

Paul Robbins, John G. Hintz, and Sarah A. Moore

# Environment and Society

A Critical Introduction

Third Edition



WILEY Blackwell

# Environment and Society

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Paul Robbins, John G. Hintz, and Sarah A. Moore

**WILEY** Blackwell

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# About the Companion Website

This book is accompanied by a companion website which includes a number of resources created by author for students and instructors that you will find helpful.

[www.wiley.com/go/robbins/environment](http://www.wiley.com/go/robbins/environment)

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# 1

## Introduction

### The View from a Human-Made Wild



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#### Keywords

- Anthropocene
- Ecological novelty
- Political ecology
- Reconciliation ecology
- Rewilding

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## 2 Introduction: The View from a Human-Made Wild

News headlines from forests, fields, rivers, and oceans suggest we are in a world of trouble. Storms ravage the coasts of Asia and the Americas, with more looming as sea levels slowly rise. Fresh water is increasingly scarce around the globe, owing not only to heavy water use but also widespread pollution; there is not a single drop of water in the Colorado River in the United States or the Rhone River in France that is not managed through complex dams and distribution systems, or affected by city and industrial waste along their paths to the sea. Agricultural soils are depleted from years of intensive cropping and from the ongoing application of fertilizers and pesticides in the search for ever-sustained increases of food and fiber; in North India, after decades of increasing production, yields of wheat and rice have hit a plateau. Global temperatures are on the rise and, with this increase, whole ecosystems are at risk. Species of plants and animals are vanishing from the Earth, never to return. Perhaps most profoundly, the world's oceans – upon which these global systems rest – show signs of impending collapse. The accumulation of these acute problems has led observers to conclude that the environment may be irreversibly lost or that we may have reached “the end of nature” (McKibben 1990).

And yet on Isle Royale, a nearly untouched wilderness located in the middle of Lake Superior, these complications only invite harder thinking about what, if anything, people must do to achieve and foster thriving ecosystems. Consider that Isle Royale, a 544-square-kilometer island near the coast of Ontario Canada, is the least-visited of all the National Parks in the lower 48 states of the United States, and is an officially designated wilderness area. Set aside as a natural experiment to see how predators and prey interact, the island is a fantastic scientific instrument to show what nature does when “untouched” by people. Wolves (*Canis lupus*) and moose (*Alces alces*) have been studied here for six decades, and the rise and fall of each population reveals the complex interactions between species in the wild.

The nature of global change, however, leaves no part of the world truly beyond interactions with people. Isle Royale is no exception (Mlot 2013). First, a deadly disease accidentally arrived in the early 1980s, brought by domesticated dogs. *Canine parvovirus* (CPV), crossed over from human-domesticated animals to their wild relatives, and caused a crash in the wolf population from which it never fully recovered.

Second, the winter ice-bridge that has historically existed between the island and the mainland has all but disappeared. This vital connection allowed wolves in search of prey to cross the ice, and support and diversify the local wolf population. As winters have warmed, a result of human-caused climate change, and the ice cover of Lake Superior has become less reliable, this crucial connection has now failed, further endangering the wolves of Isle Royale.

Just as inevitably, the Canadian shores across from Isle Royale have undergone significant development investment in recent decades. With more human activity in the vicinity of historic winter migration, the movement opportunities for the wolves are even worse.

Finally, the small size of the population has encouraged genetic bottlenecks, a condition where genetic diversity plummets, further reducing the changes of the population's survival. Sings of inbreeding, stillbirths, and blindness have set in.

This apparently grim news reflects what ecologists increasingly refer to as **ecological novelty**, a condition where whatever ecological systems occurred in the past have been swept away by new conditions, as where the climate changes, new species interact with

earlier ones, and invasion and diseases introduce new and complex dynamics, owing to migration or introductions. “Novelty” is technically “the degree of dissimilarity of a system, measured in one or more dimensions relative to a reference baseline” in “the present or a time window in the past” (Radeloff et al. 2015, p. 2051). Put simply, it is a condition of change, relative to whatever we have seen before, often reflecting a kind of “one way ticket” to a situation from which there may be little hope of natural return. Whether it is domesticated cats running amok and eating wild birds, or the ice melt that imperils the polar bear, this is the condition of many treasured places and wildlife around the world.

Ecological processes never go away, of course. Ecology’s rules, laws, and flows continue, only under radically altered conditions, and with whole new sets of players. This means that *despair would be insanely premature at Isle Royale*. Instead, all of the human-caused forces and changes on Isle Royale invite us to think about what people might do to restore, reimagine, and foster wildlife. Wolf reintroductions could be launched from other land-based populations to the island. More radically, genetic rescue might sample and bank the genes of the existing wolf pack and work to diversify the gene base. Moose populations, which have grown to a potentially disastrously high level, with implications for the land base, might be culled. In short, people could put their hands on the land and guide it to a place where wolves and moose continue to thrive.

Doing so, however, would more of an effort at **rewilding** than letting nature “take its course.” Rewilding refers to efforts by people to return landscapes and lost ecosystems by tinkering heavily with them or crafting them from whole cloth, in order to reclaim – or create – landscapes as they might have been before human influence (Kolbert 2012).

There is plenty of precedent for such activities. In the sand hills of Nebraska, for example, along the Platte River, hundreds of thousands of migrating Sandhill Cranes (*Grus Canadensis*) congregate every spring, on the migration south to the Gulf Coast, using the sandbars of the river as nightly perches and protection from predators (Figure 1.1). This stretch of the river is a critical habitat for a booming population of the elegant, strong, and giant birds, and a destination for visitors from around the world every year.

But this is by no means a “natural” condition. Owing to the century-old human damming of the river, the Platte lost its powerful ability to flood, and so its sandbars gave way to shrubby vegetation, overgrowth and habitat loss for cranes and other species. Only by scouring the river bed every year, with gigantic machinery, do people manage to maintain this habitat and allow the critical sandbars of the river to return. The returning birds also glean from nearby farmers fields as they rest on their long journey; people are providing a crucial subsidy to their non-human visitors. The Sandhill Crane was on the brink of extinction in the middle of the twentieth century. It has come roaring back in recent years, owing to human’s ability to understand their influence on the environment, and their willingness to consider their responsibility to the land.

More radically, in Flevoland, a province in the Netherlands, wild species are thriving as never before. As in the late Pleistocene (10 000 years ago), Red Deer roam the landscape,

**Ecological Novelty** An ecological condition where human-caused alterations of biotic or abiotic conditions lead to changes at different ecological levels, from organisms and populations to communities, ecosystems, and landscapes

**Rewilding** A practice of conservation where ecological functions and evolutionary processes, which are thought to have existed in past ecosystems or before human influence, are deliberately restored or created; rewilding often requires the reintroduction or restoration of large predators to ecosystems



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**Figure 1.1** Sandhill cranes of the Platte River. A half million of these birds congregate annually. *Source:* Diana Robinson Photography/Moment/Getty Images.



**Figure 1.2** Heck Cattle, introduced to replace the extinct Aurochs. *Source:* Simon Vasut/Shutterstock.

feral horses travel in herds, and an ecosystem of foxes and wild birds has arisen, including egrets and wild geese. Aurochs – the massive wild cattle of Europe – have been extinct for centuries, but their human-bred cousins, Heck Cattle, graze the landscape, their long horns and hairy forms rumbling across the marshland (Figure 1.2). This 15 000-acre wilderness,

called Oostvaardersplassen, is wholly artificial, and filled with wild life. Remarkably, all this wildlife is thriving in one of the places on Earth most densely populated by people. For safari visitors, who pay US\$45 for a visit to the park, there is no question that the place creates a great sense of wonder, as visits to wild places do for most all of us in a world that is increasingly encroached by human activity, pollution, and influence.

These views from Canada, Nebraska, and the Netherlands makes our global situation easier to understand, though perhaps no simpler to solve. The contradictory proposition – dramatically transforming the environment in ways that may preserve the environment – is a metaphor for the condition of our longstanding relationship to the non-human world. Nor is this problem rare. Yellowstone National Park in the United States, though heralded as a wilderness, was created through the violent extirpation of the dozens of native tribes who lived in the region, transformed its landscapes, and relied on the resources of what would become a park devoid of people. Coffee plantations throughout Asia and Latin America, though regarded purely as economic and artificial landscapes, often teem with wild birds, mammals, and insects, all beyond the intent and control of farmers, conservationists, or anyone else for that matter. Everywhere we seek some place beyond people, the marks of human creation and destruction confront us, and wherever the works of humans are in evidence, there are non-human systems and creatures, all operating in their own way.

Decisions made in places like Isle Royale, therefore, cannot be made solely on the basis that the region is a “natural” one, nor a “social” one. The area is simultaneously neither and both, with animals, plants, and waterways springing from human interventions, creating altogether new habitats and environments. Wildlife parks and coffee plantations are *both* landscapes of the **Anthropocene**, therefore, one term for our current era, when people exert enormous influence on the Earth, but where control of these environments and their enormously complex ecologies is inevitably elusive.

**Anthropocene** A metaphoric term sometimes applied to our current era, when people exert enormous influence on environments all around the Earth, but where control of these environments and their enormously complex ecologies is inevitably elusive

Such a condition, however, raises more questions than it answers. If a “natural” condition is unavailable to adjudicate what a wild place should look like and what its use or purpose might be, then wild nature will inevitably be, in part, a product of human choices. Who should control such decisions? Lands long-ago taken from Indigenous communities, as in the case of the Platte River, might arguably be best managed or comanaged by Native communities. What criteria will be used for deciding the ecological arrangements that follow? Should it be for the utility of people or the benefit of non-human nature? And what systems should be put in place to enact decision-making? Should nature be governed by free markets or rather by local collective institutions, or something else entirely? In short, environmental decisions in the Anthropocene are inherently and inevitably social, political, economic, ethical, and cultural.

If decisions about what to do (and what not to do) are to be made, therefore, and the larger complex puzzle of living *within* nature is to be solved, we need tools with which to view the world as simultaneously social and natural. For example, viewed as a problem of ethics, the restoration of a wilderness in Lake Superior becomes one of sorting through competing claims and arguments about what is ethically best, weighing on whose behalf one might make such argument, that of people or that of the animals themselves. From the



point of view of political economy, by contrast, one would be urged to examine what value is created and destroyed in the transformation of these muddy lands, whose specific species are selected and why, whose pockets are filled with money in the process, and how decisions are controlled and directed through circuits of expert power and conservation authority. Indeed, there is no shortage of ways to view this problem, with population-centered considerations competing with those that stress market logics, and arguments about public risk perception competing with those about equal access to the park. *What “lenses” can and should we use to look at environmental issues?*

### What is This Book?

This book is designed to explain these varied interpretive tools and perspectives and show them in operation. Our strategy is first to present the dominant modes of thinking about environment–society relations and then to apply them to a few familiar objects of the world around us. By environment, we mean the whole of the aquatic, terrestrial, and atmospheric non-human world, including specific objects in their varying forms, like trees, carbon dioxide, or water, as well as the organic and inorganic systems and processes that link and transform them, like photosynthesis, predator–prey relationships, or soil erosion. Society, conversely, includes the humans of the Earth and the larger systems of culture, politics, and economic exchange that govern their interrelationships.

From the outset we must insist that these two categories are interlaced and impossible to separate. Humans are obviously environmental beings subject to organic processes. Equally problematically, environmental processes are also fundamentally social, in the sense that they link people and influence human relationships. Photosynthesis is the basis of agriculture, for example, and so is perhaps the most critical environmental process in the history of civilization. More complex: human transformation of carbon levels in the atmosphere may further alter global photosynthesis in a dramatic way, with implications for human food and social organization. Obviously, it is difficult to tell where the environment leaves off and society begins. On the other hand, there is not universal agreement on these relationships and linkages. The perspectives summarized in this text present very different views about which parts of society and environment are connected to which, under what conditions these change or can be altered, and what the best courses of action tend to be, with enormous implications for both thinking about our place in the ecosystem and solving very immediate problems like global warming, deforestation, or the decline in the world’s fisheries.

In Part I, we lay out some of the dominant ways of interpreting the environment–society relationship. We begin in Chapter 2 with a perspective that is foundational to the history of both the natural and social sciences: population. Here we describe how human population has been viewed as a growing threat to the non-human world, contrasting this with views of population growth as a process that not only consumes, but also potentially *produces*, resources in the world. In Chapter 3 we consider economic ways of thinking about the environment. These views stress the power of markets – a category in which we include systems of economic exchange – to respond to scarcity and drive inventive human responses. In Chapter 4 we stress institutions, which we define as the rules and norms governing our

interactions with nature and resources. Institutional approaches address environmental problems largely as the product of “common property” problems that are amenable to creative rule-making, incentives, and self-regulation. Chapter 5 examines ethics-based approaches to the environment, with their often radical ways of rethinking the place of humans in a world filled with other living and non-living things. The view of the environment as a problem of risk and hazard is explored in Chapter 6, where we also consider the potentials and pitfalls of technologies that seek to address such challenges. This approach proposes a series of formal procedures for making the best choices possible, given that environments and environmental problems are inherently uncertain and highly variable. This is followed by a description of political economy approaches in Chapter 7, which are those that view the human relationship with nature as one rooted in the economy, but which insist that the economy is based in, and has fundamental implications for, *power* relationships: who gets what, who works for whom, and who pays. Contrary to market-based approaches, these point to the environmentally corrosive impacts of market economics. In Chapter 8 we describe approaches to environment and society that stress social construction, which we define as the tendency for people to understand and interpret environmental issues and processes through language, stories, and images that are often inherited or imposed through systems of media, government, education, or industry. These stories are not harmless, since they can encourage or overlook very real actions, impacts, and behaviors with serious environmental and social consequences. In Chapter 9, we introduce the critical contributions of feminist thought. This approach includes serious consideration of how the specific conditions of patriarchal society contribute to social and environmental challenges that continue to mark our world. It also provides a window on possible solutions and new ways of being in the environment. Chapter 10 closes this section of the book by engaging with critical theories of race and the environment, which locate many of the ecological dysfunctions and failures of our current world in long-standing and unresolved problems of structural racism and environmental injustice.

Within these several ways of seeing are many others, of course. Within questions of risk are deeper questions of progress, economic growth, ecomodern thinking, and its limits. We have nested many of these perspectives within larger categories of thought, though without pretending we can do more than introduce many important concepts. So too, many perspectives are threaded into one another. No critical look at population as an environmental question can set aside feminist critiques of this approach, for example, and the racial outcomes of environmental injustice have, within them, political economy as well. As such, many themes are interlaced throughout this part of the book.

Part II presents a set of nine critical objects and examines each of them using a sample of these approaches. Each chapter begins with a “short history” of the object followed by a discussion of ways in which the characteristics of the object present a puzzle or conundrum, and then presents divergent ways of thinking about the object from competing points of view. In Chapter 11, we introduce carbon dioxide ( $\text{CO}_2$ ), a curious gas with a complicated history on Earth that shows it to vary widely over time, with enormous implications for the forms of life dwelling here. As one of the most important greenhouse gases, moreover,  $\text{CO}_2$  has become an increasingly contested object, with competing views about its control, regulation, and circulation. In Chapter 12, we discuss trees. These plants have been companions of human civilization since the beginning, though the long relationship has been marked

by dramatic ebbs and flows. In this chapter we take the opportunity to introduce varying theories to account for deforestation and reforestation, as well as a startling ethical proposal for trees to legally represent themselves. Chapter 13 is dedicated to wolves, a species with which humans have a current love–hate relationship and whose return throughout North America and parts of Europe and Asia represents a dramatic change in the way humans and animals relate. This chapter stresses diverse cultural understandings of the same animals, and the implications of our ethics and institutions for the many animals that share the landscape with humanity. Chapter 14 addresses uranium, a natural element that has been harnessed for extraordinary power and benefit, but which has a history rich in danger, injustice, and environmental harm. The tuna takes center stage in Chapter 15, and with it the profound problems faced by the world’s oceans. Here, human economics and ethics collide in a consideration of how fish production and consumption are regulated and managed in a complex world. Chapter 16 discusses lawns and the risks posed by the artificial chemical inputs required to maintain them. Chapter 17 addresses one of the world’s fastest-growing commodities, bottled water. This object has the rare dual role as a solution to problems of water supply in some parts of the world, while being a clear luxury item – with attendant environmental problems – in others. We next examine French fries (also called “chips”!) in Chapter 18, a culinary invention that connects the complex centuries-old history of the transatlantic “Columbian Exchange” with the health controversies and industrial food economies of the twenty-first century. We close by addressing e-waste in Chapter 19, all the hazardous trash from cell phones, computers, and other electronics that continues to build up in landfills around the world, but which has also become a source of “treasure” for people and companies who mine it for recyclable materials.

Quite intentionally we have selected *objects* for exploration, rather than *problems*. We do this for two reasons. First, while many objects are obviously linked to problems (trees to deforestation, as we shall see in Chapter 12, for example), *not all human relations with non-humans are problems*. Second, we intend by this structure to invite people to think seriously about how different things in the world (giraffes, cell phones, tapeworms, diamonds, chainsaws ...) *have their own unique relationship to people* and present specific sorts of puzzles owing to their specific characteristics (they swim, they melt, they migrate, they are poisonous when eaten ...). This is intended as an opportunity to break away from the environment as an undifferentiated generic problem, one universally characterized by a state of immediate and unique crisis. While global climate change is a critical (and sprawling) suite of problems, for example, the long and complex relationship of people to carbon dioxide itself provides a focused entry point, filled with specific challenges and opportunities. We do indeed face enormous environmental problems, but we believe them to be best solved by exploring the specificities and differences, as well as commonalities, of both people and things.

We do not pretend to have provided an exhaustive list of socio-environmental situations, interactions, and problems. Instead we provide a few key examples to show how objects are tools to think with, and to demonstrate the implications of divergent ways of seeing environmental issues.

We have also provided boxed discussions throughout the text entitled: “Environmental Solution?” Our use of the question mark is both intentional and provocative. All the examples we describe have been considered, by someone, to be a solution to environmental

problems. We invite readers to consider whether these solutions make sense but also to interrogate the theoretical assumptions that underpin each such solution, using the tools we have provided in the text to think critically about what constitutes a sensible way to address environmental challenges.

It is also important to note that this is not an environmental science textbook, though it is a book that takes environmental science seriously. Several key concepts and processes from a range of environmental sciences are described and defined, especially in the latter half of the book, including carbon sequestration, ecological succession, and predator–prey relationships, among many others. These are described in terms detailed enough to explain and understand the way human and social processes impinge upon or relate to non-human ones. Throughout we have drawn on current knowledge from environmental science sources (the report on global climate change from the Intergovernmental Panel on Climate Change, for example), but we intend a book that requires no previous knowledge of such sciences or sources. We believe this book might reasonably accompany more strictly environmental science approaches, or be used in courses that seek to bridge environmental ethics, economics, or policy with issues in ecology, hydrology, and conservation biology, or vice versa.

## The Authors' Points of View

Finally, we provide many points of view in this volume that directly contradict one another. It is difficult, for example, to simultaneously believe that the source of all environmental problems is the total population of humans on Earth, and to hold the position that population growth leads to greater efficiencies and potentially lower environmental impacts. Even where ideas do not contradict one another (for example, risk perception in Chapter 6 might be seen as a sort of social construction in Chapter 8), they each stress different factors or problems and imply different solutions.

With that in mind, it is reasonable to ask what the points of view of the text's authors might be. Which side are we on? This is difficult to answer, not only because there are three of us, each with our own view of the world, but also because, as researchers, we often try to bring different perspectives and theories to bear on the objects of our study, and to foster a kind of pluralism in our thinking.

Nonetheless, we do collectively have a point of view. First, we are each urgently concerned about the state of natural environments around the world. Our own research has focused on diverse environmental topics, including Professor Hintz's work on the status of bears in the western part of the United States, Professor Moore's research on the management of solid and hazardous waste, and Professor Robbins' investigation of the conservation of forests in India. From these experiences, we have come to share an approach best described as **political ecology**: an understanding that nature and society are produced *together* in a political economy that includes humans and non-humans. What does this mean? To keep it as straightforward as possible, we understand that relationships among people and between people and the environment are governed

**Political Ecology** An approach to environmental issues that unites issues of ecology with a broadly defined political economy perspective

**Reconciliation Ecology** A science of imagining, creating, and sustaining habitats, productive environments, and biodiversity in places used, traveled, and inhabited by human beings

by persistent and dominant, albeit diverse and historically changing, *interactions of power* (Robbins 2020). This means that we have some special sympathy for themes from political economy, social construction, feminism, and critical race theory.

When Hintz examines the conservation of bears in Yellowstone, for example, he thinks it is critical to examine how bears are *imagined* by people and to know what media, assumptions, and stories influence that imagination, since these prefigure how people do or do not act through policy, regulation, or support for environmental laws. When examining solid waste in Mexico, in another example, Moore thinks the crucial question is who *controls access to and use of* dumps, since this determines, to a large degree, how waste is managed, whether problems are addressed or ignored, and where the flow of hazards and benefits is directed. When examining forests in India, Robbins wants to know how local people and forest officers *coerce one another*, in a system of corruption that determines the rate and flow of forest-cutting and environmental transformation. People's power over one another, over the environment, and over how other people think about the environment, in short, is our preferred starting point.

We also share an assumption that persistent systems of power, though they often lead to perverse outcomes, sometimes provide opportunities for progressive environmental action and avenues toward better human–environment relationships. We are stuck in a tangled web, in other words, but this allows us many strands to pull upon and many resources to weave new outcomes.

As a result, we also stress throughout the volume a preference for some form of **reconciliation ecology**. As described by ecologist Michael Rosenzweig (2003), this describes a science of imagining, creating, and sustaining habitats, productive environments, clean air and water, and biodiversity in places used, traveled, and inhabited by human beings. This point of view holds that while many of the persistent human actions of the past have stubbornly caused and perpetuated environmental problems, the solution to these problems can never be a world somehow bereft of human activity, work, inventiveness, and craft. We live on a planet fully transformed by our presence, yet one always outside of our control.

Such a point of view does not deny the importance of making special places (conservation areas, for example) for wild animals, sensitive species, or rare ecosystems. But it does stress that the critical work of making a “greener” world will happen in cities, towns, laboratories, factories, and farms, amidst human activity, and not in an imaginary natural world, somewhere “out there.” As author Emma Marris describes the possibilities of such a world, she wisely invokes the metaphor of the Earth and its ecosystems as a “Rambunctious Garden,” a hybrid of wild nature and human activity (Marris 2011).

For all the weight of our own views, however, we strongly believe in the analytical challenges presented by *all* of the approaches described here. It is our intention, therefore, to present the most convincing and compelling arguments of the many and diverse ways of viewing society and environment. We insist that, while it is impossible for us to present a fully unbiased view of the many ways of thinking about nature, it is possible to present fair characterizations of many points of view: characterizations without caricatures. Only the reader can judge our success in this regard.

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