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Enterprising Nature

In the Beginning, There Was Failure

In book- and paper-stuffed academic offices, walking down cold and dark streets in Norway alongside government bureaucrats, on Skype interviews with bankers – everywhere I went in the course of my research people talked about the failures of biodiversity conservation. “We tried to make people care about nature for its own sake,” said global experts, “without the results.” I read about failure within the pages of *Science* and *Nature*; I decoded profound disappointment in the stilted text of multilateral policy documents. Over beer in a noisy Palo Alto bar, the chief scientist of The Nature Conservancy, Peter Kareiva, explained the problem in his straight-shooting manner, “No one cares about biodiversity outside of the Birkenstock crowd.” Biodiversity, he went on to say, “is something that suburban white kids care about and nobody else.”

While I remain unconvinced that no one cares about biodiversity outside of white, suburban hippies, such tired resignation makes sense. The decimation of nonhuman life on earth continues. Despite conservation-oriented laws and policies at every level of governance from local to international, and the establishment of thousands of protected areas, “there is no indication of a significant reduction in the rate of biodiversity loss, nor of a significant reduction in pressures upon it” (CBD 2010a, 17). A study published in *Science* found that most indicators of the state of biodiversity are in decline, and the pressures underlying this shift are also increasing. One in five species of vertebrates are classified as threatened, with that figure increasing every year; 322 vertebrate species have gone extinct since 1500. Declining diversity is apparent in agriculture, where 75% of genetic diversity has

been lost since the 1900s. Marine ecosystems, too, face mounting pressures; one quarter of oceanic pelagic sharks and rays are classified as threatened or near threatened. What threatened status indicates is a loss of overall abundance of most animals almost everywhere on the earth, a process biologist Rodolfo Dirzo and his colleagues term defaunation: they estimate there are 28% fewer vertebrate animals across species today than there were only four short decades ago; a startling 35% fewer butterflies and moths over the same time period.¹ In a conference hall in Trondheim, Norway, Robert Watson, former chief scientist at the World Bank, declared that 2010 – the UN-declared Year of Biological Diversity – should be a time not to celebrate, but rather to mourn biodiversity’s loss.

What does this loss spell for the future of the planet? The impacts of biodiversity loss on global ecosystem function are difficult to study, and even more difficult to pin down with any certainty. In spite of focused research programs around the world, scientific understanding of the functional role of biodiversity remains in many ways elusive. Certainly there are risks to living on a planet that’s less diverse, but those risks remain hard to quantify in general terms. What these alarming statistics tell us is that we are living in a world that is becoming distinctively less lively, less colorful, and less diverse in the realm of nonhuman life. A key assumption I make in this book is that this earth simply *is* a better place with more color, more kinds of lives, and more ways of living and living with nonhumans. The radical difference of which biodiversity is a part – what many now call biocultural diversity – *matters*.

What can be done to stem this tide of loss? How can beleaguered environmental activists, bureaucrats, and ecologists generate the political will to spur governments, business, and the general population to take the urgent action that’s needed? For many ecologists and their allies, the answer lies in a turn toward economics. “The majority of the global population now lives in cities and is disconnected from nature,” said Pavan Sukhdev, the head of a major international initiative to economically value biodiversity. This is “not just a physical distance but also an emotional distance.” This disconnection, Sukhdev went on, is “so real” that “we have got to speak the language of economics to show there is a connection.” For many actors concerned with the conservation of biodiversity, a turn to economics feels like the last hope. Biodiversity, a jaded Canadian bureaucrat-scientist explained to me, must be made relevant to the Ministry of Finance for it to survive. For world-renowned biologist Hal Mooney, there is an urgent need to turn biodiversity into something that both policy-makers and citizens can care about. “When you say that biodiversity delivers services which are a benefit to society,” Mooney

told me, you begin to speak in language policy-makers understand, and they can “go to their constituents and say, biodiversity is really important for you, personally, because of the services it provides.”

In this book, I explore this turn to economics, the efforts to speak a new language in global biodiversity conservation. *Enterprising Nature* is a critical exploration of the ascent of what is becoming a new maxim in this field: “In order to make live, one must make economic.”² In other words, for diverse nonhumans to persist, biodiversity conservation must become an economically rational policy trajectory, sometimes even profitable. The proliferation of this mantra is the analytical target of this book, which investigates the roots of this refrain and the international alliances and relations that cohere in producing it.

Drawing on four years of intensive, multi-site field research in places such as Nairobi, London, and Nagoya, and on my decade-long involvement in global biodiversity policy-making, this book traces disciplinary apparatuses, ecological-economic methodologies, computer models, business alliances, and regulatory conditions that, together, I argue, aim to create the conditions wherein nature, or parts of nature, can prove itself as “enterprising.” This is a nature that no longer needs the bonds of human care or ethical concern, a nature that is certainly not a public investment burden. Rather, the hope is this will be a nature that is entrepreneurial, a nature that can compete not only in the marketplace but also in modern state governance. An *enterprising nature*.

Enterprising nature seems, theoretically and practically, an approach to biodiversity conservation that is entirely compatible with current, predominantly capitalist, global political-economic relations. Producing enterprising nature, however, as this book chronicles, is not straightforward or easy. Challenges arise at every step: there are scientific debates over how biodiversity supports ecological functions and services, and methodological debates on how to tether ecological data to economic value. Also prominent are geopolitical struggles and global political economic forces that have hampered international conservation for decades. The result is that this increasingly dominant discourse remains, by and large, on the margins of policy-making and capital flows.

The story of enterprising nature, then, holds an alarming paradox. Conservation is trying to make itself more relevant to market and state governance through economization, but all these efforts fail to become operational in a way that can let diverse ecologies live. Enterprising nature, I argue, is best conceptualized as promissory, a socioecological-economic utopia whose realization is always *just around the corner*. The story of enterprising nature is one of waiting, of waiting for the conditions that can make the work of nonhumans legible to processes of liberal governance and perhaps facilitate their entry into mainstream processes of accumulation.

Are You Being Served? Two Images of Enterprising Nature

An image from a 2005 edition of the *Economist* reveals the persistent tensions in the enterprising nature ideal. That image, which appears as this book's cover, shows a sharp-looking, somewhat jolly, white, middle-aged accountant behind a desk, doling out money to an orderly line of half-human, half-plant/animal creatures, which appear as happy-ish and perhaps bored laborers. It's payday in a tropical location of some sort and the creature's hand movements suggest impatience. All recipients of the bags of money defy the human–nonhuman species boundary in some ways; a half-conifer–half-man is followed by a mountain goat–sheep-with-boots, a hand-bag-toting, high heels–wearing bald eagle, followed by an odd-looking leopard or maybe jaguar. The image reveals the dream of enterprising nature: orderly, efficient socioecological relations mediated through a monetary transaction.

In the *Economist*, the cartoon accompanied an article titled “Are You Being Served?” that followed the release of the Millennium Ecosystem Assessment (MA). The MA was the first global survey of ecosystem services, a study warning that changing ecologies are increasingly impacting human well-being. Despite the dire findings of this assessment, however, the tone of the *Economist* article is enormously optimistic. The article heralds a new age of ecological-economic accounting. While ecosystem valuation, the *Economist* staff writer notes, was at one time “a fraught process,” it is now “improved,” mostly due to the knowledge of ecologists, who “know a great deal more than they used to about how ecosystems work” (*Economist* 2005, 77): they know how different ecosystems deliver services (such as water purification, fiber production, carbon sequestration, etc.) and in what quantities. We know, in other words, how we are “being served.”

The tone of the article suggests not simply improvement in knowledge and accounting, but the arrival at a milestone in human progress: diverse creatures and systems can now be fully brought into the balance sheets of firms and governments, informing the most efficient state or firm investments or payments. “There is no longer any excuse for considering them [ecosystems] unquantifiable,” the article reports (77). The optimism of the *Economist* article – in spite of the fact that it is describing a devastating report of a planet being rendered less and less hospitable to humans – lay within the certainty that an ecological-economic synthesis (as found in the MA) will tell us, once and for all, *how to live* on this planet, how to create a permanent order of socioecological relations. In its depiction of an orderly line-up of creatures awaiting payment, the cartoon shows a triumph of a rational system of value allocation, of enterprising nature. The image, though, sidelines critical questions at the heart of this

project: what is the right way for humans to live in relation to nonhuman nature? Who decides this and from what location? What socioecologies are investable, worthy of payment, and on whose terms and authority?³

The desire for enterprising nature is a powerful, end-of-history call that reveals troubling signals in environmental politics. What this “will to enterprise” shows, I argue, is a desire for a neutral, objective, efficient, and automatic relationship with nonhuman bodies and populations. Nonhuman nature, this increasingly influential approach pronounces, is best inhabited via an *accounting relationship*, one that can tell us, neutrally and objectively, through an ecological-economic calculus, how to optimize allocations of the services nonhumans provide. This way of thinking about the human place in nature reasserts, perhaps more than ever, a will for human omniscience regarding relations among humans and nonhumans, a “god trick” here dangerously articulated with neoclassical economics.⁴ Though an economic logic may show the need for greater investments in nonhuman lives, that investment must be efficient and selective; it is not for all.

That not everything can be saved poses yet another paradox for this kind of conservation. Enterprising nature instrumentalizes, subjugates, and attempts to make *passive* its subjects – diverse living things – in order to save them.⁵ It makes new hierarchies of life, rankings meant to guide governance processes. But by rationalizing and, in many ways, *rationing* nonhuman life through accounting and the logic of efficiency, those advocating for an enterprised nature seem to be trying to *lessen* human domination over nonhuman living beings, at least in one register: they desire to reduce ecological impoverishment, to make more space for other species to live on this planet. As Stanford biologist Hal Mooney explained to me, ecosystem service and economic valuation are for many conservationists a means to an end: conserving biodiversity. Enterprising nature then, is fraught with a broader tension: it has an end goal of lessening human impact or even domination of nature, yet aims to achieve it through increasingly instrumentalized knowledge-power frameworks and practices that seem to increase human domination over the non-human.⁶ Further, enterprising nature appears, from the cover image, as a reassertion of a *particular* human mastery, reproducing familiar geopolitical and racial orders: the white man doling out payments for socioecological relations or beings that serve his interests.

A second image: Buying the axe

In the same *Economist* article about nature’s services, a second image shows a suited, happy man towering over an alarmed *campesino* while taking away his axe (see Figure 1.1). In his other hand, the businessman is holding a big bag of money over the *campesino*’s head; coercion and



Figure 1.1 Illustration from *The Economist*, © Ian Whadcock (by permission). First appeared in *The Economist*, 2005.

cash payments appear intimately linked. The image portrays an imbalance of power and continuity with colonial relations but, like colonial relations, is also ambiguous. Who is the man holding the bag of cash, and what does he seek to achieve? Does he represent a firm producing forest carbon credits for profit, continuing colonial circuits of extractive wealth production that grab land to benefit Northern fat-cat capitalists? The man’s smile and grandfatherly sweater vest suggest a polite transaction from the point of view of the man, perhaps with honorable, not-entirely-capitalist-intentions. Maybe the man represents an environmental organization like Conservation International and he is buying the land or the forest concession to preserve a “biodiversity hotspot”? Or perhaps the man represents a Norwegian

bureaucrat, offering environment-development aid to say, Brazil, in exchange for keeping forests standing and thus doing the critical work of carbon sequestration.

Conservationists, bureaucrats, scientists, and diplomats in favor of enterprising nature are not necessarily animated by material interests; their intentions can be deeply benevolent, animated by liberal rationales of improvement. They are often more akin to what Tania Li (2007) calls “trustees,” experts seeking the proper, “right,” and perhaps optimal management of “men and things” (Foucault 1991, 93). Development, for Li, remains a deeply colonial project animated by a liberal “will to improve” the lives of subjects. Perhaps then, we might view the man with the bag of cash as a renovated form of the white, Western “savior,” à la Rudyard Kipling’s “White man’s burden.” Renovated because the altered conduct – the wresting of the axe – is achieved through a monetized economic transactions that is ostensibly “fair.” Fair for the sweater-vested man who achieves conservation or maybe carbon sequestration in return for his bag of cash. And also fair, so the image ambiguously hints, for the *campesino* who receives a bag of money equal in circumference to the tree stump at his feet. In short, the fairness of exchange value: a tree for its market price. What is on offer, then, is a promise of mutually beneficial improvement through a purportedly neutral ecological-economic calculation.

The image reminds us, however, that even benevolent actors seeking “neutral improvement” or “rational” land management are still deeply embedded in colonial circuitry and power relations. Recognition of benevolence by no means vindicates colonialism; rather, as scholars like Li, Domenico Losurdo, and Lisa Lowe remind, the growth of liberal ideals in governance, economics, and culture “have been commensurate with, and deeply implicated in colonialism, slavery, capitalism, and empire” (Lowe 2015, 2).⁷ And, depending on the specific time and place, liberal ideals are often tied up in material interests.⁸ Biodiversity has always been deeply liberal in this sense, entangled in universal impulses for the good of all humanity as well as economic and imperialist drivers (see chapter 2).

Indeed, the image reflects a well-worn trope in international environmentalism – poor people like this *campesino* cause biodiversity loss through demand for firewood or income, problems to be solved in this case by paying him. Critical scholarship by the likes of Vandana Shiva (1991) and Arturo Escobar (1998) point, again and again, to how representations of individuals and communities in the Global South dehistoricize and depoliticize the colonial and imperial institutions and impositions that so often lead to dispossession, displacement, and biodiversity loss. This is a key point made by decades of political ecological research: global

environmental policies and politics too often direct our attention away from World Bank loans that fuel monocultures and green revolutions, preferring to focus our attention on the poor person with the axe. A trustee tends to ask how one might improve the situation by enhancing the ability of the individual to “do good” (here the peasant with the axe), perhaps via an economic incentive: a tactic that obscures the messy politics and social relations that produce deforestation and the *campesino*’s involvement in it.

Along these lines, the image in the *Economist* accompanies discussion of a proposed forest bond scheme. In the article, John Forgach, a principal of ForestRe, a forestry insurance company based in London, describes his idea to create 25-year “forest-backed bonds” that would fund a massive reforestation alongside the Panama Canal in hope of reducing siltation and maintaining water flow needed for the smooth sailing of large container ships central to global trade. Rather than simply appropriating the land for reforestation activities, as colonial businesses or conservation initiatives might have done, ForestRe (the man in the suit) would pay for locals (the *campesino* with the axe) to stop logging and do the work of tree planting. To fund reforestation activities, bonds would be purchased by those firms most at financial risk from canal closures, such as Walmart. The project is presented as a win-win-win scenario, as reforestation could yield benefits for not only Walmart but also for the environment and the local community, as the proposed reforestation will be a diverse mixture of species that local people also “find useful.” The *Economist* image shows a clear-cut forest, an entire landscape reduced to stumps. According to proponents of the ForestRe initiative, what distinguishes it from other types of development, like oil palm or sugar cane monocultures, is that it is based on a broader range of services that nature provides beyond timber and other obvious commodities and, as such, will generate value while also protecting forests. The article suggests, too, that the scheme pays attention to the concerns of local people.

Taken together, the foregoing images tell a strong story of an enterprising nature: the cover image reflects the promise of orderly, efficient relations, directed by ecologies and economics; the second image of the man with the axe, meanwhile, calls attention to the processes of uneven development that run along geographical – but also classed, racialized, and gendered – hierarchies. If the two-image story were accurate and complete, enterprising nature would be a tidy set of processes that swiftly allocate resources in order to protect diverse ecosystems according to the values of northern elites. But attempts to govern are always bumpy affairs. ForestRe’s 25-year bonds never materialized; the political and the economic failed to line up. Furthermore, even the ecological fact that underpinned the bond idea in the first place – the fact that reforestation activities would solve water flow issues in the canal – is now disputed.⁹

This is where the book cover image becomes inadequate, or even misrepresentative. A more apt image for this book's cover might have had the entire scene entangled by complex mangrove forest roots or fragmented into ill-fitting puzzle pieces set in a UN negotiation hall. At the very least, the man at the desk should have a sweaty brow, bags under his eyes from jetlag, and a wrinkled suit, as the creatures negotiate hard about the amount of money that goes in the bag. Enterprising nature is, I show in this book, reflective of dominant neoliberalizing processes, but nonetheless precarious, dynamic, not at all solid.

Enterprising Nature: A Dual Definition

What does it mean to call nature “enterprising”? The idea is not that nonhumans adopt business plans, take self-help courses, or hire marketing agents. The word “enterprising,” as I mobilize it in this book, has two linked definitions, one as an adjective (“to be enterprising”) and one as a verb, a neologism (“to enterprise”).

Used as an adjective, “enterprising” describes an entity as “imaginative” and “energetic.” To call someone “enterprising” is to draw attention to their creative and productive capacities, to their ability to transform something – a company, an idea, their situation – into something else, usually profitably. The adjective “enterprising” is a term typically reserved to an individual who does not depend on handouts or charity, instead relying upon their own internal smarts, ingenuity, and hard work.¹⁰ Thus, the term “enterprising nature” refers to the way that many in the global biodiversity community represent biodiversity and nonhuman ecological bodies and processes: nonhumans *are* creative, productive, energetic contributors to life on earth.

For many proponents of this vision, the idea is not that we need to transform something uneconomic into something economic. Rather, as the head of the CBD declared, biological diversity is already the world's largest corporation; it is just not recognized as such. The task is to create the conditions wherein biological diversity can be seen for what it really is: “enterprising,” with diligent work habits that can finally be recognized. This perspective runs strangely parallel, in many ways, to the views expressed by poverty experts Hernando de Soto and C.K. Prasad, and even Nobel Peace Prize-winning microcredit financier Muhammad Yunus: the world's “bottom billion” or poorest people are *naturally* enterprising. They are, as Foucault (2008) would say, “entrepreneurial selves.” In this view, what people in poverty need are the conditions in which this true nature can be realized, conditions generated perhaps by extending microcredit (as Yunus has done), or by

establishing the right private property relations (as de Soto proposes). In creating these conditions, the goal is to end relations of aid and charity, the “handouts” that supposedly stymie this true nature of human ingenuity, creativity, and productivity. The idea of recognizing inherent entrepreneurship is so pervasive that now, as my research shows, it is being extended toward nonhuman nature. In the era of “enterprising nature,” biodiversity conservation is about creating the right conditions, the conditions under which nonhuman communities can generate the political, financial, and social capital to fend for themselves.

The multiplication of “enterprising units” is a central attribute of what Foucault, in his 1978–79 lectures at the Collège de France, terms “neoliberal governmentality” (Foucault 2003). For Foucault, neoliberal rationality and governance center on cultivating competition. This competition is not *necessarily* focused on profit-making, but on establishing quantitative differences, measuring economic magnitudes between those differences, and then using such differences to regulate and manage governing choices. Broader than a market logic, which is more tightly focused on creating the conditions for commodity production, pricing, and circulation, neoliberal rationality is focused more on rationing and optimizing “scarce resources”; it is focused on producing something like a “permanent economic tribunal for life” (2008, 247), where the most enterprising can stand up, be seen, and reap their rewards.

Enterprising nature, then, involves the creation of “enterprising units” of nonhuman life in order to set the conditions wherein *differential value* of species, nonhuman communities, and spaces can be calculated – the creation of what I describe as an ecological-economic tribunal for life (see chapter 3). This project involves rendering the qualities of ecosystems, and rich socioecological relations, into representative forms that can be compared, ranked, and ordered quantitatively. In making the world more enterprising, or competitive, the tribunal marks the “differential endowments” of diverse ecological relations in order to make biodiversity tractable for modern governance, no matter the specific breed of policy – market-oriented, command and control, or community-based.

Enterprising nature, then, is not all about the “tions” – privatization, commodification, financialization, and accumulation – at least not directly.¹¹ It comprises projects and initiatives that are at times about new kinds of commodities, but also about directing efficient government investments in “green infrastructure.” For example, I argue that ecosystem services are better understood as a political-scientific strategy to create new interests in nature, to prevent “stupid decisions,” as one advocate stated, than as an epochal transformation creating new commodities (see chapter 4). This does not mean the processes at play are benign. Nature

is of course an “accumulation strategy,” to paraphrase Neil Smith (2007), and has been for a long time (see Peluso 2012); it is the case that capital must find places to constantly expand. But the project of enterprising nature is better described as an attempt to manage the excesses of capitalism that are degrading life on this planet, a project driven by actors who are sometimes but very often not motivated by profit or potential of profit.¹²

Enterprising nature is more often like Tania Li’s “will to improve.” But unlike Li’s study of development in Indonesia, where projects of improvement bracket out political-economic processes (preferring to focus on cultivating individual and community capacities to manage and adapt to their circumstances), the people and institutions at the center of this project actually take on political-economic processes, attempting to improve the functioning of market society as a whole. “We’re just actually trying to make capitalism work the way it’s meant to,” one ecosystem service scientist and model-creator explained to me, by bringing the full ecological costs of production into state and market decision-making.¹³ This is a distinctive dream for proponents of market society, one where the invisible hand efficiently directs land use and wealth distributions, a hand now operating within the (also neutral and objective) constraints of scientific calculation (see chapter 3).

Enterprising nature, then, is an attempt to bring biodiversity into governance calculations, into a kind of “permanent visibility” (Foucault 1995) for decision-making on, say, resource developments or land use decisions.¹⁴ The circuits I study are creating the conditions that can allow biodiversity to become permanently visible not only to environmentalists but also to market relations, governance calculations, and power brokers. An enterprising nature, the trustees I study seem to be saying, will be considered *automatically* in decisions; an enterprising nature will be assessed, evaluated, and invested in neutrally and objectively, depending on its work habits and productivity. The friendly accountant pictured on the book’s cover will dole out the necessary payments. Not equal payments, of course: an ecological-economic tribunal will adjudicate the enterprising nature of nature in order to guide efficient investments of scarce resources, a process that necessarily involves making new rankings and hierarchies.

“To enterprise”

Creating and multiplying these enterprising units requires incredibly dense inputs and work, including governmental interventions. This is because, as Foucault explains, competition is not a natural characteristic

waiting to be unleashed, if only, for example, the state would get out of the way. Bodies are not in fact born enterprising. As such, a key aspect of the art of neoliberal government is to *create the conditions* upon which competition can be fostered. Neoliberal governmentality, then, requires not laissez-faire, but actually “permanent vigilance, activity and intervention” (Foucault 2008, 132) on the part of the state but also many other actors. This is why the accountant behind the desk on the cover should have sweat on his brow: cultivating the conditions for competitiveness to flourish, for enterprising nature, takes work; it takes interventions that are “no less dense, frequent, active and continuous than any other system” (145). It is not easy, and it involves enormous amounts of coordination. The man behind the desk on the cover of the book should be not only sweating; he should also be surrounded by experts, his position at the desk supported by institutions – academic, NGO, international. The amount of money in the bag should be underpinned by fractious governments and firms but also computer models, devised on the basis of abstract ecological-economic models.

In the second meaning of the book’s title, enterprising can be understood as a verb: “to enterprise.” It was long after I began using this term that I realized it was grammatically non-existent. My improper use nonetheless matches so well the processes I observed. Enterprising nature is productive; it is a set of ongoing undertakings, actions requiring ever-proliferating effort. In using “enterprising” in this way, I am also drawing from the work of theorists who call attention to the ways in which certain rationalizing knowledge systems or new representations do not somehow reveal a pre-existing world but, rather, help to bring new relations into being (Haraway 1988, 1997; Mitchell 2002, 2007). Scientists, economists, and other experts create the conditions – the subjects and objects, the regulations, laws, policies, and models – needed so that “competitive mechanisms can play a regulatory role at every moment and every point in society” (Foucault 2008, 145). “Enterprising” as a verb, then, calls attention to the *productive* work of creating a visible and economically legible biodiversity that can be seen and invested in by liberal institutions and within capitalist social relations. Global expertise actively produces “new forms of value, new kinds of equivalences, new practices of calculation,” and importantly, “new relations between human agency and the nonhuman” (Mitchell 2002, 5). Enterprising nature is an *attempt* to transform, to reorganize, to produce new subjects and objects.

The work of making “enterprising nature,” I suggest, traverses three interconnected processes: assembling consensus on the nature of the problem and solution across a wide variety of actors, logics, and

institutions; developing methods and tools to calculate value; and building political-economic agreement that can redirect capital (state and private). The book is organized into three parts, each focusing on one of these processes. At the same time, however, these processes are densely inter-linked, functioning together “to enterprise” biodiversity conservation.

Assembling a framework

Making nature enterprising involves the production of new disciplinary apparatuses and scientific objects, ones that can bring together different logics, methodologies, and concerns to define both the commonsense problem and solution. The book’s first two chapters describe the roots and history of the contemporary notion of biodiversity, pulling out some histories of the now commonsense drive to enterprise. In chapter 2, I explore the birth of global biodiversity as a scientific, political, but also deeply *economic* object in the 1980s and 1990s, an achievement involving a wide range of institutions and desires. One of the most powerful circuits involved in making nature enterprising sits at the disciplinary intersection of ecology and economics; chapter 3 explores these intersections via analysis of the Beijer Institute on Ecological Economics and its project on biodiversity in the early 1990s. At the Beijer Institute, ecologists and economists created the interdisciplinary field of “the economics of biodiversity,” attempting to make biodiversity loss and conservation visible, legible, and calculable for governance processes.

Calculating value

“To enterprise” necessarily involves more than shared scientific objects like “ecosystem services” or “biodiversity”; it requires new calculative tools and models that can do the work of rendering the ecological world comparable.¹⁵ Even if scientists and experts agree that biodiversity loss can be understood as an “externality” – a problem emerging because those who cause it directly through, say, a new soy plantation do not have to pay for those damages – the next logical step is to develop the accounting practices to internalize this externality. One needs not only a shared grammar of life but also a shared way to calculate life, to calculate the specific value of “units,” of “trade-offs” that need to be made. Chapter 4 analyzes the Stanford-based computer model InVEST, which does the practical work of enterprising: calculating trade-offs between competing ecosystem services – between, say, carbon sequestration and food production, not only in the present but decades ahead. In rendering the costs and benefits of different land uses quantifiable, InVEST aims to give the state, firms, and overall “decision-makers” the ability to simultaneously govern environmentally and economically.

Chapter 5 examines a different set of calculative devices – accounting tools that attempt to suture together the ethical and biopolitical/global social reproduction interests of biodiversity conservation with financial and corporate interests – tools attempting to create an invisible hand for conservation. The chapter takes a close look at two calculative devices, the Integrated Biodiversity Assessment Tool and the Corporate Ecosystem Service Review. They aim to attune firms to the *risks* faced from changing ecologies, with the overarching goal to incentivize corporate investment in risk mitigation, in ecological investments (or so the theory goes), reproducing the conditions of capitalist production (O'Connor 1998). If the man at the desk on the cover of the book is the CEO of, say, Mondi, a South African pulp and paper company, then tools like the Corporate Ecosystem Service Review do the accounting work that brings various nonhuman bodies into his vision and hopefully into the line-up for payment.

Redirecting capital

Making the “big big money” flow from biodiversity – as one investment banker described their interest – requires more than frameworks or new models that show nature’s true enterprising nature. Facts and numbers do not perform on their own; advocates of enterprising nature need to produce new institutional arrangements that can bring state or profit-seeking capital in line. This is my central interest in chapter 6, where I take readers into a series of “Biodiversity and Ecosystem Finance” conferences where participants grappled with how to transform biodiversity conservation into “a valuable business proposition” in order to channel capital into the good work of conservation. Chapter 7, the final empirical chapter, focuses on intergovernmental debates over market mechanisms for conservation under the auspices of the UN Convention on Biological Diversity (CBD) and on one attempt to make a globally tradable, UN-approved “asset in biodiversity.” Although a tradable asset in global biodiversity appears as the logical progression from the early ecology-economics synthesis of the 1990s – as perhaps the pinnacle of the ongoing work to create “biodiversity” as an object that can be seen by market and state institutions – the CBD initiative turns out to be a fraught and controversial endeavor, failing to receive intergovernmental assent.

The Friction-Filled Terrain of the Neoliberal, the Universal, the Global, and the Enterprising

Enterprising nature is part of the broad story of socioecological re-regulation taking place since the 1970s, what critical scholars and activists call neoliberalism.¹⁶ It is a part of a global and universal dream to

“improve” or, in the words of several of my interviewees, to “stop making bad decisions.” It is also linked to neoliberal policies and practices that function to expand the conditions for elite profit, a point well-made by David Harvey. Interventions by academics like Kathleen McAfee, Neil Smith, Sian Sullivan, Bram Büscher, and Morgan Robertson emphasize that biodiversity conservation is becoming sutured to accumulation processes, “accumulation by conservation” (Büscher and Fletcher 2015, 202), intensifying “the commodification of life itself” (Sullivan 2013, 210).¹⁷ International activists also make use of such framing. A wide-ranging group of organizations including Friends of the Earth International, Ecologistas en Acción and Carbon Trade Watch recently produced a video titled “Stop the Takeover of Nature by Financial Markets,” a video that interprets what they call the “financialization of nature” such as the carbon or biodiversity markets as driven by the incessant, restless logic of capital, by capital’s need to find new spaces and new bodies to fuel accumulation.¹⁸

I share these concerns.¹⁹ Yet, enterprising nature is different than the financialization of loans, mortgages, or even food; it involves a different and diverse set of actors, institutions, and driving rationalities. Critical scholars and activists studying these processes (myself included) can be too quick to characterize them as having a “coherent ideological and institutional formation with necessary outcomes,” a criticism Wendy Larner (2007, 220) makes of the neoliberal environments literature. She worries that there is a tendency to represent neoliberalism as monolithic and unstoppable. Similarly, the “accumulation by conservation” lens can be teleological – as in, *of course* biodiversity conservation is a target for capital’s never-ending search to accumulate, a process driven by shadowy, unspecified capitalist elites with singular interests. (Illustratively, in the video I mention above, the protagonist is the mustached businessman from the Monopoly game, known as “Rich Uncle Pennybags” or “Mr. Monopoly.”)

Any analysis of enterprising nature, then, faces a long-standing tension in critical theory: how to research, talk about, and represent the actually existing structuring forces of global capital, of the global and the universal, in a “way that avoids lending them a logic, energy and coherence” (Mitchell 2002, 14), that avoids telling a story of the unfolding potential of “the global forces of modernity, of science and technology, and of the expansion of capitalism” (2002, 13–14). In one view, held by some trustees of enterprising nature, the ascendancy of the “to make live, one must make economic” maxim in global biodiversity conservation is the natural progression of the free market, part of the crafting of a perfect capitalist system that can account for *all* environmental ills and allocate resources, including ecological functions, efficiently. We need to

avoid a similarly teleological critique. When we let the “global appear homogenous,” Anna Tsing (2005) persuasively argues, “we open the door to its predictability and evolutionary status as the latest stage in macronarratives” (2005, 58).

So again, how can we account for global forces, for deep uneven clusters of power and knowledge, for pervasive and structuring “universal dreams and schemes” (Tsing 2005, 1) without letting the global dominate the local, without letting capital, the colonial, and the Global North yet again define the terrain?

One crucial way researchers produce a more critical, complex account is by examining what happens when the “universal or the global” hits the ground, and by outlining the hybrid forms of neoliberal governance that emerge as a result.²⁰ Li calls this the moment when expert discourse or the plan, what she calls the “practice of government,” comes into contact with the “practice of politics” (12), the “witches’ brew of processes, practices and struggles that exceed their scope” (28).

Complementing this attention to “hybrid neoliberalisms” on the ground, I draw out how the global, universal, and neoliberal discourse of enterprising nature is itself a “witches’ brew.” Like local or national formations of rule, global governance is not homogenous, coherent, or straightforward, but rather “charged and enacted in the sticky materiality of practical encounters” (Tsing 2005, 1). The global dream of enterprising nature is not abstract or inexorable; it is produced by specific people, institutions, epistemological frameworks, computer models, databases, laws, and policies. As Geraldine Pratt (2004) explains, tracing the production of discourses as “situated practices in particular places” (20) is one way that we can make contradictions and tensions come to light, and thus also is a way to create conditions for political possibility, for political agency. And indeed, the “practical encounters” I trace are not at all smooth, but rather loaded with frictions, unknowns, leaps of faith, and disagreements.

To be clear, my intervention is not simply to call for more attention to “non-capitalist” spaces or logics (e.g. Gibson-Graham 1996). Neoliberal capitalism is a dominant mode of production on planet earth; enterprising nature cannot be understood separately from its hegemony.²¹

Yet, not all that happens under the banner of enterprising nature can be understood as a response to the unfolding logic of capital, or a singular pursuit of profit. Rather, there is a much more “unwieldy and contradictory political assemblage” (Larner 2007, 220) that must be wrestled into coherence, an arduous, even sweaty process. Actors have to try to align multiple desires, logics, rationalities, and interests.²² Again and again, they have to try to reconcile the fissured desires of ecologists (including scientific curiosity, research funding, and ethical drives), of conservationists struggling

within changing institutional mandates, of bureaucrats who are trying to make inroads into increasingly closed national budgets, and of green entrepreneurs who sometimes want to make a quick buck and other times are in it for the long haul. To govern, to nail down the right relation between humans, or between humans and diverse others, is not to “seek one dogmatic goal” but rather to achieve, as per Foucault, “a whole series of specific finalities” (Li 2007, 9). Enterprising nature is well steeped in capitalist social relations, no doubt, but these social relations are forged from multiple logics that are not always oriented around the singular pursuit of accumulation. Many of those doing the work of “enterprising,” such as Pavan Sukhdev and Stanford ecologist Gretchen Daily, while certainly not anti-capitalists by any stretch of imagination, do not hold the same interests as the CEO of Shell. Practical encounters among ecologists, economists, financiers, and bureaucrats working in disparate institutions with not entirely aligned goals result in cobbled together coherences loaded with what Tsing terms “frictions.”

“In the middle of things”

The primary goal of this book is to trace the apparatus that gives life to enterprising nature, to locate the roots and perpetuating practices of this increasingly commonsense, increasingly hegemonic approach. Following Foucault (1977, 194), I understand the term “apparatus” to mean the relations both material and semiotic among “thoroughly heterogenous” people, institutions, capital flows, ideas, regulations, science, valuation methodologies, computer models, and databases – relations that together produce a particular idea of a problem.²³ To trace the apparatus-in-the-making of enterprising nature, I travel among specific moments where biodiversity is tethered to economic logics, to show the specific people, institutions, and epistemologies involved. As geographer Stephen Legg points out, while apparatuses have coherences, they are not closed. Rather, as Legg writes, the very “multiplicity” of apparatuses, by which he means the diverse set of rationalities, actors, and practices that give them life, “necessarily opens spaces of misunderstanding, resistance and flight” (2011, 131–2).

Enterprising nature does not take shape in a single location. As such, my research took place in multiple sites and relied on multiple methods as I sought to trace what I call, drawing on Roy (2010), transnational “circuits” of power and knowledge. These circuits are upheld by many actors – scientists, policy wonks, economists, entrepreneurs, and financial managers – operating from diverse institutional bases, including universities, government, business, the non-profit sector, and intergovernmental organizations. Enterprising nature is an interdisciplinary,

highly collaborative, transnational project that brings together both likely and unlikely allies. I opt for the term “circuits” (Roy 2010) over the more commonly used “networks” because “circuits” suggests that the routes travelled are well-worn and regularized. Enterprising nature is a world where the same institutions and people appear over and over again. The circuits I trace are international, but they are resolutely not *global*: these circuits are busy pathways among a handful of academic institutions and international organizations predominantly in the United States and Europe.

In crossing between various sites, I also crossed between a diverse set of rationalities, actors, and practices that did not always line up. I was constantly surprised: a conservationist I thought would be aligned with a new initiative to economically value biodiversity would go on to question its efficacy. An ecologist whose published work appeared to be producing new methodologies for the commodification of nature would disagree vociferously with my interpretation in an interview, expressing deep reservations about the entire project of enterprising nature.

My approach to studying these circuits involved living in them as much as possible, beginning, as Anna Tsing describes, “in the middle of things” (2005, 1). I travelled to places like Geneva, Cambridge, Washington, New York, and Palo Alto. I interviewed a wide range of actors, especially scientists and experts, in their offices, in coffee shops, via Skype, while strolling through gardens in Nairobi, and, in one case, in a peanut bar.²⁴ I had in-depth interviews with many of the most ardent and prominent supporters of an economic approach to biodiversity, and I sought to find out their rationales and motivations; I dug into new economic-ecological models that aim to tell us the return on conservation investments decades into the future; I observed environmental market-promoters in their own “habitat” at conferences.

My research also draws on a 10-year engagement with international civil society groups working on global biodiversity policies. As I discuss in the preface, this research emerged out of pre-existing collaborations with a range of environmental organizations and social movements.²⁵ I conducted my research as a participant in the circuits of knowledge and power that give shape to the global biodiversity apparatus. For me, then, beginning “in the middle of things” also meant organizing and facilitating strategy meetings for the CBD Alliance and developing joint policy papers across organizations as different as the World Wildlife Fund and the International Collective in Support of Fishworkers.²⁶ Being in the middle of things involved listening to government delegates at negotiations make arguments and counter-arguments, often late into the night; it even meant crafting suggested alternative decision text and circulating these suggestions to friendly government delegates.

As in most field research, my position in “the middle of things” was not entirely comfortable.²⁷ In the course of my research I often found myself, as Roy (2010) nicely describes, in zones of awkward engagement, engagements where I was constantly without a clear identity. Was I a researcher? An advocate? Was I a programmer or critic? (This is a distinction Tania Li (2007) makes between those who design and implement projects and critics who stand at arm’s length – a distance she deems necessary for critique.) For me these positions were not mutually exclusive, and through them I came to see the complexity, challenge, and uncertainty within the global, the universal, and the neoliberal of enterprising nature, a project that is coherent but very far from closed.

Four Tensions within Enterprising Nature

Productive engagement with enterprising nature means working within a series of persistent tensions in contemporary conservation. I introduce these tensions as four complex and often contradictory realms of thought that the book will analyze in depth. Any participant in contemporary biodiversity politics will find herself navigating these tensions; there is no pure, uncomplicated position from which to work.

In what ways does enterprising nature both politicize and de-politicize conservation?

Enterprising nature is part of a major rethink taking place in mainstream conservation: a “post-natural” turn within which conservationists have turned away from trying to protect “pristine” nature as a realm outside human life and instead focus on protecting the parts of nature that best contribute to human well-being.²⁸ Ecosystem services – a study of the benefits to humans of particular ecosystem functions – is one example of the new approach. In this post-natural turn, conservationists ask very political questions: For whom do we conserve? How can we achieve more just conservation? In this sense, the new conservation is politicizing – focused on where and to whom the benefits of particular natures flow.

At the same time, however, enterprising nature attempts to create a new universal in conservation, a neutral, objective, apolitical approach that can determine the value of particular socioecologies. The idea is to situate conservation within the supposedly *undeniable* grammar of quantitative value; initiatives within the enterprising nature project seek to solve complex problems of socioecological justice by transforming them into questions of accounting, with accounting systems designed by

an elite group of Northern experts. Thus, while the post-natural turn appears to promise conservation within a more human-centric, poverty-alleviating framework, enterprising nature reveals the persistent tendency for global environmental initiatives to be defined in “the superior economic and institutional power of Northern parties and Northern-based NGOs” (McAfee 1999, 140). In this sense, enterprising nature is intensely *depoliticizing*, turning away from responsibility and justice through the development of financial mechanisms (see chapters 5, 7).

Is the ranking of socioecologies emancipatory or exclusionary? Is it even possible?

Conservation has always been selective in investments of time and resources; most well-known is its longstanding preference for charismatic mega-fauna. An enterprising nature could potentially broaden social concern for a wider array of nonhuman species. For example, an ecosystem service frame might turn more attention to the work of microbes and other decomposers that are crucial in soil health. At the same time, however, ecologists and other advocates of enterprising nature seek to be strategic. If resources and political will for conservation are scarce, investments must be efficient and selective; it is not efficient, rational, or even possible to value all species equally, especially in times of austerity. Thus, in seeking to protect forms of nonhuman life, enterprising nature works to create hierarchies, to create and calculate differential values of socioecological relations. Enterprising nature could produce something like surplus non-human populations: those deemed not necessary, or redundant, or at the least, less worthy of investment. The result is a kind of triage, an instrumental and economic approach to deciding which species matter and which can be more marginal to human concern. Thus, in seeking to broaden the focus of conservation, enterprising nature may also create new exclusions.

Yet we must also ask to what extent such rankings are even possible. Every expert I spoke with over the course of my research emphasized how difficult this form of quantification remains; both the ecology and the economics remain fraught with uncertainty and unresolved complexities. How do individual species contribute to ecosystem functioning, and then, further, to human well-being in the form of services? As one academic ecologist noted in an interview, “The relationship *between* biodiversity and ecosystem services is an area we need a lot of research in ... We don’t know what diversity does.” Biodiversity is incredibly dynamic, animate, complex, and therefore immensely challenging to represent and measure. As such, contemporary understandings of biodiversity largely lack the systems

of representation to value and rank different parts of the nonhuman world, to transform the complexity of life into discrete ecosystem services.

What are the risks and opportunities of endless ecological simplifications?

Ecology is a field known for increasing scientific understanding of the immense complexity of environmental processes. For the past several decades, however, ecologists and conservationists have tried to bring complexity and uncertainty into the sights of liberal institutions. In return, these institutions demand further and further simplification; ecologists are asked again and again to reduce the complexities in their models, to make their findings more straightforward and legible to governance. When it comes to bringing biodiversity into models of economic valuation that decision-makers might recognize, ecologists face tough choices: “You’re basically going to accept imperfect proxies,” one academic told me, some “pretty ugly trade-offs.” Models used rest on layer upon layer of abstraction (see chapters 4, 5).

Thus, while enterprising nature wants to bring ecological complexity into governance (state, finance, corporate), the project also bears similarities to the much-maligned models of maximum sustainable yield (MSY): both aim to render future ecological-economic futures known. There is a risk, then, that enterprising nature is a “complexity blinder,” as Richard Norgaard (2010, 1219) calls the ecology of ecosystem services. Enterprising nature continues to seek the ideal model, the perfectly simplified synthesis of ecological and economic knowledge that will offer decision-makers definitive answers about the “best” course of action; that model, of course, rests on an ever-retreating horizon. Ecologists remain caught in the ongoing tension of trying to share their understandings of complex ecosystems in a way that will be taken up in liberal governance. Yet this tension is regularly addressed not by questioning, say, the nature of liberal institutions demanding these simplifications, or by assessing the fundamental limitations of the project, but rather by calling for more interdisciplinary knowledge, more investments in expertise, or perhaps a new model that can bring the unruly unknowns of socioecologies into order.

What is the “human place in nature”?

“No one cares about nature,” says Pavan Sukhdev. For Sukhdev and his enterprising nature allies, the only viable conservation approach requires a focus on the utilitarian, the use values of nature, ideally transformed

into quantitative and perhaps monetary form. As such, enterprising nature is not only about creating the conditions for biodiversity to be automatically and efficiently considered in governance, but also a particular way of conceptualizing the “human place in nature” (to borrow a phrase from the subtitle of William Cronon’s 1995 book). This place in nature, ironically – at least for environmentalists – is one that aims to make nonhumans more “passive” and “tractable” for calculation (as Lohmann 2009, 503 puts it), while at the same time hoping that this increased instrumentalism will result in *less* human domination and devastation of nature; that it will rectify a “deep denial of human dependence on nature” (Plumwood 2002, 71).

Attempts to create new “interests” in nature via ecological-economic modeling may also have the effect of creating further abstractions, further distances, perhaps even flattening and deadening nature (Büscher et al. 2012, Sullivan 2013, Igoe 2012). As a broader strategy, then, this approach seems oppositional to activist and critical academic thinking on the role that human domination and dominion have played in legitimizing environmental and social devastation and injustices (e.g. Horkheimer and Adorno 1944, Plumwood 1993).

Yet, there *is* a crucial need to shorten the distance between people, especially Northerners, and the close-but-also-very-distant socioecological sites that sustain them. The global political economy has for too long relied upon sacrifice zones, on sacrificed bodies, on sacrificed futures: places and bodies and relationships which bear the brunt of socioecological changes, over and over again (Klein 2015). A huge shift in political economic relations is needed to break these patterns, patterns that are a part of explaining the monoculturing of the planet. The question remains, however, is enterprising nature up to the task?

Notes

- 1 Statistics from Butchart et al. (2010), Hoffman et al. (2010), Dirzo et al. (2014), FAO (2010), Dulvy et al. (2014).
- 2 This mantra – “To make live, one must make economic” – is inspired by Michel Foucault’s description of biopower, a form of modern power that operates to “make live and let die” (see Foucault 1990 [1978], 2003). This is a modality of power focused on regulating, administering, and managing life to secure and optimize the health of the population as a whole (the “whole” of concern for Foucault, especially as expressed in *Society Must be Defended*, is that of the nation state). Historically, Foucault demonstrates the emergence of biopolitical forms of power through the emergence of new knowledges about the population: birth and death rates, illnesses, economic indicators – especially measured in statistical terms, and also linked to interventions aiming to

adjust and control “macro” processes (i.e. birth control, public hygiene, insurance). This includes, as the “last domain” of biopolitics, “relations between the human race ... and their environment, the milieu in which they live” (Foucault 2003, 245). As I outline in chapters 3–5, enterprising nature is very much focused on securing the health of “the whole” through the economical and ecological management of nonhuman bodies and socioecological processes via new knowledges, models, and accounting devices. However, the health of the “the whole” is not limited to the nation; the target can be humanity (chapters 2, 3), a region or national polity (chapter 4), or the firm (chapter 5). Finally, a biopolitical approach does not at all mean that all lives – human or nonhuman – are equally valued or fostered. Some lives are more or less expendable, and killing is permissible when it results in “the elimination of the biological threat to and the improvement of the species or race” (Foucault 2003, 256), a point Foucault demonstrates with his critical discussion of state racism in *Society Must be Defended*. In enterprising nature, too, some lives are designed as more or less expendable, some spaces are more or less investable, this time depending on the results of an ecological-economic tribunal.

- 3 While cumbersome, the term socioecological signifies the inextricability of the social and the ecological, a refusal to separate nature and society, or the human and nonhuman. Similar neologisms include “naturecultures” (Haraway 2003), “social nature” (Castree and Braun 2001), and “humanity-in-nature/nature-in-humanity” (Moore 2015).
- 4 A “god trick” is Haraway’s (1988) critique of objectivity in science, in that it presents itself as synoptic and impartial, a “view from nowhere.” The problem with the god trick, for Haraway, is that knowledge claims that come from nowhere cannot be held responsible for their effects. Here I am suggesting that the god trick of scientific objectivity is being combined with another kind of science from above, that of neoclassical economics, which also makes claims to neutrality based in the operation of price signals. I describe this point in chapter 3.
- 5 Bram Büscher, Sian Sullivan, and their co-authors (2012) argue that an effect of the marketization and commodification of biodiversity conservation, what they term neoliberal conservation, is that “nonhuman natures tend to become flattened and deadened into abstract and conveniently incommunicative and inanimate objects, primed for commodity capture in service to the creation of capitalist value” (23). See also Sullivan (2013).
- 6 This is a central argument of Frankfurt School theorists Max Horkheimer and Theodor Adorno (1944), as well as feminist scholars like Donna Haraway and Val Plumwood.
- 7 By liberalism I am referring to “branches of European political philosophy that include the narration of political emancipation through citizenship in the state, the promise of economic freedom in the development of wage labor and exchange markets, and the conferring of civilization to people educated in aesthetic and national culture – in each case unifying particularity, difference, or locality through universal concepts of reason and community” (Lowe 2014, 3–4). See also Domenico Losurdo’s (2014) excellent book *Liberalism: A Counter-History*.

- 8 The example of John Locke is helpful here. Locke himself was at the epicenter of emerging liberal ideals promoting economic and political individual freedoms, but was an active investor in and beneficiary of the slave trade. In the American Revolution, those who supported the revolution as an act of liberty were not necessarily abolitionists, a situation Domenico Losurdo argues can be explained by the material interests of patriots in maintaining slavery.
- 9 A recent paper in the *Proceedings of the National Academy of Sciences* raises questions about the level and extent to which reforestation increases water supply to the canal (Simonit and Perrings 2013).
- 10 I am indebted to the prescient work of Kathleen McAfee on this point. While her seminal 1999 essay, “Selling Nature to Save It,” was focused specifically on bioprospecting as an approach to conserve biodiversity, McAfee writes that such an approach “*offers to nature the opportunity to earn its own right to survive in a world market economy*” (134; her emphasis). I first read McAfee’s essay after I had participated in my first CBD meeting in 2002, just as I started my Master’s degree. I remember feeling that she was onto something crucial, especially in noting a trend towards environmentalism coming to “service of the worldwide expansion of capitalism” (134). In many ways my book is an exploration of her arguments in that 1999 article, the post-bioprospecting attempts to make conservation pay, although my research approach and the 15-year period between her article and this book lead me to different conclusions.
- 11 Robert Fletcher argues a similar point in a (2010) article, noting the need to understand what he calls neoliberal environmentality not as “merely a capitalist economic process,” but rather as a more “general strategy for governing human action in a variety of realms” (171). Drawing from Foucault extensively, Fletcher’s article helpfully articulates the varieties of power operating in conservation.
- 12 James O’Connor (1998) terms these excesses of capitalist social relations the “second contradiction,” by which he is referring to the tendency for the biophysical conditions for capitalism to be degraded by capitalism itself.
- 13 Pavan Sukhdev, the head of The Economics of Ecosystems and Biodiversity (TEEB) project to study the economic impact of the global loss of biodiversity, at times sounds revolutionary, writing that “the root causes of biodiversity loss lie in the *nature* of the human relationship with nature, and in our dominant economic model,” going on to say that our current economy “promotes and rewards *more* versus *better* consumption, *private* versus *public* wealth creation, *human-made* capital versus *natural* capital” (TEEB 2010b, xviii, his emphasis). Yet, despite this widespread criticism of contemporary Western culture and economies, in the next breath Sukhdev states that the main problem is market-failure: “there are no ‘markets’ for the largely public goods and services that flow from ecosystems and biodiversity” (TEEB 2010b, xxi).
- 14 The terminology “permanent visibility” comes from Foucault’s (1995) discussion of the Panopticon in *Discipline and Punish*. The Panopticon is a building designed by Jeremy Bentham in the late-eighteenth century that allows

an observer to observe all inmates of an institution without them being able to tell whether or not they are being watched. The brilliance of the Panopticon, for Bentham, is the way that it is a form of power, or a technique of power, that achieves its ends efficiently, in that it does not rely upon power added from the outside, “like a rigid, heavy constraint.” As a form of power, panopticism is more subtle, built into the mode of visibility itself, operating almost automatically in an attempt to discipline subjects.

- 15 Calculation is the process of establishing “distinctions between things or states of the world,” as well as “imagining and estimating courses of action associated with those things or with those states as well as their consequences” (Callon and Muniesa 2005, 1231, drawing from Latour 1987). Calculation is not a “universally homogeneous attribute of humankind, nor an anthropological fiction” (Muniesa et al. 2007, 5), but rather a “concrete result of social and technical arrangements,” arrangements that can be described as “calculative devices.” Calculative devices make it possible to compare and contrast different courses of action, economically, and although technical, they are always political. Calculative devices “do things,” as performativity of economics scholars Fabian Muniesa and his co-authors state (2007, 2); they have effects in the world by translating rich qualitative relations into hard, quantitative numbers.
- 16 There are many definitions of neoliberalism, stemming from the many books devoted to the concept (e.g. Harvey 2005, Peck 2010, Brown 2015, Mirowski 2013), not to mention all the articles. Geoff Mann’s (2013) definition is one I regularly turn to: “Neoliberalism is the ongoing effort, in an inevitably uneven global political economy, to construct a regulatory regime in which the market is the principal means of governance and the movement of capital and goods is determined as much as possible by firms’ short-term returns” (148). Neoliberalism, then, refers to political-economic reassertion of elite power and profit, beginning around the early 1980s (“creating the conditions for short-term returns”). It is also about producing subjects and relations of rule that are market-like or economic in form; as Wendy Brown insists, neoliberal ideologies and practices are a political rationality that reaches “from the soul of the citizen-subject to education policy to practices of empire” (Brown 2005, 39). By its very name, neoliberalism suggests a continuation of older logics and processes. Its most sacred principles include private property, individual freedom, a state whose main role is to protect these property rights and freedoms, and a laissez-faire approach to environmental regulation in order to facilitate economic development. These principles stem in particular from classical liberalism, a Western political ideology that is classical because it pre-dates the modern age and liberal because it holds that “the golden road to collective wealth” is through individual freedom and a society unconstrained by the state (Mann 2013, 142).
- 17 There is a wonderful and growing body of literature here. McAfee (1999) tracks the rise of green developmentalism, a market solution that aims to literally “sell nature to save it.” Smith (2007) discusses the emergence of carbon trading schemes and other ecosystem service markets as signaling

- not only capital's pursuit of new ways to accumulate but a means of subsuming biological processes to capital (Smith draws from Boyd et al. (2001) to interpret these developments as indicative of a shift from formal to real subsumption of nature). Morgan Robertson (2012) extends Smith, arguing that the commodification of ecosystem services signals a transformation comparable to that of individual human labors becoming social labor under capitalism, heralding new forms of accumulative processes which generate profits not only off of nature's goods but also its services. Others working in what is called "neoliberal conservation" also interpret the rise of market rhetoric among practitioners as reflective of a broad repurposing of conservation around the logic of capital, which as Büscher et al. (2012) write, "shifts the focus from how nature is used in and through the expansion of capitalism, to how nature is *conserved* in and through the expansion of capitalism" (Büscher et al. 2012, 4, emphasis added). Much of the work in this area links to David Harvey's theorization of spatial fixes but in an environmental register, explaining market solutions as a "fix" to capital's "constant need ... to expand its reach into new spheres of accumulation" (Arsel and Büscher 2012, 57; see also Brockington and Duffy 2010, Büscher et al. 2014). This line of reasoning emphasizes the role that new environmental markets – in this case, structured around the management of biodiversity conservation – play in transforming nature into an "ecological" fix for capitalist crises of accumulation (Castree 2008a). The proliferation of market-driven conservation strategies and tradable environmental commodities is understood (again drawing on Harvey) as a new but "similar and spectacularly productive" (Sullivan 2013, 210) wave of accumulation by dispossession. On this and neoliberal conservation in general, see also Büscher (2009), Arsel and Büscher (2012), Brockington and Duffy (2010), Igoe et al. (2010), MacDonald (2010), Fletcher et al. (2014), Büscher (2009, 2014), Igoe and Brockington (2007), McAfee (1999), MacDonald (2010), Büscher and Fletcher (2015).
- 18 View the video at <https://vimeo.com/43398910> (last accessed February 11, 2016).
 - 19 For example, I've co-written briefing notes making similar points for Convention on Biodiversity negotiations (i.e. CBD Alliance 2010) as well as academic articles with the title "Life Is Not for Sale" (Collard and Dempsey 2013).
 - 20 See for example McAfee and Shapiro (2010), Matulis (2013), Fletcher and Breitling (2012), Shapiro-Garza (2013).
 - 21 I'm grateful for discussions with Rosemary Collard and Juanita Sundberg about this point (see Collard et al. 2015).
 - 22 Morgan Robertson's scholarship on wetland banking is exemplary in this regard, demonstrating that such translation is needed to produce a wetland banking credit that moves between the logics and practices of the law, science, and the market (see Robertson 2006, 2007).
 - 23 Foucault (1977) defines an apparatus as a "thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements,

philosophical, moral and philanthropic propositions – in short, the said as much as the unsaid ... The apparatus itself is the system of relations that can be established between these elements” (194).

- 24 I conducted interviews with individuals associated with the following organizations and institutions:
- Non-governmental organizations: Forest Trends, World Wildlife Fund (WWF), Royal Society for the Protection of Birds (RSPB), Packard Foundation, World Resources Institute, Birdlife International.
 - Intergovernmental organizations and government: International Union for the Conservation of Nature, United Nations Environment Programme Finance Initiative, The Netherlands Ministry of Housing, Spatial Planning and the Environment.
 - Financial – private sector: World Business Council for Sustainable Development, International Finance Corporation, BC Hydro, EBG Capital.
 - Academic: University of British Columbia, Stanford University, Gund Institute, Duke University, University of California–Berkeley.

Some interviewees agreed to a full use of their names within my book, whereas others requested confidentiality, or else for consultation on direct use in publications. I decided largely to make the interviewees confidential in the text, except where the person agreed and/or where the person’s identity is obvious.

- 25 My work with the CBD Alliance involved attending 13 international negotiations of the CBD; producing informational and advocacy documents, including the widely read civil society dossier *ECO*; organizing workshops and strategy sessions; coordinating increased participation of Southern and Indigenous civil society representatives; and meeting with the Secretariat of the CBD to develop strategies to improve civil society participation in the Convention.
- 26 In preparation for the 9th (2008) and 10th (2010) Conference of the Parties to the CBD, I produced joint policy papers with over 40 NGOs.
- 27 For example, at times my political commitments came into conflict with my research. At one point the daily lobby document I co-edited, the *ECO*, published an article critical of the Green Development Mechanism (GDM) (discussed in chapter 7) at a negotiation of the CBD in Nairobi, Kenya. My association with the publication meant that I was unable to interview a key proponent of the policy mechanism.
- 28 See for example Karieva et al. (2012), debates in *Animal Conservation* 17(6), academic analysis of this post-natural turn be found in Robbins and Moore (2013), Robbins (2014), Collard et al. (2014).