



**HAL**  
open science

# Making Up for Lost Nature? A Critical Review of the International Development of Voluntary Biodiversity Offsets

Sarah Benabou

► **To cite this version:**

Sarah Benabou. Making Up for Lost Nature? A Critical Review of the International Development of Voluntary Biodiversity Offsets. *Environment and Society: Advances in Research*, 2014, 5, pp.103-123. 10.3167/ares.2014.050107 . mnhn-03988263

**HAL Id: mnhn-03988263**

**<https://hal-mnhn.archives-ouvertes.fr/mnhn-03988263>**

Submitted on 14 Feb 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# Making Up for Lost Nature?

## A Critical Review of the International Development of Voluntary Biodiversity Offsets

*Sarah Benabou*

■ **ABSTRACT:** This article analyzes the international development of voluntary biodiversity offsets, a conservation instrument that permits developers to pursue their activities if conservation actions are undertaken elsewhere to compensate for the environmental impacts of their projects. Largely undertaken by extractive industries that operate in the global South where no offsetting regulations exist, this tool is currently attracting growing interest from policy makers, private companies, financial institutions, and conservation experts. Building upon the concept of market framing developed by Callon (1998), I explore in what contexts and through what processes this idea has gathered momentum, as well as the disturbing gap between the way it has been framed and its practical implementation. It is suggested that once immersed in the outside world, the market framing of offsets appears as a fragile result dependent upon substantial investments, which casts serious doubts about offsets' ability to reduce biodiversity loss on technical, governance, and social grounds.

■ **KEYWORDS:** biodiversity, conservation, market framing, measurement, mining, standard, uneven development, voluntary biodiversity offsets

### Introduction

In 2004, the launch of a report (ten Kate et al. 2004) put out jointly by the International Union for the Conservation of Nature and Insight Investment, one of the United Kingdom's largest investment management companies, propelled the idea of "biodiversity offsetting" to the forefront of the global conservation scene. Entitled "Biodiversity Offsets: Views, Experiences and the Business Case," this document enshrines this conservation tool as a way of maintaining biodiversity levels while at the same time permitting development. Simply said, the destruction of one habitat would be "offset" by the conservation, restoration, or creation of another. This is an attractive proposition for policy makers, business entrepreneurs, environmental consultancies, and conservation groups alike, offering the promise of resolving the often conflicting aims of providing for more infrastructure development while at the same time conserving the world's shrinking biodiversity (e.g., Kiesecker et al. 2009; Rajvanshi and Mathur 2010).



Over the past ten years, the idea of biodiversity offsetting has thus experienced rapid success. Pioneered in the United States in the 1990s (Robertson 2004), legislation mandating compensatory mitigation programs (including offsets) now exists in 45 countries and is under development in another 27 (Madsen et al. 2011). Meanwhile, the potential of voluntary biodiversity offsets has attracted growing interest from corporate actors, fuelled by the emergence of a dedicated financial sector that has framed biodiversity loss as a material risk to the “bottom line” of firms, especially those who operate in the global South (Dempsey 2013).

If biodiversity offsets are an increasingly popular tool, they are also fraught with controversy. Offsets are conservation activities that are carried out in order to counterbalance adverse environmental impacts of development projects, within the overall goal of “no net loss”, or, preferably, a “net gain” of biodiversity (BBOP 2012). The controversy lies precisely in the trade-off that this implies: accepting ecological losses in return for uncertain gains (Bull et al. 2013). Some environmental nongovernmental organizations (NGOs) are concerned that biodiversity offsets could thus be treated as a “license to trash” nature, by allowing the continuation of projects at the potential expense of biodiversity (e.g., Howarth 2013).

It is thus not surprising that the issue of biodiversity offsets has been widely addressed in the academic literature, particularly in the fields of biology and ecology. However, the subject has not yet attracted great interest among social scientists (for notable exceptions, see Robertson 2000, 2004, 2006, 2011; Sullivan 2012, 2013). It is beyond the scope of this article to cover all of the many issues that have been addressed in the literature,<sup>1</sup> but it should be noted that the situations of biodiversity offsetting that have been discussed cover mainly regulatory contexts—most notably the United States and Australia. These countries, along with some others, have the particularity of having introduced a trading element into the offsetting mechanism through a “habitat banking” scheme. In this case, conservation banks (i.e., parcels of lands managed for their conservation values) are created. In exchange for permanently protecting the land, the bank owner (the government, the developer, or an entrepreneur) is allowed to sell “credits” (offsets) to parties who need them to satisfy legal requirements for compensating the environmental impacts (“debits”) of their development projects (Carroll et al. 2008). Examples include systems such as Wetland Banking in the United States (NRC 2001) and BioBanking in Australia (DECCW 2009). Habitat banking is an institutional arrangement that is often defined as a “market-based instrument” (Eftec et al. 2010) and is considered more cost-effective than traditional “command-and-control” approaches, where offsets need to be designed and implanted on a case-by-case basis.

The market logic behind habitat banking has been particularly pervasive in the development of voluntary biodiversity offsets. Their multiplication in recent years has indeed been largely prompted by the 2004 report, which develops in great detail what is now commonly referred to as the “business case”, that is, the idea that there is something to be gained for the firm that undertakes an offset. However, despite the steady growth in the number of companies with “no net loss”-type commitments over the last ten years (TBC 2012), very little has been said in the academic literature about what biodiversity offsetting could cover in such voluntary situations. In what context and on what grounds have these corporate commitments emerged? How has the concept of biodiversity offsets been configured and circulated to gain traction among corporate leaders? Why, despite these developments, does the implementation of voluntary biodiversity offsets on the ground remain limited?

This article attempts to give possible answers to these questions (and to leave open those that remain to be addressed in future research) by providing a synthesized critique of the international development of voluntary biodiversity offsets, based on a review of the relevant literature, ranging across a spectrum of academic articles, gray literature, and policy documents.

## Genealogies of the Corporate “No Net Loss” Strategy

### *The Recognition of Biodiversity Loss as a Business Risk*

In a joint workshop organized in July 2003 by the International Union for Conservation of Nature (IUCN) and the International Council on Mining and Metals (ICMM), the participants agreed “to explore the use of biodiversity offsets in recognition that there may be a point at which investment in biodiversity offsets provides greater social, environmental and economic benefits than trying to mitigate all impacts” (ICMM 2005: 2). This initiative, entitled “Mining, Protected Areas and Biodiversity Conservation: Searching and Pursuing Best Practice and Reporting in the Mining Industry,” was held in the IUCN headquarters in Switzerland. Several of the participants were to become major thinkers in the development of biodiversity offsets at the international level: Kerry ten Kate (director of investor responsibility, Insight Investment), David Richards (principal adviser in environment, Rio Tinto), Assheton Stewart Carter (chief advisor for business practices, Conservation International), Martin Hollands (deputy director, Flora and Fauna International), and Mohammed Rafiq (leader of the IUCN biodiversity dialogue with the mining industry), among others. As far as the mining sector is concerned,<sup>2</sup> it seems that this was the first time that the issue of biodiversity offsets had been officially put on the table for discussion, even if the ground had been prepared beforehand.

Since the mid-1990s, in order to improve its image linked to its social, economic, and environmental footprint, the mining industry has indeed engaged in dialogue with environmental and social organizations in order to determine how to address these challenges (ICMM 2005). In 1999, nine of the largest global mining corporations, under the impetus of the Rio Tinto chairman, joined together to launch the Global Mining Initiative (GMI). If the official intention was to develop the contribution of the mining sector to the transition toward sustainable development, the real motives were much more pragmatic. According to Dr. John Groom, an official of Anglo American, “the drivers for GMI were clear recognition that mining companies had problems of access to land, and access to markets, and cost of capital. The fundamental underlying reason was the reputation of the industry. To tackle this we would have to work with others and also improve the way we worked” (Buxton 2012: 7). The following year, the GMI started a process of consultation and research known as the Mining, Minerals and Sustainable Development (MMSD) project to determine the fundamental orientations that would shape the future of the industry. This project led to the creation of the ICMM in 2002. A few months later, at the Johannesburg World Summit on Sustainable Development, the ICMM and the IUCN started a joint dialogue on mining and biodiversity “to provide a platform for communities, corporations, NGOs and governments to engage in a dialogue to seek the best balance between the protection of important ecosystems and the social and economic importance of mining” (IUCN 2003: 1). The 2003 workshop was part of this dialogue.

The mining industry was, however, under tremendous pressure to make progress on this issue of “residual” impacts on biodiversity. The same year as the IUCN/ICMM workshop, the World Resources Institute published a report indicating that three-quarters of active mines and exploratory sites overlapped with areas of high conservation value (Miranda et al. 2003). The next year, Earthworks and Oxfam launched the “No Dirty Gold” campaign, accompanied by a critical report against the mining industry, *Dirty Metals: Mining, Communities and the Environment* (2004). This latest attack prompted a coordinated response on several fronts. On the one hand, the ICMM immediately responded by insisting on the fact that this report failed to take into account its commitments made during the MMSD process (ICMM 2004). On the other hand, Kerry ten Kate undertook a series of interviews with major industrial players to clarify the

concept of biodiversity offsets and make it relevant for business. This led to the publication at the end of 2004 of the report on the “business case” for biodiversity offsets, and to the creation of an organization dedicated to its development worldwide, the Business and Biodiversity Offsets Programme (BBOP). Meanwhile, the Third IUCN World Conservation Congress in Bangkok witnessed the intensification of IUCN’s engagement with the private sector (IUCN 2006). At this very congress Rio Tinto launched its biodiversity strategy, where it committed itself to have a “net positive impact” on biodiversity (Rio Tinto 2004), thus putting itself at the vanguard of the mining sector on this question.

### *The US Experience*

Biodiversity offsetting was, however, not terra incognita for the business and conservation community. In the United States this idea emerged in the late 1970s and was officially enshrined as a biodiversity offsets *market* in the early 1990s. Participants in the IUCN/ICMM workshop thus had experiences to draw upon, even if the particularly regulated situation of biodiversity offsets in the United States cannot be transposed term-for-term in other biodiversity-rich countries where mining companies operate and where no such regulation exists. This experience has nonetheless largely “captured the imagination of those who promote market-led environmental policy” (Robertson 2006: 372), especially in the way it has framed biodiversity offsets as a useful tool to ensure competitiveness and make conservation “work for capitalism”.

According to Morgan Robertson (2000), the idea that nature destroyed in one place could be compensated by a similar natural habitat restored or created elsewhere was first developed during the 1970s in wetland policy. During this decade, two amendments to the Water Pollution Control Act of 1948 were passed to stop the unregulated destruction of these ecosystems. In 1972, the Army Corps of Engineers was given the authority to issue or deny permits for the filling of wetlands, while the Environmental Protection Agency (EPA) had a veto power over these permits. Five years later, wetlands were explicitly mentioned as a protected category by stating that mitigation (i.e., restoration or creation) of wetlands was only to be considered as a last resort, once strategies of avoidance and minimization of impact had been considered. However, due to a lack of clarity about the specific division of responsibility between the various governmental agencies supposedly in charge of executing this law (generally known as the CWA, the Clean Water Act, from 1972 onward), friction between them developed, with the result that the mitigation hierarchy was not, in fact, enforced (Robertson 2000). Developers were invited to proceed *directly* to restoration or creation of wetlands to compensate for their impact, with the consequence that, even if the slogan of “no net loss” had not yet been invented, “it can be used to describe the informal compromise worked out in the 1970s between institutions, unwilling partners in carrying out the awkward rules generated by the CWA” (Robertson 2000: 471). At the request of President Reagan’s Council on Competitiveness, a national forum was convened by the EPA in 1987 in order to clarify federal wetlands regulation. This forum led to the transformation of the de facto situation into a de jure institutionalization through the adoption of the slogan “no net loss of wetlands” (Robertson 2000: 471). The following year, this term was popularized by the presidential campaign of George H. W. Bush, who pledged to ensure no net loss of wetlands “to shore up a dismal environmental record” (Robertson 2000: 471).

As one might expect in relation to a slogan adopted by the Council on Competitiveness, the policy that was shaped introduced greater flexibility into the regulation itself by permitting restoration/creation elsewhere, where the cost is lower. Beyond this mechanism of flexibility based on the postulate of an ecological equivalence between disparate locales, another element in this project was to open up the field to the growth of a private sector conservation business. For,

now, any landholder could become an ecological restoration entrepreneur, a so-called nature banker, and sell credits to clients. A developer can thus choose, in the specific service area where s/he operates, the bank from which s/he wants to buy credits. Launched in 1991, this new biodiversity offset market developed rapidly, starting originally with wetlands and extending in 1995 to protected species. Today, there is a total of 1,044 active and sold-out wetland, stream, and conservation banks that account for the greatest volume of payments and area in the global biodiversity market, bringing in \$2.0–3.4 billion and covering over 15,000 hectares (37,700 acres) annually (Madsen et al. 2011).

The United States' offsetting legislation was inevitably a point of reference for the actors engaged in the development of voluntary biodiversity offsets in the global South. It was, however, thought that "the legally mandated and tradable offsets (such as those that are emerging in the USA) ... will probably not be feasible in the short to medium term in most of the countries that hold the majority of the world's biodiversity" (ten Kate et al. 2004: 82). Central to the actors' concerns was what to do in countries where offsets are *not* legally mandated—how to build up *voluntary* offsets robust enough to save companies from potential adverse campaigning by local communities and national and international NGOs for poor biodiversity management (ten Kate et al. 2004). It thus took a decade or so (from the mid-1990s to the mid-2000s) for this conservation instrument to become institutionalized in the rapidly growing field of "business and biodiversity", through a triple process of (1) alignment of corporate executives, senior actors in conservation organizations, and bureaucrats, (2) articulation through multiple "dialogues" and publications, and (3) orchestration in major conservation meetings. To understand how the concept of biodiversity offsets has gained traction in such a short period, I turn now to its configuration and circulation in relation to particular interests and the forms that make it relevant for business.

## Biodiversity Offsets in the Art of Market Framing

### *Building Blocks*

Contemporary debates on appropriate biodiversity conservation policy have seen the emergence and consolidation of a "neoliberal conservation" paradigm (Igoe and Brockington 2007; Igoe et al. 2010; Büscher et al. 2012) based on the premise that the target of halting biodiversity loss will only be achieved by subordinating environmental conservation to capitalist logics and associated market mechanisms, for instance, through commodification and trading of ecosystem services (McAfee 2012). Biodiversity offsets, I suggest, draw much of their legitimacy from their recent realignment with this dominant discourse on sustainability. The upsurge of interest in many countries and among many NGOs and businesses for this instrument over the last ten years, it seems, has indeed been largely driven by the way it has been framed as a potential market-based mechanism (or at minimum a mechanism for pricing certain negative environmental externalities within development projects; see Bull et al. 2013), which supposedly ensures its economic efficiency. The sociologist Michel Callon uses the notion of "framing" to show how economic actors identify externalities as exceptions "that must be contained and channeled with the help of appropriate investments" (1998: 250). This section takes the notion of market framing to qualify some of the processes—both the products of discursive reconfigurations and crystallization of relations between particular sets of actors—through which biodiversity offsets have come to gain such central importance in international debates on conservation.

In his analysis of the conditions required for the existence of markets, Callon (1998) borrows the concept of "framing" from Goffman (1974). The process involves the demarcation of

a “stage” that has been specially prepared and upon which the actors involved are capable of agreeing. “To negotiate a contract or perform a commercial transaction,” Callon argues, “effectively presupposes a *framing of the action* without which it would be impossible to reach an agreement, in the same way that in order to play a game of chess, two players must agree to submit to the rules” (1998: 250, emphasis added). The role of the players’ mutual agreement in creating this closed interactional space is indeed essential in that it clarifies “the frame within which their interactions will take place and . . . the courses of action open to them” (Callon 1998: 249).

This concept of framing is helpful to understand how the emergence of biodiversity offsets carries a particular configuration of the conservation effort. Consider this quote from Joseph Kiesecker, scientist for the Nature Conservancy (TNC):

Between one-third and one-half of Earth’s land surface has been altered by human action, resulting in an unprecedented loss of biodiversity. . . . Looking forward, such impacts could increase dramatically: the global economy is expected to double by 2030, and unprecedented investments are being made in resource development to support this growth, especially in developing countries. Given the importance of economic development for improving human well-being, there is greater pressure to find ways to balance the needs of development with those of biodiversity conservation. Biodiversity offsets are one important tool for maintaining or enhancing environmental values in situations where development is sought despite detrimental environmental impacts. (Kiesecker et al. 2009: 77)

The “stage” set here is that of a world where economic growth is seen as both desirable and inevitable, and thus where the course of action, as far as conservation is concerned, is to accompany this growth by managing its ecologically damaging side effects. It is quite striking to notice how such a statement is radically different from the once widely shared idea that conservation is about saving lands *from* development. Instead, it acts as an invitation for conservation experts to accommodate the needs of capitalism, that is, to assist developers in proceeding with their large projects, accompanied by some sort of proper compensation.

This framing of a “development/market-led” conservation is now largely considered in the international conservation milieu as the norm, in the double sense of something that is desirable and also (increasingly) statistically predominant. A peculiarly privileged vantage point to observe the pregnancy of this reasoning is constituted by international conservation meetings such as the 2008 World Conservation Congress or the 2010 Conference of the Parties to the Convention on Biological Diversity (CBD). As has been noted by scholars, the message constantly emphasized is that capitalism is the key to our ecological future (Igoe et al. 2010; MacDonald 2010; MacDonald and Corson 2012). In particular, these venues have been the sites of the emergence and consolidation of powerful discursive claims that market-based instruments, when suitably framed by expert and technical knowledge, constitute the most robust alternatives to command-and-control or community-based approaches, which are widely seen as having proved their inadequacy in practice. A good example of these claims can be found in an article written by Peter Kareiva, Michelle Marvier, and Robert Lalasz (2012). The future of conservation, says Kareiva, the chief scientist for TNC, does not lie in “preserving islands of Holocene ecosystems in the age of the Anthropocene,” but should take into account to a much larger degree the transformation of the *rest* of the landscape through mining, damming, logging, intensive agriculture, and urbanization (Kareiva et al. 2012). The challenge ahead is to explore “the right kinds of technologies” that could enable these landscapes to support healthy ecosystems and to contribute to the prioritization of “economic development for all” (Kareiva et al. 2012). “Instead of scolding capitalism,” he concludes, “conservationists should partner with

corporations in a science-based effort to integrate the value of nature's benefits into their operations and cultures" (Kareiva et al. 2012).

Market-based approaches to conserving nature are not new, but they have clearly gained new impetus after a 2010 initiative entitled the Economics of Ecosystems and Biodiversity (TEEB). This international initiative promotes a new economy, "one in which the values of natural capital, and the ecosystem services which this capital supplies, are fully reflected in the mainstream of public and private decision-making" (TEEB 2010). The basic premise is that, in order to properly protect nature, it must be given a "value". This usually means creating methods to measure ecosystems and biodiversity in monetary terms so that "nature" can be visible on the balance sheet. "It is what economists call a problem of externalities," diagnoses Ricardo Bayon, former director of Ecosystem Marketplace, a platform for information on ecosystem services markets. "Some values—like that of a species of woodpecker or of a particular ecosystem such as a rainforest or a wetland—do not enter into the economic system. They are external to it, and so they are not taken into account when economic decisions are made" (Bayon 2008: 123–124). This overflow, as Callon might put it, can be channeled back into the economic system through the help of market-based mechanisms such as offsets, where the positive and negative impacts on biodiversity are measured and represented as "credits" and "debits" (Doswald et al. 2012). Thus quantified and monetized, they are supposedly more easily integrated through cost-benefit analysis into economic decision making (Doswald et al. 2012). Central to the idea of biodiversity offsetting is the notion that, by putting a price on ecosystems, developers will be discouraged to use a site that involves high biodiversity compensation costs. Should work go ahead nonetheless, the developers will have to finance conservation. At a time when traditional sources of conservation funding (including government budget allocations, official development assistance, and philanthropy) are widely considered as insufficient (Parker and Cranford 2010), this is clearly an attractive proposition. Indeed, the strategy for resource mobilization adopted at the ninth meeting of the CBD invited parties to come forward with "innovative financial mechanisms" (IFMs) that have the potential to generate new and additional resources for biodiversity. IFMs are based on the idea that economic incentives can be used to achieve positive conservation outcomes and draw heavily on private sector involvement (and the state as market facilitator), using tools such as biodiversity offsets (OECD 2013).

Monetization, the process whereby something can be turned into money, thus occupies a central position in this overarching market framing of conservation. Money provides "the universal yardstick of value" (Harvey 1993: 4) against which grounds for action are evaluated. Terms such as "natural *capital*" or "ecosystem *services*" operate as powerful signifiers that produce a vision of nature that folds it into the monetary value sphere. This entwining of ecological and economic categories has the inevitable effect of orienting the search for solutions "in particular directions—namely towards market and technological innovation—in ways that arguably, and often intentionally, deflect understanding away from systemic causes of ecological (and associated socio-economic) crisis" (Büscher et al. 2012: 9). In other words, it traces a course of action where financial motives increasingly govern conduct, at the ineluctable expense of other forms of rules-based environmental regulations. A site of high biodiversity value is saved from destruction (or not) because it makes economic sense, not because the society as a whole has decided so.

### ***Harnessing Conservation Experts to the Private Sector***

This process of market framing "presupposes actors who are bringing to bear cognitive resources as well as forms of behavior and strategies which have been shaped and structured by pre-



vious experience” (Callon 1998: 249). Interestingly, as far as voluntary offsets are concerned, this work has been largely shaped not only by business actors (leaders of extractive industries, financial institutions, investors), but also by conservation NGOs and environmental consultancies. Together, they form, within the growing field of “business and biodiversity”, an emerging cluster of “technical experts” that advance the offsets agenda at the international level, often in coordination with government representatives. It is a small and interactive community, since the actors that specifically work on offsets in each organization are not numerous and very often come to work together or circulate between the various organizations.

To date, most of these voluntary offsets have been undertaken by extractive industries, backed by their respective industry associations for environmental and social issues, the IPIECA (global oil and gas industry association for environmental and social issues) and the ICM. For oil and gas, the Energy and Biodiversity Initiative (made up of BP, Chevron, Shell, Statoil, Conservation International, Flora and Fauna International, Smithsonian, IUCN, and TNC) played an important role by stating a “no net loss of biodiversity at project site” as a minimum standard (EBI 2003), whereas mining has engaged early on with the IUCN—a major broker between corporations and conservation groups—in a dialogue on offsets, as discussed previously. There are also examples from other sectors, such as water and urban development (Madsen et al. 2011; ten Kate et al. 2004).

The growing interest of corporate actors for biodiversity offsetting as a risk management strategy has been largely fuelled by its uptake by major financial institutions. The leading body in this field is the International Finance Corporation (IFC), the World Bank’s private sector financing arm. In 2012, the IFC revised its Performance Standard 6 (PS6) on biodiversity to explicitly require its clients to undertake an offset in order to meet the target of a “net gain” for impacts on critical habitat and a “no net loss”, where feasible, for impacts on natural habitats (IFC 2012). Many multilateral banks such as the Inter-American Development Bank follow PS6 guidelines or have developed similar approaches themselves. In addition, the 78 institutions worldwide that abide by the Equator Principles, and whose investments cover 70 percent of international project finance debt in emerging markets, have agreed to follow IFC standards in their loan agreements (Equator Principles 2006).

These business actors, both corporate and lenders, rely heavily on technical guidance from external experts that will facilitate the use of biodiversity offsets in development projects. Conservation NGOs play a key role here, even if it should be remembered that “conservation” is a broad and diverse church. The idea that conservation NGOs should partner with corporations is not consensual, and Friends of the Earth International has, for instance, withdrawn from the IUCN to mark its disapproval of the IUCN’s agreement with Shell (MacDonald 2010). Collaborating with companies is nonetheless a major strategy for other large conservation NGOs. TNC’s Development by Design program is presented as a way of “supporting energy, mining, and infrastructure development done in the right way and in the right places,” (TNC 2014) while Conservation International’s Center for Environmental Leadership in Business works with their corporate partners “to improve their business practices, creating and implementing strategies that combine bold commitments to sustainability with practical solutions that deliver benefits to the bottom line and the environment” (CI 2014). Through these large-scale programs, TNC and Conservation International regularly engage with companies to help in the development of voluntary offsets.

Consulting firms that are much smaller in size but that have developed dedicated technical expertise, policy advice, and field capacity on biodiversity offsetting also have an important position. One of the references in this field is a small UK consultancy created in 2006, the Biodiversity Consultancy (TBC). TBC has worked as in-house advisor for major corporate groups

such as Rio Tinto or Shell, collaborated with governments (e.g., New Zealand, Mongolia), partnered with conservation NGOs on specific projects (e.g., with FFI for the Oyu Tolgoi project in Mongolia), and published a whole set of industry briefing notes and reports on offsetting, including a so-called independent report on biodiversity offsets commissioned by the IUCN and the ICMM (ICMM and IUCN 2012). TBC has also been closely involved in the development of new environmental safeguards for lenders such as the IFC.

This far-from-exhaustive overview of the main actors involved in the development of corporate biodiversity offsets would not be complete without mentioning the BBOP, an organization that has provided the major contribution to date on the topic. Run by the market-oriented organization Forest Trends, based in Washington, DC, the BBOP has published a number of papers on offset principles, criteria and indicators, methodologies for design and implementation, and more recently a standard on biodiversity offsets (BBOP 2012). The BBOP is a collaboration of more than 75 organizations and individuals, including companies, financial institutions, government agencies, and civil organizations that are members of its advisory group, including (as of July 2013) many of the actors that have been cited above: IFC, TBC, Conservation International, and TNC. Shell and Rio Tinto were part of this group during its first phase of work (2004–2008). It also draws its strength from its proximity with other sister initiatives produced by Forest Trends, such as Ecosystem Marketplace. The success of the BBOP is also due to the charisma of its director, Kerry ten Kate, the “visionary” and embodied presence of the offsets agenda (Carrier and West 2009; MacDonald and Corson 2012), who is also a good example of the circulation of these actors through public, pseudopublic, and private organizations. Formerly a barrister in London, ten Kate served on the secretariat of the United Nations Conference on Environment and Development in 1992. She then founded the private consultancy Environmental Strategies, and then became the head of the CBD unit at Kew Gardens. In 2002, as director of “investor responsibility” for the firm Insight Investment, she worked extensively on business arguments and motivation for biodiversity management, which finally led her to head the newly created BBOP in 2004.

Given this configuration—a relatively small community of highly connected individuals in a milieu where the frontiers between the public, private, and corporate worlds are quite permeable—it is thus not particularly surprising to say that biodiversity offsets fits into a conception of conservation as a nonantagonistic process (Igoe et al. 2010). From this perspective, conservation accompanies and should stimulate economic development, a central thrust behind what is commonly referred to as the “business case” for offsets.

### ***Making the “Case” for Biodiversity Offsets***

Many of the gray literature and policy documents on offsetting develop various sets of narrative strategies that serve the business and biodiversity community in justifying their actions and legitimizing their views on the biodiversity agenda. In accordance with the business imperative of seeking a return on investment, there are supposedly real benefits to be gained for companies that engage in this new domain. As clearly stated by the organizations that advocate offsets, a “business case” can be made (ten Kate et al. 2004; ICMM and IUCN 2012) that operates as an instantiation of market framing specifically applied to the corporate sector. This case, whereby corporate environmental liability can be turned into an asset that takes various forms, can be divided into four main drivers: regulation, finance, business risk management, and business opportunities.

*1. Regulation.* The obvious argument advanced here is that more and more governmental policies and legislations now suggest or require the use of biodiversity offsets (TBC 2013b). But, beyond

compliance, it is argued that there is also a business case for developers to undertake voluntary offsets: in order to *preempt* future mandatory requirements. Indeed, the prospect of a “rapid proliferation” of these offset policies is raised to motivate companies to make costly efforts. This strategy has been widely studied in environmental economics literature that suggests that “voluntary” corporate environmental improvement depends upon a strong background regulatory threat—or the prospect of a reward (cf., in the field of climate policy, Baranzini and Thalmann 2004). The reward, in the case of biodiversity offsets, is presented as a “first-mover” competitive advantage that could open up the possibility for companies in influencing emerging environmental regulation.

2. *Finance.* As detailed in the previous section, financial institutions occupy a central position in the development of offsets at the international level, notably through the generalization of the adoption of the IFC’s PS6. Easy access to capital (and associated competitive advantages) being of utmost importance to companies who undertake large-scale industrial projects, this new environmental safeguard has become a major driver of offsets within industry (ICMM and IUCN 2012).

3. *Business risk management.* While the two first drivers are largely determined by compliance to governmental or financial requirements, the third stems from calculations that are endogenous to the developers themselves, especially when they operate within companies with high dependency and impacts on biodiversity, such as extractive industries. For them, there is a clear business case in demonstrating good biodiversity performance and risk management, as is widely recognized in the corporate literature (ICMM 2005; Rio Tinto 2004; ten Kate et al. 2004). It includes: gaining access to land and resources, since their activities often overlap with areas of high conservation value; obtaining a “license to operate”, that is, showing concern for conservation helps to obtain (1) better relationships with local communities and environmental groups and (2) a “regulatory goodwill” that can lead to faster permits; and more generally reputational benefits for demonstrating environmental/social stewardship as part of the corporate social responsibility portfolio, for instance, by turning biodiversity offsets into flagship environmental and community-based projects (TBC 2013b). All of these factors contribute to explain the increase in “no net loss”-type commitments within the private sector (TBC 2012).

4. *Business opportunities.* Last but not least, there is the promise of a direct business opportunity behind this recent corporate appetite for offsets. This has probably never been so clearly expounded as in the account of Rio Tinto’s biodiversity strategy, recounted by its chief biodiversity adviser, Stuart Anstee, during a side event of the 2010 CBD conference in Nagoya, Japan. Rio Tinto’s first incentive for engaging in offsets, he said, had to do with minimizing the business risk of their operations. However, he continued:

[T]he next part is ... the opportunity side. I guess when we started thinking about this whole policy, and the development of a policy about net positive impact, this sets of figures played a really important part. Rio Tinto is a significant landholder. Through exploration projects and development operations, we have some form of tenure to over ... 132,000 square kilometers. At an operational level, so where we actually have direct management control ... we’re looking at about 41 to 42,000 square kilometers of land. ... Of that, we actually only impact about 9 percent. So as a company we have a very large expanse or portfolio of nonoperational land that traditionally has just basically sat there. It’s being used for whatever it was being used before. So with the biodiversity strategy and the net positive impact policy, what we are trying to do is to say to the company: “What’s the resource value of that land as it currently sits?”

What's the ecosystem or natural capital value?" And I guess that's one of the reasons why we felt that we should be looking at a no net loss or net positive impact policy piece. (Anstee 2010)

In other words, offsets facilitate the opening up of elements of nature currently still beyond the reach of markets for trading (and, potentially, speculation). Former financially sterile lands could be transformed into assets and used as "biodiversity banks", for instance, through the sale of ecosystem service credits such as forest carbon, or of excess biodiversity credits as an offset to other developers (TBC 2013b).

## Biodiversity Offsets in Practice

### *Metrological Issues in Biodiversity Offset Design*

The overarching goal of "no net loss", or preferably a "net gain" of biodiversity (with respect to species composition, habitat structure, ecosystem function, and people's use and cultural values associated with biodiversity), is supposedly achievable through adherence to a few key design principles established by the BBOP in 2009, which revolve around the issue of measurement. Biodiversity offsets have indeed come into being through metrological efforts to ensure that the gains through an offset are "commensurate" with the losses. Through sound ecological science and quantitative rigor, it is argued, offsets can prove to be an efficient tool (Quétier and Lavorel 2011). Among the principles that have been put forward to frame the work of designing an offset, four in particular deserve attention in this context, as has been acutely observed by Sian Sullivan (2013).

1. *Offsets should come as a measure of last resort.* The first principle relates to adherence to the mitigation hierarchy, a tool commonly applied in environmental impact assessments. It states that, in order to limit as far as possible the deleterious impacts on biodiversity from development projects, a sequential procedure is to be followed—avoid, minimize, restore, and offset. The first step comprises measures to avoid creating impact from the outset of the project, such as creating roads that bypass key natural habitats. Then comes minimizing the impacts that cannot be completely avoided, such as building wildlife crossings. Usually, measures of rehabilitation or restoration should also be taken to improve the ecosystems that have been impacted anyhow, during an operation or more frequently toward the end of a project's life cycle. Collectively, these three steps aim to limit any negative impact. Offsets come as the last resort of the hierarchy, "to compensate for any residual significant adverse impacts that cannot be avoided, minimized and/or rehabilitated or restored" (BBOP 2013: 7). The justification of proceeding to offsetting thus rests on the assumption that "residual" impacts of development projects are *unavoidable*. But, as noted by Sullivan (2013: 84), it is precisely the very availability of this option that "permits the rationalization of aspects of both development and the residual environmental harm thereby caused as unavoidable." An early focus on offsets can thus encourage "fast-tracking" through the hierarchy, particularly discounting the possibility of avoidance, as has already been observed in wetland policy in Alberta, Canada (Clare et al. 2011; see also Walker et al. 2009).

2. *Offsets should consolidate areas of high biodiversity value.* Another principle that has recently gained a lot of attention rests on the possibility of mitigating the negative impact of a development project *off-site*, a principle that has been institutionalized in habitat banking programs but that is also used, in addition with on-site conservation measures, in offsets not associated with trading. Off-site mitigation selects an offset site *ex situ*, that is, outside the immediate bound-

ary of the development project, but usually within a defined area with a similar habitat. This is justified by stating that, whereas on-site offsets result in “ineffective, small, randomly created compensations,” off-site mitigation can provide a “well-thought out, larger preserve with greater ecological value” (White 2008: 34). Here again, this principle, presented as objective and making ecological sense—which is, as Sullivan notes, highly debatable (2013: 84)—seems rather to serve particular interests. It indeed constitutes a necessary step toward the abstraction process that eases the constitution of an extended market, as well as offering the possibility for developers to design an offset at a competitive price by choosing cheaper sites than the development site.

3. *Offsets should be additional.* According to the BBOP, “a biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place” (2009: 15). To determine what would have happened in the site selected for an offset in business-as-usual scenarios, the designer tends to use local, regional, or national statistics (such as deforestation rates) in order to predict the evolution of the biodiversity of the site. If a biodiversity loss is expected through this calculation, then the offset is justified and considered additional. Proving and measuring “additionality”, as might be expected, is a difficult and somewhat subjective exercise, since the alternative scenario (the one in which conservation action did not occur) “cannot be known with certainty” (Maron et al. 2013: 360). Moreover, it places a faith in the ability of restoration ecologists to restore or recreate ecosystems that contain the same biodiversity values to those that are lost that is not shared by the practitioners themselves, given the complexity and variability of ecosystems (Hobbs et al. 2011; Maron et al. 2012). In order to reduce the risk of a restoration failure for business, real-world offset practices tend to privilege an option known as “trading up” (TBC 2013a). This offers the possibility of offsets in sites that are considered more important for biodiversity conservation than those impacted. Habitat banking in regulatory systems can thus be considered a form of “trading up”. In voluntary situations, “trading up” consists of financing conservation measures in places known to be of importance for the conservation of biodiversity: usually sites that may be already protected (TBC 2013a). Proving “additionality” in such cases is thus a tightrope walking exercise, since the developer has to prove that the site chosen is “under imminent threat” or in need “of protection or effective management” (IFC 2012: 2; TBC 2013a).

4. *Offsets should be equivalent to permit exchangeability.* This is probably the most important principle guiding biodiversity offsets: offsets are usually intended to produce gains *equivalent* and thus *commensurable* to the ecological loss produced by the development project. The design of an offset should adhere to a “like-for-like or better” principle (IFC 2012), which means that an offset must be designed to conserve the same biodiversity values that are being impacted (“in-kind” offset), or, in situation where areas to be impacted are considered as having little conservation value, an “out-of-kind” offset can be considered. In both cases, the aim is equivalence, and this is achieved by assuming commensurability. An offset is regarded as equivalent if gains are scaled to balance losses in:

- *Type*: Same kind of species, habitats, ecological functions, etc. (except when “trading-up”; or in habitat banking schemes such as in the UK where habitat types are exchangeable, see Defra 2011).
- *Amount*: Measured in hectares, habitat hectares, species population sizes.
- *Time*: For example, if an offset equivalent in type and size only achieves its goals in 20 years’ time, it is not regarded as an effective compensation for the losses. This is why offsets should in theory be put in place before the impact occurs, or time discount rates should be applied (Bekessy et al. 2010; Evans et al. 2013).

- *Space*: Offsets site should be situated nearby impact sites so that equivalency in type is more likely. However, in practice, for either conservation (“trading-up”) or sociopolitical reasons, the offset site chosen is not necessarily the closest.

How to measure through loss-gain calculations equivalency for offsets is probably the most debated of the technical issues among experts, but it should also be of great interest to social scientists interested in the abstraction process leading to nature commodification. To assess ecological equivalency, offset designers follow a sequential method that ultimately permits them to decide that the offset site is a “fair exchange” with the impacts of the developer. For this purpose, they need to put in place “some form of *ecosystem metrics that account for and calculate nature so as to permit exchangeability*” (Sullivan 2013: 84, emphasis in original; see also Robertson 2006, 2011), usually constructed through a four-step process.

First, it is necessary to prioritize and select the biodiversity features to include in the calculation, since it is impossible to measure everything. The surrogates that will be ultimately chosen should, in theory, be “scientifically defensible” (in terms of irreplaceability or vulnerability, for instance) and relevant to the various (global, national, local) stakeholders. Second, the priority features identified must be measured, and thus methods to collect data on amounts of each feature must be chosen, such as canopy cover or species abundance. Third, the data collected must be converted into a biodiversity “currency” to facilitate exchange and trade. Like financial currencies, it must be fungible and allow the substitutability and exchangeability of losses and gains through the definition of a common unit. Most biodiversity offsetting projects worldwide use currencies calculated by multiplying *extent* (quantity, usually hectares) by *condition* (quality, e.g., species density, vegetation condition). Famous examples are the Australian State of Victoria’s “Habitat Hectares” and Rio Tinto’s “Quality Hectares”, expressed in percentage. For instance, 100 hectares of forest at 50 percent condition is 50 “Habitat Hectares”. Finally, this currency should be adjusted by putting into the equation ratios and multipliers to account for time discounting, uncertainty, and risks, with the aim of resulting ultimately in “no net loss” (ICMM and IUCN 2012).

There is a paradox in the central role that this work of measurement plays in offsetting. The overwhelming appeal for quantification is obviously driven by a pursuit of credibility for a tool that is supposed to perform the promise of *substitution* for the nature that is lost through development. The development of biodiversity offsets is indeed clearly embedded in a discourse that states that ecological problems are the outcome of inadequate adoption and implementation of “modern” economic techniques of conservation informed by state-of-the-art science, which is often placed under the umbrella concept of “ecological modernization” (Hajer 1995). With adequate calculations and metrics, it is argued, offsets could result in a “positive-sum game”, with both economic growth and environmental protection. But, as Sullivan notes, “what is exchanged through these offsetting mechanisms are the numerical indicators proposed by metrics ... [that] may or may not provide a ‘good fit’ with the material natures they represent” (2013: 86). Or, to put it in another way, what is produced through these calculations is a “nature that capital can see” (Robertson 2006: 367), where the debates, refinements, and uncertainties in ecological science over what is measured have no room.

The capacity of such currencies to be an adequate substitute for the biodiversity they represent is an issue that has led a substantive body of scholars to question the reliability of offset systems to truly achieve “no net loss” (Salzman and Ruhl 2000; Quigley and Harper 2006; Gibbons and Lindenmayer 2007; Walker et al. 2009). As summarized by Brownlie, King, and Treweek, “The use of crude currencies, poor biodiversity surrogates and over-simplified metrics in offsets fails to account for the significant environmental and social welfare values across space, type

and time” (2013: 27). However, what is surely achieved by this process of quantification and abstraction is the creation of an illusion of objectivity, of an impersonal knowledge “independent of the particular people who make it” (Porter 1995: ix)—a direct effect of the phenomenon of “trust in numbers” analyzed by Porter. The real individuals, organizations, and interests pushing the development of the biodiversity offsets agenda are thereby effaced. Invisible behind the banner of ecological science, which is legitimated by the force of numbers, metrics, ratios, and so forth, lie calculations that are based on subjective choices and may or may not serve particular interests. Offsets demand a high level of expertise: large amounts of ecological data have to be gathered and analyzed, not to mention the task of valuing and pricing the natural elements selected. All this involves considerable expenditure borne by the developer, who would thus have considerable power over the process. Since it is in the developer’s best interest to see this work done as quickly as possible, this could lead to the environmental impact of a project being underestimated. Beyond the issue of relationships of forces, what is also rarely clearly stated in the research on measurement issues is that environmental management decisions are expressions of preferences and values that are ultimately a matter of societal choices. In situations where different groups have disparate desires, with potentially conflicting social, economic, and/or ecological values, lies a question that is at the heart of offsets’ operations: “[W]ho decides ‘societal values,’ both now and for future society?” (Brownlie et al. 2013: 26).

### ***Implementing Biodiversity Offsets and Verifying Their Success***

The issue of the reliability of methods to calculate biodiversity offsets is not only a problem for scientists; it is also a major concern for business actors. To date, no internationally accepted standard exists to provide guidance on offset design. Many regulators, especially in North America and Australia, have developed their own mandatory currencies along with their own methods to measure biodiversity. On the voluntary side, Rio Tinto and the BBOP, among others, have also developed their own procedures. This lack of a widely agreed and credible standard on offsets is seen as a risk for the industry, and explains why few companies are currently engaged in this process. Indeed, without a recognized norm that provides “a common language to evaluators, the evaluated and their audiences” (Ponte et al. 2011: 1), there is no way to judge and compare the quality of an offset project. Furthermore, engaging in an offset project for developers means investing a large sum of money and being exposed to scrutiny and potential criticism if the offset is considered a failure. The development of a standard on biodiversity offsets is thus critical to protect themselves from the double risk of criticism (which can seriously harm their reputation and “license to operate”) and of losing their investment due to the uncertainty of the result.

This concern has been registered by the BBOP, which dedicated its second phase of work (2009–2012) to developing the trademarked BBOP *Standard on Biodiversity Offsets*. This document adds a hierarchy of criteria and indicators to the principles guiding biodiversity offsets’ design. It is the result of the collective work of the BBOP secretariat and the many bodies that compose its advisory group, and is therefore presented as agreed by “an international, multi-stakeholder group” (BBOP 2012). However, as one can observe by flipping chronologically through the various publications of the BBOP, while the BBOP was starting to work on its standard, many large transnational corporations that were key BBOP pillars, such as Rio Tinto, Shell, Anglo American, and Newmount, were abandoning the organization. The logos of these companies officially figured in the 2009 BBOP’s *Biodiversity Offset Design Handbook*, which was the output of the BBOP’s first phase of work, but these same logos shine by their absence in the 2012 BBOP’s *Standard on Biodiversity Offsets*, a document that was developed after the 2009 handbook.

It is probably not a coincidence that these industrial giants left the BBOP's advisory committee precisely when the organization was starting to engage in the process of developing a standard on biodiversity offsets, even if the precise reasons remain to be clarified. What is at stake here is the *construction* of a regulatory framework for biodiversity offsets, especially in developing countries where clear guidance in this field is often lacking. Who sets the rules regarding offsets and who verifies their success? Governments? Private companies? Independent certification agencies? A good deal of the ecology literature on offsets make important points in terms of governance, but the main focus remains on "adequate compliance" and the necessity of audits (e.g., Bull et al. 2012; Gibbons and Lindenmayer 2007). The specific issue of the mainstreaming of a global biodiversity offset standard, a step that is crucial for the potential development of a large-scale offset market, poses instead the question of the porous relationships between voluntary standards as developed by Rio Tinto or the BBOP and those set by public authorities. Mainstreaming biodiversity offsets, even strictly voluntary ones, requires an "enabling policy framework" to support this activity, such as "effective law and policy on conservation; environmental impact assessment and mitigation; land use planning and zoning; conditions for extractive and other industrial developments with biodiversity impacts; and clear national sustainable development goals and priorities with associated national biodiversity strategies and action plans" (ten Kate et al. 2004: 10). In the absence of policies or plans containing biodiversity goals, the "offsetability" of biodiversity impacts is much more difficult to assess (Pilgrim et al. 2013). The lack of such policy frameworks in many countries leaves the door open for a struggle to influence its constitution. Companies such as Rio Tinto, which presents itself as a pioneer of best practice in offsetting, are indeed in a good position to influence governments in ways that may favor their corporate interests. The BBOP, on the other hand, is also clearly engaged in exploring potential certification and verification systems for offsets (see BBOP 2008: 3).

### ***Uneven Development: Some Equity Issues***

A last avenue in the study of the material implications of biodiversity offsetting relates to the equity issues that are likely to arise locally from the distribution and allocation of "environmental health and harm" for humans as well as nonhuman nature (Sullivan 2013). This is indeed fertile ground for anthropologists or geographers who can observe in their fieldwork the distributive effects of development projects that involve offsets. However, pilot projects in offsets being few and far between, very few case studies exist, with the notable exception of Sian Sullivan's already much-cited paper that connects the extraction of uranium in Namibia with the generation of nuclear power in the UK (2013), and Caroline Seagle's research on land access issues surrounding the Rio Tinto/QMM ilmenite mine in southeast Madagascar (2011, 2012).

For both these scholars, biodiversity offsets are to be placed within the current phenomenon of "land grabbing" in developing countries, a notion that is often used in the African context to characterize the allocation of large swaths of farmland to investors to provide for the future food and fuel needs of foreign nations (De Schutter 2011). Recently, this notion has been extended to the appropriation of land and resources for industrial expansion and/or for environmental ends and christened "green grabbing" (Fairhead et al. 2012). Seagle (2011) insists on the commonalities and interdependency between these two types of land acquisition, exploring what she coins the "mining-conservation nexus." As might be expected, environmental and land access changes induced by biodiversity offsets produce the very same economic, social, and ontological effects as those that have been widely but often separately observed for local land users living around protected areas or near development projects, notably through their resettlement, lost access to critical resources, or land dispossession (Seagle 2011)—not to mention, in this "cal-



culus of casualties”, the loss of biodiversity at the development site, whose spatial and temporal specificities can never be fully compensated for by an offset (Sullivan 2013).

In what ways, then, and to what extent, does biodiversity offsetting constitute a new form of appropriation of nature, and with what particular material impacts? What are the power dynamics involved in the decision-making process, with what socioeconomic implications? These questions remain largely open for investigation, particularly as far as agrarian social relations are restructured through the development of such projects. Indeed, it might be considered unfair to accuse offset projects of repeating exactly the same ills caused by protected areas. Biodiversity offsets advocates state, for instance, that “no net loss” includes socioeconomic and cultural uses of biodiversity. A further question, then, is how it would even be possible to “offset” cultural values within a “no net loss” perspective? What kinds of compensation packages are offered? If the material translation of this particular issue has not been investigated in case studies on offsets, its strategic discursive wrapping has drawn attention. As Seagle (2012) has argued, biodiversity offsets allow a legitimation strategy through which the deleterious material impacts at the development site are “inverted” into “gifts” of sustainable development, an “ideologically useful fantasy that papers over the potentially disturbing gap between material and symbolic orders” (Sullivan 2013: 95).

## Conclusion

The growing interest in voluntary biodiversity offsets among many transnational extractive industries has been shaped through a decade-long process of “dialogues” that saw the alignment of corporate executives, senior actors in conservation organizations, and bureaucrats around the recognition that the environmental damage accruing from corporate activities represents a major business risk that can be minimized through the use of offsets. Under constant pressure from adverse campaigning from social and environmental organizations, the reputation of these large companies was at stake and with it their “license to operate”, that is, their continued access to land, markets, and capital. This initial defensive position has, however, been quickly replaced by a more offensive strategy whereby corporate liability is increasingly turned into an asset. With the long history of wetland banking in the United States in the background, offsets are increasingly framed as a nonantagonistic market-based instrument and an opportunity for business. Following Michel Callon’s observations on the process of market framing, I have argued that this work of configuration traces a normative course of action as far as conservation is concerned, where financial motives increasingly dictate conducts, a paradigm shift away from enforceable environmental legislation. The emergence of a dedicated, small, and interactive community of biodiversity offsets experts, composed of corporate leaders, financial institutions, conservation NGOs, and private environmental consultancies, has greatly contributed to this process.

However, the collective work that has been carried out under the umbrella of the BBOP to weave together a seductive business case and the promise of reconciling conservation and development faces many challenges when it comes to its implementation in the real world. The market framing of offsets appears here as a fragile result dependent upon substantial and costly investments. The complexity of measuring biodiversity in a way that is both intelligible to capital and scientifically defensible, the absence of a generalized standard to assess the quality of offset projects, and the many uncertainties that revolve around the impacts of these projects on local communities are all reasons that cast serious doubts about offsets’ ability to reduce biodiversity loss on technical, governance, and social grounds. Given all the developments under way and

the multiplication of pilot projects, these are issues that could become fruitful research subjects in the near future.

## ■ ACKNOWLEDGMENTS

I am extremely grateful to Paige West and Dan Brockington for accepting my article proposal. I also would like to thank my colleagues Valérie Boisvert, Christophe Bonneuil, and David Dumoulin for their constructive comments, as well as the Région Ile de France and the Institute for Research and Innovation in Society (IFRIS), who provided the funding to undertake this study.

■ **SARAH BENABOU** is postdoctoral fellow at the Centre Alexandre Koyré/IFRIS, Paris. Her principal research interest is in the evolution of environmental conservation in the global South (with a focus on India), as part of a wider interest in the political economy of environmental conservation. She is currently engaged in an ethnography of the making of voluntary standards for biodiversity offsets. Before this research project, she worked on the pitfalls of environmental conservation in India. She submitted in 2012 a PhD thesis in social anthropology entitled “Conserving Nature by Excluding Humans? The Struggle for Access and Use of Natural Resources in the Nanda Devi Biosphere Reserve, Uttarakhand (India)” at the Ecole des Hautes Etudes en Sciences Sociales, Paris.

## ■ NOTES

1. I can, however, refer the reader to some of the most recent articles that provide a global overview of the debates in ecology on biodiversity offsets: Bull et al. 2013; Brownlie et al. 2013; Pilgrim et al. 2013.
2. I choose to focus on the mining industry, but many parallels can be drawn with the oil and gas sector, which has been exploring the use of biodiversity offsets around the same time through the Energy and Biodiversity Initiative (EBI 2003).

## ■ REFERENCES

- Anstee, Stuart. 2010. “How Rio Tinto Is Approaching Their Objective of Net Positive Impact on Biodiversity.” Video recorded during the COP10 CBD meeting in Nagoya, Japan. <http://vimeo.com/18582625> (accessed 27 November 2013).
- Baranzini, Andrea, and Philippe Thalmann. 2004. “An Overview of the Economics of Voluntary Approaches in Climate Policies.” Pp. 1–30 in *Voluntary Approaches in Climate Policy*, ed. Andrea Baranzini and Philippe Thalmann. Cheltenham, UK: Edward Elgar.
- Bayon, Ricardo. 2008. “Banking on Biodiversity.” Pp. 123–137 in *State of the World 2008*, ed. Gary Gardner and Thomas Prugh. New York: Norton/The Worldwatch Institute.
- BBOP (Business and Biodiversity Offsets Programme). 2008. “A Draft Consultation Paper for Discussion and Comment.” Convention on Biological Diversity. <https://www.cbd.int/doc/meetings/cop/cop-09/information/cop-09-inf-29-en.pdf> (accessed 7 May 2014).
- BBOP (Business and Biodiversity Offsets Programme). 2009. *Biodiversity Offset Design Handbook*. Washington, DC: Business and Biodiversity Offsets Programme.

- BBOP (Business and Biodiversity Offsets Programme). 2012. *Standard on Biodiversity Offsets*. Washington, DC: Business and Biodiversity Offsets Programme.
- BBOP (Business and Biodiversity Offsets Programme). 2013. *To No Net Loss and Beyond: An Overview of the Business and Biodiversity Offsets Programme*. Washington, DC: Business and Biodiversity Offsets Programme.
- Bekessy, Sarah A., Brendan A. Wintle, David B. Lindenmayer, Michael A. McCarthy, Mark Colyvan, Mark A. Burgman and Hugh P. Possingham. 2010. "The Biodiversity Bank Cannot Be a Lending Bank." *Conservation Letters* 3: 151–158. doi:0.1111/j.1755-263X.2010.00110.x.
- Brownlie, Susie, Nicholas King, and Jo Treweek. 2013. "Biodiversity Tradeoffs and Offsets in Impact Assessment and Decision Making: Can we Stop the Loss?" *Impact Assessment and Project Appraisal* 31, no. 1: 24–33. doi:10.1080/14615517.2012.736763.
- Bull, Joseph W., K. Blake Suttle, Ascelin Gordon, Navinder J. Singh, and E. J. Milner-Gulland. 2013. "Biodiversity Offsets in Theory and Practice." *Oryx* 47, no. 3: 369–380. doi:10.1017/S003060531200172X.
- Büscher, Bram, Sian Sullivan, Katia Neves, Jim Igoe, and Dan Brockington. 2012. "Towards a Synthesized Critique of Neoliberal Biodiversity Conservation." *Capitalism, Nature, Socialism* 23, no. 2: 4–30. doi:0.1080/10455752.2012.674149.
- Buxton, Abbi 2012. *MMSD+10: Reflecting on a Decade*. IIED Discussion Paper. London: International Institute for Environment and Development.
- Callon, Michel, ed. 1998. "An Essay of Framing and Overflowing." Pp. 244–269 in *The Laws of the Market*, ed. Michel Callon. Oxford: Blackwell.
- Carroll, Nathaniel, Jessica Fox, and Ricardo Bayon. 2008. *Conservation and Biodiversity Banking: A Guide to Setting Up and Running Biodiversity Credit Trading Systems*. London: Earthscan.
- Carrier, James, and Paige West, eds. 2009. *Virtualism, Governance and Practice: Vision and Execution in Environmental Conservation*. New York: Berghahn Books.
- CI (Conservation International). 2014. "Center for Environmental Leadership in Business". Conservation International. <http://www.conservation.org/projects/Pages/Center-for-Environmental-Leadership-in-Business.aspx> (accessed 25 August 2014).
- Clare, Shari, Naomi Krogman, Lee Foote, and Nathan Lemphers. 2011. "Where Is the Avoidance in the Implementation of Wetland Law and Policy?" *Wetlands Ecology and Management* 19: 165–182. doi:10.1007/s11273-011-9209-3.
- DECCW (Department of Environment, Climate Change and Water). 2009. *Overview of the Biodiversity Credit Market*. Sydney, Australia: Department of Environment, Climate Change and Water.
- DEFRA (Department for the Environment, Food and Rural Affairs). 2011. *Biodiversity Offsets: Guiding Principles for Biodiversity Offsetting*. London: Department for the Environment, Food and Rural Affairs.
- Dempsey, Jessica. 2013. "Biodiversity Loss as Material Risk: Tracking the Changing Meanings and Materialities of Biodiversity Conservation." *Geoforum* 45: 41–51. doi:10.1016/j.geoforum.2012.04.002.
- De Schutter, Olivier. 2011. "How Not to Think of Land-Grabbing: Three Critiques of Large-scale Investments in Farmland." *Journal of Peasant Studies* 38, no. 2: 249–279. doi:10.1080/03066150.2011.559008.
- Doswald, Nathalie, Monica Barcellos Harris, Matt Jones, Ernani Pilla, and Ivo Mulder. 2012. *Biodiversity Offsets: Voluntary and Compliance Regimes—a Review of Existing Schemes, Initiatives and Guidance for Financial Institutions*. Cambridge: UNEP-WCMC; Geneva: UNEP FI.
- Dowie, Mark. 2009. *Conservation Refugees: The Hundred-Years Conflict between Global Conservation and Native Peoples*. Cambridge, MA: MIT Press.
- Earthworks and Oxfam America. 2004. *Dirty Metals: Mining, Communities and the Environment*. [http://www.earthworksaction.org/files/publications/NDG\\_DirtyMetalsReport\\_HR.pdf](http://www.earthworksaction.org/files/publications/NDG_DirtyMetalsReport_HR.pdf) (accessed 25 August 2014).
- EBI (Energy and Biodiversity Initiative). 2003. "Integrating Biodiversity Conservation into Oil and Gas Development." Energy and Biodiversity Initiative. [http://www.theebi.org/pdfs/ebi\\_report.pdf](http://www.theebi.org/pdfs/ebi_report.pdf) (accessed 7 May 2014).

- Eftec, IEEP, et al. 2010. *The Use of Market-Based Instruments for Biodiversity Protection: The Case of Habitat Banking*. Technical report. [http://ec.europa.eu/environment/enveco/pdf/eftec\\_habitat\\_technical\\_report.pdf](http://ec.europa.eu/environment/enveco/pdf/eftec_habitat_technical_report.pdf) (accessed 5 May 2014).
- Equator Principles. 2006. "The Equator Principles: A Financial Industry Benchmark for Determining, Assessing and Managing Social and Environmental Risk in Project Financing." Equator Principles. [http://www.equator-principles.com/resources/equator\\_principles\\_II.pdf](http://www.equator-principles.com/resources/equator_principles_II.pdf) (accessed 24 April 2014).
- Evans, Megan C., Martine Maron, Philip Gibbons, and Hugh P. Possingham. 2013. "A Bird in the Hand Is Worth Two in the Bush: Ecological Time Preference and Biodiversity Offsets." Fifteenth Annual BIOECON Conference, 18–20 September 2013, Kings College Cambridge, England.
- Fairhead, James, Leach, Melissa, and Ian Scoones. 2012. "Green Grabbing: A New Appropriation of Nature?" *The Journal of Peasant Studies* 39, no. 2: 237–261. doi:10.1080/03066150.2012.671770.
- Gibbons, Philip., and David B. Lindenmayer. 2007. "Offsets for Land Clearing: No Net Loss or the Tail Wagging the Dog?" *Ecological Management and Restoration* 8, no. 1: 26–31. doi:10.1111/j.1442-8903.2007.00328.x.
- Goffman, Erving 1974. *Frame Analysis: An Essay on the Organization of Experience*. Boston: Northeastern University Press.
- Hajer, Maarten A. 1995. *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Oxford: Oxford University Press.
- Harvey, David. 1993. "The Nature of Environment: The Dialectics of Social and Environmental Change." *Socialist Register* 29: 1–51.
- Hobbs, Richard J., Lauren M. Hallett, Paul R. Ehrlich, and Harold A. Mooney. 2011. "Intervention Ecology: Applying Ecological Science in the Twenty-First Century." *Bioscience* 61, no. 6: 442–450. doi:10.1525/bio.2011.61.6.6.
- Howarth, Lorna. 2013. "A License to Trash? Why Biodiversity Offsetting (BO) Will Be a Disaster for the Environment." *Ecologist*, 9 September. [http://www.theecologist.org/News/news\\_analysis/2048513/a\\_license\\_to\\_trash\\_why\\_biodiversity\\_offsetting\\_bo\\_will\\_be\\_a\\_disaster\\_for\\_the\\_environment.html](http://www.theecologist.org/News/news_analysis/2048513/a_license_to_trash_why_biodiversity_offsetting_bo_will_be_a_disaster_for_the_environment.html) (accessed 7 May 2013).
- ICMM (International Council on Mining and Metals). 2004. *Dirty Metals: ICMM Response*. London: International Council on Mining and Metals.
- ICMM (International Council on Mining and Metals). 2005. *Biodiversity Offsets: A Briefing Paper for the Mining Industry*. London: International Council on Mining and Metals.
- ICMM (International Council on Mining and Metals) and IUCN (International Union for Conservation of Nature). 2012. "Independent Report on Biodiversity Offsets. Prepared by the Biodiversity Consultancy." The Biodiversity Consultancy. <http://www.thebiodiversityconsultancy.com/wp-content/uploads/2013/06/BiodiversityOffsets-Rpt-5.pdf> (accessed 5 December 2013).
- IFC (International Finance Corporation). 2012. "Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources." International Finance Corporation. [http://www.ifc.org/wps/wcm/connect/bff0a28049a790d6b835faa8c6a8312a/PS6\\_English\\_2012.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/bff0a28049a790d6b835faa8c6a8312a/PS6_English_2012.pdf?MOD=AJPERES) (accessed 27 November 2013).
- Igoe, Jim, and Dan Brockington. 2007. "Neoliberal Conservation: A Brief Introduction." *Conservation and Society* 5, no. 4: 432–449.
- Igoe, Jim, Katja Neves, and Dan Brockington. 2010. "A Spectacular Eco-Tour Around the Historic Bloc: Theorizing the Convergence of Biodiversity Conservation and Capitalist Expansion." *Antipode* 42, no. 3: 486–512. doi:0.1111/j.1467-8330.2010.00761.x.
- IUCN (International Union for Conservation of Nature). 2003. "Mining and Biodiversity: Terms of Reference for the Dialogue between IUCN/ICMM." International Union for Conservation of Nature. <http://cmsdata.iucn.org/downloads/miniucnicmmtorfin.pdf> (accessed 5 December 2013).
- IUCN (International Union for Conservation of Nature). 2006. *Operational Guidelines for Private Sector Engagement*. Gland, Switzerland: IUCN.
- Kareiva, Peter, Michelle Marvier, and Robert Lalasz. 2012. "Conservation in the Anthropocene: Beyond Solitude and Fragility." *The Breakthrough*, Winter 2012. <http://thebreakthrough.org/index.php/journal/past-issues/issue-2/conservation-in-the-anthropocene/#> (accessed 19 November 2013).

- Kiesecker, Joseph M., Holly Copeland, Amy Pocewicz, Nate Nibbelink, Bruce McKenney, John Dahlke, Matt Holloran, and Dan Stroud. 2009. "A Framework for Implementing Biodiversity Offsets: Selecting Sites and Determining Scales." *BioScience* 59, no. 1: 77–84. doi:10.1525/bio.2009.59.1.11.
- MacDonald, Kenneth Ian. 2010. "The Devil Is in the (Bio)diversity: Private Sector 'Engagement' and the Restructuring of Biodiversity Conservation." *Antipode* 42, no. 3: 513–550. doi:10.1111/j.1467-8330.2010.00762.x.
- MacDonald, Kenneth Ian, and Catherine Corson. 2012. "'TEEB Begins Now': A Virtual Moment in the Production of Natural Capital." *Development and Change* 43, no. 1: 159–184. doi:10.1111/j.1467-7660.2012.01753.x.
- Madsen, Becca, Nathaniel Carroll, Daniel Kandy, and Genevieve Bennett. 2011. *State of Biodiversity Markets Report: Offset and Compensation Programs Worldwide*. Washington, DC: Forest Trends.
- Maron, Martine, Richard J. Hobbs, Atte Moilanen, Jeffrey W. Matthews, Kimberly Christie, Toby A. Gardner, David A. Keith, David B. Lindenmayer, and Clive A. McAlpine. 2012. "Faustian Bargains? Restoration Realities in the Context of Biodiversity Offset Policies." *Biological Conservation* 155: 141–148.
- Maron, Martine, Jonathan R. Rhodes, and Philip Gibbons. 2013. "Calculating the Benefit of Conservation Actions." *Conservation Letters* 6, no. 5: 359–367. doi:10.1111/conl.12007.
- McAfee, Kathleen. 2012. "The Contradictory Logic of Global Ecosystem Services Markets." *Development and Change* 43, no. 1: 105–131. doi:10.1111/j.1467-7660.2011.01745.x.
- Miranda, Marta, Philip Burris, Jessie Froy Bingcang, Phil Shearman, Jose Oliver Briones, Antonio La Viña, and Stephen Menard. 2003. *Mining and Critical Ecosystems: Mapping the Risks*. Washington, DC: World Resources Institute.
- NRC (National Research Council). 2001. *Compensating for Wetland Losses under the Clean Water Act*. Washington, DC: National Academy Press.
- OECD (Organization for Economic Cooperation and Development). 2013. *Scaling-Up Finance Mechanisms for Biodiversity*. Paris: OECD.
- Parker, Charlie, and Matthew Cranford. 2010. *The Little Biodiversity Finance Book*. London: Global Canopy Programme.
- Pilgrim, John D., Susie Brownlie, Jonathan M. M. Ekstrom, Toby A. Gardner, Amrei von Hase, Kerry ten Kate, Conrad E. Savy, et al. 2013. "A Process for Assessing the Offsetability of Biodiversity Impacts." *Conservation Letters* 6, no. 5: 376–384. doi:10.1111/conl.12002.
- Ponte, Stefano, Peter Gibbon, and Jakob Vestergaard. 2011. "Governing Through Standards: An Introduction." Pp. 1–24 in *Governing through Standards: Origins, Drivers and Limitations*, ed. Stefano Ponte, Peter Gibbon, and Jakob Vestergaard. Basingstoke, UK: Palgrave Macmillan.
- Porter, Theodore. 1995. *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*. Princeton, NJ: Princeton University Press.
- Quétier, Fabien, and Sandra Lavorel. 2011. "Assessing Ecological Equivalence in Biodiversity Offset Schemes: Key Issues and Solutions." *Biological Conservation* 144, no. 12: 2991–2999. doi:10.1016/j.biocon.2011.09.002.
- Quigley, Jason T., and David J. Harper. 2006. "Effectiveness of Fish Habitat Compensation in Canada in Achieving No Net Loss." *Environmental Management* 37: 351–366. doi:10.1007/s00267-004-0263-y.
- Rajvanshi, Asha, and Vinod B. Mathur. 2010. "Reconciling Conservation and Development: the Role of Biodiversity Offsets." Pp. 255–286 in *Biodiversity in Environmental Assessment: Enhancing Ecosystem Services for Human Well-Being*, ed. Roel Slootweg, Asha Rajvanshi, Vinod B. Mathur, and Arend Kolhoff. Cambridge: Cambridge University Press.
- Rio Tinto. 2004. *Rio Tinto's Biodiversity Strategy*. London and Melbourne: Rio Tinto.
- Robertson, Morgan. 2000. "No Net Loss: Wetland Restoration and the Incomplete Capitalization of Nature." *Antipode* 32, no. 4: 463–493. doi:10.1111/1467-8330.00146.
- Robertson, Morgan. 2004. "The Neoliberalization of Ecosystem Services: Wetland Mitigation Banking and Problems in Environmental Governance." *Geoforum* 35, no. 3: 361–373. doi:10.1016/j.geoforum.2003.06.002.

- Robertson, Morgan. 2006. "The Nature That Capital Can See: Science, State, and Market in the Commodification of Ecosystem Services." *Environment and Planning D: Society and Space* 24, no. 3: 367–387. doi:0.1068/d3304.
- Robertson, Morgan. 2011. "Measurement and Alienation: Making a World of Ecosystem Services." *Transactions of the Institute of British Geographers* 37, no. 3: 386–401. doi:10.1111/j.1475-5661.2011.00476.x.
- Salzman, James, and J. B. Ruhl. 2000. "Currencies and the Commodification of Environmental Law." *Stanford Law Review* 53: 607–694. doi:10.2139/ssrn.206628.
- Seagle, Caroline. 2011. "The Mining-Conservation Nexus: Rio Tinto, Development 'Gifts' and Contested Compensation in Madagascar." LDPI Working Paper 11. <http://www.plaas.org.za/plaas-publication/ldpi-11#sthash.QJW7Hr4F.dpuf> (accessed 3 December 2013).
- Seagle, Caroline. 2012. "Inverting the Impacts: Mining, Conservation and Sustainability Claims Near the Rio Tinto/QMM Ilmenite Mine in Southeast Madagascar." *Journal of Peasant Studies* 39, no. 2: 447–477. doi:0.1080/03066150.2012.671769.
- Sullivan, Sian. 2012. *Financialisation, Biodiversity Conservation and Equity: Some Currents and Concerns*. Penang, Malaysia: Third World Network.
- Sullivan, Sian. 2013. "After the Green Rush? Biodiversity Offsets, Uranium Power and the 'Calculus of Casualties' in Greening Growth." *Human Geography* 6, no. 1: 80–101.
- TBC (The Biodiversity Consultancy). 2012. "Private Sector No Net Loss Commitments." The Biodiversity Consultancy. <http://www.thebiodiversityconsultancy.com/wp-content/uploads/2013/07/Private-Sector-No-Net-Loss-commitments2.pdf> (accessed 7 May 2014).
- TBC (The Biodiversity Consultancy). 2013a. "Globally and Nationally Important Sites as Biodiversity Offset Opportunities." The Biodiversity Consultancy. <http://www.thebiodiversityconsultancy.com/wp-content/uploads/2013/07/Globally-and-nationally-important-sites-as-biodiversity-offset-opportunities.pdf> (accessed 7 May 2014).
- TBC (The Biodiversity Consultancy). 2013b. "Government Policies on Biodiversity Offsets." The Biodiversity Consultancy. <http://www.thebiodiversityconsultancy.com/wp-content/uploads/2013/07/Government-policies-on-biodiversity-offsets3.pdf> (accessed 27 November 2013).
- TEEB (The Economics of Ecosystems and Biodiversity). 2010. *Mainstreaming the Economics of Nature: A Synthesis of the Approach, Conclusions and Recommendations of TEEB*. <http://www.unep.org/pdf/LinkClick.pdf> (accessed 1 December 2013).
- ten Kate, Kerry, Joshua Bishop, and Ricardo Bayon. 2004. *Biodiversity Offsets: Views, Experience and the Business Case*. Gland, Switzerland: IUCN; London: Insight Investment.
- TNC (The Nature Conservancy). 2014. "Smart Development: Development by Design". The Nature Conservancy. <http://www.nature.org/ourinitiatives/urgentissues/smart-development/> (accessed 25 August 2014)
- Walker, Susan, Ann L. Brower, R. T. Theo Stephens, and William G. Lee. 2009. "Why Bartering Biodiversity Fails." *Conservation Letters* 2: 149–157. doi:0.1111/j.1755-263X.2009.00061.x.
- White, Wayne. 2008. "The Advantages and Opportunities." Pp. 33–42 in *Conservation and Biodiversity Banking: A Guide to Setting Up and Running Biodiversity Credit Trading Systems*, ed. Nathaniel Carroll, Jessica Fox, and Ricardo Bayon. London: Earthscan.