (2017). Why ecocentrism is the key pathway to sustainability. *Ecological Citizen, 1,* 35–41.
Weber, A. (2016). *The biology of wonder: Aliveness, feeling, and the metamorphosis of science*. Canada: New Society Publishers.
Westover, R. (2016). *Conservation versus preservation?* US Forest Service blog. See: https://www.fs.fed.us/blogs/conservation-versus-preservation.
Wilson, E. O. (2003). *The future of life*. New York: Vintage Books.
Wilson, E. O. (2016). *Half-Earth: Our planet's fight for life*. New York: Liveright/Norton.
Worster, D. (1994). *Nature's economy: A history of ecological ideas* (2nd ed.). Cambridge, MA: Cambridge University Press.
WWF. (2018). Living planet report—2018. In M. Grooten & R. E. A. Almond (Eds.), *Aiming higher*. Gland, Switzerland: World Wide Fund for Nature (WWF).

Chapter 5
With Friends like These Wilderness and Biodiversity Do Not Need Enemies

David Johns

The human footprint is growing at the expense of other species and the integrity of ecosystems (Ewing et al. 2009; Butchart et al. 2010; Brashares 2010). What poet of the wild Snyder (1990) called the growth monster remains not just unchecked but embraced in theory and practice by virtually all human societies (Wright 2004). There is nothing new in this situation—it has been accelerating for several millennia and especially the last few hundred years. Nor is there anything new in the arguments made by those who justify it (Czech 2013; Nadeau 2006). Although the expression of self-righteous greed is rarer and sounds extreme amidst claims by business and political leaders that biodiversity is important, human behavior has not changed much judged by its consequences—we take more and more and continue to squander a heritage that we can never replace. Each species humans destroy diminishes not only the Earth community, but all who remain.

Those leading the conversion and reduction of more and more life into profit have always had apologists. In the mid-1990s conservationists responded to a wave of attacks on wilderness and biodiversity (Burks 1994; Callicott and Nelson 1998). In the last few years concerted attacks have again emerged and although they are shopworn, riddled with factual errors and marbled with hierarchical values, they also appear well-funded, get lots of media attention, and are advanced with great energy, as if careers depended on them.

In this essay I address five criticisms of wilderness and biodiversity conservation: that wilderness and biodiversity protection goals must be curtailed and tied to human interests in order to be achievable; that humans have always been everywhere and there is no real wilderness left; that our effects on other species, and our efforts to dominate or turn the world into a garden, are natural and therefore acceptable (if not good); that protected semi-wild and wild areas separate humans from the world; and

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D. Johns (✉)
Hatfield School of Government, Portland State University, Oregon, USA
e-mail: johnsd@embarqmail.com

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that human wants (as a whole or a group) should take precedence over the survival of all other species and entire ecological communities.

As a practical matter, factual assertions in arguments are entwined with the values, purposes, and meanings their proponents wish to further, but the distinction is important in analyzing arguments. Factual assertions about how the world works are generally subject to testing against reality. Individuals, groups and even whole cultures, may make factual assertions not based on testing for cause and effect but based on compatibility with the purposes and meanings they hold. The distinction between knowledge and mere belief is important and led Senator Daniel Patrick Moynihan to say that people are entitled to their own opinion but not their own facts (Hume 1995). Critics of conservation often have their facts wrong. But even values, meanings, and purposes—plainly human creations—may be subject to a kind of testing over the longer term: cultural orientations are more or less adaptive, serving the actual and long term's needs of groups or undermining them. Rappaport (1976: 65) observed that economic and political institutions which undercut "biological well-being… may be considered maladaptive." Many of the values and purposes advocated by critics of conservation are problematic from this perspective.

(1) *Wilderness and biodiversity protection goals must be curtailed and tied clearly to human interests in order to be achievable.*

Justly unhappy that the world's governments are not meeting biodiversity protection goals for 2010 established by the Convention on Biological Diversity, a group of preeminent scientists write that it is "critical" that goals for protecting biodiversity "be grounded in the real interests that people have in benefits provided by biodiversity" (Perrings et al. 2010a: 323). In response to criticism that their view, if adopted, would leave much biodiversity vulnerable because many species or ecosystem functions might not clearly serve human interests, they state that because arguments on behalf of biodiversity's intrinsic value have failed to sway policy-makers a new argument is needed based on human self-interest (Perrings et al. 2010b: 1745). Kareiva and Marvier (2007) make similar arguments.

Scientists are not street fighters though at least one editorial in *Nature* (Grantham 2012) encouraged them to learn the trade. Nonetheless it is disappointing that some scientists seem prepared to backtrack on goals that scientific findings point to simply because such findings and the values that make such findings relevant fail to persuade. Scientific research is critical—it describes how the world works. This knowledge is essential to maintaining and recovering healthy species' populations and ecological integrity. But other kinds of "argument" are needed to persuade societal decision-makers—arguments that hinge on the capacity of groups seeking a policy to reward and punish decision-makers more effectively than opponents. Carrots and sticks include campaign contributions or the equivalent (Duffy 2007; Kamieniecki 2006); bringing media resources to bear to define issues and acceptable solutions (Duffy 2007; Kamieniecki 2006; Layzer 2007; Libby 1999); economic leverage—such as that possessed by banks too big to fail or by mass popular unrest (Kamieniecki 2006; Lindblom 1977; Grover 1989; Gonzalez 2001); control of information (Cogkianese 2007); and personal relationships often based on long-shared interests (Gonzalez

2001; Dye 2014; Domhoff 1998, 2012; Furlong 2006). These "arguments" help or hinder decision-makers in gaining or keeping the power they desire and therein is their persuasiveness.

The intrinsic value argument has not failed conservation; it is conservationists' failure to organize enough people willing to act on behalf of biodiversity that has limited realization of conservation goals. The consequences of biodiversity loss for various human groups are important in organizing groups to act, but so are moral arguments (Kelman 2001; Stern 2000), emotionally compelling stories (Polletta 2006), the creation of a strong community around biodiversity (Staggenborg 2011), and other factors including transcending narrow notions of self-interest (Johns 2009; Rodman 1977).

Justifying biodiversity protection based on narrowly conceived human well-being (essentially cost-benefit analysis) ignores that benefits are often difficult to quantify and that invoking future generations is not the same as political pressure in the here and now: the future does not organize and bring political pressure.

There is no escape for conservation from the need to organize a strong political force.

(2) *Humans have always been everywhere, have fundamentally changed virtually every place on Earth, and so there are no pristine lands (wilderness) to protect.*

There is no question that the collective human impact on other species and ecosystems is significant and has been accelerating rapidly since the availability of huge quantities of energy that magnify our actions (Rands et al. 2010; Goudie 2005). We have been causing extinctions since we left Africa 60,000 years ago (e.g. Barnosky 2008; Rule et al. 2012; McGlone 2012), although once the initial and significant large-animal extinctions accompanying human arrival had occurred the impacts were much more limited (McKee 2012; Alroy 2001). Low population, low population density, stone technology, and a largely egalitarian social order which checks aggrandizing schemes of conquest, accumulation, and other sorts of domination (Johnson and Earle 2000; Boehm 1999) probably contributed to this. With the transition to agriculture humans began a more systematic conversion of ecosystems to human use, reducing species' populations and range, causing extinctions, and generally simplifying ecological interactions. The fossil-fueled industrial revolution further ratcheted up the reach, intensity, and pace of human colonization and exploitation of ecosystems and other species (for overviews see McNeill 2000; Goudie 2005; Simmons 2007). If large mammals have been particularly hard hit because of their range needs or perceived threat to humans, then forests have been the hardest hit ecosystems over the longer term (Williams 2003). But the oceans' biota has also been seriously depleted from overfishing and other destructive fishing practices and many areas have been damaged by the marine equivalent of clearcutting, i.e. bottom trawling (Halperin et al. 2012; Brewer and Peltzer 2009; Norse and Crowder 2005). A review article (Jones 2011) about whether the human impact on the Earth merits the designation of a new age—the Anthropocene—notes that humans have significantly altered just over half of the ice-free land mass. About 25% remain wildlands, another 20% or so are "semi-natural," and the rest are in crops, grazing range, or heavily settled. And even wild

lands and the oceans are affected by global forces such as climate change, airborne pollution, human noise, and the like.

The human impact is not only significant but negative: humans have diminished biological diversity and disrupted, degraded, and in many cases simply destroyed ecological function. Yet critics of the existence of wildlands and waters are mistaken on two major points: that wildlands no longer exist in any meaningful way because of human influence and that this state of affairs is long-standing, uniformly pervasive, and no restoration is possible.

Critics of the existence of wildlands usually posit a red herring: that wilderness by definition means pristine or completely without human imprint. The U.S. Wilderness Act of 1964 (PL 88-577 §2(c))—the product of over a decade of work by conservationists—does not use the term pristine, but instead deliberately uses the term untrammeled (Scott 2001); a term very close to the original meaning of wildlands as undomesticated or self-willed land but not necessarily "pristine" (Vest 1985). Many conservation groups around the globe do focus on protection of largely intact lands and waters, often high in biodiversity, from further damage including loss of native species, but they are not concerned with purity (Noss 1991; Soulé and Terborgh 1999), any more than civil libertarians cease defending the US Bill of Rights just because they are routinely ignored by governments. Such places are wild and biologically critical. They offer the clear opportunity for halting further degradation, for healing, and for expansion and connection to other areas as part of a conservation strategy to hold the line against continued population and consumption growth—growth that has already overshot Earth's carrying capacity (Ewing et al. 2010). These areas, moreover, are not the exclusive focus of conservation (e.g. Layzer 2011). But claims that humans are not simply destroying habitat but creating new habitat (e.g. Kareiva et al. 2011) are disingenuous and obfuscating—they ignore the comparative biological poverty of, for example, tree farms to forests and monoculture croplands to grasslands.

Largely intact places won't solve every conservation problem but they are essential to preserving wildness, biodiversity, and ecological communities (Noss 1993). To work successfully, such places require good enforcement, size (bigger is better), the right location, good buffers, and appropriate connections (e.g. Jeffrey 2012; Laurence et al. 2012; Gilbert-Norton et al. 2010; Lester et al. 2009; Hilborn et al. 2006; Oates 1999). Two *Nature* editorials (2011, 2012) call for addressing outside effects on wildlands and protected areas, as have earlier scientific and strategic assessments (Noss 1993; Soule and Terborgh 1999). Conservation is not served by counseling surrender to further encroachment.

The notion that wilderness no longer exists and that substantial biodiversity losses must be accepted as inevitable is often accompanied by claims that people have always been everywhere and therefore nothing can be done. It is also often linked to the idea that significant human presence and impact means that humans are in charge—"already running the whole Earth" (Marris 2011: 2). Such literary imagination is coupled with massive denial about the overwhelming biological damage resulting from human management.

This view of perennial and ubiquitous human presence fails to discern the difference between a few million humans and seven billion, between dense and sparse settlement, and between differing levels of energy use, resource extraction, and technology; it also ignores humanity's short career compared to length of time other species have been present in places. Many areas of the Earth have been until recently relatively free of human presence, or were occupied only seasonally or transiently; and many areas were used only in a limited way, e.g. for sacred purposes (Simmons 2007; Diamond 1992; Denevan 1992; Klein 1989; Harris and Ross 1987; McNeill 1986; Ellen 1982). Claims, for example, that the Amazon is a human constructed garden are dubious; settlement has been sparse (McMichael et al. 2012). The same can be said for many other regions such as the boreal forests.

Although the cycle of intensification (population growth > more "resource" extraction to support more people > more population growth > more intense extraction) has its roots in the Neolithic (Johnson and Earle 2000; Harris 1977; Lenzen et al. 2012; Essl et al. 2011; Chew 2001), in the last few hundred years, with greater populations and densities, more intrusive technologies, more energy at human command, self-aggrandizing elites making ever greater demands, the vaster reach of population centers into distant areas, and denser trade networks, the effect on wildlands and biodiversity has been globally devastating (e.g.; Goudie 2005; Tucker 2000; Smil 2013). Globalization is not new but its reach and intensity is (Chase-Dunn and Hall 1997; Chase-Dunn and Anderson 2005). To argue that this extreme and relatively recent state of affairs must be accepted despite its biological destructiveness is like arguing that colonial domination and exploitation must be accepted despite their obliteration of other peoples and cultures.

That we will never, "return a substantial part of the Earth to a preindustrial state" (Kareiva and Marvier 2007: 56) is an example of either Occidental (Enlightenment) fatalism or an effort to rationalize the current grim biological trend in the interests of those who benefit disproportionately from degrading the natural world. The inertia behind the current human trajectory is tremendous. But apartheid was overthrown, slavery in most of the world has been abolished, and women in much of the world enjoy improved conditions. Major change *is* possible. In some parts of the world the restoration of species and ecosystems has increased the store of wildness.

Species can be repatriated. Biologically degrading influences such as industrial incursions, roads, pollution, and exotic species can be halted. Injuries can be healed. Processes that have been suppressed or disrupted (such as fire, migrations, and succession) can be re-established, enhancing resilience. Humans can try to cast their interventions to mimic natural healing, while recognizing the limits of knowledge and wisdom, and try to minimize the need for future intervention or intensive management, allowing for eventual self-regulation. That means restoring very large areas and/or linking them to mostly intact areas.

Such restorative intervention contrasts with the violence done to species and ecosystems by large-scale industrial or agricultural resource extraction—extraction based on the exercise of power and the object of control. Large-scale resource extraction refuses to acknowledge that other species are ends-in-themselves and not merely

means for human purposes, or that human well-being is antithetical to power and control over others. Humans have a place and it is not as lords of creation.

For all of the ink (soy-based included) spilled over the idea of wilderness the problem is plain: humans are inadequate to the task of managing nature. Humans lack the knowledge, intelligence, and wisdom. Though management has achieved goods, to rely on it to ensure the future of biodiversity it is like resting our fate on the failed Biosphere Project. Former American Association for the Advancement of Science President and US presidential advisor, John Holdren, noted that, "I'm a great believer in science and technology, but the notion that science and technology will ride to the rescue is a pernicious one. Believing in technological miracles is usually a mistake" (2007: 1068). A vibrant Earth requires large, intact, and connected places (including restored places), off limits to exploitation by industrial and agricultural peoples whose inability to control their numbers and wants has been more than amply demonstrated in the last 12 thousand years.

(3) *Humans are part of nature and so our effects on other species, our efforts to dominate, and to turn the world into a garden are all natural.*

How can human behavior be anything but part of nature? We are the products of evolution, we breath air, eat, and are otherwise dependent upon the Earth. Unless one invokes the supernatural then by definition everything we do is natural but that doesn't get us very far. If we reflect on the use of *natural* and *unnatural* we see that they designate something as good or not good (a cultural judgment) and also seek to transform the designation into a property of the world rather than a human creation. Much human behavior is not genetically determined and is instead regulated mostly by culture (shared emotions, attitudes, and worldviews shaped by experience and transmitted from one generation or group to another). Where does this leave us? We must address the consequences for the living world of culturally shaped behavior.

For conservationists, behavior which converts, diminishes, or destroys the Earth's biodiversity and ecological systems is morally wrong—we have no right to cause extinctions or take so much for one species anymore than we have a right to enslave others (once culturally right and considered natural). As a practical matter it is stupid (maladaptive, per Rappaport 1976) to destroy systems we depend on and may not be able to fix once broken. As Leopold suggested, it's unintelligent to throw parts away when tinkering with something important (1993).

Acknowledging humans as part of nature does not and cannot justify our ever-growing footprint. Like the colonial domination of some peoples by others, the human domination of other species and ecosystems, although common in recent millennia, shares the same attributes as intra-human colonialism for its victims: visiting brutally stupid exploitation, displacement, and death. We might better ask whether the societal machinery that converts so much of the world into commodities for one species—and disproportionately for a few millions at the very top of social hierarchies—is adaptive, healthy, or just. For James Lovelock (1979: 145) the answer is clear: "(A)ll attempts to rationalize a subjugated biosphere with man in charge are as doomed to failure as the similar concept of benevolent colonialism. They all assume that man is possessor of this planet, if not the owner, than the tenant."

Lovelock is certainly not alone (Ehrenfeld 1979; Rodman 1977). Brand's (1968) appropriation from another of the notion that we are "godlike" and should get good at it, and Marris's (2011) view that we can be competent gardeners, are just more examples of the same hubris that generates extinction, ocean dead zones, dust bowls, desertification and depleted soils, superfund sites, climate change, and nuclear power plants built in tsunami zones. We are about as godlike as a bull in a china shop (Wright 2004).

The human conceit of being godlike rests on assumptions that gained dominance among European elites in the Enlightenment and have since spread to most elites and others. These assumptions include notions that all problems are solvable by human reason, technology, or changes in social organization; that if humans face great difficulties we will rise to the occasion; and that resources are infinite or there will always be substitutes (Ehrenfeld 1979: 16–7). Ehrenfeld (1979), Peet (1992), Dietz and O'Neill (2013) and the Global Footprint Network (Ewing et al. 2009) have documented the mounting evidence undermining these assumptions. Our capacity to problem-solve is limited by the world's complexity. Our pretensions to divinity are belied by our limited ability to grasp how the world works well enough to manage it, even if we actually had the requisite wisdom, judgment, and political will. As a result our "solutions" are inadequate and generate new and more complex problems that take more resources to address, in part because there is more inertia to be overcome (Ehrenfeld 1979: 107).

Bad "choices" are the result of structural constraints not just limited wisdom and intelligence. The few thousands of decision-makers at the head of government and business institutions are heavily invested in the current order and generally resist changes that could undermine their positions of power. Their awareness is also constrained by the insulation that technology and hierarchy provides from the consequences of their actions (Johnson and Earle 2000; Jackson 1987; Harris 1977). When an elite is united it may effectively constrain societal choices by controlling problem identification, formulation, and the range of acceptable solutions (Guber and Bosso 2007; Layzer 2007; Lindblom 1977). Elites also influence or control the machinery of repression: laws, police, armies, prisons (e.g. Singer 2007; Klare 2002).

Societal structure constrains choices in other ways. Dorothy Dinnerstein argued that it is not just our psychopathology that leaves us unable to confront what we are doing to Earth and ourselves; the societal process is now too, "mindlessly complex, …unwieldy and … overcentralized" that even if we saw how bad things are it is questionable we could do much with the existing decision making apparatus. It is part of the problem; only relatively small groups can express healthy emotion and reason (1976: 254). Searles (1960: 78–101) and Shepard (1982) argue that a sense of self and a healthy identity depend on close contact with nonhumans and the broader ecology during development. Only with such contact can we connect with and be grounded in reality, recognizing, inter alia, that we are kin with the rest of the world. Absent such connection people are left with the experience of human hierarchy as the only model of order.

(4) *Humans are part of nature and reserves of various sorts separate us from the natural world.*

It is not the advocates of placing some lands and waterways off limits to human exploitation who have separated humans from the rest of the world. Agriculture and civilization did that (Lancy 2008; Berman 1989; Shepard 1982; Harris 1977; Searles 1960). Agricultural and industrial societies depend on the systematic effort to control and reshape ecosystems for the benefit of humans at the expense of other species. They enhance human carrying capacity by subjugating others, just as imperial Britain reshaped the Indian economy to serve British rather than Indian interests (Smil 2013; Chase-Dunn and Anderson 2005; Goudie 2005; Chase-Dunn and Hall 1997; Rodman 1977).

Colonization and concomitant exploitation divides humans from the rest of the world just as surely as it divides peoples and nations despite the effort to mask it under Orwellian terms such as "interdependence." Colonization markedly ratchets up the intensification of extraction from and conversion of the natural world, generating ever larger-scale and more hierarchical human societies. Devaluing and distancing from what is conquered is a psychological necessity (Grossman 2009; Fromm 1964). The ability to love and the drive to control are opposites.

Modern conservationists are not the first to lament the changes from forager to conqueror. Roman poet Ovid (1990: 71) wrote that once the Earth gave, "crops from fields unfurrowed/And fruits, and honey from a hollow tree,/And no one scored the soil with sturdy ploughshares." Human cleverness changed all that, bringing tragedy. A few hundred years earlier Tsu (1972, Chap. 29) asked: "Do you think you can take over the universe and improve it?/I do not believe it can be done./The universe is sacred./You cannot improve it./If you try to change it, you will ruin it."

The idea of wilderness (self-willed land) emerged from the dualism that characterizes agricultural societies and their successors in order to describe those places not yet conquered (Turner 1980; Shepard 1982). Humans initiated the divorce, not bears or birds or rivers. In seeking to conquer the natural world, humans set themselves at odds with the Earth just as the slave-master is with the slave and the colonizer with the colonized (Jordan 1968; Fanon 1963). Other creatures' homes and necessities merely constitute space or food that we covet. To merely stop thinking in terms of the wilderness/civilization dichotomy—as the wilderness debunkers ask us to do—cannot resolve the actual material separation resulting from the quest to dominate.

Calls to make wilderness and comprehensive biodiversity protection subservient to growth—as if more growth will solve inequality anymore in the future than it has in the past—is the language of conquest and colonization using different words. It rationalizes the death warrants of large, intact areas and of the species dependent on them such as large predators and wide-ranging species. Marginalizing wilderness and biodiversity protection negates the best insurance we have against human foolishness. Gardening can neither replace wilderness nor heal the self-inflicted wound of estrangement. Trying to make ourselves feel good about our overreach is like taking 19th Century nostrom for a life-threatening disease. To abandon wilderness

and large-scale restoration in the name of transcending dualism is to leave the Earth vulnerable to further impoverishment.

Those groups (e.g. Hopi, Hadza, Bushmen, Gwich'n) who seem to remain most connected with the Earth have small footprints and share some obvious attributes: they are few in numbers, lack dense settlements, and do not rely on industrial technologies and vast inputs of materials and energy (Johnson and Earle 2000). Most have been pushed to the margins of habitable land by more powerful societies and states. Can 7 billion adopt these attributes? Humans first went from foraging to agriculture despite poorer diet and increased disease because of population pressure (Cohen and Crane-Kramer 2007).

What, then, is the path toward healing our separateness if there is no return to the pre-Neolithic? This essay is not the place to set out a detailed vision or strategy to contain the machinery of control that separates humans from the world that gave them birth. But if wilderness is destroyed healing will become impossible. We cannot expect the path to reconnection to be led by those heavily invested in the status quo as some have suggested (Kareiva et al. 2011). The path forward is not about sacrifice. It is about recovering what we have long ago sacrificed—our wholeness and our connection to other life and our deepest selves. We traded these away for hierarchy and distractions in a deal we did not understand.

(5) *Human wants must take priority over the needs of other species, even to the point of extinction.*

The belief that human wants should have priority over the survival needs of species and the integrity of ecological processes is variously expressed but the end is always the same: humans have the right to alter the world for their benefit at the expense of other species regardless of the consequences: suffering, death, extinction, or the destruction of entire ecological communities. The Great Chain of Being has fallen before the Rights of Man, but it remains alive and thriving in human relations with other species.

That the Earth belongs to us rests on notions that we uniquely possess some attributes other species lack. Why these attributes are a suitable basis for elevating us to godhood is never explained because it would reveal the contest to be rigged. It is difficult to know whether the claim of specialness is based on a genuine if misplaced sense of achievement, or arises from a deeply compensatory impulse: like Gilgamesh, we are frightened by our mortality, feel insignificant in a very large universe, or, having divorced ourselves from our wild home, we feel lost and so create grand narratives in which we can be the hero.

The delusion that Earth belongs to us is not harmless like the notion that lightning manifests the anger of Zeus. It is more akin to the inaccurate claim that tiger bone or rhino horn have medicinal properties. Such claims rationalize violence, disrupt ecological relationships, and carry a high risk of extinction; this harm obtains even if the claims are true.

Claims by powerful states in the last century that they had the right to control other states or nations have lost legitimacy even though exploitation continues in different

forms and carrying capacity continues to be transferred from poor to rich (e.g. Tucker 2000; Klare 2002; Lawrence 2008; Monbiot 2008). Today we see plainly that past exploitation was based on power not on the merit of the colonizer. Colonialism is always violent. We can also see today how the human need to feel good about ourselves causes us to dress up the theft and murder of conquest. In 1870 the Big Horn Association of Cheyenne Wyoming published the following:

> The rich and beautiful valleys of Wyoming are destined for the occupancy and sustenance of the Anglo-Saxon race. The wealth that for untold ages has lain hidden beneath the snow-capped summits of our mountains has been placed there by Providence to reward the brave spirits whose lot it is to compose the advance-guard of civilization. The Indians must stand aside or be overwhelmed by the ever advancing and ever increasing tide of emigration….The same inscrutable Arbiter that decreed the downfall of Rome has pronounced the doom of extinction on the red men of America.

Colonialism is nowhere more apparent and thriving than in the relationship between humanity and the rest of the Earth.[1] Humans take what they want with limited restraint and dress it up like the Big Horn Association (Kareiva et al. 2011; Marris 2011). That there is any restraint at all is the result of conservation success: protected areas that are *actually* protected, laws that are mostly enforced such as the Convention on International Trade in Endangered Species or the US Endangered Species Act. This restraint is the exception and it must be constantly defended.

Rationalizing Nature's colonization does not hide the ugly realities. Remaking the Earth in the human image is violent: forests and grasslands are transformed into tree farms, pasture, subdivisions, and endless corn and soybean fields or rice paddies. Inconvenient species are persecuted. Ecosystems are altered for the benefit of one species and the community as a whole is discounted. Colonization diminishes the capacity of lands and waters to support diversity, replacing many species with a few or even one. Colonization means human numbers grow and consumption increases at the expense of other species' numbers, range, diversity, and even existence. The self-regulation of the community as a whole is replaced with control by a part for its own exclusive benefit; and spontaneity, liveliness, and biological integrity are diminished. The tiger is caged or dead and the oxen bred to plod endlessly before the plow. We do it because we can.

Most of the destruction inflicted by colonizing nature is unnecessary. We have long had the means to control our numbers though some have always had fears about who will fill the armies and workshops and support the old. Much collective human consumption is unnecessary as well—a vain effort to control our anxiety over mortality (Solomon et al. 2004). The world's poor do not simply aspire to full bellies, they want what the middle classes have.

There was a time when humanity was grounded enough to see ourselves as part of the cycle of things. We were troubled by killing (Shepard 1973). We could see ourselves in the other and sought reassurance in ritual that acknowledged the "sac-

[1] I am indebted to Rodman (1977) who to my knowledge first used the analogy of colonialism to describe the post-forager human relationship to the rest of nature.

rifice" of the other. That insight and the imperfect restraint it brought is gone. The factory farms are invisible and death is not real.

No other animal is as behaviorally flexible as we are. We have choices. Other species do not. It may be that most humans will never be biocentric. But if we do not behave as if we were, if we continue on the current path, we will impoverish the Earth and at last become the "stewards" of a graveyard. We cannot degrade Nature without doing the same to ourselves. To call ethical rules which rationalize human lordship is to make the notion of ethics meaningless.

In the End…

…What matters is not endless blather over gardening, pristine wilderness, how long people have occupied a place, or how much damage they have done. What matters is this: humans are behaving like an asteroid hitting the Earth in slow motion. We are destroying what we could never create. The Earth did recover (after 10 million years) from the Cretaceous extinction 65 million years ago; it was not the end of the Earth. But it was the end of many creatures. Is being an asteroid the great purpose of our species? To steal the lives and homes of millions of species and billions of creatures?

Almost two centuries ago an astute observer of human behavior said that a person is wealthy in proportion to what they can leave alone (Thoreau 1964: 335). By that measure societies which enshrine striving for wealth, power, and fame are desperately poor and needy. Our stomachs are full but we are hollow in our souls. In separating ourselves from the world by trying to control it we have created a hunger that things can never fill, though we keep trying. We have wounded our souls and our capacity for empathy and love. "This is what is the matter with us," D. H. Lawrence wrote (1968: 504). "We are bleeding at the roots, because we are cut off from the earth and sun and stars, and love is a grinning mockery, because, poor blossom, we plucked it from its stem on the tree of life, and expected it to keep on blooming in our civilized vase on the table." This is the great sacrifice we have made and it need not be.

References

Alroy, J. A. (2001). A multispecies overkill simulation of the end-Pleistocene megafaunal mass extinction. *Science, 292,* 1893–1896.

Barnosky, A. D. (2008). Megafauna biomass tradeoff as a driver of quaternary and future extinctions. *PNAS, 105*, 11543–11548 (12 August).

Berman, M. (1989). *Coming to our senses*. New York: Simon and Schuster.

Big Horn Association (Ed.). (1870). *Cheyenne daily leader* (March 3).

Boehm, C. (1999). *Hierarchy in the forest*. Cambridge, MA: Harvard University Press.

Brand, S. (1968). *Whole Earth Catalog*. (Fall) Brand is quoting Edmund Leach. 1968. *A Runaway World?*. Oxford UK: Oxford University Press.

Brashares, J. S. (2010). Filtering wildlife. *Science, 329,* 402–403.

Brewer, P. G., & Peltzer, E. T. (2009). Limits to marine life. *Science, 324*, 347–348.

Burks, D. C. (Ed.). (1994). *Place of the wild*. Washington, DC: Island Press.

Butchart, S. H. M., et al. (2010). Global biodiversity: Indicators of recent declines. *Science, 328,* 1164–1168.

Callicott, J. B., & Nelson, M. P. (Eds.). (1998). *The great new wilderness debate*. Athens, GA: University of Georgia Press.
Chase-Dunn, C., & Anderson, E. N. (Eds.). (2005). *The historical evolution of world systems*. New York: Palgrave Macmillan.
Chase-Dunn, C., & Hall, T. D. (1997). *Rise and demise*. Boulder, CO: Westview Press.
Chew, S. C. (2001). *World ecological degradation*. Walnut Creek, CA: Alta Mira Press.
Cogkianese, G. (2007). Business interests and information in environmental rulemaking. In M. E. Kraft & S. Kamieniecki (Eds.), *Business and environmental policy* (pp. 185–210). Cambridge, MA: MIT Press.
Cohen, M. N., & Crane-Kramer, G. (Eds.). (2007). *Ancient health*. Gainesville, FL: University of Florida Press.
Czech, B. (2013). *Supply shock*. Gabriola, BC: New Society Publishers.
Denevan, W. M. (1992). *The native population of the Americas in 1492* (2d ed.). Madison, WI: University of Wisconsin Press.
Diamond, J. (1992). *The third chimpanzee*. New York: Harper Collins.
Dietz, R., & O'Neill, D. (2013). *Enough is enough*. San Francisco: Barret & Koehler.
Dinnerstein, D. (1976). *The mermaid and the minotaur*. New York: Harper and Row.
Domhoff, G. W. (1998). *Who rules America?* (3rd ed.). Mountain View, CA: Mayfield Publishing.
Domhoff, G. W. (2012). *Wealth, income and power*. See: http://whorulesamerica.net/power/wealth.html. Accessed October 7, 2012.
Duffy, R. J. (2007). Business, elections and the environment. In M. Kraft & S. Kamieniecki (Eds.), *Business and environmental policy* (pp. 61–90). Cambridge, MA: MIT Press.
Dye, T. R. (2014). *Who's running America?* (8th ed.). Boulder, CO: Paradigm Publishers.
Ehrenfeld, D. (1979). *The arrogance of humanism*. New York: Oxford University Press.
Ellen, R. (1982). *Environment, subsistence and system*. Cambridge: Cambridge University Press.
Essl, F., Winter, M., & Pyšek, P. (2011). Trade threat could even be more dire. *Nature, 487,* 39.
Ewing, B., Goldfinger, S., Oursler, A., Reed, A., Moore, D., & Wackernagel, M. (2009). *The ecological footprint atlas 2009*. Oakland, CA: Global Footprint Network.
Ewing, B., Goldfinger, S., Oursler, A., Reed, A., Moore, D., & Wackernagel, M. (2010). *The ecological footprint atlas 2010*. Oakland, CA: Global Footprint Network.
Fanon, F. (1963). *Wretched of the earth*. New York: Grove Press.
Fromm, E. (1964). *The heart of man*. New York: Harper and Row.
Furlong, S. R. (2006). Business and the environment: Influencing agency policy making. In M. Kraft & S. Kamieniecki (Eds.), *Business and environmental policy* (pp. 155–184). Cambridge, MA: MIT Press.
Gilbert-Norton, L., Wilson, R., Stevens, J. R., & Beard, K. H. (2010). A meta-analytic review of corridor effectiveness. *Conservation Biology, 24*(3), 660–668.
Gonzalez, G. A. (2001). *Corporate power and the environment*. Lanham, MD: Rowman & Littlefield.
Goudie, A. (2005). *The human impact on the natural environment* (6th ed.). Oxford UK: Blackwell.
Grantham, J. (2012). Be Persuasive. Be Brave. Be Arrested (if necessary). *Nature, 491*, 303.
Grossman, D. (2009). *On killing* (2nd ed.). New York: Little Brown.
Grover, W. F. (1989). *The president as prisoner*. Albany, NY: State University Press of New York.
Guber, D. L., & Bosso, C. J. (2007). Framing ANWR. In: M. Kraft & S. Kamieniecki (Eds.), *Business and environmental policy* (pp. 35–59). Cambridge, MA: MIT Press.
Halperin, B., et al. (2012). An index to assess the health and benefits of the global ocean. *Nature, 488,* 615–620.
Harris, M. (1977). *Cannibals and kings*. New York: Random House.
Harris, M., & Ross, E. B. (1987). *Death, sex and fertility*. New York: Columbia University Press.
Hilborn, R., Arcese, P., Borner, M., Hando, J., Hopcraft, G., Loibooki, M., et al. (2006). Effective enforcement in a conservation area. *Science, 314*(5803), 1266.

Holdren, J. (2007). Opening address to the 2007 Annual Meeting of the American Association for the Advancement of Science. Quoted in Coontz, R. Wedging sustainability into public consciousness. *Science, 315*, 1068.

Hume, E. (1995). *Tabloids, talk radio, and the future of news: Technology's impact on journalism*. Washington, D.C: The Annenberg Washington Program in Communications Policy Studies of Northwestern University.

Jackson, W. (1987). *Altars of unhewn stone*. San Francisco: North Point Press.

Jeffrey, C. F. G., et al. (2012). An integrated biogeographic assessment of reef fish populations and fisheries in dry Tortugas: Effects of no take reserves. NOAA Technical Memorandum NOS NCCOS 111. See: http://ccma.nos.noaa.gov/ecosystems/coralreef/TortugasAssessmentReport_final.pdf?utm.

Johns, D. (2009). *New conservation politics*. Oxford: Wiley-Blackwell.

Johnson, A. W., & Earle, T. (2000). *The evolution of human society* (2nd ed.) Stanford: Stanford University Press.

Jones, N. (2011). Human INFLUENCE COMES OF AGE. *Nature, 473,* 133.

Jordan, W., III. (1968). *White over black*. Chapel Hill: University of North Carolina Press.

Kamieniecki, S. (2006). *Corporate America and environmental policy*. Stanford, CA: Stanford University Press.

Kareiva, P., Lalas, R., & Marvier, M. (2011). Conservation in the Anthropocene. *Breakthrough Journal, 2,* 29–37.

Kareiva, P., & Marvier, M. (2007). Conservation for the people. *Scientific American, 297*(4), 50–57.

Kelman, H. C. (2001). Reflections on social and psychological processes of legitimization and delegitimization. In J. Jost & B. Major (Eds.), *The psychology of legitimacy* (pp. 54–73). Cambridge, UK: Cambridge University Press.

Klare, M. (2002). *Resource wars*. New York: Metropolitan/Owl Books.

Klein, R. (1989). *The human career*. Chicago: University of Chicago Press.

Lancy, D. F. (2008). *The anthropology of childhood*. Cambridge, UK: Cambridge University Press.

Laurence, W. F., et al. (2012). Averting biodiversity collapse in tropical forest protected areas. *Nature, 489,* 290.

Lawrence, D. H. (1968). A propos of lady Chatterley's lover. *Phoenix II* (pp. 487–515). London: Heinemann.

Lawrence, F. (2008). Britain's water habit leaves others parched. *Guardian Weekly, 29*.

Layzer, J. (2007). Deep freeze: How business has shaped the global warming debate in congress. In: M. Kraft & S. Kamieniecki (Eds.), *Business and environmental policy* (pp. 93–125). Cambridge, MA: MIT Press.

Layzer, J. (2011). *The environmental case*. Washington, DC: CQ Press.

Lenzen, M., Moran, D., Kanemoto, K., Foran, B., Lobefaro, L., & Geschke, A. (2012). International trade drives biodiversity threats in developing nations. *Nature, 486*, 109–112.

Leopold, A. (1993). *Round river*. New York: Oxford University Press.

Lester, S. E., et al. (2009). Biological effects within no-take marine reserves: A global synthesis. *Marine Ecology Progress Series, 384,* 33–46.

Libby, R. T. (1999). *Eco-Wars: Political campaigns and social movements*. New York: Columbia University Press.

Lindblom, C. (1977). *Politics and markets*. New York: Basic Books.

Lovelock, J. (1979). *Gaia: a new look at life on earth*. Oxford, UK: Oxford University Press.

Marris, E. (2011). *Rambunctious garden*. New York: Bloomsbury.

McGlone, M. (2012). The hunters did it. *Science, 335,* 1452–1453.

McKee, J. 2012. The Human Population Footprint on Global Biodiversity. in *Life on the Brink*, P. Cafaro, and E. Crist, Eds. Athens GA: University of Georgia Press: 91–7.

McMichael, C. H., et al. (2012). Sparse pre-columbian human habitation in Western Amazonia. *Science, 336,* 1429–1431.

McNeill, J. R. (1986). Agriculture, forests, and ecological history. *Environmental Review, 10,* 122–133.

McNeill, J. R. (2000). *Something new under the Sun*. New York: Norton.
Monbiot, G. (2008, 9 May). Trade deals are the new gunboats. *Guardian Weekly* (p. 9).
Nadeau, R. L. (2006). *The environmental endgame*. New Brunswick, NJ: Rutgers University Press.
Nature Magazine (Eds.). (2011). Think big. *Nature, 469*, 131.
Nature Magazine (Eds.). (2012). Protect and serve. *Nature, 487*, 405–406.
Norse, E. A., & Crowder, L. (2005). *Marine conservation biology*. Washington, DC: Island Press.
Noss, R. (1991). Sustainability and wilderness. *Conservation Biology, 5*(1), 120–122.
Noss, R. (1993). The wildlands project land conservation strategy. *Wild Earth Special Issue, 1,* 10–25.
Oates, J. F. (1999). *Myth and reality in the rain forest*. Berkeley, CA: University of California Press.
Ovid (Publius Ovidius Naso). (1990). (ca.16 BC). *The love poems*. Oxford, UK: Oxford University Press.
Peet, J. (1992). *Energy and the ecological economics of sustainability*. Washington DC: Island Press.
Perrings, C., et al. (2010a). Ecosystem services for 2020. *Science, 330,* 323.
Perrings, C., et al. (2010b). Response to biodiversity transcends services. *Science, 330,* 1745.
Polletta, F. (2006). *It was like a fever*. Chicago: University of Chicago Press.
Rands, M. R. W., et al. (2010). Biodiversity conservation: Challenges beyond 2010. *Science, 329,* 1298–1303.
Rappaport, R. A. (1976). Adaptations and maladaptations in social systems. In I. Hill (Ed.), *The ethical basis of economic freedom* (pp. 39–79). Chapel Hill, NC: American Viewpoint.
Rodman, J. (1977). The liberation of nature? *Inquiry, 20,* 83–131.
Rule, S., et al. (2012). The aftermath of megafaunal extinction: Ecosystem transformation in Pleistocene Australia. *Science, 335*, 1483–1486.
Scott, D. (2001). "Untrammeled", "Wilderness Character", and the challenge of wilderness preservation. *Wild Earth, 11*(3/4), 72–79.
Searles, H. F. (1960). *The non-human environment in normal development and in Schizophrenia*. New York: International Universities Press.
Shepard, P. (1973). *The sacred game and the tender carnivore*. New York: Scribners.
Shepard, P. (1982). *Nature and madness*. San Francisco: Sierra Club Books.
Simmons, I. G. (2007). *Global environmental history*. Chicago: University of Chicago Press.
Singer, P. W. (2007). *Corporate warriors* (2nd ed.). Ithaca, NY: Cornell University Press.
Smil, V. (2013). *Harvesting the biosphere*. Cambridge, MA: MIT Press.
Snyder, G. (1990). *The practice of the wild*. San Francisco: North Point Press.
Solomon, S., Greenberg, J. L., & Pyszczynski, T. A. (2004). Lethal consumption: Death-denying materialism. In T. Kasser & A. Kanner (Eds.), *Psychology and consumer culture* (pp. 127–146). Washington, DC: American Psychological Association.
Soule, M., & Terborgh, J. (1999). *Continental conservation*. Washington, DC: Island Press.
Staggenborg, S. (2011). *Social movements*. New York: Oxford University Press.
Stern, P. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues, 56*(3), 407–424.
Thoreau, H. D. (1964 (1854)). Walden. In C. Bode (Ed.), *The portable thoreau* (pp. 248–572). New York: Viking.
Tsu, L. (1972). *Tao te Ching*. New York: Knopf.
Tucker, R. (2000). *Insatiable appetite*. Berkeley CA: University of California Press.
Turner, F. (1980). *Beyond geography*. New York: Viking.
Vest, J. H. C. (1985). Will-of-the-land. *Environmental Review, 9*(4), 321–329.
Williams, M. (2003). *The deforestation of the world*. Chicago: University of Chicago Press.
Wright, R. (2004). *A short history of progress*. Toronto: Anansi.
Wuerthner, G., Crist, E., & Butler, T. (Eds.). (2014). *Keeping the wild: Against the domestication of Earth*. Island Press: Washington, DC.

Chapter 6
Ecosystem Services—A Key Step Forward *or* Anthropocentrism's 'Trojan Horse' in Conservation?

Haydn Washington

Introduction

As an ecologist, I well remember when the Millennium Ecosystem Assessment came out in 2005 (MEA 2005). I found it exciting, as here was a definitive report of the United Nations Environment Programme (UNEP) that showed that humanity was 'living beyond its means'. It focused on the term 'ecosystem services' (here truncated to ES). It seemed promising, for here was a term (grounded in environmental science) that showed how society *depended* on all the services and benefits nature provides us for free. It seemed to provide another argument which environmentalists could use to push for the conservation of nature—because society fully relies on nature to survive. Many environmentalists thought that the MEA would 'wake up' society, that society would at last comprehend that it could not (as it were) saw off the branch it rested on. However, it is now 13 years since the MEA came out, and the environmental crisis has worsened. Environmental indicators are all in decline, as the 6th mass extinction event in the history of life on Earth accelerates—due to human actions (Wijkman and Rockstrom 2012; Ceballos et al. 2015; WWF 2018; GFN 2018). Since the MEA put ES in the spotlight, they have been much discussed, and as of April, 2017 over 17,000 papers had been published with the term in the paper's title, abstract or keywords—over 2800 in 2016 alone (Costanza et al. 2017).

As I became more interested in ecological ethics, I started to look at ES from different perspectives, and to question whether the concept was truly the best approach to retaining the diversity of life on Earth. This chapter will consider whether ES are a good idea for conservation, and whether they consider (or help reconcile) ecojustice and social justice. Alternatively, are they a 'Trojan Horse' for anthropocentrism within conservation?

H. Washington (✉)
PANGEA Research Centre, BEES, UNSW, Kensington, Australia
e-mail: h.washington@unsw.edu.au

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Definitions

The functioning of ecosystems in terms of providing humanity with what are now called 'ecosystem services' was first described in a US government report on 'Man's Impact on the Global Environment' (SCEP 1970). It listed nine services that would decline if there was a decline in ecosystem function. This was slightly expanded by Holdren and Ehrlich (1974). The services ecosystems provide humanity were subsequently referred to as 'public services of the global ecosystem' (Ehrlich et al. 1977) and 'nature's services' (Westman 1977). Finally, it was termed *ecosystem services* by Ehrlich and Ehrlich (1981). 'Natural capital' was another idea coined by Vogt (1948) and further developed by Schumacher (1973), Herman Daly and Robert Costanza (e.g. Costanza and Daly 1992), and Hawken et al. (1999). The ecosystems that provide ES are seen as 'natural capital', using the general definition of capital as a stock that yields a flow of services over time (Costanza and Daly 1992). The Natural Capital Coalition similarly defines it as: 'the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people' (NCC n.d.). 'Critical natural capital' has been defined as natural capital which is responsible for important environmental functions (for humans), and which cannot be substituted for (Ekins et al. 2003). In other words they are ecological assets essential for human well-being or survival (Pearce 1993). However, defining a subgroup of natural capital that is critical for human use undermines the idea that total natural capital must remain constant, as argued by Costanza and Daly (1992).

Daily (1997: 3) defines ES as the: 'conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfil human life'. They maintain biodiversity and the production of ecosystem goods such as seafood, forage, timber, biomass fuels, fibre, medicines and industrial products (ibid). Costanza et al. (2017) define them as the ecological characteristics, functions, or processes that directly or indirectly contribute to human wellbeing: that is, the benefits that people derive from functioning ecosystems.

The Millennium Ecosystem Assessment

The term 'ecosystem services' really came into vogue with the 2005 Millennium Ecosystem Assessment (MEA 2005) written by 1360 experts from 95 countries. The term sought to encapsulate the idea that nature provides essential services to humanity that we depend on. Basically, ES as a term highlights what is obvious to any ecologist (if not to society), that humanity is *fully dependent* on nature. The MEA (2005: v) stated:

> The human species, while buffered against environment changes by culture and technology, is fundamentally dependent on the flow of ecosystem services.

Figure 6.1 shows how the MEA (2005) saw ecosystem services relating to human well-being.

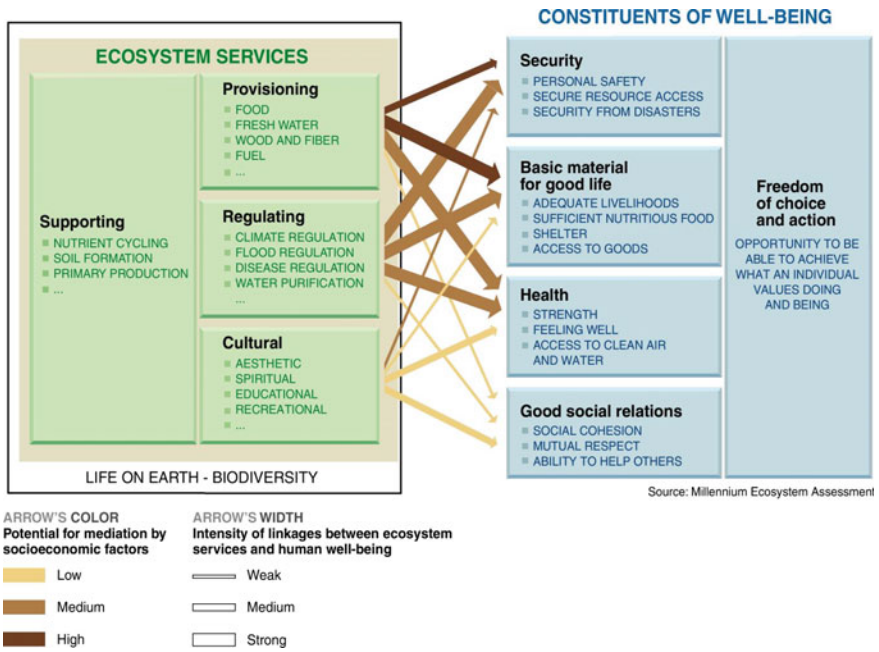

Fig. 6.1 The relationships between ecosystem health and human well-being (*Source* MEA 2005)

The MEA noted that few ES have been the focus of research, and thus the data is often inadequate for their detailed global assessment. It split ES into 31 topics, organised under four types: *provisioning services* (products obtained from ecosystems); *regulating services* (benefits obtained from regulation of ecosystem processes); *cultural services* (non-material benefits); and *supporting services* (those necessary for the production of all other ES).

The MEA (2005) showed true leadership by recognising 'cultural ecosystem services' as a category, even though they don't provide physical benefits. Small et al. (2017) argue that more correctly these should be called 'non-material' ES. Many religions (and also many 'non-religious' people) attach spiritual values to ecosystems and wild places (Washington 2018a). People value the 'sense of place' that is associated with recognized features of their environment (ibid). The font of human creativity and art is tied up with a deep spiritual bonding to place, and a sense of wonder at life and the Universe (Berry 1988; Curry 2011). At a fundamental level people's spiritual connection to nature deserves recognition as something not only necessary—but *essential* (Washington 2018a). Their inclusion in the MEA showed an implicit (if unstated) understanding that the roots of the environmental crisis are tied up with our worldviews and ethics. Such non-material values have been called 'existence values' and 'warm glow values' and are rightly considered to be ES (Davidson 2013). However, Chan et al. (2012) note that the current ES framework is essentially set up for material values, and that non-material values really require a

new vision and new methods. However, we should also remember that non-material benefits remain benefits to humanity that nature provides, and hence do not coincide with *benefits to nature herself*. They do not in fact acknowledge the intrinsic value of nature to exist for itself, nor do they express our moral duties towards nature (Davidson 2013).

Ecosystem Services and 'TEEB'

Six years after the MEA, 'The Economics of Ecosystems and Biodiversity' or TEEB (a project run by UNEP) modified the list of ES down to 22 topics (Kumar 2010). The 'provisioning' and 'regulating' services are much the same as in the MEA. The major changes were in 'cultural services', which became 'cultural and amenity services', and in 'supporting services', which was replaced by 'habitat services'. The cultural services category was also substantially reduced, through omitting 'sense of place' and 'knowledge systems'. Spiritual and religious values became just spiritual 'experience'. The inclusion of 'amenity' in the new title 'cultural and amenity services' gives an indication as to where TEEB was coming from philosophically, as 'amenity' is about *human* use and comfort. Values in TEEB other than monetary values received only token status (less than one page on 'intrinsic value'). So TEEB represented (possibly unwittingly) a strengthening of anthropocentrism in terms of the discussion of ES. As an ecocentric ecologist, I find the original MEA (2005) list of ES a more holistic, ethical, and understandable approach to ES than those of TEEB.

State of Play of Ecosystem Services

So what is happening to ES? The MEA (2005) noted that human use of all ES is growing rapidly. Half of provisioning services such as food and water supply, and 70% of regulating and cultural services were being degraded or used unsustainably. Overall it concluded 60% of ES were being degraded or used unsustainably (ibid). Many ES were being degraded primarily to increase food supply. Take a moment to sit back and think about this. These are the categories of the essential products and processes that ecosystems provide humanity. However, half of the products ecosystems provide us, and 70% of the regulating services (and also cultural services) are in decline, being degraded or used unsustainably. The MEA came out in 2005, and this single statement should have rung (and continued to ring) alarm bells across society. However, the message has not got through, or if it was heard it was not understood. The reason it was not understood is likely due to society's ongoing ecological ignorance (Orr 1994; Washington 2013), plus the dominant anthropocentric worldview, and our capacity to *deny* unpleasant realities (Washington 2018b).

The MEA concluded that degradation of ES could increase significantly during the first half of the century and stop achievement of the Millennium Development Goals (now the Sustainable Development Goals). Any progress achieved in addressing these goals of poverty and hunger eradication, improved health, and environmental sustainability was deemed unlikely to be sustained if most of the ES on which humanity relies continued to be degraded (MEA 2005; Kopnina 2016). The degradation of ES is harming many of the world's poorest people, and is sometimes the principal factor *causing* poverty (Washington 2013). The reliance of the rural poor on free ES is rarely measured and often overlooked. As human well-being declines, the options available to people to enable them to regulate the use of natural resources (at sustainable levels) also declines. This increases the pressures on ES, and can create a downward spiral of increasing poverty and degradation of ES (MEA 2005; Costanza et al. 2017). The MEA also noted that both economic growth and population growth lead to increased consumption of ES.

The main problem (TEEB concluded) was that society does not think about or *value* ES. ES are seen as natural capital assets not included in our national accounts, and economic indicators such as GDP don't measure their degradation (MEA 2005). Most resource management decisions are influenced by ES entering markets, and non-market benefits are often lost or degraded (MEA 2005). Many ES (such as purification of water, regulation of floods or provision of aesthetic benefits) don't pass through markets and are largely unrecorded. The non-market benefits of ES however are often high, and sometimes higher than the marketed benefits (MEA 2005). The authors of TEEB argued that the lack of progress to protect ES after the release of the MEA stemmed from the failures of markets and systems of economic analysis and accounting (notably GDP) to capture values of ES (Kumar 2010). There are no markets for the largely public goods and services that flow from ecosystems and biodiversity, and so there are no established 'prices'. TEEB noted that this is in fact 'market failure', as markets exist only to trade 'private' claims (Sukhdev 2010).

Valuing Ecosystem Services—The Key Debate

So how do we value ES? Daily (1997) explained that ES are absolutely essential to civilisation, but modern urban life obscures their existence. She concluded ES have *infinite use value*, because human life could not be sustained without them. However, the actual assigning of value to ES may arouse great suspicion, and for good reason, Daily concluded. This valuation involves resolving fundamental philosophical issues, such as the underlying basis for 'value'. This is a debate that has continued to the present day, and is arguably a key cause of the environmental crisis (Curry 2011; Rolston 2012; Washington 2018a). The MEA (2005) touched on this issue, while TEEB (Kumar 2010) gave it more coverage. TEEB argued that abstaining from explicit valuation (on apparently valid scientific or ethical grounds) often amounted to no more than an acceptance of someone else's implicit valuation, which is then used to determine environmental trade-offs (Sukhdev 2010).

The above statement at first glance sounds reasonable, but the issue is more complicated than it suggests. TEEB argued that economic valuation of ES was both necessary *and* ethical, and that 'shadow prices' can and should be calculated and presented (Sukhdev 2010). TEEB argued that so deep-seated is modern society's inherent market-centric mindset, that the mere device of demonstrating economic value for ES can become an important strategy for positive change (Sukhdev 2010). TEEB felt it sufficed at times just to recognize value (be it intrinsic, spiritual or social) to create a policy response favouring conservation or sustainable use (Sukhdev 2010). Many of the authors of TEEB accepted that it is not a risk-free exercise to demonstrate value by deriving and propagating 'shadow prices'. There is always the risk that misguided decision-makers or exploitative interests may want to 'use the prices for the wrong ends' (Sukhdev 2010: xii).

TEEB observed that the common metric in economics is *monetary* valuation, so accordingly they used this. However, it should be emphasised that this is accepting the arguments and assumptions of neoclassical economics. One chapter of TEEB believed that the reliance on this has plagued many ES assessments, failing to show values that are critical to understanding the relation between society and nature (De Groot et al. 2010). I share this concern. Another chapter of TEEB acknowledged that economic valuation functions as a system of 'cultural projection' which imposes a way of thinking and form of relationship with the environment, and reflects particular perceived realities, worldviews, mind-sets and belief systems (Brondizio et al. 2010). They note also that economic values are not objective 'facts', nor do they reflect universal truths (ibid). TEEB however concluded overall that the right ethical choice was to compute these imperfect valuations for society to use. This is the heart of the issue—is this *actually* the 'right' ethical choice? They believed valuations were a powerful feedback mechanism for a society that has distanced itself from the biosphere, upon which its very health and survival depends. However, valuation can contribute to the creation of a 'commodity fiction' or Western construct that nature is pure materiality (Brondizio et al. 2010). The danger of this commodity fiction is that the commoditized environment becomes a contrived artefact of itself, as ecosystems and biodiversity can be owned and traded in the market system for money (ibid). Brondizio et al. (2010) thus understand that this is the *commodification of nature*, one that can remove non-material valuation of ES altogether out of the equation (James 2015). Costanza et al. (2014) however argue that valuation of ecoservices (in whatever units) is not the same as commodification or privatization. They argue (p. 152) that: 'these services must be (and are being) valued, and we need new, common asset institutions to better take these values into account'.

However, TEEB concluded that the mainstream economic beliefs of the values of ecosystems and biodiversity are defined by *people's willingness to pay for them.* In other words, it accepts the Cost Benefit Analysis approach (Davidson 2013). However, the neoclassical approach to valuation (people's willingness to pay) is based on the belief that there is no intrinsic value except as perceived by humans (Crabbe 2008). This approach cannot measure benefits *to* nature by asking people about their willingness to pay for benefits *from* nature to humanity (Davidson 2013). It has been argued that intrinsic value lies outside the scope of the wide palette of

ES, and that: 'Intrinsic value is incompatible with any ecosystem service (Davidson 2013: 172). However, while TEEB acknowledged the danger of monetary valuation, its authors concluded they had to value ES in monetary values to save them. This is a difficult ethical call, as we shall see.

So how to value ES meaningfully? Having warned of the problem of deriving value, TEEB described three ways to articulate value (Brondizio et al. 2010: 163):

1. **Contingent valuation method**—value is deemed to be pre-existing and needs to be 'discovered'. There is a separation between values and facts, and human and nature. It works on the principle that you can substitute money for ecosystem goods and services.
2. **Deliberative or social process methods**—has a democratic stance, and value is 'constructed' in social processes, and unknown values evolve through deliberation.
3. **Multi-criteria methods**—involves complexity, value is understood in terms of ranked importance.

However, clearly none of the above gives nature a *voice*. All of the above are anthropocentric, and none of them accept that nature has intrinsic value. The first believes that money can replace essential ES, which is a delusion in terms of ecological reality (Washington 2013). The second seems to think that value depends just on the group of people who 'construct' it (a strongly postmodernist stance). This may at first glance seem 'democratic' but is only a partial human democracy, with no ecodemocracy in play (see Chap. 11 in this volume by Gray and Curry). The third basically seems to dodge the issue, being made up of many small values that can be easily biased (Pascual et al. 2010). Accordingly, each of the above has problems and is unsatisfactory to value ES, both practically and ethically.

However, I do understand the dilemma faced by the authors of TEEB, wondering what else they could *do* that has not been tried before? Intrinsic, non-material, scientific and spiritual values have been put forward time and again for the protection of nature (e.g. Catton 1982; Ehrlich and Ehrlich 1991; Curry 2011; Wijkman and Rockstrom 2012), and Western society has not listened, or listened and not acted. However, I remain unconvinced TEEB chose the best approach out of this dilemma.

Are 'Natural Capital' and 'Ecosystem Services' Anthropocentric?

First, let us consider 'natural capital'. By using terms such as 'natural resources' and 'natural capital', society is effectively reducing the diversity of life (in all its beauty) down to just a 'resource' (Crist 2012) and a natural form of 'capital' for neoclassical economics to consider (Rolston 2012). Braungart and McDonough (2008: 155) point out that the idea of 'natural capital' might have been valid 200 years ago but: 'now it cries out for rethinking'. It should be emphasized that Costanza and Daly (1992) argued that Total Natural Capital must *remain constant*, and cannot be traded for

human-made capital (the 'weak sustainability' argument, Washington 2015). However, it is clear from Costanza and Daly (1992) that natural capital is something that society can 'bequeath' to future human generations. Dobson (1998) notes that the description of nature as a form of capital: 'is to look at it [nature] in a certain light, as economic asset of some description'. Chesiera and De Groot (2003: 221) argue that such an appraisal of nature as capital: 'simply reiterates the reductionistic and utilitarian vision of neo-classical economics'. This ignores the fact that Daly and Costanza are renowned *ecological* economists, however it is correct to characterize the concept as utilitarian. It also appears to be implicitly anthropocentric. However, Daly (2014a) explains the confusion around the way the term is being used. Neoclassical economics was treating nature as though it was 'income' that can be consumed, rather than 'capital' that should not be consumed. Hence Schumacher (1973) and Daly (2014a) speak of natural capital in terms of 'stocks and flows' of matter and energy in nature, arguing they must *not* be diminished. They were not arguing that it should be given a monetary value and commodified, quite the opposite. Daly (2014a) argues strongly that nature does have intrinsic value. Daly (2014a) agrees with Monbiot (2014) that the monetary commodification of the term 'natural capital' is a bad thing. It was never what he was arguing for, yet this meaning of commodification has now taken over discussion of 'natural capital'.

Monbiot (2014) argues that natural capital (in the commodified sense) is the triumph of neoliberalism, where we don't speak of 'nature' anymore, for:

> It is now called natural capital. Ecological processes are called ecosystem services because, of course, they exist only to serve us. Hills, forests, rivers: these are terribly out-dated terms. They are now called green infrastructure. Biodiversity and habitats? Not at all à la mode my dear. We now call them asset classes in an ecosystems market.

He argues the monetary values derived for natural capital are gobbledegook, as we are dealing with values which are non-commensurable. Sullivan (2017) points out that Credit Suisse, with the backing of the international environmental organizations WWF and the IUCN, produced a series of reports that proposed 'capitalizing conserved natures' in situ. This demonstrates that natural capital *is* being commodified, where investors are involved with a focus of making money—rather than protecting nature for its intrinsic value. It is notable that the 'Natural Capital Project' (https://www.naturalcapitalproject.org/) set up by Stanford University, the Chinese Academy of Sciences, and the University of Minnesota has no discussion of the ethics of the commodification of natural capital. Even more worryingly, the focus on 'critical natural capital' suggests that some natural capital is *not* in fact critical to humanity, and hence is not something to be concerned about.

Moving to ES, Costanza et al. (2014: 153) argue:

> Probably the most important contribution of the widespread recognition of ecosystem services is that it reframes the relationship between humans and the rest of nature.

However, one must question if this is true? Do ES actually reframe the relationship between humans and nature? 'Ecocentrism' as a *worldview* certainly does this (Washington et al. 2017) but do ES? Costanza et al. (2017: 3) argue that ES are not

anthropocentric: 'rather than implying that humans are the only thing that matters, the concept of ecosystem services makes it clear that the whole system matters'. Why this is the case however is not clearly explained.

We need to return to the big picture, and consider how ES relates to conservation and ecojustice. ES as defined are anthropocentric in that they are all about the services provided 'to humanity' by nature. The term could have been defined differently, being the *services ecosystems provide their species* (not just humans). Clearly, all species on Earth require the services that their ecosystems provide. However, that was not the definition used, and we seem stuck with this anthropocentric definition. TEEB argued that the basic assumption is that society can assign values to ES and biodiversity, but only to the extent that these fulfil needs of conferring satisfaction to humans, either directly or indirectly (Pascual et al. 2010). The economic conception of 'value' they admitted was thus anthropocentric. Others recognise the limitations of ES, and Pascual et al. (2017) suggest that it be replaced by the term 'Nature's Contributions to People' (NCP). They state it (p. 15): '…goes further by explicitly embracing concepts associated with other worldviews on human–nature relations and knowledge systems (e.g. 'nature's gifts' in many indigenous cultures)'. While the broadening of the term to consider other worldviews is of value, this is still anthropocentric as it remains contributions *to people*. As such it has missed the point that all species require contributions (gifts) from their ecosystems. A recent article on NCP (Diaz et al. 2018) fails to discuss their anthropocentric origin or to even mention the word 'ethics'. Perhaps it is time to ethically consider an alternative term—'People's Contributions to Nature' (PCN)?

Batavia and Nelson (2017) argue that ES clearly *are* anthropocentric and utilitarian. It has also been argued that the ES concept is not meant to replace biocentric arguments, but bundles a broad variety of anthropocentric arguments for protection and sustainable human use of ecosystems (Chan et al. 2012; Luck et al. 2012). These authors hence accept that ES *are* anthropocentric, and that biocentric arguments are also needed (ibid). Pascual et al. (2010) agree that ES valuation should be used to complement, but not substitute for, other legitimate ethical or scientific reasoning (and arguments) relating to biodiversity conservation. Davidson (2013: 175) takes a slightly differing stance, arguing:

> That ecosystem services do not cover intrinsic value does not necessarily make ecosystem services an anthropocentric concept in the moral sense, however. The concept of ecosystem services only becomes anthropocentric in the moral sense if accompanied by the denial that nature or benefits to nature have intrinsic value.

In fact Davidson argues for a 'Total Economic Value' (TEV) that has 'benefits to humans' as one main category and 'benefits to nature (intrinsic value)' as the other main category. However, he admits that how you measure the latter is as yet 'unknown territory' (ibid). However, academia overwhelmingly does ignore 'benefits to nature', and similarly denies that nature has intrinsic value. This lack of academic focus on ecocentrism and ecological ethics (Curry 2011) makes clear that ES, as currently applied by academia, *is* decidedly anthropocentric.

As noted in the valuation section, TEEB decided that society operates according to neoclassical economics, including neoliberal markets, hence they concluded (with a degree of evident desperation) that they simply *had* to adopt a monetary approach. However, the growth economy espoused by neoclassical economics is fundamentally unsustainable, and arguably the key cause of ecocide (Rees 2008; Daly 1991, 2014b; Dietz and O'Neill 2013). Costanza et al. (2017: 1) argue: 'the substantial contributions of ecosystem services to the sustainable wellbeing of humans and the rest of nature should be at the core of the fundamental change needed in economic theory and practice if we are to achieve a societal transformation to a sustainable and desirable future'. However, clearly ES cannot properly foreground the sustainable well-being of the 'rest of nature', when all ES benefits are *for humanity*.

Turnhout et al. (2013), Monbiot (2014) and Sullivan (2017) see valuation and shadow-pricing as leading to commodification. Costanza et al. (2017) argue that valuation of nature using ES is not commodification, but is this correct? Once monetary values are allocated, then neoclassical economics will insist that 'the market' decide whether we conserve an area of nature—or not. Ethically, the commodification of nature has never been a good idea, as it plays into the idea that nature is just a pool of resources for human mastery (Curry 2011; Crist 2012; Monbiot 2014; Kopnina 2017), and ignores the intrinsic value of nature. Daly and Cobb (1994: 379) concluded that a: 'sustained willingness to change depends on a love of the earth that humans once felt strongly but that has been thinned and demeaned as the land was commodified'. Similarly, the psychological and spiritual values of nature cannot be meaningfully commodified. The sacred has no cost we can establish, it is *sacred*. No monetary value given to a wild river (as discussed in Chap. 8 by Strang in this volume) or a sacred mountain can ever be considered 'ethical' in terms of ecological ethics (Curry 2011). Monetary values in a Cost-Benefit Analysis are designed to be compared against each other to determine what we protect, and what we develop. By commodifying nature, we are thus playing the game of anthropocentrism and neoliberalism (Monbiot 2014)—two ethically flawed worldviews that ignore ecological reality (Washington 2015). By doing so I believe we are thus failing ethically and philosophically to support a viable transition to a truly sustainable future. Or as Monbiot (2014) argues, by assigning monetary values to natural capital we are effectively pushing the natural world even further into the neoliberal market system that is 'eating it alive'.

However, Pascual et al. (2017) suggest that the 'pluralistic valuation' in Fig. 6.2 may move society away from the neoclassical Cost-Benefit Analysis. This could be a constructive way forward. It is difficult however to see the dominant neoclassical economics supporting such a pluralistic valuation, hence the need for society to swiftly change to ecological economics (Daly 2014b).

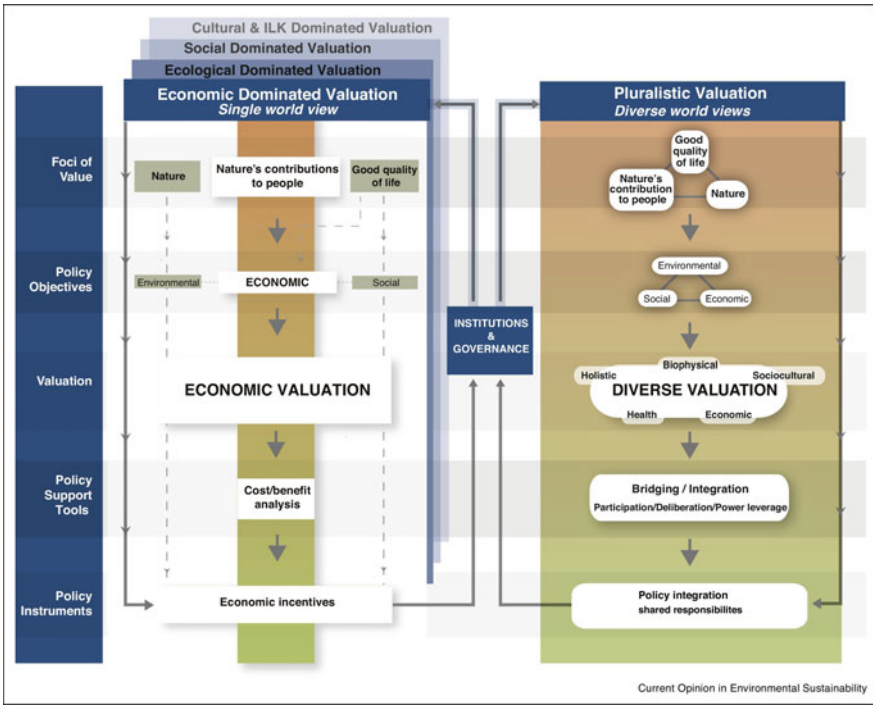

Fig. 6.2 Economic valuation versus pluralistic valuation (*Source* Pascual et al. 2017)

Have ES Worked for Conservation?

In practical terms, we should ask: 'Have 13 years of ES worked for conservation?'. This remains a difficult question to arbitrate. Has it made a difference practically in terms of protecting nature? Native habitat continues to be cleared and fragmented, climate change degrades ecosystems, native species are still overharvested, and species pushed towards extinction as the 6th mass extinction accelerates (Ceballos et al. 2015). Jordan (2018) argues that the natural capital approach has increased tree and plant cover so that China now has the highest rate of reafforestation in the world. Ehrlich (2018) argues: "In my view both natural capital and ecosystem services have made major contributions to the (basically losing) fight for conservation. We'd be in much worse shape without them". However, he also argues that "ethical arguments go nowhere". In contrast, I believe ethical arguments based on intrinsic value are both the best chance we have for long-term conservation, but also for a meaningful sustainability (Washington 2015). It has also been argued that planning and executing conservation strategies that are based on ES provision might not safeguard biodiversity, but only divert away attention and interest from more fundamental problems (Vira and Adams 2009). Kopnina (2017) warns that the prevailing assumption of human entitlement to the benefits of nature will facilitate the conversion of the last

remaining wilderness into 'resources'. Batavia and Nelson (2017) argue the idea of nonhuman *intrinsic value* is certainly at risk, and will likely become functionally extinct, if the ES approach continues to subsume conservation practice and policy. This is especially worrying, as the intrinsic value of nature is a fundamental part of ecocentrism, and arguably the ethical basis for most past conservation strategies. ES are also being used to justify anthropocentric conservation strategies such as 'new conservation' (Batavia and Nelson 2017).

The use of 'Payment for Ecosystem Services' (PES) has arguably had a positive effect in some countries, such as increasing rainforest area in Costa Rica (Barton 2013). Others however argue that PES has yet to demonstrate efficacy and financial sustainability (Hiedanpaa and Bromley 2014). Indeed, even staunch advocates of ES such as Costanza et al. (2017: 13) note that: 'practical applications are still limited'. Given my original hope raised in the Introduction regarding ES, one key question to ask is: 'Has it taught society that we are fully dependent on nature?'. This clearly was the original hope of Schumacher (1973) and Costanza and Daly (1992) when speaking of 'natural capital', and of Ehrlich and Ehrlich (1981) when they originally formalised the term 'ecosystem services'. However, the answer is clearly 'no', terms such as natural capital and ES have *not* embedded in society the reality of human dependence on nature. Indeed the idea of human mastery of nature via techno-centrism is worse than ever in Western society (Bonnett 2007; Curry 2011; Washington 2013; Vetlesen 2015) and natural capital and ES are arguably being used as the Trojan Horse to ideologically embed neoliberalism in conservation (Monbiot 2014).

Conclusion

The last 20 years have seen enormous discussion of natural capital and ES, yet despite this the environmental crisis has worsened, as have prospects for the long-term conservation of nature. It may be that through ES, some decision-makers are now more aware that society is completely dependent on nature, and thus some decisions may have been better than they might otherwise have been. We should ask how ES (and natural capital in its commodified sense) relate to ecojustice? One can only conclude: 'not well'. All the stakeholders for natural capital and ES are *human* stakeholders, and the benefits come only to humans. Do ES relate any better to social justice? At first glance their focus on benefits to humans (and the accompanying argument that we need nature to provide ES) may suggest this. However, the fact that ES ignore 'benefits to nature' means that over time biodiversity will continue to decline, with consequent impacts on society, especially the poor. The benefit of ES to social justice are thus questionable. Similarly, ES do not help reconcile the two justices (social and ecological)—as both 'natural capital' and ES were born out of an anthropocentric worldview. Perhaps it is time to consider that if the worldview and ethics that defined ES were flawed, the term itself may be also? If the anthropocentric and utilitarian ethics of neoclassical economics are flawed, then maybe the idea of

assigning 'shadow prices' is indeed part of *commodifying nature*, and hence it too is flawed? Of course ES (or NCP) are not going to go away, however perhaps we should acknowledge their origins and inherent bias? Its value to conservation remains to be seen, but may improve if the suggested strategy of 'pluralistic valuation' (Fig. 6.2) became mandatory.

The point of this chapter was to consider whether ES will help conservation in the future, as well as whether they would help to reconcile social justice and ecojustice? Given the anthropocentric underpinnings of ES and natural capital, this seems unlikely. It is increasingly likely that many anthropocentric scientists will agree to research what biodiversity is needed to retain ES *for people*. Thus they would seek primarily to protect only 'critical natural capital', with the implication that society can dispense with that natural capital that is *not* critical to human survival. Because of the flaw in its definition, some anthropocentric ES practitioners may indeed be happy to let the rest of nature (not necessary for human survival)—slip away. Such an approach however is not conservation, but acquiescence to further ecocide and extinction. 'Ecosystem services' thus remain a conflicted term, and certainly cannot be considered one that foregrounds ecocentrism and ecojustice. It may well be one more 'Trojan Horse' of anthropocentrism within the conservation community (similar to 'new conservation' and 'critical social science'). ES on balance may thus be negative, as they assist in denying the need for ecological ethics, and assist in burying the key ethical premise that nature should—first and foremost—be conserved for its intrinsic value.

References

Barton, D. (2013). Payments for ecosystem services: Costa Rica's recipe. In *International Institute for Environment and Development website*. https://www.iied.org/payments-for-ecosystem-services-costa-rica-s-recipe.

Batavia, C., & Nelson, M. (2017). For goodness sake! What is intrinsic value and why should we care? *Biological Conservation, 209,* 366–376.

Berry, T. (1988). *The dream of the Earth*. San Francisco: Sierra Club Books.

Bonnett, M. (2007). Environmental education and the issue of nature. *Journal of Curriculum Studies, 39*(6), 1–11.

Braungart, M., & McDonough, W. (2008). *Cradle to Cradle: Remaking the way we make things*. London: Vintage Books.

Brondizio, E., Gatzweiler, F., Zografos, C., & Kumar, M. (2010). The socio-cultural context of ecosystem and biodiversity valuation. In P. Kumar (Ed.), *The economics of ecosystems and biodiversity: Ecological and economic foundations* (pp. 148–182). London: Earthscan.

Catton, W. (1982). *Overshoot: The ecological basis of revolutionary change*. Chicago: University of Illinois Press.

Ceballos, G., Ehrlich, A., & Ehrlich, P. (2015). *The annihilation of nature: Human extinction of birds and mammals*. Baltimore: Johns Hopkins University Press.

Chan, K. M. A., Satterfield, T., & Goldstein, J. (2012). Rethinking ecosystem services to better address and navigate cultural values. *Ecological Economics, 74,* 8–18.

Chesiera, A., & De Groot, R. (2003). Critical natural capital: A socio-cultural perspective. *Ecological Economics, 44,* 219–231.

Costanza, R., & Daly, H. (1992). Natural capital and sustainable development. *Conservation Biology, 6,* 37–46.
Costanza, R., de Groot, R., Sutton, P., et al. (2014). Changes in the global value of ecosystem services. *Global Environmental Change, 26,* 152–158.
Costanza, R., de Groot, R., Braat, L., et al. (2017). Twenty years of ecosystem services: How far have we come and how far do we still need to go? *Ecosystem Services, 28,* 1–16.
Crabbe, P. (2008). The Copenhagen consensus: A global public-good perspective comparing the Earth Charter with other recent declarations. In C. Soskolne (Ed.), *Sustaining life on Earth: Environmental and human health through global governance* (pp. 209–226). New York: Lexington Books.
Crist, E. (2012). Abundant Earth and the population question. In P. Cafaro & E. Crist (Eds.), *Life on the brink: Environmentalists confront overpopulation* (pp. 141–151). Georgia: University of Georgia Press.
Curry, P. (2011). *Ecological ethics: An introduction* (2nd ed.). Cambridge: Polity Press.
Daily, G. (1997). *Natures services: Societal dependence on natural ecosystems*. Washington: Island Press.
Daly, H. (1991). *Steady state economics* (2nd ed.). Washington: Island Press.
Daly, H. (2014a). The use and abuse of the "natural capital" concept. In *The Daly News*, November 13, 2014, https://steadystate.org/use-and-abuse-of-the-natural-capital-concept/. Accessed July 13, 2018.
Daly, H. (2014b). *From uneconomic growth to the steady state economy*. Cheltenham: Edward Elgar.
Daly, H., & Cobb, J. (1994). *For the common good: Redirecting the economy toward community, the environment, and a sustainable future*. Boston: Beacon Press.
Davidson, M. (2013). On the relation between ecosystem services, intrinsic value, existence value and economic valuation. *Ecological Economics, 95,* 171–177.
De Groot, R., Fisher, B., & Christie, M. (2010). Integrating the ecological and economic dimensions in biodiversity and ecosystem service valuation. In P. Kumar (Ed.), *The economics of ecosystems and biodiversity: Ecological and economic foundations* (pp. 9–40). London: Earthscan.
Diaz, S., Pascual, U., Stenseke, M., et al. (2018). Assessing nature's contributions to people. *Science, 359*(6373), 270–272.
Dietz, R., & O'Neill, D. (2013). *Enough is enough: Building a sustainable economy is a world of finite resources*. San Francisco: Berrett-Koehler Publishers.
Dobson, A. (1998). *Justice and the environment: Conception of environmental sustainability and theories of distributive justice*. Oxford: Oxford University Press.
Ehrlich, P. (2018). Personal communication by Prof. Paul Ehrlich, July 10, 2018 in response to a question about the value of ecosystem services.
Ehrlich, P., Ehrlich, A., & Holdren, J. (1977). *Ecoscience: Population, resources, environment*. San Francisco: WH Freeman.
Ehrlich, P., & Ehrlich, A. (1981). *Extinction: The causes and consequences of the disappearance of species*. New York: Random House.
Ehrlich, P., & Ehrlich, A. (1991). *Healing the planet: Strategies for resolving the environmental crisis*. New York: Addison-Wesley Publishing Company.
Ekins, P., Simon, S., Deutsch, L., Folke, C., & De Groot, R. (2003). A framework for the practical application of the concepts of critical natural capital and strong sustainability. *Ecological Economics, 44,* 165–185.
GFN. (2018). World footprint, global footprint network. http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/.
Hawken, P., Lovins, A., & Lovins, H. (1999). *Natural capitalism: Creating the next industrial revolution*. New York: Little Brown and Co.
Heidanpaa, J., & Bromley, D. (2014). Payments for ecosystem services: Durable habits, dubious nudges, and doubtful efficacy. *Journal of Institutional Economics, 19*(2), 175–195.

Holdren, J., & Ehrlich, P. (1974). Human population and the global environment. *American Scientist, 62,* 282–292.
James, S. P. (2015). Cultural ecosystem services: A critical assessment. *Ethics, Policy and Environment, 18,* 338–350.
Jordan, R. (2018). Stanford partners with Chinese academy of sciences. In *Stanford Woods Institute for the Environment*, https://woods.stanford.edu/news-events/news/stanford-partners-chinese-academy-sciences.
Kopnina, H. (2016). The victims of unsustainability: A challenge to sustainable development goals. *International Journal of Sustainable Development and World Ecology, 23*(2), 113–121.
Kopnina, H. (2017). Commodification of natural resources and forest ecosystem services: Examining implications for forest protection. *Environmental Conservation, 44*(1), 24–33.
Kumar, P. (Ed.). (2010). *The economics of ecosystems and biodiversity: Ecological and economic foundations*. London: Earthscan.
Luck, G. W., Chan, K. M. A., Eser, U., et al. (2012). Ethical considerations in on-ground applications of the ecosystem services concept. *BioScience, 62,* 1020–1029.
MEA. (2005). Ecosystems and human well-being: Synthesis, United Nations Environment Programme (UNEP), https://www.millenniumassessment.org/documents/document.356.aspx.pdf. Accessed April 24, 2018.
Monbiot, G. (2014). Put a price on nature? We must stop this neoliberal road to ruin. In *The Guardian*, July 24, 2014, https://www.theguardian.com/environment/georgemonbiot/2014/jul/24/price-nature-neoliberal-capital-road-ruin. Accessed July 8, 2018.
NCC. (n.d.). 'Natural capital', natural capital coalition website, https://naturalcapitalcoalition.org/natural-capital/. Accessed July 7, 2018.
Orr, D. (1994). *Earth in mind: On education, environment and the human prospect*. Washington: Island Press.
Pascual, U., Muradian, R., Brander, L., Gomex-Baggethun, E., Martin-Lopex, B., & Verma, M. (2010). The economics of valuing ecosystem services and biodiversity. In P. Kumar (Ed.), *The economics of ecosystems and biodiversity: Ecological and economic foundations* (pp. 183–255). London: Earthscan.
Pascual, U., Balvanera, P., Diaz, S., et al. (2017). Valuing nature's contributions to people: The IPBES approach. *Current Opinion in Environmental Sustainability, 26–27,* 7–16.
Pearce, D. (1993). *Blueprint3: Measuring sustainable development*. London: CSERGE and Earthscan.
Rees, W. (2008). Toward sustainability with justice: Are human nature and history on side? In C. Soskolne (Ed.), *Sustaining life on Earth: Environmental and human health through global governance* (pp. 81–93). New York: Lexington Books.
Rolston, H., III. (2012). *A new environmental ethics: The next millennium for life on Earth*. New York: Routledge.
SCEP. (1970). *Man's impact on the global environment: Report of the study of critical environmental problems*. California: MIT Press.
Schumacher, E. (1973). *Small is beautiful*. New York: Harper Torchbooks.
Small, N., Munday, M., & Durance, I. (2017). The challenge of valuing ecosystem services that have no material benefits. *Global Environmental Change, 44,* 57–67.
Sukhdev, P. (2010). *Preface to "The economics of ecosystems and biodiversity: Ecological and economic foundations"*, P. Kumar (Ed.) (pp. 1–4). London: Earthscan.
Sullivan, S. (2017). Noting some effects of fabricating "nature" as "natural capital". *The Ecological Citizen, 1,* 65–73.
Turnhout, E., Waterton, C., Neves, K., & Buizer, M. (2013). Rethinking biodiversity: From goods and services to "living with". *Conservation Letters, 6,* 154–161.
Vetlesen, A. (2015). *The denial of nature: Environmental philosophy in the era of global capitalism*. London: Routledge.
Vira, B., & Adams, W. M. (2009). Ecosystem services and conservation strategy: Beware the silver bullet. *Conservation Letters, 2,* 158–162.

Vogt, W. (1948). *Road to survival*. New York: William Sloan.
Washington, H. (2013). *Human dependence on nature: How to help solve the environmental crisis*. London: Earthscan.
Washington, H. (2015). *Demystifying sustainability: Towards real solutions*. London: Routledge.
Washington, H. (2018a). *A sense of wonder towards nature: Healing the planet through belonging*. London: Routledge.
Washington, H. (2018b). Denial—The key barrier to solving climate change. In D. A. DellaSala & M. I. Goldstein (Eds.), *Encyclopedia of the Anthropocene* (Vol. II, pp. 493–499). UK: Elsevier.
Washington, H., Taylor, B., Kopnina, H., Cryer, P., & Piccolo, J. (2017). Why ecocentrism is the key pathway to sustainability. *Ecological Citizen, 1,* 35–41.
Westman, W. (1977). How much are nature's services worth? *Science, 197,* 960–964.
Wijkman, A., & Rockstrom, J. (2012). *Bankrupting nature: Denying our planetary boundaries*. London: Routledge.
WWF. (2018). Living planet report—2018: Aiming higher. In M. Grooten & R. E. A. Almond (Eds.), *World wide fund for nature*. WWF: Gland, Switzerland.

Part II
Ideas that Expand the Debate—Rights, TEK and Education

Chapter 7
Has Anthropocentrism Replaced Ecocentrism in Conservation?

Dominick A. DellaSala

Surfing the Conservation Biology Wave

I cut my intellectual teeth at the pinnacle of the 1980s conservation biology movement. Inspired by outspoken scientists the likes of Edward Wilson, Thomas Lovejoy, Reed Noss, Michael Soulé, Jane Goodall, Rachel Carson, and Carl Sagan, it was an exciting time to be at the forefront of an emerging planetary discipline. An intellectual buzz permeated the halls of my Alma Mater, the University of Michigan, where graduate students elbowed for lab space to organize bio-blitzes—rapid field work to catalogue some of the planet's most biodiverse regions ahead of the developers. Schooled in the intrinsic standing of Nature perspectives of Naess (1973) and Devall and Sessions (1985), we debated what it meant to be a 'deep' (i.e. interconnectedness and intrinsic value of natural systems and species; see Chap. 1) versus 'shallow' (i.e. how humans benefit from Nature; see Chap. 1) ecologist. Years later, I got my first job at the non-profit World Wildlife Fund, where I learned the real-world practice of conservation biology within a supportive think- and action-tank, much like a United Nations for biodiversity. Through a vast international network of dedicated conservationists, I began to understand the biodiversity of majestic rainforests from Alaska to Peru, Chile to Borneo, and many other fascinating places. Forests were the hip-hop of the times, biodiversity our professional calling card, Peterson's (1973) 'Field Guide to the North American Birds' our Bible, and a curiosity of all things Wild oozed from our intellectual pores. Oh, how I long for those days to return.

Having worked as a conservation biologist for over three decades, I bear witness to a tsunami of recent tactical changes by conservation groups that have placed biodiversity messaging behind a green curtain of an ever-increasing *anthropocentric* (i.e. utilitarian—having primarily a human focus, see Chap. 1) chorus of 'what's-in-it-for-me.' Guided by public polls, expensive marketing research, and a desire to partner

D. A. DellaSala (✉)
ConsciencouScience Institute, 222, Joseph Drive, Talent, OR, USA
e-mail: dominick@geosinstitute.org

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even at significant costs to Nature with 'natural resource' extractionists (corporate executives, logging companies, government agencies), biodiversity became passé and old-school, to be replaced by the modernist view of the 'natural' world (Kareiva and Marvier 2012; Foreman 2012; Kloor 2015; also see neoliberalism—Chap. 1). Private foundations and major donors increasingly moved from funding ecocentric to other worthy but human-centered causes, most notably, social justice, renewable energy, poverty alleviation, and indigenous land-tenure rights. Meanwhile, because conservation groups rise and fall with donations, they followed the money, treating biodiversity like the 'crazy uncle' in the closet (we know he's in there but we don't pay him much attention). Although many groups still have biodiversity in their mission statements, today's tactics are fundamentally aligned with anthropocentric views of Nature. How far the programmatic scales tip one way (Nature) or the other (humans) has the feeling of 'deja vu' from the early days of deep versus shallow ecology.

I still consider myself a deep ecologist, which I now argue is even more urgent than at any point in the emergence of conservation biology as a discipline. However, I also work with the 'what's-in-it-for-me' crowd, where I provide a voice for the voiceless (i.e. defending ecojustice) and a hopeful way to bridge the growing divide between the anthropocentric and ecocentric platforms. That's what this essay is about. It is not a deep dive into the how and why of the shifts in perspectives, but rather a combination of fundamental conservation biology constructs and personal examples of witnessing a growing rift within the conservation movement, spearheaded especially by certain BINGOs (**B**ig **I**nternational **N**on-**G**overnmental **O**rganizations) such as The Nature Conservancy (TNC). I unpack some of the main schisms in perspectives and conclude with an urgent call for conservationists to embrace their ecocentric roots, not at the expense of humanity, but for the purpose of achieving justice for humans and Nature alike (see Chap. 1).

In general, most conservation groups practice Nature conservation along a continuum tilted one way (anthropocentric) or the other (ecocentric) (Table 7.1). I discuss how a tilt toward the anthropocentric is damaging to *both* humans and Nature while, the alternative, striving for an optimal decision space tilted toward ecojustice can protect Nature while incorporating compatible human needs. While my focus is on western US forests, other examples (not covered) are being played out in many places, unfortunately at Nature's expense.

To Be or Not to Be a Forest: Nature in the Eyes of the Beholder

Let me now share two personal examples of where an anthropocentric or ecocentric tilt has vastly different implications and outcomes for nature.

Table 7.1 A simplified comparison of two viewpoints of nature that in practice are blended

Attribute	Ecocentric view	Anthropocentric view
Biodiversity	Intrinsically important (for its own sake), nature is sacred and to be revered, everything is connected to everything else, we are all participants in a diverse (divine) and complex web-of-life	Coupled with ecosystem services and utilitarian perspectives. Examples: 'working forests,' 'feedstock' for biomass burning, huntable and fishable wildlife (e.g. National Wild Turkey Federation, Trout Unlimited, Ducks Unlimited)
Old-growth (or ancient) forest	Unique, rare, exceptionally diverse	Provisioning ecosystem services (e.g. wood fiber, water purification, climate regulation), decadent (also called 'senescent' by foresters in Australia) and needing to be replaced by vigorous young growing trees (e.g. old-school forestry)
Wetlands and nearshore ecosystems	Habitat for rare, endemic and threatened species, extraordinary biodiversity especially in ecotones and areas where water is limiting (e.g. desert oases)	Flood abatement for towns, storm proofing shorelines for cities, 'blue' carbon (e.g. kelp beds) for climate regulation, coral reefs as food for people, areas to be drained for development
Native versus invasive species	Natives to be conserved, invasives to be contained and eliminated where possible	It's all mixed up anyhow, so just embrace what's there rather than favor native species
Wildfire	Self-willed force shaping certain ecosystems that have coevolved with fire for millennia	'Good versus bad' fire, the 'right fire' in the 'right places' is a slowly creeping fire along the ground, non-threatening to people and without much smoke
Predators	Apex species necessary for intact ecosystem functions	Much like fire: the 'right' kinds in the 'right' places (e.g. grizzly bears only in national parks)
Snag forest	Recovered from the green forest and restored by Nature for fire-adapted species	'Catastrophically' destroyed by fire and needing to be 'restored' by logging and replanting with young vigorously growing trees
Ecological integrity versus healthy forest	Having native species composition, complex structure, and intact processes expected for a particular site based on historic or reference conditions	Having the 'right mix' of age classes, species composition, and disturbance processes based on utilitarian views (forests engineered for a specific purpose)

Source compiled by the author

Rainforests as the 'No-Brainer' Conservation Objective

Upon completion of my book "Temperate and Boreal Rainforests of the World: Ecology and Conservation" (DellaSala 2011), I began to understand some of the inner workings of a rainforest. I trained my eye to see these forests as verdant, old growth with lush plant and animal life spanning centuries of tightly interwoven and complex ecological and evolutionary interactions (Fig. 7.1a, b). A sort of surreal image emerged in my mind where widespread death of trees seldom showed up, unless through clearcut logging (Fig. 7.1c). Scientists understand this view, the public gets it, and even some politicians see intrinsic value in rainforests—an all-around no-brainer for conservation. Today, nearly everyone loves rainforests as evident by thriving ecotourism businesses, zoo exhibits, stuffed animals, t-shirts, and postcards that are easy to find.

While there have been some modest but important rainforest conservation victories over the years, the threats to rainforests have overall escalated mainly from rapid climate change, agriculture (both animal and crop), industrial-scale logging and road-building for wood fiber, woody biomass and hydro-development for energy

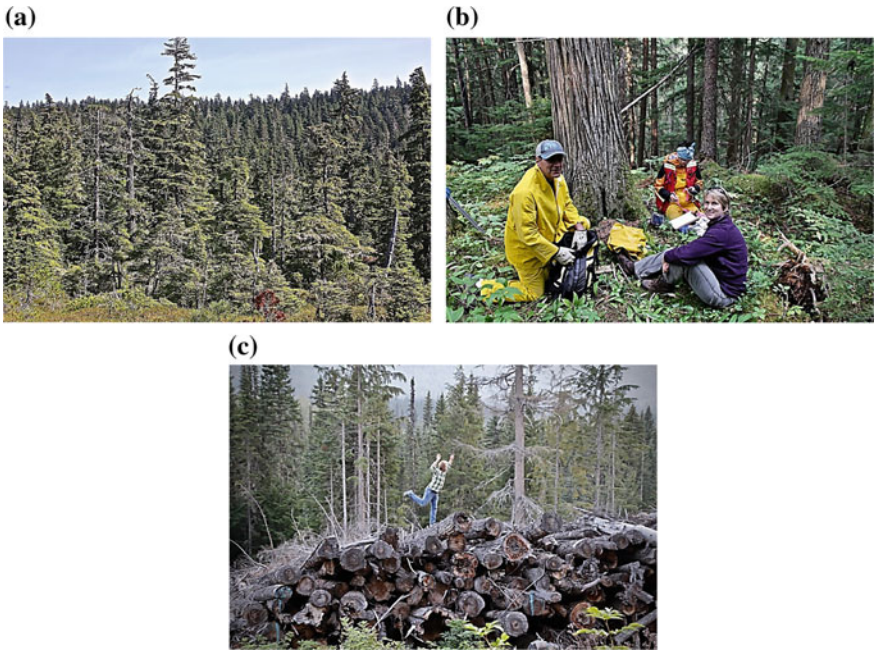

Fig. 7.1 Views of the forest through the lens of verdant rainforest. **a** Old-growth temperate rainforest, Tongass National Forest, southeast Alaska; **b** scientists on a bio-blitz in the inland rainforests of BC before they are likely destroyed by such logging, as shown in (**c**) (*Source* D. DellaSala)

production, poaching of wildlife, and mining, among other threats (e.g. Williams 2006). A blending of perspectives tilted toward ecojustice presents a possible path forward, but time is running short given the scale and pace of forest losses (see Mackey et al. 2014).

An example of where a tilt toward ecocentrism has the potential to work is the Tongass rainforest in Alaska. Here, the USDA Forest Service (2016), after decades of public controversy, has proposed to shift logging out of old-growth forests and into previously logged and reforested sites. According to the agency, the transition would not fully take hold until around 2030 or so; although faster timelines have been proposed by conservation groups. In this case, ecocentric (old growth protections) and anthropocentric (wood supply) can coexist by living within the means of what the rainforest can give back without compromising irreplaceable ecosystem benefits such as biodiversity, salmon runs, carbon capture, and water purification (also see Kopnina 2017). Ticking the box on problem-solving in favor of the ecocentric standpoint means quickly (in years instead of decades) transitioning to a more ecologically-compatible forestry approach (see Washington 2015). This is almost never achieved anywhere in the world because human needs nearly always take precedence, but blending perspectives with a tilt toward the ecocentric would avoid irreparable losses to this unique rainforest. Unfortunately, while the Tongass transition plan exists on paper, in reality, the political winds shifted when President Trump was elected. Under the Trump administration there is the real threat that intact old-growth forests on the Tongass will once again be opened to logging, thus shifting the approach from predominately ecocentric to exclusively anthropocentric. In this case anthropocentric wins in the short-term, while Nature loses in the long-term. Tilting it back to ecocentric will require a shift in US politics (perhaps with the 2020 presidential election) that favor an accelerated transition to rainforest protection, along with projects that demonstrably show how young trees can be used to supply wood-product needs instead of old growth.

If a Tree Dies in the Forest (or the Forest 'Dies' Itself) from Wildfire Does Anybody Care?

Before turning to a discussion of the intrinsic role of wildfire as an architect of Nature, I must begin with a general statement that different regions around the world have vastly different fire regimes with varied effects on people and Nature. For instance, in tropical rainforests non-anthropogenic fires are exceptionally rare and human-caused fires are ecologically devastating. Examples of hugely destructive anthropogenic fires in rainforests include slash-and-burn fires in Amazonia and Indochina for land conversion into animal and/or crop agriculture. Climate change is increasingly exacerbating the effects of human-set fires; indeed, climate change is emerging as an anthropogenic cause or major aggravator of forest fires in its own right. In contrast, fire is a frequent natural occurrence in many dry forests (DellaSala and Hanson

Fig. 7.2 Pyrodiversity (the diversity of burn effects on vegetation viewed as a quilt-like mosaic pattern at landscape scales) begets biodiversity (e.g. south Kalmiopsis region, southwest Oregon). Fire-mosaics are intrinsically valuable for species that require either the emerging forest (e.g. deer, woodpeckers, songbirds, butterflies) or the old-growth forest that escaped the flames (such as Northern Spotted Owls—*Strix occidentalis caurina*; Lee 2018) (photo by author)

2015) and grasslands (see Noss 2018) that have evolved to require fire in order to rejuvenate these ecosystems. Widespread fire suppression and logging to 'control' fires, rather than the fires per se, have had a negative impact on biodiversity in these cases.

In the example I consider below, the beneficial ecosystem effects of wildfire apply to dry forests [mixed conifer and pine (*Pinus* spp.)] in low- to mid-montane regions of the western US (DellaSala and Hanson 2015). Large wildfires in these forests typically have mixed mortality effects on vegetation, from light under-burn patches (most trees survive) to moderate (some trees survive) to high severity (most trees are killed) effects all in the same fire complex. The ultimate net effect of these different post-fire patch types is extraordinary levels of biodiversity and the rejuvenation of forests overtime (Fig. 7.2), but fire in general is at loggerheads with anthropocentric values, as discussed below.

Nature's Phoenix—While taking a spring hike with my eight-year old daughter, shortly after my rainforest book came out (DellaSala 2011), I got a chance to witness firsthand the effects of a pyrodiverse landscape on biodiversity. We stopped for lunch in a recently burned forest where nearly all the trees were fire-killed (large and small patches). My daughter was excited about the kaleidoscope of flowering plants, busy pollinating bees and butterflies, sonorous songbirds, and persistently drumming woodpeckers. A proliferation of chest-high conifer seedlings, the progeny of their 'parent' trees now fire-killed, punctuated the canopy of dense shrubs, while slowly ascending to form the newly emerging overstory canopy. In this fire-created forest, life and death were conjoined by a rebirthing process that has recurred countless times before (Fig. 7.3a, b). It was then that my views of a forest changed. I began to see the forest in more dynamic, diachronic terms than simply its collection of constituent trees. It occurred to me that if a eight-year old Nature/self-aware child

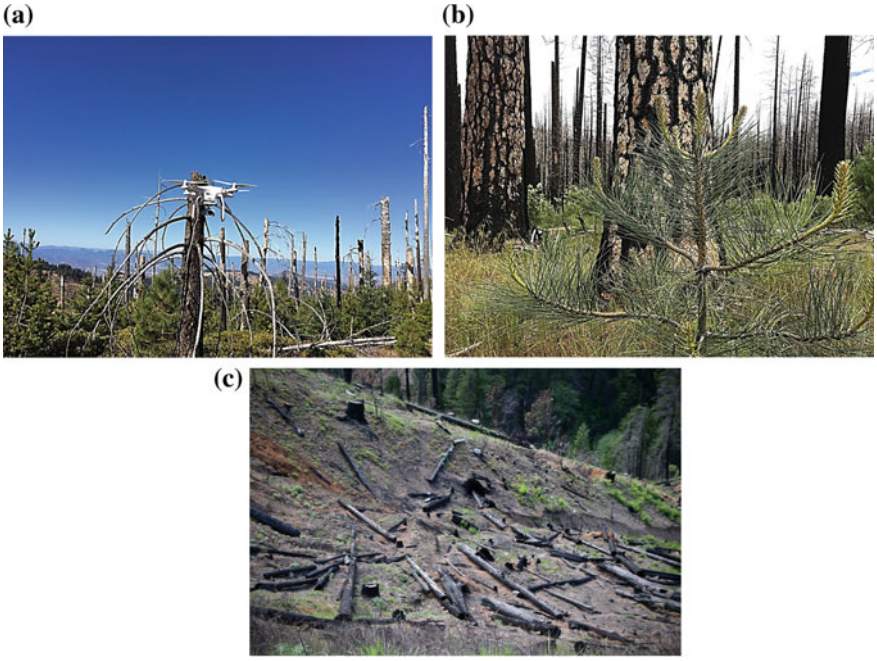

Fig. 7.3 **a** Antelope fire area Grizzly Peak, Ashland, Oregon, where my views on forests were changed by my daughter who saw beauty in forest death. The drone in the center of the photo was used by local news media to provide a 'birds-eye' view of the rejuvenating forested landscape. **b** Complex-early seral forest on the Stanislaus National Forest, Sierra region, California. Note the young conifer in the foreground shielded by its 'parent' that did not survive the fire. **c** Post-fire 'salvage' on the Klamath National Forest, northwest California, destroys the rejuvenating forest perceived as having only economic value and needing 'restoration' because of fire. Note the damage to soils from ruts caused by dragging logs up steep, erosive soils. This logging, and not the wildfire itself, is the true ecological catastrophe (*Source* Photos by the author)

could see beauty in the forest's cycle of death and life, then perhaps members of Congress, the media, and certainly my fellow conservationists could. Unfortunately, this has not been the case given the predominance of anthropocentric views on fire, which almost invariably provide an excuse to log these biodiverse forests in the name of fire suppression or control (Fig. 7.3c).

Since the day of that perspective-altering hike, my colleagues and I have been bio-blitizing burned landscapes, describing the resultant fire-forest as 'complex early seral' or 'snag forest' (DellaSala et al. 2014; charcoal or emerging forest also have been used as terms). Dead trees (snags), known as 'biological legacies' (Fig. 7.3a, b), are the most vital structural components of these newly emergent forests as they anchor soils, shield tree seedlings from intense sunlight, and provide habitat for scores of insect-eating bats and birds and other fauna. Scientists are now paying

closer attention to these post-fire forests, because they are under-appreciated and menaced by logging (Swanson et al. 2011; DellaSala et al. 2014; DellaSala and Hanson 2015).

Over the years, I have used my field expertise in an educational role about wildfires. This includes testifying at numerous congressional hearings, debating fellow conservationists about the intrinsic value of burned forests, and being quoted in weekly news stories about how the fires that produce these forests are not an eco-catastrophe as claimed, but rather a natural part of these forests' cycles—Nature's Phoenix (DellaSala and Hanson 2015), if you will. Unlike the plethora of rainforest exhibits and postcards, I am unaware of comparable educational efforts aimed at burned forests; although the National Park Service in Yellowstone routinely gives fire tours to photo-snapping tourists who are at the park presumably for other reasons. Where we go from here will determine the fate of these forests and humanity's relationship to wildfire more generally.

Nature Loses When Anthropocentric Views Dominate

In my three decades as a deep ecologist and conservation biologist, in nearly every case, I have witnessed Nature lose when anthropocentric views predominate. In the case of wildfires, this is because the public mostly regards fire as a predatory nuisance, health hazard (smoke), and safety risk to homes and fire-fighters as hundreds of lives and thousands of structures are sometimes lost in large fires. The nightly news sensationalizes fires barreling down on unprepared communities, including the tragic loss of life and homes, while seldom covering the miracle of forest rejuvenation in processes that follow the subsiding of the flames. Politicians introduce sweeping legislation to log the forest to 'save' it from burning again, and some even blame recent fires on 'lack of logging' such as the recent remarks by President Trump regarding the presumed cause of California fires. Even some conservation groups will tilt the decision space in favor of anthropocentric perceptions of fire at the expense of the complex, rejuvenating role of fires in ecosystems that have evolved with them.

Witness the world's largest international conservation group, TNC, which has gone as far as claiming that through 'active management' (code for certain forms of logging) they can 'prevent smoke and fire' (see SOFRC 2017; Medford Mail Tribune 2018). TNC advocates that thinning (logging) of certain trees in a forest will 'restore' overgrown forests to more 'open park-like' conditions less susceptible to burning (Metlen et al. 2018) even though scientists have questioned these claims (DellaSala et al. 2018).

Organizations like TNC are highly skilled at message-framing, including setting up a false dichotomy of 'good' fire (low severity under-burns) versus 'bad' fire (tree-killing fires, see USDA Forest Service/The Nature Conservancy/Catamount Center for Geography of the Southern Rockies 2005). Instead of solving for the optimal decision space, this view reinforces the public's fear of fire. TNC also has supported

congressional legislation to fund massive fire suppression (TNC 2018a, b) without fully addressing the substantial ecological costs on fire-mediated biodiversity. TNC's anthropocentric view is not only restricted to its western forest policies. In Wisconsin, TNC promotes timber sales for 'restoration' and job creation, making that organization sound more like a logging company than a conservation group (Wisconsin Public Radio 2017).

All of this is masquerading under TNC's mission statement:

> …to conserve the lands and waters on which all life depends. Our vision is a world where the diversity of life thrives, and people act to conserve nature for its own sake and its ability to fulfill our needs and enrich our lives.

While there is no doubt a need to demonstrate how people benefit when Nature is properly protected and stewarded (see below), how far the scales tip one way or the other will determine whether Nature and humans can coexist. Notably, the accountability of wildfire claims is often difficult to track, especially when projects are on long timelines. For instance, in southwest Oregon, TNC claims it can lower fire risks by some 70% by 'treating' 25% of landscapes over a 20-year period (TNC 2018a, b; Medford Mail Tribune 2018). They estimate it will cost >$30 million per year to thin around 105,000 acres annually (for 1.1 million acres this ratchets up to ~$600 million total). Such expenses are costly to implement in practice, leading to escalating pressures to log big fire-resistant trees in order to pay for small tree thinning, as is currently the case for Bureau of Land Management timber sales following TNC's guidance and project approval (DellaSala et al. 2018). Thus, while on paper 'forest management' can be made to sound innocuous, during implementation such management with the approval of TNC can become far more impactful and destructive. In sum, the primary emphasis on anthropocentrism in this situation has led to a complete misunderstanding of the importance of fire-mediated biodiversity, while setting the public up for a false sense of fire security via logging approaches as promoted by the world's largest 'conservation' organization. This is nothing new for TNC, as they have been advocating that conservation biology needs to become more anthropocentric because of the emergence of the 'Anthropocene' (see Kareiva and Marvier 2012 vs. Greenwald et al. 2013 and Noss et al. 2013; Chaps. 1 and 2). Yet as we will see, solving problems for human needs and fire safety does not have to come at the expense of either.

Optimizing the Decision Space

The social and environmental justice movements, in the absence of an ecojustice perspective, will not solve for the ecocide crisis that is occurring globally or locally. Therefore, like Foreman (2012), I challenge my fellow conservationist groups to go back to their conservation roots, not by divorcing the anthropocentric and ecocentric perspectives, but rather by doing a better job of showing how ecojustice can be *compatible* with social and environmental justice and human needs more generally

(human and Nature together, Chap. 1). The key here is not to fall into the proverbial chicken-and-egg trap of 'which comes first'—humans or Nature, as both are sacred and worthy causes (social/environmental justice, ecojustice). Humans need Nature to thrive, as humanity evolved within an integrated relationship with the natural world, but the reverse is certainly not true. Nature does not need humans to persist or thrive (Washington 2013; also see Chap. 1). It then becomes a question of moving from a collision of values to one of humanity living within Nature's means. Whatever we do to Nature, we ultimately do to ourselves, so protecting the natural world and abiding by what it needs to thrive will be in the long-term interest of humanity as well (Treves et al. 2019).

Conservation groups also need to reinvent messaging by embracing humanity as part of Nature, instead of the predominant view that Nature is primarily a 'resource' to be exploited (see Johns and DellaSala 2017 for discussion of the term 'natural resource'). Human systems need to self-regulate by operating within the bounds delimited by a biodiverse world on human population growth and consumption. The consequences of not blending perspectives with a prudent bias toward the ecocentric is that we are approaching unprecedented disrepair of the Earth's life-support systems, especially the biosphere and atmosphere. Since human beings are part of this integrated whole, such damage will undoubtedly cause widespread human suffering as we are already seeing.

I believe in starting with a tilt toward the ecocentric paradigm and then bringing in the compatible anthropocentric elements. If compatibility is operative, then a true 'win-win' situation for ecojustice and social/environmental justice is the desired outcome. If the decision space results in an anthropocentric tilt, then we must go back to the drawing board and solve for ecojustice. The Nature Needs Half (https://natureneedshalf.org/) and Half Earth (http://www.half-earthproject.org/) movements (discussed in Chaps. 1 and 2) are bold visions for human and Nature coexistence on a shrinking planet with a rapidly expanding human footprint. However, these movements need to be coupled with efforts to address runaway consumption, population growth, and growth-based economies (Soskolne 2008; Washington 2015). After all, a living planet full of prospering, biodiverse life and a safe climate is the desirable outcome for everyone. We are thus called to recognize that putting Nature first with an ecocentric tilt is in humanity's best interests (Treves et al. 2019).

For the snag forest, the road ahead is tenuous at best, given that human safety is both paramount and a seemingly insurmountable challenge if we are going to have fire-mediated biodiversity in wild areas. In many ways, we are where the old-growth forest campaign was in the 1980s—old growth was viewed then by foresters as decadent or senescent, with clearcut logging and replanting young vigorously growing trees (i.e. 'we plant two trees for every one that is logged') the desired anthropocentric outcome. Over the years, logging old growth became socially unacceptable through the persistent organizing and effective messaging that aptly blended ecocentric with anthropocentric (ecosystem services) views. Snag forests are now the 'new' old growth—appreciated by few, treated by politicians as decadent/destroyed by fire, and even by some conservation groups as in need of 'restoration' logging and tree planting (the 'Nature needs humans' perspective). In the meantime, conservationists

need to come out of the biodiversity closet, embrace their mission roots, and recalibrate public messaging to show how these underappreciated and increasingly rare forests are intrinsically valuable and part of an important ecological process, while simultaneously addressing human health, safety, and survival needs. Thus, justice for Nature and humans can be thought through and championed together.

The good news is that efforts are underway to do just that. Scientists are increasingly calling on decision-makers to get to coexistence with fire (Moritz et al. 2014; DellaSala and Hanson 2015; Schoennagel et al. 2017; Noss 2018), given no amount of logging ('thinning') will stop or reduce wildfires during extreme fire weather ramped up in our time by a rapidly changing climate. That means providing ecojustice options that solve for human health and safety so that fire can perform its vital ecological role safely in the backcountry—a backcountry that we must allow to become vast again to optimally handle wildfires and protect biodiversity (Treves et al. 2019). Here are some ways to get to coexistence from a western US fire perspective:

- Reduce fire risks to home structures (e.g. build with fire resistant structures and practice defensible space within a ~30-m radius around homes), instead of logging the wildlands which does nothing to protect homes.
- Make developers and governments aware of risks and liabilities of building in fire-unsafe areas via growth containment measures.
- Thin and prescribe-burn flammable plantations (see Bradley et al. 2016; Zald and Dunn 2018) left by industrial-scale logging and reform forestry practices to be 'fire safe' (by ending clearcut logging).
- Keep fossil carbon in the ground by switching to clean-renewable energy, and store more carbon in forest ecosystems by protecting old forests and allowing them to expand to store large amounts of carbon (Law et al. 2018).
- Recognize that we are one of the millions of magnificent species sharing this shrinking planet; we thus have a moral obligation to treat Nature's innumerable denizens as planetary co-inhabitants and to include future generations in our decisions (Treves et al. 2019).

Conservation groups also must change tactics if the desired outcome is Nature conservation. While it is true that a pure-ecocentric perspective has not succeeded in averting catastrophic human impact (witness the sixth mass extinction event and rapid climate change), it is equally true that shifting to a predominately anthropocentric perspective will only temporarily postpone the inevitable catastrophes from boomeranging on humanity. For the largest conservation groups, improving public image and accountability may mean reforming board development to be more aligned with biodiversity/ecocentric mission statements, instead of chasing deep-pocket donors that, in turn, result in mission drift or 'greenwashing' conservation. More biodiversity scientists, ecojustice advocates, and nature philosophers on governing boards would help balance the increasing presence of pro 'business interests.'

Attention to social/environmental justice issues, while worthy in its own right, in the absence of a robust ecojustice stance comes with enormous consequences to the natural world. Conservation investments thus need to include a more *ecocentric focus* that can work harmoniously with social/environmental justice issues. The

lack of funding of ecocentric causes is why most large and even small conservation groups have lost their way. Sadly, the ecocentric platform is no longer financially prosperous; hence, the capitulation in favor of more fundable anthropocentric perspectives. However, by demonstrating that ecojustice and social justice are equally needed and compatible, conservation groups can re-invigorate funders to put more financial resources into ecocentric causes.

For smaller groups that are struggling to exist in an increasingly anthropocentric donor world, this means producing results with clear biodiversity outcomes while motivating the public, donors, and even our fellow colleagues (especially the BINGOs) to step up their conservation investments in order to stem the unprecedented and irreplaceable losses to Nature.

Embracing ecojustice means building on the social justice theme of 'justice for all,' by including *all* life-forms as integral to the social and ecological fabric (Treves et al. 2019). This will enable the emergence of a truly just world where all earthlings (human and nonhuman) prosper. Ecojustice for all life forms means all native species have an inalienable right to exist as planetary co-inhabitants. Getting there will take a concerted and well-funded effort to put humanity back into Nature. As conservationists and cultural creatives, we can take back the ecocentric 'center' from which we came, lest we become part of the problem we seek to resolve. Borrowing on the #MeToo movement—it's time for a #NatureToo movement to rise up from the ashes as the Phoenix that will regenerate humanity by living in justice with Nature, and not at its expense. To get there will take both the social/environmental and ecojustice movements working together for a common cause—a shared thriving world. After all, the alternative, namely destruction of Nature, is especially damaging to minorities and the economically disadvantaged and to all of humanity, sooner or later (see Chap. 1).

References

Bradley, C. M., Hanson, C. T., & DellaSala, D. A. (2016). Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? *Ecosphere, 7,* 1–13.

DellaSala, D. A. (Ed.). (2011). *Temperate and boreal rainforests of the World: Ecology and conservation*. Washington, D.C.: Island Press.

DellaSala, D. A., Bond, M. L., Hanson, C. T., et al. (2014). Complex early seral forests of the Sierra Nevada: What are they and how can they be managed for ecological integrity? *Natural Areas Journal, 34,* 310–324.

DellaSala, D. A. & Hanson, C. T. (Eds.). (2015). *The ecological importance of mixed-severity fires: Nature's phoenix*. Boston, MA.: Elsevier.

DellaSala, D. A., Odion, D., & Baker, W., et al. (2018). Scientific shortcomings and areas of disagreement regarding TNC's Rogue Basin strategy to treat 1.1 million acres of forests in southwest Oregon. https://www.forestlegacies.org/images/projects/fire-tnc-roguebasin-180914.pdf.

Devall, B., & Sessions, G. (1985). *Deep ecology*. Layton, UT: Gibbs M. Smith.

Foreman, D. (2012). *Take back conservation*. Durango, CO: Ravens Eye Press LLC.

Greenwald, N., DellaSala, D. A., & Terborgh, J. W. (2013). Nothing new in Kareiva and Marvier. *BioScience, 63,* 241.

Johns, D., & DellaSala, D. A. (2017). Caring, killing, euphemism and George Orwell: How language choice undercuts our mission. *Biological Conservation, 211,* 174–176.

Kareiva, P., & Marvier, M. (2012). What is conservation science? *BioScience, 62,* 962–969.

Kloor, K. (2015). The battle for the soul of conservation science. *Issues in Science and Technology, 31*(2), 74.

Kopnina, H. (2017). 'Commodification of natural resources and Forest Ecosystem Services: Examining implications for forest protection'. Thematic Issue on Forest Ecosystem Services. *Environmental Conservation, 44,* 24–33.

Law, B. E., Hudiburg, T. W., Berner, L. T., et al. (2018). Land use strategies to mitigate climate change in carbon dense temperate forests. *PNAS*. www.pnas.org/cgi/doi/10.1073/pnas.1720064115.

Lee, D. (2018). Spotted owls and forest fires: a systematic review and meta-analysis of the evidence. *Ecosphere, 9*(7), e02354.

Mackey, B., DellaSala, D. A., Kormos, C., et al. (2014). Policy options for the world's primary forests in multilateral environmental agreements. *Conservation Letters, 8,* 139–147.

Medford Mail Tribune. (2018). We can prevent forest fire smoke. In *One Answer Lies in the Rings*. http://mailtribune.com/news/top-stories/we-can-prevent-forest-fire-smoke.

Metlen, K., Skinner, C. N., Olson, D. R., et al. (2018). Regional and local controls on historical fire regimes in the Rogue River Basin, Oregon, USA. *Forest Ecology and Management, 430,* 43–58.

Moritz, M. A., Battlori, E., Bradstock, R. A., et al. (2014). Learning to coexist with wildfire. *Nature, 515,* 58–66.

Naess, A. (1973). The shallow and the deep, long-range ecology movement. A summary. *Inquiry, 16,* 95–100.

Noss, R. F. (2018). *Fire ecology of the Florida and Southeastern Coastal plain*. Gainsville: University of Florida Press.

Noss, R. F., Nash, R., Paquet, P., et al. (2013). Humanity's domination of nature is part of the problem: a response to Kareiva and Marvier. *BioScience, 63,* 241–242.

Peterson, R. T. (1973). *Peterson birds of North America*. Boston, MA.: Houghton Mifflin Hartcourt.

Schoennagel, T., Balch, J. K., Brenkert-Smith, H., et al. (2017). Adapt to more wildfire in Western North America forests as climate changes. *PNAS, 114,* 4582–4590.

SOFRC (Southern Oregon Forest Restoration Collaborative). (2017). Rogue basin cohesive forest restoration strategy: A collaborative vision for resilient landscapes and fire adapted communities. https://www.researchgate.net/publication/317952738.

Soskolne, C. L. (Ed). (2008). *Sustaining life on Earth: Environmental and human health through global governance*. Lanham, MD.: Lexington Books.

Swanson, M. E., Franklin, J. F., Beschta, R. L., et al. (2011). The forgotten stage of forest succession: Early-successional ecosystems on forested sites. *Frontiers in Ecology and Environment, 9,* 117–125.

TNC. (n.d.). Our mission, vision and values. In *The Nature Conservancy Website*, https://www.nature.org/en-us/about-us/who-we-are/our-mission-vision-and-values/.

TNC. (2018a). Fire-resilient Ashland, https://www.nature.org/en-us/about-us/where-we-work/united-states/oregon/stories-in-oregon/ashland/.

TNC. (2018b). Fix the wildfire funding problem, https://support.nature.org/site/Advocacy?cmd=display&page=UserAction&id=180.

Treves, A., Santiago-Avila, F. J., & Lynn, W. S. (2019). Just preservation. *Biological Conservation, 229,* 134–141.

USDA Forest Service/The Nature Conservancy/Catamount Center for Geography of the Southern Rockies. (2005). Good fire, bad fire. In *How to Think About Forest Land Management and Ecological Processes*, https://www.fs.fed.us/rm/pubs_other/rmrs_2005_kaufmann001.pdf.

USDA Forest Service. (2016). Tongass forest plan amendment, https://www.fs.usda.gov/detail/tongass/landmanagement/?cid=stelprd3801708.

Washington, H. (2013). *Human dependence on nature. How to help solve the environmental crisis*. London: Routledge.
Washington, H. (2015). *Demystifying sustainability: Towards real solutions*. London: Routledge.
Williams, M. (2006). *Deforesting the Earth. From prehistory to global crisis, an abridgment*. Chicago, IL: University of Chicago Press.
Wisconsin Public Radio. (2017). Growing timber sales translates to more conservation work in Northern Wisconsin, https://www.wpr.org/growing-timber-sales-translates-more-conservation-work-northern-wisconsin.
Zald, H. S. J., & Dunn, C. J. (2018). Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape. *Ecological Applications, 28*(4), 1068–1080.

Chapter 8
The Rights of the River: Water, Culture and Ecological Justice

Veronica Strang

Introduction

After nearly 150 years of debate with Māori *iwis* (tribes), and recent intense efforts to bring complex changes through the legal system, the New Zealand Government announced in 2017 that the Whanganui River had been granted the status of a living entity. This defined 'the River from the mountains to the sea, its tributaries, and all its physical and metaphysical elements, as an indivisible and living whole' (New Zealand Government 2017: 129). In accord with the bi-culturalism through which New Zealand/Aotearoa strives to acknowledge the cultural beliefs and values of its indigenous people, the decision was largely a response to the *tikanga* (customs and beliefs) of the Māori people located along and around the river. For them, the river is a living ancestor (*Te Awa Tupua*): an entity indivisible from themselves, and whose well-being is interdependent with their own (Muru-Lanning 2010) (Fig. 8.1).

Although it is more common to draw a distinction between a 'living entity', which may or may not be a person, and 'personhood', which is generally assumed to entail a specific social identity, in this instance, these definitions were conflated. From now on, the new law stated, the river would have rights similar to those granted to corporate 'persons' such as trusts, companies and societies (Stone 1972). '*Te Awa Tupua* is a legal person and has all the rights, powers, duties, and liabilities of a legal person' (Ibid: 14(1)). Nominated individuals—a representative for the Crown and one from the Whanganui *iwi* [tribes]—would have a responsibility to 'speak for' the river and promote its rights and interests, not just in terms of its management and use, but also within the legal system. A new role, *To Pou Tupua* was created by the Bill 'to be the human face of *Te Awa Tupua* and act in the name of *Te Awa Tupua'* (Ibid: 18(2)). Reflecting the relationship between the Māori *iwis* and the River, the Bill lists various functions for this office, including:

V. Strang (✉)
Institute of Advanced Study, Durham University, Cosin's Hall, Durham DH1 3RL, UK
e-mail: veronica.strang@durham.ac.uk; veronica.strang@anthro.ox.ac.uk

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Fig. 8.1 The Whanganui River between Jerusalem and Matahiwi. Wikimedia, Creative Commons

- to act and speak for and on behalf of *Te Awa Tupua*;
- to promote and protect the health and well-being of *Te Awa Tupua*;
- to perform landowner functions with respect to land vested in *Te Awa Tupua* under the legislation;
- to maintain the *Te Awa Tupua* register, which is a register of hearing commissioners qualified to hear and determine applications under the Resource Management Act 1991 for resource consents (a) relating to the Whanganui River: (b) for activities in the Whanganui River catchment that affect the Whanganui River (Ibid. 57. See also New Zealand Government 1991) and
- to administer a contestable trust fund established to 'support the health and well-being of *Te Awa Tupua* (Ibid: 57).

The legal decision provided a settlement of $80m (NZD) in legal redress, and a further $1m to establish a legal framework for the protection of the river, which will also serve, potentially, as a model for similar protective measures elsewhere (Ruru 2013).

The Minister responsible for the Treaty of Waitangi negotiations, Chris Finlayson, noted that the decision brought the longest-running litigation in the country's history to an end:

> *Te Awa Tupua* will have its own legal identity with all the corresponding rights, duties and liabilities of a legal person… The approach of granting legal personality to a river is unique… it responds to the view of the *iwi* of the Whanganui river which has long recognised *Te Awa Tupua* through its traditions, customs and practice. (Roy 2017)

The lead negotiator for the Whanganui *iwi,* Gerrard Albert expressed a hope that the decision would set a precedent. He observed that the decision reflected a basic premise of a Māori worldview in which people considered themselves to be at one with, and having equal status to, the mountains, the rivers and the seas, thus encapsulating the core principles of ecological justice:

> We have fought to find an approximation in law so that all others can understand that from our perspective treating the river as a living entity is the correct way to approach it, as an indivisible whole, instead of the traditional model for the last 100 years of treating it from a perspective of ownership and management. (Roy 2017)

Responses, both within New Zealand/Aotearoa and internationally, represented a spectrum of views. There were those who found it 'inspirational' that such respect and acknowledgement of intrinsic value could be accorded to a river. Comments on newspaper websites (Roy 2017) (anonymised here) included:

> The most uplifting development in how we regard our planet that I think I've ever read about. Pure joy.
>
> Lovely news - I love it when the law is used to stand up for the environment.
>
> This story really made me smile. I'm so glad that there are people fiercely defending the planet we're so keen on destroying.
>
> Bang on! Very proud to be a New Zealander and to see the legitimate interests, and grievances, of Māori recognised and dealt with such innovative measures… People inevitably 'joke' about the river being like a person but this is a very significant and historic event.
>
> What a glorious precedent - recognition that a complex ecosystem really is a living entity.

However, there were also many negative comments on public websites (and quite a few more 'removed by the moderator'). In New Zealand, although some respondents were sympathetic to the history of colonial dispossession and disadvantage that had to be navigated, and to the idea that there was case for redress both for the Māori communities and the river, there was some cynicism about the financial settlement. But the majority of negative comments were those that rejected the notion that a river could be a person, or equal to a person. Reflecting a common tendency to conflate ethical and religious ideas, these often expressed unease with what they saw as the introduction of 'religious' ideas into a purportedly secular legal system.

> You got environmental laws for this. What's next - equating a rock to a human?
>
> I can see how rights will work but how is the river going to meet its 'duties and liabilities as a legal person'? If it floods and damages something will it/the tribe pay compensation?
>
> It has no characteristics of a living entity. Idiocy. It has no sentient capabilities… More religious twaddle made into law. Protect the river, but do it through environmental laws.
>
> Oh dear. I'm all in favour of keeping rivers clean but modern secular states shouldn't make decisions on the basis of religious beliefs.

For the most part, the international coverage provided little or no insight into Māori lifeways, or considered that there might be diverse viewpoints within these. Many commentators nevertheless accepted that the decision was based on accommodating a (rather monolithic) view of indigenous ways of thinking, and welcomed this as a general critique of dominant practices:

> This is the best, most sane item of news I've read for a long long time. The Maoris believe things we all need to believe in order to live honestly in our environment. Thank you New Zealand and the tribe of Whanganui for your flexible thinking and persistence - respectively.

Respondents expressed relatively little anxiety about acknowledging the river as a living entity. However, without the benefit of details about the cultural context,

there was some bafflement as to why this categorisation should apply specifically to a river:

> If a river is a living entity, then so is the rest of the universe … there are all manner of uncontroversial living entities (for example, dragonflies and crocodiles) that would also need to be granted the same legal status as a human being.
>
> If a river can be given human rights, then why not a meadow?

Some people got the point that the objective was to define more egalitarian relationships with the non-human world:

> At last, somewhere, humanity is waking up to the truth. We share this planet equally with all beings and nature's creation.
>
> Like many people here, I was hugely heartened to see this item… We need a better, more accurate way of seeing ourselves, i.e. as an integral part of Nature in which 'we live, move and have our being'.

However, for many commentators, such as the one quoted below, this did not translate into a concept of personhood or legal rights:

> I have tried in vain to find in the article the argument from moving from the river's status as a living entity to granting it the same legal status as a human being.

Protection in Law

The establishment of the Whanganui River as a legal 'person' therefore brought to the fore some pressing questions about how societies define living kinds and personhood; whether non-human species, rivers, or even whole ecosystems should be considered in these terms; and whether they should have legal rights and protection similar or equal to those accorded to human beings. The case also highlighted some more subtle issues about who decides these matters and how, and the extent to which minority views might influence such debates (see Chap. 11, Gray and Curry on ecodemocracy, this volume).

Indigenous communities have long provided inspiration to conservationists' efforts to promote the interests of non-human beings and 'nature' more generally. Though their relations with 'nature' have sometimes been romanticised, respect for non-human well-being is often integral to indigenous beliefs and values, and embedded in their traditional forms of law (Bicker et al. 2004). For example, in Aboriginal Australia, Ancestral Law, transmitted from one generation to the next via stories, images, and performance, often contains homilies about not overusing resources. Kunjen elders in Cape York therefore note instructions about being required to replace the main root in harvesting yams; maintaining sufficient 'spear tree' to allow regrowth; and respecting restrictions on hunting and gathering at sacred sites which, it has been posited, therefore act as generative 'game reserves' (Strang 1997; *see also* Dudley et al. 2009). The long-term persistence of Aboriginal lifeways over millennia suggests that the integration of these values with low resource use and population

control (which Kunjen elders recall as a normal practice prior to colonial settlement) has enabled high levels of social and ecological sustainability.

Attempts to enshrine protection for non-human beings also have a long history in legal systems based on Roman Law. For example, one of the first (written) laws to provide such protection was initiated by St. Cuthbert on Lindisfarne Island in the sixth century, to protect his beloved Eider Ducks, still known locally as 'Cuddy Ducks' because of his efforts. However, despite a plethora of such legislation, particularly in the last century, industrialised societies have adopted wholly unsustainable growth-based economic practices and levels of population expansion. The result is a major failure to protect the needs and interests of non-human beings and ecosystems sufficiently to prevent a massive global reduction in biodiversity and a rate of species loss equivalent to previous mass extinction events (IUCN 2018).

Recognition of this failure has driven a campaign to reframe the debate in terms of legal rights for non-human beings, aiming for some degree of equivalence to human rights, for example those set out in the Declaration of Human Rights established by the United Nations' General Assembly in 1948. These included a right to life, the prohibition of slavery, a right to basic dignity, adequate standards of living, and a range of freedoms (for example in thought, movement, beliefs, and associations).

Such endeavours build on earlier concerns about animal experimentation. The 1990s saw a campaign to extend legal rights and protection to 'higher' primates, in particular chimpanzees, gorillas, orangutans and bonobos. The Great Apes Project, established in 1993 by the philosophers Peter Singer and Paola Cavalieri, argued that 'non-human hominids' should enjoy the right to life, freedom and not to be tortured, and should be regarded as sentient 'persons'. These rights were approved by the Spanish Government, and, as Pedro Pozas, the Spanish director of the Great Apes Project, put it: 'This is a historic day in the struggle for animal rights and in defense of our evolutionary comrades which will doubtless go down in the history of humanity' (Glendinning 2008). Not long afterwards, the British Government passed laws preventing experimentation on chimpanzees, orangutans and gorillas, and in 1999 the New Zealand Government did likewise.

However, Perlo identifies a problem with 'moral schizophrenia' in which, on the one hand, many societies do want to accept that non-human beings should have rights and interests, but at the same time remain unwilling to undertake the changes in behaviour towards them that would reflect any equality in this regard (2009: 4). There is a persistent problem that 'when push comes to shove', good intentions quickly give way to pressing human interests. Thus in the Great Apes campaign, Colin Blakemore (Head of the UK's Medical Research Council 2003–2007), pointed out that, while he was pleased that the great apes were not being used for experiments, a pandemic affecting only human and non-human apes might re-open the case for such research (Glendinning 2008).

This suggests that while the campaign to assert legal rights for non-human beings and 'living entities' is a useful pull towards more reciprocal human-non-human relations, as long as 'push comes to shove' for humankind, as it does most of the time, achieving significant ecological justice is likely to remain challenging.

Recently, there have been increasing efforts to establish legal rights for nature more broadly (Berry 2002; Cullinan 2003; Washington 2013). In response to pressure from its indigenous communities, the Government of Ecuador passed legislation in 2008 securing the 'rights of nature', *Pachamama*, in its Constitution. Bolivia followed suit a few years later with a 'Law for Mother Earth'. As illustrated by the Standing Rock debate, indigenous communities in America have continued to try to apply similarly protective laws based on their own cultural beliefs and values. Their voice is also evident in some State-based campaigns for ecological justice, for example in Washington State (see Washington State Department of Health 2017; Washington Environment Council 2018). At an international level, activists have been campaigning for a UN Declaration specifically protecting the Rights of Nature (Gray and Curry 2016; Schläppy and Grey 2017; *see also* Global Alliance for the Rights of Nature 2018).

New Zealand/Aotearoa itself has gone down this road previously. In a 2014 Waitangi Treaty settlement with the Ngäi Tuhoe *iwi*, their forest homeland, *Te Urewera,* was provided with its own legal identity and, as with the Whanganui River, an arrangement was made through which *iwi* and Crown nominees would act in its best interests (New Zealand Government 2014). There have been attempts to confer similar rights on rivers in various parts of the world, with some success in relation to the Ganges and Yamuna Rivers in India, and the Atrato River in Colombia. A campaign to establish further such rights has been promoted by the Earth Law Centre (ELC). Based in New York and San Francisco, but linked to multiple NGOs internationally, the ELC aspires to be 'a global force of advocates for the rights of nature':

> Just as people have fundamental rights, so too should nature. EARTH LAW is the idea that ecosystems have the right to exist, thrive, and evolve – and that nature should be able to defend its rights in court. EARTH LAW looks at the pressures on the Earth that contribute to the destruction of its ecosystems and species. It then argues that a balanced approach can provide for the entire Earth community, including humans. We envision a future in which humans and nature flourish together. (Earth law Centre website 2018)

The ELC has devised a Universal Declaration of rights for rivers:

> The Earth Law Center is committed to achieving legal personhood for more rivers and waterways. In support of a campaign to establish rights for the Rio Magdalena and other rivers, ELC has developed a draft Universal Declaration of River Rights. The Declaration draws from victories for the rights of rivers worldwide as well as scientific understandings of healthy river systems. (Ibid)

Deepening anxieties about climate change and the destruction of ecosystems have sharpened debates about how to avert catastrophic levels of extinction, environmental degradation, major shortfalls in freshwater supplies and threats to food security. In the last few years there has been somewhat of a confluence of ideas between activist counter-movements and parts of the academy. Philosophical and anthropological ideas about non-human and material worlds have found increasing common ground with the worldviews of indigenous communities and the aims of conservationists (Brightman and Lewis 2017; Chen et al. 2013). Although not going so far as to define rights for non-human beings, a recent initiative by the United Nations to

develop some new *Principles for Water*, has foregrounded the intrinsic value of water (United Nations 2018; Strang 2017). While societies continue to struggle to institute real changes, there is growing recognition that a new intellectual paradigm—a repositioning of humankind in relation to non-human kinds—is needed to move towards more sustainable practices.

However, instituting such fundamental changes—if achievable at all—is a long-term endeavour. Given the lack of impact of previous legislative efforts, and the continuing rise in extinctions, many international activists feel that providing non-human species, rivers and ecosystems with legal rights akin to those accorded to humans is key to ensuring that greater parity and immediacy is given to non-human needs and interests. The comments responding to the announcement regarding the Whanganui River indicate that gaining widespread understanding and support for such rights is challenging. This is something that might benefit from anthropology's capacities for cross-cultural translation, and its abilities to elucidate diverse world-views.

Rivers as Living Kinds

There are several areas of anthropological thinking that illuminate how a river might be considered as a living entity. The first is classic ethnographic research examining how societies think about whether or not things are 'alive'. Atran (1990) observed that, cross-culturally, there is a general expectation of animation—i.e. that things that are alive will move, an idea that is nicely encapsulated in the Biblical phrase defining the difference between: 'the quick and the dead' (King James Bible 1611). However, what is considered to be animate, and the extent to which this overlaps with concepts of animism (which is not the same thing by any means) varies considerably across cultures. For many indigenous communities, things such as rocks, trees, water bodies and entire landscapes may be animated by ancestral or spiritual forces which, in local cosmological terms, renders them 'alive' and sentient (Fig. 8.2).

Aboriginal Australian cultural landscapes provide a useful example. Living as hunter-gatherers for millennia prior to European colonisation, many indigenous communities have maintained permanent relations with the clan 'country' from which, according to their beliefs, they are spiritually generated and to which, at the end of their lives, their spirit must return. This is a sentient landscape, inhabited by the totemic ancestral beings who created the world and its human and non-human inhabitants during the 'early days' of cosmogenesis, commonly called the Dreamtime or Story Time. The ancestral beings remain, held in the land and its waters, as a source of the Ancestral Law that underpins every aspect of Aboriginal life, and as a continued presence that renders the landscape sentient, alive and responsive to human action. Thus ancestral beings inhabiting trees that manifest their presence may 'become' new ones when their current 'home' dies. Objects may become visible, or disappear. Even rocks might be said to 'move around'. In explaining these powers, Kunjen

Fig. 8.2 Kunjen elder Alma Wason beside the Mitchell River on Cape York. Photo, Veronica Strang

elders provide their own translation of ideas, drawing an analogy between ancestral forces and electric batteries, whose charge enables action or animation (Strang 1997).

Similar ideas underpin Māori cultural beliefs in which ancestral beings created the world, also taking non-human form as manifestations of seas, forests, rivers and so forth. Their continued presences composes a sentient, responsive environment which, as Gerrard Albert observed (in 2017), is 'not divisible' from its human inhabitants.

For both Māori and for Aboriginal Australians, then, the non-human world and its material components contain the consciousness and agency of their ancestral beings. In both cases, water itself has a central role, in that it is the substance that carries 'living being' over time. In Australia, this understanding is expressed through the Rainbow Serpent, from which all other beings emerged in the Dreamtime, and which continues to generate all forms of life. In New Zealand/Aotearoa, while water guardian beings such as *taniwha* serve to articulate Māori ideas about the sentience and responsiveness of non-human worlds, rivers are primarily understood more holistically, as the 'living entities' from which life emerges over time. They are thus readily described as the 'living ancestors' of the human communities conjoined with them 'from the mountains to the sea' (New Zealand Government 2017: 129(1)).

For industrialised societies, ideas about 'aliveness' come primarily from science, in which the category of living kinds is generally confined to biological organisms in which there are discernible material processes in motion, such as transpiration and growth in plants, and respiration, circulation etc. in animals. Scientific categories underpin popular understandings that plants are 'alive', but lacking in sentience, and that non-human animal species inhabit some kind of spectrum of sentience or consciousness, with those inhabiting the 'upper' echelons (i.e. those most like humans) assumed to have more intrinsic value in consequence (Singer 1975). The potential to consider a river as a 'living entity' is similarly hampered by a Cartesian view of a material world composed of physical properties and behaviours rather than sentient forces (Oelschlaeger 1991). The 'disenchantment' of science reduces water

to H_2O: a cleaning and irrigating fluid, composed of atoms rather than ancestors (Illich 1986; *see also* Linton 2010).

However, Western societies contain both historical and recent ideas about water that, if brought to the fore, provide some basis for thinking more imaginatively. For those assuming that there is a spiritual dimension of being, there are deep temporal aquifers of beliefs about 'living water' to which Celtic and, Roman societies subscribed, believing its agency to be manifested in aquatic deities; in wells with generative and healing forces; or in 'holy water' imbued with spiritual power (Bord and Bord 1985; Taylor 2010). The extraordinary persistence of such ideas over time is demonstrated in contemporary pagan and New Age beliefs in water's spiritual or healing powers, and in contemporary Christianity, which—having adopted such ideas foundationally—continues to represent water as the substance of the spirit (Tvedt and Oestigaard 2010; Lykke-Syse and Oestigaard 2010).

Those committed to secular ways of thinking are by no means bereft of such ideas. A universal understanding that water is essential to the functionality of all biological organisms also imbues it with a core meaning as the essence of life. In this sense, water 'animates' all living kinds, providing a secular vision of 'quickness' that requires no religious underpinnings. It also provides an important image of interconnectedness that, both materially and imaginatively, locates humankind within the larger non-human world. Such thinking has been articulated via visions of the 'biosphere', first proposed by Vernadsky in the early 1920s (1986), and further developed by Lovelock in his 'Gaia' theory (1987[1979]). Also useful in this regard is the McMenamin and McMenamim (1994) connective notion of the 'Hypersea,' in which they observe that all biological organisms began in a deep aquatic past, so that even after making it onto *terra firma,* they nevertheless retained their total reliance upon a shared irrigating flow—a Hypersea—of water.

Recent anthropological writing on materialism has widened understandings about the dynamic interactions between all material and living kinds (Coole and Frost 2010). Latour (2005) has provided a vision of interacting 'assemblages' of people, non-human beings and things; Tsing has observed the active 'friction' between the material and organic participants in systems (2004); and Bennett (2009) has considered the liveliness of matter. This work foregrounds the 'quickness' of the material world and its active agency in events. Thus Edgeworth highlights the power of rivers in acting upon the landscape, and upon ourselves (2011); Krause looks at how the movements of rivers encapsulate notions of liveliness (2016); and De la Croix highlights the way that water enables concepts of flow (2014). As I have noted in my own work, water also contains its own 'liveliness'. Its material properties—fluidity, reflectivity etc.—mean that it is constantly animated or in motion, and is therefore readily perceived as being alive.

Although the new materialism cited above has sometimes been criticised for downplaying human responsibilities for a destructive Anthropocene, a dynamic view of the world as a flux of lively, interactive processes does make it more feasible to locate all living kinds, including ourselves, within it. Such an inclusive repositioning of humankind is further aided by increasing understandings about non-human living kinds, their cognitive and sensory capacities, and their own ways of engaging with

and perceiving environments. Building on earlier work about human-animal relations (Serpell 1996; Haraway 2008), recent interspecies ethnographies have both illuminated non-human experiences and highlighted the multiple relationalities between living kinds (Kirksey and Helmreich 2010). Such insights into non-human worlds can also serve to strengthen appreciation of their complexities, to evoke wonder, and to heighten concern for their well-being.

Placed within these ways of thinking, the notion of a river as a 'living entity' is not difficult to comprehend, and it is not a much larger stretch to appreciate its generative capacities as a 'living ancestor'. Nor is it hard to see the flow of water that a river represents as part of a wider flow of life processes that are indeed visible as well in a meadow, a forest, or in entire ecosystems. If humans lived for long enough, we would also be able to discern much slower material processes of erosion, entropy etc. As Heraclitus put it, anticipating physicists in their development of rheology, 'everything flows' (πάντα ῥεῖ) (Cratylus n.d.). It is merely a matter of time (Strang 2015). But this reality also highlights the brief temporality of 'persons' which helps to explain why it may be difficult to extend this notion to entities with less visible lifespans.

Rivers as Persons

Anthropological research has articulated considerable cultural diversity in notions of what constitutes a person. Material culture specialists have explored the ways in which personhood is embedded in objects (Csikzentmihalyi and Rochberg-Halton 1981), and as noted above, work on human-animal relations has shown how non-human beings can be quite readily accepted as kin or semi-persons. Also useful is the literature on how wider extensions of social identity and personhood might be considered as manifestations of 'extended mind' (Clark and Chalmers 1998). However, there remains a considerable gap between abstract projections of personhood into things, environments and non-human beings, and a more specific acceptance of non-human beings and things as persons with concomitant legal rights (Kopnina 2017).

While acknowledging rivers as living entities may provide a partial bridge towards this idea, the notion of a river as a person is challenging. Personhood is more generally defined in conjunction with social identity and reflexive consciousness. The notion of 'higher primates' being included as 'evolutionary comrades' (as defined by the Great Apes project) is therefore not impossible to countenance. Many people consider their domestic pets as persons and even kin (and indeed might treat them better than their human relatives), but they still draw a distinction between human and non-human persons. There is a much larger gap between companion animals and the domesticated species categorised as 'food' and, as noted above, with the Cartesian 'disenchantment' of the material world, an even sharper distinction between persons and non-sentient things, including rivers.

For European societies there are further impediments to seeing non-humans as persons. Industrialised economic practices, dependent upon consumerism, are intrinsically exploitative of non-human worlds, and are supported by secular neoliberalism. A heavy influence is maintained by Christian religious beliefs historically containing a deep concern to separate humankind from 'the beasts of the field', and to assume the moral superiority of human (or at least male human) beings. Evolutionary thinking, while promoting a sense of shared origins, has also encouraged a vision of progressive development and hierarchy in which human-non-human relations are intrinsically unequal. Such influences have contributed to notions of 'dominion', and dislocated humanity from a shared sphere of living kinds.

They have also entrenched, over centuries, a dualistic worldview in which (feminised) Nature is 'other' to (masculinised) human Culture, creating a sharp divergence of ideas between societies in which these ideas became dominant, and those for whom such dualism is not meaningful, and who locate their social identity within an undifferentiated human and non-human world (Plumwood 1993). In writing about indigenous Australians, I have described this contrast as a concept of Nature as 'Self' and 'Other' (Strang 2005; *see also* Kopnina 2016; Rolston 2001). Ingold (2000) proposed a similar division between those dwelling 'in' and 'on' the earth, commenting that 'the world can only exist as nature for a being who does not belong there' (P. 20). It has been argued that culture may be seen as a (distinctive) part of nature (Gare 1995; Plumwood 2002), which quite reasonably implies that culture is simply a thing that humans do. Anthropological work on cultural landscapes (Bender 1993) has made it clear that these emerge from both human and non-human agencies. However, common definitions of culture as a product of specifically human activities, and persistent ideas about nature as 'other', present some risk that defining the 'rights of nature', while potentially upholding non-human rights, may also reaffirm a flawed perceptual dualism between Nature and Culture.

Identification *with* the non-human is clearly important in defining the extent to which it is seen as something that must be protected (Naess 1985; *see also* Milton 2002). How does such co-identification come about? Close affective attachment to places and their non-human inhabitants often goes hand in hand with belief systems that include non-human (totemic) ancestral beings (Morris 2000). This enables a powerful co-identification that embraces the non-human as 'self' rather than 'other'. Returning to our ethnographic examples above, in Cape York, clans are typically 'descended from' ancestral beings in the form of animals, birds, and elements of the material world, such as clouds or floodwaters. And, because water embodies the Rainbow Serpent itself, which is the source of all ancestral beings, rivers and water sources are particularly imbued with a powerful ancestral presence (Strang 1997, 2009).

Māori creation stories similarly involve non-human deities such as Tane, the God of the Forest, and describe both human and non-human ancestral beings, with multiple stories about ancestral *taniwha* (water beings). Older renditions of such stories are quite literal:

> Of all the descendants of Rua-pani, the Ngati-Hine-hika and Ngati-Pohatu, of Te Reinga, are perhaps the most interesting… Their ancestor Tane-kino… is said to have intermarried with a race of Taniwha, who were the original inhabitants of the Whakapunake mountain and Te Reinga falls… From the tale told by Ngati-Hine-hika, it would seem that the first six generations… were not quite men or women as we understand the term at the present day, but were a species of man-god, or substantial water-spirit. (Gudgeon 1897: 180)

Today, just as Biblical accounts are now more fully recognised as metaphorical devices, Māori are more likely to present such stories as a way of thinking about the generative powers, the spiritual essence (*mauri*) of the non-human world, encapsulated in more abstract terms such as 'living ancestor' or 'living entity'.

On both sides of the Tasman Sea, then, the landscape is the spiritual and material substance of human persons: just as the well-being of Māori people and their homelands is seen as mutually interdependent, Aboriginal elders in Cape York describe how people are 'grown up by' and composed of their country (Strang 1997). The well-being of both is so closely intertwined that negative impacts upon one are believed to have a detrimental effect upon the other. This intimate sense of interconnectedness, and the capacity to co-identify with non-human beings, is a powerful projection of personhood, and thus a substantial basis for describing a river as a legal person.

As indigenous communities have achieved an influential voice in conversations across global networks, ideas about more equal and collaborative relations with non-human worlds are coming to the fore, and now form the basis of much ethical debate. Some degree of co-identification with the non-human is implicit in some of the ideas outlined earlier: for example in the notion of the biosphere (Vernadsky 1986), in Lovelock's Gaia theory (1987[1979]), or in the 'connected by water' vision of the Hypersea (McMenamin and McMenamin 1994). However, these are quite large and abstract concepts with rather less affective force than is provided by the 'ancestral' co-relations that form the basis of identity for many indigenous communities. In industrialised societies, then, the challenge is how to give real immediacy to ideas that reposition humankind more collaboratively amongst all living kinds.

Conclusion

As the ethnographic examples above suggest, a willingness to consider rivers as persons is more than an intellectual exercise. Enshrining non-human rights in law is fundamentally a statement of values, and—as relationships between beliefs and values and actions are recursive—a pragmatic view might be that to establish legal rights for rivers in the first place will initiate a relational shift. However, there is clearly a need to follow through by expressing these values in practice. The indigenous lifeways described above demonstrate that achieving more egalitarian and reciprocal human-environmental relationships means integrating such beliefs and values in all domains, including social and economic activities. In practice, for larger societies, this means that efforts to rethink relations with non-human beings must be accompanied by real striving to reduce the pressure of human needs and interests:

by addressing population issues; by cutting excessive resource exploitation, and by eschewing short-termist capitalist ideologies and over-dependence on growth-based economic systems.

Here too, indigenous lifeways—though not replicable on a larger scale—can suggest some principles that might be applied to practical questions, for example in thinking about ways that water infrastructures are designed and employed. To change the ways that we engage with and make use of rivers is a large task, but thinking about them as living entities, and promoting their legal rights as persons, is surely a good place to start.

References

Atran, S. (1990). *Cognitive foundations of natural history*. Cambridge, NY: Cambridge University Press.

Bender, B. (1993). *Landscape, politics and perspectives*. Oxford, NY: Berg.

Bennett, J. (2009). *Vibrant matter: A political ecology of things*. Durham, NC, London: Duke University Press.

Berry, T. (2002). Rights of the Earth: Recognising the rights of all living things. In *Resurgence, 214*, https://www.resurgence.org/magazine/author2-thomas-berry.html.

Bicker, A., Pottier, J., & Sillitoe, P. (Eds.). (2004). *Development and local knowledge: New approaches to issues in natural resources management, conservation and agriculture*. London: Routledge.

Bord, J., & Bord, C. (1985). *Sacred waters: Holy wells and water lore in Britain and Ireland*. London, Toronto, Sydney, New York: Granada.

Brightman, M., & Lewis, J. (Eds.). (2017). *Anthropological visions of sustainable futures*. London, New York: Palgrave.

Chen, C., Macleod, J., & Neimanis, A. (Eds.). (2013). *Thinking with water*. Montreal: McGill-Queens University Press.

Clark, A., & Chalmers, D. (1998). The extended mind. *Analysis, 58*(1), 7–19.

Coole, D., & Frost, S. (Eds.). (2010). *New materialisms: Ontology, agency and politics*. Durham NC, London: Duke University Press.

Cratylus. (n.d.). Works of cratylus. In *Paragraph 401 Section d. Line 5*.

Cullinan, C. (2003). *Wild law: A manifesto for Earth justice*. Totnes: Green.

Csikszentmihalyi, M. & Rochberg-Halton, E. (1981). *The meaning of things: domestic symbols and the self.* Cambridge: Cambridge University Press.

Dudley, N., Higgins-Zogib, L., & Mansourian, S. (2009). The links between protected areas, faiths and sacred sites. *Conservation Biology, 23*(3), 568–577.

Earth Law Centre. (2018). *Universal declaration of river rights*. https://therightsofnature.org/rights-of-nature-laws/universal-declaration-of-river-rights/.

Edgeworth, M. (2011). *Fluid pasts: Archaeology of flow*. London, Oxford, New York: Bloomsbury Academic Press.

Féaux de la Croix, J. (2014). 'Everybody Loves Flow': On the art of rescuing a word from its users. *Suomen Antropologi: Journal of the Finnish Anthropological Society, 39*(2), 97–99.

Gare, A. (1995). *Postmodernism and the environmental crisis*. London, New York: Routledge.

Glendinning, L. (2008). Spanish parliament approves 'Human Rights' for Apes. In *The Guardian*, June 26, 2008. https://www.theguardian.com/world/2008/jun/26/humanrights.animalwelfare.

Global Alliance for the Rights of Nature. (2018). http://therightsofnature.org/.

Gray, J., & Curry, P. (2016). Ecodemocracy: Helping wildlife's right to survive. *ECOS, 37*(1), 18–27.

Gudgeon, W. (1897). The maori tribes of the east coast: Those inhabiting the Wairoa District of Northern Hawke's Bay. *The Journal of the Polynesian Society, 6*(4), 177–186.
Haraway, D. (2008). *When species meet*. Minneapolis: University of Minnesota Press.
Illich, I. (1986). *H_2O and the waters of forgetfulness*. London, New York: Marion Boyars.
Ingold, T. (2000). *Perceptions of the environment* (p. 20). London, New York: Routledge.
International Union for the Conservation of Nature (IUCN). (2018). http://www.iucnredlist.org/about/summary-statistics.
King James Bible. (1611). *Apostles 10*, 42.
Kirksey, S., & Helmreich, S. (2010). The emergence of multispecies ethnography. *Cultural Anthropology, 25*(4), 545–576.
Krause, F. (2016). Making space along the Kemi River: A fluvial geography in Finnish Lapland. *Cultural Geographies, 24*(2), 279–294.
Kopnina, H. (2016). 'Rejoinder: Discussing dichotomies with colleagues' Special Forum: Environmental and Social Justice? The Ethics of the Anthropological Gaze. *Anthropological Forum, 26*(4), 445–449.
Kopnina, H. (2017). Beyond multispecies ethnography: Engaging with violence and animal rights in anthropology. *Critique of Anthropology, 37*(3), 333–357.
Latour, B. (2005). *Reassembling the social: An introduction to actor network theory*. Oxford, New York: Oxford University Press.
Linton, J. (2010). *What is water? The history of a modern abstraction*. Vancouver, Toronto: University of British Colombia Press.
Lovelock, J. (1987[1979]). *Gaia: A new look at life on earth*. Oxford: Oxford University Press.
Lykke-Syse, K., & Oestigaard, T. (Eds.). (2010). *Perceptions of water in Britain from early modern times to the present: An introduction*. Bergen: BRIC Press.
McMenamin, M., & McMenamin, D. (1994). *Hypersea: Life on the land*. New York: Columbia University Press.
Milton, K. (2002). *Loving Nature: Towards an ecology of emotion*. London, New York: Routledge.
Morris, B. (2000). *Animals and ancestors: An ethnography* (pp. 31–69). Oxford, New York: Berg.
Muru-Lanning M. (2010). *Tupuna Awa and Te Awa Tupuna: Competing discourses of the Wakiato River* (Ph.D. Thesis). University of Auckland.
Naess, A. (1985). Identification as a source of deep ecological attitudes. In M. Tobias (Ed.), *Deep ecology*. San Diego, CA: Avant Books.
New Zealand Government. (1991). *Resource Management Act. Parliamentary Counsel Office, Te Tari Tohutohu Pāremata,* http://www.legislation.govt.nz/act/public/1991/0069/208.0/DLM230265.html.
New Zealand Government. (2014). *Te Urewera Act. Parliamentary Counsel Office, Te Tari Tohutohu Pāremata,* http://www.legislation.govt.nz/act/public/2014/0051/latest/DLM6183601.html.
New Zealand Government. (2017). *Te Awa Tupua (Whanganui River) Claims Settlement Bill. Parliamentary Counsel Office, Te Tari Tohutohu Pāremata,* http://www.legislation.govt.nz/bill/government/2016/0129/latest/DLM6830851.html?src=qs.
Oelschlaeger, M. (1991). *The idea of wilderness: From prehistory to the age of ecology*. Newhaven and London: Yale University Press.
Plumwood, V. (1993). *Feminism and the mastery of nature*. London, New York: Routledge.
Plumwood, V. (2002). *Environmental culture: The ecological crisis of reason*. London, New York: Routledge.
Rolston, H. III. (2001). Natural and unnatural; wild and cultural. In *Western North American Naturalist* (Vol. 61, No. 3, Article 4). https://scholarsarchive.byu.edu/wnan/vol61/iss3/4.
Roy, E. (2017). New Zealand river granted same legal rights as human being. In *The Guardian*, March 16, 2017, https://www.theguardian.com/world/2017/mar/16/new-zealand-river-granted-same-legal-rights-as-human-being.

Ruru, J. (2013). Indigenous restitution in settling water claims: The developing cultural and commercial redress opportunities in Aotearoa, New Zealand. *Pacific Rim Law and Policy Journal, 22*(2), 311–328. http://www.digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/22PRLPJ311.pdf.

Schläppy, M.-L., & Gray, J. J. (2017). Rights of nature: A report on a conference in Switzerland. *The Ecological Citizen, 1*(1), 95–96.

Serpell, J. (1996). *In the company of animals: A study of human-animal relationships*. Cambridge; New York: Cambridge University Press.

Singer, P. (1975). *Animal liberation*. London: The Bodley Head.

Stone, C. D. (1972). Should trees have standing: Toward legal rights for natural objects. *Southern California Law Review, 45,* 450–487.

Strang, V. (1997). *Uncommon ground: Cultural landscapes and environmental values*. Oxford, New York: Berg.

Strang, V. (2005). 'Knowing me, knowing you: Aboriginal and Euro-Australian concepts of nature as self and other. *Worldviews, 9*(1), 25–56.

Strang, V. (2009). Water and indigenous religion: Aboriginal Australia. In T. Tvedt & T. Oestigaard (Eds.), *The idea of water* (pp. 343–377). London: I.B Tauris.

Strang, V. (2015). On the matter of time. *Interdisciplinary Science Reviews, 40*(2), 101–123.

Strang, V. (2017). Valuing the cultural and spiritual dimensions of water In *Report to the United Nations High-Level Panel on Water*.

Taylor, B. (2010). *Dark green religion: Nature, spirituality and the planetary future*. Berkeley, Los Angeles: University of California Press.

Tsing, A. (2004). *Friction: An ethnography of global connections*. Princeton and Oxford: Princeton University Press.

Tvedt, T., & Oestigaard, T. (Eds.). (2010). *The ideas of water from antiquity to modern times*. Tauris: London. I.B.

United Nations. (2018). *Principles for water,* https://sustainabledevelopment.un.org/content/documents/17825HLPW_Outcome.pdf.

Vernadsky, V. (1986). *The biosphere*. Oracle, AZ: Synergetic Press.

Washington, H. (2013). *Human dependence on nature: How to help solve the ecological crisis*. London, New York: Routledge.

Washington Environmental Council. (2018). https://wecprotects.org/about-us/.

Washington State Department of Health. (2017). *Environmental justice issues—Washington tracking network (WTN)*, https://www.doh.wa.gov/DataandStatisticalReports/EnvironmentalHealth/WashingtonTrackingNetworkWTN/Resources/EnvironmentalJusticeIssues.

Wills Perlo, K. (2009). *Kinship and killing: The animal in world religions*. New York: Colombia University Press.

Chapter 9
Strengthening Traditional Environmental Knowledge for the Integration of Social and Ecological Justice

Alessio Thomasberger

Introduction

This chapter considers the conservation aspects of increasing deforestation for charcoal production in Ghana, and the way in which Traditional Environmental Knowledge (TEK) relates to this. The previous chapter (Chap. 8 by Strang in this volume) discussed that implementing indigenous beliefs into constitutions is not enough to reach egalitarianism between humans and non-human beings, but that relationality must reach all domains of society. The focus of this chapter is on the role of existing TEK for the implementation of social and ecological justice in the local context of Dawadawa 2, Ghana.

In the transitional forest/savannah zone in Ghana, between the cities of Kintampo and Buipe, there are eight communities along the N10 highway in the Kintampo north district that produce large amounts of charcoal. One of these communities is Dawadawa 2. From January to March 2017 I conducted field research (Thomasberger 2017) on the charcoal supply chain in Ghana. Undertaking participant observation, Dawadawa 2 was my focal field site. I lived for ten weeks among community members, out of which I spent six actively accompanying charcoal producers as they undertook their charcoal production process. Living among community members gave me insights into the reasons why people seek to engage in charcoal production.

The research was separated into two parts: First, I engaged in qualitative data collection. In the second part the collected data was verified among other households in the immediate community, and where possible with residents of other villages in the area. It is through an analysis of this data, collected among farmers who engage in deforestation for charcoal production, that I discuss the integration of social and ecological justice, and why it is necessary for successful conservation in an area of deforestation.

A. Thomasberger (✉)
Leiden University, Leiden, The Netherlands
e-mail: alessio_thomasberger@posteo.de

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The need for the integration of social and ecological justice is at the center of the first two chapters of this volume. It has been noted that the ecocentric worldview, affiliated to ecojustice advocates, coheres with (and is influenced by) TEK in terms of biotic kinship ethics (Washington et al. 2018). However, there has not been a lot of discussion regarding what role TEK actually plays for the integration of social and ecological justice in rural and threatened environments in which TEK is still present around the world. 'Threatened' here refers to any activity, such as deforestation, mining or agriculture that may cause damage to the natural environment.

In the following part of this chapter, TEK in general, and in Dawadawa 2 in particular, will be considered. Thereafter, the background of charcoal production and justice will be considered in Ghana. Then the relevance of charcoal production for deforestation and conservation will be stressed. Thereafter, this chapter discusses the relevance of an implementation of social justice with ecological justice, and the role TEK must play in this process and for conservation. The threats responsible for declining TEK will be clarified.

Traditional Environmental Knowledge

TEK is an 'umbrella-term' that refers to a society's (generally indigenous) 'body of knowledge' with regards to the relationship between natural and human entities. One definition, provided by Berkes (1993: 3), defines it as:

> … a cumulative body of knowledge, belief, and practice, evolving by accumulation of TEK and handed down through generations through traditional songs, stories and beliefs. It is concerned with the relationship of living beings (including human) with their traditional groups and with their environment.

With Berkes' definition in mind, the relevance of TEK for conservation should be considered in regard to the integration of social and ecological justice. Curry (2011: 175) argues that "at the heart of non-modern sustainability… is a mixture of local or bioregional scientifically ecological wisdom" which, along with animism and socio-political ethics, makes up TEK. TEK is often reflected in biotic kinship beliefs and a belief in a 'great spirit' and/or attributes personhood to prey animals (e.g. Ingold 2002), wild animals, or landscapes such as mountains or rivers (see Chap. 8 by Strang in this volume). It evolves over time (Berkes 1993) and is applied differently around the world (Taylor 2010; Sponsel 2013). The ecocentric aspect of TEK, which can assist regarding sustainable living with nature, not only makes TEK relevant to the implementation of social and ecological justice, but also makes it intrinsically important for conservation itself. Boafo et al. (2016) note that in Ghana there has been a growing interest in TEK in regard to assisting sustainable resource use in the past decades. However, although a wide variety of TEK has been reported in rural areas (Abayie-Boateng 1998; Appiah-Opoku and Hyma 1999), it seems to be in decline in Ghana (Millar 2003; Gyampoh et al. 2008).

In Dawadawa 2, TEK was predominantly spiritual. As the tribes in Dawadawa 2 migrated to the area around the time when the British commenced building the N10 highway, their spiritual connection to the land in Dawadawa 2 is arguably weaker in comparison to their spiritual relation to their 'homeland'. For example, burial procedures involving spiritual contestations only took place in an individual's 'place of origin'. Meanwhile, people's local ecological wisdom included knowledge about plants, and this was partly reflected through specific taboos that set specific rules and framed their relation to specific animals and plants. For my informants, some wild animals and trees were seen as being inhabited by spirits; the same spirits are seen as also inhabiting humans. This contributed to a reciprocal relation of humans to some beings in nature.

However, although TEK was relatively weak in Dawadawa 2—as the first tribes only arrived some 100 years ago—my research indicates that the real problem seems to come from globalizing modernity; the exploitative 'nature' of neoliberalism's market forces, and consumerism. Regarding its relation to nature TEK can be considered to oppose 'modernity' because the latter is anthropocentric and therefore values nature as lifeless 'matter in motion' (Oelschlaeger 1991), which is assumed to exist as a servant of human development and economic growth (Crist 2012). TEK, on the other hand, is predominantly ecocentric (Curry 2011) and coheres to the realm of ecological ethics, relationality and care for nature with ecojustice. Faced with this context, TEK would be hard–pressed to evolve to counteract modernity. The possible reasons for a decline of TEK in Dawadawa 2 (and arguably all of Ghana) will be considered later.

Background of Charcoal Production in Dawadawa 2

Good environmental conditions for growing rice, maize, beans and yam have attracted migrating farmers to the area. About ten different tribes have settled in the community of Dawadawa 2 to farm on the communal land, under the administrative rule of a chief. From what I learnt during fieldwork, many of its inhabitants retained ties to their 'homeland' in the north.

For the majority of tribes in Dawadawa 2 farming has always been their traditional livelihood, and most of its inhabitants would consider themselves farmers. However, among the last migrating tribes to arrive in the area were the Sissala. In 1978, 46 Sissala tribesmen migrated to Dawadawa 2. They were traditionally blacksmiths, and consequently, experts in the production of charcoal. As a result, the Sissala have progressively introduced their charcoal production knowledge to the larger community. Although it is common in Sub-Saharan Africa for farmers to engage in alternative livelihood activities, such as charcoal production, during the dry season (e.g. Jansen 2010) at the time of my research, the seeds that people were using for the upcoming farming season in Dawadawa 2 were bought using the money they had made from charcoal production. This indicates that charcoal production has gradually

Fig. 9.1 Charcoal is collected after the carbonization process in an artisanal oven. *Photo* Alessio Thomasberger

become the farmers main source of income, and therefore something to rely on (as opposed to a side-activity) (Fig. 9.1).

Approximately 2.2 million Ghanaian households are dependent on charcoal for cooking and heating their homes (UNDP 2014). The cities of Accra and Kumasi alone consume 80% of all charcoal produced (Obiri et al. 2014). Around 98,000 people in Ghana make their livelihood from charcoal (Mafro 2010), making it a significant part of the national economy by providing income and employment. However, in the last 50 years Ghana has lost 90% of its primary rainforest for bushfires, gold mining, agriculture and use for fuel (Mongabay 2006). Deforestation for unsustainable charcoal production on the African continent accounts for a loss of 3 million ha of forest, an area the size of Belgium, annually (Sousa 2017). In Ghana this equates to an average loss of 135,000 ha or 2% of forest per year, which is one of the highest deforestation rates in the world (Gyampoh 2011). Much of the Ghanaian forest loss is due to charcoal production (Obiri et al. 2014). Thus, while charcoal production may secure people's livelihoods, it has disastrous consequences for nature. Dawadawa 2 is a community in the Brong-Ahafo Region, which produces 40% of Ghana's charcoal (UNDP 2014).

Deforestation for charcoal production is supposedly controlled by Ghanaian laws. The 1927 Forest Act was consolidated by the Ghanaian post-colonial government, which declared all forest land, whether private, communal and governmental as forests reserves. Offences towards forests were newly codified with the 1975 Forest Protection Act and the 1998 Timber Resource Management Act condemning and prohibiting all unregistered use of forests reserve land. However, these laws do not seem to be enforced due to the economic significance of charcoal production today.

The Impact of Population

Population growth matters anywhere, as it produces a growing ecological footprint (Engelman 2010). Ghana's population, however, grows at an average of 2.2% per annum, which is one of the fastest growing populations in the world. While in Ghana about 30% of the population are below the age of 14 (Worldometers 2018), in rural Dawadawa 2 it was not uncommon for a married woman to be the mother of 5–10 children. More children result in more intensified subsistence agriculture as the pressure to feed mouths rises. Rising population, therefore, is thus clearly a contributor to deforestation.

The disturbing impact of cattle as well as inconsistent rainfall, which has in the past caused four consecutive years of bad harvests, were reasons for the farmers to engage in charcoal production (Thomasberger 2017). This contextual backdrop of growing economic pressures, combined with population growth, were the central ongoing pressures that drove many of Dawadawa 2's inhabitants to look for alternative land uses, and/or alternative livelihoods.

Farmers were likely to take higher risks under growing pressures. Risks are reflected in their growing dependency on products like fertilizers for intensified agriculture, which has a negative effect on nature. Intensified agriculture does not only refer to the increased clearing and preparing of land, but also a toxification of land, rivers and groundwater, by pesticides and fertilizers and growing CO_2 release (Fianko et al. 2011).

Debt/Creditor Relations in Charcoal Production

Credits from rural banks created long-term debt relations for farmers. Farmers received seeds and fertilizers from their creditor, and some were not able to reimburse their debts. According to my informants, the only possible option to boost their financial income seemed to be part of a local microfinance system based on charcoal production.

The charcoal microfinance system has become the backbone of the Dawdawa 2 community in times of crisis. Central to this were the creditors, or 'Road Side Sellers' who gave credits in form of money to farmers, and received charcoal as payment. They then sold charcoal directly to their business partners, as well as on the market. For the creditors it was crucial that credits were only reimbursed via charcoal production. The relative independence of charcoal production from short-term environmental variabilities, provided farmers the security that they could repay their debts. For farmers, the reasons for entering charcoal debt relations can be succinctly categorized: food, seeds, school fees, donations for funerals, medicine and debts at rural banks. The majority of farmers thus engaged in charcoal production to satisfy their basic needs (Thomasberger 2017).

How Does Charcoal Production Relate to Deforestation and Conservation?

As no meaningful afforestation is taking place in Dawadawa 2, nor for the whole of Ghana, charcoal production is fundamentally unsustainable as it necessitates continued deforestation. Globally, deforestation is estimated to contribute 15% of anthropogenically caused CO_2 emissions (Engelman 2010), threatening life for human and non-human beings alike. Beyond the release of CO_2 emissions, unsustainable charcoal production, in terms of deforestation, contributes to biodiversity loss and thus is a serious problem for conservation.

Conservation by definition is the "preservation, protection, or restoration of the natural environment and of wildlife" (Oxford Dictionary 2018). The general 'tool' of conservation is the establishment of Protected Areas (PAs), which are established to protect wildlife, biodiversity and 'natural resources' (Adams 2009). In Ghana, twenty-one wildlife protected areas have been established, totaling 1,347,600 ha or 5.6% of the country (IUCN/PAPACO 2010). While PAs have greatly increased in the past decades in Ghana (Abukari and Mwalyosi 2018), Wilson (2016) argues that the expansion of PAs to at least 50% of the total land surface of the globe is necessary to curb biodiversity loss. Adams (2009), however, notes that wildlife is not secured by simply expanding PAs, as wildlife is not limited to these areas. Conservation, therefore, is clearly relevant beyond PAs, and the case of Dawadawa 2 is relevant for understanding the problems that conservation faces outside of these protected areas.

What Justice? The Role of Justice for Conservation in Dawadawa 2

The Conflict Between Social Justice and Conservation in Dawadawa 2

Scholars have argued that social, as well as environmental justice, is not concerned with the environment per se, being instead a fair distribution of resources among humans (see Chaps. 1 and 2) (Kopnina et al. 2018; Washington et al. 2018). This makes them anthropocentric (Ibid.). The case of Dawadawa 2 shows why this is insufficient for conservation, and arguably explains why many conservation strategies fail.

Measures for social protection are not at play in Dawadawa 2 beyond schooling and basic medical care. Rising market pressures create social pressures that conflict with forest protection laws. To protect forests, informal chainsaw milling was prohibited by the Ghanaian government in 1998 (Obiri et al. 2014). In 2017, however, it was clear that the law was not being enforced by the responsible institutions in the area where I was conducting my research. The Forestry Commission, the governmental institution

in charge of protecting forests and enforcing relevant laws, was so underfunded that it was unable to replant a sufficient number of trees, and (unwilling to) enforce the law. The same institution receives 1 Ghana Cedi (~0.20 €) in tax fees per bag of charcoal. The Forestry Commission thus relies on income from charcoal production. This is paradoxical as this is a key cause of forest loss. This conflict of interest is undoubtedly key to comprehending why the institution in charge of protecting forests and wildlife is seemingly inactive; because a primary source of funds comes from the commodification of the very forests that it is in place to protect. As stated on the commission's homepage:

> The Forestry Commission of Ghana is responsible for the regulation and *utilization* of forest and wildlife *resources*, the conservation and management of those resources and the coordination of policies related to them (FCG 2018). (my emphasis)

This is clearly operating from an anthropocentric stance. The head Forestry Commissioner of the Kintampo South District—the district to the south of Dawadawa 2—pointed to the economically challenging situation of the farmers legitimizing the absence of law enforcement. In Dawadawa 2, forests on communal land are recognized protection zones from chainsaw milling. However, when social issues caused by the neoliberal market for charcoal arose, their legal protection status was ignored by the very institution that is in charge of protecting forests and wildlife. This is because the Forestry Commission is not really about 'conservation' but the 'utilization of forest and wildlife resources' for humans. This is a typical failure in society, and has been called the 'greater value assumption', an assumption that prioritizes humans before nature (Curry 2011). People are portrayed as having 'greater value', in this case, than trees, and are therefore legitimized to continue resource extraction. This is a short-sighted and anthropocentric approach to conservation, and in Dawadawa 2 it has disastrous consequences for nature. It will also consequently negatively affect humans in the long-term. Prioritizing human before ecological needs leads to a dead end; firstly, the destruction of nature and secondly, it threatens humans (who depend on nature).

The case of Dawadawa 2 shows this clearly: while charcoal production secured the continuation of the farmers' livelihood in the short term, it threatens to destroy the very natural foundation of their livelihood in the long term. Forests produce humidity, which in the form of clouds brings rain; thus forests themselves work 'as a hydrological pump' to bring greater rainfall (Makarieva and Gorshkov 2007). Cutting down forests is not only disastrous for nature, but rural communities in particular are directly dependent on trees, wildlife as well as ecologically biodiverse areas (Gyampoh et al. 2008). In the case of Dawadawa 2 this is clear through the correlation of inconsistent rainfalls and bad harvests. Thus, in the long term, the destruction of nature through charcoal production rebounds on the inhabitants. This shows that prioritizing humans and the market (neoliberalism) before ecological justice is completely insufficient for conservation. Moreover, such a process will simply lead to greater social injustice in the future.

Stressing the relevance of an 'equalization of justice' or, in other words, the integration of social and ecological justice, I pose the question: "Where would a

'fairer' distribution among humans and more 'effective' use of 'resources' in terms of charcoal and forests lead in the case of Dawadawa 2?".

The UNDP (2014), consider the implementation of more effective artisanal ovens for more 'sustainable' charcoal production. This is not a meaningful change to the situation/threats of farmers and their destructive impact on nature at present. More efficient ovens may lead to a short-term economic gain, as people earn more money. However, any efforts of efficiency are likely to be offset by population growth and a growing demand for energy and resources. What is considered 'sustainable' charcoal production by the UNDP would only help people make a living through a *slower* destruction of the natural areas that both humans and non-human beings depend on. This is similar to what Braungart and McDonough (2002) point out; that 'eco-efficiency' at best only *slows* the process of harming nature. Efficiency in this context, therefore, is not sustainable, but simply prolongs exploitation, and does little to solve the problem at its root cause.

Integrating Ecojustice—A Way Towards Bridging the Conflict Between Social Justice and Conservation—And the Role of TEK

Advocates of ecojustice have been accused by some scholars of being misanthropic and have been held responsible for advocating 'green violence' (e.g. Fletcher 2014). Such arguments, however, have falsely categorized the negative effects of wildlife preservation on local human communities in economic terms as well as land rights (Shoreman-Ouimet and Kopnina 2015). The authors of this volume, as well as Shoreman-Ouimet and Kopnina (2015) and Washington et al. (2018) argue that ecological sustainability is really about the reconciliation of social and ecological justice to achieve what conservation is (and should be) about: conservation of nature, biodiversity and geodiversity. A reconciliation such as this is relevant because it can help curb neoliberal resource extraction. Applying justice to 'resources' equates to a more equal protection of human and non-human beings alike. Ecocentrism and ecojustice respect the intrinsic value of non-human beings and thereby counteracts the dominating 'greater value assumption' (Curry 2011) and opposes the sole application of value to nature based on its human utilitarian value (Crist 2012).

Scholars have been arguing that social justice is caught within the same paradigm that is the main cause of biodiversity loss at present—anthropocentrism (see chapters by DellaSala and Washington). Against the backdrop of the sixth—but first anthropogenically caused—mass extinction in the history of the planet, the integration of social and ecological justice advocates a change from anthropocentrism to ecocentrism in conservation. The main difference of the two poles of eco- and anthropo-centrism manifests itself in the way humans perceive and position themselves within the natural world with regards to an applied (or non-applied) moral value to non-human beings (Washington et al. 2018). Ecocentrism operates through

Fig. 9.2 The eyes of a caiman in a nearby river which is used to fetch water, wash clothes and recreation. *Photo* Alessio Thomasberger

respectful relations between humans and nature (e.g. Curry 2011). Such respectful relations to some wild animals were inherent in the TEK of the people in Dawadawa 2. Caimans, were one species that were valued. During the rainy season they could be spotted in the village and in the dry season caimans retreated to the river basins. The same basins were used by the inhabitants of the human community for washing, water collection and recreation. People did not *like* caimans, as every few years a person was killed by one. However, my informants reported that taboos existed on killing them, as in their spiritual beliefs *personhood* was applied to caimans. The people feared them, but caimans and humans had learned to live side by side. This demonstrated a respectful relation between caimans and humans, and adds to the argument that TEK is relevant for conservation as it aids the protection of wildlife. The baobab tree is also perceived as a spiritual being. The tree, however, is scarce at Dawadawa 2, being more common further north in the people's 'homeland'. There, the tree is diminishing due to its prestigious rosewood (ENA 2018). The people's TEK beliefs however would act as an obstacle to its decline. In this case, the spiritual taboo would aid a sustainable use of the baobab tree. In regard to these examples, TEK coheres with ecojustice in terms of *relationality* and *reciprocal relation* to nature (Fig. 9.2).

Considering this cohesion, and taking into account the fact that human well-being is dependent on a healthy ecosystem, TEK has great relevance for the integration of social and ecological justice in conservation. However, in Dawadawa 2 (as in many parts of the world) TEK is in decline.

Threats to TEK in Dawadawa 2

From my research I argue that the economic pressure of globalizing modernity and neoliberal market forces (as well as population growth and consumption) do not leave

the necessary time and physical resources for people to relate to the land outside a context dominated by extractivism. A number of examples show that societies that historically engaged in deforestation also engaged in reforestation (e.g. Fairhead and Leach 1996; Brightman 2015), and this is also true for the Sissala. The Sissala introduced charcoal production to the community, and they also replanted trees *for* charcoal production. However, although other tribes present in the community may have been taught this relational dimension by the Sissala, only their knowledge of how to produce charcoal was still present during my research period. For short-term economic opportunity, farmers were constrained to act anthropocentrically to make their living. TEK in Dawadawa 2 is not predominantly ecocentric (as TEK in some other places is), but of limited spiritual aspect. Through spiritual beliefs, people would relate to certain beings from the natural world. Encapsulated in a neoliberal context, I argue that any reciprocal relationality to other living beings is in decline for the reason of an increasing engagement in neoliberal economic activities. As people's traditional livelihood does not provide enough money to pay for new economic costs, TEK is discarded in favor of anthropocentric neoliberalism, which becomes increasingly dominant (as commonly happens through globalization).

Charcoal production in the neoliberal context influences the farmer to solely perceive the monetary value of trees once turned into charcoal. When I asked about specific trees' names in the tribal language I was told that the names relate to other elements in the natural world. For instance, the 'water-tree' typically grows in a wet area, which is important for the farmer when seeding rice. Regarding charcoal, however, the farmers were predominantly interested in the density of wood which would secure better and greater amounts of charcoal (which equates to money). They knew that X trees would make X charcoal bags and therefore X amount of money. This change of value, I argue, is characterized by a shift of values due to the commodification of what Western society tends to categorize as 'resources' (Crist 2012). The adoption of such 'modern values' is arguably comparable to the 'colonization of the human mind', identified by Kidner (2014), who claims that industrialized systems are the underlying reason for the spread of anthropocentrism. Kidner's words apply here (2014: 6):

> A system based around money, then, not only backgrounds human subjectivity in judging value; it also reduces the complexity of the entire natural order to something much simpler, so that our values, identity, and understanding of the world are uprooted from the natural order and relocated in the industrial system.

Moreover, when discussing low prices and wages for charcoal workers, farmers generally referred to 'the market'. For the farmers, the market decides, and is responsible for their situation.

The majority of the inhabitants of Dawadawa 2 settled the region for more promising conditions to farm in wetter areas with a different local environmental condition to their 'homeland'. As they have not been present in the landscape for very long, it is likely that people's TEK—in relation to the Dawadawa 2 region—is not fully developed. The possible 're-working' of TEK in Dawadawa 2 is further hindered by the growing influence of globalization and modern institutions such as Western-oriented

education. For example, the movie 'Schooling the World' (Black 2010) exposes the negative aspect of schooling on the transfer of knowledge in the 'global south'. In many cases, local ecological wisdom is often disrupted by schooling that favors 'modern' thinking over traditional perspectives, such as TEK. Western schooling gives more importance to educating people to become part of a 'developing' and modern Ghana, in which consumerism increasingly means status (Black 2010). Hence modern schooling is one of many modern institutions that is contributing to the loss of TEK. However, this could change, and schooling could actually be a powerful tool to rejuvenate TEK.

It could be argued that TEK is in decline because people are increasingly restricted to short-term livelihood perspectives. Population growth and growing modern consumption demands drive people to engage in charcoal production to raise extra cash. The engagement in charcoal production (as part of the neoliberal market system) fosters the spread of anthropocentrism and the adoption of modern Western values. Unsustainable charcoal production however destroys nature—and therefore the basis of the people's livelihood in the future. Unsustainable charcoal production thus produces ecological *and* social injustices.

Rejuvenating TEK

With regards to the farmers, solutions that are demanded by the integration of social and ecological justice must go beyond law enforcement. As we have seen with regards to the Forestry Commission, mere legislative protection does little to ensure the protection of forests and wildlife in Ghana, as their protective status often falls in direct conflict with funding for that department. This conflict of interest leads to ecological protective rights being ignored in favor of the neoliberal market, implying that the implementation of top-down law enforcement would have little to no effect in the context of Ghana.

Although TEK is in decline in Dawadawa 2, historically it has been an important way to sustainably relate to nature, which is critically relevant for the aims of conservation. Therefore, I would argue that the promotion of TEK via grassroots movements, environmental NGOs, reforestation programs, and schools and universities is essential. The strengthening of mutual understanding and alliances between these social and environmental institutions is important for successfully integrating social and ecological justice in Dawadawa 2.

To realize a strengthening of TEK, the pressures and threats responsible for the decline of TEK must be analyzed, responded to and alleviated. Central to this situation are the increasing economic pressures that fall upon individual households and small communities due to population growth. Secondly, the growing dominance of modernity and neoliberalism in such societies needs to be reduced. What is evident in Dawadawa 2 is that, beyond the satisfaction of basic necessities, consumerism, neoliberalism and growing material inequalities are equally to blame for creating growing economic pressures. This leads to dependencies via debt relations, the

increased use of fertilizers and GMO seeds, and the growing engagement in charcoal production. These threats drive people into a situation where they feel they have 'no choice' but to overexploit nature, and rely on institutions who cultivate dependencies which, in turn, affects their worldview, leading to the decline of TEK (among other things). As a result, Dawadawa 2 is quickly becoming enveloped within the globalized anthropocentric 'monoculture' that Black (2010) describes. However, a campaign to teach TEK alongside the aspects of ecocentrism, ecological ethics and ecojustice could assist in reducing such globalization. Education is a central institution that must embrace change.

A key element of modernity is its repression of other worldviews, wisdoms and systems of knowledge. It finds itself embedded within the dichotomy between the 'modern' and the 'traditional', and the 'developed', 'developing' or 'underdeveloped' (e.g. Escobar 1991), placing 'traditional' knowledge in a position of inferiority. In order for TEK to strengthen, then, modernity needs to be questioned. The modern worldview is not any realer than any other (Escobar 2017). Taking into consideration the damage the 'developed world' wreaks upon the natural world, if we are to seek a sustainable relationship with nature, it is crucial to question who is more 'developed'; the 'modern' or the 'traditional' (Sponsel 2013).

200 years of modernization has led to human alienation from nature (Washington 2015) which is leading the world towards the sixth mass extinction. Vertebrates have diminished by 60% in just the past 40 years (WWF 2018). To strengthen traditional wisdom, we should underline the fact that climate change, biodiversity loss and increasing inequalities between humans are the direct consequence of decisions taken in the name of anthropocentric 'development'. Informing and educating populations about the negative effects of modernity, therefore, is crucial. Modernity has not only disastrous effects on a planetary scale, but neoliberal resource extraction and the adoption of a modern lifestyle has disastrous effects on a local level, as is the case of Dawadawa 2. Putting emphasis on these negative effects strengthens the importance of local traditional wisdom and people's traditional identity.

How Could the Integration of Social and Ecological Justice via the Empowerment of TEK Take Place?

Breaking with the regime of dominating modernity and population growth, while empowering TEK could be achieved via different mechanisms. In many cases, the transmission of local ecological wisdom is disrupted by schooling that prioritizes the production of 'modern' or 'urban' minds. Instead of preventing the discussion of TEK, schooling has the capacity to do the contrary. Elders and spiritual leaders could be included in school teaching, and 'classrooms' could also relocate to outdoor spaces that are meaningful for the transmission of local environmental knowledge. Universities similarly can play a crucial role in re-establishing the discussion of traditional wisdom and knowledge. An example is the indigenous and intercultural

University 'URACCAN' in Nicaragua, which has just recently (2015) graduated their first medicine graduates using a successful focus of the integration of traditional as well as occidental healing practices in their education (URACCAN 2015).

There are various other grassroots movements that could be promoted. 'Food Sovereignty Ghana' organizes demonstrations against Monsanto and fights against GM seeds in the courts (FSG 2018). Meanwhile, the 'Population Media-Center' (PMC 2018) demonstrates an interesting approach. Through entertainment dramas (based upon scientific behavioral change theories) they have found a unique way to foster positive change. They have been able to tackle issues of population growth, environmental degradation, HIV and women's rights. To date this group has operated in nearby countries but not in Ghana. If they were to operate in Ghana they may become a force for positive change. Also, there is 'ecosia.org' (Ecosia 2018), a non-profit web-based search engine that uses the money raised from commercial ads to plant trees around the world. Since its inception in 2009, they state that they have supported the plantation of over 40 million trees and aim to plant 1 billion by 2020. In Ghana, Ecosia's partner is 'Tree-Aid' (TA 2018), an NGO which recognizes the relevance of trees and nature to make an income for people. While this NGO works in the northern part of Ghana, a recently uploaded video (DGM 2018a) from the NGO 'DGM-Global' (DGM 2018b) filmed in Dawadawa 2 shows the positive effect NGOs can have. In this video, a woman explains that she has just learnt about the connection between trees and rain, and stresses the relevance of replanting trees for their livelihood in the future. For all such environmental NGOs it is crucial that they embrace the ecocentric aspect of conservation. Otherwise they are likely to negatively impact indigenous people in terms of how they value nature (Howell 2017). This would be dangerous, as it could lead to a greater decline in ecocentric worldview. Adams (2017) states that conservation must 'reinvent itself' to find a mid-ground between top-down and bottom-up conservation. Within this 'new approach', whether for grassroots movements, NGOs or governmental conservation attempts, the ethical foundation must be ecocentrism. Based on ecological ethics, valuing the intrinsic value of nature, fostering a reciprocal relation between human and non-human beings, such an approach is necessary to attain the conservation of biological and geological diversity (Washington et al. 2018).

From a governmental level, a challenge for this shift in thought, especially in the 'global south', is that of overseas debt. Susan George, President of the Transnational Institute (TNI), 20 years ago made a calculation of interest and debt repayments, stating that: "Sub-Saharan Africa, which is the poorest part of the world, is paying 25,000 dollars every minute to Northern creditors" (George 1999). Structural adjustments implemented by the IMF during the 1980s and 1990s in Ghana, led to greater resource exploitation for export and increasing inequalities for humans in the country (Konadu-Agyemang 2010). As nature, once extracted, is a source of income to repay debts, overseas debts hinder any progress to implement ecological rights on a governmental level. The establishment of nature as a constitutional entity occurred in Bolivia and Ecuador in the 1990s. In New Zealand a river has now been given 'personhood status' (see Chap. 8 by Strang in this volume). However, governmental

overseas debt relations hinder such progress in many countries, as governments in the 'global south' become obliged to destroy their own environment to pay their debts.

The integration of ecocentric values for nature are under pressure in all domains of society in the context of a modern world dominated by anthropocentrism and neoliberalism. Meanwhile, not only the implementation of ecocentric elements in constitutions are signs of positive resistance and recognition of the relevance of TEK for sustainability. An example can be found in various groups joining together in the recent climate march in San Francisco. Not only was it attended by 25,000 people but it was also led by indigenous people (Scheinman 2018). This shows public acceptance of giving indigenous people a lead role for such actions. Indigenous alliances as the 'COICA', which is an umbrella organization of indigenous peoples in the Amazon (COICA 2018), are growing (Scheinman 2018). This is relevant in regard to a hope for overall social change. The 'climate alliance' (CA 2018) shows that alliances can also be built between indigenous and 'modern' societies, with the central aim being to support and learn from indigenous people and their relationship to nature. This shows that the integration of social and ecological justice via strengthening TEK is most relevant for the aims of conservation in all domains of society.

Conclusion

Traditional Knowledge is still widely spread in Ghana, and in Dawadawa 2 in particular the element of reciprocity in TEK has played a key role for the conservation of caimans. The biggest quest for conservation today, I believe, is in the way that humans re-establish reciprocal relations to non-human beings. Strengthening and re-creating TEK for the integration of social and ecological justice via grassroots movements can help conservation to embrace a reciprocal and caring relationship with nature.

If we took seriously the aims of conservation (the protection of biodiversity and geodiversity), then the anthropocentric conservation shown by the Forestry Commission in Ghana does not, and will not, lead to a fulfilment of these goals, as it prioritizes humans over non-human beings. As a response to neoliberal resource extraction, conservation driven by anthropocentric goals remains unsatisfactory for the broader aims of conservation. It prioritizes humans before nature. This is shortsighted because the inhabitants of Dawadawa 2 depend on nature for a living. To achieve conservation's aims, the integration of social and ecological justice is now necessary. It demands strategies that go beyond a distribution of 'resources' and law enforcement. The integration of social and ecological justice demands a care for nature, and an understanding of relationality between humans and our non-human cousins. This ecocentric approach to conservation coheres with aspects of TEK in Dawadawa 2 in regard to the people's spiritual relation to caimans and the baobab tree. TEK is in decline because, despite its crucial value in nature protection, it is

not about generating extra money to spend in the neoliberal market. And why should TEK consider such ideas, when it is mostly about living *sustainably* with nature?

In order for conservation to be successful there must be a way to strengthen and re-create TEK. For this, the adoption of the destructive modern lifestyle and worldview needs to be modified to find a sustainable middle-ground. To re-create TEK, schools, universities, NGOs and grassroot movements should now emphasize the relevance of TEK for the well-being of non-human and human beings alike. It is of key importance that these NGOs are ecocentric, and based on ecological ethics themselves (see chapter by DellaSala). The integration of social and ecological justice is not just relevant for conservation in terms of strengthening TEK. The re-creation of TEK in Dawadawa 2 in a renewed way could also serve as a way of achieving the integration of all forms of justice via grassroots movements.

References

Abayie-Boateng, A. (1998). Traditional conservation practices: Ghana's example. *Research Review of the Institute of African Studies, 14,* 42–51.

Abukari, H., & Mwalyosi, R. (2018). Comparing pressures on national parks in Ghana and Tanzania: The case of Mole and Tarangire National Parks. *Global Ecology and Conservation, 15,* e00405.

Adams, W. (2009). *Green development: Environment and sustainability in a developing world.* London, New York: Routledge.

Adams, W. (2017). Conservation from above: Globalizing care for nature. In M. Brightman & J. Lewis (Eds.), *The anthropology of sustainability: Beyond development and progress*. New York: Palgrave.

Appiah-Opoku, S., & Hyma, B. (1999). Indigenous institutions and resource management in Ghana. *Indigenous Knowledge and Development Monitoring, 1,* 15–17.

Berkes, F. (1993). Traditional ecological knowledge in perspective. In J. Inglis (Ed.), *Traditional ecological knowledge: Concept and cases*. Ottawa: International Program of Traditional Ecological Knowledge.

Black, C. (2010). '*Schooling the world*' *video*. See: https://www.filmsforaction.org/watch/schooling-the-world-2010/. Accessed: October 20, 2018.

Boafo, Y., Saito, O., Kato, S., Kamiyama, C., Takeuchi, K., & Nakahara, M. (2016). The role of traditional ecological knowledge in ecosystem services management: The case of four rural communities in Northern Ghana. *International Journal of Biodiversity Science, Ecosystem Services & Management, 12*(1–2), 24–38.

Braungart, M., & McDonough, W. (2002). *Cradle to cradle: Remaking the way we make things*. London: Vintage Books.

Brightman, M. (2015). Savage values. Conservation and personhood in Southern Suriname. In C. Hill, A. Webber, & N. Priston (Eds.), *Understanding conflicts about wildlife: A biosocial approach*. Oxford: Berghan.

CA. (2018). *Climate Alliances.* The Climate Alliance. See: https://www.climatealliance.org/home.html. Accessed: November 14, 2018.

COICA. (2018). *Coordinadora de las Organizaciones Indígenas de la Cuenca Amazónica*. See: https://www.sourcewatch.org/index.php?title=Coordinating_Body_for_the_Indigenous_Peoples%27_Organisations_of_the_Amazon_Basin. Accessed November 25, 2018.

Crist, E. (2012). Abundant earth and the population question. In P. Cafaro & E. Crist (Eds.), *Life on the brink: Environmentalists confront overpopulation* (pp. 141–151). Georgia: University of Georgia Press.

Curry, P. (2011). *Ecological ethics: An introduction*. Cambridge: Polity Press.
DGM. (2018a). *Njisam patience on climate change, Dawadawa no. 2. Dedicated grant mechanism*. See: https://www.youtube.com/watch?v=kAoEH0eRzsg. Accessed November 10, 2018.
DGM. (2018b). *Dedicated grant mechanism*. See: https://www.dgmglobal.org. Accessed November 10, 2018.
Ecosia. (2018). *How it works*. See: https://info.ecosia.org/what. Accessed November 12, 2018.
ENA. (2018). *CSOs commit to fighting against illegal rosewood logging*. Environment News Agency. See: https://enaghana.com/2018/10/21/csos-commit-to-fighting-against-illegal-rosewood-logging/. Accessed November 11, 2018.
Engelman, R. (2010). *Population, climate change, and women's lives*. Worldwatch report 183. Washington, DC: Worldwatch Institute. See: http://www.worldwatch.org/system/files/183%20Population%20and%20climate.pdf. Accessed November 25, 2018.
Escobar, A. (1991). *Anthropology and the development encounter: The making and marketing of development anthropology*. Princeton: Princeton University Press.
Escobar, A. (2017). Sustaining the pluriverse: The political ontology of territorial struggles in Latin America. In M. Brightman & J. Lewis (Eds.), *The anthropology of sustainability: Beyond development and progress*. New York: Palgrave.
Fianko, J., Donkor, A., Lowor, S., & Yeboah, P. (2011). Agrochemicals and the Ghanaian environment review. *Journal of Environmental Protection, 2,* 221–230.
Fairhead, J., & Leach, M. (1996). *Misreading the African landscape: Society and ecology in a Forest-Savanna Mosaic*. New York: Cambridge University Press.
FCG. (2018). *About the Forestry Commission Ghana*. Forestry Commission Ghana. See: http://fcghana.org/page.php?page=46&section=22&typ=1. Accessed November 08, 2018.
Fletcher, R. (2014). *Romancing the wild: Cultural dimensions of ecotourism*. Durham: Duke University Press.
FSG. (2018). *Food Sovereignty Ghana*. See: http://foodsovereigntyghana.org/. Accessed November 12, 2018.
George, S. (1999). *A short history of neoliberalism*. Presented at the Conference on Economic Sovereignty in a Globalising World, Bangkok, March 24–26, 1999. See: https://www.tni.org/en/article/short-history-neoliberalism. Accessed November 12, 2018.
Gyampoh, B. A. (2011). *Deforestation in Ghana: Government's incentives and policies*. See: https://benjigyampoh.blogspot.com/2011/10/deforestation-in-ghana-governments.html. Accessed December 14, 2018.
Gyampoh, B. A., Idinoba, M., & Amisah, S. (2008). Water scarcity under a changing climate in Ghana: Options for livelihoods adaptation. *Development, 51,* 415–417.
Howell, S. (2017). Different knowledge regimes and some consequences for 'Sustainability'. In M. Brightman & J. Lewis (Eds.), *The anthropology of sustainability: Beyond development and progress*. New York: Palgrave.
Ingold, T. (2002). Jagen und Sammeln als Wahrnehmungsformen der Umwelt. In E. Mader & A. Gingrich (Eds.), *Metamorphosen der Natur*. Vienna: Böhlau Verlag.
IUCN/PAPACO. (2010). *Parks and reserves of Ghana: Management effectiveness assessment of protected areas*. Ouagadougou: IUCN/PAPACO. See https://portals.iucn.org/library/sites/library/files/documents/2010-073.pdf. Accessed November 25, 2018.
Jansen, J. (2010). What gold mining means for the Malinke, and how it was misunderstood by the French colonial administration. In C. Panella (Ed.), *A world of debts* (pp. 95–110). Amsterdam: Rozenberg Publishers.
Kidner, D. W. (2014). Why "anthropocentrism" is not anthropocentric. *Dialectical Anthropology, 38*(4), 465–480.
Kopnina, H., Washington, H., Taylor, B., & Gray, J. (2018). The 'future of conservation' debate: Defending ecocentrism and the Nature Needs Half movement. *Biological Conservation, 217,* 14–18.

Konadu-Agyemang, K. (2010). The best of times and the worst of times: Structural adjustment programs and uneven development in Africa: The case of Ghana. *The Professional Geographer, 52*(3), 469–483.

Mafro, E. (2010). *Chainsaw milling in Ghana: An overview of the issue*. Wageningen: Topenbos International. See: http://www.tropenbos.org/file.php/213/chainsaw%20milling%20in%20ghana_final%20version%20may%202009_low%20res.pdf. Accessed October 12, 2018.

Makarieva, A. M., & Gorshkov, V. G. (2007). Biotic pump of atmospheric moisture as driver of the hydrological cycle on land. *Hydrology and Earth System Sciences, 11*(2), 1013–1033.

Mongabay. (2006). *Tropical forests Ghana*. See https://rainforests.mongabay.com/20ghana.htm. Accessed November 23, 2018.

Millar, D. (2003). *Forest in northern Ghana: Local knowledge and local use of forest*. Copenhagen: Sahel-Sudan Environmental Research Initiative.

Obiri, B., Isaac, N., Obeng, E., Owusu, F., & Mafro, E. (2014). *Charcoal industry in Ghana: An alternative livelihood option for displaced illegal chainsaw lumber producers*. Wageningen: Tropenbos International.

OED. (n.d.). *Definition of conservation in english by Oxford dictionaries*. Oxford Dictionaries. English, Oxford Dictionaries. See: https://en.oxforddictionaries.com/definition/conservation. Accessed August 12, 2018.

Oelschlaeger, M. (1991). *The idea of wilderness: From prehistory to the age of ecology*. Newhaven, London: Yale University Press.

PMC. (2018). *About population media center*. Population Media Center. See: https://www.populationmedia.org/. Accessed October 20, 2018.

Scheinman, T. (2018). *They won't be able to eat their money*. Amazon Watch. See: https://amazonwatch.org/news/2018/0910-they-wont-be-able-to-eat-their-money. Accessed October 22, 2018.

Shoreman-Ouimet, E., & Kopnina, H. (2015). Reconciling ecological and social justice to promote biodiversity conservation. *Biological Conservation, 184,* 320–326.

Sousa, G. (2017). *Deforestation triggered by charcoal production around the world*. See: http://www.worldatlas.com/articles/world-regions-with-the-highestdeforestation-triggered-by-unsustainable-charcoal-production.html. Accessed: October 12, 2018.

Sponsel, L. E. (2013). Human impact on biodiversity: Overview. In S. Asher & W. Levin (Eds.), *Encyclopedia of biodiversity* (pp. 137–152). Minnesota: Academic Press.

TA. (2018). *Tree aid*. See: https://www.treeaid.org.uk. Accessed November 12, 2018.

Taylor, B. (2010). *Dark green religion: Nature spirituality and the planetary future.* Berkeley & Los Angeles: University of California Press.

Thomasberger, A. S. (2017). "*Today-job*"*—Temporalities, futures and social ties along the charcoal value chain in Ghana*. Masters thesis. Leiden: Leiden University. See: https://openaccess.leidenuniv.nl/handle/1887/56857. Accessed October 12, 2018.

UNDP. (2014). *Nama study for a sustainable charcoal value chain in Ghana*. New York: UNDP. See: http://www.undp.org/content/dam/LECB/docs/pubs-namas/undp-lecb-mdgc-Ghana-Sust-Charcoal-NAMA-Study-2016.pdf. Accessed December 07, 2018.

URACCAN. (2015). *Medicina intercultural*. Universidad de las Regiones Autónomas de la Costa Caribe Nicaragüense. See: http://www.uraccan.edu.ni/medicina-intercultural. Accessed November 15, 2018.

Washington, H. (2015). *Demystifying sustainability: Towards real solutions*. London: Routledge.

Washington, H., Chapron, G., Kopnina, H., Curry, P., Gray, J., & Piccolo, J. (2018). Foregrounding ecojustice in conservation. *Biological Conservation, 228,* 367–374.

Wilson, E. O. (2016). *Half-earth: Our planet's fight for life*. New York: Liveright/Norton.

Worldometers. (2018). *Ghana population* (*Live*). See: www.worldometers.info/world-population/ghana-population/. Accessed August 07, 2018.

WWF. (2018). Living planet report—2018: Aiming higher. In M. Grooten & R. E. A. Almond (Eds.), *World wide fund for nature*. Gland: WWF.

Chapter 10
Should Justice for People Come Before Justice for the Environment? Examining Students' Reflections on Environmental Ethics

Helen Kopnina

This chapter will discuss Bachelor level students' perceptions of social (environmental) and ecological justice. Social justice concerns the fairness of distribution procedures, based on individual moral convictions of fairness and the willingness to obey the demands of authorities (Hegtvedt 2008: ix–x). Social justice focuses on equalizing power relationship and access to natural resources among different social groups. While in some definitions environmental justice may encompass ecological justice (Schlosberg 2007), most commonly it is associated with fairness in the distribution of environmental risks and benefits among human groups (Kopnina 2014a). While nature protection necessitates the need to designate large areas of the Earth as reserves and necessitate strict regulation (Noss 1992), some social justice advocates are worried that vulnerable communities will be deprived of land and sources of livelihood by reserve creation (Guha 1989; Büscher 2015).

As discussed in the first two chapters, this type of exclusive social justice is also anthropocentric. Anthropocentrism argues that moral consideration rests only with humanity as the superior and only valued species (Crist 2012; Mathews 2016). By contrast, ecocentrism, sometimes used interchangeably with the related concepts of deep ecology (Naess 1973), biophilia (Kellert and Wilson 1995) and ecological justice (Schlosberg 2007; Washington et al. 2018) to denote a life- or nature-centered (or geo-centered, zoo-centered, etc.) system of intrinsic values, assumes that moral consideration should also extend to nonhuman nature.

The so-called 'pragmatic' environmental philosophers argued that human and environmental needs may coincide. This "convergence theory" assumes that maintaining the environment for human material benefit is the strongest motivation for nature protection, postulating that anthropocentric self-interest is the best argument for maintaining the ecological systems on which we depend, ultimately converging on the same practical outcomes as ecocentric positions (Norton 1984, 1991).

H. Kopnina (✉)
The Hague University of Applied Sciences, The Hague, The Netherlands
e-mail: h.kopnina@hhs.nl; alenka1973@yahoo.com

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However, many scholars point out that self-interest, in fact, has not operated well to protect nature (e.g. Rees 2008). While informed self-interest may produce environmentally positive outcomes in situations where both humans and environment are negatively affected, anthropocentrism does not seek to protect nonhumans that have no utilitarian value, nor guarantee animal rights (Katz 1996; Shoreman-Ouimet and Kopnina 2015). In fact, neglect of animal welfare or the loss of some biodiversity may not affect humanity in the short to medium term (Crist 2012). While many species are not known to assist in the production of food, fibre, or other ecosystem services, this is most likely a function of lack of research about such species, some of which may be keystone species (Washington 2015). What allows so-called pragmatic ethicists to attempt the rehabilitation of anthropocentrism as a basis of an environmental ethic is the rejection of the intrinsic value of nature or individual organisms (Katz 1996; Mathews 2016).

While worldviews and ethics differ based on the social background (Chawla and Derr 2012; Kopnina 2015), research shows that young people are at the forefront of environmental protection movements (Boeve-de Pauw and Van Petegem 2010; Wray-Lake et al. 2010). Surprisingly, however, ecocentric approaches have so far attracted little interest among educational scientists. Little research has been conducted on what factors influence student beliefs about the treatment of nature (Boeve-de Pauw and Van Petegem 2010; Erlanger and Tsytsarev 2012), especially in relation to justice. This lack of interest is especially surprising as the strong impact of education on cultural reproduction of human-environment relationships suggests a rich research area for educational science (Spannring 2015) and conservation (Wray-Lake et al. 2010; Chawla and Derr 2012).

This chapter will attempt to expand the research on relationships between human wellbeing, environmental sustainability and justice, both in practical and ethical terms. Assuming that international students represent a microcosm of global (educated) citizens, this chapter aims to explore how one might develop a strategy for effectively educating responsible 'ecological citizens' (Gray and Curry in this volume, Chap. 11). This chapter compares research results with the goal of examining the students' view on justice and nature, and distills recommendations for the development of an ecocentric educational curriculum.

One of the key objectives of the course described below was not necessarily to prescribe a particular view, but to 'learn from students'. The aim was to better understand students' reasoning to aid pedagogical strategies aimed at enhancing ecological sustainability and ecocentric worldview. This study seeks to test the idea that student assignments reveal larger patterns of environmental awareness. In this exploration, it is hoped the students' understanding of environmental ethics in relation to sustainability be developed. Below, the section on methodology is followed by the presentation of excerpts from student essays and analysis.

Methodology

In the autumn of 2016, the students of the elective course "Environment and Development" of Leiden University College were asked to engage with topics related to environmental justice, ecological justice as well as animal rights and welfare. In-class debate "Justice for people should come before justice for the environment" was styled after the Hallsworth Plenary Debate held at the World Congress of the International Union of Anthropological and Ethnological Sciences, at Manchester University in 2013 [described in Abram et al. (2016) and which can be viewed on https://www.youtube.com/watch?v=oldnYTYMx-k]. This debate reflects a larger discussion in social science and biological conservation in Chap. 2.

There were 22 (12 females and 10 males) international students enrolled in the course, with the majority being Dutch (although of mixed ethnic backgrounds), the rest European, Asian or Middle Eastern. A random sample of student assignments was selected from the group by selecting assignments in the order that they were submitted to the lecturer. Opinions in the essays below reflect individual stance rather than nationality or culture, as segments are disconnected from personal identifying features to guarantee anonymity. The European Commission's code of research ethics was followed to protect the collected data (Iphofen n.d.: 42). All assignments were pasted into one document, which was consequently analysed for recurrent topics and coded in themes along an anthropocentrism-ecocentrism continuum. In segments presented below, original style, grammar, and spelling were retained. Student names were changed.

The lecturer assured students that their ability for critical argument, rather than their support of the position preferred by the lecturer, would count toward grading. The lecturer acknowledged her support of ecological justice, without explaining her reasons prior to the assignment. In their assignments, aside from reflecting on the debate, the students were asked to read literature representing different sides of the debate, and to develop an argument supporting *their own* opinions. The students had to define and discuss a number of terms, including different types of justice, and consequently had to articulate and defend their stance towards the central proposition statement.

Results: Student Assignments

In total, of the twenty-two students four explicitly stated their support for "justice for people should come first", seven supported "justice for the environment should come first", and the rest chose in-between positions. Relevant comments by students are shown below.

Menno

Menno wrote an essay revealingly titled "Why I am an anthropocentrist". Menno opened his essay with the statement that despite his "strict absence of belief in a higher power", he believes that, to speak with Moore's (1919) words, if a "mortal was to hear the word of god, it would be in a garden at the cool of day". However, he states, "I have no choice but to state that I am a strict anthropocentrist". This is because the "environment, the ecosystem or individual non-human entities do not have personhood" and "are not moral agents":

> It was disturbing to me that my fellow students seem to accept intrinsic value as a given; it is not an undisputed principle in ethics, and treating it as such pollutes the discourse surrounding environmentalism […] The environment is not a moral agent, and it has no value aside from the value that people attach to it. The environment is, on the other hand, worthy of our moral consideration, just because people value it. Justice for people thus comes before justice for the environment.

Menno continues that therefore the environment, lacking personhood, has "no ability to even perceive reality, and humans will have to make those judgment for it":

> The consequences of this paradigm are that, even if individual humans care about the environment, persons and by extension moral agents are the only entities that are able to understand or express ethical concerns. The concept of 'justice' – for the environment or for people – is thus inherently human. The environment cannot defend itself or evaluate its unethical experiences. Biospheric equality can therefore not be attained fully.
>
> If humanity has to survive, we have to realise our inherent connection to the environment and thus find solutions to the potential ecological disaster […] I do, in fact, care a lot about the environment. I have always had a special connection with nature. It inspires me. It sustains me. It is the fruits of the environment that I reap, and therefore I shall fight for its conservation […]
>
> I believe that, in many cases, preserving the environment, even if this results in a short-term loss of human utility, does entail justice for people. Essentially, the issue of this debate is a false dichotomy. I think we should find ways to aid the environment, grant it moral consideration, and find a way in which justice for mankind and for the environment can come together.

Eliza

In supporting her position that justice for people should come first, Eliza states that, "Environmental protection can often be misused in such a way that the poorest or most vulnerable groups are hit the hardest […] creating, in a sense, a kind of reversed environmental racism". Eliza quotes Peluso (1993: 200) who argues: "some state interests appropriate the ideology, legitimacy, and technology of conservation as a means of increasing or appropriating their control over valuable resources and recalcitrant populations". Eliza also uses a case in South Africa where conservationists, "applied a fixed carrying capacities for land allowing wealthier individuals to benefit though exclusive access to land, at the expense of black, poor farmers". The

reason why environmentalism is imposed upon developing countries, she reasons, is that, "Environmental protection policies often protect landscapes which do not include cities or big factories, farms or companies, because these areas are already too affected. However, the areas that they do protect are often inhabited by more vulnerable groups".

Eliza continues that justice for people should come first, "because of the fact that people are different from all other organisms on this earth and are more morally valuable, and practically because of the fact that environmental protection is misused to repress minorities or poor communities". She further argues:

> Even though it is claimed that humans and other species are on the same level morally, we can clearly see that from our development curve the morality of humans is fundamentally different from that of animals […] Even though one might dislike an anthropocentric worldview, it is the view that speaks most to the general public, and since democracy is currently the most idealized way of governing a country, the general public must not be underestimated. This is why I think that the convergence hypothesis might be the answer in the end.

Fatima

Fatima reflected in her essay on interdependency of all species, reflecting that this interdependency "means that harming one species can eventually lead to harming human species". Fatima quoted Strang (2016: 268): "prioritizing the rights of manufacturers or farmers to make short-term profits at the expense of the non-human is likely to become very expensive for humans themselves." Our interdependency shows, Fatima continues, that it is "also in the interest of humans to protect the environment". However, she reasons, not all protection "results from instrumental value". The Red List of Threatened Species, Fatima reflects, includes "multiple species that have no instrumental value".

> Why should we care about other species if all species only care about their own interests? Why should we, as rational and selfish human-beings, not purchase our own interests, but instead take into account the rights of other species too? A lion will not stop other lions from killing deer or humans, so why should humans be treated differently? Fortunately, the answer can be quite short. We as human beings are the most destructive species on earth, but also the most intelligent form of life on earth.
>
> We should strive towards a society in which justice for people does not come before justice for the environment, for reasons that expose the immorality of such behavior, the unequal distribution of environmental externalities… Our intelligent yet destructive behavior comes with a certain responsibility to act. If we truly take our responsibility, human beings might be able to leave something behind: it is justice for all… Initially, I thought that justice for people should indeed come before justice for the environment. But when you rationally examine the arguments, you realize that we do not have much grounds to stand on.

Dorine

Dorine argued that humans are dependent on nature: "An intact natural environment is also the basis for a sustainable, i.e. intra- and intergenerational just development providing humane conditions". Dorine continues that the degradation of soil or pollution of water are, "negatively affecting human livelihood and development and thus foster social injustice". Thus, "a healthy biodiversity is no end in itself but a mere means to support human well-being and living-standard". However, Dorine notes, "instrumental incentives for the protection of nature exclude those species that have no direct use for human society". Dorine sees the necessity to, "care for nature and especially for sentient beings", due to "human empathy as well as a basic notion of what humans consider to be right and humane":

> How would humans feel if they imagine themselves in the position of animals; to be used for the testing of chemicals or to be shot down as a hunting trophy? Even though the usage of other species for nutrition is a natural necessity for survival many human societies are exploiting animals for "unnatural" reasons or in a manner regardless of the capacity of animals to feel joy and pain. Does this mean that humans should act on the principle: do as you would be done by? Is it really possible to apply this principle to other species? […]
>
> Ecological justice should not be neglected for two reasons: first, it can be seen as a necessary condition for more social justice. Second, one can value nature as the basis and framework of the existence of all biotic and abiotic beings. Both arguments are stressing the importance of nature conservation but for two very different reasons: Anthropocentrism and ecocentrism […]
>
> There are also some difficulties to define and implement concrete means to promote ecological justice […] What is value and by what is it created? […] It appears ethically questionable to promote justice among different groups of beings via the attempt to introduce ethics and rights which are exclusively informed by the ideas of one group. Even among different human cultures no consensus concerning the nature and scope of ethics and law exists.
>
> Another question is: what is the scope of ecological justice, i.e. who and what should be included: only animals or also plants or even inanimate things like water or soil? Are pathogens included and if yes would that mean that the use of antibiotics and other medicines which saved the lives of millions of people is morally wrong?

Moana

Moana reflected that our natural surroundings are, "our facilitators for survival, and therefore, its acquisition of justice must supersede our own". She elaborates that we have a "circular relationship of dependence between ourselves and the environment, upon which we are dependent, and it is dependent on us for its preservation".

> Therefore, ecocentric behaviour will also reap benefits for humanity, by promoting a sustainable usage of natural resources to promote human stability…We as humans are an intrinsic part of nature and have a certain responsibility to the environment, and we can ultimately benefit from the long-term commitment to environmental justice […]
>
> Biospheric egalitarianism grants agency to those non-human species. This concept is not as implausible as it may seem, as many institutions, such as slavery and racist-institutions were

> eradicated as legal practices, their motivations and actions now openly labelled as deplorable […] However, at the time of their existence, many saw these institutions as necessary evils, yet these attitudes have been drastically reversed within a century. Perhaps such a transformative change could also occur within our interpretation of the genocide of non-human species, if we are able to convince mankind that our position is not at the centre of the universe.

Kasim

Kasim reflects that, "we cannot assume that same defiance demonstrated with the Civil Rights movement" can "occur by factory cows". Hence, he reflects that we should think of justice in two ways, as being applicable, "to those that can communicate" or due to the fact "that human beings also rely on ecosystem services and biophysical resources to flourish, justify the necessity of non-human rights as well?" He argues that "consumerist patterns are facilitated by over-exploitation of resources".

> This is further aggravated by the growing population, anthropocentric attitudes, and the ever-growing gap in social equality that seems to eclipse mainstream consideration for non-human species […] In conclusion, justice for people and justice for non-human species are both relevant and demonstrate that debates between the two undermine their dependence on one another. Prioritizing humans overall indulges in anthropocentric ideas, which place (wo)mankind as outside the realm of the environment. This also, does not consider the long-term impact that ecological degradation will have on future generations. Furthermore, eco-centric initiatives are significant, but can also overlook facets of western imperialism as well as traditional and indigenous populations that depend on (conserved) forestry for their livelihood. Therefore, reconciling both sides would make for a more fruitful debate.

Damien

Damien disagreed with the statement that, "justice for people should come before justice for the environment", explaining it by the fact that, "it is clear that we are intrinsically linked to the environment". He writes:

> We will eventually damage ourselves and therefore, justice for the environment should come first […] Foreign companies have used their wealth and influence to alter the politics of regions and hence the environment. This is also because the environment is a common pool resource good, and if it is not appropriated in the necessary ways, the whole world will suffer. Only through beginning to solve the issue of the environment, can we save ourselves […]. To provide equality, nonhuman entities and the environment need to be considered when making economic decisions as otherwise, it constitutes discrimination and a form of environmental injustice. This is particularly true as they make up the vast majority of Earth's inhabitants, and that the survival of other species may hang in the balance.
>
> On the whole, the academic discourse on justice for people infers that the most disadvantaged groups ought to have special rights to amend for these long-term imbalances. Nevertheless, the inevitable short-term gain of saving the environment makes the need to prioritise justice for the maligned, the minorities, the poor and the non-human even greater. Only through

looking at the environment as a whole and dispensing the paradigm of anthropocentrism can we begin to partake in the sustainable process of maintaining both social or environmental equity.

Discussion

The students are grappling with the distinction between anthropocentrism and ecocentrism. While saving nature for its ecosystem services is not an intrinsic value approach, some students seem to think so. For example, Damien speaks of the environment as "a common pool resource good" but simultaneously also of "dispensing the paradigm of anthropocentrism". There is good evidence in the assignments that human dependence on nature is accepted as a fact. The students show some understanding that humans may not protect natural capital that is not obviously needed for human survival, but appreciation of the intrinsic value is not always apparent in the excerpts. As an example, Menno declares he is an anthropocentric but then he argues that we should find ways to grant moral standing to nature.

Student assignments show the view that social, environmental or ecological justice often overlap. Damien, for example, speaks of, "sustainable process of maintaining both social or environmental equity". Norton's (1984) convergence theory finds reflection in some of the student assignments. However, while Norton's convergence hypothesis may find wide support among students, there is little evidence that self-interest can achieve wider sustainability objectives (Rees 2008). While convergence theory may be appealing because it panders to the idea that humanity is able to rationally address sustainability challenges, empirical evidence shows that even self-interested individuals do not necessarily act to avert climate change or crises of natural resources (Rees 2008; Washington 2015).

The distinction between protecting nature for its intrinsic value on the one hand, and for the fact that society is fully dependent on nature on the other is illustrated by Kasim's questions in regard to justice. He notes that human beings rely on "ecosystem services and biophysical resources to flourish", assuming that humans existentially need nature. This does not, however, include understanding that nature should be protected due to its intrinsic value. Other students see a negative loop in regard to ignoring environmental problems and producing social inequality. Dorine, for example, mentions the case of water pollution that fosters social injustice. She recognizes that society is dependent on nature so degrading it will impact on society, especially the poor.

Even self-proclaimed 'anthropocentrist' Menno is not fully anthropocentric, as he is willing to see the short-term loss of human utility to protect nature. Presumably, this is because it will benefit humans in the future, though he does not specifically say this. Menno points out the complexity of assigning personhood (as discussed by Strang in this volume, Chap. 8). Dorine also raises this point in posing the question about the scope of ecological justice. Indeed, the question of who and what should be included as morally significant, and the fact that intrinsic value is not a given

(to quote Menno) remains large in other areas of conservation that involve practical trade-offs, including treatment of invasive species or trophy hunting. The difficulty of assigning (different) value to entities also translates into the difficulty of making decisions in the name of nature (see also Chap. 11 in this volume by Gray and Curry).

Menno feels that protecting the environment is necessary for all humans. Menno is unclear when he says it is a false dichotomy, presumably he means it *should* be a false dichotomy, as currently there is no dichotomy—as the anthropocentric view of the world is dominant. Both Menno and Kasim conclude that we need *both* ecological and social justice in order to address imbalances in human-environmental relationships as well as facets of western Imperialism.

Eliza, on the other hand, does link environmental protection to repression of "minorities or poor communities". This point is reflected in Dorine's observation that it is, "ethically questionable to promote justice among different groups of beings via the attempt to introduce ethics and rights which are exclusively informed by the ideas of one group". However, while Eliza states that environmental protection is repressing human minorities, Dorine is saying that the ethics of promoting justice via the attempt to introduce rights informed by one species (i.e. humans) is questionable. In this sense Dorine is using an ecocentric argument, saying that justice just for humans is not ethical, and hence is not in agreement with Eliza, who takes essentially the opposite position.

Eliza reflects that environmental protection policies often protect, "landscapes which do not include cities or big factories", but focus on areas that are still relatively unaffected by industrial development, which are "often inhabited by more vulnerable groups". Admittedly, rewilding areas that have been industrially developed is more difficult than maintaining wilderness where native biodiversity remains largely undisturbed. Many relatively untouched habitats are indeed found in the tropics, which are characterized by high biodiversity richness (Noss 1992; Mathews 2016). However, Eliza can only see that some human groups live in wild places and deserve justice, while not considering ecological justice for the nonhuman nature that lives alongside them.

Indeed, the difficulty of restoring or rewilding areas in developed countries that have already been deforested in previous centuries, turned into urban infrastructure or used for intensive agriculture, is serious. The European and American Rewilding groups and Nature Needs Half movement have done a great deal of good through promoting nature's right to exist (Kopnina 2016a; Wilson 2016; Dinerstein et al. 2017). Yet, these initiatives can hardly address the loss of biodiversity in areas where it has been historically rich, or indeed to confront larger economic interests that see "land" as productive property. In broader terms, this implies that imposing control or management over weaker entities—other humans or nonhumans—becomes easier in places or circumstances where those in power assume themselves to be superior (Crist and Kopnina 2014). This does not, however, mean that conservation as practiced (through protecting tropical habitats and their inhabitants) in any way disadvantages its human inhabitants. It is hard to see how impoverishing and degrading land cannot but dispossess its human groups, not to mention the thousands of nonhuman beings that depend on it.

Unlike Dorine, Eliza is convinced that humans are indeed superior to other beings as she states that we can, "clearly see that from our development curve the morality of humans is fundamentally different from that of animals". This presents a clear anthropocentric stance that supports a hierarchy of living beings with one species "on top". Eliza's point about the power of the "general public" (which she assumes to be anthropocentric) in making political decisions is significant, especially in relation to the (im)possibility of making democratic decisions on behalf on nonhumans. Like Menno, she sees convergence as the only way to protect nature.

Similar to Menno and Eliza, Fatima thinks that humans are "exceptional", but not necessarily in terms of inherent superiority, but because they are, "the most destructive species, but also the most intelligent" and thus need to accept responsibility for their actions. This seems in agreement with the idea of *human exceptionalism*, the belief that humans are categorically or essentially different than all other animals (Smith 2016). It is often argued on religious grounds, though secular arguments have also been advanced. However, she also raises the interesting aspect of accepting responsibility, which is in line with ecocentric philosophy'.

The students appear to have some difficulty in recognizing intrinsic values independent of human utility. Indeed, Fatima and Dorine also recognize the dependency of human welfare on ecological integrity (soil degradation or water pollution negatively affect human livelihood). Moana's idea of a "circular relationship" does not seem to be exactly balanced or symmetrical. While we are dependent on the environment—that is, it sustains humanity, environment, on the other hand, it is said to be "dependent on us for its preservation"—that is humans are in the position to destroy it. Not destroying nature, however, is not 'dependence' but a practical necessity as well as a recognition of ethical obligation.

While the majority of students are opposed to the statement: "Justice for people should come first", in fact, justice for people—especially the poor, vulnerable, or minority communities are still seen as of paramount importance, as Damien's essay demonstrates.

Recommendations

In the future, it might be of value to require students to go out into nature (alone) and report on their experience, as suggested by Louv (2011) and Bonnett (2013). Somewhere away from people, where students can listen to the birds, the wind, the insects, and ask themselves if this nonhuman nature has a right to continued existence? Louv (2011: 285) believes that what students recalled (or found new) from such trips was a: "sense of the unnoticed world, of the possible, of hope". Regrettably, much of the surrounding area where students find themselves in The Hague offers little original undisturbed nature (Kopnina 2013), with strict environmental management of "cultural landscapes" seen as normative in the Netherlands (Van den Berg and Koole 2006). The celebration of wilderness would thus require lecturers and students to read, discuss and contemplate those writers who engage with nature not just

as managed environments that form behind-the-window-background for classroom activities, but as a moral entity requiring consideration of justice.

The following step in the development of ecological justice, as Moana reflects, would be to follow civil rights movements, such as the ones that helped to abolish slavery. Moana notes that at the time of the existence of discriminatory practices, they were seen as normative. Accepting recognition of the political and legal rights of nature and/or nonhumans is indeed a necessary move, one supported by Schlosberg (2007) and through Earth jurisprudence (Cullinan 2003).

Hence, in order to move forward, we need to embrace the notions of justice based on conviviality (Abram 2010) and participation in relations between human communities and non-humans. If the non-humans are to be entitled to a fair share of essential goods (Mathews 2016), and their right to 'flourish' is recognized, the inclusion of non-humans through eco-advocates within political systems would be the next step. To achieve this pedagogically, one suggestion would be the in-class discussion of how 'human guardians' or custodians of nature (discussed by Gray and Curry in this volume, Chap. 11), can operate most effectively, even in highly disturbed landscapes.

Ecocentric worldview also demands recognition of the intrinsic value of nonhumans expressed through education targeted at the development of alternative (non-economic, perhaps instructed by nonwestern traditions) values (Kopnina 2014b, 2016b). When talking about oppressed groups, ecocentric education needs to develop students' appreciation that the human poor are not the only oppressed group. Nonhumans are also oppressed—sometimes to the point of extermination. Indeed, nonhumans are not just 'one' of the oppressed groups (in Damien's words, "the maligned, the minorities, the poor") but representatives of billions of living beings that deserve planet-wide ecological justice.

Granted, considering that even acting out of self-interest does not sufficiently address sustainability aims, asking students (or others) to act *beyond* self-interest in the interest of other species independent of their utility does seem very challenging. Yet, this challenge needs to be undertaken.

Conclusion

This chapter aimed to explain the connection between human wellbeing and the wellbeing of nature on the basis of the debate in my course about social and ecological justice. The assignment was intended as an exercise to 'learn from students', with the aim of better understanding their reasoning about trade-offs and congruities between social and ecological justice. Assuming that the exploration of young people's worldviews reveals larger patterns in environmental awareness, the examination of assignments shows that students tend to seek congruities between human and environmental interests. Despite differences between individual perspectives, and some confusion, most students stressed both types of justice were needed, demonstrating some willingness to engage with ecocentric ethics.

The students' views on social and ecological justice suggest ways in which the educational curriculum could be improved to support environmental sustainability and the ethical treatment of nonhuman nature via ecocentric perspectives. Pedagogical strategies to further develop students' appreciation of ecocentrism need to draw on students' understanding of human dependence on nature, and the interconnectivity of concerns for the oppressed—*both* human vulnerable groups and millions of nonhumans. Just having the opportunity to think about such issues will widen the students' views on ethical aspects of environmental problems. Another way of deepening this may be through students spending time in and writing about nature, and engaging in 'role plays' where students represent nature. Further discussion of Earth jurisprudence and ecodemocracy would also help to expand an ecocentric curriculum.

This study served as an opportunity to think and discuss anthropocentrism versus ecocentrism, and how people depend on nature. One key aspect that emerged is that despite confusion about the anthropocentrism-ecocentrism continuum, students demonstrated compassion, and some allocated value and agency to nature. Hence this writing exercise was valuable in getting students to think about the key ethical issue of our times—the moral value of nature.

References

Abram, D. (2010). *Becoming animal: An earthly cosmology*. New York: Vintage Books.

Abram, S., Acciaioli, G., Baviskar, A., Kopnina, H., Nonini, D., & Strang, V. (2016). Special Module: Plenary Debate from the IUAES World Congress 2013: Evolving Humanity, Emerging Worlds, August 5–10, 2013. Involving anthropology: debating anthropology's assumptions, relevance and future. *Anthropological Forum, 26*(1), 74–95.

Boeve-de Pauw, J., & Van Petegem, P. (2010). A cross-national perspective on youth environmental attitudes. *The Environmentalist, 30*(2), 133–144.

Bonnett, M. (2013). Sustainable development, environmental education, and the significance of being in place. *Curriculum Journal, 24*(2), 250–271.

Büscher, B. (2015). "*Rhino poaching is out of control*!" *Violence, heroes and the politics of hysteria in online conservation*. Paper presented at the British International Studies Association, London, 16–19 June, 2015.

Chawla, L., & Derr, V. (2012). The development of conservation behaviors in childhood and youth. In S. By (Ed.), *The Oxford handbook of environmental and conservation psychology* (pp. 527–555). Clayton. Oxford: Oxford University Press.

Crist, E. (2012). Abundant earth and population. In: P. Cafaro & E. Christ (Ed.), *Life on the brink: Environmentalists confront overpopulation* (pp. 141–153). Athens: GA: University of Georgia Press.

Crist, E., & Kopnina, H. (2014). Unsettling anthropocentrism. *Dialectical Anthropology, 38,* 387–396.

Cullinan, C. (2003). *Wild law: A manifesto for earth justice*. Devon: Green Books.

Dinerstein, E., Olson, D., Joshi, A., et al. (2017). An ecoregion-based approach to protecting half the terrestrial realm. *BioScience, 67,* 534–545.

Erlanger, A. C. E., & Tsytsarev, S. V. (2012). The relationship between empathy and personality in undergraduate students' attitudes toward nonhuman animals. *Society & Animals, 20*(1), 21–38.

Guha, R. (1989). Radical American environmentalism and wilderness preservation: A third world critique. *Environmental Ethics, 11*(1), 71–83.
Hegtvedt, K. A. (2008). *Justice. Advances in group processes* (p. 371). Bingley: Emerald Group Publishing Limited.
Iphofen, R. (no date). *Research ethics in ethnography/anthropology* (p. 42). European Commission. http://ec.europa.eu/research/participants/data/ref/h2020/other/hi/ethics-guide-ethnog-anthrop_en.pdf.
Katz, E. (1996). Envisioning a de-anthropocentrised world: Critical comments on Anthony Weston's 'The incomplete eco-philosopher'. *Ethics, Policy and Environment, 14,* 97–101.
Kellert, S. R., & Wilson, E. O. (Eds.). (1995). *The biophilia hypothesis*. Washington: Island Press.
Kopnina, H. (2013). Requiem for the weeds: Reflections in Amsterdam city park. *Sustainable Cities and Society, 9,* 10–14.
Kopnina, H. (2014a). Environmental justice and biospheric egalitarianism: Reflecting on a normative-philosophical view of human-nature relationship. *Earth Perspectives, 1,* 8.
Kopnina, H. (2014b). Education for sustainable development (ESD) as if environment really mattered. *Environmental Development, 12,* 37–46.
Kopnina, H. (2015). Revisiting the Lorax complex: Deep ecology and biophilia in cross-cultural perspective. *Environmental Sociology, 1*(4), 315–324.
Kopnina, H. (2016a). Half the earth for people (or more)? Addressing ethical questions in conservation. *Biological Conservation, 203*(2016), 176–185.
Kopnina, H. (2016b). Challenging economic development: the case study of teaching alternative cultural values in business education. *Journal of Integrative Environmental Sciences, 13*(1), 67–84.
Louv, R. (2011). *Last Child in the Woods: Saving our children from nature-deficit disorder. 2nd edition.* Algonquin, Chapel Hill.
Mathews, F. (2016). From biodiversity-based conservation to an ethic of bio-proportionality. *Biological Conservation, 200,* 140–148.
Moore, F. F. (1919). *A garden of peace*. New York: George H. Doran Company.
Naess, A. (1973). The shallow and the deep: long-range ecology movement. A summary. *Inquiry, 16,* 95–99.
Norton, B. G. (1984). Environmental ethics and weak anthropocentrism. *Environmental Ethics, 6*(2), 131–148.
Norton, B. (1991). *Toward unity among environmentalists*. New York: Oxford University Press.
Noss, R. F. (1992). The wildlands project land conservation strategy. *Wild Earth, 1,* 9–25.
Peluso, N. L. (1993). Coercing conservation?: The politics of state resource control. *Global Environmental Change, 3*(2), 199–217.
Rees, W. (2008). Toward sustainability with justice: Are human nature and history on side? In C. Soskolne (Ed.), *Sustaining life on earth: Environmental and human health through global governance* (pp. 81–93). New York: Lexington Books.
Schlosberg, D. (2007). *Defining environmental justice: Theories, movements, and nature*. Oxford: Oxford University Press.
Shoreman-Ouimet, E., & Kopnina, H. (2015). Reconciling ecological and social justice to promote biodiversity conservation. *Biological Conservation, 184,* 320–326.
Smith, D. L. (2016). Paradoxes of dehumanization. *Social Theory and Practice, 42*(2), 416–443.
Spannring, R. (2015). I and animal thou: Perspectives for educational theory. *Society and Animals, 23,* 613–629.
Strang, V. (2016). Justice for all: inconvenient truths and reconciliations in human and non-human relations. In H. Kopnina & E. Shoreman-Ouimet (Eds.), *Routledge handbook of environmental anthropology* (pp. 259–275). Routledge, Oxford, New York.
Van den Berg, A. E., & Koole, S. L. (2006). New wilderness in the Netherlands: An investigation of visual preferences for nature development landscapes. *Landscape and Urban Planning, 78*(4), 362–372.

Washington, H. (2015). *Demystifying sustainability: Towards real solutions*. London: Routledge.
Washington, H., Chapron, G., Kopnina, H., Curry, P., Gray, J., & Piccolo, J. (2018). Foregrounding ecojustice in conservation. *Biological Conservation*, *228*, 367–374.
Wilson, E. O. (2016). *Half-earth: Our planet's fight for life*. New York: Liveright/Norton.
Wray-Lake, L., Flanagan, C. A., & Osgood, D. W. (2010). Examining trends in adolescent environmental attitudes, beliefs, and behaviors across three decades. *Environment and Behavior, 42*(1), 61–85.

Part III
Conservation Solutions

Chapter 11
Ecodemocracy and Political Representation for Non-human Nature

Joe Gray and Patrick Curry

Contexts and Literature

As we witness the sixth mass extinction unfold, it is hard not to feel exasperated by the lack of a say in human democracy for all the species and ecosystems that are suffering, if not being destroyed outright, at the hands of humans (see Washington 2018). We are making decisions that have dramatic impacts on their fates without stopping to think what *they* might want. But this does not need to be the case. This paper is intended to contribute to the creation of political processes that recognize the intrinsic value of non-human nature (a value that is independent of any benefits for humans). We present, first, a review of the background—exploring where ecodemocracy fits into broader political and ethical theory—and then turn to consider how representation for non-human nature might be practically implemented in political processes. We are considering a political scale ranging from local groups all the way up to international alliances of governments—ecodemocracy can be put into practice at any of these.

There are several theoretical contexts for our discussion but our ability to engage with them will be constrained by the need to leave room for what is most original about what we have to offer. This concerns suggestions for systems and mechanisms for democratically representing the interests of nature (using that word as shorthand for the natural world, including but not limited to humans). Perhaps the largest context is that of justice, including environmental justice—justice for humans as it relates to environmental issues such as pollution—and ecological justice or ecojustice, where the intrinsic value of non-human nature is also recognized (see Baxter 2005). However, a standard dictionary of politics comments that "Although it is clearly a matter of great importance, 'justice' as a political value can really be analysed no further

J. Gray (✉)
Independent Scholar, St Albans, UK
e-mail: joe@deepgreen.earth

P. Curry
Independent Scholar, London, UK

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than to say that it requires a 'fair' distribution of goods" (Robertson 1993: 262). It is therefore beyond our remit, the available space, and our current capabilities to explore the issue farther, except to note that although ecojustice is clearly an important part of ecocentrism, caution is required in using justice to advance ecocentric values.

One reason is the fact that both environmental and ecological justice have been overlooked, or actively ignored, in most of the justice discourse to date (Washington et al. 2018). Another reason is that one of the most eminent political theorists of the last century, John Rawls, made justice the cornerstone of his philosophy, yet despite (or because of) this commitment, he was notoriously dismissive of attempts to include animals, let alone more holistic natural entities, within its ambit (Rawls 1971). Andrew Dobson uses the same point—that "justice can only very arguably be predicated of non-human natural beings"—to retain an anthropocentric concept of ecological citizenship (Dobson 2003: 113). Finally, Derek R. Bell defends a concept of "ecological justice" that is compatible with political liberalism but argues that "liberal ecologism requires that we give priority to humans over nonhuman nature" (Bell 2006: 216). What these points flag up is the amount of work still to be done (some of which is to be found elsewhere in this collection) on adapting the concept of justice to ecocentrism, rather than sacrificing the latter in order to retain its anthropocentric provenance.

The next context is democracy. Although arguably a subset of justice, it is another huge and complex subject ["there is little agreement as to what is important in constituting a regime as democratic", observes another source (Scruton 1983: 116)]. For our purposes it must suffice to say that by far the dominant modern understanding and practice of democracy is *representative* democracy, where decisions are taken by elected or delegated representatives, usually mixed with liberal democracy, using constitutional measures to guard against a tyranny of the majority [a fear classically articulated by Mill (1859) in *On Liberty*]. This form of democracy has largely elbowed aside direct and participatory democracy, in which citizens themselves take the major decisions.

Direct democracy and participatory democracy overlap but are not identical. Participatory democracy differs from representative democracy (where most citizens' participation is limited to voting every few years) in being more actively involved in decision-making processes, and it differs from direct democracy in allowing, or encouraging, alongside standard mechanisms of representation, the use of public enquiries, advisory referendums, consultative bodies, citizens' panels and so on. All of these can help foster deliberative democracy, in which decisions are arrived at through a process of collective reasoning where competing arguments and viewpoints are heard and debated. For this reason, participatory democracy is important in the context of our project, and what we advocate is essentially a major new addition or extension. To that extent, we differ from Lidskog and Elander (2009), seeking to address climate change democratically, who want participation and deliberation to be constrained by democratic representation. However, they do favour 'a patchwork of multi-level governance', which overlaps with our proposals.

Arguably the oldest, most sophisticated and vigorous tradition of participatory democracy is civic republicanism (see, e.g. Honohan 2002; Pettit 1997). Put at its simplest, the emphasis of civic republicanism is on an actively self-governing citizenry, non-domination by small, powerful and unaccountable elites, a wariness of concentrations of power (including financial and economic power) and their corrupting effects on a polity, and civic virtue; hence its affinity with virtue ethics as opposed to either of ethics' modern forms, consequentialist and deontological (see Curry 2017: 52–60). It is also worth mentioning that there are two broad strains of civic republicanism, 'neo-Roman' (rooted in the Roman Republic, Machiavelli and the American Founders) and 'Athenian' (especially as articulated by Rousseau). Our affinity is with the former, less absolutist and less utopian sort.

There is now a small but growing body of work on green republicanism, also sometimes called eco-citizenship. Despite his anthropocentrism, there is much that is valuable in Dobson (2003) and a great deal more in Barry's more recent work (Barry 2012, 2016). Other important contributions are Fremaux (2018) and Cannavò (2018). One of us has also made an initial attempt to redefine community in an eco-republican way (Curry 2000).

Let us turn to the smallest (but still important) theoretical context involved, ecodemocracy. We proposed, back in 2015, the following definition of an ecocentrically modified form of democracy, to be called 'ecodemocracy' for short (Gray and Curry 2016: 21):

> Groups and communities using decision-making systems that respect the principles of human democracy while explicitly extending valuation to include the intrinsic value of non-human nature, with the ultimate goal of evaluating human wants equally to those of other species and the living systems that make up the ecosphere.

In our conception of ecodemocracy, consideration should be given to the intrinsic value of not only the biotic parts of the ecosphere but the abiotic parts too (Gray 2013), such as landforms, rivers and soil. We were not the first authors to offer a definition of ecodemocracy. Back in 1992, Jan Lundberg described it as "restructuring of our society for maximum conservation and equal rights for all species" (Lundberg 1992: 226). We acknowledge that there is a need to refine the definition (and this is something that should be returned to), but the basic concept is clear. There is also a need for various mechanisms that could operate at different geographic scales, from local groups all the way up to international alliances of governments. At each level, there is a need to recognize non-human stakeholders. Here, we believe that such mechanisms are of fundamental importance to, in the words of Sarkki and Heikkinen (2014: 116), "legitimately 'close down' decisions in order to resolve complex and value-laden environmental conflicts" and so avoid legacies from current decision-making processes "undermining the legitimacy of future decisions." While Sarkki and Heikkinen were writing of human stakeholders, their point remains relevant when extended to include non-human stakeholders too.

At this point, we will head off the criticism that inevitably forms in some minds when the idea of non-human stakeholders is posited: that non-human nature cannot sensibly accept the moral obligations associated with the fairness-based underpin-

ning of stakeholder processes. We counter the rebuttal of "stakeholder identity run amok," as Phillips and Reichart (2000: 191) branded it, by arguing that entitlement for stakeholder status should come not from the capacity to understand fairness (something which, in any case, can be easily covered by having human proxies) but instead from the potential to be subjected to clearly unethical outcomes, such as being driven extinct (Gray and Curry 2016). A similar challenge that we wish to head off here is that since non-human stakeholders cannot *authorize* their representation or be *present* in political discussion, they are outside the domain of representation. As O'Neill (2006) observes on this point, legitimacy of representation can instead arise *epistemically*, through the possession of knowledge of the interests of non-human stakeholders.

As important a concept as we feel it to be, the literature to date on representation for non-human nature is relatively light. The key analysis published thus far, perhaps, on this topic is to be found within Lundmark's (1998) Ph.D. thesis, titled 'Eco-democracy: A green challenge to democratic theory and practice'. A part of Lundmark's argument is that the rights of non-human biota call for their democratic representation. She notes that "if natural entities have inherent worth, they can also be argued to have interests, and according to established conceptions of democracy, interests call for equal consideration in the democratic decision-making process" (Ibid: 50). Citing the work of Burnheim (1995), Dobson (1996) and Mills (1996), Lundmark discusses the idea of implementing equal consideration through having *human proxies* for non-human nature. This, she writes, could be achieved by letting "a random sample of people from the 'ordinary' electorate act on behalf of non-humans" (Lundmark 1998: 52). Lundmark also considers the question of the qualifications that are needed in order to be able to make effective moral judgements on behalf of other life-forms. "Through science and experience," she argues, "we can increase our understanding of other species and maybe even uncover what they want," but "our ability to understand non-humans is primarily restricted to species that are similar to us." While, within an ecocentric worldview, we do not see any such restriction on the scope of human empathy, it is a point worth noting as it may be presented as a challenge to a broad implementation of ecodemocracy. Lundmark (Ibid: 54) concludes her analysis of existing ideas on representation by observing that it rests "on the assumption that it is possible for 'ordinary people' to understand or, at least, feel empathy for other life-forms," and that she did not detect any "meritocratic undertones suggesting that governing should be left to an 'environmental elite'" (meritocracy is a form of representative democracy in which the representatives are selected according to merit).

While not discussing practical elements of representation for non-human nature to the same extent as Lundmark, Freya Mathews's edited *Ecology and Democracy* is nevertheless an important collection in this context. It sets out to investigate "whether liberal democracies are, even in principle, capable of responding adequately to the environmental challenge" (Mathews 1996: 1). After outlining the serious ecological shortcomings of anthropocentric politics, Mathews argues that what is needed is:

> … a form of democracy dedicated to the maximisation of communication rather than preference aggregation… [in which] nature becomes a co-respondent in the new system, capable of sending signals which may be received and integrated into the deliberative processes whereby policy is formed. In this way, nature becomes a party to the democratic process (Ibid: 8)

What is at stake, as she points out, is not only an ecological polity but equally a truly democratic one since democracy is taken outside just the human species.

In the same collection, Val Plumwood argues cogently that liberal democracy "is unable to recognize that nature is not just another interest group or another speaker, but the condition for all our interest and for all our speech" (Plumwood 1996: 142), a sentiment that reinforces the aforementioned ideas discussed by Lundmark (1998). But Plumwood also points out that "in a polity in which the privileged have the sole or central role in decision-making, decisions are likely to reflect their especially strong interest in maintaining processes destructive of nature." If the needs of the least privileged humans cannot effectively be voiced or considered, how much more so will be ecological information, communities and values, which are seen as outside the social contract altogether? The implication is that social justice and ecological justice must proceed hand-in-hand. Otherwise, says Plumwood, "structuring into the forms of democratic communication political speakers for the interests of nature" will amount to an exercise in futility, "sowing the wind" (Plumwood 1996: 159).

Also relevant is Robyn Eckersley's *Environmentalism and Political Theory* (1992). This is a critique of political anthropocentrism that calls for a perspective which "ensures that the interests of nonhuman species and ecological communities … are not ignored in human decision making simply because they are not human or because they are not of instrumental value to humans" (Ibid: 57). In later works, however (e.g. 2004), Eckersley seems to pull back from ecocentrism to a more cautious position.

Finally, Dobson's (2010) paper 'Democracy and nature: Speaking and listening' contributes an articulate plea for attentiveness, attunement and listening as neglected virtues with particular urgency in a green political context. He deliberately doesn't address the question of how to get the voice of non-human nature heard, so to that extent is not directly relevant here. However, he has important things to say, making use of Latour (2004), on how to encourage the admission of nature to the charmed circle of political subject-hood. (Latour's own case is unfortunately vitiated by his usual uncritical admiration for science and technology; the 'nature' he considers has already been reductively defined as exhausted by scientific naturalism, and he is not really interested in any other kind.)

Elsewhere (Gray and Curry 2016) have reviewed a broader range of suggestions for green socio-political systems, running from eco-authoritarianism to eco-anarchy (Hester 2010; Ott 2012; Melo-Escrihuela 2015). None of them, however, included *explicit recognition* of ecocentrism and, more importantly for the present context, none of them help us as regards representation for non-human nature.

Before we turn to consider the practicalities of implementing representation for non-human nature in detail, let us consider two potentially disabling and over-riding questions. The first is: "Why would anyone actually support such novel and demand-

ing measures?" Some people might consider it sufficient to reply, with the doyen of political studies, Max Weber, that "all historical experience confirms the truth that man would not have attained the possible unless time and again he had reached out for the impossible" (2008 [1919]: 207). Reasons to support ecocentric measures which are convincing for enough people will have to emerge from the work of ecocentrically-inclined or at least sympathetic politicians, activists, educators, public intellectuals and workers in all media. Most crucially, in our view, they need to articulate (that is, both voice and link) two things: (1) the empirically and personally evident signs of deepening ecological crisis, together with its anthropogenic causes, and (2) the advisability of taking responsibility for those causes, given their ethically contemptible effects on the natural world, including our fellow creatures. To the extent that these realizations gain sufficient traction among a sufficient number of people (a number impossible to define, of course, but none the less crucial for that), experimenting with new political remedies will start to become sufficiently plausible for it to happen.

The second potentially disabling question is: "What is the point of developing mechanisms aimed at achieving ecocentrism in what is a largely anthropocentric society?" Indeed, it would be dishonest for us to suggest that implementing ecodemocracy is as simple as effecting changes to the mechanics of decision-making processes. Instead, for it to come to be fully realized, it is imperative that there is an accompanying shift in human society to a more ecocentric worldview. Otherwise, even if it was implemented and it achieved successes for ecocentrism in the short term, there are no guarantees at all that it would be stable in the long run, especially with resource pressures on humans and non-humans set to escalate over the coming decades (Crist et al. 2017). That remains as a key challenge, but one that is outside the scope of our paper.

We are willing, indeed eager, to be as "realistic" as possible, but not to give that consideration the final say. We are mindful of Anderson's (1995: 11) acute observation, concerning calls to meet the demands of 'realism', even progressive and indeed 'green' realism: "It is not hard to see how [such] arguments seek in the end to draw radical ecology into the 'conversation' of bureaucracy and managerialism, from which, once drawn in, it will go nowhere that 'progress' does not approve that it should go." Quite so, and given in addition the urgency of the ecocrisis, we have therefore chosen to start not from what seems (by some sort of unspoken consensus) "possible" to do and then cautiously extend it, but rather from where, if that crisis is to be ameliorated, let alone stopped, we must end up: ecocentrism in action. That is where we take our stand.

Implementing Representation for Non-human Nature in Practice

The key practical concepts relating to representation for non-human nature that emerge from our literature review are:

- deliberative methods (which could, but does not necessarily need to, involve human proxies for non-human nature);
- human proxies given voting rights;
- and meritocratic principles [this last idea was raised, with a warning flag, by Lundmark (1998)].

Of these, the simplest way, from a logistical perspective, to ensure that the intrinsic value of non-human nature is considered in socio-political systems is the first one: deliberative methods. Here, representation for non-human nature could work independently of assigning proxy voting rights by instead simply allocating time in any decision-making processes that is protected for the discussion of the intrinsic value and rights of non-human nature. As O'Neill (2006: 271) notes, deliberative democracy allows for "virtual representation" of non-human nature through the *internalization* of wider interests. O'Neill (Ibid: 276) also opines that even where deliberative democracy fails in resolving conflicts, it is valuable if it helps ensure that "hidden conflicts are made explicit and silenced voices are heard".

For this kind of deliberative democracy to be particularly effective, it would be wise, we believe, to still appoint a number of humans who would be specifically tasked with speaking for non-human nature in the discussions. This would help ensure a high-quality discursive process (where 'quality' is related to achievement of a broader ecocentric context). This is because, while anyone participating in the discussions can of course consider the importance of intrinsic value in their own inputs, having these proxies in place would help increase the likelihood that any discussion does not become completely dominated by anthropocentric ideas.

The act of adequately *representing* another player in nature should not be seen as a trivial one. Indeed, the undertaking of some form of deeper preparation is fundamental to the validity of the exercise. While this is particularly important for any 'ordinary citizens' who may be acting as representatives for non-human natures, even those with richer ecological expertise should not forego such an exercise. This preparation, we feel, should combine both background reading and solitary reflection or meditation (at an intensity suited to the individual), combined with group-based expressive exercises. A part of this, where it is practical, should be spending time around what it is that one is representing (if it's the trees, for instance, then one or more trips to the woods should be made). A well-formulated option for this process is a Council of All Beings, which was conceptualized by John Seed (Rainforest Information Centre n.d.) and Joanna Macy (Macy and Brown 2014), drawing inspiration from both the philosophical writings of Arne Naess and Macy's own 'despair and empowerment' workshops (Macy 1983) and Seed's deep ecology workshops (Seed et al. 1988). In short, it is a process designed to help participants step aside from their human identity

and speak on behalf of another life-form. The Council of All Beings method was originally applied not in a true political context but among groups of people wishing to develop an emotionally richer response to Earth's destruction, and to better understand both their place in the ecosphere as humans and how they should behave. Nevertheless, we think that it could be adapted to our purposes in regard to assisting those who speak as proxies for non-human nature (see Box 1). Another option for helping proxies prepare for their role may lie in video games. Alf Seegert, creator of a course titled 'Video Games and Storytelling' at the University of Utah, has argued that their potential extends to evoking empathy for other species (Seegert 2014). A game that he cites as being especially effective in this regard is *Shelter* (Might and Delight, Stockholm, Sweden, 2013), in which the players take on the role of a mother badger who is trying to keep her cubs safe during a hazardous journey (Seegert 2014). What is more important than any specific focus of their content, he argues, is that the games can serve more broadly as training for taking a non-human perspective (A. Seegert, pers. comm., 2018). Thus, it would not be necessary to develop games specific to each context in which ecodemocracy was being applied.

Box 1: Preparing to Represent Non-human Nature Through a Council of All Beings Approach

In marked contrast to 'normal' political discussion, a Council of All Beings is a deeply spiritual process, involving breathing exercises, rituals of remembrance, mask-making and more. It may be necessary to lighten and simplify the spiritual nature of the process, if those who are not used to such exercises are going to be willing to fully immerse themselves in it (we say this reluctantly and for pragmatic reasons only, knowing that it is stripping something very important from the method). Seed et al. (1988) offer templates for these workshops, including a full version that runs over a weekend. It is easy to recoil at the suggested length, not least as it may dwarf the time given to the official deliberative process that follows these preparatory exercises. We suggest that if it is only possible to find, say, two hours to allocate to preparation, then this would certainly be better than running nothing at all. At the same time, we observe that if the thing being discussed is, for instance, whether or not to fell a veteran beech tree, then even the full weekend might only be 0.0001% of the time spent on the Earth by that tree. Thinking about it on the beech's timescale suggests that a weekend is not such a long time. Whatever the format and length that is opted for, it is ideal that everyone involved in the discussion does at least some preliminary work towards developing empathy for non-human entities, but, as a minimum, the human proxies will certainly need to take part in the mental preparations, in order to do justice to their particularly important role.

A way to extend the benefits of the discursive process in deliberative ecodemocracy would be to assign stakeholder status and explicit voting rights to non-humans,

which would, again, be achieved through human proxies. In our view, stakeholder status could be assigned to species, ecological communities, or non-living components of ecosystems such as water and soil. If this principle was applied to a general election (just one of countless possible contexts for ecodemocracy), then people might wish to be granted multiple votes to avoid sacrificing their right to speak on behalf of themselves too. If, however, this was applied to a committee that was a subset of the full voting population, then the same issue would not occur and so proxies and voting non-proxies could each be given a single vote. The balance between the number of human votes and those given to proxies for non-human entities (and how those given to non-human nature are themselves divided) is a critical factor here. In a fully ecocentric system (one designed to govern in the interests of all nature), non-proxy humans might constitute only a very small proportion of the voting panel for certain decisions [e.g. cutting down a beech (see Box 1)]. However, even if proxies for non-human nature made up only a minority of the panel this would still be better than having no proxies, and it would serve as a gateway to a more fully ecocentric voting process. Arching over these discussions is the consideration that, as with deliberative ecodemocracy, some form of spiritual or other mental preparation would be necessary for the role of proxy to be adequately fulfilled.

Also of general relevance in this discussion is the issue of how the identity of proxies would be decided upon. As mentioned earlier, Lundmark (1998) suggested that random lot could be used. The other obvious means of appointing proxies would be by election among volunteers for the roles. The pool of potential proxies would vary with the context—for decisions affecting a local nature reserve, for instance, the pool could be all individuals who have chosen to register as stakeholders or it could be those volunteering in response to a call for candidates sent to locally registered members of the electoral body. It is not possible to offer definitive recommendations on the optimal mechanism for appointing proxies, because what we are proposing is significantly different from traditional democracy, and the learnings do not necessarily apply. Instinctively, however, it feels like it may be preferable to have proxies who *want* to be proxies. What we do know is needed is practical experience of using different methods, with the outcomes being reflected upon and the methods refined.

An alternative to having a number of individual proxies (appointed by random lot or otherwise) would be to appoint a group of experts in ecology, environmental science and ethics, and to charge them with producing recommendations, where decisions were needed, that reflected what they thought would be preferable from the perspective of the community of life. If these recommendations were automatically implemented then it would, of course, be a meritocracy, something that is anathema to many. However, it would be possible to reduce the power of the expert group, and thus revert the system to a more traditionally accepted form of democracy, by appointing a second panel, formed of elected individuals, to similarly make recommendations on the topic, but where the significance of human wants and needs would be considered in the traditional way (this would not, of course, necessarily exclude nature conservation). The crux of this suggestion (in which we ensure that the appointed experts are one step removed from the final stage of decision-making) is in what we describe next—the *mechanism for resolving disputes* where the two

panels disagree with each other. Here, a jury of citizens would be tasked with deciding whether, within an ecocentric context, the human desires were sufficiently important to outweigh the needs of the community of life as a whole. It is crucial that this jury understands the ecocentric remit of their task, as stated in a Charter for this purpose, since otherwise the decision is not going to differ from that which would be reached by traditional political means, and thus the system could not be described as a form of ecodemocracy. Again, some form of mental preparation would be necessary, especially for the jury of citizens but also for the members of the expert committee.

The set of mechanisms presented above is not intended as an exhaustive list. Instead, it has illustrated that there are a number of means of achieving representation for non-human nature, and it has allowed some of the key practical challenges to be considered. This is the starting point for broader discussions. Other ideas to be explored might include 'veto' powers for human proxies for non-human nature (to give expression to the precautionary principle in regard to proposed developments). We emphasize that ecodemocracy is a work in progress, yet a very necessary work.

Where Do the 'Rights of Nature' Fit In?

Within a broader ecodemocratic governance system, the mechanisms described above for implementing representation for non-human nature could by complemented by the intrinsic rights of non-human nature being written into a statute—that is, for the rights of nature to be legally recognized. Partnering *representation* for non-human nature with *legal rights* for non-human nature [the latter as in Earth jurisprudence (Bell 2003; Cullinan 2003)] offers a way of allowing political decisions to be reached that account for the intrinsic value of non-human nature *and* for legal levers to be in place to discourage ecological harm to non-human entities granted such rights. In other words, the two concepts go hand in hand. Campaigners, such as Polly Higgins, through her 'Eradicating Ecocide' (http://eradicatingecocide.com/) and 'Mission LifeForce' projects (https://www.missionlifeforce.org/), are working to gain the concept of rights of nature broad acceptance and widespread implementation. Local victories are beginning to occur across the globe (e.g. Roy 2017). There is a growing body of literature on the topic (but tackling it is outside the scope of our paper). We see Earth jurisprudence that legislates for the rights of nature working hand-in-hand with an effective ecodemocracy.

Concluding Remark

We have discussed here where ecodemocracy fits in within broader theory and, more practically, how representation for non-human nature within political decision-making could be achieved. As we have made clear, though, on-the-ground experience of its implementation is, to our knowledge, minimal at present. [A rare case—and

one that we will need to wait to examine the learnings from—is that of the two 'guardians' appointed to act on behalf of the Whanganui river in New Zealand (Roy 2017); for more on this see Chap. 8 by Strang in the present volume.] Thus, while there is still work to be done in refining the definition and scope of ecodemocracy, it is far more urgent at this point to develop and test practical means of achieving representation for non-human nature. Once we have a tried-and-tested 'toolkit', we can begin to campaign with vigour for a broader implementation of ecodemocracy. This will constitute a crucial piece in the jigsaw for fostering and implementing ecocentrism.

References

Anderson, K. (1995). Our natural selves. In *Times Literary Supplement* (pp. 10–11). September 8, 1995.

Barry, J. (2012). *The politics of actually existing unsustainability*. Oxford: Oxford University Press.

Barry, J. (2016). Citizenship and (un)sustainability: A green republican perspective. In S. M. Gardiner & A. Thompson (Eds.), *The oxford handbook of environmental ethics* (pp. 333–343). Oxford: Oxford University Press.

Baxter, B. (2005). *A theory of ecological justice*. London: Routledge.

Bell, D. R. (2006). Political liberalism and ecological justice. *Analyse & Kritik, 28,* 206–222.

Bell, M. (2003). Thomas Berry and an earth jurisprudence: An exploratory essay. *The Trumpeter, 19,* 69–96.

Burnheim, J. (1995). Power-trading and the environment. *Environmental Politics, 4,* 49–65.

Cannavò, P. (2018). Ecological limits as promoting republican non-domination. In *Conference Paper Delivered at the Workshop*, "*Green Politics and Civic Republicanism: Green Republicanism as a Response to the Environmental and Political Crises of the 21st Century*", *ECPR Joint Sessions*. Nicosia, Cyprus, April 10–14, 2018.

Crist, E., Mora, C., & Engelman, R. (2017). The interaction of human population, food production, and biodiversity protection. *Science, 356,* 260–264.

Cullinan, C. (2003). *Wild law: A manifesto for earth justice*. Totnes, Devon: Green Books.

Curry, P. (2000). Redefining community: Towards an ecological republicanism. In: *Biodiversity and conservation* (Vol. 9, pp. 1059–1071). Available at http://www.patrickcurry.co.uk/papers/TowardsEcolpublicanism.pdf. Accessed August 2018.

Curry, P. (2017). *Ecological ethics: An introduction* (2nd ed.). Cambridge: Polity.

Dobson, A. (1996). Representative democracy and the environment. In W. M. Lafferty & J. Meadowcroft (Eds.), *Democracy and the environment* (pp. 124–139). Cheltenham: Edward Elgar.

Dobson, A. (2003). *Citizenship and the environment*. Oxford: Oxford University Press.

Dobson, A. (2010). Democracy and nature: Speaking and listening. *Political Studies, 58,* 757–768.

Eckersley, R. (1992). *Environmentalism and political theory: Toward an ecocentric approach*. New York, NY: SUNY Press.

Eckersley, R. (2004). *The green state*. Cambridge, MA: MIT Press.

Fremaux, A. (2018). *Towards a critical towards a critical theory of the anthropocene and a life-affirming politics a post-anthropocentric, post-growth, post-(neo)liberal green republican analysis*. Ph.D. thesis for Queen's University Belfast. Available at https://www.researchgate.net/profile/Anne_Fremaux. Accessed August 2018.

Gray, M. (2013). *Geodiversity: Valuing and conserving abiotic nature* (2nd ed.). Hoboken, NJ: Wiley.

Gray, J., & Curry, P. (2016). Ecodemocracy: Helping wildlife's right to survive. *ECOS, 37,* 18–27.

Hester, R. T. (2010). *Design for ecological democracy*. Cambridge, MA: MIT Press.

Honohan, I. (2002). *Civic republicanism*. Abingdon: Routledge.
Latour, B. (2004). *The politics of nature: How to bring the sciences into democracy*. Cambridge, MA: Harvard University Press.
Lidskog, R., & Elander, I. (2009). Addressing climate change democratically: Multi-level governance, transnational networks and governmental structures. *Sustainable Development, 18,* 32–41.
Lundberg, J. (1992). America needs restructuring. *Population and Environment, 13,* 225–228.
Lundmark, C. (1998). *Eco-democracy: A green challenge to democratic theory and practice* (thesis). Umeå: Umeå University.
Macy, J. (1983). *Despair and personal power in the nuclear age*. Philadelphia, PA: New Society Publishers.
Macy, J., & Brown, M. (2014). *Coming back to life: The updated guide to the work that reconnects*. Gabriola Island, Canada: New Society Publishers.
Mathews, F. (Ed.). (1996). *Ecology and democracy*. London: Frank Cass.
Melo-Escrihuela, C. (2015). Should ecological citizenship advocates praise the green state? *Environmental Values, 24,* 321–344.
Mill, J. S. (2006) [1859]. *On liberty and the subjection of women*. London: Penguin Classics.
Mills, M. (1996). Green democracy: The search for an ethical solution. In: B. Doherty & M. De Geus (Eds.), *Democracy and green political thought*. London: Routledge.
O'Neill, J. (2006). Who speaks for nature? In Y. Haila & C. Dyke (Eds.), *How nature speaks: The dynamics of the human ecological condition*. Durham, NC: Duke University Press Books.
Ott, K. (2012). Variants of de-growth and deliberative democracy: A Habermasian proposal. *Futures, 44,* 571–581.
Pettit, P. (1997). *Republicanism: A theory of freedom and government*. Oxford: Oxford University Press.
Phillips, R. A., & Reichart, J. (2000). The environment as a stakeholder? A fairness-based approach. *Journal of Business Ethics, 23,* 185–197.
Plumwood, V. (1996). Has democracy failed ecology? An ecofeminist perspective. In F. Mathews (Ed.), *Ecology and democracy* (pp. 134–168). London: Frank Cass.
Rainforest Information Centre. (no date). *The council of all beings workshop manual.* Available at http://www.rainforestinfo.org.au/deep-eco/cabcont.htm. Accessed August 2018.
Rawls, J. (1971). *A theory of justice*. Cambridge, MA: Harvard University Press.
Robertson, D. (1993). *Dictionary of politics*. London: Penguin.
Roy, E. A. (2017). New Zealand river granted same legal rights as human being. *The Guardian*, March 16, 2017. Available at: https://www.theguardian.com/world/2017/mar/16/new-zealand-river-granted-same-legal-rights-as-human-being. Accessed August 2018.
Sarkki, S., & Heikkinen, H. I. (2014). Why do environmentalists not consider compromises as legitimate? *Forest Policy and Economics, 50,* 110–117.
Scruton, R. (1983). *A dictionary of political thought*. London: Pan Books.
Seed, J., Macy, J., Fleming, P., & Naess, A. (1988). *Thinking like a mountain: Towards a council of all beings*. London: Heretic Books.
Seegert, A. (2014). Pixels and pathos: Video games and empathy. Presented at: *Interdisciplinary Symposium on Empathy, Contemplative Practice and Pedagogy, the Humanities, and the Sciences.* University of Utah, USA.
Washington, H. (2018). *A sense of wonder towards nature: Healing the world through belonging*. London: Routledge.
Washington, H., Chapron, G., Kopnina, H., Curry, P., Gray, J., & Piccolo, J. (2018). Foregrounding ecojustice in conservation. *Biological Conservation, 228,* 367–374.
Weber, M. (2008) [1919]. Politics as vocation. In J. Dreisjmanis (Ed.), *Max Weber's complete writings on academic and political vocations.* New York, NY: Algora Press.

Chapter 12
The Spectrum of Wildness and Rewilding: Justice for All

Reed F. Noss

I wish to speak a word for Nature, for absolute freedom and wildness, as contrasted with a freedom and culture merely civil...
Henry David Thoreau (Walking, 1862: 592)

Introduction

I am fortunate to have had wild places close to home for most of my life, places to which I could escape from the nerve-shattering madness of civilization. Woods, creeks, ponds, old fields, pastures, abandoned limestone quarries—all places that were damaged to varying degrees by humans but in which people do not now have a dominating presence. None of these places could be called wilderness by any stretch of the imagination. They are not natural areas in the pure sense of the term. They are semi-natural, but they are wild. Processes as old as life on Earth still operate within them, not completely overwhelmed by human activity and technology. And they are quiet, except for the songs of birds, frogs, and insects, the bubbling of brooks, the wind through the trees, and occasional sounds of automobiles, airplanes, or guns in the distance. These have been places where, since childhood, I could relax but also feel exhilarated, where I could contemplate difficult questions about life and death, where I could exercise my body and break a sweat, and where I could hone my skills as a naturalist. The other beings in a wild place, and even the rocks and waters, feel like friends and family. I am never alone there.

Who on Earth does not need wild places? I suspect that, to be sane, nearly everyone needs wild nature, whether they realize it or not. John Muir observed, "There is a love of wild nature in everybody, an ancient mother-love ever showing itself whether recognized or no, and however covered by cares and duties" (Muir, in Teale 1954:

R. F. Noss (✉)
Florida Institute for Conservation Science, 1255 E Peppertree Dr., Apt. 407, Sarasota, FL 34242, USA
e-mail: reedfnoss@gmail.com

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311). The growing literature on nature's salubrious effects on human physical and emotional health and intellectual development is persuasive (e.g. Kellert 2002; Louv 2011; Flies et al. 2017; Oh et al. 2017). Wild areas, however, have many important values aside from enhancing human well-being. The most essential value is providing habitat to wild species—each one valuable for its own sake—and sustaining ecological and evolutionary processes fundamental to all life. The "extinction of experience" (Pyle 1978) and alienation from nature that accompanies urbanization and extensive loss of wildlands is a great social injustice as well as a root cause of the biodiversity crisis.

In this chapter I review the concept of wildness, particularly how it applies to conservation ethics, biodiversity preservation, and ecological justice (sensu Washington et al. 2018). I accept the common definition of wildness as the quality of being wild, undomesticated, or untamed. Wildness is a relative rather than an absolute quality. It can be recognized within many different landscape contexts and across spatial scales ranging from vacant lots, back yards, and city parks to immense wilderness areas with intact food webs, megafaunal assemblages, disturbance regimes, and biogeochemical processes. Wildness is critically important to protect and to restore (i.e. rewilding) across all of these contexts and spatial scales. To fully serve its most essential functions (providing habitat to native species and sustaining natural processes) wild natural and semi-natural sites must collectively encompass a vast area. How much area is enough varies regionally and depends on the ecological and land-use context. Nevertheless, as discussed later, estimates based on sound science suggest approximately half of an average ecoregion, and of earth as whole, must be protected to meet well-established conservation goals. Moreover, it is a sensible policy alternative for providing justice to as many species as possible, including humans, on a deteriorating planet (Kopnina 2016).

Wildness: From Vacant Lots to Vast Wilderness

Wildness and wilderness are not the same thing. Wilderness, as defined in the landmark U.S. Wilderness Act of 1964, is, "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain" (http://legislink.org/us/pl-88-577). Although not a common term, "untrammeled" is a perfect way to describe wilderness; it means not hindered or restrained. Lack of hindrance and restraint of nature by humans is a fundamental attribute of wilderness. The U.S. National Wilderness Preservation System is the largest network of strictly protected lands in the world, now encompassing 110 million acres (445,154 km^2) (Tricker and Landres 2018). Similar systems of wilderness areas exist around the world, some of which go by the name of wilderness but in other cases are national parks or other protected areas that meet the criteria for wilderness. The IUCN recognizes the distinct qualities of wilderness in its protected area categorization. Wilderness areas (Protected Area Category Ib) are, "usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or

significant human habitation, which are protected and managed so as to preserve their natural condition" (IUCN 2008).

A wilderness is a self-willed landscape (Nash 2001), an intact place that operates largely free of human control. Most true wildernesses are able to escape domination by people because they are large, remote, legally protected, or some combination of these qualities. Although most wilderness areas are affected to some degree by anthropogenic impacts such as air pollution and global climate change, wilderness is no place for industrial-scale activities (Allan et al. 2017) or for any commercial activities or intensive recreation that degrade its ecological health or wild character. The U.S. Wilderness Act, for example, stipulates that wilderness areas, "shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character" (http://legislink.org/us/pl-88-577).

All wildernesses are wild areas, but not all wild areas qualify as wilderness. Wildness is a broader and more accommodating concept than wilderness, but it is just as necessary to the human spirit and to biodiversity (Noss 1990). Importantly, wildness encompasses much more land, water, and species diversity than wilderness. I worry that some purist wilderness defenders set so high a bar that they are not interested in protecting smaller, more modified wild areas that serve as critical habitat for wild species and which are usually much more accessible to humans—a desirable attribute if we want people to fall in love with nature (Miller 2006). Henry David Thoreau's Walden Pond was not wilderness. It lies only 2.25 km from the center of Concord, Massachusetts, which even in the mid-19th century was a bustling town. But consider what Thoreau sought and found at Walden Pond: "I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived" (Thoreau 1854: 343). In his essay "Walking," published one month after his death from tuberculosis at the age of 44, we find not only one of his most-quoted lines, "In wildness is the preservation of the world," but also, more emphatically, "Give me a wildness whose glance no civilization can endure" (Thoreau 1862: 609, 610).

Like probably most conservationists, I have always had my own personal Waldens. I would not have survived long without such places. But my survival, or yours, or any person's is not the primary reason for allowing wildness to persist in the landscapes we inhabit in addition to those far away. The fundamental and indispensable role of wild natural and semi-natural areas in this time of mass extinction is to provide habitat for wild species. Wild areas serve as refugia within which species can hold on through the collapse of civilization and perhaps later recolonize their former territory. Not all species require wildness, of course. Some species are synanthropic: they live with humans. Beyond our specialized parasites, such as the two species of *Demodex* mites found only on human eyelashes and the sebaceous glands connected to them, are quite a few opportunistic species that have come to depend on human-altered habitats. There are also those species humans have domesticated, which provide us meat, milk, hides, transport, and companionship.

Most species are tolerant of some level of human activity. Nevertheless, the majority of species still require secure and essentially wild places to reproduce or perform other life history functions. In Florida, where I live, several bird species are associated with anthropogenic habitats. Some are of conservation concern, such as the state-Threatened Florida sandhill crane (*Antigone canadensis pratensis*) and the federally-Endangered (i.e. under the U.S. Endangered Species Act) wood stork (*Mycteria americana*). Both of these species are often seen in roadside ditches, retention ponds, front lawns, and McDonald's parking lots. Pushed out of their original habitats, they showed the flexibility to adapt to anthropogenic habitats. Their apparent preference for human habitats is misleading, however, because both species require wild wetland sites with minimal human interference in order to nest and fledge their young. Without secure wildness, they would decline to extinction.

The Florida populations of the federally-Threatened crested caracara (*Caracara cheriway*) and state-Threatened Florida burrowing owl (*Athene cunicularia floridana*), both of which presumably migrated to Florida from western North America during the Pliocene or Pleistocene, probably once depended on grasslands grazed by now-extinct megaherbivores (Noss 2013). Today we find them in cattle pastures, with the caracara hiding its nest in the tops of isolated palms or oaks and the burrowing owl nesting in burrows, sometimes in mowed lawns as well as pasture. Research shows that the vast majority of caracara nest sites in Florida are on private cattle ranches; paradoxically, caracara appear to prefer non-native pasture to native grasslands (Morrison and Humphrey 2001). Pastures have low-stature grasses, which suit these birds because they often forage by walking. Whenever I see caracara or burrowing owls, I visualize vast herds of mammoths, mastodons, giant ground sloths, and other immense beasts roaming the ancient Florida grasslands. Both species require secure nesting sites free from direct human disturbance. Fortunately, most of the large cattle ranches of Florida provide considerable wildness and protection from such disturbance.

Wild species are associated with a broad spectrum of wildness, from remnant patches of vegetation within urban and agricultural landscapes at one end to immense wildernesses on the other. Most species fall somewhere in the middle and utilize small to large patches of natural or semi-natural habitat within a human-altered landscape matrix. Mammals such as black bear (*Ursus americanus*), bobcat (*Lynx rufus*), and river otter (*Lontra canadensis*) usually require relatively large patches. And because these animals have large home ranges and disperse fairly long distances, the patches must be connected by habitat corridors or by a relatively permeable landscape matrix such as managed forest or rangeland. The presence of viable populations of these species in a region is an indicator that a considerable degree of wildness remains. Loss, fragmentation, and alteration of habitats by humans have eliminated these species from many landscapes across North America, especially in the eastern and midwestern United States and much of southern Canada (Reid 2015). Moreover, these animals are vulnerable to persecution from humans, including legal and illegal hunting and trapping, as well as road mortality. The latter increases relentlessly with expansion of road networks and traffic volume (Forman and Alexander 1998).

In some areas, populations have rebounded with recovery of native vegetation, a testimony to the power of rewilding (see following section).

At the wildest end of the spectrum are species mostly associated with large wildernesses with limited access to humans (i.e., roadless or with very low road density), not so much because they prefer wilderness, but because people actively persecute them everywhere else. In North America, these wilderness-associated species include large or medium-sized carnivores such as gray wolf (*Canis lupus*), grizzly bear (*Ursus arctos horribilis*), wolverine (*Gulo gulo*), Canada lynx (*Lynx canadensis*), and puma (*Puma concolor*) (Noss et al. 1996). The puma, however, has adapted reasonably well to human-inhabited landscapes in much of North America, so long as it has secure den sites and movement corridors (e.g., Dickson et al. 2005). The pronghorn (*Antilocapra americana*) does not require strict wilderness, but it needs large unfragmented shrub-steppe or grassland with minimal human activity or structures such as roads and fences; indeed, pronghorn perceive high-traffic roads as a risk (Gavin and Komers 2006). These examples suggest that maintenance of the full suite of species native to any ecoregion requires protection or restoration of substantial areas of connected wild habitat (Noss and Cooperrider 1994). Regions heavily dominated by intensive agriculture or cities retain mostly species associated with the domesticated or weedy end of the wildness gradient.

Although all species ultimately have equivalent intrinsic value, at any given place and time conservationists usually should concentrate on those species most threatened by human activities (Diamond 1976), and these are often species requiring large, wild landscapes. For all species on Earth to survive, protected areas must encompass the entire wildness spectrum, ideally with large blocks of wilderness in each ecoregion, but not neglecting small sites. These small sites occur not only as patches of remnant vegetation in heavily developed landscapes, but also sites in various landscapes with atypical physical conditions and species assemblages. Many local endemic species, for instance, are found only within small patches of unusual habitat, such as extreme soils (Rajakaruna 2004; Noss 2013).

Rewilding: Should We Return to the Original Meaning?

> Hope and the future for me are not in lawns and cultivated fields, not in towns and cities, but in impervious and quaking swamps.
>
> Henry David Thoreau (Walking, 1862: 611)

Can we bring back the impervious and quaking swamps that have been lost to civilization and thereby restore justice to the creatures whose homes we have defiled? Rewilding, as the word implies, means bringing back wildness. At least it should mean this. Many disparate concepts of rewilding are discussed within the conservation community (Johns 2016), which has led to considerable confusion about its meaning and goals. The earliest application of the rewilding idea did not use that term, but rather "wilderness recovery." Wilderness recovery was proposed for sev-

eral regions of North America in various articles in the *Earth First*! journal during the 1980s. One of the more detailed proposals, for the State of Florida, noted the irony that active management is now required to restore wilderness character in many regions, including such actions as, "removal of roads, structures, and other intrusions; reestablishment of original drainage patterns; reintroduction of large predators and other missing ecosystem components; and guarding against human trespass, poaching, and overuse" (Noss 1985: 18).

Restoring populations of apex predators quickly became the hallmark of wilderness recovery, for the simple reason that these species are usually the first to disappear as an area loses its wilderness character through road-building or other increases in human access. In the early 1990s Dave Foreman (e.g. Foreman 1992, 2004) substituted the term rewilding for wilderness recovery. The term, however, was apparently first used in a 1990 article in *Newsweek* magazine, which discussed the desire of radical environmentalists to protect or restore to a wild condition at least one-third of the North American continent (Foote 1990). In the first full article on rewilding (by that name), Soulé and Noss (1998: 2) noted that, in contrast to conventional biodiversity conservation focused on representation of vegetation or physical features and protection of special biotic elements, rewilding involves the, "restoration and protection of big wilderness and wide-ranging, large animals—particularly carnivores." Carnivores were emphasized because they often regulate food webs through top-down control, that is, they serve as keystone species (Terborgh et al. 1999). Moreover, due to their large body sizes and sensitivity to human persecution, large carnivores typically require very large or interconnected landscapes with limited human access (Noss et al. 1996), that is, a high degree of wildness.

Some authors have expressed concern about the emphasis on large carnivores in rewilding proposals. Reliance on the hypothesis that carnivores are keystone species is a potential weakness of the rewilding paradigm, because sometimes apex predators regulate food webs and sometimes they do not (Nogués-Bravo et al. 2016). In some ecosystems, bottom-up control by climate, other physical factors, nutrients, or plant diversity is equally or more important than top-down control by predators (Frederiksen et al. 2006; Scherber et al. 2010). A more defensible proposition might be simply that wild ecosystems with intact food webs, including apex predators, and natural processes have value for their own sake, and they are now exceedingly rare. Thus, we have an ethical obligation to restore such ecosystems wherever we can. Because large carnivores with enormous area requirements are often umbrella species, whose protection will bring along many other species (Noss et al. 1996), their emphasis in rewilding proposals is well-justified. Moreover, large carnivores, as well as some large herbivores, often serve as indicators of unfragmented landscapes and as flagships for conservation initiatives (Dalerum et al. 2008). People in general find these beasts charismatic and exciting.

The original meaning of rewilding was muddled with the publication of a controversial essay in *Nature* in 2005, which used the term to refer to the experimental introduction to North America of megafauna from other continents, such as elephants (Donlan et al. 2005). The reasoning is that these species represent the closest living relatives of animals that went extinct in North America during the late Pleis-

tocene, approximately 13,000 years ago, due at least in part to human hunting. These species probably played critical ecological roles on this continent (Donlan et al. 2005). Subsequently, to many people rewilding became synonymous with Pleistocene rewilding and was considered impractical as well as dangerous because of the uncertain impacts of introduced species on native ecosystems, among other concerns (Nogués-Bravo et al. 2016). Retaining the original meaning of rewilding—the restoration of wildness—and emphasizing recovery (including reintroductions, when necessary) of extant native species first and foremost, seems sensible. Thus, bison would come before elephants and wolves and puma before African lions in rewilding North America.

Today rewilding is discussed mostly in terms of reintroducing native species to restore ecological functionality, although in some cases, "a rewilding translocation could also take the form of a conservation introduction through ecological replacement using suitable substitute species" (Seddon et al. 2014: 411). In portions of Europe, for example, domestic cattle, horses, and ponies have been introduced as substitutes for extinct native herbivores (Gillson et al. 2011). Restoration of truly wild conditions and viable populations of large carnivores is often absent from these proposals. Indeed, Seddon et al. (2014: 411) advise us to move away from, "increasingly unobtainable concepts of self-sustaining wildlife populations within pristine landscapes untouched by human influence" and accept the alternative approach of, "restoring and sustaining species and their habitats, possibly in novel configurations, with ongoing management." While I acknowledge that this approach is the more realistic one for many human-dominated landscapes, genuine opportunities to restore complete, naturally functioning wilderness in many regions around the world should not be ignored or trivialized.

What I see most blatantly missing from the current rewilding agenda is attention to wild natural processes aside from predation and herbivory. Fire and other natural disturbances are among the most critical of these processes and are supreme expressions of wildness. Although restoration of natural disturbance regimes was implicit or explicit in early wilderness recovery and rewilding proposals (see Noss 1992), it is not prominent in recent discussions.

In general, natural disturbances are just as important as apex predators in maintaining ecological integrity (Pickett and White 1985; Baker 1992; Noss and Cooperrider 1994; Noss 2018). Disturbance regimes often must be actively restored in degraded landscapes and, except in very large blocks of habitat, must be managed in perpetuity. Fire is a particularly important process, which has been on Earth for some 420 million years as a dominant ecological and evolutionary force in many types of ecosystems worldwide (Pausas and Keeley 2009; He and Lamont 2017). Not only species, but entire ecosystems have evolved to become fire-dependent, in the literal sense that they would disappear in the absence of fire. In many regions restoring the fire regimes with which species evolved over thousands to millions of years would arguably do more to restore overall biodiversity than any other single action (Noss 2018). In some ecosystems, though, fire is now more abundant than historically, with negative effects on native species. Human-set fires in moist tropical forests can be highly destructive (Nepstad et al. 1999), as can fires in North American sagebrush

steppe, which have become much more frequent due to invasion by highly flammable non-native grasses such as cheatgrass (*Bromus tectorum*) (Shinneman and McIlroy 2016). Fire activity is declining globally, however, mostly due to human population growth and agricultural expansion, and this decline is likely to continue despite climatic conditions becoming more favorable to fire (Andela et al. 2017).

Just as there is a spectrum of wildness, there is also a spectrum of rewilding. At the far end of the spectrum is wilderness recovery (Noss 1985), which implies restoration of true wilderness conditions in large and interconnected blocks of land that are essentially able to manage themselves with natural disturbance regimes and predator-prey interactions. Because some disturbance regimes (such as fire in boreal forests) as well as the population processes of large carnivores operate on scales of millions of square kilometers (Noss and Cooperrider 1994), this scale of rewilding is not possible in many ecoregions within the near future. Nevertheless, it is essential that we pursue this option where feasible. Closer to home, we can bring back a degree of wildness by not mowing our lawns and be amazed by the diversity of plants and pollinators that gradually overtake it. At intermediate scales, in landscapes with patches of natural or semi-natural habitat embedded in a human-dominated matrix, rewilding should include three fundamental actions, beginning with: (1) enlargement of patch size by adding area to small nature reserves and restoring native vegetation; and (2) restoration of functional connectivity among sites. Restoring connectivity can create a whole greater than the sum of its parts, in that small reserves by themselves cannot maintain viable populations of area-demanding species, but a network of connected sites might provide enough habitat to support viable populations or metapopulations (i.e. systems of populations connected by occasional dispersal) (Noss and Harris 1986; Noss and Daly 2006). With reserves enlarged and interconnected, the third action can be implemented: reintroduction of extirpated species and management (e.g. controlled burning) to simulate natural disturbance regimes.

How Much Is Enough?

> A 1:1 ratio of natural to developed environment would provide a basis for an optimum environmental-use program.
>
> Odum and Odum (1972: 183)

> The current ratio of protected to exploited land in the United States is a lopsided 5:95. I would suggest 50:50 as a more reasonable compromise.
>
> Noss (1991: 121)

> Justice demands setting aside at least half Earth's lands and seas for nature, free from intensive economic activities.
>
> Kopnina (2016: 176)

How much wild area is needed to minimize extinctions and provide ecological justice for all species? In his 2016 book *Half Earth*, E. O. Wilson proposed protecting

half of the biosphere in order to save the vast majority of species (Wilson 2016). Surprisingly, this proposal is considered by many conservationists and others a new and radical idea. The three quotations above show that suggestions to protect at least half of the Earth extend back several decades before Wilson's book and continue today, often in the name of ecological justice. Wilson did not invent the idea of Half Earth, but built on the legacy of others. Nevertheless, because he is deservedly such a well-respected figure, Wilson did a great service by bringing this bold but biologically defensible goal to a broad audience, perhaps ultimately making it more acceptable to society. Below I review some of the history of proposals to protect on the order of half the Earth as wild or natural area, showing that this idea is not so radical after all, but rather follows from solid research and reasoning. And it just might be attainable.

Until recently most widely publicized targets for land protection were based more on political or pragmatic judgments than on science. And they were excessively modest. The 1982 World Parks Congress in Bali urged governments to protect 10% of their land area, with no specific justification for this percentage (Noss 1996). The 12% target proposed by the Brundtland Commission of the United Nations amounted to a tripling of global protected area at that time, which was about 4% (World Commission on Environment and Development 1987). The 12% target was deemed politically feasible, but it was also assumed to be biologically adequate so long as protected areas captured representative samples of all global ecoregions.

The most recent global policy that set targets for protection arose from the 2010 meeting of the Convention on Biological Diversity (CBD), a multilateral treaty. In particular, Aichi Target 11, one of 20 policy targets adopted by the Convention, states: "By 2020, at least 17 per cent of terrestrial and inland water areas and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape" (Convention on Biological Diversity 2010). Target 11 is a modest improvement over previous policy targets for land and water protection, but it is best viewed by conservationists as an interim goal—a step in the right direction, but only a small step. Target 11 is science-based only in its language. Truly science-based conservation plans and the informed judgments of conservation scientists almost always result in much higher percentages of land allocated to nature conservation than political targets such as Aichi (Svancara et al. 2005; Noss et al. 2012).

When did truly science-based, or at least science-informed, targets begin to emerge? To my knowledge, the first publication that offered a science-based protection target was an overlooked paper by the eminent ecologist brothers E. P. and H. T. Odum. Based on what we would today call an ecosystem services argument, the Odums suggested that half of each region be kept as natural area (Odum and Odum 1972). They acknowledged that aesthetic, recreational, religious, and cultural values have sometimes provided sufficient justification for conservation of large areas of land. They reasoned, however, that with rapid technological and population growth, these arguments would no longer suffice. Rather, nature must be valued for its sup-

port of human civilization. To this end they developed an "ecosystem management model" for South Florida derived from systems ecology. The model considered flows of energy and materials between developed and natural lands and the long-term sustainability of life-support systems. Beyond their argument for, "1:1 ratio of natural to developed environment" in South Florida (Odum and Odum 1972: 183), they offered a bold general recommendation: "Until this kind of systems analysis procedure can be refined and becomes a basis for political action, it would be prudent for planners everywhere to strive to preserve 50% of the total environment as natural environment" (Odum and Odum 1972: 183).

The argument of Odum and Odum (1972) was anthropocentric and did not explicitly consider biodiversity or welfare of nonhuman species (i.e., ecological justice). An ecocentric ethic holds more promise for protecting nature on a vast scale (Kopnina et al. 2018). The modern field of conservation biology began to develop a few years after the Odums' paper. Conservation biology was marked from the beginning by a biocentric or ecocentric philosophy, which recognizes intrinsic value in nature as fundamental, while not ignoring nature's many other values and services to humans (Soulé 1985; Meine et al. 2006; Piccolo et al. 2018). The idea that the land as a whole has intrinsic value is not new; indeed, it was a central tenet of Aldo Leopold's land ethic (Leopold 1966 [1949]), as well as being implicit in the writings of Thoreau, Muir, and other nature writers. Legitimate conservation biologists seek to ensure that no additional species go extinct due to human actions and that evolutionary processes continue (Noss and Cooperrider 1994; Wilson 1999).

Four well-accepted goals emerged from the early years of conservation biology: (1) represent all native ecosystem types and seral stages across their natural range of variation; (2) maintain viable populations of all native species in natural patterns of abundance and distribution; (3) maintain ecological and evolutionary processes; and, (4) be responsive to short-term and long-term environmental change and maintain the evolutionary potential of lineages. Focusing on these goals, Noss (1992) sought to determine how much of a given region, and in what configuration, should be protected or managed with biodiversity conservation as a primary objective. While recognizing that, "each region must be assessed individually," Noss (1992: 15) generalized that, "at least half of the land area of the 48 conterminous states [of the U.S.] should be encompassed in core reserves and inner corridor zones…within the next few decades." A more thorough review concluded that, "most regions will require protection of some 25–75% of their total land area … assuming that this acreage is distributed optimally with regard to representation of biodiversity and viability of species and well connected within the region and to other reserve networks in neighboring regions" (Noss and Cooperrider 1994: 168).

The question of "how much is enough?" is not an entirely scientific question—values, worldviews, ethics, and socioeconomic factors also come into play—but it can be addressed empirically by applying the principles and analytic techniques of systematic conservation planning (Margules and Pressey 2000; Kukkala and Moilanen 2013). This is when generalizations no longer suffice and when ecoregion-specific studies, plans, and protection targets are essential. Several factors make some ecoregions more demanding than others in terms of the extent of land protection needed

to meet similar sets of conservation goals. These factors include population viability of the most area-demanding species; topography and other physical heterogeneity; level of endemicity (i.e. number of species found in the ecoregion but nowhere else); beta diversity (the differences or turnover in species composition among sites); the spatial scale of natural disturbance regimes; and the amount of land in the region already protected, converted to human land-uses, or unprotected but not yet converted (Noss 1996). A heterogeneous ecoregion packed with endemic species will require more protected area than a more homogeneous ecoregion with few or no endemic species. An ecoregion that is still largely intact can afford more protected area than an ecoregion that has been extensively converted to agriculture or urban development. Importantly, "protected" does not usually mean human-free or unmanaged, but it does mean the needs of the native biota come first in the design and management of landscapes (Noss and Cooperrider 1994; Noss 1996).

A review of systematic conservation planning found that, "recent comprehensive conservation plans have delineated around 50% or more of regions for nature conservation" (Pressey et al. 2003: 122). Noss et al. (2012: 2) reviewed the literature and confirmed that, "In contrast to policy-driven targets, scientific studies and reviews suggest that some 25–75% of a typical region must be managed with conservation of nature as a primary objective to meet goals for conserving biodiversity." Addressing their conservation biology peers, they stated, "Nature needs at least 50%, and it is time we said so" (Noss et al. 2012: 4). Thus, the Nature Needs Half movement (Locke 2014; https://natureneedshalf.org) was born, with the goal of protecting 50% of Earth by 2050.

Just how impractical is the "at least 50%" recommendation? Perhaps not so impractical after all. Dinerstein et al. (2017) prepared a revised classification and map of the Earth's 846 terrestrial ecoregions and assessed progress toward the goal of protecting 50% of the terrestrial biosphere. Encouragingly, 12% of the ecoregions already exceed half protected, with many having sufficient unaltered habitat to move well beyond 50%. Although these ecoregions are concentrated in the tropical and subtropical moist forests and tundra biomes, 12 of the 14 global biomes have at least one ecoregion that has achieved this status. The take-away message from this study is that more than three-quarters of the Earth's ecoregions already have achieved, *or could achieve with rewilding*, the status of half protected.

Another study shows that current protected areas plus unprotected wilderness-quality lands with a very small human footprint (<3.3 on a scale of 0–50) already encompass approximately half of Earth (Pimm et al. 2018). The problem is that most protected areas (especially large ones) are located in wilderness landscapes, which are generally cold, dry, high-elevation, or otherwise unproductive for agriculture (Scott et al. 2001). Even when supplemented with the remaining unprotected wilderness, protected areas inadequately represent the world's species, most of which have small ranges (i.e., endemics) and are located in warmer and more productive regions with relatively high levels of human population and associated habitat loss; such regions are known as biodiversity hotspots (Myers et al. 2000; Mittermeier et al. 2011; Noss et al. 2015). Only five regions, comprising tropical moist forests, tropical woodlands, and subtropical deserts, have globally high biodiversity (in terms of endemic species)

combined with wilderness conditions (Mittermeier et al. 2003). Thus, "expanding protection to the wilder half of Earth is far from sufficient to protect biodiversity" (Pimm et al. 2018: 2). It appears theoretically possible to represent all species in less than half of Earth, if selection of new protected areas is carefully optimized. To do so, most new protected areas would have to be located in areas with lower degrees of wildness, and by necessity most will be relatively small. To achieve other benefits of big wilderness—together with comprehensive protection of biodiversity—probably more than half of Earth is required, but more research is needed to confirm this.

An obvious trade-off for meeting the 50% protection goal, especially on an ecoregion scale, is the high probability of significant losses of food-production capacity, given current production and consumption patterns and practices (Mehrabi et al. 2018). Unfortunately, the projected losses of food calories are higher in land-sparing approaches, which set aside large contiguous blocks of natural habitat, than under land-sharing regimes. Existing evidence suggests that most species benefit when food is produced on as little area as possible, while sparing as much wild area as possible (Phalan 2018). Competition between feeding people and protecting nature could be mitigated by agricultural intensification, reductions in food waste, and dietary shifts away from animal-based foods (Mehrabi et al. 2018). All of these changes would be challenging to implement, but not impossible. For the terrestrial land surface as a whole, the ethically responsible and practically necessary goal of 50% or more protected is not unattainable, but it requires that human population be stabilized and then begin to decline within this century. Crucial steps to this necessary de-growth include increasing access to contraception and family planning, educating women, and achieving gender equality (Crist et al. 2017).

Conclusion: Wildness and Ecological Justice

> For us of the minority, the opportunity to see geese is more important than television, and the chance to find a pasque-flower is a right as inalienable as free speech.
>
> Aldo Leopold (1966 [1949]: ix)

Ecological justice—justice for all species, human and non-human (Shoreman-Ouimet and Kopnina 2015)—must be foregrounded; that is, it must become the central consideration in debates about justice (Washington et al. 2018). Otherwise, it will inevitably be breached by immediately pressing socioeconomic concerns. Ecological justice depends on wildness to the extent that native species and healthy ecosystems require wildness. As discussed in this chapter, non-human species require varying degrees of wildness. Quite a few species persist perfectly well in human-dominated and tame landscapes; some perform optimally in such landscapes or even depend on them. Other species require wilder places, ranging from small patches of natural or semi-natural habitat embedded in urban or agricultural landscapes up to vast wilderness regions with little or no human activity. Similarly, ecological and evolutionary processes operate in all landscapes, but the scale of some fires and other

disturbance regimes, and the population processes of large carnivores, are so huge that only the largest and least human-modified landscapes are able to accommodate them (Noss and Cooperrider 1994). We have a duty to protect and restore the entire spectrum of wildness for its myriad benefits to humans and non-humans.

Regarding social justice, individual humans require varying degrees of wildness to meet their psychological needs and be happy, healthy, and intellectually well developed. Although research suggests exposure to wild nature benefits everyone (e.g. Kellert 2002), some people seem to need more wildness than others to be happy. I am one of those people who need daily contact with natural or semi-natural areas to be reasonably well-adjusted psychologically, and I require occasional immersion in big wilderness to be fully satisfied. Access to wild areas for all people, according to their personal needs, is a social justice imperative. A central tenet of democracy is that minority rights must be defended as vigorously as majority rule (Kymlicka 1995). Thus, we of the minority who need frequent contact with wild nature must be provided such opportunity. Although shrinking the human population and economy is ultimately the only way we can achieve justice for all species (Crist et al. 2017), in the meantime rapid establishment of new protected areas, strategically located, is the best way to block the most serious breach of justice imaginable—extinction. Education of the populace of the urgency of this mission is our task at hand.

References

Allan, J. R., Kormos, C., Jaeger, T., Venter, O., Bertzky, B., Shi, Y., et al. (2017). Gaps and opportunities for the World Heritage Convention to contribute to global wilderness conservation. *Conservation Biology, 32,* 116–126.

Andela, N., Morton, D. C., Giglio, L., Chen, Y., et al. (2017). A human-driven decline in global burned area. *Science, 356,* 1356–1362.

Baker, W. L. (1992). The landscape ecology of large disturbances in the design and management of nature reserves. *Landscape Ecology, 7,* 181–194.

Convention on Biological Diversity. (2010). Strategic plan for biodiversity 2011–20. Aichi Target 11. https://www.cbd.int/sp/targets/. Accessed 1 Oct 2018.

Crist, E., Mora, C., & Engelman, R. (2017). The interaction of human population, food production, and biodiversity protection. *Science, 356,* 260–264.

Dalerum, F., Somers, M. J., Kunkel, K. E., & Cameron, E. Z. (2008). The potential for large carnivores to act as biodiversity surrogates in southern Africa. *Biodiversity and Conservation, 17,* 2939–2949.

Diamond, J. M. (1976). Island biogeography and conservation: Strategy and limitations. *Science, 193,* 1027–1029.

Dickson, B. G., Jenness, J. S., & Beier, P. (2005). Influence of vegetation, topography, and roads on cougar movements in southern California. *Journal of Wildlife Management, 69,* 264–276.

Dinerstein, E., Olson, D., Joshi, A., Vynne, C., Burgess, N. D., Wikramanayake, E., et al. (2017). An ecoregion-based approach to protecting half the terrestrial realm. *BioScience, 67,* 534–545.

Donlan, J., Greene, H. W., Berger, J., Bock, C. E., Bock, J. H., Burney, D. A., et al. (2005). Rewilding North America. *Nature, 436,* 913–914.

Flies, E. J., Skelly, C., Singh Negi, S., Proabhakaran, P., Liu, Q., Liu, K., et al. (2017). Biodiverse green spaces: A prescription for global urban health. *Frontiers in Ecology and the Environment, 15,* 510–516.

Foote, J. (1990). Trying to take back the planet. *Newsweek, 115*(6), 24–25.
Foreman, D. (1992). Around the campfire. *Wild Earth, 2*(3), 1.
Foreman, D. (2004). *Rewilding North America: a vision for conservation in the 21st Century*. Washington, DC: Island Press.
Forman, R. T. T., & Alexander, L. E. (1998). Roads and their major ecological effects. *Annual Review of Ecology and Systematics, 29,* 207–231.
Frederiksen, M., Edwards, M., Richardson, A. J., Halliday, N. C., & Wanless, S. (2006). From plankton to top predators: Bottom-up control of a marine food web across four trophic levels. *Journal of Animal Ecology, 75,* 1259–1268.
Gavin, S. D., & Komers, P. E. (2006). Do pronghorn (*Antilocapra americana*) perceive roads as a predation risk? *Canadian Journal of Zoology, 84,* 1775–1780.
Gillson, L., Laddle, R. J., & Araújo, M. B. (2011). Base-lines, patterns and process. In R. J. Whittaker & R. J. Ladle (Eds.), *Conservation biogeography*. Oxford: Blackwell-Willey.
He, T., & Lamont, B. B. (2017). Baptism by fire: The pivotal role of ancient conflagrations in evolution of the Earth's biota. *National Science Review*. https://doi.org/10.1093/nsr/nwx041.
IUCN. (2008). *IUCN guidelines for applying protected area management categories*, N. Dudley (Ed.), Gland, Switzerland: International Union for Conservation of Nature.
Johns, D. (2016). Rewilding. reference module. In *Earth systems and environmental sciences*. https://doi.org/10.1016/b978-0-12-409548-9.09202-2.
Kellert, S. R. (2002). Experiencing nature: affective, cognitive, and evaluative development in children. In P. H. Kahn, & S. R. Kellert (Eds.), *Children and nature: Psychological, sociocultural, and evolutionary investigations* (pp. 117–151). Cambridge, MA: MIT Press.
Kopnina, H. (2016). Half the earth for people (or more)? Addressing ethical questions in conservation. *Biological Conservation, 203,* 176–185.
Kopnina, H., Washington, H., Gray, J., & Taylor, B. (2018). The 'future of conservation' debate: Defending ecocentrism and the Nature Needs Half movement. *Biological Conservation, 217,* 140–148.
Kukkala, A. S., & Moilanen, A. (2013). Core concepts of spatial prioritization in systematic conservation planning. *Biological Reviews, 88,* 443–464.
Kymlicka, W. (1995). *Multicultural citizenship: A liberal theory of minority rights*. New York: Clarendon/Oxford University Press.
Leopold, A. (1966) [1949]. *Sand county Almanac, with other essays on conservation from round river*. New York: Oxford University Press.
Locke, H. (2014). Nature needs half: A necessary and hopeful agenda for protected areas in North America and around the world. *The George Wright Forum, 31*(3), 359–371.
Louv, R. (2011). *The nature principle: Human restoration and the end of nature-deficit disorder*. Chapel Hill, NC: Algonquin Books.
Margules, C. R., & Pressey, R. L. (2000). Systematic conservation planning. *Nature, 405,* 243–253.
Mehrabi, Z., Ellis, E. C., & Ramankutty, N. (2018). The challenge of feeding the world while conserving half the planet. *Nature Sustainability, 1,* 409–412.
Meine, C., Soulé, M., & Noss, R. F. (2006). "A mission-driven discipline": The growth of conservation biology. *Conservation Biology, 20,* 631–651.
Miller, J. R. (2006). Restoration, reconciliation, and reconnecting with nature nearby. *Biological Conservation, 127,* 356–361.
Mittermeier, R. A., Mittermeier, C. G., Brooks, T. M., Pilgrim, J. D., Konstant, W. R., da Fonseca, G. A. B., et al. (2003). Wilderness and biodiversity conservation. *Proceedings of the National Academy of Science, 100,* 10309–10313.
Mittermeier, R. A., Turner, W. R., Larsen, F. W., Brooks, T. M., & Gascon, C. (2011). In F. E. Zachos & J. C. Habel (Eds.), Global biodiversity conservation: The critical role of hotspots. In *Biodiversity hotspots: distribution and protection of conservation priority areas* (pp. 3–22). Heidelberg, Germany: Springer.
Morrison, J. L., & Humphrey, S. R. (2001). Conservation value of private lands for Crested Caracaras in Florida. *Conservation Biology, 15,* 675–684.

Myers, N., Mittermeier, R. A., Mittermeier, C. G., da Fonseca, G. A. B., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature, 403,* 853–858.
Nash, R. (2001). *Wilderness and the American mind* (4th ed.). New Haven/London: Yale Nota Bene.
Nepstad, D. C., Verissimo, A., Alencar, A., Nobre, C., Lima, E., Lefebvre, P., et al. (1999). Large-scale impoverishment of Amazonian forests by logging and fire. *Nature, 398,* 505–508.
Nogués-Bravo, D., Simberloff, D., Rahbek, C., & Saunders, N. J. (2016). Rewilding is the new Pandora's box in conservation. *Current Biology, 26,* R83–R101.
Noss, R. F. (1985). Wilderness recovery and ecological restoration: An example for Florida. *Earth First*! *5*(8), 18–19.
Noss, R. F. (1990). What can wilderness do for biodiversity? In P. Reed (Ed.), *Preparing to manage wilderness in the 21st century* (49–61). Asheville, NC: USDA Forest Service, Southeastern Forest Experiment Station.
Noss, R. F. (1991). Sustainability and wilderness. *Conservation Biology, 5,* 120–122.
Noss, R. F. (1992). The Wildlands project: Land conservation strategy. *Wild Earth* (Special Issue), 10–25.
Noss, R. F. (1996). Protected areas: How much is enough? In R. G. Wright (Ed.), *National parks and protected areas: Their role in environmental protection* (pp. 91–120). Cambridge, MA: Blackwell.
Noss, R. F. (2013). *Forgotten grasslands of the south: Natural history and conservation*. Washington, DC: Island Press.
Noss, R. F. (2018). *Fire ecology of Florida and the Southeastern Coastal Plain*. Gainesville: University Press of Florida.
Noss, R. F., & Cooperrider, A. (1994). *Saving nature's legacy: Protecting and restoring biodiversity*. Washington, DC: Island Press.
Noss, R. F., & Daly, K. (2006). Incorporating connectivity into broad-scale conservation planning. In K. Crooks & M. Sanjayan (Eds.), *Connectivity conservation: maintaining connections for nature* (pp. 587–619). Cambridge, UK: Cambridge University Press.
Noss, R. F., & Harris, L. D. (1986). Nodes, networks, and MUM's: Preserving diversity at all scales. *Environmental Management, 10,* 299–309.
Noss, R. F., Quigley, H. B., Hornocker, M. G., Merrill, T., & Paquet, P. (1996). Conservation biology and carnivore conservation. *Conservation Biology, 10,* 949–963.
Noss, R. F., Dobson, A. P., Baldwin, R., Beier, P., Davis, C. R., DellaSala, D. A., et al. (2012). Bolder thinking for conservation. *Conservation Biology, 26,* 1–4.
Noss, R. F., Platt, W. J., Sorrie, B. A., Weakley, A. S., Means, D. B., Costanza, J., et al. (2015). How global biodiversity hotspots may go unrecognized: Lessons from the North American Coastal Plain. *Diversity and Distributions, 21,* 236–244.
Odum, E. P., & Odum, H. T. (1972). Natural areas as necessary components of man's total environment. *Transactions of the North American Wildlife and Natural Resources Conference, 37,* 178–189.
Oh, B., Lee, K. J., Zaslawski, C., Yeung, A., Rosenthal, D., Larkey, L., et al. (2017). Health and well-being benefits of spending time in forests: Systematic review. *Environmental Health and Preventive Medicine, 22,* 71. https://doi.org/10.1186/s12199-017-0677-9.
Pausas, J. G., & Keeley, J. E. (2009). A burning story: The role of fire in the history of life. *BioScience, 59,* 593–601.
Phalan, B. T. (2018). What have we learned from the land sparing-sharing model? *Sustainability, 10,* 1760. https://doi.org/10.3390/su10061760.
Piccolo, J. J., Washington, H., Kopnina, H., & Taylor, B. (2018). Why conservation scientists should re-embrace their ecocentric roots. *Conservation Biology, 32,* 959–961.
Pickett, S. T. A., & White, P. S. (Eds.). (1985). *The ecology of natural disturbance and patch dynamics*. Orlando, FL: Academic Press.
Pimm, S. L., Jenkins, C. N., & Li, B. V. (2018). How to protect half of Earth to ensure it protects sufficient biodiversity. *Science Advances, 4*(eaat2616), 1–8.

Pressey, R. L., Cowling, R. M., & Rouget, M. (2003). Formulating conservation targets for biodiversity pattern and process in the Cape Floristic Region, South Africa. *Biological Conservation, 112,* 99–127.

Pyle, R. M. (1978). The extinction of experience. *Horticulture, 56,* 64–67.

Rajakaruna, N. (2004). The edaphic factor in the origin of plant species. *International Geology Review, 46,* 471–478.

Reid, F. A. (2015). *A field guide to the mammals of North America* (4th ed.). Boston: Houghton Mifflin.

Scherber, C., Eisenhauer, N., Weisser, W. W., Schmid, B., Voigt, W., Fischer, M., et al. (2010). Bottom-up effects of plant diversity on multitrophic interactions in a biodiversity experiment. *Nature, 468,* 553–556.

Scott, J. M., Davis, F. W., McGhie, R. G., Wright, R. G., Groves, C., & Estes, J. (2001). Nature reserves: Do they capture the full range of America's biological diversity? *Ecological Applications, 11,* 999–1007.

Seddon, P. J., Griffiths, C. J., Soorae, P. S., & Armstrong, D. P. (2014). Reversing defaunation: Restoring species in a changing world. *Science, 345,* 406–412.

Shinneman, D. J., & McIlroy, S. K. (2016). Identifying key climate and environmental factors affecting rates of post-fire big sagebrush (*Artemisia tridentata*) recovery in the northern Columbia Basin, USA. *International Journal of Wildland Fire, 25,* 933–945.

Shoreman-Ouimet, E., & Kopnina, H. (2015). Reconciling ecological and social justice to promote biodiversity conservation. *Biological Conservation, 184,* 320–326.

Soulé, M. E. (1985). What is conservation biology? *BioScience, 35,* 727–734.

Soulé, M., & Noss, R. (1998). Rewilding and biodiversity: Complementary goals for continental conservation. *Wild Earth, 8*(3), 18–28.

Svancara, L. K., Brannon, R., Scott, J. M., Groves, C. R., Noss, R. F., & Pressey, R. L. (2005). Policy-driven vs. evidence-based conservation: A review of political targets and biological needs. *Biological Sciences, 55,* 989–995.

Teale, E. W. (Ed.). (1954). *The wilderness world of John Muir: A selection from his collected work*. Boston: Houghton Mifflin.

Terborgh, J., Estes, J. A. Paquet, P., Ralls, K., Boyd-Heger, D., Miller, B. J., & Noss, R. F. (1999). The role of top carnivores in regulating terrestrial ecosystems. In M. E. Soulé & J. Terborgh (Eds.), *Continental conservation: Scientific foundations of regional reserve networks* (pp. 39–64). Washington, DC: Island Press.

Thoreau, H. D. (1854). Walden. In C. Bode (Ed.), *The portable thoreau*. New York: Penguin Books.

Thoreau, H. D. (1862). Walking. The Atlantic Monthly. In C. Bode (Ed.), *The portable thoreau*, 1977. New York: Penguin Books.

Tricker, J., & Landres, P. (2018). Mapping threats to wilderness character in the National Wilderness Preservation System. *Biological Conservation, 227,* 243–251.

Washington, H., Chapron, G., Kopnina, H., Curry, P., Gray, J., & Piccolo, J. J. (2018). Foregrounding ecojustice in conservation. *Biological Conservation, 228*, 367–374. https://www.sciencedirect.com/science/article/pii/S0006320718305020?via%3Dihub.

Wilson, E. O. (1999). *The diversity of life*. New York: Norton.

Wilson, E. O. (2016). *Half earth: our planet's fight for life*. New York: Liveright.

World Commission on Environment and Development (The Brundtland Commission). (1987). *Our common future*. New York: Oxford University Press.

Chapter 13
Population Issues and Solutions

Richard Grossman

Introduction

Our human species is pretty amazing. We have spread over most of the planet and changed much of Earth in order to support us. However, there are costs to our conquering the planet and to our technology. We are using up resources such as petroleum and metals. In addition, we are polluting with wastes such as the carbon dioxide produced from burning fossil fuels. Much of nature and many people are suffering because of human overconsumption. Our mark on the natural world is likely to become more and more severe as time goes on. Indeed, all the environmental indicators show this to be the case (see Chap. 4 by Washington in this volume). There is injustice in what we are doing to the planet—and injustice in what we are also doing to our fellow human beings. How can we make the world more just? Although there are many possible actions that can help, this chapter will concentrate on one—voluntary limitation of human fertility.

Why Should We Be Concerned About Human Population?

This chapter will touch on a number of questions about how humans fit into the natural environment. The questions are:

- What does human population have to do with social and ecological justice?
- How are populations of humans measured and what measures are helpful to understand?
- Are small families good?
- How can a woman avoid pregnancy until she plans to be a mother?

R. Grossman (✉)
Affiliated Faculty, Fort Lewis College, 800 Heartwood, Bayfield, CO 81122, USA
e-mail: richard@population-matters.org

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- Can family planning help protect the environment?
- What are the best solutions to slowing population growth, and thus promoting social and ecological justice?

Washington (Chap. 4 in this volume) has already outlined the Ecological Footprint concept, including how it would take 1.7 Earths to support the way people are using resources (GFN 2018). I would like to stress one of the limitations of the Ecological Footprint (which Washington also mentions), which does not take into account resources for *nonhuman* species. Therefore, if we humans use more resources than the planet has to offer, there is injustice to all the other animals and plants we share this world with. Washington also cites two other measures of our impact, the Living Planet Index of WWF and the Planetary Boundaries concept. All these measures agree: humans have overwhelmed planet Earth.

There is another way of looking at the impact we have on the planet. We need to remember the equation: **I**mpact = **P**opulation × **A**ffluence × **T**echnology (Holdren and Ehrlich 1974). This means the environmental impact is determined by: the number of people times their consumption times the type of technology they use (which may increase or decrease impact). How can we reduce our impact? It is not fair for our current generation of people to use more than our share of the wealth of the planet. The I = PAT formula shows that both the number of people and the affluence (or consumption) of each person are important.

We are surrounded by advertisements that try to get us to consume more, not less. Therefore, trying to get people to reduce their consumption is difficult (Assadourian 2013). While it is important to reduce the **A** (affluence, or consumption) in the formula I = PAT, it is also essential that we reduce the **P**, population (as well as move to technology that reduces impact). Despite the declining Total Fertility Rates (TFRs), population momentum will cause global population to rise to 9.8 billion by 2050 and 11.2 billion by 2100 (UNDESA 2017). Awareness of this problem will allow us to decrease this projected growth. Given that we are already in 'overshoot' (i.e. beyond our ecologically sustainable population, Washington 2015a) with a world population approaching 7.6 billion, this predicted increase poses grave risks for nature conservation (Crist et al. 2017). However, effective, non-coercive strategies *can* stabilise, then reduce, world population. These are discussed at the end of this chapter.

How Human Overpopulation Decreases Social and Ecological Justice

I would argue that a just society (in purely human terms) is one in which every human has a just share of wealth, opportunities and privileges. This does not necessarily mean that every person has an equal share of these resources, but the share should be sufficient for a safe and healthy life. By analogy, I would argue that a 'just environment' is one which provides a just share to all organisms, of whatever

phylum. This share should be sufficient for every organism to exist and to reproduce relatively unmolested. Of course, the carnivores will prey on and eat the herbivores! However, in a just environment no one species will endanger the livelihood of all species with nuclear weapons or with polluting chemicals such as DDT. As argued in Chap. 1, social and ecological justice should be intertwined to a large extent, because we all share the limited resources of the planet. Furthermore, promoting justice for humans may interfere with justice for nonhuman species, and vice versa.

How Are Populations of Humans Measured and What Measures Are Helpful to Understand?

No other species of animal lives across such broad geography, nor is as mobile as we humans. Population estimates show a relatively small number of us until about a thousand years ago. There was slow growth up until the middle of the 18th century, than the rate of growth accelerated (Fig. 13.1). Many factors contributed to this increase in our numbers, including better hygiene, improved medical care and increased food production (Bongaarts and O'Neill 2018). Demographers study human populations, why they grow and why they move from place to place (McFalls 2007). More information about current and projected population, where growth is happening and many other demographic subjects can be found at the United Nations Population Fund website (UNFPA 2018).

Most countries have a census every few years. This is a way of keeping track of the number of people in a given part of the country. A census usually includes other information, such as the ages of people, the number of children they have, their ethnicity, their education. A census also tracks migration—where people lived before the census—to know how people are moving around.

Demographers refer to "rates"—for instance, the "birth rate" is the number of live births per 1000 people and the "mortality rate" is the number of deaths per 1000 people. Often these numbers are broken down to cover just a portion of the population. For instance, the "infant mortality rate" is the number of children who die at less than 1 year of age per 1000 live births. The "under 5 mortality rate" is the number of children who die before age 5 years per 1000 live births. It is important to pay attention not only to what is being measured (the numerator) but also to what that is being compared to (the denominator). For instance, the denominator is different in the mortality rate and the infant mortality rate. Also notice that all these measures assume a given geographic place, and that the time interval is a year.

Population pyramids are a quick way of visualizing the age structure of a group of people as Fig. 13.2 shows. Males are on one side and females on the other. Each horizontal bar represents an age range—usually 5 or 10 years. The number of people in each age range is shown by the length of the bar. You can see that the shapes of the three pyramids below (Figs. 13.2, 13.3 and 13.4) are very different. The Central African Republic (Fig. 13.3) has a large number of children, meaning that

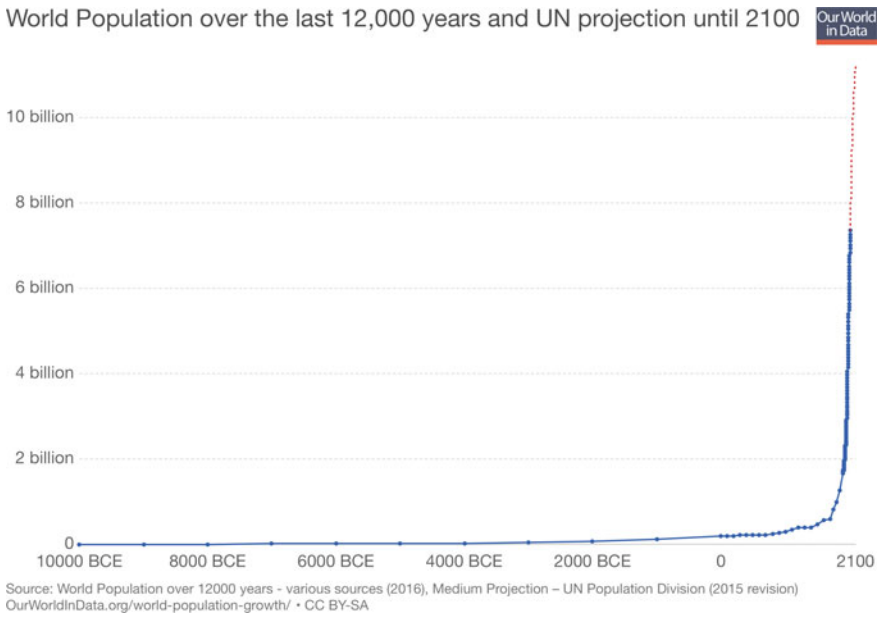

Fig. 13.1 World population growth. *Source* https://ourworldindata.org/world-population-growth

its population is growing rapidly. The pyramid for the whole world is narrower (Fig. 13.2), which is typical for a population that is growing slowly. Notice that the base of the Swiss pyramid (Fig. 13.4) is narrower than its middle; its population is growing slowly or perhaps even decreasing. The bar with the most people is the 50–54 age range—already out of the child-bearing years. As time goes on and those people age and some die, the bar for that age cohort will get shorter. In the world population pyramid, however, the longest bar (except for children) is the 25–29 year olds. These people are still in their reproductive years and so we can expect that they will have more children—and the world population will continue to grow.

There are two measures to get an idea of how rapidly a population is changing—the birth rate and the Total Fertility Rate (TFR) (McFalls 2007). The birth rate is the number of live births per 1000 people. The TFR is the average number of children a woman will have during her lifetime. I prefer the TFR because it is easy to compare with the number that is required to have a steady population (with no growth and no decrease). Of course, neither of these measures looks at the death rate, which also helps determine the rate of change.

The TFR for a stable population size (neither growth nor shrinkage) is about 2.1 (McFalls 2007). This is true in a country with good health care. It takes one child to replace the mother and one child to replace the father. Unfortunately, some children will die before they reproduce; this accounts for the fraction in the stable population TFR figure. As a country's growth slows, the number of people will continue increasing for decades even after the TFR declines to 2.1, however. This

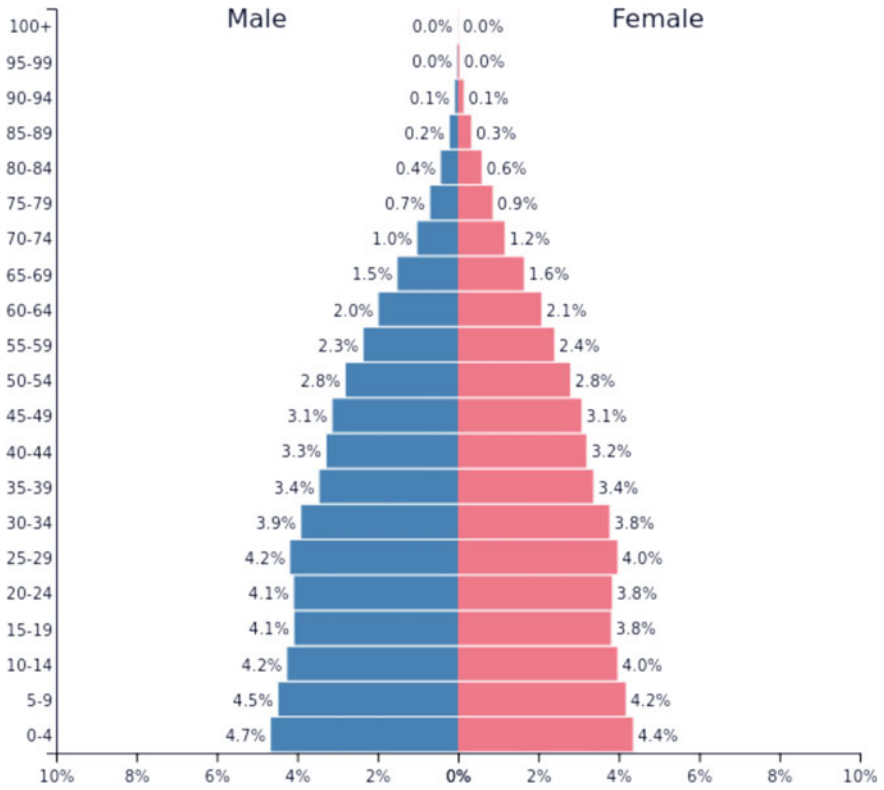

Fig. 13.2 World population pyramid. *Source* www.populationpyramid.net/ used with permission

is because there are already a large number of children who will become parents as time goes on. This is called "population momentum" (Ibid).

Many countries historically had a period of slow growth, then rapid growth and more recently slow growth again. The term "demographic transition" can help understand these changes. The slow increase is usually attributed to high death rates—especially of infants and children. Then, with better sanitation, improved agriculture and health care, the death rates fell—this is Stage 2 in Fig. 13.5 (McFalls 2007). Gradually, people realize that they don't need to have such large families, so they start to limit the number of children who are born—Stage 3 (Fig. 13.5). The population continues to increase, but more slowly. Then in Stage 4 the birth rate and the death rate are about the same and the population is steady—but much larger than previously (Fig. 13.5). Stage 5 of the demographic transition (Fig. 13.5) is already happening in some parts of the world. People are having smaller families (PRB 2018), and more women are choosing to not bear any children (Blackstone 2014).

The demographic transition is a model that helps to explain what was observed to happen with population over several centuries in England and some parts of Western Europe (McFalls 2007). It took about two centuries for this change to happen in

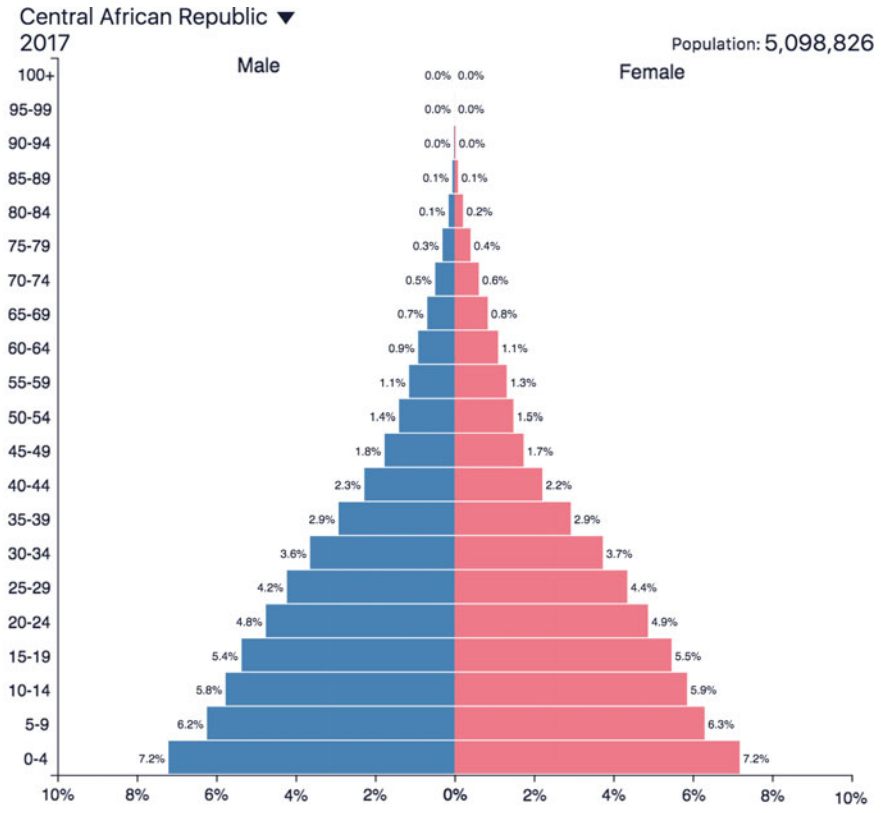

Fig. 13.3 Central African Republic population pyramid. *Source* www.populationpyramid.net/ used with permission

these areas, starting with the Industrial Revolution in the mid-1700 s (Ibid.). In other places the demographic transition occurred later, or is still happening. For instance, the Diné (Navajo) society in the USA started late, and progressed rapidly. Many Diné went through stages 1–4 in the 20th century; in some cases, in just one or two generations (McCloskey 1993).

Keeping track of large numbers of people is pretty difficult if they stay in one place, but people tend to be mobile. That is especially true now, when people move around for work or for safety or for recreation. This makes demographers' jobs more difficult, but it is important to keep track of the migrations of people. There is one relatively new type of migration that is worth noting. Climate change has caused people to leave their homes because of sea level rise and desertification. An example is people who live on islands in the Pacific Ocean, such as the Marshall Islands (Constable 2016). Even though the Marshallese have done very little to cause climate change (and thus the sea level to rise), they are unfairly affected by it.

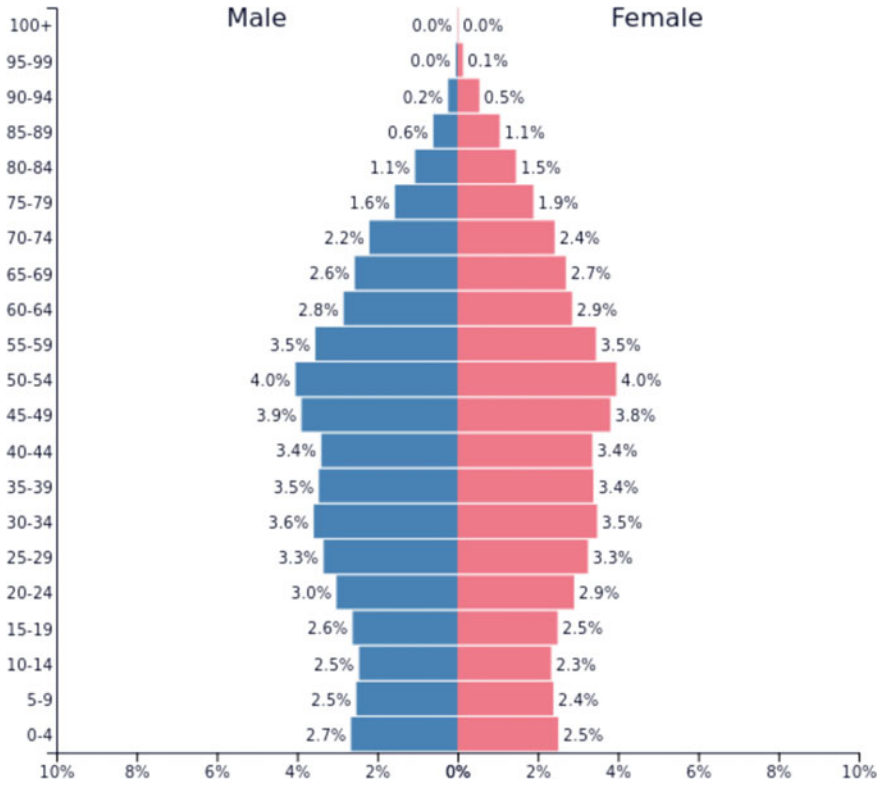

Fig. 13.4 Switzerland population pyramid. *Source* www.populationpyramid.net/ used with permission

Four Asian countries (South Korea, Singapore, Hong Kong and Taiwan) went through the demographic transition starting in the latter half of the 20th century. They did this rapidly and arguably enjoyed an economic benefit that is partly due to the change in demography (Bloom and Finlay 2009). These countries are sometimes called the "Asian Tigers" because of their strong economies. Although there are many factors that helped their rapid economic growth, one reason is that they concentrated on education. This has had the additional benefit of empowering people to limit family size (Lam and Duryea 1999). These four countries also had the advantage of a high proportion of people in the economically productive age range. The "Asian Tigers" are examples of the beneficial effect of what has been called the "demographic dividend". Other countries have also benefitted from decreasing population growth rates, although to a lesser extent (UNFPA 2018).

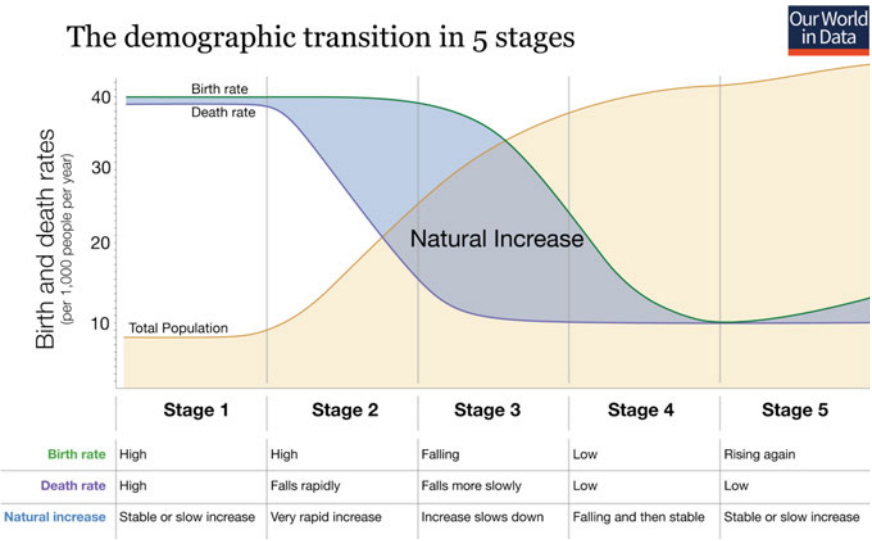

Fig. 13.5 The 5 stages of demographic transition. *Source* https://ourworldindata.org/world-population-growth (see above)

Are Small Families Good?

In the past, many children died, so it was necessary to give birth to many babies just so just a few might survive to adulthood. In addition, children were important to help with farming and housework—but that need has changed. There are now over 100 nations with the TFR at or less than replacement (2.1 children per woman) (CIA 2017). Mexico is a good example, 50 years ago women had an average of about 7 children, (UNDESA 2009) but now the average is 2.2—barely above replacement (PRB 2018).

A small family is good all around—it is better for the parents and for the child or children—and especially for the planet (McKibben 1998; Grossman 2012). The long-term benefits of family size have been worked out for climate change, however these findings might arguably be generalized for other environmental issues. This was well demonstrated by Travis Rieder (2016) who examines the ethics of having children in the era of climate change. It is based on calculations that the "carbon legacy" of an individual is much greater than the carbon that a person emits during their lifetime (Murtaugh and Schlax 2009). This is because most children grow up to have their own children, and so on, all emitting while parents are still alive and after. Indeed Murtaugh and Schlax (2009) estimate that a women's carbon legacy under current conditions in the US is 5.7 times her lifetime emissions. Were she to have fewer children, then her carbon legacy would drop.

The importance of family size choices to climate change was pointed out by Wynes and Nicholas (2017). They found that the most frequent recommendations of

individual lifestyle choices to reduce carbon emissions were actions such as recycling and changing lightbulbs. Unfortunately, these actions are relatively ineffective (Ibid). Wynes and Nicholas (2017) found that three actions are significantly more effective, although less frequently recommended. These three are: (1) living car-free; (2) avoiding long-haul airplane travel; and (3) eating a plant-based diet. Furthermore, the *highest* impact action an individual can take is almost never recommended, even though it is more than ten times as effective as the three 'more effective' actions combined. The highest impact action they note is to have *one fewer child* (Ibid).

In most parts of the world couples are choosing to have fewer children (PRB 2018). There are many different answers as to why, depending on what culture is asked. In the past people raised much of their own food and kids helped with the work—both inside and outside the home. Children were much more likely to die before adulthood. Birth control was mainly used by the elite, and was not very reliable, but now effective contraception is available to all in many parts of the world. Children are expensive: estimates of the cost of raising a child in the USA to age 18 are about $250,000 (USDA 2018). Children in large families with limited finances often have to do without certain resources, while a child in a smaller family can often take advantage of more. Some parents have recognized the struggle of finding time and money for each child, and have chosen to have fewer children (Miller 2018). These are reasons for the decrease in family size—and there are others, too.

Some people have environmental concerns when they consider raising a child. There are two sorts of concerns—the first is that the child would be affected by the contaminants in the environment (Steingraber 2003). The second is that increasing the human population will also increase greenhouse gas emissions and contribute to climate change (Rieder 2016). Although there is strong social pressure in most societies for women to become mothers, that is changing. More women are ending their reproductive careers without having a child than previously (USCB 2018). There is also a trend for women to wait until their 30 s or later to start a family (McFalls 2007). Now that it is possible to have sex without pregnancy, some couples are making a conscious choice to be child-free. There is some evidence that child-free people are actually happier than those who parent (Glass et al. 2016).

There are advantages of small family size for the child/children. For years it was assumed that large families were good for children. People thought that by growing up with brothers and sisters would make a child better equipped to deal with life in the real world, and that single children suffered from the lack of interaction with siblings. In his book 'Maybe One' Bill McKibben (1998) looked at the value of large families. His conclusion was that single children are actually more likely to succeed in the world. He finds that single kids are not spoiled, weird, selfish, or asocial, but do well in society. McKibben also traces myths about single children to a psychologist who liked large families and injected his prejudices into the ethos of the United States (Ibid). Single children and children from small families, are more likely to get the attention they crave, while growing up including health care and education (Ibid). Arguably, this is especially true in cultures that have very limited resources such as developing countries, and poor neighborhoods in rich countries such as the USA.

How Can a Woman Avoid Pregnancy Until She Plans to Be a Mother?

One of the greatest public health advances of the 20th century was the development of effective contraception (CDC 1999). The availability of reliable contraception has led to huge changes in society, and especially to improving the lives of women (USAID 2017). Reliable contraception has allowed people to have much better control over their fertility, and to have sexual intercourse with less fear of an unwanted pregnancy. There are many good sources of information about family planning; one of the best is Planned Parenthood (www.plannedparenthood.org). Personal knowledge of birth control methods is important to prevent unplanned pregnancies. Especially important is knowledge of Emergency Contraception (EC) (which can be used after unprotected intercourse, such as in case of rape) and Long Acting Reversible Contraception (LARC). However, neither EC nor LARCs provide protection against reproductive infections, including HIV. Both male and female condoms provide some protection against these infections.

There are several types of EC, both hormonal and IUDs. Most common is a tablet of 'levonorgestrel', which is reported to be so safe that it is usually available without a prescription (WHO 2018). It is about 90% effective, but works best if taken within 12 h of unprotected intercourse (Ibid). An IUD containing copper is the most effective EC, but has the disadvantage that it requires a visit to a health care provider. Its effectiveness lasts for up to 5 days after unprotected sex. Another advantage of the IUD is that it can give many years of excellent protection against pregnancy (Curtis and Peipert 2017; WHO 2018).

Long Acting Reversible Contraceptives (LARCs) are in two categories: IUDs and implants. IUDs fit inside a woman's uterus and can last 3–10 years or longer. Implants are small, flexible plastic rods that are filled with a hormone that are inserted under the skin of a woman's arm. The hormone lasts for 3 years or longer.

Studies have shown that children who come from unplanned, unwanted pregnancies do not succeed as well in life as if they were wanted (David 1988, 1992). If an abortion was requested but denied, the children who resulted from unplanned pregnancies did not do well in school, were more disruptive and were more likely to have criminal records than a matched control group (Ibid). When they were in their 20 s these people were less happy with their lives than people in the control group. These studies point out the importance of effective family planning programs and the injustice of forcing people to become parents against their will (Ibid).

Can Family Planning Help Protect the Environment?

The natural world will benefit from reduced human population growth via family planning—at least this is one of the goals of Population, Health and Environmental (PHE) programs (Engelman et al. 2016). PHE programs are located where there are

high concentrations of biodiversity and also high concentrations of people (Ibid). Blue Ventures (2018) is a not-for-profit organization that carries out PHE programs. In a coastal community in southwest Madagascar, fishermen and Blue Ventures staff both observed that the octopus catch had decreased markedly. Blue Ventures suggested that a closure of the fishery might restore the catch, and the fisher community were willing to try. A seven month closure was very successful in increasing the catch (Oliver et al. 2015). Following the lead, surrounding communities have started periodic closures.

Blue Ventures (2018) expanded their horizons by meeting the need for primary health care with clinical services. They also provide public health services, including family planning. In all of Madagascar only a third of women use a modern method of contraception, but in 2007 just one in ten women was using reliable contraception where Blue Ventures worked. Many more women are using contraception now and the program: "…between August 2007 and July 2013 is estimated to have averted a total of 804 unintended pregnancies among a population of approximately 15,000 people" (Robson and Rakotozafy 2015: 10).

Can PHE programs actually help protect nature? A project of the Worldwatch Institute is evaluating their effectiveness (Engelman et al. 2016). Their primary research question is: "Does evidence support the claim that the practice of voluntary family planning promotes environmental benefits and helps lead to an environmentally sustainable world that meets human needs?" (Ibid: 1). The report concludes they cannot absolutely confirm the hypothesis. However, Engelman et al. (2016: 1) argue: "The preponderance of evidence from the papers reviewed nonetheless supports it, with little refutation". There are thus some grounds to argue that family planning is effective not only in promoting ecological justice, but also in promoting social justice.

What Are the Best Solutions to Slowing Population Growth, and Thus Promoting Social and Ecological Justice?

Engelman (2016) has suggested nine strategies to slow population growth). Importantly, these are all humane, non-coercive and voluntary. I have added material in support of these points. After Engelman's nine, I have added three more of my own—making an even dozen solutions:

1. **Assure access to contraceptives and family planning**. Although most women in developed countries have access to reliable contraception, it is estimated that over 200 million women worldwide lack this access (Guttmacher Institute 2018). Family Planning 2020 (FP2020 2018: 1) argues for: "…a global partnership that supports the rights of women and girls to decide, freely, and for themselves, whether, when, and how many children they want to have". Its hope is to reach 120 million women and girls with voluntary family planning in 69 of the world's poorest countries.

2. **Guarantee education through secondary school for all (with particular focus on girls)**. If a girl is in school she is less likely to be married, thus delaying her sexual debut. When she leaves school she is more likely to be able to take care of her children, so they will be healthier and less like to die (see point 11 below). Perhaps most important is that education increases women's autonomy. Women who feel empowered are more likely to recognize the advantages of smaller families and also be better able to access contraception (Lam and Duryea 1999).
3. **Offer age-appropriate sexuality education for all**. In many societies children and adolescents are not taught about sexuality, and are less able to protect themselves against abuse, disease and pregnancy. Some states in the USA don't allow sexuality education that teaches contraception, but only teach young people to abstain from sex until marriage (Breuner and Mattson 2016). Unfortunately, 'abstinence only' education is not successful, and the pregnancy and sexually transmitted infection rates in these areas may be high (Ibid). Sexuality education curricula that are more inclusive have been shown to reduce the risks of adolescent pregnancy, HIV and infections for children and adolescents (Ibid).
4. **Eradicate gender bias from laws, economic opportunity, health and culture**. Bias in favor of males is common throughout the world. Starting with the fetus, abortion for sex selection is not uncommon in countries such as India and China. Femicide starts with selective abortion and progresses to the killing of newborn girls (and of women) because of their gender (Garcia-Moreno et al. 2012). Events in several countries have shown that it is possible to decrease gender bias; South Korea is an example (Kim 1994). Another example is Rwanda, where 61% of seats in the National Parliament are held by women—the highest percentage in the world (World Bank 2018). This country has a strong, effective family planning program. (RoR 2012).
5. **End all policies that reward parents financially based on their number of children**. It is unclear that rewarding parents for having children has actually increased birth rates significantly (Engelman 2016). However, it makes sense to eliminate these policies as they send precisely the wrong message.
6. **Integrate teaching about population, environment and development into all school curricula**. Although schools are teaching some about environmental issues, few curricula mention the most important issue—our growing human population (Wynes and Nicholas 2017). Fortunately, there are curricula already available for schools and colleges to use (Population Education 2018).
7. **Put full pricing on environment costs and impacts**. Most products and services have externalities that are not considered in determining their price. Air pollution from burning coal to generate electricity is an example (Haswell and Washington 2014). The risk of respiratory disease is known to be increased by this pollution, but the price of the electricity does not reflect the cost of healthcare for those who suffer from the pollution (Ibid; Gies 2017).
8. **Adjust to population aging, rather than trying to delay it through government programs aimed at boosting birth rates**. Some countries have tried to deal with population aging by encouraging immigration of workers. Unfortunately, more babies and more working-age immigrants only offer short-term solutions,

since these people will eventually age, requiring a new supply of babies and immigrants. Taking advantage of the fact that people are living longer and can work later in life is a better way of dealing with aging (Sanderson and Scherbov 2010). Norway is an example of a country that is changing its retirement policy to reward workers who work later in life (Farrell 2016)

9. **Convince leaders to commit to ending population growth through the exercise of human rights and human development**. For example, the official policy of the USA includes this wording: "The goal of U.S. international population policy is to promote healthy and educated populations by supporting reproductive health and rights, voluntary family planning, women's empowerment, development, and efforts to combat HIV/AIDS. The U.S. does not endorse population 'stabilization' or 'control'. The 'ideal' family size should be determined by the desires of couples, not governments. The U.S. strongly opposes coercive population programs" (USDS n.d.). Unfortunately this policy does not recognize the fact that the world is *already overpopulated.*

My three extra points are:

10. **Promote breastfeeding**. Breastfeeding is best for the infant, for the mother and for the planet. There is no nutrition as good for a baby as her mother's milk, which also helps the baby fight respiratory, ear and gastrointestinal infections (diarrhea) (ACOG 2016). Nursing helps to avoid childhood obesity and Sudden Infant Death Syndrome (SIDS). The mother benefits from breastfeeding by helping her lose weight and it aids in bonding with her new child. When a new mother breastfeeds her baby she is relatively infertile. This is not entirely foolproof—as the child grows older and starts to eat food the mother may start ovulating. Infertility while breastfeeding is reliable enough that it has been called the Lactational Amenorrhea Method (LAM) of birth control (PP n.d.). It requires three conditions: the baby must nurse almost exclusively, s/he must be no older than 6 months of age and the mother cannot have started to menstruate yet. If these conditions are met, LAM is a very effective method of child spacing.
11. **Promote child survival**. It may seem paradoxical, but decreasing the under-five death rate can decrease birthrates (Lloyd and Ivanov 1988). In many societies children are "insurance" for their parents. Many developing countries do not have any retirement or social security system, so children are the only means of support in old age or in case of incapacitation.
12. **If you live in a democracy, vote!** This is the best way to achieve many of the strategies above. To quote Dr. Martin Luther King, Jr.: "It is my belief that one of the most important steps that members of a minority community may take is that short walk to the voting booth. It is the responsibility of every good citizen to register and vote" (King 1962). Vote for candidates who support family planning that promotes both social and ecological justice.

These 12 strategies arguably help *both* social justice and ecological justice. When society has passed ecological limits (as we have, see Chap. 4 by Washington in this volume) 'more' people is neither good for society nor for the nature that supports society. Overpopulation beyond ecological limits remains a key driver of unsustainability and a key problem for conservation (Washington 2015b).

Conclusion

Although social and ecological justice may often be in conflict, stabilizing and reducing the human population by voluntary family planning can assist both, and reduce the pressures on the natural world. This chapter included some basic demography and information about advantages of small families. Access to safe, effective contraception helps women achieve goals of health, education and empowerment. In addition to helping people reach their goals, this will reduce pressure on the rest of life on Earth, a major aid to moving towards ecological justice. The stabilization and reduction of human population is thus a key strategy for effective conservation. Indeed, long-term conservation of nonhuman nature is unlikely without stabilization and reduction of human population. This chapter ends with suggestions for people to help solve overpopulation and thus improve both ecological and social justice.

References

ACOG. (2016). *Optimizing support for breastfeeding*. The American College of Obstetricians and Gynecologists. https://www.acog.org/-/media/Departments/Toolkits-for-Health-Care-Providers/BreastfeedingToolkit.pdf?dmc=1&ts=20180818T0154117648. Accessed 18 Aug 2018.

Assadourian, E. (2013). Re-engineering cultures to create a sustainable civilization. In L. Starke (Ed.), *State of the world 2013: Is sustainability still possible?*. Washington: Island Press.

Blackstone, A. (2014). Doing family without having kids. *Sociology Compass, 8*(1), 52–62.

Bloom, D., & Finlay, J. (2009). Demographic change and economic growth in Asia. *Asian Economic Policy Review, 4*(1), 45–64.

Blue Ventures. (2018). *About blue ventures*. Available at https://blueventures.org/about/. Accessed 14 Jul 2018.

Bongaarts, J., & O'Neill, B. (2018). Global warming policy: Is population left out in the cold? *Science, 361,* 650–652. https://doi.org/10.1126/science.aat8680.

Breuner, C., & Mattson, G. (2016). Sexuality education for children and adolescents. *Pediatrics, 138*(2). Available at http://pediatrics.aappublications.org/content/138/2/e20161348. Accessed 18 Jul 2018.

CDC. (1999). *Achievements in public health, 1900–1999: Family planning*. Division of Reproductive Health, US Center for Disease Control and Prevention. Available at https://www.cdc.gov/mmwr/preview/mmwrhtml/mm4847a1.htm. Accessed 11 Jul 2018

CIA. (2017). *The world factbook—central intelligence agency*. Available at https://www.cia.gov/library/publications/the-world-factbook/rankorder/2127rank.html. Accessed 15 Aug 2018.

Constable, A. (2016). Climate change and migration in the Pacific: Options for Tuvalu and the Marshall Islands. *Regional Environmental Change, 17*(4), 1029–1038.
Crist, E., Mora, C., & Engelman, R. (2017). The interaction of human population, food production, and biodiversity protection. *Science, 356,* 260–264.
Curtis, K., & Peipert, J. (2017). Long-acting reversible contraception. *New England Journal of Medicine, 376*(5), 461–468.
David, H. (1988). *Born unwanted: Developmental effects of denied abortion*. New York: Springer.
David, H. (1992). Born unwanted: Long-term developmental effects of denied abortion. *Journal of Social Issues, 48*(3), 163–181.
Engelman, R. (2016). Nine population strategies to stop short of 9 billion. In H. Washington & P. Twomey (Eds.), *A future beyond growth: Towards a steady state economy*. New York: Routledge.
Engelman, R., Mastny, L., Terefe, Y., Gourmelon, G., Yang, J., Bish, J., Fanta, J., et al. (2016). *Family planning and environmental sustainability: Assessing the science* (Worldwatch Institute Report). Washington DC: Worldwatch Institute. Available at http://fpesa.net/wp-content/uploads/2016/06/16-118_WW_FPESAReport-working-links.pdf. Accessed 17 Jul 2018.
Farrell, C. (2016). What we can learn from Norway about retirement. *Forbes*. Available at https://www.forbes.com/sites/nextavenue/2016/11/06/what-we-can-learn-from-norway-about-retirement/. Accessed 19 Jul 2018.
FP2020. (2018). *Family planning 2020*. Available at http://www.familyplanning2020.orghttp://www.familyplanning2020.org/microsite/about-us. Accessed 17 Jul 2018.
Garcia-Moreno, C., Guedes, A., & Knerr, W. (2012). *Understanding and addressing violence against women—femicide*. World Health Organisation. Available at http://apps.who.int/iris/bitstream/handle/10665/77421/WHO_RHR_12.38_eng.pdf?sequence=1. Accessed 16 Aug18 Jul 2018.
GFN. (2018). *World footprint*. Global Footprint Network. Available at https://www.footprintnetwork.org/our-work/ecological-footprint/. Accessed 30 Jun 2018.
Gies, E. (2017). The real cost of energy. *Nature, 551*(7682). Available at https://www.nature.com/articles/d41586-017-07510-3. Accessed 19 Jul 2018.
Glass, J., Smith, R. and Andersson, M. 2016. CCF Brief: Parenting and happiness in 22 countries Council on Contemporary Families. Available at: https://contemporaryfamilies.org/brief-parenting-happiness/ (Accessed 4 Jul. 2018).
Grossman, R. (2012). The importance of human population to sustainability. *Environment, Development and Sustainability, 14*(6), 973–977.
Guttmacher Institute. (2018). Adding it up: Investing in contraception and maternal and newborn health. Available at https://www.guttmacher.org/fact-sheet/adding-it-up-contraception-mnh-2017. Accessed 24 Jun 2018.
Haswell, M., & Washington, H. (2014). Not so cheap: Australia needs to acknowledge the real cost of coal. *The Conversation*, June 9th. https://theconversation.com/not-so-cheap-australia-needs-to-acknowledge-the-real-cost-of-coal-26640. Accessed 18 Aug 2018.
Holdren, J., & Ehrlich, P. (1974). Human population and the global environment: Population growth, rising per capita material consumption, and disruptive technologies have made civilization a global ecological force. *American Scientist, 62*(3), 282–292.
King, Jr., M. (1962). *The importance of voting*. The Martin Luther King Jr. Center for Nonviolent Social Change. Available at http://www.thekingcenter.org/archive/document/importance-voting#. Accessed 20 Jul 2018.
Kim, R. (1994). The legacy of institutionalized gender inequality in South Korea: The family law. Law Digital Commons, Boston College Law School. Available at http://lawdigitalcommons.bc.edu/twlj/vol14/iss1/7. Accessed 19 Jul 2018.
Lam, D., & Duryea, S. (1999). Effects of schooling on fertility, labor supply, and investments in children, with evidence from Brazil. *The Journal of Human Resources, 34*(1), 160.
Lloyd, C., & Ivanov, S. (1988). The effects of improved child survival on family planning practice and fertility. *Studies in Family Planning, 19*(3), 141.

McCloskey, J. (1993). *Changing fertility patterns of three generations of Navajo Women* (Ph.D. thesis). Albuquerque: University of New Mexico.
McFalls Jr., J. 2007. *Population: A Lively Introduction*. 5th edition. Washington DC: Population Reference Bureau. Available at https://www.prb.org/wp-content/uploads/2007/03/62.1LivelyIntroduction.pdf. Accessed 2 Jul 2018.
McKibben, B. (1998). *Maybe one: A case for smaller families*. New York: Simon & Schuster.
Miller, C. (2018). Americans are having fewer babies: They told us why. *New York Times* 5th July 2018. Available at https://www.nytimes.com/2018/07/05/upshot/americans-are-having-fewer-babies-they-told-us-why.html. Accessed 10 Jul 2018.
Murtaugh, P., & Schlax, M. (2009). Reproduction and the carbon legacies of individuals. *Global Environmental Change, 19*(1), 14–20.
Oliver, T., Oleson, K., Ratsimbazafy, H., Raberinary, D., Benbow, S., & Harris, A. (2015). Positive catch & economic benefits of periodic Octopus fishery closures: Do effective, narrowly targeted actions 'catalyze' broader management? *PLOS ONE, 10*(6), e0129075.
Population Education. (2018). *Population education resources for teachers*. Available at https://populationeducation.org. Accessed 19 Jul 2018.
PP (Planned Parenthood). (no date). *Breastfeeding*. https://www.plannedparenthood.org/learn/birth-control/breastfeeding. Accessed 26 Aug 2018.
PRB. (2018). *2018 World population data sheet*. Washington, DC: Population Reference Bureau. Available at https://www.prb.org/wp-content/uploads/2018/08/2018_WPDS.pdf. Accessed 11 Sept 2018.
Rieder, T. (2016). *Toward a small family ethic: How overpopulation and climate change are affecting the morality of procreation*. New York: Springer.
Robson, L., & Rakotozafy, F. (2015). The freedom to choose: Integrating community-based reproductive health services with locally led marine conservation initiatives in southwest Madagascar. *Madagascar Conservation & Development, 10*(S1), 6–12. Available at http://www.journalmcd.com/index.php/mcd/issue/view/82/showToc. Accessed 16 Aug 2018.
RoR. (2012). *Family planning policy*. *Republic of Rwanda, Ministry of Health, Maternal and Child Health*. Kigali: Government of Rwanda. http://www.moh.gov.rw/fileadmin/templates/Docs/Rwanda-Family-Planning-Policy.pdf. Accessed 26 Aug 2018.
Sanderson, W., & Scherbov, S. (2010). Remeasuring aging. *Science, 329*(5997), 1287–1288.
Steingraber, S. (2003). *Having faith: An ecologist's journey to motherhood*. New York: The Berkley Publishing Group.
UNDESA. (2009). *Completing the fertility transition*. *UN Department of Economic and Social Affairs, 2009* (p. 450). New York: United Nations. http://www.un.org/esa/population/publications/completingfertility/bulletin-english.pdf. Accessed 1 Aug 2018
UNDESA. (2017). *World population projected to reach 9.8 billion in 2050, and 11.2 billion in 2100*. United Nations Department of Economic and Social Affairs. https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html. Accessed 26 Aug 2018.
UNFPA. (2018). *Demographic dividend*. United Nations Population Fund. https://www.unfpa.org/demographic-dividend. Accessed 2 Jul 2018.
USAID. (2017). *Social and behavior change: Family planning and reproductive health*. USAID. Available at https://www.usaid.gov/what-we-do/global-health/cross-cutting-areas/social-and-behavior-change/family-planning-reproductive-health. Accessed 12 Jul 2018.
USCB. (2018). *Fertility of women in the United States: 2016*. US Census Bureau, Department of Commerce. Available at https://census.gov/data/tables/2016/demo/fertility/women-fertility.html#par_list_62. Accessed 4 Jul 2018.
USDA 2018. USDA Calculator. US Department of Agriculture. Available at: https://www.cnpp.usda.gov/tools/CRC_Calculator/ (Accessed 3 Jul. 2018).
USDS. (no date). *Population*. U.S. Department of State. Available at https://www.state.gov/j/prm/population/. Accessed 19 Jul 2018.
Washington, H. (2015a). *Overshoot*. *Reference module in earth systems and environmental sciences*, New York: Elsevier. https://doi.org/10.1016/b978-0-12-409548-9.09517-8.

Washington, H. (2015b). *Demystifying sustainability: Towards real solutions*. London: Routledge.
WHO. (2018). Emergency contraception. World Health Organization. Available at http://www.who.int/news-room/fact-sheets/detail/emergency-contraception. Accessed 15 Aug 2018.
World Bank. (2018). *Proportion of seats held by women in national parliaments*. World Bank. Available at https://data.worldbank.org/indicator/SG.GEN.PARL.ZS. Accessed 19 Jul 2018.
Wynes, S., & Nicholas, K. (2017). The climate mitigation gap: Education and government recommendations miss the most effective individual actions. *Environmental Research Letters, 12*(7).

Chapter 14
Let Earth Rebound! Conservation's New Imperative

Eileen Crist

The Blueprint

The status quo of a human-possessed and humanized ecosphere might be viewed as a shared "blueprint" in being widely regarded as given, normal, and even desirable. The blueprint consists of a physical and ideational apparatus of planetary ownership that includes an array of types of owning (private, nation-state, international, and commons), along with the entrenched normalcy of the endless stream of uses and practices that human possession entitles. Importantly, the blueprint of a physical-ideational apparatus of Earth ownership is what social theorists call hegemonic: it operates, or more precisely *is*, by virtue of broad human consent.

The blueprint essentializes the humanization of the world thereby solidifying itself as a foundation upon which the human gridding of the world is undertaken. Because the blueprint of ownership or possession has been essentialized—meaning Earth appropriation has been disguised as Earth ontology—the human gridding has become enabled to be something that is ever-in-process: it has been undertaken and will continue to be undertaken (barring revolutionary social change or societal collapse) in perpetuity. Neither the blueprint of planetary ownership nor the gridding it sponsors are universal to human cultures or an inherent drive of human nature. They are an Earth regime "kit" that Western civilization elaborated over the course of millennia and which today has become globally ascendant.

Gridding consists in slicing the (variously) human-owned world and apportioning the slices to (various) human uses. (Conventionally, "the grid" refers to the network of electricity deliverance, but here I am repurposing it for a much wider sense.) Human gridding is effected through roads and highways, fences and walls, above- and below-ground infrastructures, nation-state borders and the geopolitical maps representing them, surveillance technologies (such as GIS, collaring wild animals,

E. Crist (✉)
Department of Science, Technology and Society, Virginia Tech, 231 Lane Hall, Blacksburg, VA, USA
e-mail: ecrist@vt.edu

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mobilizing drones, etc.), large-scale agricultural estates, industrial plants, military installations, mega-dams, shopping centers, strip malls, mining operations, zoos, golf courses, and of course rural and urban settlements. Intrinsic to the nature of the grid is that it is always unfurling. Metaphorically (and literally) it is like the all-too-familiar town that is always under construction either to accommodate growth or just to accommodate always-being-under-construction.

There are also profuse griddings of the seas (though many less available to direct perception). Shores have been massively appropriated worldwide—an enabling of the shared blueprint of Earth ownership—and turned into "beaches" and "beach-front" properties. Entire regions of the ocean have been configured into "fisheries," a weird albeit commonplace term that fuses the fish, their places, and the industrial fishing industry into one (presumed good) conglomerate. Some areas of the ocean with fishery or mineral "resources" are literally gridded into blocks that nation-states auction off to industries for extraction operations. Even as I write these words, behind closed doors, the seabed is being sliced up by nation-states and allied industry marauders for mining polymetallic nodules, seamounts, and hydrothermal vents. Already, over 1 million square kilometers of the high seas have been divvied up in seabed mining contracts (Roberts et al. 2017). The ocean as a whole is gridded for shipping lanes and as dumping ground for agrochemicals, sewage, industrial waste, plastic, and lost fishing gear. (In recent times, it has also been consigned to being a "carbon sink.") The atmosphere above each nation-state is carved out as owned by the corresponding nation, while the whole atmosphere as humanity's "commons" serves as its waste bin. The stratosphere also—as it is looking increasingly likely—may well be gridded as a receptacle of regularly injected sulfur particles for climate geoengineering.

The grid resembles a mechanical virus, restless to reproduce more or upgrades of itself. Indeed, right now, amidst a tidal wave of species extinctions and population annihilations morphing into a mass extinction event, the global political-economic establishment is pouring colossal resources into nature-destroying and nature-fragmenting infrastructural expansion, within and between national territories (Laurance 2015, 2018a, b; Alamgir et al. 2017). At this historical moment of biodiversity collapse and dangerous climate change, precisely when human gridding should become exceedingly circumspect and sizeable portions of it undone, "we are living in the most explosive era of infrastructure expansion in human history" (Laurance 2018a). The compulsion to affirm human control of geographical space and ownership of Earth's estate is feeding the grid's expansionism. The viral grid is here, ceaselessly expanding, ever in planning, and determined to continue asserting itself.

Underlying the grid and its modus operandi is the blueprint, or the physical-cum-ideational essentializing of the planet as human-owned that has successfully secured broad consent to that ownership as ontologically given. "Ontologically given" means that people see Earth ownership as something natural rather than *political*—i.e. involving the exercise of power, inequality, and exploitation by means of entrenched institutional and discursive structures. The iniquitous relationship of the dominant human to the Earth has been all but effectively concealed: in an ultimate Machiavellian move, the political *as such* has been retracted from the world of "the merely

living" and drawn exclusively into the realm of the supreme human. Earth colonization thus appears unproblematic within the dominant culture; in fact, it does not even really *appear*. The social conditioning of people—from a very young age and throughout their lifespans—into the blueprint of planetary possession accounts for "why the land-use crisis gets so little publicity," as eco-commentator Brian Palmer (2015) complains regarding the disproportional conversion of land for human uses. Simply put, the humanized metamorphosis of the planet does not constitute a "crisis" for hegemonic humanity; it is just how things are. Nature colonialism perennially disguises itself as essence and thereby endures.

Because of the human grid's stout foundation—the normalcy of Earth ownership—the grid is always already authorized to expand. Which it does and will continue to do, for the grid has no built-in mechanism, rule, ethos, etiquette, point of satiation or contentment to ever bring it to rest. In its always-in-process character the human grid is, if you will, shameless.

The blueprint of Earth-possessed includes variously sized geographical pockets of nature reserves—wild and semi-wild places that fall under the rubric of "protected": strictly protected, sustainably used, multiple-use designated, conserved for ecosystem services, labelled as cultural or natural heritage, serving recreational and ecotourist functions, and all around kept at hand as Earth's "natural capital." These places appear to be off-grid, but because the human grid is ubiquitous and ever underway these places are perpetually menaced by the grid and, anyway, almost invariably partially gridded. Nature reserves contain roads, borders, trails, research stations, campgrounds, cellular towers, and so on; they may be zoned for "sustainable" logging, grazing, or mining; and they are monitored and managed often with killings and herbicides. The ever-looming and always-partial grip of the grid on nature reserves (national parks, wildlife refuges, wilderness areas, etc.) is the case because nature reserves are *in* the blueprint. They do not have an identity outside human possession—as an exception or deviation from it—but are fully ensconced within that possession. Humans control (ultimately all) geographical space and consider themselves entitled to do so, full stop. (This presumption is so normalized that the Moon, Mars, and their "resources" also appear, *naturally*, up for grabs.)

Indeed, nature reserves enhance the blueprint and legitimate it all the more, because (on the one hand) they add to its versatility and (on the other) they seem exempt from human possession. Nature reserves may even work to defuse resistance to the blueprint of human planetary ownership, by serving as a smoke-screen to the blueprint's totalitarian rule. Please do not misinterpret this analysis: nature reserves (all of them and most especially the strictly protected) are *absolutely necessary*, otherwise so much more of the world's places and beings would have gone into the night of extinction and oblivion (Pimm et al. 2014). Yet in the prevailing human regime, nature reserves are not outside the blueprint; they are human-owned, and what's more, they are never safe from the grid's expansionism. The potential reneging of their status as protected—for as long as this nature-colonizing civilization endures—hangs over them like a guillotine held back by a threadbare rope. As environmental thinker David Johns puts it, "if existing societal structures continue as they are, most

conservation achievements may turn out to have been little more than temporary stays of execution" (Johns 2010: 641).

Conservation in the blueprint does not work beyond being an indispensable, stopgap, and precarious remedy to the present-day eco-calamity. Protected areas have not stemmed the tide of destruction, only slowed it down (Pimm et al. 2014). In the medium- and long-run, conservation in the blueprint (aka "conservation in the Anthropocene") will not preserve the planet's species, subspecies, and varieties, abundance of wild populations, genetic variation, ecological complexity, biodisparity (uniqueness of places), richness of ecotones and natural processes, animal migrations, and other wild and wilderness qualities. Over time, protected areas become degraded and lose species and populations for any number of (compounding) reasons: they are too small, they are breached by (lawful or law-breaking) hunters, miners, loggers, or settlers, they get partially or fully degazetted by (right-wing or left-wing) human-supremacist governments, and they are perpetually ingressed by pollutants, from nitrates and acid rain to climate-altering greenhouse gases.

Many dimensions of the natural world cannot even survive conservation functioning at its best: big wide-ranging animals, migratory and dispersal phenomena, river systems, and the absorption of wild natural processes like fire or volcanic eruptions—all of which need bigness and connectivity—lose out in the present-day status quo (see Chap. 12 by Noss in this volume). Moreover, these grievances do not even touch on how nature "reservations" commandeer mobility, autonomy, and self-determination away from wild nonhumans. For example, this very morning—devoted to my reading over this chapter one last time before submission—I read the news that one of Yellowstone's famed wolves, nicknamed Spitfire by wolf lovers, was shot dead by a trophy hunter 5 miles outside of Yellowstone's borders (Rahman 2018). There is no end to the crimes perpetrated against nonhumans—crimes exonerated by a thing as insubstantial as the tyrannical power of life and death that humans have just seized over all other beings. Meanwhile, it is a fair generalization to state that conservation in the blueprint treats the nonhuman realm as composed of wild species-specimens to be sequestered, confined, managed, and kept in existence in (often minimally and ever monitored) viable numbers (Lulka 2004; Mathews 2016). From that perspective, Spitfire was specimen number 926F, and her death deemed a conventionally acceptable misfortune for roaming beyond her designated detention camp in the world.

Adding to these withering critiques, climate change is the deal-breaker of conservation in the blueprint. Climate change will not only destabilize protected areas, but the entire globe. Nonhuman and human beings will be (are being) forced to move and they will be (are) hard-pressed to do so. There will be, as we are already seeing, the spread of disease, suffering, starvation, mass mortality events, and extinction in the geographical-temporal zone where a deepening climate crisis meets an increasingly humanized world. Climate change is poised to synergize with a natural world already severely diminished and fragmented to intensify the blows on life (Urban 2015). It will make land crack with dryness, bring deluges of floods, cause wildfires to rage, turn the ocean corrosive, shrink freshwater entities and glaciers, unravel ecological partnerships, batter the coastlines, and redefine nonhuman and human epidemics in

a Biblical idiom. Climate change will grab the baton of mass extinction—now in the hands of agriculture and mass killings—and go for the finish line (Maxwell et al. 2016).

In short, conservation in the blueprint does not, and will not, work. The humanized world it squarely resides in is neither good nor prudent. The blueprint of human Earth ownership sponsors a (pseudo) world-order that is "world-poor," and brittle to boot. It turns—in a downwardly cascading spiral given the perennial human gridding it propagates—the diverse into the less diverse, bio-disparity into bio-homogeneity, wild animal abundance into defaunation, coral reefs into graveyards, the unknown into the mundane, and the enchanted into the banal by inscribing a human regime onto Earth's chaotically and richly entangled being. Yet it is within Earth's chaos that the supreme order of the Creative lies. The blueprint of human planetary ownership undoes that self-arising, incomparable order.

We are thus called to undo the blueprint both in our minds and in the world. We must unmask its guise as normal and understand Earth's possession for what it is—the exercise of power, violence, and injustice on a cosmic scale. A critical piece of undoing the blueprint is to redefine conservation *against it* instead of in it.

The Great Reversal: Earth-Wide Conservation

Originally, conservation was about protecting nature for its scenery, unique landscape features, provider of recreational, aesthetic, and spiritual experiences, and aid to health promotion and stress reduction. Toward the latter part of the 20th century, conservation's aim also became about maintaining viable wildlife populations, sustaining ecosystem services, and promoting green infrastructure and ecotourism. Whatever the various rationales, conservation within the blueprint of a human-possessed Earth has always remained "compatible with large-scale human exploitation of natural environments" and, in terms of its nature-protection goals, has tended toward an "ecology of the minimal" (Mathews 2016: 140).

Conservation visionaries today are urging a profound shift is how we think of and practice conservation (Noss et al. 2011). Now is the turning point to recognize that protecting land and seas cannot be defensibly defined as another "land-use" category among others (agricultural, forestry, and so on). Conservation's emerging imperative is about letting Earth rebound, with its diverse, lavishly numbered beings set free to live as who they are, become what they may, and co-create the ecosphere (Locke 2013; Mathews 2016; Dinerstein et al. 2017; Butler and Lubarsky 2017; Kopnina et al. 2018; Washington 2018; see Chap. 12 by Noss in this volume). As ecocentric thinker Helen Kopnina and coauthors write, we must imagine "the future of conservation as nothing less than an attempt to preserve abundant life on Earth" (2018: 140). "Abundant life" here includes the ecosphere's autochtonous features of species and subspecies diversity, ecological complexity, plentiful numbers of wild beings, variety of behavioral repertoires, animal cultures, and individualities, and

uniqueness of different places. All these aspects require bigness and connectivity—Earth-wide conservation.

The vision of Earth-wide conservation is profoundly compelling on a double register: it constitutes the surest pathway to preempting and mitigating the catastrophes of mass extinction and rapid climate change; and it forges the way for the emergence of a historically new, harmonious relationship between ecosphere and humanity. To implement this visionary conservation approach, our mandate is to restore Earth as the very matrix—the bio-alchemical cauldron—within which sustainable, modest, and ecologically friendly human land-uses can be couched. Large-scale conservation is about unleashing vast expanses of land and seas, to remain unexploited, unoccupied, and unfragmented, within which humanity and a myriad other life forms can all make roomy homes. To draw on an analogy of the five elements (earth, water, fire, air, and space), Earth-wide conservation involves reinstating the integrity of the space element—the element which encompasses all others—conserving Earth itself as the plenum that encompasses the arising and unfurling of all earthly existence.

This re-imagination of conservation—both as a means to address eco-catastrophes and as a long-term end in itself—is the antidote to extant and contemplated geo-engineering schemes as ostensible solutions to the ecological and social crises that confront us. Such schemes include rerouting rivers and tethering them with mega-dams, massive outbuilding of infrastructural systems, genetically engineering crops and animals for a degraded world, "solar radiation management" for treating global warming, and extraterrestrial mining and colonization. All such pursued and anticipated "techno-sublime" solutions are nothing novel: they are the blueprint of human planetary ownership putting the grid on steroids.

But the bold pursuit of large-scale conservation is about something new under the Sun. It is about setting Earth free to be an expansive, untamed, and exuberant mandala of life that can *actually*, if implemented in timely fashion, heal many ecological wounds, arrest the ongoing destruction of wild animals and flowering plants, preempt mass extinction, and "manage solar radiation" with unparalleled expertise (Roberts et al. 2017; Wilson 2016; Scheffers et al. 2016).

Freed of most human-imposed griddings and all but the lightest human uses, Earth's federation of ecologies will become rife in beings, allow life to move, provide a refuge for the threatened, soak up much of the atmospheric carbon of the industrial age, and be our noble legacy of an integral planetary hearth for the future of all life. The following are now absolutely imperative: ending all wetland, primary forest, seagrass meadow, and coral reef destruction; protecting the ocean from industrial fishing and pollution on a massive scale; preserving river and lake systems; restoring forests, (terrestrial and coastal) wetlands, and grasslands; and guarding wild animals from the global poaching holocaust (Butler 2008; Jackson 2008; Manning 2009; Diop et al. 2009; Pitcher and Chang 2013; Wuerthner et al. 2015; Pauly and Zeller 2016; Hance 2017; Jones et al. 2018; Ripple et al. 2016).

Only this scale of conservation can prevent the devastation of extinctions and take the catastrophic edge off climatic upheaval. Only this scale of Earth protection can turn the course of history away from the planet-devouring prerogative and inertia that the blueprint of planetary colonization has inflicted.

Opting for Earth-wide conservation—protecting land and ocean on a massive scale with unbounded generosity—requires of us to tap into the deep intelligence that resides in our brain-heart-gut complex, an intelligence to which technocratic projects for constructing a "smart planet" (The Economist 2011) cannot hold a candle. All smart-planet projects are, indeed, the predictable progeny of the blueprint—of a humanized and human-possessed Earth holding on for dear life to its image as ontology, that is, to its self-image as unquestionably and indestructibly real. To keep the blueprint afloat, even if on dialysis, all manner of machinations are abroad: from "sustainable intensification" of industrial food production to the desalination solution for water shortages, from zoning more of the seas and coastlines for aquaculture to subordinating all Earth's rivers, from mining the seabed to mining asteroids, from multiplying nuclear power plants to moving to Mars. Such grandiose plans are absurdly out of step with what is required of us.

The direction calling us has a circumscribed place for modern technology—this is not a neo-Luddite war cry—but its main thrust is so technologically unglamorous and simple that its beauty and expedience tend to be missed. Earth-wide conservation (large-scale protection, restoration, and connectivity of terrestrial and watery realms) has long been known to be the guarantor for safeguarding biodiversity (Noss and Cooperrider 1994; Wilson 2002). Studies are now revealing that it is also a critically important strategy for dealing with global warming. Briefly put, Earth-wide conservation is key to preempting both the sixth extinction and hothouse Earth (Ceballos et al. 2015; Wilson 2016; Steffen et al. 2018). One recent study found that conserving forests, grasslands, and wetlands, reforesting grazing ranges within forest ecoregions, and revving up agroecological practices can (by 2030) contribute 37% of the mitigation needed to keep temperatures from rising more than 2 °C over preindustrial levels (Griscom et al. 2017). Other recent reports urge that ending all (land and coastal) wetlands destruction is imperative to avert additional carbon releases (which are threatening runaway heating), while massively restoring wetlands will help gobble up atmospheric carbon dioxide (Roberts et al. 2017; Finlayson et al. 2017; Steffen et al. 2018).

Undoing the blueprint of Earth-possession involves reversing its specs. Unbridled nature, wild in beauty, diversity, expansiveness, unexpectedness, and above all creativity will hold us in its gracious being and carry us through the dark times here and coming. This vision of massive Earth conservation is not about reinstating some mythic condition or romantic primordial dream. It is simply about freeing the natural world on an vast scale—to be roadless, cellular-tower-less, pipeline-less, with *no* logging, mining, or grazing, off limits to off-road vehicles, agrochemicals, and animal murders, networked, taking care of itself, and busy building soil, making lushness, and birthing beings. Big enough and linked up enough to handle wildfires and mega-storms and to transmute carbon into green.

Downscaling the Human Enterprise

Releasing nature into its voluminous freedom cannot be achieved without substantial demographic, economic, social, and behavioral changes on the human end of things (Mora and Sale 2011; Mander 2012; Butler 2015; Bongaarts 2016; Washington and Twomey 2016; Crist et al. 2017). Importantly, Earth-wide conservation calls us to revolutionize how we make food. Organic, polycultural, and in good part perennialized food production, on agroecological landscapes biodiverse in plant cultivars and heirloom animal breeds, and interfacing in abiding friendship with wild nature is—as a complementary strategy to large-scale Earth conservation—key to protecting biodiversity and coping with climate change (Jackson 2010; Rodale Institute 2014; Jackson et al. 2018). The industrial food system—with animal agriculture in the lead—is hands-down the most destructive human system on Earth. We cannot redress the ecological crisis and move in the direction of Earth-wide conservation without profound changes in the food system.

Freeing nature—while also averting any human hardships implied in placing large-scale areas off limits to human uses—means there must be far fewer of us, as well as far fewer of our resource-intensive and intensively-polluting "livestock" (Weis 2013; Machovina et al. 2015; Monbiot 2016; Crist 2019). Amazingly, the pathway to a reduced human population, also educated to eat far fewer animal products, is simultaneously the pathway to securing fundamental human rights for all (family planning, gender equality, and education), and to securing healthier and longer human lives that a well-balanced, mostly plant-based diet all but guarantees (Engelman 2016; Machovina et al. 2015; Crist 2019). Freeing Earth and elevating humanity go hand in hand. This alignment should give us pause and joy in equal measure.

Protecting land and ocean on vast scales—thereby liberating Earth from the blueprint of human ownership and the ironclad grip of the grid—must be complimented with big social changes. As mentioned, paramount among them is to fast-track policies that will humanely lower the global population to where an organic and ethical agriculture—as a modest subsystem of the Earth—can support it (Crist 2019). Teaching humanity to gravitate toward a plant-based and closer-to-home sourced diet is also vital for biodiversity preservation, climate-change moderation, and the attainment of food sovereignty and human wellness. Needed as well is the overdue transition away from fossil fuels toward distributed (primarily) solar and wind renewables along with making energy conservation a commonplace social norm (Delucchi and Jacobsen 2013; McKibben 2016).

Still, there is more to be done. We must stop making and trading junk—the cheap, the throwaway, and the luxury variants of junk (Dietz and O'Neill 2013). Global trade needs to be scaled down by means of strengthening local economies and de-emphasizing the procurement of goods (especially basic goods like staple foods) from far-flung places (Kloppenburg et al. 1996; Patel 2009; Lenzen et al. 2012; Otero et al. 2013). Global trade today—the main engine and "central dogma" of the global economy—is driving the triple whammy of extinctions, infrastructural sprawl,

and greenhouse gas emissions. Intractable human food insecurity may not be that far behind (Lang 2010; Brown 2011; Ehrlich and Harte 2015).

These reversals of pulling back humanity from the natural world while downsizing the human presence are unlikely to be spearheaded by a large-scale, grassroots social movement. To recognize the mandate of this two-pronged historical redirection (of freeing Earth and downscaling the human factor) requires a configuration of sight, which, in this age of Babylon, is not yet available to the human majority. In a nutshell: devotion to our home planet, commitment to the possibility of a future ecological and equitable global civilization, and clear-headed understanding of our moribund (whether with a bang or a whimper) course. Many have yet to realize the validity of any one of these discernments—let alone all three combined.

Historical redirection is more likely to originate (at least for the foreseeable future) from two sources. One, enlightened leadership in educational, faith-based, political, media, entertainment, legal, and business circles. We are already seeing hopeful signs of this kind of leadership working, on many fronts, to shift the human enterprise (both ideologically and in practice) out of its nature-domination box and toward a downsized, ecological civilization. And two, from minority enclaves of ordinary folk who have (and increasingly will) come to recognize this life-destroying civilization for the socio-historical construct gone-haywire that it is: politically and economically largely corrupt, militarily dangerous, indifferent and cruel to nonhumans, mostly indifferent to disempowered people and future generations, and utterly blind to Earth's grandeur.

Such enclaves of awakened people will organize themselves into alternative communities—especially around agroecological food production while also fostering other forms of energy and economic self-reliance—thus seeding a future bioregional way of life within a global civilization (Kloppenburg et al. 1996; Hannum 1997; Crist 2019). In this century, all around the globe, people can embark on forming such new communities, performing harmonious relations within their ecoregions, undertaking ecological restoration projects, learning from indigenous life-ways, deploying tools of citizen science, creating and rediscovering ceremonies to honor all earthlings, and honing deep love in practices of loyalty, courage, hospitality, and compassion that are (will be) demanded. Within such alternative communities—globally networked and mutually supportive—we will discover who we must become to live integrally within this majestic planet. It will be long-term work, but for starters, it will have us turning our backside to the human-supremacist establishment that is heading the world to ruin.

The Restoration Baseline

A frequent refrain nowadays is that in recent decades "the challenge of accommodating people and biodiversity has accelerated enormously" (Kareiva and Marvier 2012: 964). This is surely the case and that particular challenge is poised to accelerate even faster. The resolution of the "people versus nature" quandary, however, does not call

for the final merger of the two, wherein humanity bequeaths full Earth colonization (along with the cheap mantra "Be Resilient") to the future. To resolve the growing tension between people's demands and nature's integrity means we work to massively scale down the human enterprise, safeguard the seas and land on "continental" scales, and instigate social transformations toward a global ecocentric civilization that understands *real wealth*—irreplaceable, cosmic wealth that is unassignable a dollar figure (see Chap. 11 by Gray and Curry in this volume). Taking this historical turn will not simply allow "accommodating people and biodiversity," but also build the foundation for a coming world in which both thrive.

There has been much talk of "no going back"—no self-evident ecological restoration baselines to implement in conservation (Hobbs et al. 2014). Earth in the "Anthropocene" has been diagnosed as a "planet of no return" and a "used planet" (Ellis 2012; Ellis et al. 2012). To be sure, we will not (any time soon) retrieve a Holocene-like world of 250 or 500 years ago, let alone of bygone millennia. The Dodo is gone and so is the Steller's sea cow and the uncountable species of half the world's rainforests razed, well over half of the world's wetlands drained, and most of the world's rivers dammed. We will not recover extinguished species, nor will we ever know anything but the tip of the iceberg of what life forms have been mindlessly obliterated.

Yet the principal historical lesson of the grim panorama of human impact is not that "we cannot go back," but that in moving forward we must reinvent ourselves, our way of life, our scale of occupation, as well as civilization itself from the ground up. It is critical that we eradicate the human superiority-and-entitlement complex that breathes inane, but seemingly compelling meaning into treating the world as human real estate. History has delivered the reckoning of a planet-colonizing enterprise. Heeding this with clear sight, we are invited to break resolutely with past ways: to downscale the human project for the sake of the wellness of our nonhuman and human kin (present and future), for the endless delights of diverse earthly coexistence, and for the honor of belonging with Earth over the debased and benighted condition of domineering.

Regarding the question of the restoration baseline for Earth's places, far from being elusive it is transparent: Freedom! Freedom is the ultimate ecological baseline, the one that Earth itself created. Let Earth rebound! Let rehabilitated wilderness as idea, reality, and protagonist rule the biosphere. It has oft been remarked that many languages do not have a word for "wilderness." I would wager, however, that all languages have a word for freedom and a word for nature—and thus all languages have a composite concept for wilderness. "Free nature" is wilderness universal. To free nature is to rewild. Rewilding involves enlarging protected terrestrial and marine areas (toward strict protection of at least 50 percent of every ecoregion type), repatriating the big carnivore, herbivore, and other keystone players, and forging corridor linkages to achieve landscape connectivity (Soulé and Noss 1998; Noss 2013; Monbiot 2013; Locke 2013; Hiss 2014; Benz et al. 2016; Wilson 2016; Tompkins and Butler 2016; Johns 2019). Current official policy targets to protect 17 percent of the land and 10 percent of the ocean are "woefully below" what is needed to stem biodiversity's "downward slide" (Noss et al. 2011: 1; see also Pauly and Zeller 2016; Belote et al. 2017; Chap. 12 by Noss in this volume).

An Earth-wide network of large-scale terrestrial and marine protected areas will serve ambitious and visionary aims, enabling restoration achievements that disconnected reserves cannot deliver. Big carnivores, big herbivores, and all marine animals are in dire straits, with their numbers globally decimated and declining and many on the brink of extinction (Dirzo et al. 2014; Ripple et al. 2015, 2016; McCauley et al. 2015). Only large, networked reserves can support the resurgence of these species. More generally, large-scale networked reserves can maintain not just viable but ecologically and evolutionarily abundant populations by enabling movement, migrations, founder effects, and escape from disturbances or encroachment. While rewilding places may initially need a helping hand via active restoration, removal of infrastructures, and reintroduction of life forms, the ultimate goal of rewilding is to return self-mastery—freedom—to the natural world (Monbiot 2013).

Freedom for Earth and all its beings and ecologies means restoring the conditions for living beings to express their natures, to support their flourishing and enjoyment of life, and to allow their potential becomings (as individuals), evolutionary destinies (as species), and integrity and complexity (as ecosystems). It means letting fish and trees grow old—very old—and to become abundant. (As fish age, they grow bigger and bigger and lay orders of magnitude more eggs than the younger ones. Big trees, known as mother or hub trees, nourish the entire forest and become habitats in their own right.) Freedom for wolves, sharks, whales, gorillas, giraffes, elephants, rhinos, bison, cougars, orangutans, saiga, snow leopards, and countless others means for them to live as denizens of spacious worlds, not as starving and cowering refugees of dilapidated, stolen, and turned-dangerous homes. Freedom for wild beings means mobility without constriction, persecution, and the lethal booby-traps of plastics, poisons, nets, snares, guns, dams, fences, and walls.

What's more, the emergency of preserving animal migrations as phenomena of "abundance and freedom" is an under-recognized, critical ingredient of celebrating freedom on this planet (Wilcove 2008). If ever there was a canary in the coalmine of how rapidly Earth is being human-gridded—and made hostile to so many—it is the freefall in numbers of migrating beings and the endangerment of the phenomenon of migration as such (Wilcove 2008; Quammen 2010). Earth-wide conservation will aim to preserve and restore these ecosphere-enriching, spectacular peregrinations. Freedom is also for places. For rivers, for example, freedom is to flow as they will, nourishing environs and beings with nutrient loads and life-giving waters, connecting land and seas and their two-way traffic of life forms, being home to so many organisms, and being the singularly biotic-abiotic hybrid entities they themselves are (Chap. 8 by Strang in this volume). Finally, freedom is not just for the wild ones and wild places, but also for the farm animals. We should liberate them from the objectifying tag of "livestock," and let them live long, good lives in the environments they are adapted to, able to sunbathe and dustbathe, mate and chatter, rest and root, and just noodle around as they like to do.

Freedom is a big word. It is not only for humanity, nor even invented by humans. Freedom is an elevated state that people first experienced as earthlings, then crystallized into language, and finally celebrated as among the highest ideals—if not, indeed, the highest of all.

People Versus Nature?

Some analysts have objected to strictly protecting vast portions of the natural world, arguing that this will deprive people of the freedom to use those places for their livelihood. Such critics are especially concerned that poor people will pay a heavy price when excluded from accessing parts of the natural world (Fairhead et al. 2012; Duffy 2014; Büscher et al. 2016). To be sure, concerns for how people will be affected must inform how conservation is designed and implemented. Within the conservation arena, all agree that conservation projects should involve the engagement, input, and participation of nearby communities (Wuerthner et al. 2015; Chan et al. 2016). Jane Goodall's organization Roots & Shoots is a model of rights-based conservation philosophy and practice, working simultaneously on the levels of nature protection, ecological restoration, agroecological food production, local employment, family planning, as well as education and schooling for all (Goodall 2015). The present historical moment demands this kind of comprehensive approach, and can inspire and incite us to drop the interminably wearying dichotomy of "people versus nature."

The question of "how to weigh the inviolability of nature against the rights of people in need or starving" (Max 2014) cannot be answered, *yet again*, by affirming the violability of nature, for two fundamental reasons. First, history teaches that this approach will lead to more people in poverty and/or food insecurity in the future (and a far more precarious future, the one coming). Second, rallying for the rights of disempowered people is incoherent when the recommended tactics involve brushing aside and trampling on the most disempowered of all—the nonhumans, ever deemed dispensable and displaceable. We must do things entirely differently at this historical juncture: restoring Earth's ecological wholeness (Earth-wide conservation) and changing ourselves (scaling down our numbers and economies), so that we give humanity a fighting chance to find the path toward living equitably and well within Earth's vibrant expanse.

The critique that nature protection violates human freedom discounts the fact that authentic human freedom can never be founded on annihilating, constricting, and enslaving nonhumans nor can it blossom in the bleak landscape of Earth bondage and ruins. Critics of large-scale conservation seem incapable of thinking of human well-being with the depth and vision demanded at this unprecedented time: If anthropogenic mass extinction is left to run its course unchecked, how will the human psyche bear the onus of having massively extinguished our fellow earthlings? Conservation critics have zero insight into the unthinkable existential burden we are bequeathing humanity, and the imperative to put a stop to this Earth catastrophe *now*.

The way to real human freedom—freedom from material want and toward self-realization—does not lie in perpetuating incursions into the natural world (including incursions labelled "sustainable"), but exactly elsewhere: in busting the (often non-conscious) human allegiance to nature-domination, which is the very source from which human hierarchies and inequalities spring. The source of the disparity between the haves and the have-nots, between the powerful and the powerless, lies in constituting Earth's beings and places as "resources" for amassing wealth, power, and

privilege. Wealth, power, and privilege (as currently understood concepts and realities) are actualized through sucking out the marrow of the Earth. This onslaught on the planet would have no ground to stand on—anymore than Hitler's *Lebensraum* found any ground to stand on—without a conception-and-treatment of nonhumans and ecologies as legitimately displaceable, killable, and for the taking. Even that bane of neoliberalism—the academic buzzword and scarecrow de jour—draws its tacit, sturdiest legitimation from the shared image of Earth as human turf for using.

Without shining light on and ending nature's long-standing domination—the root cause of human inequity—inequity can never be resolved. Striving for social justice in a colonized ecosphere is like trying to create a beautiful garden in a vandalized landscape. As long as a human-supremacist mindset reigns toward Earth and earthlings, the realization (and even the deep idea) of justice will elude humanity (Chap. 2 in this volume). A planet regarded as container of "natural resources"—to vie and militarize over, to exploit, steal, and kill to procure—is a planet rife with human (and of course nonhuman) misery. But by enlarging the conceptual-pragmatic understanding of freedom beyond human exclusivity, the ecological and social justice platforms can join forces—as they should and must (Chap. 1 in this volume; Chap. 4 by Washington in this volume; Chap. 11 by Gray and Curry in this volume). All beings love freedom—freedom from want and toward becomings. The prerequisite for realizing authentic human freedom is to free humans from the debasing shackles of human supremacy, lifting humanity into the infinite sight of the fundamental goodness of all life freed.

Unsurprisingly, those who resolve the (vacuous) conundrum of "people versus nature" in favor of *people*—claiming, for example, that "the only reason we should conserve biodiversity is for ourselves, to create a stable future for human beings" (quoted in Safina 2018)—also peddle a dismissive position toward the destruction of species and even the eventuality of an anthropogenic mass extinction (see for example, Kareiva et al. 2012; Thomas 2017; and critical responses, Ceballos and Ehrlich 2018; Safina 2018). As Peter Kareiva and his colleagues notoriously opined, the passenger pigeon's demise (by the offensive of a human-supremacist culture) yielded "no measurable results" (Kareiva et al. 2012). Such cavalier attitudes (sprouting here and there) toward the annihilation of our nonhuman family and toward the siege on Earth's exquisite being should fill us with dread: They foreshadow the moral decay and deep slumber that human totalitarianism holds in store.

We need to "look and see," as Ludwig Wittgenstein once quipped (1968). *Look and see* the shining dervish of planet Earth, whose reality—even as its luster recedes before our eyes—is as close to the eternal and the magical as our limited, all-too-brief mortal being can witness. Conservation is not, and never has been, about "saving the planet." It always has been, and is most urgently now, about giving back to the planet so that the planet might save us—body and soul. Before the extinction and climate crises become irreversible disasters, we can still fight for *the turning of history*. We must become willing to give back generously to the planet and concurrently to diminish the scale and scope of humanity's presence. We can agitate to jettison the blueprint of human planetary ownership and free most Earth from the human grid. We will then look toward how to gracefully cohabit with all earthlings, for we are

all, nonhuman and human, world citizens. Co-creating the ecosphere through the symphonic harmonies of diverse life beckons as the inexhaustible source of material and spiritual abundance for all.

References

Alamgir, M., Campbell, M. J., Sloan, S., et al. (2017). Economic, socio-political and environmental risks of road development in the tropics. *Current Biology Review, 27,* R1130–R1140.

Belote, R. T., Dietz, M. S., Jenkins, C. N., et al. (2017). Wild, connected, and diverse: building a more resilient system of protected areas. *Ecological Applications, 27*(4), 1050–1056.

Benz, R., Boyce, M. S., & Thurfjell, H., et al. (2016). Dispersal ecology informs design of large-scale wildlife corridors. *PLOS One*. https://doi.org/10.1371/journal.pone.0162989, 1–20.

Bongaarts, J. (2016). Slow down population growth. *Nature, 530,* 409–412.

Brown, L. (2011). The new geopolitics of food. *Foreign Policy* May/June.

Büscher, B., Fletcher, R., & Brockington, D., et al. (2016). Whole earth or half earth? Radical ideas for conservation, and their Implications. *Oryx* (December), 1–4. https://doi.org/10.1017/s0030605316001228.

Butler, R. (2008). *Destruction of wetlands worsens global warming*. Mongabay.com. https://news.mongabay.com/2008/07/destruction-of-wetlands-worsens-global-warming/.

Butler, T. (Ed.). (2015). *Overdevelopment, overpopulation*. Overshoot: Goff Books.

Butler, T., & Lubarsky, S. (2017). *For beauty: Douglas R. Tompkins—aesthetics and activism*. Berkeley: David Brower Center.

Ceballos, G., & Ehrlich, P. (2018). The misunderstood sixth extinction. *Science, 360,* 1080–1081.

Ceballos, G., Ehrlich, A. H., & Ehrlich, P. R. (2015). *The annihilation of nature: human extinction of birds and mammals*. Baltimore: Johns Hopkins University Press.

Chan, K., Balvanera, P., Benessaiah, K., et al. (2016). Why protect nature? Rethinking values and the environment. *PNAS, 113*(6), 1462–1465.

Crist, E. (2019). *Abundant earth: Toward an ecological civilization*. Chicago: University of Chicago Press.

Crist, E., Mora, C., & Engelman, R. (2017). The interaction of human population, food production, and biodiversity protection. *Science, 356,* 260–264.

Delucchi, M., & Jacobsen, M. (2013). Meeting the world's energy needs entirely with wind, water, and solar power. *Bulletin of Atomic Scientists, 69*(4), 30–40.

Dietz, R., & O'Neill, D. (2013). *Enough is enough: Building a sustainable economy in a world of finite resources*. San Francisco: Berrett-Koehler Publishers.

Dinerstein, E., Olson, D., Joshi, A., et al. (2017). An ecoregion-based approach to protecting half the terrestrial realm. *BioScience, 67*(6), 534–545.

Diop, A., Palola, E., Staudt, A., & Stein, B. A. (2009). *Standing tall: How restoring longleaf pine can help prepare the southeast for global warming* (National wildlife federation report). https://www.nwf.org/~/media/PDFs/Global-Warming/Reports/LongleafPineReport.ashx.

Dirzo, R., Young, H. S., Galetti, M., et al. (2014). Defaunation in the anthropocene. *Science, 345,* 401–406.

Duffy, R. (2014). Waging a war to save biodiversity: The rise of militarized conservation. *International Affairs, 90*(4), 819–834.

Ehrlich, P., & Harte, J. (2015). Food security requires a new revolution. *International Journal of Environmental Studies, 72*(6), 908–920.

Ellis, E. (2012). *The planet of no return: Human resilience on an artificial earth*. The Breakthrough Institute. http://thebreakthrough.org/index.php/journal/past-issues/issue-2/the-planet-of-no-return.

Ellis, E., Kaplan, J. O., Fuller, D. Q., et al. (2012). Used planet: A global history. *PNAS, 110*(20), 7978–7985.

Engelman, R. (2016). Nine population strategies to stop short of 9 billion. In H. Washington & P. Twomey (Eds.), *A future beyond growth: Toward a steady state economy* (pp. 32–42). London: Routledge.

Fairhead, J., Leach, M., & Scoones, I. (2012). Green grabbing: A new appropriation of nature? *The Journal of Peasant Studies, 39*(2), 237–261.

Finlayson, C., Davies, G. T., & Moomaw, W. R., et al. (2017). The second warning to humanity—providing a context for wetland management and policy. *Wetland Science & Practice*. https://doi.org/10.1007/s13157-018-1064-z.

Goodall, J. (2015). Caring for people and valuing forests in Africa. In G. Wuerthner, et al. (Eds.), *Protecting the wild: Parks and wilderness, the foundation for conservation* (pp. 21–26). Washington, DC: Island Press.

Griscom, B., Adams, J., Ellis, P. W., et al. (2017). Natural climate solutions. *PNAS, 114*(44), 11645–11650.

Hance, J. 2017. Failing our forests: In *Two years we've lost enough forests to cover Spain*. The Guardian. https://www.theguardian.com/environment/radical-conservation/2017/dec/22/failing-our-forests-in-two-years-weve-lost-enough-trees-to-cover-spain.

Hannum, H. (Ed.). (1997). *People, land, and community: Collected E. F. Schumacher society lectures*. New Haven: Yale University Press.

Hiss, T. (2014). Can the world really set aside half of the planet for wildlife? Smithsonian September. http://www.smithsonianmag.com/science-nature/can-world-really-set-aside-half-planet-wildlife-180952379/?no-ist.

Hobbs, R., Higgs, E., Hall, C. M., et al. (2014). Managing the whole landscape: Historical, hybrid, and novel ecosystems. *Frontiers in Ecology and the Environment, 12*(10), 557–564.

Jackson, J. (2008). Ecological extinction and evolution in the brave new ocean. *PNAS, 105*(1), 11458–11465.

Jackson, W. (2010). *Consulting the genius of place: An ecological approach to a new agriculture*. Berkeley: Counterpoint.

Jackson, W., Krug, A. S., Vitek, B., & Jensen, R. (2018). Transforming human life on our home planet, perennially. *The Ecological Citizen, 2*(1), 3–46.

Johns, D. (2010). Adapting human societies to conservation. *Conservation Biology, 24*(3), 641–643.

Johns, D. (2019). History of rewilding: Ideas and practice. In N. Pettorelli, S. M. Durant, & J. T. du Toit (Eds.), *Rewilding*. Cambridge: Cambridge University Press (in press). More information on the book can be found here https://www.cambridge.org/core/books/rewilding/2D3CFD33718F14F641AEF83FA1DB21AE.

Jones, K. R., Klein, C. J., Halpern, B. S., et al. (2018). The location and protection status of Earth's diminishing marine wilderness. *Current Biology, 28,* 2506–2512.

Kareiva, P., & Marvier, M. (2012). What is conservation science? *BioScience, 62,* 962–969.

Kareiva, P., Marvier, M., & Lalasz, R. (2012). Conservation in the anthropocene: Beyond solitude and fragility. *Breakthrough Journal,* Fall, 29–37.

Kloppenburg, J., Hendrickson, J., & Stevenson, G. W. (1996). Coming into the foodshed. *Agriculture and Human Values, 13*(3), 33–42.

Kopnina, H., Washington, H., Gray, J., & Taylor, B. (2018). The "Future of Conservation" debate: Defending ecocentrism and the nature needs half movement. *Biological Conservation, 217,* 140–148.

Lang, T. (2010). Crisis? What crisis? The normality of the current food crisis. *Journal of Agrarian Change, 10*(1), 87–97.

Laurance, W. (2015). *Roads to ruin*. New York Times April 12.

Laurance, W. (2018a). Is the global era of massive infrastructure projects coming to an end? Yale Environment 360. https://e360.yale.edu/features/is-the-global-era-of-massive-infrastructure-projects-coming-to-an-end.

Laurance, W. (2018b). Conservation and the global infrastructure tsunami: disclose, debate, delay! *Trends in Ecology & Evolution, 33*(8), 568–571.
Lenzen, M., Moran, D., Kanemoto, K., et al. (2012). International trade drives biodiversity threats in developing nations. *Nature, 486,* 109–112.
Locke, H. (2013). Nature needs (at least) half: A necessary and hopeful new agenda for protected areas. In G. Wuerthner, E. Crist, & T. Butler (Eds.), 2015. *Protecting the wild: Parks and wilderness, the foundation for conservation* (pp. 3–15). Washington, DC: Island Press.
Lulka, D. (2004). Stabilizing the herd: Fixing the identity of nonhumans. *Environment and Planning D; Society and Space, 22*, 439–463.
Machovina, B., Feeley, K. J., & Ripple, W. J. (2015). Biodiversity conservation: The key is reducing meat consumption. *Science of the Total Environment, 536,* 419–431.
Mander, J. (2012). *The capitalism papers: Fatal flaws of an obsolete system*. Berkeley: Counterpoint.
Manning, R. (2009). *Rewilding the west: Restoration in a prairie landscape*. Berkeley: University of California Press.
Mathews, F. (2016). From biodiversity-based conservation to an ethic of bio-proportionality. *Biological Conservation, 200,* 140–148.
Max, D. T. (2014). *Green is good*. The New Yorker. https://www.newyorker.com/magazine/2014/05/12/green-is-good.
Maxwell, S., Fuller, R. A., Brooks, T. M., & Watson, J. E. M. (2016). The ravages of guns, nets and bulldozers. *Nature, 536,* 143–145.
McCauley, D., Pinsky, M. L., & Palumbi, S. R., et al. (2015). Marine defaunation: Animal loss in the global ocean. *Science, 347*(6219), 247, 1255641-1.
McKibben, B. (2016). *Recalculating the climate math*. New Republic September 22. https://newrepublic.com/article/136987/recalculating-climate-math Accessed 9 June 2017.
Monbiot, G. (2013). *Feral: Searching for enchantment on the frontiers of rewilding*. London: Allen Lane Books.
Monbiot, G. (2016). I've converted to veganism to reduce my impact on the living world. The Guardian. https://www.theguardian.com/commentisfree/2016/aug/09/vegan-corrupt-food-system-meat-dairy.
Mora, C., & Sale, P. (2011). Ongoing global biodiversity loss and the need to move beyond protected areas: A review of the technical and practical shortcomings of protected areas on land and sea. *Marine Ecology Progress Series, 434,* 251–266.
Noss, R. (2013). Wilderness, wildness, and biodiversity: We need all three. Lecture presented by the University of Montana Wilderness Institute. https://archive.org/details/Wilderness_Issues_Lecture_Series_2013_-_7.
Noss, R., & Cooperrider, A. (1994). *Saving nature's legacy*. Washington, DC: Island Press.
Noss, R., Dobson, A. P., Baldwin, R., et al. (2011). Bolder thinking for conservation. *Conservation Biology, 26*(1), 1–4.
Otero, G., Pechlaner, G., & Gürcan, E. C. (2013). The political economy of "Food Security" and trade: Uneven and combined dependency. *Rural Sociology, 78*(3), 263–289.
Palmer, B. (2015). There goes the neighborhood: How humans use land is dramatically decreasing biodiversity worldwide. NRDC. https://www.nrdc.org/onearth/there-goes-neighborhood.
Patel, R. (2009). What does food sovereignty look like? *The Journal of Peasant Studies, 36*(3), 663–706.
Pauly, D., & Zeller, D. (2016). Catch reconstructions reveal that global marine fisheries catches are higher than reported and declining. *Nature Communications, 7,* 10244. https://doi.org/10.1038/ncomms10244.
Pimm, S., Jenkins, C. N., Abell, R., et al. (2014). The biodiversity of species and their rates of extinction, distribution, and protection. *Science, 344,* 1246752-1–1246752-10.
Pitcher, T., & Chang, W. (2013). Fisheries: Hope or despair? *Marine Pollution Bulletin, 74,* 506–516.
Quammen, D. (2010). *Great migrations*. National Geographic, November. http://ngm.nationalgeographic.com/2010/11/great-migrations/quammen-text.

Rahman, K. (2018). Yellowstone's beloved Wild Wolf "Spitfire" is killed by a trophy hunter after wandering outside the national park. Daily News, 3 December. https://www.dailymail.co.uk/news/article-6454433/Beloved-wild-wolf-nicknamed-Spitfire-killed-trophy-hunter.html.

Ripple, W., Newsome, T. M., Wolf, C., et al. (2015). Collapse of the world's largest herbivores. *Scientific Advances, 1*(e1400103), 1–12.

Ripple, W., Abernethy, K., & Betts, M. G., et al. (2016). Bushmeat hunting and extinction risk to the world's mammals. www.pnas.org/cgi/doi/10.1073/pnas.1702078114.

Roberts, C., O'Leary, B. C., & McCauley, D. J., et al. (2017). Marine reserves can mitigate and promote adaptation to climate change. *PNAS*. http://www.pnas.org/content/pnas/early/2017/05/31/1701262114.full.pdf.

Rodale Institute. (2014). Regenerative organic agriculture and climate change. White Paper. https://rodaleinstitute.org/assets/WhitePaper.pdf.

Safina, C. (2018). In defense of biodiversity: Why protecting species from extinction matters. Yale Environment 360. https://e360.yale.edu/features/in-defense-of-biodiversity-why-protecting-species-from-extinction-matters.

Scheffers, B., Meester, L., & de Bridge, T. C. L., et al. (2016). The broad footprint of climate change from genes to biomes to people. *Science, 354*(6313), 719, aaf7671-1-11.

Soulé, M., & Noss, R. (1998). Rewilding and biodiversity: Complimentary goals for continental conservation (pp. 19–28). Wild Earth Fall.

Steffen, W., Rockström, J, & Richardson, K., et al. (2018). Trajectories of the earth system in the anthropocene. *PNAS*. http://www.pnas.org/content/pnas/early/2018/07/31/1810141115.full.pdf.

The Economist. (2011). Welcome to the anthropocene. https://www.economist.com/node/21521911.

Thomas, C. (2017). *Inheritors of the earth: How nature is thriving in an age of extinction*. New York: PublicAffairs.

Tompkins, K., & Butler, T. (2016). Expanding parks. *Outside* October 10.

Urban, M. (2015). Accelerating extinction risk from climate change. *Science, 348*(6234), 571–573.

Washington, H. (2018). *A sense of wonder towards nature: Healing the planet through belonging*. London: Routledge.

Washington, H., & Twomey, P. (Eds.). (2016). *A future beyond growth: Toward a steady state economy*. London: Routledge.

Weis, T. (2013). The meat of the global food crisis. *The Journal of Peasant Studies, 40*(1), 65–85.

Wilcove, D. (2008). *No way home: The decline of the world's great animal migrations*. Washington, D.C.: Island Press.

Wilson, E. O. (2002). *The future of life*. New York: Alfred A. Knopf.

Wilson, E. O. (2016). *Half earth: Our planet's fight for life*. New York: W.W. Norton.

Wittgenstein, L. (1953/1968). *Philosophical investigations*. New York: Macmillan.

Wuerthner, G., Crist., E., & Butler, T (Eds.). (2014). *Keeping the wild: Against the domestication of earth*. Washington, DC: Island Press.

Wuerthner, G., Crist., E., & Butler, T., et al. (Eds.). (2015). *Protecting the wild: Parks and wilderness, the foundation for conservation*. Washington, DC: Island Press.

Chapter 15
Conclusion—A Just World for Life?

Haydn Washington and Helen Kopnina

This book arose out of a desire to consider how society is travelling in terms of retaining the rich diversity of life on this spectacular planet. Once green and teeming, it is now a planet in peril, with the living world in decline (e.g. Wijkman and Rockstrom 2012; Ceballos et al. 2015). In this book we also consider where 'justice' lies in all this. After all, we all want justice, but what exactly do we want it *for*? We are sure all chapter authors believe in justice for society, and that involves questions of equity and equality (e.g. Wilkinson and Pickett 2010). We argue society should seek to cultivate an environmentally-focused perspective that embraces not only social and economic justice but also concern for non-human species. Through this we can find a middle road of cooperation that acknowledges the rights of human and nonhuman species alike (Shoreman-Ouimet and Kopnina 2015).

The underlying ethics behind this book is that we cannot just stop at social justice, that ethics, rights and justice cannot just belong *only* to our own species. Consider the eyes of a child, what one may call 'wild eyes' (O'Hanlon 2012), remember the sheer beauty and wonder that as children we saw, heard and felt when we stepped forward into that teeming green 'more-than-human' world, of which we were a part (Abram 2010). How could justice cease at the boundaries of one species? How could our childhood pets, the glorious birds that forage in our gardens, the majestic trees down the road, the secret places we found in childhood rambles—how could they not deserve justice also? Surely they too have a right to be, to evolve, to continue, to manifest the 'will to live' (Schopenhauer 1983) that animates the living world?

'Integrating social and ecological justice' means we need *both*, we should have both, and they should be integrated. That means they must be entwined. Many of the authors of this book have been champions for wild nature, working to create

H. Washington
PANGEA Research Centre, BEES, UNSW, Kensington, Australia
e-mail: h.washington@unsw.edu.au

H. Kopnina (✉)
The Hague University of Applied Sciences, The Hague, The Netherlands
e-mail: alenka1973@yahoo.com; h.kopnina@hhs.nl

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and defend national parks and other conservation initiatives. Quite simply, this was because they loved life, and even felt a deep spiritual connection to it, feeling 'kin' to all those with no human voice, often speaking out on their behalf. We point out that what poet Jeffers (1924) called 'falling in love outward' is to identify with and value life *outside* our species. However, this in no way means one cannot love inside our species. We have never met conservationists who did not also believe in social justice, along with ecojustice. Love after all is not a fixed entity, as it can expand outwards to take in all those pets, birds, trees and secret places of our childhood. Indeed, it can extend to gigantic wilderness, and to the planet itself. The eyes of a child see that clearly—they *love it all*, and as Edith Cobb (in Trimble 1994: 28) noted, they are: "in love with the universe". Thus, most children seem to know what many of us adults need to rediscover, that justice should apply to all. So the arguments in this book for ecojustice are pointing out that the scales of justice are currently out of balance, as 'justice' today only applies to humans. Of course justice does apply to humans, and we certainly support justice for all human groups, but why should it stop there? It should extend out also to the rest of life, and to the land itself. It is not a case of either/or in regard to justice. Indeed the whole point of this book has been to argue: "It has to be both".

To return to conservation itself, this book shows there are indeed good grounds to ask: 'Has conservation lost its way?'. Several chapter authors in this volume (e.g. Kaitlyn Creasy, Dominick DellaSala, Eileen Crist, David Johns, Haydn Washington) argue that some of it has, that sections of the conservation movement have been subverted and taken over by an anthropocentric and neoliberal worldview. For a long time, conservationists have argued that nature should be protected *for itself*. Now, some scholars, governments (and even supposedly 'conservation' bodies) are arguing that nature should be protected only for humanity. This view is singularly lacking in any care or generosity towards the rest of life we share this planet with. Many indigenous societies operate from a kinship ethics, where nonhumans are seen as our relatives (e.g. Knudtson and Suzuki 1992). Such lore and kinship ethics has a lot to teach Western society, which seems embarked on an unsustainable endless growth trajectory (Rees 2008). The view that "conservation has to be only for people" is thus we feel ethically bankrupt. Also, we believe such an approach is doomed if we really do want to retain the wealth of life on Earth that we have today (but maybe not by century's end if conservation fails). Several chapters (e.g. DellaSala, Johns, Washington) argue that conservation is one of the great issues of our time—which requires the rediscovering of an ecologically sustainable worldview and ethics of conservation. That worldview will have to extend justice to the nonhuman world, speaking for those who have no human voice. Indeed, as Joe Gray and Patrick Curry argue, society should extend a role to nature in terms of society's governance in the form of 'ecodemocracy'.

So how do we integrate social and ecological justice? The simple truth is that while it may be ethically easy to say they 'must' be integrated, practically it is *hard*. We always understood this was going to be the case, and this book was a venue to consider this in more detail. Part I considers various 'perspectives' involved in this issue. Chief among these is the issue of trying to shift an anthropocentric worldview that has been

dominant for centuries. The idea that science is fully 'objective', when it operates from an underlying (but almost never acknowledged) anthropocentric and neoliberal bias, is clearly mistaken (see Chap. 4). The idea that all of life on Earth (apart from us) is somehow 'just a resource' reflects just how deeply anthropocentrism is entrenched in society. Indeed we believe Crist (2012: 145) described the term 'resource' accurately as being a: "gaping wound on the face of language", one which has led to a distorted (and destructive) view of the world.

Perhaps no idea in ecology illustrates the need to think about ecological ethics so well as that of 'ecosystem services' (discussed here by Washington, while 'natural capital' is also discussed by Creasy). It is everywhere in science, and figures strongly in any discussion of conservation. Yet the ethical underpinnings of ecosystem services are anthropocentric, they are services *just for people* that nature provides. As argued by Washington in Chap. 6, it is time we considered not 'Nature's Contributions to People' but 'Peoples Contributions to Nature'. Chief amongst such contributions are respect for nature and a 'duty of care' towards her. Conservation should lead the way towards such discussion, rather than treating it as a taboo to be ignored. Johns in his chapter summarises this beautifully:

> Our stomachs are full but we are hollow in our souls. In separating ourselves from the world by trying to control it we have created a hunger that things can never fill, though we keep trying. We have wounded our souls and our capacity for empathy and love. "This is what is the matter with us," Lawrence wrote (1968: 504). "We are bleeding at the roots, because we are cut off from the earth and sun and stars, and love is a grinning mockery, because, poor blossom, we plucked it from its stem on the tree of life, and expected it to keep on blooming in our civilized vase on the table." This is the great sacrifice we have made and it need not be.

DellaSala discusses a key problem within conservation, which is that anthropocentric and neoliberal ideologies have become ingrained in many big conservation organisations over the last few decades. He argues that:

> For the largest conservation groups, improving public image and accountability may mean reforming board development to be more aligned with biodiversity/ecocentric mission statements, instead of chasing deep-pocket donors that, in turn, result in mission drift or 'greenwashing' conservation. More biodiversity scientists, ecojustice advocates, and nature philosophers on governing boards would help balance the increasing presence of pro 'business interests.'

He argues that it is time for conservationists to "take back the ecocentric center" from which we came. He believes we should borrow from the #MeToo movement—as it is now time for a #NatureToo movement to "rise up from the ashes as the Phoenix that will regenerate humanity by living in justice with Nature, and not at its expense".

So how do we integrate social and ecological domains? Veronica Strang considers this in terms of Earth jurisprudence and the 'rights of the river', discussing the case of the Whanganui river in New Zealand. This river was granted legal status and rights similar to a corporate person or trust. Two individuals were appointed to speak for the river, a representative of the Crown, and a representative of the Maori tribe. Strang concludes that to change the ways we engage with and make use of rivers is a large task, but thinking about them as living entities, and promoting their legal

rights as persons, is a good place to start. Indeed, she believes there is a growing recognition that a new intellectual paradigm—"a repositioning of humankind in relation to nonhuman kinds" is needed if society is to reach sustainability.

Gray and Curry in their chapter develop this idea further through arguing that nature should be allocated proxies in social governance structures. This is also articulated in a new platform 'GENIE' supporting ecodemocracy (www.ecodemocracy.net). Imagine if nature had two representatives on every National Park Board of Management. Currently, various human interest groups (recreation, environmental NGOs, local government, science) have representatives, but nature itself has none. Imagine if local and other governments had proxies representing nonhuman nature, speaking out for those with no human voice. This would be one good way of integrating social and ecological domains, literally giving nature a voice.

Similarly, Traditional Environmental Knowledge (TEK) offers a chance to rediscover what many indigenous cultures believed, that the two domains (nature and human) should be integrated—as nature is our kin. Strang and Thomasberger discuss this further in their chapters. Strang speaks of the Maori view, where people consider themselves to be at one with, and having equal status to, the mountains, the rivers and the seas. Hence she believes it encapsulates the core principles of ecological justice. Alessio Thomasberger argues that the biggest quest for conservation today is for humans to re-establish reciprocal relations to non-human beings. Hence he believes grass-root movements can strengthen and rejuvenate TEK to assist in the integration of social and ecological justice. Hence, building on indigenous lore and TEK can assist in many countries to move conservation back towards the ecocentric, towards a 'kinship ethics' with the rest of life.

Another way to integrate our social and ecological ideas is through our education system, as Helen Kopnina discusses. Conscious examination of one's own worldviews and ethics in regards to justice and conservation provides students a chance to think about a topic that may have been off their radar. The assignment she discusses was intended for the researcher to learn from student's perspectives and understanding of trade-offs and congruities between social and ecological justice. The exploration of the students' worldview revealed larger patterns in environmental awareness. Examination of assignments suggested ways in which a more ecocentric curriculum might be developed. Also, students' views on social and ecological justice suggested that support for ecological sustainability and the ethical treatment of nonhuman nature needs clear articulation of an ecocentric position, one that exposes its ethical underpinnings.

Cleary, Part II and III overlap, as ideas that expand the debate are also conservation solutions. Hence two key solutions have already been referred to, learning from indigenous worldviews and 'representation for nature' in governance (ecodemocracy). Another solution is to 'rewild' our world and to protect half of it for nature, so as to stop the mass extinction currently underway. Reed Noss in his chapter shows how we can do this, that it is in fact possible. Noss explains how the term 'rewilding' has become confused over time, moving from the idea of 'wilderness restoration' to 'Pleistocene rewilding' (introducing megafauna to replace those that have gone extinct) to reintroducing carnivores (or other native species) now extinct in an area.

This illustrates the problem of multiple meanings for a term, which help to confuse the original aim (in this case to restore land to wilderness condition). Noss explains the significant history of the vision that half of terrestrial lands need to be protected to keep the world's rich biodiversity. This has more recently been called 'Half Earth' (Wilson 2016) or 'Nature Needs Half' (Locke 2013; Kopnina 2016; Dinerstein et al. 2017). Most of the chapter authors here support such a vision. It is also thankfully a vision that is gaining increasing traction within a number of areas in academia.

Of course, there are 'elephants in the room' in regard to conservation that many in academia simply refuse to see. We consider three here. The first is *population*. As Richard Grossman notes in his chapter, conservation is so difficult because there are simply too many people on Earth, placing too great an impact on the natural world. As Grossman notes, we are on track to expand to 9 or perhaps 11 billion people, putting even more pressure on Earth's wondrous diversity of life, now very much under threat (Crist et al. 2017). Grossman explains how the I = PAT formula demonstrates that both the number of people and the affluence (or consumption) of each person must both be considered. In relation to this, Noss believes that shrinking the human population and economy is ultimately the only way we can achieve justice for all species. However, we face a strong denial of the problem of overpopulation in both society and academia. The chance of successfully integrating social and ecological justice is small in a future world where society continues to ignore this huge (and growing) elephant in the room. Not controlling human population (ethically and non-coercively) would be a disaster for *both* types of justice.

The second elephant in the room is *climate change*, referred to by several authors. Crist believes that climate change will exceed the impacts currently caused by agriculture and mass killings, and "grab the baton of mass extinction". Strang observes that the deepening anxieties about climate change and ecosystem destruction have sharpened debates about how to avert catastrophic levels of extinction and environmental degradation. Johns reminds us of the impact of climate change in terms of nature conservation, pointing out that all wild lands and oceans are affected by this. Grossman looks to the future, where increasing human population will of necessity increase greenhouse gas emissions. DellaSala reminds us of what should always be present in our minds as the desired outcome—"a living planet full of prospering, biodiverse life and a safe climate". Given the recent IPCC (2018) report, it is clear that effective nature conservation cannot occur if the climate crisis warms the planet beyond 2 degrees. Climate change is thus a key problem for ecojustice, as while many humans may be able to adapt, many other species and ecosystems cannot. If we cannot stop climate change then the future of conservation will become increasingly grim.

There is a final elephant in the room we feel should be mentioned—the idea of *endless growth* on a finite planet. The problem of the endless growth economy is referred to by several authors. Strang argues that society needs to abandon "short-termist capitalist ideologies" and over-dependence on growth-based economic systems. Crist observes that global trade—the main engine of the global economy is driving the: "triple whammy of extinctions, infrastructural sprawl, and greenhouse gas emissions". Washington concludes that the growth economy espoused by neoclassical

economics is fundamentally unsustainable, and is the key cause of ecocide. He suggests one solution is to re-engineer our consumer culture and move to a steady state economy. Creasy categorises the endless growth economy as "profoundly anthropocentric", where it ignores the reality of how "economically flourishing societies" have continued to degrade nature. Johns states that the call to make wilderness and comprehensive biodiversity protection 'subservient to growth' is: "the language of conquest and colonization using different words". DellaSala believes that to protect the Tongass rainforest in Alaska means getting the region moving toward an ecologically sustainable economy. Clearly, the authors here realise that endless growth on a finite planet is not working for conservation. Judging by past results, its continuation would likely lead to an escalating ecological holocaust.

In her chapter, Crist speaks eloquently of the need for us to let the Earth 'rebound', to be free, to be renewed and healed. She also speaks with passion about our society's curious idea that we 'own' the land, as if it was exclusively ours to possess and control. Indeed, she says this is the blueprint that has 'gridded' the world into little parcels supposedly *owned* by humans (no matter what else lives there). Crist argues that conservationists too have fallen into this mistake of thinking humanity 'owns' the world, and that the new imperative for conservation is to break free from this idea. Arguably, until it is commonly accepted that the world and the rest of life are not 'ours' to own, it will be hard to unify social and ecological justice. Crist speaks about conservation and 'freedom':

> … the bold pursuit of large-scale conservation is about something new under the Sun. It is about setting Earth free to be an expansive, untamed, and exuberant mandala of life that can *actually*, if implemented in timely fashion, heal many ecological wounds … authentic human freedom can never be founded on annihilating, constricting, and enslaving nonhumans nor can it blossom in the bleak landscape of Earth bondage and ruins. … The prerequisite for realizing authentic human freedom is to free humans from the debasing shackles of human supremacy, lifting humanity into the infinite sight of the fundamental goodness of all life freed.

Crist notes what others allude to, that as part of the solution we must become willing to *give back* generously to the planet. We would observe that chief among the 'Contributions to Nature' we can make ethically is offering respect to the nonhuman world, and also upholding a human responsibility, a 'duty of care' towards life. In fact we would argue that ecocentric conservation is really putting that 'duty of care' into operation. That duty of care could help to integrate social and ecological justice. It will not be easy—but we believe it *is* possible.

Many of us (especially in conservation) worry about the future and what it will bring. Grossman notes that long-term conservation of nonhuman nature is unlikely without stabilization and reduction of human population. Johns reminds us that the 'growth monster' remains not just unchecked, but in fact is embraced in theory and practice by virtually all human societies. Gray and Patrick state that as we witness the sixth mass extinction unfold, it is hard not to feel exasperated by the lack of a say in human democracy for all the suffering species and ecosystems. Strang argues that efforts to rethink relations with non-human beings must be accompanied by real striving to reduce the pressure of human needs and interests. Washington argues

that the future of life on Earth is at a critical stage, as is whether society will itself reach a sustainable future. Creasy notes that the more widespread anthropocentrism becomes, the more society risks the extinction of the idea that nature and non-human life forms have "goods all their own". Crist believes that conservation critics have zero insight into the unthinkable ethical burden we bequeath humanity (through causing mass extinction). She concludes it is: "imperative to put a stop to this Earth catastrophe *now*".

Such worries and fears are of course valid, and anyone who reads widely on environmental issues is likely to share many of these. However, such concerns should not paralyse us from taking action. Rather, they should motivate us all to find solutions to the current environmental crisis. As Crist concludes, we now need: "devotion to our home planet, commitment to the possibility of a future ecological and equitable global civilization …". A key solution is to *create the political will*. While academics tend to shy away from advocating political lobbying, we feel it is essential for effective conservation of nonhuman nature. One obvious example is we need to lobby all governments to support the 'Half Earth' conservation vision. Others include the need to campaign politically for ecodemocracy, and to argue that social and ecological justice should be entwined.

We do not believe society will find an ecologically and socially sustainable future unless social justice and ecojustice go hand in hand. However, unless it is acknowledged that nature requires ecojustice as much as people require social justice, there will never be a dialogue established to consider how to implement both together. An example of this is the situation where it is implied we simply have to log forests unsustainably for social justice reasons. One example is the increasing deforestation in Ghana that Thomasberger describes, where poor farmers are caught in a debt trap, felling forests to make charcoal so as to earn money to buy seed for crops, etc. However, without any counter-balancing ecojustice, this is leading towards total deforestation (where both humans and nature lose). Another example is where DellaSala describes how the Tongass rainforest in Alaska may now be scheduled for unsustainable clearcutting. However, unsustainable logging leads to the eventual loss of such forests, along with all the social benefits they brought society (and ecological benefits they brought the rest of life). Unsustainable logging is thus eventually a lose/lose situation for both nature *and* society.

While seeking to integrate social and ecological justice, we should accept there are complex issues involved, and complex ethical choices. To allow the integration of both justices to happen, society will need to overturn two deeply embedded *assumptions*, the 'Sole Value' assumption, and the 'Greater Value' assumption (Curry 2011). The first is essentially anthropocentrism, arguing that only humans have value. The second is much harder, as the 'Greater Value' assumption accepts that nature has some value, it is just that humanity *always* has greater value. This assumption becomes more and more problematic as the world becomes more crowded and overpopulated. On a full planet, conservation of nature comes into greater conflict with desires to grow more food and develop more land.

Given that the 'scales of justice' are clearly out of balance, one could argue for an 'Equal Value' assumption, where *both* nature and humanity have equal value. That

would imply that sometimes human desires for development will have to come second so as to protect nonhuman nature. An 'Equal Value' assumption would be moving in the right direction. However, we believe this too is inadequate. Even if one speaks of 'equal value' the default position (given the insidious nature of anthropocentrism) will be to favour humanity. It is worth remembering that ecocentrism foregrounds the more-than-human, but also acknowledges humans are part of nature. A prime focus on nature thus also includes human well-being as part of (but not master) of the ecosystem.

However, given that centuries of anthropocentrism have massively degraded nature, we argue that now nature must have *primary value*, since we all (humans included) depend on it. This would at last properly correct the scales of justice. Given the scope of the environmental crisis and the accelerating mass extinction event now underway, it is time for a 'Nature First' assumption. That means retaining the rich biodiversity of this living world has to come *first* in our decision-making. Before we are called 'antihuman', let us again point out that society relies on nature to survive. It provides the food, fibre, nutrients, ecosystem processes and spiritual harmony humanity needs to live well on Earth. It is our kin. If we destroy nature, we would leave a devastated world to our descendants and we eventually destroy ourselves. So putting nature first means that we are also putting the ecosystem processes that support our civilization first. At the same time, a 'Nature First' assumption puts ecocentrism, ecological ethics and ecojustice in key focus, maintaining that nature has intrinsic value. The assumption of society should be that we have a duty of care to protect nonhuman nature. Projects that should be controlled under a 'Nature First' assumption are those that strongly degrade nature—increasing overpopulation and overconsumption; burning fossil fuels; clearing forests; large-scale mining; and over-harvesting (and illegal poaching) of life. Where the balance should lie may be indicated by the 'Nature Needs Half' vision, and it will be different for each locality. However, without a 'Nature First' assumption, few degrading activities are likely to be controlled. After all, most have failed to be controlled over the last century of the 'Sole Value' assumption.

However, a 'Nature First' assumption will not come into being *without* the acknowledgment that nonhuman nature deserves respect, acknowledgment of its intrinsic value, ecojustice, ecodemocracy, and acceptance that we have a duty of care towards her. Without this, business-as-usual will continue—as ongoing and accelerating ecocide that makes nature conservation increasingly difficult (perhaps impossible). However, with this acceptance, we can move towards an ongoing dialogue that seeks to retain the beauty and wonder of the living world. Such a dialogue will seek to balance both social and ecological justice so the two operate together in harmony. It will probably always be a work in progress, but one that needs to commence now. A key part of this is getting conservation groups to stand up for ecocentric conservation and the integration of social and ecological justice. Conservation organisations now need to undertake dialogue with the big international conservation groups, as some of them need to re-join ecocentric conservation (see Chap. 7 by DellaSala). Some groups that could take a lead in this dialogue include: The Rewilding Institute; The Center for Biological Diversity; Nature Needs Half;

Half Earth; and the Earth Charter Initiative. Such groups could also enter a dialogue with social justice advocate organisations, such as The Equality Trust and The Network for Social Change, in regard to the need for integrating social and ecological justice, so they operate entwined.

In conclusion, there are key ethical questions in play that society must ponder and resolve. Will society learn from indigenous cultures and their kinship ethics to assist it to live in harmony with the rest of life? Will we extend ethics to all of life and the land? Will we abandon the 'Sole Value' assumption in favour of a new 'Nature First' assumption? Will we care enough to change? We believe that conservation needs to return to being the *voice for all of life* that has no human voice. Conservation should be about caring for this green, living planet we are so lucky to live on—as we have a responsibility to do so. Indeed, we believe the integration of social and ecojustice is essential today for a sustainable future—not just for humanity, but for all of life. This is a great challenge, but one of infinite value for us to work towards. Entwining social and ecological justice is a path we should now travel for us to conserve this planet's diverse and amazing living reality. We conclude with the wisdom of Aldo Leopold (1949: 262) and his Land Ethic:

> Examine each question in terms of what is ethically and aesthetically right, as well as what is economically expedient. A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.

References

Abram, D. (2010). *Becoming animal: An earthly cosmology*. New York: Vintage Books.

Ceballos, G., Ehrlich, A., & Ehrlich, P. (2015). *The annihilation of nature: Human extinction of birds and mammals*. Baltimore: Johns Hopkins University Press.

Crist, E. (2012). Abundant Earth and the population question. In P. Cafaro & E. Crist (Eds.), *Life on the Brink: Environmentalists Confront Overpopulation* (pp. 141–151). Georgia: University of Georgia Press.

Crist, E., Mora, C., & Engelman, R. (2017). The interaction of human population, food production, and biodiversity protection. *Science, 356,* 260–264.

Curry, P. (2011). *Ecological ethics: An introduction* (2nd ed.). Cambridge: Polity Press.

Dinerstein, E., Olson, D., Joshi, A., et al. (2017). An ecoregion-based approach to protecting half the terrestrial realm. *BioScience, 67,* 534–545.

IPCC. (2018). *Global warming of 1.5* °C. International Panel on Climate Change, see: http://www.ipcc.ch/pdf/special-reports/sr15/sr15_spm_final.pdf.

Jeffers, R. 1924 (1986). Poem 'The Tower Beyond Tragedy'. In J. Hart (Ed.) *The Concise Oxford Companion to English Literature.* Oxford: Oxford University Press.

Knudtson, P., & Suzuki, D. (1992). *Wisdom of the elders*. Australia: Allen and Unwin.

Kopnina, H. (2016). Half the earth for people (or more)? Addressing ethical questions in conservation. *Biological Conservation, 203*(2016), 176–185.

Lawrence, D. H. (1968). A Propos of Lady Chatterley's Lover. *Phoenix II* (pp. 487–515). London: Heinemann.

Leopold, A. (1949). *A sand country almanac, with essays on conservation from round river.* New York: Random House (1970 printing).

Locke, H. (2013). Nature needs half: A necessary and hopeful new agenda for protected areas. *Parks, 19,* 9–18.

O'Hanlon, E. (2012). *Eyes of the wild: Journeys of transformation with the animal powers*. Washington: Earth Books.

Rees, W. (2008). Toward Sustainability with justice: Are human nature and history on side?. In Soskolne C (Ed) *Sustaining Life on Earth: Environmental and Human Health through Global Governance* (pp. 81–93). New York: Lexington Books.

Schopenhauer, A. (1983). *The will to live: The selected writings of arthur schopenhauer*, In: R. Taylor, New York: Ungar.

Shoreman-Ouimet, E., & Kopnina, H. (2015). Reconciling ecological and social justice to promote biodiversity conservation. *Biological Conservation, 184,* 320–326.

Trimble, S. (1994). The scripture of maps, the names of trees. In G. Nabhan & S. Trimble, (Eds.), *The Geography of Childhood: Why Children Need Wild Places.* Boston: Beacon Press.

Wijkman, A., & Rockstrom, J. (2012). *Bankrupting nature: Denying our planetary boundaries*. London: Routledge.

Wilkinson, R., & Pickett, K. (2010). *The spirit level: Why equality is better for everyone*. London: Penguin Books.

Wilson, E. O. (2016). *Half-earth: Our planet's fight for life*. New York: Liveright/Norton.

Index

H. Kopnina and H. Washington (eds.), *Conservation*,
https://doi.org/10.1007/978-3-030-13905-6