

# Biodiversity offsetting and conservation: reframing nature to save it

EVANGELIA APOSTOLOPOULOU and WILLIAM M. ADAMS

**Abstract** Biodiversity offsetting involves the balancing of biodiversity loss in one place (and at one time) by an equivalent biodiversity gain elsewhere (an outcome referred to as No Net Loss). The conservation science literature has chiefly addressed the extent to which biodiversity offsets can serve as a conservation tool, focusing on the technical challenges of its implementation. However, offsetting has more profound implications than this technical approach suggests. In this paper we introduce the concept of policy frames, and use it to identify four ways in which non-human nature and its conservation are reframed by offsetting. Firstly, offsetting reframes nature in terms of isolated biodiversity units that can be simply defined, measured and exchanged across time and space to achieve equivalence between ecological losses and gains. Secondly, it reframes biodiversity as lacking locational specificity, ignoring broader dimensions of place and deepening a nature–culture and nature–society divide. Thirdly, it reframes conservation as an exchange of credits implying that the value of non-human nature can be set by price. Fourthly, it ties conservation to land development and economic growth, foreshadowing and bypassing an oppositional position. We conclude that by presenting offsetting as a technical issue, the problem of biodiversity loss due to development is depoliticized. As a result the possibility of opposing and challenging environmental destruction is foreclosed, and a dystopian future of continued biodiversity loss is presented as the only alternative.

**Keywords** Biodiversity units, conservation banking, conservation credits, metrics, mitigation hierarchy, offsets, offsetting

## Introduction

Offsetting is rapidly expanding as a promising policy for allowing development and economic growth while achieving a No Net Loss of biodiversity. This expansion is international. One of its key moments was the establishment of the Business and Biodiversity Offsets

Programme (BBOP) in 2004 by a partnership of companies, financial institutions, government agencies, business and non-governmental organizations (BBOP, 2015). By 2011, at least 72 countries had either passed or were developing laws or policies related to biodiversity offsets or No Net Loss (Madsen et al., 2011), and the EU has held a public consultation on a No Net Loss policy (European Commission, 2015). In 2014 BBOP co-organized a conference in London with the Star Trek inspired title *To No Net Loss of Biodiversity and Beyond*. This was pitched as ‘the first global conference on approaches to avoid, minimize, restore, and offset biodiversity loss’, and brought together various corporations, governments and non-governmental organizations (BBOP, 2014).

Biodiversity offsets are defined as ‘measurable conservation outcomes designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken’ (BBOP, 2012a, p. 13). In effect, offsetting seeks to compensate for losses to biodiversity in one place (and at one time) by creating equivalent gains elsewhere. Thus forest cleared to make way for a development project might be compensated through the restoration of forest (or prevention of forest loss) somewhere else and in some cases at a later time. The appeal of offsetting to conservationists is its potential, when taken as part of the so-called mitigation hierarchy (BBOP, 2009), to deliver a No Net Loss (or net gain) conservation outcome (BBOP, 2012a) by keeping a balance between nature destroyed by development and nature for conservation. The attraction of offsetting to developers is that it provides a practical, cost-effective and predictable process to address the environmental impacts of development while enabling the relocation of environmental compensation across space and time.

The conservation science literature has so far focused on the technical challenges of implementing offsetting. There has been discussion of ways to equate ecological losses and gains in development and offset sites, to select appropriate biodiversity currencies, accounting systems and exchange rules, to address practical challenges for adequate monitoring, compliance and post-implementation evaluation, and to deal with perverse incentives (e.g. Bull et al., 2013; Gardner et al., 2013; Pilgrim et al., 2013; Gordon et al., 2015). Despite criticisms (e.g. Quétier & Lavorel, 2011; Maron et al., 2012) this literature tends to approach offsetting as a neutral conservation tool and take for granted the role of

EVANGELIA APOSTOLOPOULOU (Corresponding author) and WILLIAM M. ADAMS  
Department of Geography, University of Cambridge, CB2 3EN, Cambridge, UK  
E-mail ea367@cam.ac.uk

Received 24 March 2015. Revision requested 5 May 2015.  
Accepted 22 June 2015. First published online 6 October 2015.

offsetting as a solution to the problem of the environmental impacts of development or even as a means to achieve sustainable development (e.g. Bayon et al., 2008; Gordon et al., 2015).

The implications of offsetting are more substantial than these essentially technical discussions suggest. The underlying promise of offsetting, namely the production of equivalent natures (E. Apostolopoulou & W.M. Adams, unpubl. data), has the potential to bring about a profound change both to the conception of nature and the practice of conservation. Here, we consider these changes and their implications, using the concept of policy frames (Entman, 1993). We define framing as the act of defining problems, diagnosing their causes, making moral judgements and suggesting remedies (Tuchman, 1978; Apostolopoulou & Paloniemi, 2012). Focusing on policy frames can shed light on the implicit politics of presenting (and chiefly analysing) offsetting as neutral and free of ideology. The latter is important since framing is a critical and unavoidable element of policy-making and thus an understanding of the way a policy issue is framed is essential (Lakoff, 2010) if the consequent policy options and underlying value struggles (Sullivan & Hannis, 2015) are to be unravelled and properly assessed. The way nature is discussed in debates about development (as when it is set within a frame of thinking about offsetting) affects the chances that it will survive or be destroyed.

As Monbiot (2014) observes, offsetting reframes the issue of conservation: 'those who believe they can protect nature by adopting this frame are stepping into a trap their opponents have set'. Here, we identify four ways in which offsetting achieves such a reframing of biodiversity and its conservation and we explore the ways it changes the options for conservation by bringing in and disallowing certain kinds of arguments.

### Reframing biodiversity conservation

Offsetting reframes non-human nature as a score of isolated biodiversity units

In offsetting, biodiversity and ecosystems are defined, valued and characterized in terms of quantitative units or credits that are used to represent selected ecosystem attributes and are considered exchangeable across space and time (e.g. DEC, 2006; Defra, 2013). The selection of units of measurement, currencies and rules for exchanges between different sites has proven inherently challenging (Tucker et al., 2013). The attempt to design simple and practical offset metrics has often made them highly reductionist (e.g. the simple habitat area ratio based metrics widely used in Germany and the USA, and more sophisticated metrics such as the Australian Habitat Hectares offsetting scheme initially

developed in Victoria; Tucker et al., 2013; IEEP, 2014). In the UK concerns have been raised that the offsetting process will resemble a fast 'box-ticking exercise' that is inadequate to assess a site's year-round biodiversity (Kinver, 2013).

The creation of offset metrics to represent ecological losses and gains through numerical scores (Environment Bank, 2013a) involves a narrowing of focus to isolated parts of an ecosystem. This narrowing is fundamental to offsetting calculations and reproduces the reductionist myth of simplicity (Levins & Lewontin, 1980). This is inherently unsatisfactory and impoverishes both the advance of theory and conservation practice because it traps ecology in reductionist strategies involving a continuous retreat from the study of intrinsically complex systems (Levins & Lewontin, 1980). Ecosystems are dialectically composed, dynamic, multi-layered systems that do not form simple mappable units (Boitani et al., 2015), and biodiversity is non-interchangeable in terms of type, space and time (Walker et al., 2009). No single surrogate (or even a series of them) can entirely capture biodiversity, since not all biodiversity attributes are measurable, and therefore it is impossible to guarantee that no biodiversity is lost (and thus that No Net Loss is actually achieved; BBOP, 2012b; Bull et al., 2013; Gardner et al., 2013).

The use of reductionist metrics is common in conservation but the way they are used in offsetting is distinctive in several critical ways. Firstly, offsetting metrics incorporate assumptions about future states of nature, both in terms of future rates of loss (which conservation action can be predicted to slow; Seagle, 2012) and in terms of the potential of ecological restoration. In reframing biodiversity as fully replaceable and re-creatable by human action, offsetting deliberately confuses the state of ecological restoration science and practice with its aspiration. Restoration ecology has advanced greatly in sophistication but it is 'not a magic bullet that provides instant ecosystems of the desired type' (Menz et al., 2013). Techniques such as the relocation of soils from Ancient Woodland on the route of the HS2 high-speed train in the UK are at best experimental (HS2, 2013) and many studies have proven that the majority of offsets do not deliver what they promise (e.g. Kettlewell et al., 2008). Secondly, as a standard procedure, offsetting conflates the state of nature with other factors, for example applying crude multipliers to address issues such as time lags between biodiversity loss and future gain in an offset site (Eftec, IEEP et al., 2010; HS2, 2013), or the distance between the development and offset sites (IEEP, 2014). Such calculations raise fundamental problems of incommensurability because such issues cannot possibly be adequately addressed by simply increasing the number of credits required to offset the damage caused in a development site.

Thirdly, the crude reductionism of offsetting metrics is not a technical issue that more scientific data can resolve. On the contrary, it is a defining characteristic of the

offsetting logic itself. The promise of offsetting to resolve the longstanding conflicts between economic development and conservation (Bull & Brownlie, 2016) reproduces the classic 'win-win' scenario of sustainable development and depends significantly on the reductionism of its metrics. Offsetting is useful precisely because the efficiency and cost-effectiveness of its methodologies make the quantification of losses and gains in planning more straightforward, less costly and less time consuming than alternative approaches (e.g. Defra, 2013). The purpose of offsetting is not conservation as such, but to 'give greater certainty for businesses' in their development planning (Commonwealth of Australia, 2012, p. 4). Current international best practice in offsetting (Gordon et al., 2015) is represented by the Business and Biodiversity Offsets Programme launched by Forest Trends, an organization created to promote market-based approaches to conservation and bridge 'traditional divides' between industry, donors and environmental groups (Forest Trends, 2015). Ecosystems are sliced into biodiversity units precisely to simplify the measurement of development impacts, and these units are purposefully separated from their ecological context through functional and spatial abstraction (Robertson, 2004; Sullivan, 2013a; see also Bumpus & Liverman, 2008, about carbon offsets) to become equivalent and thus to allow their exchange across space and time. Interestingly, Robertson (2006, p. 384) notes that the 'rapid assessment methods' that are currently used in wetland mitigation banking in the USA are the descendants of much more complex rapid assessment methods developed in the early 1980s, when wetland banking was performed only non-commercially. Offsetting therefore champions mechanistic reductionism to quantify biodiversity in a way that makes it possible to speak about it 'in business terms' (Baker, 2014) and make non-human nature something 'that capital can see' (Robertson, 2006).

#### Offsetting removes the place specificity of nature

In its representation of non-human nature as biodiversity units, offsetting explicitly reframes the links between biodiversity, conservation and place at the most fundamental level by reworking nature's specific relation to place. Location is critical to biodiversity both in biogeographical terms (biodiversity reflects the geophysical context; Comer et al., 2015) and in cultural terms (biodiversity in situ reflects historical human management or impact, and is reflected in extant cultural values). Estimations of conservation value have long recognized the importance of history, culture and place in conservation sites (e.g. criteria of typicality, recorded history, position in an ecological or geographical unit, and intrinsic appeal; Ratcliffe, 1977). In offsetting, the biological and social characteristics of places are treated only as representative of a standard category that can be replicated in the offset site (for

example the Australian government argues that offsets can in some circumstances also compensate for adverse impacts on heritage values; Commonwealth of Australia, 2012). Thus although the need to consider the cultural or social values of biodiversity is often recognized by the advocates of offsetting (e.g. DEC, 2006; BBOP, 2012a), such factors are typically absent in technical debates. The abstracted biodiversity units used in offset metrics (e.g. Tucker et al., 2013) take no account of the cultural or historical importance of place and the social ties between communities and particular habitats and ecosystems.

This is not, however, just a technical limitation of the metrics in use but rather a consequence of the way the core logic of offsetting reframes nature's place. By denying social history to landscapes, offsetting promotes a techno-managerial vision for conservation (Adams, 2015; c.f. Asafu-Adjaye et al., 2015) and frames the latter within a 'flat world' (Friedman, 2005), where exchanges of ecological losses and gains can be separated from their ecological, cultural, socio-economic and political context. Offsetting often involves a notional trade with offset sites far from the development sites (e.g. Robertson, 2000; see also the EU discussion on offset trades across national borders; European Commission, 2013). In the process, cultural engagements with place are disrupted or lost, and public access to conservation sites, biodiversity and more generally to green spaces may be changed (lost in one place, gained somewhere else) or restricted (e.g. if an accessible habitat is replaced with one under strict protection; Seagle, 2012). Under the surface of an apparently technical process to calculate equivalence, offsetting in fact establishes a new policy frame that has the potential to create outcomes that are socially and spatially uneven (as there are always specific winners and losers to such exchanges of environmental goods and bads; e.g. Ruhl & Salzman, 2006; Sullivan, 2013a). Even though offset metrics may calculate the importance of the places lost only in terms of ecological units, they do so by portraying nature as external to society and by ignoring any links between people and nature, the result is a total remaking of places (both in the development and the offset sites) in a way that reflects an increasing social reproduction of non-human nature driven by specific corporative interests and not by concerns over socio-environmental and spatial justice.

#### Offsetting reframes conservation as an exchange of credits

Biodiversity offsetting is a part of the fundamental shift in the way we think about non-human nature towards the economic valuation of ecosystem services and natural capital (Sukhdev et al., 2014; c.f. World Forum on Natural Capital, 2015). In the language of offsetting, pre-existing conservation sites are reframed as territories providing ecosystem services

(ten Kate et al., 2004) and ecological credits are framed as products owned by prospective 'sellers' who are in turn advised how to know better the 'value' of their product when selling it to prospective 'buyers' (Roberts & Waage, 2007). Conservation activities are thus becoming part of confidential commercial transactions over land for the creation of offset sites (Conservation Bank Agreements, Ecosystem Marketplace, 2015).

While the translation of nature from the scientific language of ecosystems into the financial language of capital is generic, reflecting the wider shift towards neoliberal approaches to conservation (Büscher et al., 2012; Apostolopoulou & Adams, 2015), offsetting is quite specific in its dependence on a market-based frame for conservation. Offsetting reframes conservation action as an exchange of ecological credits, where numerical scores that are considered equivalent in both ecological and monetary terms represent nature lost, saved or recreated. This creation of ecologically equivalent credits is the defining characteristic of offsetting. The exchange between ecological gains and losses across space and time occurs in all the common approaches for delivering offsets, namely bespoke, project-specific offsets and conservation (or habitat) banking, but its potential to transform ecological credits into assets becomes most evident in the latter (Madsen et al., 2011). Conservation banking allows developers to buy credits (representing species or habitats) in order to either use them for internal mitigation (purchasing their right to degrade nature) or sell them to others (or both). This establishes a market for developers' compensation liabilities (eftec, IEEP et al., 2010; E. Apostolopoulou & W.M. Adams, unpubl. data), and allows credit purchasers to be involved in a for-profit version of conservation (Sullivan, 2013b).

Environmental offsetting is further advanced in the context of carbon than in that of biodiversity. Unlike carbon, biodiversity is always tied to place, making trade more problematic in technical terms, and more questionable in its principles than it already is for carbon (e.g. Bumpus & Liverman, 2008; Lohmann, 2012). To overcome this and make biodiversity more accountable, marketable and tradable, there are attempts to create global units for biodiversity exchange, such as the Verified Conservation Areas registry (VCA, 2015), which will list areas where biodiversity and ecosystem services are certified to be protected or restored 'much as houses are listed on a real estate board' (Hamrick, 2014).

Offsetting therefore reframes conservation practice around environmental markets, with monetary payments for biodiversity credits after the model of carbon trading. The resulting arrangements owe little to ecology. Ecosystems can be said to deliver bundles of services, and these can be stacked (or paid together to the landowners) or disaggregated. Robertson (2012) points out that an interlocking set of ecological relations in a freshwater ecosystem might be defined as salmonid habitat credits and temperature credits and sold separately to interested buyers in other areas to compensate

for their environmental impacts. Such a deal makes no ecological sense.

In theory, the price of conservation credits should reflect the marginal cost of securing an offset (Conway et al., 2013), rather than the economic value of the nature lost. However, the opinions of the governments promoting offsetting show that such distinctions are quite feigned: according to the Australian Government the 'use of market-based mechanisms for delivering offsets is supported as a means of determining the *conservation value* of both the proposed action site and the proposed offset' (Commonwealth of Australia, 2012, p. 26; our emphasis), while the UK's Government Green Paper on offsetting framed environmental compensation as something that could be bought 'off-the-shelf' from a market (Defra, 2013, p. 5). The act of putting a price on nature does determine the cost to the developer of destroying it. A simplistic market logic, largely based on neoclassical economics, might suggest that such prices will increase recognition of nature's value and hence reduce destruction. However, subjecting nature to the vagaries of the market means that prices can be highly variable (ranging from EUR 30,000 to EUR 1.2 million per hectare; Conway et al., 2013), and reflect restoration costs, land prices, supply and demand, speculative action by landowners (Madsen et al., 2011) and even financial crises (Muradian & Rival, 2012). It further means that the same credit system that supposedly protects a particular species or habitat can lead to its destruction when it collapses (Smith, 2006).

Offsetting therefore transforms conservation into an exchange of priced ecological assets. This reframes a genuine concern for the value of nature (intrinsic or use value), for example halting the degradation of ecosystems, into a matter of market price: 'a question of economic value that is entirely inimical to the original concern' (Smith, 2010, p. 249).

#### Offsetting ties conservation to land development and economic growth

The last way in which offsetting reframes conservation is that it dissolves the conventional contradiction between development (e.g. for mining, construction, house-building) and conservation, the latter becoming an extension of a development and growth agenda. Thus, the UK Government presents offsetting as a key element in succeeding in the 'global race' by 'creating growth and delivering lasting prosperity' while being 'the first which leaves the natural environment of England in a better state than it inherited' (Defra, 2013, p. 5; Kinver, 2013). The allure of offsetting lies in its promise to make conservation (in the form of No Net Loss) possible without limiting economic growth, but in the process it makes both offsetting and conservation an integral element of development (BBOP, 2012b). Thus offsetting allows ecosystem degradation caused by development

to be presented as a conservation opportunity, as for example where quarries can provide ‘an exciting opportunity for wildlife habitat creation’ (BirdLife International, 2011), or where an offset site is considered as of such high ecological value that the destruction of a development site (that is considered of lower conservation value) can actually be portrayed as beneficial for nature conservation (Lean, 2013).

Specific interests are benefited by such a choice. Offsetting is attractive to industry in fields such as mining, oil and gas, housing and infrastructure because it has the potential to enable the conversion of undeveloped land in valuable locations, in exchange for land managed for conservation elsewhere. Moreover, many corporations wish to be seen to respond to shareholder concerns about the environmental impacts of their operations, and offsetting allows them to do this: almost three quarters of active mines and exploration sites overlap with areas of high conservation value (World Resources Institute, 2003). Other benefits for corporations include the possibility of regulatory goodwill which could lead to faster permitting, easier access to finance, capital and associated competitive advantages, product branding, and the possibility of influencing emerging environmental regulation and policy (ICMM, 2005; ten Kate, 2005; Environment Bank, 2013b).

In parallel, the rhetorical framing of offsetting as a means to ensure simultaneously more development and more biodiversity conservation brings together otherwise opposing actors from governments, industries and NGOs. Thus Bayon et al. (2008, p. 38) argue that the goal of biodiversity markets is to prove that profit and environmental preservation are not mutually exclusive but mutually beneficial, and that biodiversity markets can create ‘a space where both can expand together’. The latter obviously also involves the creation of new business opportunities for consultants, brokers and conservation banking companies (Duke et al., 2012). Such opportunities extend to conservation organizations. As Bayon et al. (2008, p. 38) note, ‘the more experienced banking companies are looking to agencies for advice to focus their land acquisition efforts or review species recovery plans to find the most ecologically important lands to purchase and establish banks’. Offsetting can thus provide a valued revenue stream for conservation organizations, particularly where they become involved in technical assessments or the acquisition or management of offset sites.

Offsetting ties conservation to an agenda of land development and economic growth as the last element in a mitigation hierarchy. At each successive step down the hierarchy the degree of environmental protection is diminished, moving in turn through avoidance, minimization, rehabilitation or restoration of degraded ecosystems to offsetting (BBOP, 2009). Crucially, the existence of offsetting as a final option changes the way progression down the hierarchy is framed (e.g. McGrath, 2013): experience with US wetland mitigation

has shown that the existence of offsetting as a possibility in planning has led to an underuse of the earlier stages of the mitigation hierarchy (Robertson, 2000). In conservation terms this could lower the threshold for approving projects and facilitate permanent land-use change, with negative net impacts on biodiversity. Moreover, offsetting mostly refers to conservation activities occurring outside the geographical boundaries of a development site (off-site compensation) to compensate for unavoidable impacts on site, allowing developers to increase their net developable area (Environment Bank, 2015a).

The role of offsetting is therefore not neutral because it can facilitate planning permissions that might otherwise have been refused (e.g. see the National Planning Policy Framework in the UK; Department for Communities and Local Government, 2012). If conservationists focus efforts on proving that ecological equivalence or No Net Loss are possible in the hope of winning better compensation for the environmental impacts of development, they should also be aware of the adverse effects of this choice, namely the weakening of long-standing critiques of the environmentally destructive activities of many corporations and industries. Focusing on how to deal with the impacts of a development project rather than on preventing projects with detrimental impacts on nature is based on the fundamental acceptance that ‘development impacts on biodiversity are unlikely to cease or even abate in the near future’ (Gordon et al., 2015), foreclosing any ecological critique of the current political and economic context. This is obvious in the following quote from Gordon et al. (2015, p. 536): ‘*in this context*, offsetting remains one of the few options for delivering truly “sustainable” development’ (our emphasis).

### Biodiversity offsetting: it ain’t just technical

Offsetting already faces serious challenges. These are reflected in the gradual acceptance of the controversial character of the policy (e.g. Gordon et al., 2015; Bull & Brownlie, 2016), in the admission that standard approaches for the systematic calculation of its conservation benefits are still relatively rare or unavailable (Maron et al., 2013) and in attempts to re-brand the terminology in the face of increasing criticism from activists and scholars (e.g. biodiversity accounting rather than offsetting; Environment Bank, 2015b).

The issues at stake with offsetting are more than technical, and the decision to frame biodiversity offsetting as a conservation tool is not neutral. Such a strategy leaves the core logic of offsetting unchallenged. A focus on how to improve its implementation, ostensibly depoliticizes (Wilson & Swyngedouw, 2014) the problem of the environmental impacts of development, implying that it is an inevitable problem, rather than the result of particular political choices. But not talking about politics does not mean that

politics disappear. It simply means that the debates regarding offsetting metrics or principles take place without reference to the social, political and economic questions they raise.

Acceptance of the framing of conservation and development provided by offsetting implies acceptance of the inevitability of biodiversity loss. It a priori reframes conservation as a pragmatic search for the least worst outcome in the face of development demands and as an attempt to promote conservation only in areas that do not interest developers. This in turn separates the practice of conservation from struggles by environmental and social movements to prevent the further degradation of ecosystems (Apostolopoulou et al., 2014).

By reframing nature as a set of tradable units, offsetting turns conservation into a system of exchange in an attempt to optimize biodiversity protection while allowing the achievement of development goals. As such it favours technocratic solutions to streamline policy debate about the value of nature. In the process, nature is essentially treated as a 'commodity', divorced from its social, ecological and geographical context. Only in the reductionist technical calculations of offsetting methodologies can offset sites be seen as equivalent to ecosystems and places destroyed by development. The protection of such sites may be better than nothing, but in almost all cases they are less good than the original.

It is not surprising that proponents of biodiversity offsetting (ten Kate et al., 2004; Madsen et al., 2011; BBOP, 2012b) frame it as a ground-breaking strategy. Its radical potential is profound but it does not favour conservation outcomes. Offsetting forecloses discussion of the nature of the social and economic forces behind the environmental impacts of development. Within the frame of offsetting, conservation is prevented from addressing key issues concerning the socio-economic and political context that determines society's destructive relationship with non-human nature, the way the costs and benefits of development may unevenly affect different social groups or classes, or the identity of winners and losers of uneven growth and development under capitalism. Offsetting is one outcome of private sector investment in conservation and market-based approaches to addressing biodiversity loss. It coincides in time with cuts in conservation funding, the further commodification of non-human nature and the increasing deregulation of environmental legislation (Büscher et al., 2012; Apostolopoulou & Adams, 2015), which reflect a paradigm shift away from conservation strategies based on enforceable environmental legislation (Benabou, 2014) towards those based on financial incentives and profit.

If conservationists accept offsetting as a strategy (and simply try to improve the methods used), they are essentially accepting a dystopian future where biodiversity loss is continuous, and chiefly directed by the financial interests of developers. Conservation is restricted to simply directing, or redirecting, where the destructive footprint of developments

will fall, without any guarantee that what is protected today will not be developed in further cycles of offsetting tomorrow. Offsetting therefore substantially forecloses the possibility of a conservation challenge to the drivers of environmental destruction, implying there is no alternative to the current situation. Offsetting can be the response to biodiversity loss only if we accept a society where all ecosystems and places are open for trading, and nature will be restricted only to 'what is left over after every other demand has been satisfied' (Baltz, 1980, p. 29).

Conservation has been criticized for approaching protected areas as places without people (Rangarajan & Shahabuddin, 2006). Offsetting further deepens and exacerbates this conceptual and material separation between society and non-human nature. Failing to recognize the way it reframes non-human nature and its conservation makes its effects impossible to challenge. This has crucial consequences. In the offsetting case, it is not the protection of ecosystems that is not based on a dialectical understanding of the nature–society relationship but their destruction. A dystopian vision for the future suggests that our only choices are between the two. It is vital for conservation to challenge the ideological potency of this rhetorical framing and allow direct political engagement not only to oppose environmental destruction and secure public access to nature but also to re-imagine a different production of nature based on societal needs. Conservation is profoundly a cultural and political practice and offsetting highlights the importance of its connection to wider debates about environmental and social justice in future provisions for the protection of biodiversity.

## Acknowledgements

This study was supported by a Marie Curie Intra-European Fellowship (PIEF-GA-2013-622631) within the 7th European Community Framework Programme (Conservation and Ecosystem Services in the New Biodiversity Economy). We thank Chris Sandbrook for his insightful comments and two referees for their helpful comments.

## References

- ADAMS, W.M. (2015) Ecomodernism and the anti-politics of Prometheus. <http://thinkinglikeahuman.com/2015/05/18/ecomodernism-and-the-anti-politics-of-prometheus/> [accessed 18 May 2015].
- APOSTOLOPOULOU, E. & ADAMS, W.M. (2015) Neoliberal capitalism and conservation in the post-crisis era: the dialectics of 'green' and 'un-green' grabbing in Greece and the UK. *Antipode*, 47, 15–35.
- APOSTOLOPOULOU, E., BORMPOUDAKIS, D., PALONIEMI, R., CENT, J., GRODZIŃSKA-JURCZAK, M., PIETRZYK-KASZYŃSKA, A. & PANTIS, J.D. (2014) Governance rescaling and the neoliberalization of nature: the case of biodiversity conservation in four EU countries. *International Journal of Sustainable Development & World Ecology*, 21, 481–494.

- APOSTOLOPOULOU, E. & PALONIEMI, R. (2012) Frames of scale challenges in Finnish and Greek biodiversity conservation. *Ecology and Society*, 17, 9.
- ASAFU-ADJAYE, J., BLOMQUIST, L., BRAND, S., BROOK, B., DE FRIES, R., ELLIS, E. et al. (2015) An ecomodernist manifesto. <http://www.ecomodernism.org/manifesto> [accessed 15 June 2015].
- BAKER, J. (2014) How numbers (not offsetting) can realise the ideal – development with a net gain for biodiversity. *Environment Industry Magazine*, 32, 56–65.
- BALTZ, L. (1980) *Landscape: Theory*. Lustrum Press, New York, USA.
- BAYON, R., FOX, J. & CARROLL, N. (2008) *Conservation and Biodiversity Banking: A Guide to Setting Up and Running Biodiversity Credit Trading Systems*. Earthscan, Abingdon, UK.
- BPOP (BUSINESS AND BIODIVERSITY OFFSETS PROGRAMME) (2009) *Biodiversity Offset Design Handbook: Appendices*. Business and Biodiversity Offsets Programme, Washington, DC, USA.
- BPOP (BUSINESS AND BIODIVERSITY OFFSETS PROGRAMME) (2012a) *Standard on Biodiversity Offsets*. Business and Biodiversity Offsets Programme, Washington, DC, USA.
- BPOP (BUSINESS AND BIODIVERSITY OFFSETS PROGRAMME) (2012b) *Resource Paper: No Net Loss and Loss–Gain Calculations in Biodiversity Offsets*. [http://www.forest-trends.org/documents/files/doc\\_3103.pdf](http://www.forest-trends.org/documents/files/doc_3103.pdf) [accessed 5 June 2015].
- BPOP (BUSINESS AND BIODIVERSITY OFFSETS PROGRAMME) (2014) <http://bbop.forest-trends.org/events/no-net-loss> [accessed 29 July 2015].
- BPOP (BUSINESS AND BIODIVERSITY OFFSETS PROGRAMME) (2015) <http://bbop.forest-trends.org> [accessed 29 July 2015].
- BENABOU, S. (2014) Making up for lost nature? A critical review of the international development of voluntary biodiversity offsets. *Environment and Society: Advances in Research*, 5, 103–123.
- BIRDLIFE INTERNATIONAL (2011) A strategic partnership between CEMEX and BirdLife is helping to reduce impacts on biodiversity. <http://www.birdlife.org/datazone/sowb/casestudy/228> [accessed 5 June 2015].
- BOITANI, L., MACE, G.M. & RONDININI, C. (2015) Challenging the scientific foundations for an IUCN Red List of Ecosystems. *Conservation Letters*, 8, 125–131.
- BULL, J.W. & BROWNLIE, S. (2016) The transition from No Net Loss to a Net Gain of biodiversity is far from trivial. *Oryx*, in press.
- BULL, J.W., SUTTLE, K.B., GORDON, A., SINGH, N.J. & MILNER-GULLAND, E.J. (2013) Biodiversity offsets in theory and practice. *Oryx*, 47, 369–380.
- BUMPUS, A.G. & LIVERMAN, D.M. (2008) Accumulation by decarbonization and the governance of carbon offsets. *Economic Geography*, 84, 127–155.
- BÜSCHER, B., SULLIVAN, S., NEVES, K., IGOE, J. & BROCKINGTON, D. (2012) Towards a synthesized critique of neoliberal biodiversity conservation. *Capitalism Nature Socialism*, 23, 4–30.
- COMER, P.J., PRESSEY, R.L., HUNTER JR, M.L., SCHLOSS, C.A., BUTTRICK, S.C., HELLER, N.E. et al. (2015) Incorporating geodiversity into conservation decisions. *Conservation Biology*, 29, 692–701.
- COMMONWEALTH OF AUSTRALIA (2012) *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*. [http://www.environment.gov.au/system/files/resources/12630bb4-2c10-4c8e-815f-2d7862bf87e7/files/offsets-policy\\_2.pdf](http://www.environment.gov.au/system/files/resources/12630bb4-2c10-4c8e-815f-2d7862bf87e7/files/offsets-policy_2.pdf) [accessed 5 June 2015].
- CONWAY, M., RAYMENT, M., WHITE, A. & BERMAN, S. (2013) *Exploring Potential Demand for and Supply of Habitat Banking in the EU and Appropriate Design Elements for a Habitat Banking Scheme*. Final report submitted to DG Environment. ICF GHK and BIO Intelligence Service, London, UK.
- DEC (DEPARTMENT OF ENVIRONMENT AND CONSERVATION) (2006) *BioBanking: A Biodiversity Offsets and Banking Scheme. Conserving and Restoring Biodiversity in NSW*. Working paper. Department of Environment and Conservation NSW, Sydney, Australia.
- DEFRA (2013) *Biodiversity Offsetting in England*. Green paper. Department for Environment, Food and Rural Affairs, London, UK. [https://consult.defra.gov.uk/biodiversity/biodiversity\\_offsetting/supporting\\_documents/20130903Biodiversity%20offsetting%20green%20paper.pdf](https://consult.defra.gov.uk/biodiversity/biodiversity_offsetting/supporting_documents/20130903Biodiversity%20offsetting%20green%20paper.pdf) [accessed 5 June 2015].
- DEPARTMENT FOR COMMUNITIES AND LOCAL GOVERNMENT (2012) *National Planning Policy Framework*. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/6077/2116950.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf) [accessed 15 June 2015].
- DUKE, G., DICKIE, I., JUNIPER, T., TEN KATE, K., PIETERSE, M., RAFIQ, M. et al. (2012) Opportunities for UK business that value and/or protect nature's services; Elaboration of proposals for potential business opportunities. Attachment 1 to Final Report to the Ecosystem Markets Task Force and Valuing Nature Network. GHK, London, UK.
- ECOSYSTEM MARKETPLACE (2015) <http://www.ecosystemmarketplace.com> [accessed 29 July 2015].
- 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 2 August 2015].
- ENTMAN, R.M. (1993) Framing: toward clarification of a fractured paradigm. *Journal of Communication*, 43, 51–58.
- ENVIRONMENT BANK (2013a) Impact calculator. <http://www.environmentbank.com/impact-calculator.php> [accessed 29 July 2015].
- ENVIRONMENT BANK (2013b) *Corporate Responsibility Investment in Conservation Credits. Biodiversity Offsetting Information Sheet 9*. Environment Bank, Ripon, UK.
- ENVIRONMENT BANK (2015a) Frequently asked questions. [http://www.environmentbank.com/docs/FAQs\\_Offsetting.pdf](http://www.environmentbank.com/docs/FAQs_Offsetting.pdf) [accessed 2 August 2015].
- ENVIRONMENT BANK (2015b) Biodiversity accounting and offsetting. <http://www.environmentbank.com/biodiversity-offsetting.php> [accessed 2 August 2015].
- EUROPEAN COMMISSION (2013) *Scope and Objectives of the No Net Loss Initiative*. [http://ec.europa.eu/environment/nature/biodiversity/nnl/pdf/Subgroup\\_NNL\\_Scope\\_Objectives.pdf](http://ec.europa.eu/environment/nature/biodiversity/nnl/pdf/Subgroup_NNL_Scope_Objectives.pdf) [accessed 5 June 2015].
- EUROPEAN COMMISSION (2015) Consultation. [http://ec.europa.eu/environment/consultations/nnl\\_en.htm](http://ec.europa.eu/environment/consultations/nnl_en.htm) [accessed 29 July 2015].
- FOREST TRENDS (2015) <http://www.forest-trends.org/page.php?id=153> [accessed 2 August 2015].
- FRIEDMAN, T.L. (2005) *The World Is Flat: A Brief History of the Twenty-First Century*. Farrar, Straus & Giroux, New York, USA.
- GARDNER, T.A., VON HASE, A., BROWNLIE, S., EKSTROM, J.M.M., PILGRIM, J.D., SAVY, C.E. et al. (2013) Biodiversity offsets and the challenge of achieving no net loss. *Conservation Biology*, 27, 1254–1264.
- GORDON, A., BULL, J.W., WILCOX, C. & MARON, M. (2015) Perverse incentives risk undermining biodiversity offset policies. *Journal of Applied Ecology*, 52, 532–537.
- HAMRICK, K. (2014) Verified Conservation Areas: A real-estate market for biodiversity? [http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page\\_id=10492&section=news\\_articles&eod=1](http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=10492&section=news_articles&eod=1) [accessed 5 June 2015].
- HS2 (2013) *London–West Midlands Environmental Statement. Volume 5. Technical Appendices*. Scope and methodology report addendum (CT-001-000/2). <https://www.gov.uk/government/uploads/system/>

- [uploads/attachment\\_data/file/260153/Vol5\\_Scope\\_and\\_methodology\\_report\\_addendum\\_CT-001-000.2.pdf](#) [accessed 5 June 2015].
- ICMM (INTERNATIONAL COUNCIL ON MINING & METALS) (2005) *Biodiversity Offsets – A Briefing Paper for the Mining Industry*. <http://www.icmm.com/document/25> [accessed 5 June 2015].
- IEEP (INSTITUTE FOR EUROPEAN ENVIRONMENTAL POLICY) (2014) *Study on Specific Design Elements of Biodiversity Offsets: Biodiversity Metrics and Mechanisms for Securing Long Term Conservation Benefits*. <http://ec.europa.eu/environment/nature/biodiversity/nnl/pdf/Biodiversity%20offsets%20metrics%20and%20mechanisms.pdf> [accessed 29 July 2015].
- KETTLEWELL, C.I., BOUCHARD, V., POREJ, D., MICACCHION, M., MACK, J.J., WHITE, D. & FAY, L. (2008) An assessment of wetland impacts and compensatory mitigation in the Cuyahoga River Watershed, Ohio, USA. *Wetlands*, 28, 57–67.
- KINVER, M. (2013) Biodiversity offsetting plans too simplistic, MPs warn. <http://www.bbc.co.uk/news/science-environment-24899708> [accessed 5 June 2015].
- LAKOFF, G. (2010) Why it matters how we frame the environment. *Environmental Communication*, 4, 70–81.
- LEAN, G. (2013) Builders: the saviours of meadows? <http://www.telegraph.co.uk/news/earth/countryside/10404841/Builders-the-saviours-of-meadows.html> [accessed 5 June 2015].
- LEVINS, R. & LEWONTIN, R. (1980) Dialectics and reductionism in ecology. *Synthese*, 43, 47–78.
- LOHMANN, L. (2012) Financialization, commodification and carbon: the contradictions of neoliberal climate policy. *Socialist Register*, 48, 85–107.
- MADSEN, B., CARROLL, N., KANDY, D. & BENNETT, G. (2011) *Update: State of Biodiversity Markets. Offset and Compensation Programs Worldwide*. Forest Trends, Washington, DC, USA. [http://www.forest-trends.org/documents/files/doc\\_2848.pdf](http://www.forest-trends.org/documents/files/doc_2848.pdf) [accessed 5 June 2015].
- MARON, M., HOBBS, R.J., MOILANEN, A., MATTHEWS, J.W., CHRISTIE, K., GARDNER, T.A. et al. (2012) Faustian bargains? Restoration realities in the context of biodiversity offset policies. *Biological Conservation*, 155, 141–148.
- MARON, M., RHODES, J.R. & GIBBONS, P. (2013) Calculating the benefit of conservation actions. *Conservation Letters*, 6, 359–367.
- MCGRATH, M. (2013) 'Licence to trash' offsetting scheme set back until autumn. <http://www.bbc.co.uk/news/science-environment-23502362> [accessed 5 June 2015].
- MENZ, M.H., DIXON, K.W. & HOBBS, R.J. (2013) Hurdles and opportunities for landscape-scale restoration. *Science*, 339, 526–527.
- MONBIOT, G. (2014) Reframing the planet. <http://www.monbiot.com/2014/04/22/reframing-the-planet/> [accessed 5 June 2015].
- MURADIAN, R. & RIVAL, L. (2012) Between markets and hierarchies: the challenge of governing ecosystem services. *Ecosystem Services*, 1, 93–100.
- PILGRIM, J.D., BROWNLIE, S., EKSTROM, J.M., GARDNER, T.A., VON HASE, A., TEN KATE, K. et al. (2013) A process for assessing the offsetability of biodiversity impacts. *Conservation Letters*, 6, 376–384.
- QUÉTIÉ, F. & LAVOREL, S. (2011) Assessing ecological equivalence in biodiversity offset schemes: key issues and solutions. *Biological Conservation*, 144, 2991–2999.
- RANGARAJAN, M. & SHAHABUDDIN, G. (2006) Displacement and relocation from protected areas: towards a biological and historical synthesis. *Conservation & Society*, 4, 359–378.
- RATCLIFFE, D.A. (ed.) (1977) *A Nature Conservation Review*. Cambridge University Press, Cambridge, UK.
- ROBERTS, J.P. & WAAGE, S. (2007) *Negotiating for Nature's Services*. <http://www.katoombagroup.org/documents/publications/NegotiatingforNature.pdf> [accessed 5 June 2015].
- ROBERTSON, M.M. (2000) No net loss: wetland restoration and the incomplete capitalization of nature. *Antipode*, 32, 463–493.
- ROBERTSON, M.M. (2004) The neoliberalization of ecosystem services: wetland mitigation banking and problems in environmental governance. *Geoforum*, 35, 361–373.
- ROBERTSON, M.M. (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, 367–387.
- ROBERTSON, M.M. (2012) Measurement and alienation: making a world of ecosystem services. *Transactions of the Institute of British Geographers*, 37, 386–401.
- RUHL, J.B. & SALZMAN, J.E. (2006) *The Effects of Wetland Mitigation Banking on People*. FSU College of Law, Public Law Research Paper No. 179.
- SEAGLE, C. (2012) Inverting the impacts: mining, conservation and sustainability claims near the Rio Tinto/QMM ilmenite mine in Southeast Madagascar. *The Journal of Peasant Studies*, 39, 447–477.
- SMITH, N. (2006) Nature as accumulation strategy. In *Socialist Register 2007: Coming to Terms with Nature* (eds L. Panitch & C. Leys), pp. 16–36. Merlin, London, UK.
- SMITH, N. (2010) *Uneven Development*, 3rd edition. Verso, New York, USA.
- SUKHDEV, P., WITTMER, H. & MILLER, D. (2014) The Economics of Ecosystems and Biodiversity (TEEB): challenges and responses. In *Nature in the Balance: The Economics of Biodiversity* (eds D. Helm & C. Hepburn), pp. 135–152. Oxford University Press, Oxford, UK.
- SULLIVAN, S. (2013a) After the green rush? Biodiversity offsets, uranium power and the 'calculus of casualties' in greening growth. *Human Geography*, 6, 80–101.
- SULLIVAN, S. (2013b) Banking nature? The spectacular financialisation of environmental conservation. *Antipode*, 45, 198–217.
- SULLIVAN, S. & HANNIS, M. (2015) Nets and frames, losses and gains: Value struggles in engagements with biodiversity offsetting policy in England. *Ecosystem Services*. <http://dx.doi.org/10.1016/j.ecoser.2015.01.009>.
- TEN KATE, K. (2005) Biodiversity offsets: good for business and biodiversity? Presentation to IPIECA Biodiversity Working Group. <https://www.cbd.int/financial/offsets/g-offsetsbusiness.pdf> [accessed 5 June 2015].
- TEN KATE, K., BISHOP, J. & BAYON, R. (2004) *Biodiversity Offsets: Views, Experience, and the Business Case*. IUCN, Gland, Switzerland, and Cambridge, UK, and Insight Investment, London, UK.
- TUCHMAN, G. (ed.) (1978) *Making News. A Study in the Construction of Reality*. Free Press, New York, USA.
- TUCKER, G., ALLEN, B., CONWAY, M., DICKIE, I., HART, K., RAYMENT, M. et al. (2013) *Policy Options for an EU No Net Loss Initiative*. Report to the European Commission. Institute for European Environmental Policy, London, UK.
- VCA (2015) Verified Conservation Area registry. <http://v-c-a.org/registry> [accessed 2 August 2015].
- WALKER, S., BROWER, A.L., STEPHENS, R.T. & LEE, W.G. (2009) Why bartering biodiversity fails. *Conservation Letters*, 2, 149–157.
- WILSON, J. & SWYNGEDOUW, E. (2014) Seeds of dystopia: post-politics and the return of the political. In *The Post-Political and its Discontents: Spaces of Depoliticisation, Spectres of Radical Politics* (eds J. Wilson & E. Swyngedouw), pp. 1–22. Edinburgh University Press, Edinburgh, UK.
- WORLD FORUM ON NATURAL CAPITAL (2015) <http://naturalcapitalforum.com/about> [accessed 2 August 2015].
- WORLD RESOURCES INSTITUTE (2003) *Mining and Critical Ecosystems: Mapping the Risks*. World Resources Institute, Washington, DC, USA.

### **Biographical sketches**

ELIA APOSTOLOPOULOU'S main research interest is the investigation of the relationship between nature and society in capitalism, with a particular emphasis on the political ecology of nature conservation. Her current research focuses mainly on the reconstruction of

nature conservation around the measurement of the economic value of non-human nature. BILL ADAMS is interested in changing ideas about nature and its conservation. His current research addresses the politics of landscape-scale conservation and the power of ecosystem services and other metaphors in conservation policy.