



Bulldozing biodiversity: The economics of offsets and trading-in Nature



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ABSTRACT

Many conservationists have become enamoured with mainstream economic concepts and approaches, described as pragmatic replacements for appeals to ethics and direct regulation. Trading biodiversity using offsets is rapidly becoming part of the resulting push for market governance that is promoted as a more efficient means of Nature conservation. In critically evaluating this position I argue that offsets, along with biodiversity and ecosystem valuation, use economic logic to legitimise, rather than prevent, ongoing habitat destruction. Biodiversity offsets provide a means of commodifying habitat for exchange. They operationalise trade-offs that are in the best interests of developers and make false claims to adding productive new economic activity. Contrary to the argument that economic logic frees conservation from ethics, I expose the ethical premises required for economists to justify public policy support for offsets. Finally, various issues in offset design are raised and placed in the context of a political struggle over the meaning of Nature. The overall message is that, if conservationists continue down the path of conceptualising the world as in mainstream economics they will be forced from one compromise to another, ultimately losing their ability to conserve or protect anything. They will also be abandoning the rich and meaningful human relationships with Nature that have been their *raison d'être*.

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1. Introduction

Many ecologists and conservation biologists have become advocates for an economic approach to ecosystem degradation and biodiversity loss that emphasises the principle cause as a missing market value (Balmford et al., 2002; Daily et al., 2000; Duke et al., 2012; Juniper, 2012). In order for Nature to be taken into the financial accounts it must have a value that can be recognised, demonstrated and captured. That is the logic of The Economics of Ecosystems and Biodiversity (TEEB), a project backed by the United Nations Environment Programme (UNEP) and headed by Pavan Sukdev, an international banker from the Global Markets division of Deutsch Bank. That study moved from being announced as a global cost–benefit analysis of biodiversity, following in the footsteps of Stern et al. (2006), to becoming an international instrument for promoting the creation of new environmental markets.

Before TEEB was born the idea of valuing ecosystems as services was well advanced within the international conservation community (IUCN et al., 2005), and the potential for linking biodiversity to carbon markets had been identified (Roe et al., 2007; Swingland, 2003). Indeed the Millennium Ecosystem Assessment (2005, p. 22) saw carbon trading as a potential role model for how ecosystem services could be marketed and noted the potential for biodiversity offsets (p. 96). Environmental

markets have continued to be promoted despite the abject failure of carbon markets to reduce emissions and their numerous problems costing the taxpayer billions (Koch, 2014; Spash, 2010, 2014). Directly following the 2008 financial crisis bankers and financiers were actively exploring for new financial instruments to sustain and grow their business. By the time TEEB (2010) produced its synthesis report, subtitled *Mainstreaming the Economics of Nature*, there was considerable momentum behind neoliberal commodification and financialisation of ecosystems including biodiversity offsets (Madsen et al., 2010).

In October 2010, simultaneously with the TEEB report, the UNEP Finance Initiative (2010) published a briefing entitled *Demystifying Materiality: Hardwiring Biodiversity and Ecosystems into Finance*. This included looking at “ways in which a financial institution can competitively position itself to tap into growing environmental markets” (p. 2) with biodiversity mitigation/offsets given as one example (p. 15). The initiative had the support of Rio Tinto, Industrial Development Corporation, JP Morgan Chase & Co., Uni Credit Group, Credit Suisse, Citigroup, Barclays, Bank of America Merrill Lynch, and many others. These are some major corporate power players with several of them having individual company revenues equal to or greater than the income of nation states, such as Bangladesh, Vietnam, Hungary and Ukraine (Dietz and O'Neill, 2013, pp. 144–145). This is the corporate world of high finance into which conservation has been plunged. A world in which environmental non-governmental organisations (ENGOs) expect to win conservation victories by using mainstream economic arguments.

In this contest conservationists are armed with the ideas of valuation, exchange and trade, based on neoclassical economic theory, as developed by environmental economists. Typically those promoting the

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engagement as a good thing, and a revolution in conservation, are non-economists who employ a set of basic beliefs about how economies and markets operate. These include the idea that: (i) some things called 'externalities' are accidentally left out of market calculations; (ii) market failures can be corrected by 'getting the prices right'; (iii) externalities can be valued and then included in prices so that markets will work to allocate resources efficiently; (iv) some new innovative market (or market like) institutions will be required, such as biodiversity offsets, banking and bonds; and (vi) these new institutions will help send the correct price signals to incentivise economic actors to 'do the right thing' for conservation. This is about as much as most ecologists and conservation biologists want to know about economics, and seems enough for many to conclude that valuing Nature in monetary terms and making biodiversity an exchangeable commodity will help them make powerful allies in the world of economics and finance, enable them to talk with corporations on their own terms, and create new sources of financing conservation at little or no cost.

That the theory behind the economics they are buying into is one very particular mainstream school of economic thought, which is opposed by others, might appear as some uninteresting internal disciplinary squabble. Even if they were concerned, conservation biologists and ecologists seeking political allegiance to corporate power need to put aside theoretical rigour, with respect to economics and its contents, in preference for using whatever theory is favoured by their new friends. Today that means a mixture of neoclassical and neo-Austrian (free-market) economics combined with neoliberal ideology (i.e. a political belief that capitalist markets unfettered by government provide freedom for the individual). Conservationists hold a variety of value positions and beliefs about the role of conservation, biodiversity and policy (Sandbrook et al., 2011). Some may therefore be happy to ally with corporations, adopt mainstream economic concepts and commit to neoliberalism, because they share the same values and political ideology. Others may regret the ideas they promote but are still prepared to buy-in to get the hoped for rewards from what they think is the dominant discourse in policy, if not society. Either way, the argument prevails that conservation must adopt the language, tools and institutions of market economics and high finance.

Despite a variety of conservationists' warnings (e.g., Büscher, 2008; Child, 2009; Collar, 2003; Ehrenfeld, 1988, 2008; Jepson and Canney, 2003; McCauley, 2006; Redford and Adams, 2009), the move to market logic has proceeded as if there were no alternatives. I refer to this as part of a new environmental pragmatism (Spash, 2009) that is clearly identifiable in fields such as ecological economics (Spash, 2013; Spash and Ryan, 2012). The lines of battle in conservation are being drawn between those pushing for this pragmatic change (Kareiva and Marvier, 2012) and those opposing it as undermining the very essence of their practice (Cafaro and Primack, 2014; Doak et al., 2014). However, the situation has moved very fast since the 2008 financial crisis, rather perversely, boosted neoliberal power (Mirowski, 2013). Practitioners and ENGOs are in the process of adopting neoliberal justifications for conservation, and individual conservationists are redefining their own role and sense of identity accordingly (Wynne-Jones, 2012). As Apostolopoulou and Adams (forthcoming: 2) note, "[t]he framing of 'wild nature' in terms of monetary value is rapidly becoming a hegemonic discourse (Roth and Dressler, 2012) and the neoliberal mode of conservation is advancing across the globe". This development is also clear in the discourse on biodiversity offsetting that, since 2006, has shifted from ecologically based approaches to a common use of economic terminology revealing a specific market oriented turn in conservation governance (Calvet et al. this issue).

In this article I want to explain to conservationists why biodiversity offsetting falls within the realm of the move to market governance and the problems that this raises. I therefore begin with an exploration, for the non-economist, of the assumptions behind environmental economic theory and how it conceptualises values. Some may be surprised to discover that the approach does not promise to protect biodiversity

and in fact is consistent with the optimal extinction of species.¹ Learning why involves understanding the role of trade-offs, opportunity costs and individual preferences in economics. The following section looks at how the rhetoric of economic valuation and the reality of biodiversity offsets are being used to create business opportunities under market governance. I scrutinise claims that offsets stimulate economic well-being and avoid regulatory inefficiency. In the next section, I analyse the economic logic for conservationists and government to support biodiversity offsets. This exposes the fallacy of claiming that economics provides a new value free alternative to an old ethically based conservation approach, and debunks the 'win-win' argument for offsets. In covering the above issues, I explain how offsets impose commensurability, enforce trade-offs and normalise exchange. Finally I show that offset 'design' is a political battle over human–Nature relationships involving premature closure of debate and regulatory capture. By the end I hope to have rearmed the conservationist with some modicum of understanding as to how the economic Emperor standing before them in his wondrous attire of monetary valuation methods and efficient market mechanisms is in fact totally naked.

2. The economics of optimal extinction

The way in which environmental economists employ microeconomic neoclassical theory is illustrated in Fig. 1. The figure brings together the conceptualisation of costs and benefits of conservation as marginal units that can be reflected in functional relationship to land use. For illustrative purposes land area is taken as representing the means for supplying species habitat and ecosystem services as objects of ecological or conservation value. The use of land as a proxy also occurs in practice, e.g. as a pragmatic approach to biodiversity banking in the USA (Mann et al., 2014, p. 38). Indeed the use of surrogates and proxies to represent biodiversity losses and gains is an essential requirement for biodiversity offsetting (Dauguet this issue).

On the cost side, the basic assumption is that every unit of land used to provide species or ecosystem services has an opportunity costs in terms of the alternative uses of land. For example, a nature reserve or protected area might be useful for agro-forestry or farming, or if on the urban periphery then housing, or there may be possibilities for roads, factories, car parks, shopping malls or something similar. Even when no cost is charged or appears in the market there is a potential alternative use that can be regarded as the forgone cost of the existing use of land for conservation. The opportunity cost argument is at the core of calls for biodiversity offsetting, i.e., believing that land use for development is a higher value. According to Fig. 1, in the absence of any monetary benefit from species or ecosystems being taken into account no land would be allocated to species habitat or ecosystem services, because even the very first hectare has an opportunity cost, i.e. something else it could be doing.

The argument is then that calculating the value of species habitat and ecosystem services would prevent this environmentally bad outcome. Therefore the marginal benefit function must be estimated and included in decision processes. Valuation in monetary terms requires some means of attributing a value. Over time environmental economists have expanded both their methods and the categories of value for calculating environmental benefits.

The tools available in environmental economics are revealed preference methods (hedonic pricing, travel cost, production function analysis, avoided costs) and stated preferences methods (contingent valuation, choice experiments). The former include methods for the

¹ Clark used net present value calculations to show Blue Whales should, on economic logic, be hunted to extinction and the cash obtained reinvested in growth industries. He withheld making this a policy recommendation on the basis that he had not included social costs/benefits. I illustrate how such mainstream economists are liable to conclude that extinction is optimal even if they do include such welfare calculations. Clark, 1973. Profit maximization and extinction of animal species. *Journal of Political Economy* 81, 950–961.

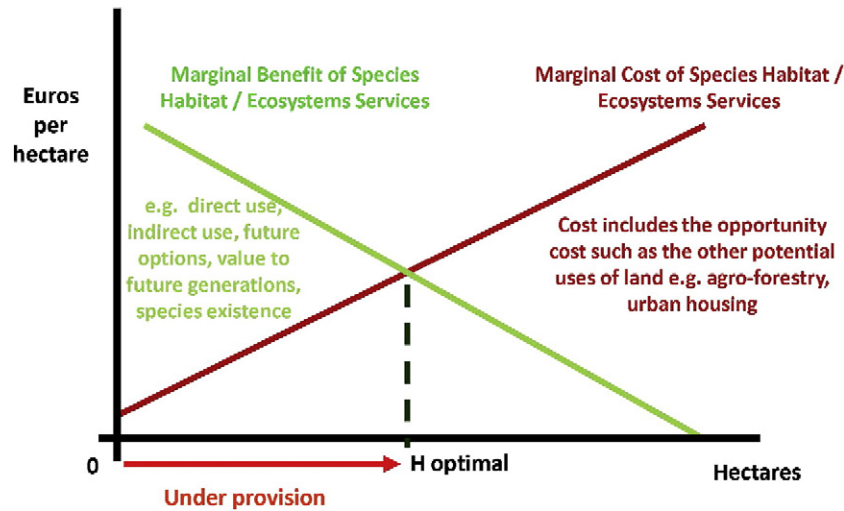


Fig. 1. Efficient resource allocation: Pro-environmental argument.

monetary valuation of such things as wild pollinators contributing to agricultural production or ecosystems cleansing water used by urban areas. The latter have been used more extensively because they involve asking people directly for a maximum willingness to pay for any environmental change and so are deemed highly flexible.² However, the expense and time involved in original studies has also led to value transfer where money numbers (e.g. € per hectare of habitat X) are employed regardless of temporal or spatial context (Spash and Vatn, 2006). Uncertainty over the applicability of methods has multiplied as the objects of valuation have moved from air and water quality, recreation, health and materials damage to aesthetics, cultural assets, ecosystems and biodiversity.

In terms of a value typology, environmental economists started with direct use values (e.g. visiting a national park), but when contingent valuation produced inexplicable numbers they then added a range of different indirect use categories. Three categories have for some decades been generally regarded by environmental economists as theoretically acceptable: (i) keeping the option open for possible future personal use, (ii) the value to future generations of use, and (iii) the value of knowing something exists (whether you or anyone else uses it or not). These categories represent an arbitrary selection, chosen because they appear plausible to the average environmental economist and conform to their utilitarian model (unlike more comprehensive classifications from environmental ethics e.g., Rolston, 1985). They are regarded as part of what is instrumental in giving an individual utility (or happiness). Ecologists and biologists also often employ instrumental justifications for why something should be conserved (or not) and this is evident in the classification and grading of habitat for biodiversity offsets where priorities are set and rankings established (see Dauguet this issue). The difference is that experts are meant to employ scientific argument and judgement rather than their own preferences, while, at least in theory, economists' appeal to the public and their preferences.

In order to make Fig. 1 operational all the various aspects of economic value need to be related to an extra unit of conservation. This must be a small (marginal) unit in value terms, relative to income, otherwise the

measuring rod of money will itself change (the utility or value from more/less money being relative to how much money you have). In Fig. 1, the marginal cost and benefit functions slope in opposite directions on the assumption that the less land in conservation the more valuable conservation becomes per unit (increasing marginal benefits), while alternative uses become fewer or less valuable so the opportunity costs fall. The result is to argue that monetary valuation will increase conservation in a world where previously there were no benefits taken into account. The under provision of land for conservation will be corrected and an optimal allocation achieved when adding one more unit of land produces less value in species/ecosystem benefits than it would cost in lost alternative development opportunities.

There are numerous qualifications and criticisms that could be made concerning this neoclassical story from environmental economics. (i) The figure is a static equilibrium diagram that has no ability to describe historical time. (ii) The cost and benefit functions in Fig. 1 are kept simple for exposition and are linear and continuous. They might well be non-linear, discontinuous having threshold effects (e.g. species extinction), step functions and so on. (iii) There is no uncertainty about any of the calculations. (iv) The entire functions are assumed known and knowable. (v) Even if they are knowable, in practice valuation exercises can at best give single point estimates on a function. (vi) The functions are assumed to be stable but could easily be shifting around, e.g. cost might shift due to technology, and benefit due to changing preferences or tastes. For the diagram to be drawn (or functions estimated) all other things in the economists' world must be held constant i.e. preferences, income, prices of all other goods and services.

All the opportunity costs are assumed known which means knowing all the potential alternative uses of the land in question. Costs are typically regarded as easier to calculate than benefits because they are expected to relate to existing market prices as opposed to things like species existence or loss of human life. However, costs in welfare economics are 'social', meaning that they need to account for non-market aspects as well, just like benefits. This soon becomes complicated as indirect or secondary costs are included. For example, land might be used for local food subsistence so improving health and life expectancy. In this way, rather than just the market value of agricultural products, the value of health and life would come into the calculations as secondary benefits i.e., reducing the cost of using land for agriculture as opposed to conservation (assuming for illustrative purposes that they are mutually exclusive, which in fact does not have to be the case).

² The correct welfare measure for a loss is willingness to accept compensation, but due to the large numbers this produced the income constrained willingness to pay is almost exclusively employed Spash, C.L., 2008a. Contingent valuation design and data treatment: If you can't shoot the messenger, change the message. Environment & Planning C: Government & Policy 26, 34–53.

The diagram also implies the economy is totally divorced from the environment because all land could be used for something besides ecosystems services or species habitat, i.e. humanity does not require anything from Nature to survive. This is typically justified with arguments about perfect substitutes being available. The logic of substitution across discrete aspects is aided by converting the world into forms of capital (e.g., human, social, cultural, spiritual and of course natural). A popular longstanding environmental economics text states the case as follows:

“We can pass on less environment so long as we *offset this loss* by increasing the stock of roads and machinery, or other man-made (physical) capital. Alternatively, we can have fewer roads and factories so long as we compensate by having more wetlands or mixed wood lands or more education.”

[(Turner et al., 1994, p. 56, emphasis added)]

Underlying this reasoning is the additional economic assumption that there is perfect commensurability so that everything can be compared and measured to allow perfect trade-offs. This is the essence of the logic that has also come to the fore in biodiversity offsets, where institutional rules are established to measure and quantify with the express purpose of achieving exchange (i.e., trading). Unique and special qualities of sites must then be redefined in terms of common units allowing substitution, otherwise the commensurability that enables exchange is discredited (see Dauguet this issue).

If human lives are inviolable (infinite value) and ecosystem services are non-substitutable then the benefit function would go off the chart as functions essential for the maintenance of life are destroyed. Similarly, if one person values say a species beyond all else they violate the economic presumption that everything can be traded. One way economists classify such responses is as lexicographic preferences (Spash, 2000a; Spash and Hanley, 1995). Such preferences rank things in an order, where some are absolutely more important than others, and no amount of compensation can be given that will make a person as well-off as having their prioritised object, e.g., oxygen, food, water. A range of ethical positions (e.g. intrinsic value, rights, virtues) might give absolute protection to a species regardless of the cost and be consistent with a form of lexicographic preference (Spash, 2000a). However, economists regard lexicographic preferences as anomalies and ignore them, because otherwise one person refusing trade-offs has the equivalent of an infinite valuation and destroys the entire theory. Typically economists

have excluded respondents appearing to have lexicographic preferences, protesting against payment or offering any unacceptable responses (Spash, 2008a).

This unscientific practice removes the empirical evidence for the existence of multiple values and motivations (Spash, 2000c, 2008a). People may donate for a good cause without the amount representing the value of an object the cause supports (Ryan and Spash, 2011; Spash, 2000b). Otherwise, being willing to pay for famine relief would be equivalent to placing a value on starving people. Mainstream economists assume exactly that, equating amount paid to the value of an object, while not wishing to probe motives for payment. They do this because their world view is restricted to market exchange for personal gain.

Regarding the world as commodities that are tradable is fundamental to modern mainstream economics, but is also at the heart of biodiversity offset schemes which aid exchange through the creation of a common metric. In contrast, conservation that attempts to protect land on the basis of non-economic values (e.g. sites of special scientific interest in the UK) requires a compatible set of institutional arrangements that conform with this philosophy and agencies that have the power to enforce rules in opposition to economic utilitarianism (Spash and Simpson, 1993, 1994). Quite simply, rights and intrinsic values in Nature are not protected by forcing trade-offs and compensation.

Putting to one side all these problems, let us return to Fig. 1 and consider an alternative pro-development interpretation of the exposition, based upon varying the initial conditions. In a situation where development has not yet taken place the analysis would start on the far right-hand side of the figure. As shown in Fig. 2, this means in an unexploited environment the marginal benefits have reached zero. The argument runs that there are only so many bugs and beast that humans can value and any more adds nothing (diminishing marginal utility). Now the logic of opportunity costs is that there must be higher value land uses than that. Economic development helps bring in those alternatives and economic efficiency requires that society start bulldozing biodiversity.

Efficiency requires removing all those things that just don't have enough value for humans compared to the material riches of the growth economy. Who cares about soil microbes, insects, spiders, stinging plants and ugly snakes? People prefer the warm and cuddly, the powerful and strong, and the aesthetically beautiful. Research shows zoological collections already reflect public preferences for what is attractive in

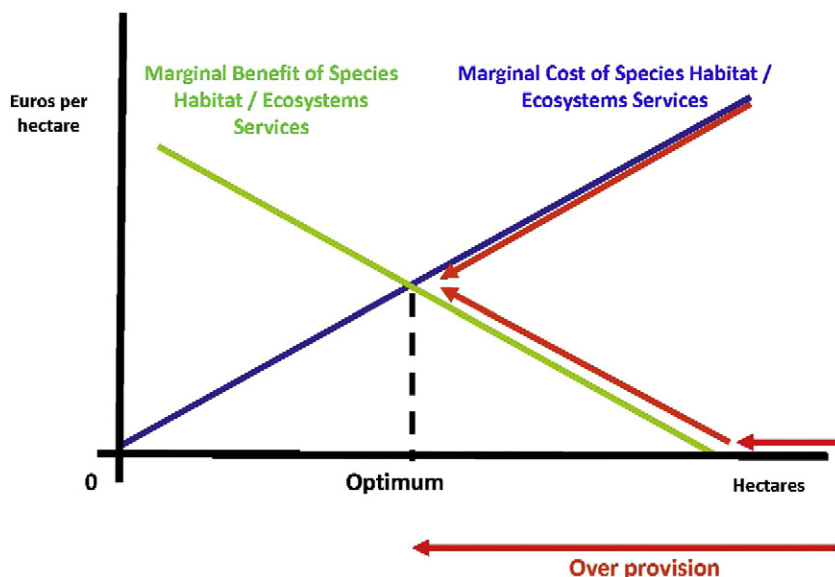


Fig. 2. Optimal extinction.

the non-human world (Maresová and Frynta, 2008). A market-based approach promotes this by responding to what attracts visitors, and more than that, what people are prepared to pay for the most e.g. tigers, pandas, elephants, colourful plants and pretty butterflies. Under this line of reasoning, there is a lot of wasted space given to 'natural stuff' few people value, and because ecosystems are so resilient there are also a lot of functions that can be removed as well. In this case optimal species extinction is efficient and will maximise net societal benefits. The bottom-line is that, without including the opportunity costs of foregone development, there is overprovision of land for conservation (i.e., too much Nature), as shown in Fig. 2.

Biodiversity offsets follow much the same economic reasoning. That is, in brief, currently land is misallocated to species, ecosystems and gene pools because it has better uses (financially) and there are cheaper land areas that can be substituted in exchange for any residual impact. There is a gain to developers from this trade. As a result, some of the extracted profit can be used to pay-off conservationists and regulatory authorities with substitutes while Nature that has too little value, for anyone to show concern about, can be scrapped. The idea of biodiversity offsetting is to streamline this process.

Now these diagrams are rather poor at trying to express anything dynamic, but a simple comparative static scenario is possible. Consider what happens to land values over time. They are increasing with such things as population pressure, urban expansion and rising incomes. Humans want more and that more means the opportunity costs of leaving land for species habitat and ecosystems services is increasing. This is reflected in Fig. 3 by the marginal cost function shifting to the left over time, i.e. over provision of land for conservation is continuously increasing.

Once conservationists have entered fully into the logic of economic valuation the only come back they have is in trying to argue ecosystems, species and gene pools are also getting more valuable. However, they cannot do this on the basis of science because science is irrelevant for economic value. What counts are the preferences of the individual and if people don't care then Nature does not matter. Preferences are king in the economist's world. Adopting the mainstream economic approach means conservation biology becomes a matter of getting people to hold the 'right' preferences.

In the economic framing, conservation value as a consumer preference must compete with all the products being offered in the consumer world. Perhaps the next step for conservationists is to merge their

marketing interests with corporations who already spend billions on lifestyle advertising. They can then help sell Nature as a side benefit of products and corporate imaging.

Conservationists who find this idea unappealing will need to pursue institutional alternatives and make them a political reality. This is now becoming harder because of the search by powerful vested interests for new financial instruments that can be justified as addressing environmental problems. The rhetoric of economics is spreading throughout conservation (Calvet et al. this issue), along with the practice of thinking in terms of economic concepts and acting in terms of commodifying and trading. Biodiversity offsetting does not involve explicit cost-benefit analysis nor explicit use of public preferences, but does form a process of commodification and reduction of habitats to an exchange value. As explained next it is also clearly part of a market governance agenda.

3. Governance by markets and offsets as a business opportunity

Economists claim that their analysis of the optimal supply of biodiversity, species habitat or ecosystem services, as outlined above, is totally separate from the regulatory approach that might be employed to achieve provision. On a purely theoretical level this is correct. Once the optimal level of extinction has been determined, the amount of land to be bulldozed could be laid down in law. However, in practice what monetary valuation and the economic discourse enable is the empowerment of economic logic in public policy. That means a presumption against direct regulation, legal restrictions, planning, public participation and any form of government intervention that does not support private property rights or work through market-based approaches.

The promise of switching away from an ecologically driven discourse, involving plural values, to a monistic economic one was to get financially squeezed governments to listen. TEEB seems to have succeeded, at least in some countries. For example, in the UK the post of Secretary of State for Environment, Food and Rural Affairs, under the Conservative administration of David Cameron was Caroline Spelman (2010–2012) and then Owen Paterson (2012–2014). Spelman made the following endorsement of TEEB, as used in the publishers' publicity: "We need to understand the true cost of losing what nature gives us for free, and integrate this into our decision making across government, business and society. At the national and international level TEEB for Policy Makers helps us think about how this can be done."

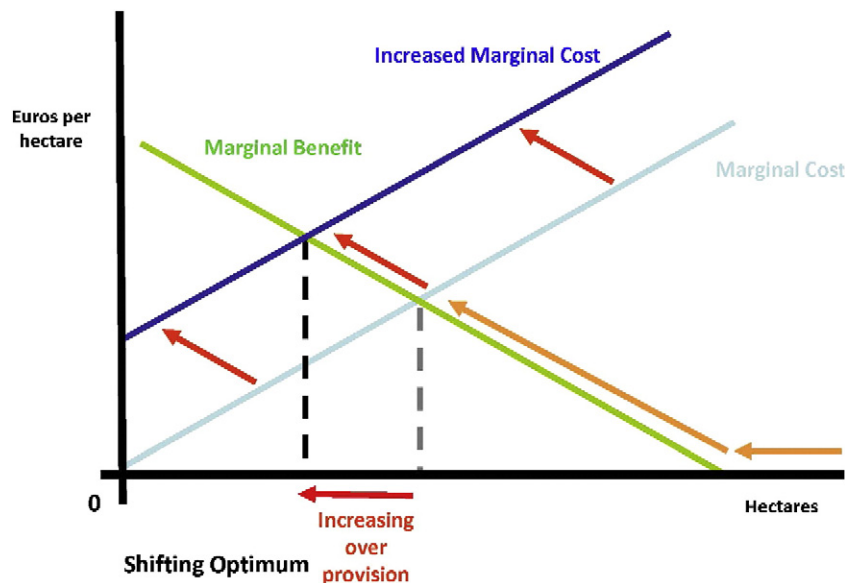


Fig. 3. Accelerating extinction: The developers' option.

The UK government then commissioned The National Ecosystem Assessment (NEA) that produced a report monetising ecosystem goods and services. The official government press release (2nd June 2011) stated: “The true value of nature can be shown for the very first time thanks to groundbreaking research by hundreds of UK scientists.”

Governments that support valuing natural capital, pricing ecosystems and exercises to determine the “true value” of Nature are also likely to advocate market governance and neoliberalism. They are unconcerned with the optimal provision of anything, and the same applies for TEEB. The point of TEEB was not to achieve better planning, but better value capture using habitat banking, mitigation banking, bio-banking, conservation trading schemes and offsets. TEEB (2010, p. 24) explicitly concludes that using an economic approach can help decision makers by “generating information about value for designing policy incentives” to reward the provision of ecosystem services and to create markets.

Duke et al. (2012), reporting to the UK quango of corporate leaders Ecosystem Markets Task Force (EMTF), lists twelve opportunities for UK businesses to profit from valuing and/or protecting Nature's services (the task force later expanded this to 22 options). The highest ranked option by Duke et al., and the final report of EMTF (2013) to government, is biodiversity offsets. The EMTF state their goal as being “the emergence of a new economy: one that fully integrates the real value of nature” (p. 3). Offsets are desirable to avoid “inefficiencies in the current systems which slow down necessary development”. The three primary objectives are to: (i) “save developers time and money”; (ii) “revolutionise conservation in England” on the belief that offsets will “incentivise location of development at sites of lower nature value”; (iii) “stimulate the competitive growth of business”. The major obstacles for offsetting are (i) sufficient market scale to maximise demand, growth of competitive supply and the scope for pooling habitat restoration/creation projects; (ii) maintaining existing safeguards; and (iii) clear guidance and metrics to signal the costs and benefits for business (p. 10). There are no substantive ecological or conservation concerns; this is all about speeding up development and competitive growth in a safer securer environment for businesses to generate profits.

There are a range of activities involved in setting-up and running offset schemes that their promoters describe as providing positive contributions to the economy. A German report summarises these as follows.

“Biodiversity offsets create a wide range of new businesses, including (a) environmental consulting for the design of offsets as well as consulting for project developers, (b) brokers who bring together demanders and suppliers, (c) registration and certification agents and developers, (d) financial service providers offering loans and insurance, and (e) biodiversity offsets offered by landowners.”

[(GNF and DUH, 2014, p. 14)]

These intermediate expenditures are not gains for the economy but losses, they are transaction costs due to the regulatory approach, and rather than promoters being happy they are going to be so large they should be concerned to minimise such costs.

In general, costs incurred to rectify damages are not welfare enhancing but what economists call ‘defensive expenditures’. Regarding defensive expenditure as positive economic activity is a basic error, although even high profile economic reports, such as Stern et al. (2006), make this mistake (Spash, 2010). This is equivalent to being happy there is a large and growing police force and army, both of which reflect an increasingly violent and unstable society. Using more and more resources to compensate defensively for social and environmental problems is not the sign of a healthy society. Otherwise we can just create more disasters and more clean-up activities and call that progress. This reveals the fallacy of a common argument that the increasing use of biodiversity offsets is ‘better than nothing’.

An economic justification for bulldozing biodiversity, emitting pollution and creating environmental destruction requires that there be the

creation of something more valuable. In fact, so much more valuable that the destruction can be repaired and society can come out ahead. In this case, offsetting becomes an intermediate cost of production and again should not be counted as a final product, something of value itself. So there is a fundamental contradiction in claims that offsetting is going to create a whole new business growth sector and that the approach is low cost and more efficient than direct regulation.

In ten Kate et al. (2004) the argument is made that legal regulation is inflexible and leads to decisions that waste resources on poor outcomes. The example given is saving 10 newts at the cost of £250,000, because a new habitat had to be constructed by a developer. The rhetorical question posed is: ‘Was that the best use of funds for conservation?’; the implied answer being ‘no’, and that offsets would provide flexibility to avoid such waste and economic inefficiency.

The ideological commitment to commodity trading, and market institutions as always best, avoids the real issues of whether regulation need be susceptible to inflexibility and whether the economic based approaches, such as offsets and banking, are necessarily always more flexible. There are many ways in which institutional arrangements in legal regulatory systems can be applied and these can involve roles both for participatory debate and judgment (e.g. juries and judicial trial). Outcomes do not need to be totally inflexible. At the same time the presumption in favour of compensation enforces a different inflexibility; that is, the necessity of damages to others and deliberate imposition of recognised harm. As Sullivan (2012, p. 24) says, “The model is development-led: it requires ecological degradation in order for conservation units or credits to attain market value.” There is also the issue of why flexibility should be prioritised as a desired goal above all else. In this respect being flexible can easily conflict with protection of any basic rights including those developers hold dear, such as private property rights.

This raises another issue, namely, “who has the presumption of the law on their side?” Coase (1960) famously, and erroneously, argued that who gets legal rights does not matter to outcomes because individuals with legal standing can bargain an optimal outcome. His argument is flawed not least because he assumes all parties have legal standing, are able to articulate a voice in the system and there is no issue of unequal power. Sentient non-humans, non-sentient Nature, future generations and other silent voices (e.g. children, mentally ill) only get political, or legal, representation through others who act on their behalf. The idea that allocating private property rights is enough for a just world is fundamentally flawed and only operative in the unrealistic world of neoclassical economists and neoliberal political theory.

Biodiversity offsets are favoured by developers because they can be used to impose a presumption in favour of development. Successful institutionalisation of the process, from the perspective of the developer, will give them the right to proceed as long as they compensate adequately, e.g. 8 low quality hectares for 1 top quality hectare (see Dauguet this issue). There can be little doubt that a core lobby group, as exemplified above by the UK and Germany, see this as a positive prospect. This is rather different from say inviolable habitat protection and endangered species legislation that impose an a priori right against the deliberate infliction of harm as an unethical act.

4. Offsets, economics and ethics

The old ethical conflict in conservation is that between intrinsic and instrumental values. However, some have begun to argue that this ethical dispute is a distraction from the real world of business and economic growth with which conservationist should be engaging (Juniper, 2012). Economic logic is being presented as value free, scientific and practical. A new form of conservation is then recommended and one that engages in partnership with, not opposition to, corporations and developers (Kareiva et al., 2012; Revkin, 2012). From this perspective, offsetting can provide a flagship approach, and the chance for win-win solutions.

Before critically appraising the economic case for conservationists adopting biodiversity offsetting let me recount how offsetting is generally expected to work. Assume a developer buys a piece of land with rare species and habitat for a new development project. Their development project (housing, mining, oil extraction and so on) will destroy the habitat, kill the species and remove some ecosystem functionality. That is, there are a set of impacts that cannot be avoided. The government requires that these impacts should be compensated by the developer paying for offsetting activities. This requires adopting another site to be improved in terms equivalent to the impacts (without destroying other ecological value at the offset site). There is then a need to measure what is being gained and lost at both project and offset sites, i.e. to evaluate the ecological costs and benefits. The project impact and the restoration/improvement at the offset site must be compared. Ethically this requires comparing harm and good and deciding between them, but does not specify on what grounds this is undertaken. Transdisciplinary processes of expert judgement and public deliberation might be used, multiple incommensurable criteria could be maintained, and only weak comparability could be invoked (Martinez-Alier et al., 1998). However, these are not approaches compatible with the vision for biodiversity offsetting.

The idea of biodiversity offsetting, and the related banking approaches, is to make this into a technical accounting exercise by converting impacts and restoration/improvement into common units i.e., creating full commensurability. The two are not just compared but equated (see Dauguet this issue). Standardised units facilitate ease of offset provision and trading. Biodiversity can then be treated as a commodity with exchange value. The offset provider can be the developer, a commercial company, a bank supplying credits, a government agency, an ENGO or conservation group (or all of them competing to supply in a market). As explained in the previous section, the aim is explicitly to avoid lengthy planning inquiries, government agency interventions and public decision processes in order to streamline development. The system is then described as more economically efficient because it achieves the specific outcomes desired by developers faster. That benefit is maximised by equivalence units that allow universal exchange. This is the commodification process.

The creation of simple units with exchange value is also the attraction of the scheme for bankers and financiers. They can gain through speculation and the creation of futures markets. The potential of offsetting in this regard is the creation of new innovative financial instruments. As far as the financial sector and traders are concerned, these need have no relationship to any material reality (i.e. actual biodiversity) and only require official endorsement, within the corpus of buyers and sellers, as legitimate financial instruments (e.g., derivatives). This is the financialisation of Nature that goes beyond its commodification in markets.

Conservation today is being told such commodification and financialisation are not a problem because there is a win–win scenario of getting lots of money for biodiversity loss and being able to use that money to create something equivalent to the biodiversity and associated habitat being destroyed. Robinson (2011, p. 960) claims “all conservation efforts should aspire to win–win situations”. Yet, even on these grounds, why would conservationists support offsetting unless there was more to gain than that which is lost? Assume there was in reality fair exchange of old biodiversity for new that maintained no net loss. If offsetting provided a perfect substitute conservationists should be indifferent, and if less than perfect in opposition, to such schemes. There must be other reasons attracting conservationists to offsetting and two come to mind.

First is the prior claim that development is inevitable and will therefore go ahead anyway. Conservationists know that recreated ecosystems are second best, lower quality and would rather keep what already exists. However, they have no choice because they lack power and must accept what they can get. In this case there is no ‘win’ for conservation, and there is also a lie in the idea that there will be no net loss.

The approach should not then be described as a positive new era of conservation but rather a nail in its coffin. There is only an accelerating degradation of biodiversity, habitat and species loss in prospect as offsetting increases and repeatedly downgrades existing Nature on a piecemeal basis, project after project, site after site. The fight should then be against development destroying biodiversity in order to reverse this trend, not for biodiversity offsetting that institutionalises the decline.

Second is the possibility for gains that go beyond no net loss and so make indifference illogical. Conservationists might argue there is adequate room for compensation by developers in excess of merely rectifying the harm they create. In order for there to be such compensation there must be an economic surplus beyond the cost the developer incurs for undertaking the project. The surplus developers capture depends upon their ability to minimise costs including those of any offset scheme. For ecologists and conservation biologists the ecological value is important but for developers this is merely another financial cost. In purely economic terms there is a case for supporting offsetting and seeing this as a positive outcome, not just for developers and conservationist but for society, if the benefits exceed the costs.

This economic case in favour of offsets implies that government intervention should also be undertaken to support offsetting if it creates such net social welfare. This is in fact the argument put forward by those favouring economic growth that destroys biodiversity. The basic mainstream economic argument in favour of ‘decision-makers’ adopting biodiversity offsets as official policy might then be broken down into six steps.³

1. There is an amount of compensation that falls between that which losers are willing to accept as a minimum and developers are willing to pay as a maximum. As economically rational individuals, both sides will prefer biodiversity destruction and development.
2. Whatever well-informed and rational individuals prefer makes them better-off. (Ethical Premise A)
3. So developers destroying biodiversity and paying compensation makes everyone better-off. This is a win–win scenario.
4. A social welfare improvement can be obtained on the (Pareto) criterion that some people are made better-off and none worse-off. (Ethical Premise B)
5. Society should adopt policies that make some people better-off and none worse-off. (Ethical Premise C)
6. Governments as societal representatives should adopt policies that destroy biodiversity and pay compensation.

Offsetting in this economic logic is a form of compensation that can be represented by the cost of biodiversity restoration/improvement, or credit note purchase, as incurred by the developer.

In this argument, economists take preference satisfaction as being linked to welfare (being better-off), and welfare enhancement is taken as the moral good. Three specific moral premises (A, B and C) are involved. The argument moves from a supposedly positive (i.e., objective) claim, about how rational and well-informed agents choose, to an ethical premise (A) about welfare. Moving from individual welfare to a societal level involves deciding how to deal with conflicts and welfare economics does this by side-stepping the whole issue using another ethical premise (B) the Pareto criterion. Due to the fact that someone is nearly always made worse-off in public policy decisions the issue of compensation becomes central. Harm must be rectifiable by good. Finally, there is a move from a claim about social welfare to a claim about public policy, based upon an ethical premise (C) about societal action. In this whole process the extent to which agents’ preferences are satisfied is taken as the criteria of welfare. This is measured, as in any market exchange, by the willingness to pay of

³ Here I have adapted and expanded from a discussion on the economics of rich nations dumping waste in poor nations Hausman, D.M., McPherson, M.S., 2008. The Philosophical Foundations of Mainstream Normative Economics, In *The Philosophy of Economics: An Anthology*. ed. D.M. Hausman, pp. 226–250. University Press, Cambridge.

the buyer (in our case the developer) to achieve their favoured outcome, and the simultaneous and reciprocal willingness to accept compensation by the seller (i.e., stakeholders with institutionalised rights over what is being exchanged).⁴

This economic justification for biodiversity exchange and offsetting raises a series of objections. (i) There may be complexity and indeterminacy so that uncertainties arise preventing both parties from ever being well-informed. Offsetting aims to simplify and avoid, not address, such issues. (ii) Information can be asymmetrical so one party has an advantage over the other (unequal power). For example, a developer has a financial interest in suppressing information about ecological value at the project site of which the regulatory authority knows nothing. (iii) Premise A may be rejected as a moral criteria because agents are quite simply not always the best judge of what should be done, and enter into exchanges against their own best interests. For example, myopia and selling long term assets for short term gain. (iv) There are other ethical criteria on which to make judgements rather than the cost involved in compensation (e.g. justice, rights, virtues). (v) Related to this, the deliberate infliction of harm on the innocent (both human and non-human) does not equate with the creation of good except in specific forms of consequentialist ethics. (vi) What economists always regard as compensation may also be regarded as moral bribery, depending upon the context; for example, developers paying NGOs who are then morally compromised and unable to criticise those developers. (vii) The underlying model of rationality can be rejected as failing to account for real human behaviour and so what is necessary to run a society. Agents acting as purely selfish individuals seeking to negotiate gain for personal interest fail to take into account, and would destroy, the trust that is necessary for the operation of social institutions including those of exchange (e.g., see Sen, 1977). (viii) Choices are not best regarded as trade-offs solved by supplying appropriate levels of compensation, but rather moral conflicts requiring debate, discussion, deliberation and judgement for resolution (Holland, 2002; Spash, 2008b). While some of these issues may be more pertinent than others, the economic argument for adopting biodiversity offsetting proves both highly contentious and ethically loaded.

Mainstream economics also assumes away issues of income inequality as being problems for society to handle that lie outside its chosen remit to concentrate on efficiency, as if the two could be kept separate. The Pareto criterion is consistent with making the wealthy better-off and the poor no worse-off, and where compensation is unpaid (potential) can make the rich better-off and the poor worse-off. Where there is income inequality compensation can be regarded as unjust, or at least not undertaken on an equal footing, i.e. the measuring rod of money is not constant. As Martinez-Alier (2002, pp. 30, 111) says “the poor sell cheap”. “If natural capital has a low price, because it belongs to nobody or to poor and powerless people who must sell it cheaply, then the destruction of nature will be undervalued.” (Martinez-Alier, 2002, p. 45). There are then opportunities for arbitrage where offset providers exploit poor landowners and lands lacking clear entitlements (i.e. land grabbing). Land grabbing is already highly problematic in countries pushing economic growth as development, and is being driven globally by multinational corporations and foreign investors (Bienkowski, 2013; Geary, 2012). Offsetting may merely help legitimise, or be legitimised by, such fraudulent land dealings.

Income is power to command resources. Yet power is totally outside the economic model. The distribution of income in society is taken as given because otherwise efficiency analysis is undermined (i.e. redistribution changes the allocation of resources and what is produced for whom). In the market place exchanges are regarded

as free and fair between freely engaging actors with no coercion. Yet this absence of power simultaneously conflicts with the claims made for consumer sovereignty, because a sovereign by definition has power over those they command (Fellner and Spash, 2014). In the context of offsets there is typically inequity in both wealth and power with corporate interests, developers and their political allies having the upper hand on both fronts. This in fact was the reason given earlier for why offsets are even being considered, because the powers of those bulldozing biodiversity makes it seem inevitable and unstoppable.

This brief exposition should make clear that claims about offsets as economically efficient instruments providing social welfare improvements are embedded in moral claims. As Hausman and McPherson (2008, p. 248) note: “The evaluation given by the market or simulated by welfare economists depends on a highly contestable theory of welfare and is no more solid or objective than other sorts of moral appraisals.” There is in fact no economic logic applicable in public policy that is free from values.

That attempts are made to justify offsets as improving efficiency shows the link to a core way in which mainstream economics frames all issues. Efficiency is taken by economists to be uncontroversial and even objective when in fact it is a moral goal. Efficiency is the ethical criterion condemning the deliberately waste of resources. The ethical judgement is that waste is bad and avoiding waste is good. Human societies actually ritualise resource wastage and this includes consumer society, e.g. fashion. There is a long social history of wasting resources as a display of power and wealth, and this is prevalent today e.g. celebrity weddings, stretch Limos, SUVs, McMansions, private jets, luxury yachts. Economics pays no attention to the double standard of promoting efficiency and simultaneously the conspicuous consumption and waste of the consumerist growth economy.

5. Designing human–Nature relationships

There are numerous issues that arise when designing any regulatory system. Table 1 summarises some of the principle problems arising over biodiversity offset design. Those who are in favour of offsets regard such things as solvable technical issues. However, these issues also implicitly involve a range of deeper concerns such as human–Nature

Table 1
Some issues with offsets ‘design’ and operation.

<i>Baseline scenario</i> , what is the current state of biodiversity?
<i>Additionality</i> , what does the offset site add that would not have occurred anyway?
<i>Comparability</i> , how far is the offset site equivalent with the original site and on what basis?
<i>Measurability</i> , how are characteristics of importance to be measured (i.e. metrics) and what about things that cannot be quantified or measured?
<i>Commensurability</i> , can all the objects of value be measured on the same basis?
<i>Complexity</i> , how much ecosystem complexity is permissible before offsets become infeasible?
<i>Time</i> , over what time period will the offset scheme deliver and be maintained?
<i>Space</i> , where should the offset site be located relative to the original site?
<i>Uncertainty</i> , what approach is taken to the unknowns and the unknowables?
<i>Measure of last resort</i> , is the mitigation hierarchy going to be strictly employed so that offsets only occur after harm has been avoided, mitigated and/or rehabilitated?
<i>Enforcement</i> , what mechanisms are going to ensure monitoring and performance?
<i>Transaction costs</i> , who will cover all the set-up and running costs involved, and are they less than alternatives e.g. direct regulation?
<i>Liability and severance</i> , what will be the responsibility of the developer for ensuring the quality of the offset and can they be held responsible for failure, or will offset purchase be used to claim they complied regardless of any actual change in say biodiversity?
<i>Speculation</i> , will trading of credits result in financial speculation and price manipulation for rent seeking and profiteering.
<i>Financialisation</i> , will there be a divorce between traded credit value and the physical reality to which credits relate?

⁴ A category of losers, as used above, could go well beyond those simply holding rights of this kind. For example, loss of free roaming birds, mammals, fish and insects may impact many who have no such rights, let alone property rights.

relationships, treatment of plural environmental values, public vs. private property rights, the treatment of uncertainty and the role of expert judgement in public policy. Space precludes going through all the issues, or covering [Table 1](#) in detail, but a few examples can serve to illustrate some key points.

Knowing of what an ecosystem consists is a necessary first step to assessing both what will be lost in development and what might be gained at an offset site. Existing knowledge is unevenly distributed, for example, land managers and locals might be expected to know more than distant land owners, corporations or regulators. Offsets attempt to level the playing field using expert ecological assessment. In economic terms assessing the physical components of ecosystem function, structure, rarity and presence of endangered species, is inadequate. Economics concerns human well-being, or in neoclassical economics (a more narrow concept) welfare. This requires taking into account cultural, social and economic factors of change for compensation to be equivalent. Neoclassical economics would then convert all this into a single money metric. Social ecological economics would employ a multiple criteria approach allowing for incommensurability. The greater the complexity here the less likely a comparable site is to be found. For example, people local to the development site will lose a place where they may have grown-up and have family history, because by definition another site is going to 'replace' it. In economic terms this psychological damage is as much a loss as species and ecosystem functions.

Defining the terms in which offsets are undertaken acts to disempower/empower specific groups and their values. Offsets are typically limited to a narrow conceptualisation of instrumental values based around the quality of a site in terms of Nature metrics. For example, in the UK pilot offset scheme a habitat scoring metric is based upon condition (poor, moderate, good) and biodiversity distinctiveness (low, medium, high). Amongst those who want biodiversity offsets, there is a clear desire to make development easier and that means using the simplest metrics possible. As [Mann et al. \(2014\)](#) note, with respect to the USA, "the dominance of a neo-liberal imperative has led to the question of how to render ecological complexity in a form that is as abstract and transportable as a commodity". The conflict between ecology and economy is then evident.

"Ecological proponents are usually more concerned with issues of complexity, uniqueness and uncertainty for governance and management of nature and reluctant to draw up general scales. On the economic end, the focus tends to be on the efficiency of compensation tradeoffs and the liquidity of markets, which leads to the promotion of simple and standardised methods of establishing equivalence between incremental units of nature."

[[Mann et al., 2014, p. 15](#)]

Simple metrics will make transactions occur faster and at lower financial cost for the developer, although they fail to adequately represent the social and ecological attributes of lost Nature.

In [ten Kate et al. \(2004, p.13\)](#) offsets are defined as: "conservation actions intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects, so as to ensure no net loss of biodiversity." This approach employs a common claim that offsets will be a method of last resort in the conservation 'mitigation hierarchy'. In the UK the erosion of existing legislation protecting land for conservation and related environmental value has been openly admitted as a government intention. As reported in the national news.

"The offset debate is central to future British nature conservation because environment secretary, Owen Paterson, is keen to have laws passed here which would allow ancient woods, wetlands and sites of special scientific interest to be destroyed to make way for road, housing and rail developments in return for new woods being planted or areas being flooded."

[[Vidal, 2014](#)] [emphasis original]

Paterson has clearly been concerned to promote economic growth and reduce barriers to rapid development that might be posed by existing legislation and planning regulations (see also [Apostolopoulou and Adams, forthcoming](#)).

In the USA the Nature Conservancy, an ENGO, has become an advocate for biodiversity offsetting. Their "Development by Design" framework aims to "identify development impact and determine appropriate offsets with ecological equivalence" ([Madsen et al., 2010, p. 31](#)). Their chief scientist, ecologist Peter Kareiva, believes "working with and partnering with corporations is a promising conservation strategy", because they are equivalent to a keystone species ([Revkin, 2012](#)). In a flyer entitled "Natural Solutions for a Growing World" they advertise alliance with BP America and the goal of "transforming the mitigation hierarchy". That basically means replacing it by using "compensatory mitigation programs for biodiversity impacts". They declare that "NGOs are advancing international principles and standards for biodiversity offsets". The Nature Conservancy is now pushing biodiversity offsets for oil, gas and coal mining, while promoting economic growth as development and a vision of conservation as creative destruction.

Such new environmental pragmatism adopts a narrow set of social and ecological priorities. This creates a fungible concept of ecosystems and species falling in line with the neoclassical economics concept of natural capital. In addition, the role of restoration ecology becomes one of 'producing' Nature as a human artefact, because Nature is to be regarded as a mere human construct. Restoration has been criticised as a project for promoting man's control, mastery and domination of Nature in denial of its own autonomy ([Katz, 2014](#)). There is a distinct shallowness to the conceptualised human–Nature relationship and refusal to accept there are alternatives ([Doak et al., 2014](#)).

Prioritising trading over social and ecological criteria divorces the instruments of exchange from the underlying reality. In the case of species banking a site is given credits on the basis of providing habitat for members of a species that will be destroyed elsewhere. The credits may be based on actual numbers of a species (e.g. breeding pairs) but more typically employs a proxy measure using land area of habitat conserved, created or restored. According to [Sullivan \(2012, p. 14\)](#) for the USA species banking scheme 107 out of 123 banks were listed as preserving already conserved habitat. This raises concerns that they add nothing to a business as usual or status quo position, i.e. there are no more members of a species than would have existed anyway. In that case the scheme merely passes money for nothing, and legitimises the resulting net loss of species. Again, the so-called 'better than nothing' justification proves fallacious. Such additional concerns raise the need to predict what the world would have been like without the offset scheme, and what is adequate to ensure an addition to that base case in a changing and uncertain world (additionality has also been highly problematic for carbon offsets, see [Spash, 2010](#)). This requirement for prediction inevitably promotes a strong role for experts.

Mainstream economic regulatory approaches (e.g. emissions trading, taxation, subsidies) are also expert driven tools for administration. They fit well with a technocratic administrative structure which is closed to the public. This results in a very specific approach to environmental problems, that [Dryzek \(2005\)](#) terms administrative rationalism, where experts are empowered to design policy initiatives that direct government action. In this process, Nature is regarded as subordinate to humans and environmental policy is a problem solving exercise.

Public debate, contestation and political process are replaced as soon as economic approaches become institutionalised. The closing down of debate shifts ground from principled arguments and broader societal and consequential impacts for regulation to the technical detail of implementation. Analytical and design issues then predominate, protecting the protagonists with a barrier of expert knowledge. Successful closure is achieved when broader engagement is prevented by positioning design

and implementation issues as objective technical questions that are the sole remit of experts.

Regulatory capture means government choice of experts and framing of the policy problems aims to direct and control public debate and suppress opposition to corporate interests. In the UK under the Conservative Party administration serious concerns have arisen over regulatory capture and conflicts of interest in conservation and land use planning (ECRA, 2014). For example, Natural England is the governing body responsible for protecting biodiversity. The government appointed David Hill as Deputy Chair (2011) and Andrew Sells as Chair (2013). While Hill is an ecologist he is also founder and chairman of The Environment Bank, a private company working to broker biodiversity offsetting agreements for developers and landowners. Sells is an accountant, investment banker and property developer who has made major financial contributions (£111,000 in 2010 and 2011) to the Conservative Party. He is a treasurer of the Conservative think tank Policy Exchange that put biodiversity offsetting on the UK's political agenda (Monbiot, 2013).

The process of conservation adopting biodiversity offsets and banking is then one where an initially open debate in society can be quickly closed down. Value conflicts over human–Nature relationships are forced into being expressed as differences over technical details (Sullivan and Hannis, 2014). The underlying rationality of market-based approaches and the expectations of their performance, limitations and societal consequences are placed beyond question. As Mann et al. (2014, p. 12) note, this is part of changing how society is governed and rationalises about the world.

“the design of biodiversity offsets and banking approaches is part of a larger, transnational process of reconfiguring environmental governance through environmental markets. The construction of these designs and tools is de facto a political process of establishing collectively binding rationalities for humans to relate with nature.”

The process is well underway without any public debate. At Rio+20 the Natural Capital Declaration was launched as a financial sector, CEO endorsed, initiative to mainstream natural capital into loans, bonds, equities and insurance, as well as accounting and reporting frameworks. Internationally 44 financial institutions are signatories.

6. Conclusions

A shift is perceptible in conservation from the protection of Nature for non-instrumental and ecocentric reasons such as duty of care, prevention of harm and protection of non-humans to the anthropocentric, instrumental and economic. Matching the rise of neoliberal political economy, the role of Nature has become exclusively that of value provision in the global economy. The aim has been to convert environmental problems into a narrow mainstream economic and financial discourse supporting market governance. Ideally Nature can be bought and sold to boost corporate profits. If nothing else Nature protection cannot be allowed to stand in the way of business interests and economic growth.

This is the same logic supporting biodiversity offsetting because developers are expected to make gains that exceed costs allowing them to claim: (i) a legitimate political reason for destroying habitat based on the creation of jobs, growth and economic value; (ii) an efficiency gain can result because a net economic surplus will be created; and (iii) conservation will benefit from trading habitat by capturing some of this surplus. In pushing this agenda forward biodiversity offsets and banking are claimed to correct the failure to give Nature a value, send price signals for competitive markets to allocate resources efficiently and avoid ethical conflict. These claims are all deeply flawed. The real substantive claims that are justified concern providing business opportunities for middlemen and financial services, promoting economic growth and deconstructing regulatory blocks to corporate interests. Developers have a clear interest in buying, or creating, the cheapest acceptable offsets and getting such schemes in place. Offsets by definition are about

destruction of ecosystems, species habitat and local Nature in order to benefit developers. They redefine human–Nature relationships as value capture and capital maintenance, where Nature becomes a malleable constructed human artefact. In the capital accumulating growth economy such creative destruction is the mantra of progress and development. Roll on the bulldozers.

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